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ABSTRACT

This curriculum guide was created to guide workplace basic skills instructors in the design of customized curricula for Project Employment Assistance and Skill Enhancement (EASE II), an on-the-job literacy and basic skills improvement project for employees of small companies in the metal working industry in the Chicago area. The guide contains lesson plans for three courses: workplace vocational English as a second language on three levels, p, estatistical processing control mathematics, and training the trainer. Lesson plans include competencies to be taught, instructional activities, introduction and presentation, lesson practice and reinforcement activities, evaluation, and instructional materials. (KC)

PROJECT EASE II

OFFICE OF APPLIED INNOVATIONS

WORKPLACE EDUCATION CURRICULA: FROM TEACHING BASIC SKILLS TO TRAINING THE TRAINER

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PROJECT EASE II WORKPLACE CURRICULUM
OFFICE OF APPLIED INNOVATIONS (OAI)

Purpose and Scope

The Project EASE Workplace Curriculum has been created to guide workplace basic skills instructors in the design of customized curricula for the precision metal work industry. Additionally, it is an historical record of OAI's development as a curriculum innovator. The samples submitted here were selected to represent three distinct stages through which OAI staff have travelled in our three years of research and innovation under national workplace literacy demonstration grants:

CURRICULUM STAGE	FOCUS	EXAMPLES
I. Basic Skills	• Customizing • Nesting multiple skills	• Beginning ESL • Intermediate ESL • Advanced ESL • Basic Math
II. Pre-technical and Technical Support Basic Skills	• Applying basics to technical training needs • Diversifying delivery models	• Pre-SPC Math • Blueprint BVT
III. Institutionalizing the Training Function	• Special needs population awareness • Techniques of training • Hands-on application	• Train the trainer

Stage I: Teaching Basic Skills

At the outset of our grant period, OAI conducted formal and informal assessments of training needs among our partner companies in the metro-Chicago precision metalwork industry. Chicago's tradition of providing unskilled and semi-skilled manual jobs to new immigrants and newly legalized aliens has brought with it a steady flow of hardy blue collar workers. It has also brought the problem of communicating with and training workers with English language proficiency too limited to keep pace with rapid changes in product lines and technologies. Ninety percent of our partner clients identified their limited English proficient workers as the group most in need of our training efforts

and the functional and technical English of the workplace as the most needed skill . Not wanting to neglect their native English speaking workers, the companies asked us to address basic applied math needs with that group. The areas of skill development most often requested by new Project EASE partner companies were the following:

- *Three levels of Vocational English as a Second Language (VESL)*
  - *Beginning*
  - *Intermediate*
  - *Advanced*
- *Basic Technical Mathematics*

Our vision was to create a textless classroom which, in effect, drew its " text" from the context of the learners' job tasks and the company 's organization, culture, and strategic plans. To realize this vision, staff had to become expert investigators, drawing information and direction from workers, supervisors, and managerial staff. Once the literacy audit was complete, instructors were charged with continuing to build a body of knowledge about the companies they worked with and to take on a professional liaison role. The vast majority of faculty thrived with this vote of confidence from OAI and blossomed into first rate curriculum developers and innovators.

Customizing through partnerships

- With the corporate client

Throughout the partnership period, Project EASE staff maintained sensitivity to training needs by meeting regularly with corporate planning teams composed of a cross-section of company personnel.. On completion of the **EASE Literacy Audit** * and the assessment process, EASE staff identified the gaps between basic skills demands of the jobs audited and the basic skills levels of the workers who do them. Proposed **course outlines*** were prepared to address the skills gaps observed and **competency checklists*** designed to focus the evaluation of each student's progress. Project staff then reality-tested the audit summaries with their corporate planning teams. Any necessary alterations to the course outlines and competency checklists were made jointly at that time. Supervisors received an orientation to their role, which was crucial to the success of the partnership. Instructors met with them before, during, and after the course to solicit their input on student progress via the **Record of Progress Observed.*** Course content was modified whenever necessary during the instructional cycle to reflect the changing priorities of production and company training plans.

- With the learners

Learner needs and goals were assessed at the beginning of each class via the **Individual Education Plan (IEP)** *, and these were incorporated into the curriculum already revised by the planning committee. Learners were asked to evaluate themselves routinely in terms of the progress they made toward personal goals and their application of targeted teamskills. Additionally, each learner completed a **structured** and/or **open-ended evaluation** * of the instruction and its impact on his skills and attitudes.

* See appendices

Nesting Multiple Skills

In order to maximize the return on worker time off the line for training, OAI staff saw the need to integrate a number new skills in every lesson. In effecting this integration we are indebted greatly to James Bellanca and Robin Fogarty of the Illinois Renewal Institute for their outstanding work in the areas of critical/creative thinking models and curriculum structures . The **nested curriculum** has proved to be an ideal model for maximizing the effectiveness of EASE training cycles, as it allows for integrating content-specific, social, and thinking skills development into a single lesson. For purposes of our program, OAI staff would incorporate most of the following skills in a lesson:

* math enabling skills/ English grammar skills
* graphic organizers
* thinking skills
* teamskills
* content knowledge

So as not to overburden the learner, only 3 skill areas would be varied at any one time, while the others were held constant for reinforcement.

Graphic organizers have been incorporated as ideal facilitators of **thinking skills**, quickly clarifying the relationship of ideas and taking advantage of the brain's preference for visual as opposed to verbal data. The works of Spencer Kagan have provided rich resources for ready-make team structures such as Numbered Heads and for **teamskill** observation instruments.

Lesson Format and Duration

The EASE curriculum has adapted Thomas and Kuy's lesson plan sequence, which includes the following components:

•	**Presentation:**	Sets the workplace scenario and accesses the learner's prior knowledge
▸	**Practice:**	Guides a teacher-directed activity which usually focuses on developing several skills simultaneously
▸	**Application:**	Usually conducted as a team activity in which learners select from among several given options or issues that are company- or department-wide
▸	**Reinforcement:**	Nearly always a self-directed team activity which is related directly to the jobs of team members
▸	**Evaluation:**	May have a teacher observation component but is more typically designed to invite learner self-reflection or observation of peer behaviors

Each of the four basic curricula guides a 36-hour cycle of instruction delivered in 90-minute segments, twice weekly, for a period of 12 weeks. Most lessons require several 90-minute instructional periods, which would of necessity be bridged in the second segment with a review of the first segment's content. The materials attached to some lessons (e.g. math) are intended to guide instructors through class activities and at the same time model a sound format for new lesson development. Sample graphic organizers and evaluation tools are appended as additional resources for those who wish to design and implement customized lessons.

Stage II: Pre-technical and Technical Support Basic Skills

OAI staff and learners were so successful in their skill building partnership in EASE I that corporate clients began more and more to request a bridge between the applied language and math skills development and the kinds of technical training they were now anxious to deliver. Typically, the client training plan included a sequence of three must-do courses: Basic Metrology, Elementary Blueprint Reading, and Basic Statistical Process Control (SPC). In the initial planning stage, OAI staff met with corporate planning teams of technicians and foremen, some of whom had been appointed as technical trainers for the upcoming classes. Uncomfortabe with this additional and new set of duties, most of the trainers-to-be proposed commercial texts and workbooks which were far beyond the capabilities of their line worker trainees. It became our task, then, to draw from these groups a bottom line need-to-know list of principles and skills for each of the target training areas. This list became the building base for designing activities and exercises which would provide experiential learning of skills and knowledge which workers needed to apply and, therefore, would be able to reinforce immediately on the job. To further bridge between trainee skills levels and technical coursework, OAI utilized two Bilingual Vocational Training (BVT) models :

The **Front-end model** provides basic skills on a just-in-time basis, and packs its skill development into a period immediately preceding technical training, tailoring its activities to the upcoming training exercises. The *Pre-SPC Math* is an example of the Front-end model in which the basic skills component was delivered in English to limited English proficient trainees over a period of 10 weeks. The technical portion in this case was telescoped into only two weeks with the use of Spanish, the first language of both the technical trainer and the trainees.

The **Concurrent model** allows trainees who want to enter technical training without delay to do so while providing them a forum to practice skills and clarify information. The *Elementary Blueprint BVT* course follows this paradigm, alternating contact hours of technical and basic skills instruction, almost one for one. In this course the design of the exercises was a result of intense pre-course and ongoing collaboration between the technical trainer and the basic skills curriculum coordinator, who completed class exercises with drafting tools and company blueprints like any other trainee. The result was an integrated basic skills/technical course in blueprint reading complete with customized pre- and post-tests utilizing company blueprints and parts. No first language component was utilized in this

course because of ethnic heterogeneity among class members and overall high proficiency in English.

It should be mentioned for those programs serving limited English proficient trainees that these models work best for trainees with English proficiencies in the high intermediate to advanced level (MELT SPL VII and above).

Stage III: Institutionalizing the training function

Team teaching with technical trainers , many of whom were training formally for the first time, was an enlightening experience for us. We became acutely aware of how little appreciation they had for the gaps in knowledge and skills their line workers brought to the training situation. Most wanted to use commercial materials; many wanted to lecture and expected trainees to take notes and pose hypothetical questions or make analytical observations. In short, theu expected their audiences to have the mindset and skill set of workers with post-secondary educations. When frustrated in these expectations, they did not know what alternative course of action to take. OAI's *Train the Trainer (TTT)* course evolved over time to meet the eagerness of our long-term partners to take on the training role and their readily acknowledged need for a practical hands-on preparation. Designed for 12 contact hours, the course includes awareness of special needs populations, multi-sensory techniques of teaching, pre-post assessment design, lesson planning, and a 15-minute mini-lesson practicum for each participant. The latter is designed for delivery and peer evaluation in a small group so as to reduce anxiety. Post-TTT technical assistance is provided to any participant for a year following the trai ning.

Staff development/Training

No curriculum can be adequately conceptualized or delivered without a continuous schedule of staff development for instructional staff. To ensure this outcome OAI has provided staff with a rich array of training in the areas of adult learning theory, methods and materials, multi-sensory techniques, cognitive skill building, and lesson planning. Furthermore, to promote ownership of the staff development process, all staff members are asked to identify and prioritize a list of training topics for the year. Each member teams with a partner twice yearly to research a topic from the prioritized list and to present a 30 to 60-minute staff development activity to other staff at the monthly meeting. Additionally, staff share ideas and techniques and solve problems during informal networking sessions. Fresh ideas and new paradigms are regularly introduced and integrated into existing methodologies via some of the best thinkers, speakers, and teachers in the fields of leaderhip, education, and cognition: Stephen Covey, Peter Senge, Warren Bennis, Thomas Sticht, and Reuven Feuerstein. OAI has been and will remain committed to a policy of continuous improvement in developing staff and delivering quality training products to the precision metal industry in metropolitan Chicago.

PROJECT EASE

TARGET GROUP	Beginning VESL	Week 1
Workplace Competency	Give name and department	
Technical and/or Sub-technical Vocabulary	department, country, alphabet letters and numbers 0-9; his, her, I'm, your, he, she, my	
Grammatical Patterns	subject--verb To Be--object What is ...	
Thinking Skills		
Team Skills	round robin; pairs	
Graphic Organizer		

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to ask and answer social questions and write legibly.

2. **INTRODUCTION/PRESENTATION:**
   - Introductions: Hi/Hello, my name is _____. What's your name? My name is _____. Employees practice this short dialogue round robin around the room.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**
   - Add: My name is _____. His/her name is _____.
   - Add: What country are you from? I'm from _____.
   - Add: My country is _____. His country is _____.
   - Add: What is your department? My department is _____.
   - Add: My department is _____. His/her department is _____

PROJECT EASE

TARGET GROUP	**Beginning VESL** Week 2
Workplace Competency	Fill out a simple chart
Technical and/or Sub-technical Vocabulary	grid, chart, rows, columns, form, words on alphabet list
Grammatical Patterns	What is... I am (I'm), His/Her _____ is; He/She is...
Thinking Skills	classify
Team Skills	pairs taking turns
Graphic Organizer	chart, grid

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to be able to read and fill out simple charts.

2. **INTRODUCTION/PRESENTATION:**
   - The whole class repeats the written conversation for review and pronunciation practice. See attached.

   - Hand out number cards. Dictate the alphabet and numbers out of order. Call on # 1 to go to the board to write the letter. The class verifies if he/she is correct. Tell them to practice writing the numbers and **spelling** the number words for HW.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**
   - Explain rows and columns. First label the Classification Grid columns: name, country, department (written on the board). Model the conversation and filling out of the chart. Ask What is your name? Write the answer in the appropriate box in the chart. Continue with "What is your country?" and "What is your department?" Divide students into pairs. They repeat the activity. Each student needs to talk to at least 3 other students so that a total of 3 to 4 rows are completed.
   - Hand out the Demographic chart and have them fill it out. Ask how many

rows and columns there are. Use the overhead to guide the activity. Collect this sheet.

- Hand out the alphabet list. Read over the words. Give students lined paper to write the word and definition. Ask for the meaning of each word and see how many of the words the students can define. They are to write the word and its short definition on the paper. Cover 5 words each class until the list is done. This exercise should be filed in the Vocabulary part of the notebook.

- When class is over, complement them and say, "Class is finished. You've done a great job. See you Thursday." They are to respond, "See you Thursday."

- HW Practice writing and saying numbers and/or number words. Practice saying the words on the Alphabet List and in the Dictionary.

4. **EVALUATION:** Observe fluency in conversations; dictation "quiz"

5. **ATTACHED MATERIALS:** Classification Grid; Demographic chart; Number practice

- Whole conversation: See attached conversation.

- Practice numbers from 0 to 9. Repeat the numbers. Then say the number when the teacher holds up the number. Hold up the correct number of fingers when the teacher says the number. Distribute the number cards. Practice the dialogue with each person directing the questions to the next number. Change cards and practice again. Additional activity for number practice: tell how many children (grandchildren?) he/she has.

- Hold up alphabet letters. Elicit the name of the letter from the class. Have them repeat each letter. Hold up a card. Have them say the letter and then write it on the More Practice alphabet sheet. Use letter cards that show both upper and lower case letters. Model one set on More Practice sheet.

HW Ask them to write each set (upper and lower case) of letters 5 more times and try to say the letter each time.

4. **EVALUATION:** Students answer any of the questions introduced in the class. End the class with, "Good bye _____. See you Tuesday/Thursday."

5. **ATTACHED MATERIALS:** Alphabet More Practice sheet; Practice Conversation

PROJECT EASE

TARGET GROUP	**Beginning VESL**	Week 3
Workplace Competency	Describe work-related activities	
Technical and/or Sub-technical Vocabulary	who, where, subject pronouns, job title, birth place	
Grammatical Patterns	Subject pronouns, contractions; present and past tense verb To Be, Excuse me...	
Thinking Skills	classifying	
Team Skills	round robin; triads and pairs taking turns	
Graphic Organizer	simple table: Dictionary	

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to be able to talk about work activities to supervisors and customers.

2. **INTRODUCTION/PRESENTATION:**

- Hand out another notebook divider as needed for graphics, dialogue, or grammar.

- Dictate numbers including minimal pairs (ex. 13--30); alphabet letters

- Introduce, "What is your job title?", "Excuse me, what is...?". Practice **top** dialogue on Practice Dialog 2 sheet. Divide into triads. Each person in the triad goes through the dialog one time. Practice at home.

- Collect HW. Quickly review skills learned (See flip chart).

- Pass out alphabet cards to students. Call out letters. Students hold up appropriate letters. Repeat the words on the Alphabet List. Complete 5 more alphabet list definitions. Write the word and definition on the lined paper. Try to

use in a sentence.3.

LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:

- Introduce Who and Where. Practice saying the questions on the Who, What, Where sheet. The exercise can be done in pairs, triads, or round robin.

Each student introduces him/herself by saying the B statements in order. Recommend students stand up to make their introductions.

- Hand out the dictionary. Write in current lesson vocabulary words on the flip chart. Students copy into Dictionary. Repeat these words. Try to elicit sentences using these words. Use the questions Who, What, and Where. Write these question phrases (like What is...) on the board.

- Pass out number cards. Using the Who, What, Where sheet. Students ask and answer questions (Student 1 asks student 2 who answers; student 2 asks student 3, etc). Begin the question with the person's name.

- Develop vocabulary to answer the following questions:

What are you doing?

Look for actions--sitting, standing, laughing, smiling, crying, writing, reading, talking, speaking, listening, whispering, yelling, working, eating, sleeping, learning, etc.

Related to the job--assembling, moving, delivering, inspecting, soldering, weighing, setting-up, sorting fitting, operating, drilling, shipping, testing, painting, repairing.

How are you (doing)?

Adjectives--happy, sad, fine, unhappy, glad, tired, sleepy, OK...

4. **EVALUATION:** Today I learned _____. What did you learn? Student who answers asks the question to the next student. Instructor writes on the flip chart what each one learned. Adds additional skills that were learned so students are continually aware of the learning process going on.

5. **ATTACHED MATERIALS:** Dialog 2; Dictionary; Who, What, Where sheet

PROJECT EASE

TARGET GROUP	Beginning VESL	Week 4
Workplace Competency	Names tools, equipment, and measuring instruments used in own job	
Technical Vocabulary	Allen wrench, micrometer, digital scale, gage, hand truck, etc.	
Grammatical Patterns	Simple present tense of IS, NEED Simple questions: WHAT'S THIS?	
Thinking Skills	Classifying, Brainstorming	
Team Skill	Participating	
Graphic Organizer	Grid/Matrix	

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Employees need to communicate with and cross-train each other in English regarding tasks. Many LEP employees do not know the English names of the tools, equipment, and instruments they use daily.

2. INTRODUCTION/PRESENTATION: Identify departments students represent and list them on the board. Ask students to name items they use at work daily (excluding safety equipment). Draw a three-column grid/matrix on the board and label it DEPARTMENT, TOOLS/EQUIPMENT, and MEASURING INSTRUMENTS. Guide class in selecting items from the list to classify under the given headings.

3. **PRACTICE a:** Team students according to department and have them complete a blank grid/matrix of the tools, etc. which are specific to their worksites. Discuss the verbal and non-verbal behaviors of PARTICIPATING. Model the behaviors and ask teams to practice them as they complete the grids. Teams evaluate themselves on PARTICIPATING skills and then share their grids with the class. Students check their grids with supervisors and bring actual tools and instruments back to class.

   PRACTICE b: Teams report on additions to grid as suggested by supervisors Model the question/answer pattern. WHAT'S THIS? IT'S A... Pairs quiz each other using the realia they have brought Model the use of Total Physical Response (TPR) and have pairs practice using I NEED A /PLEASE HAND ME A as grammatical patterns

4. **APPLICATION:** Elicit a brief realistic dialog from the whole class, using as many newly learned words and grammar patterns as possible. Practice it chorally several times. Each pair performs the dialogue for the class. Pairs then revise the dialog in some way to reflect their work situation and again perform for the claSS.

5. **REINFORCEMENT:** Have each student lead class to his/her work station and identify frequently used tools, in English.

   Brainstorm possible solutions: Mario doesn't know the English name for one of his tools. What can he do to learn this new word? How can he practice using it?

6. **EVALUATION:**
   - Student self-evaluation and peer evaluation of PARTICIPATING.
   - Teacher observation of student's contributions to grid and performance in dialog

7. **ATTACHED MATERIALS:**
   - The Grid
   - Team Skill Behavior Sheet: Participating
   - Team Skill Evaluation Sheet: Participating

TARGET GROUP	**Beginning VESL** Week 5
Workplace Competency	Follow directions.
Technical and/or Sub-technical Vocabulary	look, put, take, give, lift, carry, get, move, stack, count, boxes, parts, desk, chair; prepositions: in, on, under, next to; furniture in the classroom
Grammatical Patterns	command form: Verb + the + noun + preposition + the noun.
Thinking Skills	
Team Skills	pairs or triads: taking turns
Graphic Organizer	"bingo" grid

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to be able to follow common directions.

2. **INTRODUCTION/PRESENTATION:**
   - As each student comes into the room ask, "How are you (doing)? After they are sitting begin a chain question, "What are you doing?"
   - Define 5 more Alphabet list words. Use each word in a sentence. Students copy the sentence and underline the vocabulary word.
   - Go over Word List for pronunciation and comprehension.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**
   - Write the word lists from Follow The Directions on the board. Demonstrate the verbs and prepositions. Students identify the areas and furniture in the room to understand nouns. Make sure each student understands what the words mean. Ask more capable students to "say back" to show their comprehension. Then have them translate in first language to co-workers. Divide students into pairs. Give each pair a box that has 3-5 company parts in it. The instructor uses as many of

the verbs, prepositions, nouns as possible before asking the students to "look in" the box." For example, "Lift the box", "Put the box on the chair", etc.

Go through the Follow the Directions sheet with students making up sentences. The instructor writes these on the board. Partners taking turns following directions read by the instructor from those on the board. Partners practice saying and doing the board directions. After that list has been completed, partners make up and give directions to each other using the box and parts. After 5 minutes of the latter activity for each partner, change partners.

- Give each student a bingo grid. Tell them to randomly number the boxes in the upper left corner. Give the Word List which contains pronouns, verbs, the, and propositions from previous lessons. Students write word number 1 in box 1. Play bingo one or two times. Divide students into teams of 3. Each member takes a turn at being the caller.

- Review the directions vocabulary. Pass out numbers. Following number order, each student reads a sentence and the person with the next number follows the directions. Change numbers and repeat the activity 3 more times. If sentences don't make sense, write them on the board and make corrections.

4. **EVALUATION:** Students are to ask each other, "What did you learn today?" Then each student tells the class, "He/She learned _____ today." Instructor writes down the skills and/or vocabulary.

5. **ATTACHED MATERIALS:** Follow Directions worksheet (HW); bingo grid; word list

PROJECT EASE

TARGET GROUP	**Beginning VESL** Week 6
Workplace Competency	Practice work-related oral language
Technical and/or Sub-technical Vocabulary	review
Grammatical Patterns	review
Thinking Skills	
Team Skills	triads and pairs: taking turns
Graphic Organizer	grids: classification, bingo

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** It is important that employees practice (reinforce) newly acquired language skills.

2. **INTRODUCTION/PRESENTATION:**

   - Read over the word list (for bingo).

   - Practice first two conversations.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**

   - Pick the most competent student to be caller for word bingo. After the game is finished, divide the class into triads. Each team plays at least 3 games so that each member is able to call the words (pronunciation practice). During the bingo game, let the most competent student(s) work on making sentences from the words to use later in sentence bingo.

   - Use Classification Grid to show subject, verb, object to introduce subject pronouns. I am, you are, etc. Students give the object which is a state of being or

-ing verb. They fill in 9 rows on the grid.

- HW Students alphabetize their bingo word list on the first day Alphabet More Practice sheet.
- Using the sentences generated from Day 7, choose another competent student to call a game of sentence bingo. If there are any students with very low reading and writing skills, pair these students with the most competent students (tutor--tutee teams)to practice the beginning conversations while this game is going on. Let them also practice the "treasure hunt" following directions activity. The competent student models the direction while saying it, then gives the direction and the less competent student follows the direction. If possible, the least competent students gives the directions, with help, to the more competent student.

When the game is finished, divide the class into teams of 3 and let them take turns calling for sentence bingo. After each member has called one game, play three games where all the squares must be covered.

- Give bingo words to each team. Let them make and write down as many sentences as they can. This activity can also be given to the tutor-tutee teams. The instructor circulates, helps teams if they are having trouble making sentences, offers encouragement. Point out their good teamwork and improving pronunciation.

- HW Bring a picture with people in it. The picture will be used to practice who, what, where, as well as eliciting as much other English vocabulary as possible. It will also be used to identify similarities among class members.

4. **EVALUATION:** Observation; listening to the oral reading; observe sentence construction and writing

5. **ATTACHED MATERIALS:** Classification Grid; last page More Practice sheet

PROJECT EASE

TARGET GROUP	**Beginning VESL** Week 7
Workplace Competency	Distinguish between similar-sounding infomation questions
Technical and/or Sub-technical Vocabulary	how
Grammatical Patterns	present tense sentences; command form
Thinking Skills	
Team Skills	taking turns; partners A & B, change roles
Graphic Organizer	classification grid

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to incorporate new words into their vocabulary.

2. **INTRODUCTION/PRESENTATION: Try to incorporate yes/no questions throughout the lessons** such as "Do you Understand?"

   - Review "How are you" and "What are you doing?" Ask about the weekend.

   - Follow Directions sequence developed by instructor.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**

   - Students work in teams to make as many sentences as they can from the Word List. Each team reads their sentences outloud. (Variation: Other teams check the sentences that are the same. Team with the most different sentences "wins.")

   - HW Pass out the second part of the word list. Students to make sentences at home.

PROJECT EASE

TARGET GROUP	**Beginning VESL** Week 8
Workplace Competency	Respond appropriately to greetings Practice following directions.
Technical and/or Sub-technical Vocabulary	review; definitions of subject pronouns; when
Grammatical Patterns	action verbs in place of to be
Thinking Skills	
Team Skills	taking turns, helping, encouraging
Graphic Organizer	dictionary

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to be able to explain a situation.

2. **INTRODUCTION/PRESENTATION:**

   - Each student tells how he/she spent the weekend.

   - Ask each student "How are you?" Write their responses on the board: tired, sleepy, happy, OK, fine, so-so, etc. Students to ask the question to each other round robin. Could be done in quad teams.

   - Read the job nouns outloud.

   - Develop a list of "Who we are." Examples will be man, father, husband, co-worker, son, repairman, operator, etc or equivalent nouns for women. Review subject pronouns by asking Who....? and Where...? and use the "Who are We" lists.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**

- Students tell about their pictures using the following dialogue: _____ is in the picture. He (She, they) is (are) _____ (doing). The place is _____. The picture was taken in _____ (year). Encourage each student to tell as much about his/her picture as possible.

The instructor models the dialogue with his/her picture. The whole class practices repeating the dialogue. Choose the most proficient student to be the first to explain a picture. Let least proficient students give their presentations at the end so they have more time to hear the dialogue and think about how they will tell about their own picture.

- Write* subject pronouns in Dictionary with explanation: I=myself; you=the person I talk to; he, she, it= the person or thing I'm talking about; we=my group; you (plural)=the people I talk to; they=the group I'm talking about.

* Partner students who have difficulty writing with students who write quickly. The tutor can write the information for the tutee.

Demonstrate each category by drawing stick figures on the board and/or grouping members of the class to demonstrate talking to, talking about, singular, plural.

- HW Each student write 5-10 nouns related to work.

- Divide students into triads. Each triad practices their sentences from past lessons on "Who is, am are..."; "Where..."; "What _____ doing?" by using all the subject pronouns (not just "I").

- Hand back the Following Directions homework. Pair students. Partners take turns reading a direction sentence with the other one doing the activity. Partners of less competent students need to model the direction while saying it, say it and help the tutee successfully complete the direction, help the tutee say the direction to the tutor.

- HW Students are to copy their sentences but put one of the 8 subject pronouns in front of each sentence. Ex: "Put the box on the floor" becomes "I (or another pronoun) put the box on the floor."

4. **EVALUATION:** HW; instructor observation; each students expresses what he/she learned

5. **ATTACHED MATERIALS:** None

TARGET GROUP	**Beginning VESL** Week 9
Workplace Competency	Ask for repetition of instructions Identify colored tags in routing system
Technical and/or Sub-technical Vocabulary	tags, colors, terms on the tags
Grammatical Patterns	Excuse me, ... present tense verbs
Thinking Skills	
Team Skills	
Graphic Organizer	

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to take responsibility in understanding Engl sh conversation and instructions.

2. **INTRODUCTION/PRESENTATION:**

   - Excuse me, _____ I don't understand.
     please repeat.
     please speak slower.
     please say it again.
     please speak louder.
     what did you say?

   - Return sentence HW. As students read their sentences, make the appropriate excuse me responses.

   - Students write their verbs on the board. Each student just adds his/her verbs that are not already recorded. The instructor gives definitions for any verbs the students don't know.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**

- Students bring in a picture that has people in it. Each students will tell about his/her own picture using the following dialogue: _____ is in the picture. The _____ is _____ (action). The place is _____. The picture was taken in _____ (year).

- Fill in Dialogue 4 worksheet as each student presents his/her picture. Instructor models the dialogue and fill-in.

- Add vocabulary to the Dictionary from the word list with definitions. Include department names and days of the week. Finish writing the remaining words in the Dictionary at home.

- HW Write 10-20 infinitive verbs.

- Students write the names of as many colors as they can on the board. Elicit an example of each color from the work environment.

- Point to colored tags. Elicit the names of the tags and write correct spelling on the board. Define the vocabulary on the tags. Use the color and description in a sentence. Develop questions for each tag. "The gold tag means the castings go to paint preparation. What is paint preparation? Paint preparation is _____. Where is the paint preparation? The paint preparation is _____.

- Review present tense verb construction. See handout.

- HW Color Code worksheet

4. **EVALUATION:** Round robin: Each student asks the next, "What did you learn today?" Responds with the answer, "He/She learned _____. The instructor writes down the responses.

5. **ATTACHED MATERIALS:** word list (with definitions), colored tags, Color Code sheet; present tense verb sheet, Dialogue 4

PROJECT EASE

TARGET GROUP	**Beginning VESL** Week 10
Workplace Competency	Give and follow directions Explain what someone is doing
Technical and/or Sub-technical Vocabulary	review
Grammatical Patterns	I can I can't
Thinking Skills	categorize
Team Skills	roles: reader, doer, helper
Graphic Organizer	grids

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to be able to give/explain directions as well as follow them.

2. **INTRODUCTION/PRESENTATION:**

- Each student tells what he/she did on the weekend. The information is recorded in a 6 column grid: who, what, when, where, I can, I can't (Classification Grid B). Review the 6 column headings. Who is the person's name; what is the activity; when is the day (Sat. or Sun.); where is the place (home, park, etc.). Explain can and can't. Instructor models the activity.

- Students read HW sentences outloud..

- Hand out role cards. Explain roles of helper, reader, doer. One person reads the direction, the other does it. The Helper assists with clear pronunciation and with comprehension of the direction itself. Doers and Readers change roles after each direction. Thus, the Reader tells direction 1 to the Doer. When the direction is completed, the Doer becomes the Reader for direction 2, etc. Hand out p. 1 of Following Directions compilation. Students practice their roles with these short directions.

3. LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:

- Practice answering the who, what, where, when questions from the introduction activity for this day using round robin. Divide students into groups. Taking turns, students practice the following dialogue using the information in the grid.

  On Saturday I _____ at _____. On Sunday I _____ at _____.

  Repeat the dialogue substituting the pronouns He, She, They to include each member of the triad.

Write this dialogue on the board so students can copy it. Include the variations using the other subject pronouns.

- Pairs follow a set of written directions, saying them as they do the activity. The two most competent students can write out one or two more sets of directions. Encourage them to make directions using other equipment or places in the room. These directions can be duplicated for Introduction/Review activities.

- HW Students write down 5 "I can" sentences. Less proficient can copy from their chart. More proficient can also write 5 "I can't".

- Hand out p. 2 of Follow Directions compilation. Working in their roles, one student reads the directions, the other follows the directions. Doers and Readers change roles. The helper remains the same. For faster groups, hand out p. 3 of the compilation and let the next most competent person become the helper and let the helper become the first reader.

- Give teams a cut up word list so they can make as many sentences as they are able. These sentences should be written on flip chart paper and taped to the wall. Students walk around the room reading the sentences. Allow 10 minutes for them to practice these sentences.

- HW Categorize and label words on Word List 1 according to verbs, nouns, prepositions. V, N, or P is written above each appropriate word. This labeled list will be used for HW to make a category chart on the Classification Grid. Label three columns on the Classification Grid--verbs. nouns. prepositions. Classify words from the word list according to these categories.

4. **EVALUATION:** In groups, students write down what they learned and share this with the whole class. The instructor collects these evaluations to put in the student files.

5. **ATTACHED MATERIALS:** Classification Grid, Classification Grid B, Follow Directions Compilation, Follow Directions sequence, Word List I

PROJECT EASE

TARGET GROUP	**Beginning VESL** Week 11
Workplace Competency	Gather information about routing tickets
Technical and/or Sub-technical Vocabulary	review
Grammatical Patterns	past tense verbs
Thinking Skills	
Team Skills	help and encourage
Graphic Organizer	Yes-No chart

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to

2. **INTRODUCTION/PRESENTATION:**

   - Each student tells what he/she did on the weekend. The information is recorded in a 6 column grid: who, what, when, where, I can, I can't. Explain can and can't. Practice answering the who, what, where, when questions about the weekend information using the round robin.

   - Ask if there are any questions about past tense.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**

   - Divide students into groups. Taking turns, students practice the following dialogue using the information in the grid.

     On Saturday I _____ at _____. On Sunday I _____ at _____.

   Variations: Repeat the dialogue substituting the pronouns He, She, They to

include each member of the triad. Write this dialogue on the board so students can copy it. Include the variations of other subject pronouns.

- Use verb handout to review past tense verb construction . Students give examples which are written on the board by the instructor.

- HW Write 10 past tense sentences. Bring in 5 castings.

- Students read their past tense sentences to the class.

- Use the color and direction of the tag in a sentence. "The gold tag means the castings go to paint preparation. What is paint preparation? Paint preparation is _____. Where is the paint preparation? The paint preparation is _____. See handout.

Model the first dialogue. Teams go to resource charts to complete the rest of the page.

When teams finish writing the dialogue, they need to practice reading it to each other, helping each other with pronunciation.

- Explain the Classification Grid--Yes-No chart to show specific operations casting undergo before getting shipped to the customer. List the numbers of the castings in the first column. Label other columns with Machining, Plating, Painting, Flash Removal, etc.

HW Complete the Y-N chart by asking the supervisor or inspector for missing information.

4. **EVALUATION:** Yes-No Chart; Ticket Dialogue and Questions; instructor observation

5. **ATTACHED MATERIALS:** Classification Grid B; Classification Grid (Yes-No Chart); Ticket Dialogue and Questions

PROJECT EASE

TARGET GROUP	**Beginning VESL** Week 12
Workplace Competency	Update print resources
Technical and/or Sub-technical Vocabulary	review
Grammatical Patterns	____, ____, and ____...
Thinking Skills	sequencing
Team Skills	pairs, help
Graphic Organizer	flow chart

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to know how to organize written information as resources and updating manuals.

2. **INTRODUCTION/PRESENTATION:**

   - Review Y-N charts.
   - Read HW sentences outloud.

LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:

- Model a flow chart of one part. Divide into pairs. Each pair makes flow charts for each part on their Y-N Chart. Each student goes round robin to tell about the flow of one part Students can use the following dialogue. Invite class discussion if there is a question about any of the processes.

  This part is a _____. It is made in the _____ department. After it is trimmed, it goes to _____. Then it is returned to CWM. Then it goes to _____. Continue until the product reaches the customer.

• Divide class into pairs. Students help each other file handouts and homework in the appropriate sections. Instructor is available to help if there are any organizational questions.

• HW 1) Students write 3 "I can" sentences, 3 "I can't sentences, 3 past tense sentences. Less proficient can copy from their chart. Simplify on an individual basis. 2) Record the correct flow for 2 parts. Each must have at least one outside operation. Draw a sequence flow chart to represent the flow from casting to the customer. Due in one week. Ask a supervisor or inspector for help with this assignment if necessary.

• Fun learning activity: Pass out the Conversation Grid (What Do I Know sheet). Practice reading and pronouncing all the questions. Explain any that they don't understand. Model the activity by asking a student the question, "Do you have children?" If he/she answers "yes" then he/she writes his/her name in the square. If he/she answers "no," go to another student. Continue until 3 names have been written in that square. Explain it is important to ask the question for speaking practice; asking the question in the first language or just having students write their name is a wasted activity.

Ask one of the more competent students to ask the question to the instructor. If the answer is "yes", then the student gets up to begin asking the question to another student and to continue until the sheet is completed. The instructor repeats the starter activity with a second student and that student begins circulating. After several "starts" the more competent students will be circulating. This will allow the instructor to help the less competent/confident students to ask questions and circulate. When students are finished they return to their seats.

• Instructor writes dialogues on the board to correspond with the Conversation Grid:

_____, _____, and _____ have children.

Each student is given a chance to repeat this dialogue using the names on his/her Conversation grid. After the first student reads his/her list, the instructor tells that student to "pick someone." Explain that pick is the same as choose. If the student picks his/her neighbor, tell him/her to pick someone else. After that student reads the dialogue, using the names on his/her Conversation Grid, the instructor tells the student to "pick someone." After several students have read the dialogue, the remainder will understand that picking someone is a random choice and is based on his/her own decision.

Introduce the second dialogue: _____, _____, and _____ are tired. Repeat the activity.

- Introduce Hangman. Draw the completed figure: circle head, stick body, arms, legs, small circles for hands and feet. Explain this is a vocabulary spelling game. If the class guesses the word before the figure is drawn the class wins; if the figure is drawn the instructor wins. JOB is a good word to start. Play the game several times. If the class begins to randomly guess words, begin to complete the figure for wrong guesses so that they have to begin thinking critically to get the correct answer.

  Once they understand the activity, let students come to the board to choose the word and try to stump the class. Each student should tell the instructor the word so that the instructor can help with spelling, drawing the figure, etc.

4. **EVALUATION:** (5-7 minutes) students decide as a team what they have learned and present it to the rest of the class.

5. **ATTACHED MATERIALS:** What Do I Know sheet

TARGET GROUP	**Intermediate VESL** Week 1
Workplace Competency	Understand questions who, what, when, where, why, how (much). Ask and answer questions.
Technical and/or Sub-technical Vocabulary	Caliper, micrometer, thread gages, plug gages, functional gages
Grammatical Patterns	Question construction; *ya = you; *whaddaya = what do you; *whadda = what do ; will = going to
Thinking Skills	Classifying
Team Skills	Partners; whole group round robin
Graphic Organizer	Question Chart

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Communication depends on the ability to ask and answer appropriate work-related questions as well as understand relaxed speech.

2. **INTRODUCTION/PRESENTATION:** Welcome the participants. Pass out notebooks and Objectives sheet; review the 4 goals for the class. Pass out the course Class overview. Highlight today's lesson which has to do with asking and answering questions.

   Encourage students to ask questions throughout the lesson particularly for word pronunciation and meaning. List skills on the board as they are introduced and practiced.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**
   - Pass out Question Words Chart. Ask the students for definitions of these question words; explain the words that students don't know. Point out the relaxed forms and have everyone practice them. If the English is careful, stand up. If relaxed, sit down. Use an overhead of the HW sheet.

   - Have each student interview his/her neighbor. Each person quickly introduces his/her partner.

   - Pass out and explain the Personal Data sheet. (Need OH of Data sheet) Point out the question word vocabulary we have been learning and have them circle those words. Have

them work as partners to fill out the sheet.

- Wh-Question Exercise. Divide into pairs or quads. Pass out flash cards with the question words on them. Read the questions. Students hold up the appropriate card. If you have a large enough group, students can take turns in their group asking the questions with team members holding up the appropriate card. Read the questions again. Students mark which question word they heard on the WH Question Checklist.

For the last part of the exercise use the measuring tools. Elicit the names of 5 tools provided by the Quality Department and write the names on the board. Pass out the Question Chart so the students can record their questions about 1 tool.

Practice asking and answering the questions. When one group has cycled their questions and answers, let them trade questions with another group.

4. **EVALUATION:** What have we learned today? Review list with them. Explain that class activities are designed to introduce information to them BUT mastering the information depends on PRACTICE!

5. **ATTACHED MATERIALS:** Course Objectives, Question Words Chart, Interview, Personal Data sheet, Wh-Question Checklist

PROJECT EASE

TARGET GROUP	**Intermediate VESL**	Week 2
Workplace Competency	Learn routing document vocabulary. Identify learning goals.	
Technical and/or Sub-technical Vocabulary	Specific to routing document	
Grammatical Patterns	1st/3rd person in information question and answer sequences	
Thinking Skills	Sequencing, classifying	
Team Skills	Numbered heads	
Graphic Organizer	Table flow chart; checklist	

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** As employees take more responsibility in their jobs it is important they understand the formating and terminolgy of key documents.

2. **INTRODUCTION/PRESENTATION:**
   - Each student reports on his/her practice of English during the week: Who they talked to and about what.

   - Review questions, answers, tools: one team is given tools; one question words; . Each team member picks a number. The instructor calls out a number. Number 1 from the tool team holds up a tool; and asks a question about the tool. (When do you use...Is that ____ yours? Practice until all the tools have been discussed in some way.

   - Give each student the opportunity to ask the instructor a question to practice asking spontaneous questions.

   - Students fill out pre-course Competency Checklist and list what learning goals they want to gain from attending the class.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**

- Discuss the need to learn the terminology and sequence of the routing document. Hand out the blueprint and routing document. Point out the sections of the document: identification section and routing sequence.

- Look at blueprint. (Show the part) Point out the list of pieces, from the routing document, needed to make the part. (Show the pieces) Ask the students to number these pieces on the routing document. Have them circle all the pieces that go with the first operation in Sequence of Operations. Ask, "What is the next operation (name it by number)? What parts belong to that operation?"

- Point out items on the routing document that refer to the blueprint. Also discuss ECN (engineering change notice) with regard to the importance of regularly checking the blueprint for any revision data. Note the date of the original print and dates of successive changes.

- List all the abbreviations on the board such as STD, ECN, OPER... Ask students if they know what these abbreviations mean. Once that is established, put the routing document on the overhead and review what the abbreviations mean on the print-out. These definitions are in the Table of Vocabulary. Point out that terms like "standard number" may not be necessary to make the part but knowing what the term means could be helpful in understanding general operations at the company as well passing some promotional tests.

- Ask if there are any questions. If not, develop a sequence flow chart on the board showing the operation, picking up the parts needed to make the part, going to the next operation, etc. until the part is ready to go into stock. Ask students to tell each step and make the flow chart to reflect this process.

- Allow 10 minutes at the end of class to present HW: "want to" pronunciation and gammer exercise; practice answering questions. Encourage continued speaking practice at home by reading hand-outs and homework in front of a mirror to see oneself speaking English.

4. **EVALUATION:** Allow 5 minutes for evaluation: List what each student learned this lesson.

5. **ATTACHED MATERIALS:** Competency checklist, routing document, blueprint, Table of Vocabulary, "want to" grammar and pronunciation, Practice Answering Questions

PROJECT EASE

TARGET GROUP	**Intermediate VESL** 1 Week 3
Workplace Competency	Explain the routing document.
Technical and/or Sub-technical Vocabulary	Routing terminology, ordinal numbers
Grammatical Patterns	Sentences containing a sequence or list ending with ,and _____.
Thinking Skills	Drawing conclusions (reconstructing an event)
Team Skills	Taking turns
Graphic Organizer	Flow chart; mind map

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to be able to tell others what they have learned such as explaining processes or forms.

2. **INTRODUCTION/PRESENTATION:**
   - In small groups, students take turns asking each other and answering the "what do you?", "want to?", tool, and job-related questions. Hand out tool pictures. Remind students to speak more slowly to clarify pronunciation.
   - Collect homework. Ask if there are any questions.
   - Draw a flow chart of the sequence of operations as a review of the routing document. Review ordinal numbers. Have each employee explain the sequence using ordinal numbers.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**
   - On a flip chart, list all the skills students are learning .
   - Working in pairs, have students fill out the routing vocabulary sheet.

- On flip chart, write out the aspects that need to be covered in the discussion. Each team is assigned one section of the routing document to explain to each other. One member of each team presents their section to the whole group. *Identification* group needs to refer to the blueprint, note any ECN, list of parts, etc. *Routing* group needs to refer to the sequence of operations, responsibility and work centers, pieces per hour; time to make 100 pieces. *Parts* group needs to refer to operation number, what pieces are part of what operation, note operations that generate scrap.

- Give a new routing document to each group and a new section to present.

- Each team makes a flow chart to show the operation of the new routing document. Each explains the flow chart using ordinal numbers. Their ability to construct the flow chart depends on their understanding of the first routing document.

- HW "Going to" pronunciation and question worksheet.

4. **EVALUATION:** Ask each student what he/she learned from class that can be used on the job. Represent on a mind map. Ask what they learned in class that they can explain to a friend or co-worker in English.

5. **ATTACHED MATERIALS:** Tool pictures, "Going to", Routing Document Vocabulary review, different routing document and accompanying blueprint

PROJECT EASE

TARGET GROUP	Intermediate VESL Week 4
Workplace Competency	Understand internal/external customers and suppliers.
Technical and/or Sub-technical Vocabulary	Internal and external customer's and supplier's
Grammatical Patterns	Past tense: did, -ed
Thinking Skills	Sequencing
Team Skills	
Graphic Organizer	Sequence flow chart

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to see their jobs in terms of the whole production process including their understanding of internal/external customers and suppliers.

2. **INTRODUCTION/PRESENTATION:**

- Each student writes a question on the board. The whole class practices making corrections. Practice asking answering the questions round robin.

- Change the questions into the past tense. Repeat previous activity in past tense.

- introduce the homework activity "Don't Know --->*Dunno and briefly review abbreviations and contractions.

- Hold up flash cards of question words and routing abbreviations. Elicit the definitions from the students. Could do as a team relay and give points. Students use Routing Vocabulary Review sheet as a reference.

Or, list the abbreviations on the board and let the students figure out the words. Afterward, students take turns explaining what each word means.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**

- Ask one student to draw the routing flow chart on the white board. Make any corrections as a whole group activity. Using ordinal numbers, have another student explain the process. Ask if there are any questions about the flow of material.

- Introduce the words customers and suppliers. Ask if any one remembers internal and external. These words have been introduced in terms of measurement: inside and outside dimensions.

Look at the flow chart on the board and ask where the parts for the product came from. Identify that department as the internal supplier. Identify the one receiving the parts as the internal customer.

Ask who receives the product from assembly and identify the customer and supplier. Elicit the next set of customers and suppliers until the part gets into the hands of the external customer.

Then reverse the process until an external supplier is identified.

- Discuss expectations that customers have of suppliers: customers, both internal and external, expect quality in order to do their jobs effectively and productively. Be sure to include how maintenance and office jobs are an important part of the customer and supplier flow of work.

4. **EVALUATION:** Look at Course Objectives handout and point out what we have learned so far. Ask "What has been most helpful for you today?"

5. **ATTACHED MATERIALS:** Don't Know --->Donno

PROJECT EASE

TARGET GROUP	**Intermediate VESL** Week 5
Workplace Competency	Identify product flow.
Technical and/or Sub-technical Vocabulary	QR, foundry, location, pull system, push system, forecast (anticipate or expect), died, set down, demand (want)
Grammatical Patterns	"do" and" make" construction; present and past tense
Thinking Skills	
Team Skills	Pairs
Graphic Organizer	Sequence flow charts; floor plan of room

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to see how materials and parts flow through their own department as well as through the company.

2. **INTRODUCTION/PRESENTATION:**
   - Ask each student to explain the Sequence of Operations on the MOS using ordinal numbers (one student to draw this flow chart on the board and label with ordinal numbers). Why does Company need the MOS?

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**
   - Draw map of the room and label--whole class activity.
   - HW Each student draws a map of his/her dept. or work area.
   - Look at OH flow chart for movement of A3 bodies through the plant. Identify important vocabulary and shapes. Review customers and suppliers. Discuss the importance of being both good suppliers and customers (important to point out a problem before the product gets too far into production or go to the external customer; note monetary and time implications.

- Discuss push vs pull system.

- Introduce Do-Make worksheets to be compleated as HW. Use the OH. Students read the sentences and supply the correct answer. Explain the difference between *do* and *make*.

4. **EVALUATION:** Observation of review activities and HW.

5. **ATTACHED MATERIALS:** A-3 Bodies Flow Chart; Do--Make worksheet; conversation sheets for lower level students

PROJECT EASE

TARGET GROUP	**Intermediate VESL** Weeks 6 & 7
Workplace Competency	Describe a defective product. Practice asking and answering questions about defects.
Technical and/or Sub-technical Vocabulary	List of defects from Quality Department
Grammatical Patterns	
Thinking Skills	Classifying, attributing: describing
Team Skills	
Graphic Organizer	Table; floor plan of department

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to identify and describe defects.

2. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**

- Each student explains his/her dept. floor plan and answers the following questions which appear on a flip chart

Suppliers:

1. Who are your suppliers?
2. What do they supply?
3. When do they supply _____?
4. How do they supply _____?
5. Why do they supply _____?

Customers:

1. Who are your customers?
2. What do you supply?
3. When do you supply _____?
4. How do you supply _____?
5. Why do you supply _____?

- Students look at the parts and identify the defects. List the defects on the flip chart in 3 columns. *Name of defect; brief description; name of part.* Get examples of other parts with this type of defect (parts they have seen in their own depts). Include in column 3.

- Week 7 hand out Defect Chart.

- HW Go over the following questions which are about a company publication. Hand out the worksheet with the same questions. For example:

    1. What is the name of the newsletter?
    2. What is inside this issue? (see lower right corner of front page)
    3. What are the names of the people in the picture on the front page?
    4. Where is their picture?
    5. Look at the picture on p. __ . What is the name of that employee and what did he receive?

    (More difficult HW) Read a specific article and answer 5 WH questions about the article.

- Students take turns describing defective parts using this presentation: This part is a _____. The defect is _____. It is located _____. It is caused by _____.

- Using the word list, students work in pairs to make as many sentences as they can. HW is to make at least 50 sentences from the words on the list.

3. **EVALUATION:** Observation of dept. floor plans; discussion of defects.

4. **ATTACHED MATERIALS:** Defect Table, Defect Chart; company publication; questions about the publication and specific article; word list

PROJECT EASE

TARGET GROUP	Intermediate VESL	Week 8
Workplace Competencies	Describes safety procedures Completes injury report form	
Technical & Sub-technical Vocabulary	Steel toe shoes, safety glasses, wrist guards, hazard, debris, flammable, aisle, minimum clearance, burn, cut, fracture, sprain, hernia	
Grammatical Patterns	Passive voice: a)_____ MUST BE WORN when entering this area/working at this station. b) A minimum clearance of 3 feet MUST BE MAINTAINED around power panels, alarm boxes, and fire extinguisher.	
Thinking Skills	Attributing	
Team Skills	Valuing the ideas of others Encouraging team accuracy	
Graphic Organizers	Grid/Matrix; Wh Model, Attribute Web	

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Plant workers must know and understand the importance that company safety procedures play in the prevention of injury.

2. **INTRODUCTION/PRESENTATION:** Ask students what kind of injuries might occur on their jobs, and make a list of these on the board. Then ask them to identify some safety procedures they follow on a regular basis and record these as well. Discuss the insurance coverage implications (to the company) of a job injury and (to the employee) of accurately or inaccurately reporting an injury.

3. **PRACTICE:** Form small groups and give each group a partially filled grid to complete, modeling one or two entries as examples. Model the behaviors of VALUING THE IDEAS OF OTHERS and ask groups to practice these during the grid completion process.

4. **APPLICATION:** As a group, create a typical injury scenario, using the Wh Model to report the event. Then use the Attribute Web to describe the injury accurately and completely. Elicit details needed to complete the injury report form.

PROJECT EASE

TARGET GROUP:	**Intermediate VESL** Weeks 9 & 10
Workplace Competency	Read/Understand Quality Manual procedures for own job Record job procedures and shop documentation sequentially on flow chart
Technical and/or Sub-technical Vocabulary	Specific to student's own job procedures
Thinking Skills:	Sequencing
Team Skills:	Cooperating in pairs
Graphic Organizer:	Flow chart

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** The Quality Manual documents job procedures for each position in the plant. Employees need to have a thorough understanding of the procedures specified for their jobs.

2. **INTRODUCTION:** Survey students for those who have read parts of the Quality Manual, which parts were read, and what difficulties were encountered.

3. **PRACTICE:** Hand out job procedures pages for students' own jobs. Ask a few volunteers to orally give some steps from their jobs. Review on board how the language would be reduced for flow charting.

4. **APPLICATION:** Hand out flow charts and pair students having same jobs. Have them read one section of their procedures and underline any unfamiliar words.

Circulate to define words orally or provide an ESL monolingual dictionary. Provide space on board or flip chart for students to record unfamiliar words, and assist them in writing glosses.

Continue through the procedures, adding to the glossary as needed.

Hand out blank flow charts and have pairs sequence their job procedures, highlighting the shop documents which appear in the sequence. Have pairs confer with another pair with the same job: are the flow charts the same? Discuss differences.

5. **REINFORCEMENT #1:** Provide each pair with a write-on transparency and vis-a-vis pen. One partner of each pair acts as *Recorder*, transferring the flow chart to the transparency for

presentation. The other partner, the *Reporter*, comes to the overhead and presents the flow charted procedures to the class.

6. **REINFORCEMENT #2:** Pairs return to glossed word list and arrange the c\words in alpha order. Have them write a sentence context for each word. Collect the lists and word process the glossary, incorporating the best sentence examples. Students keep the completed glossary in their notebooks as a reference.

    HW: Students show completed flow charts to their supervisors and have them verify accuracy.

7. **EVALUATION:** Observation of pair and team dynamics; completion of flow charts

8. **ATTACHED MATERIALS:** Blank flow chart; job procedures pages for each plant position

PROJECT EASE

TARGET GROUP	**Intermediate VESL** Week 11
Workplace Competency	Organize written information in a resource book.
Technical and/or Sub-technical Vocabulary	Review
Grammatical Patterns	Present tense verbs
Thinking Skills	Making decisions
Graphic Organizer	

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to be able to organize important information to use as resources.

2. **INTRODUCTION/PRESENTATION:**
   - Notebooks organized with tabbed dividers make it easy to locate training notes and references when needed. Students decide as a group on what the tabs should say.

3. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**
   - Using 5W & H questions, students ask each other about the micrometer, dial caliper, plug gage, progressive gage, thread gage.

   - Explain a quality product; explain a defective product. Fill in the Defect Dialogue sheet as a whole group activity. Students take turns reading the dialogue for practice in explaining defects. Remind them to practice reading the dialogue outloud (format in Week 7). This dialogue can be used on the job to explain production defects.

4. **EVALUATION:** Instructor observation; student comments.

5. **ATTACHED MATERIALS:** Review sheet, tabbed dividers, Present Tense Verb sheet

PROJECT EASE

TARGET GROUP	Intermediate VESL	Week 12
Workplace Competency	Evaluate progress. Set new learning goals.	
Technical and/or Sub-technical Vocabulary	review	
Grammatical Patterns	review	
Thinking Skills	sequencing, evaluating, making decisions	
Team Skills		
Graphic Organizer	Competency Checklist	

INSTRUCTIONAL ACTIVITIES:

1. **COMPANY CONTEXT:** Employees need to be able to evaluate their own learning and job progress.

2. **LESSON PRACTICE AND REINFORCEMENT ACTIVITIES:**
   - Students take turns explaining a routing form; including abbreviations, and identifying which parts of the form are important for the office and which for the employee. Draw and explain a flow chart of the sequence of operations including the materials for that operation.

   - Have students complete the post-course Competency Checklist then evaluate the course and make suggestions. Elicit learning goals for the future from each.

3. **EVALUATION:** Competency Checklist; student comments; course certificates

4. **ATTACHED MATERIALS:** Competency Checklist, Certificates of Participation

5. **REINFORCEMENT:** Form teams and have each make a sketch of an imagined injury (e.g. a broken toe) and to record the pictured details using the Wh Model and Attribute Web. Again ask them to practice the behaviors, VALUING THE IDEAS OF OTHERS during this process. Discuss the principles of accuracy and completeness, such as asking the six Wh questions and recording important details. Have groups complete an injury report form based on their injury and to select a reporter to present to the large group. Ask peer groups to rate the accuracy and completeness of each report.

6. **EVALUATION:**
   - Student self and peer evaluation of VALUING THE IDEAS OF OTHERS
   - Teacher observation and peer evaluation of accuracy and completeness of reports

7. **ATTACHED MATERIALS:**
   - Grid/Matrix
   - Wh Model
   - Attribute Web
   - Team Skills behavior sheet: Valuing the Ideas of others
   - Accident Report

TQL: TEAMWORK, QUALITY, LANGUAGE

An Advanced VESL Curriculum

Created for Suncast Corporation

Northern Illinois University/Office of Applied Innovations

Jean Olthoff
Vicki Hathaway

June, 1994

SUNCAST CURRICULUM

Week 1	Introduction to course Interview and video presentation
Week 2	Set goals Practice log
Week 3	Identify customers, suppliers, and workflow Write an article for the company newsletter
Week 4	Collect data and represent in a Pareto Chart Identify the key elements of a job
Week 5	Review Create job-related sentences
Week 6	Communicate with supervisors
Week 7	Develop a job description Explore crosstraining and promotions
Week 8	Solve problems using a Cause and Effect Diagram
Week 9	Prepare a presentation with visual aids
Week 10	Practice the presentation Videotape Peer Training Project
Week 11	Continue the videotaping
Week 12	Review of course and on-going learning strategies Evaluation of course by students and instructor

LESSON PLAN: ENGLISH AS A SECOND LANGUAGE

TARGET GROUP	Advanced VESL
Workplace Competency	Lesson 1: Interview co-worker and supervisor Lesson 2: Present information to others
Technical and/or Sub-technical Vocabulary	Interview, presentation
Grammatical Patterns	WH Questions
Thinking Skills	Evaluating (Self or peer regarding presentation skills)
Team Skill	Inviting questions
Graphic Organizer	Mind map

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Employees who are part of problem solving (QUEST) teams may be asked to interview management personnel as part of the fact-finding mission of the team. In addition, they will need to present their findings to the team as well as to the planning committee.

LESSON 1

2. **INTRODUCTION/PRESENTATION:** Instructor introduces him/herself, explains the purpose of the course, and hands out the Curriculum Outline. Allow the class time to look over the outline, ask questions, and suggest changes.
With the help of the class, build a mind map beginning with the central focus: *Questions to help find out about each other.* Students supply the second round of mind map circles in the form of informational questions they could ask each other. When everyone has had a chance to contribute, all copy the mind map for their own use.

3. **PRACTICE a:** Model an interview by asking the mind map questions of a student or yourself. The answers form the third ring of mind map circles

   PRACTICE b: Model how to present one's partner by using part of the questions and the answer recorded on the mind map (e.g. "Where do you live?" "Aurora." "Jose lives in Aurora.") Demonstrate how the students can vary their presentations by delivering the questions and answers in a different order from other class members

4. **APPLICATION a:** Pair students and have them interview each other for 15 minutes using the mind map questions Encourage them to record their answers on the mind map

   APPLICATION b: Have pairs stand and introduce each other, using their mind maps as notes

5. **REINFORCEMENT:** As homework, students will make any changes necessary to the mind map questions so that they can use them to interview their supervisors. Have them interview the supervisor and present the information in the next class for videotaping.

LESSON 2

3. **PRACTICE:** Prepare students for presentations by modeling basic presentation skills such as appearing to look at the audience, using hands properly, standing straight, and projecting one's voice to the back of the room. Model inviting questions from the audience as well. Hand out Peer Evaluation/Self Evaluation of Presentation Skills and discuss.

4. **APPLICATION:** Have each student give his/her name and tell something about himself. Other students use evaluation form and give feedback.

5. **REINFORCEMENT:** Videotape students individually as they report on their supervisors. Have peers rate each presenter during the videotaping. Play the tapes back so presenters can evaluate themselves, the class can compliment strengths and offer suggestions for improvement.

6. **EVALUATION:**

Lesson #1
- Teacher observation of student's contributions to mind map and performance in introducing partner.

Lesson #2
- Self/Peer Evaluation of Presentation Skills

7. **ATTACHED MATERIALS:**
- Preliminary Curriculum
- Mind Map
- Self/Peer Evaluation of Presentation Skills

MIND MAP

SELF AND/OR PEER EVALUATION

Did speaker:	YES	NO	SOMETIMES
Introduce him/herself?			
Greet the audience?			
Look at audience?			
Use hands appropriately?			
Speak loudly enough to be heard?			
Speak clearly enough to be understood?			
Invite questions from the audience?			

Comments:

LESSON PLAN: ENGLISH AS A SECOND LANGUAGE

TARGET GROUP	Advanced VESL
Workplace competency	Lesson 3: Set goals Lesson 4: Chart improvement
Technical and/or Sub-technical Vocabulary	strengths, weaknesses, IEP (Individualized Educational Plan), checklist, record, progress, goals
Grammatical Patterns	Future: I will ____. I want to ____. Past: I learned ____. I practiced ____.
Thinking Skills	Evaluate; make decisions
Graphic Organizers	IEP Checklist; Practice log, Mind map

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Employees are asked to meet company goals which have been set for them. As employees become more involved in problem solving and evaluation, it will be important for each one to set goals and record progress to keep on target with company goals.

LESSON 3

2. **INTRODUCTION/PRESENTATION:** Instructor introduces the IEP as a checklist to identify strengths, weaknesses, and goals.

3. **PRACTICE:** Students fill in top portion of the IEP. The instructor explains headings and then reads each skill, explaining what it means, if necessary. Students fill in the appropriate columns (not the % column). The instructor asks the students to pick their 3 best skills from those marked in the MOST TIMES column. These choices are their strengths. Weaknesses are explained as the skills that are marked in the NO or SOMETIMES column. These need improvement.

4. **APPLICATION a:** Students then pick 3 skills from those marked in the NO or SOMETIMES column and record them as goals on the IEP. These will be the focus of the student's improvement during the 12 week cycle. In addition, students will answer the question, "Why did you take this class?" Students are given a copy of their goals to refer to during the course.

   APPLICATION b: Give students 3 minutes to think about other strengths they have that may or may not be associated with their jobs. They can work in pairs or small groups if they wish. Each student will orally report 3 IEP strengths as well as 3 additional strengths. Before students make this brief presentation have them verbalize the most important presentation skills (speaking loud enough, making eye contact, keeping hands away from mouth, etc.) Point out that there are so many strengths in this class that they can easily find someone who would be able to help them with class activities and homework assignments.

2. **INTRODUCTION/PRESENTATION:** Instructor explains that recording progress helps a person see (s)he is staying focused on the goals and improving skills.

3. **PRACTICE:** Students fill in standard information on the top of the form. Each student dates the column by week. The instructor reads each skill to be practiced and students decide if they practiced it that week. The boxes are appropriately filled with YES, NO, or a number. Then the student writes in his/her 3 IEP goals. The student can decide if (s)he practiced any of the IEP goals during the week and also mark those boxes.

4. **APPLICATION:** Each student picks an IEP goal to work on during the week. (S)he writes down 3 ways to practice that goal on a 3x5 index card using the future tense construction "I will _____" or "I want to _____." Each time (s)he practices the goal, (s)he makes a tally mark by that particular practice activity. This way (s)he will have evidence that progress has been made. In one week after filling in the Practice Log, write the answer to the question, "How did I practice my IEP goal?" Use the past tense sentence construction, "I learned _____" or "I practiced _____." Students can tell the class how they accomplished their IEP goal or what they need to do to accomplish the goal next time.

5. **REINFORCEMENT:** Instructor guides class reflection on what has been learned in the class so far. Represent this with a mind map "What We Have Learned" on which each student comes to the board and adds a "bubble." The focus is meta-cognition.

6. **EVALUATION:**
   Teacher observation of
   - Practice logs
   - Mind Maps
   - Choice of IEP Goal

7. **ATTACHMENTS:**
   - IEP Checklist
   - Practice Log

INDIVIDUALIZED EDUCATIONAL PLAN
VESL II Competency Checklist

Name _____ Company _____

Pre-evaluation date _____: Use pencil to check the boxes

Post-evaluation date _____: Use pen to check the boxes

If you can do the skill most of the time, check **MOST TIMES**. If you can do the skill part of the time, check **SOMETIMES**. Check **NO** if you cannot do the skill or it is very hard for you.

I can _____ in English.	MOST TIMES	SOMETIMES	NO	%
Listening				
1. Follow spoken directions for a given task				
Speaking				
1. Describe the products I work with				
2. Ask questions related to job tasks				
3. Report problem situations				
4. Give instructions to co-workers				
5. Present information to others				
6. Interview someone				
Reading				
1. Find important information on company forms				
2.. Understand company newsletters, reports, memos				
Writing				
1. Write down ideas for department meetings				
2. Write brief reports for shift changes				
3. Write my job description				
4. Write an article for the company newsletter				
5 Correct my own writing				
Team Skills				
1. Work with others in teams or pair situations				
2 Participate in training activities				
3 Respect what others do and say				

POST-EVALUATION

1. Which of your goals did you improve? Write them below and tell how you know they are improved.

   A. Goal: _____

   How improved: _____

   B. Goal: _____

   How improved: _____

   C. Goal: _____

   How improved: _____

2. What other skills improved?

   A. On your job: _____

   B. At home: _____

   C. Other: _____

3. What helped you the most from this course?

4. What should be improved?

INSTRUCTOR COMMENTS:

vesl2.rep

PRACTICE LOG

Name _____ Company _____

Course Title _____

SKILLS											
1. Learned ____ new words											
2. Read ____ minutes each day											
3. Completed homework											
4. Solved a job problem											
5. Used Thinking Skills											
6. Used teamwork on the job in English											
7. Used teamwork in class in English											
8. Spoke to supervisor in English											
9. Practiced pronunciation											
10. Asked a classmate for help											
11. Used graphic organizers											
12. Practiced one IEP goal:											
*											
*											
*											

*Write in IEP goal

LESSON PLAN: ENGLISH AS A SECOND LANGUAGE

TARGET GROUP	Advanced VESL
Workplace Competency	Lesson 5: Develop a Sequence/Work Flow Chart Monitor use of first language in work communications
Technical and/or Sub-technical Vocabulary	Sequence, Dot Plot, internal/external customer, internal/external supplier
Grammatical Patterns	Ordinal numbers (reviewed), 3rd person singular present tense
Thinking Skills	Sequencing
Team Skills	Assisting others
Graphic Organizer	Sequence Flow Chart; Dot Plot

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Employees are often unaware of the interdependence of departments within the company, of their position between the *internal supplier* and the *internal customer*, and of the necessity to have a common language for communication. Similarly, they often do not conceptualize the flow of work from the *external supplier* to the *external customer.*

2. **INTRODUCTION/PRESENTATION:** Instructor elicits the ways that various departments communicate efficiently with one another about the technical work they do together. (Via spoken and written communication of a common language). Discuss how a non-native speaker of English gains and maintains proficiency in English by sustained practice. Elicit examples of internal/external suppliers and internal/external customers.

3. **PRACTICE:** Instructor and class review the functions of the dot plot. Tell students they will use the Dot Plot Chart to keep a diary of their language use over the next week.

   Ask each student to bring a labeled floor plan of his/her own department and give each individual an opportunity to speak briefly about it. One member of each department identifies the department's location on a company-wide map taped to the wall.

   Select a department, not represented in the class, and discuss its suppliers and customers. Guide students in describing the flow of material through this department. Arrange the description in steps and use them to create a sequential flow chart.

4. **APPLICATION:** Students use the Dot Plot Chart to record whether they speak English or Spanish each time they communicate with their supervisors. Tell them you want to see if using the chart will increase their use of English.

   Have each team assist the least capable writer make a sequence flow chart to show the flow of work in his/her department. (S)He copies this flow chart while teammates each begin a flow chart for their departments. Homework: Complete flow charts and interview supervisor on how their department is vital to the company as a whole.

5. **REINFORCEMENT:** Students report on completed flow charts and on supervisor interviews. Each comments on what (s)he has learned from keeping the dot plat chart of language use.

6. **EVALUATION:**
   - Instructor observation of student-generated flow chart
   - Student self-report of English language use via dot plot chart
   - Routine self-evaluation on Practice Log
   - Choice of IEP Goal

7. **ATTACHED MATERIALS:**
   - Dot Plot
   - Make a Sequence Flow Chart

DOT PLOT

Dot plots are used to collect date that falls within a range. They are not valid for tine-related patterns, however. Dots are used instead of tally marks because they are thought to be easier and faster.

Types of dot plots could include:

1. Which type of scrap situation occurs the most.

short shots	warped	flash
_____	_____	_____

2. Checking to see which part in a packet is missing the most; give each part a number and record a dot by the number when that part is missing.

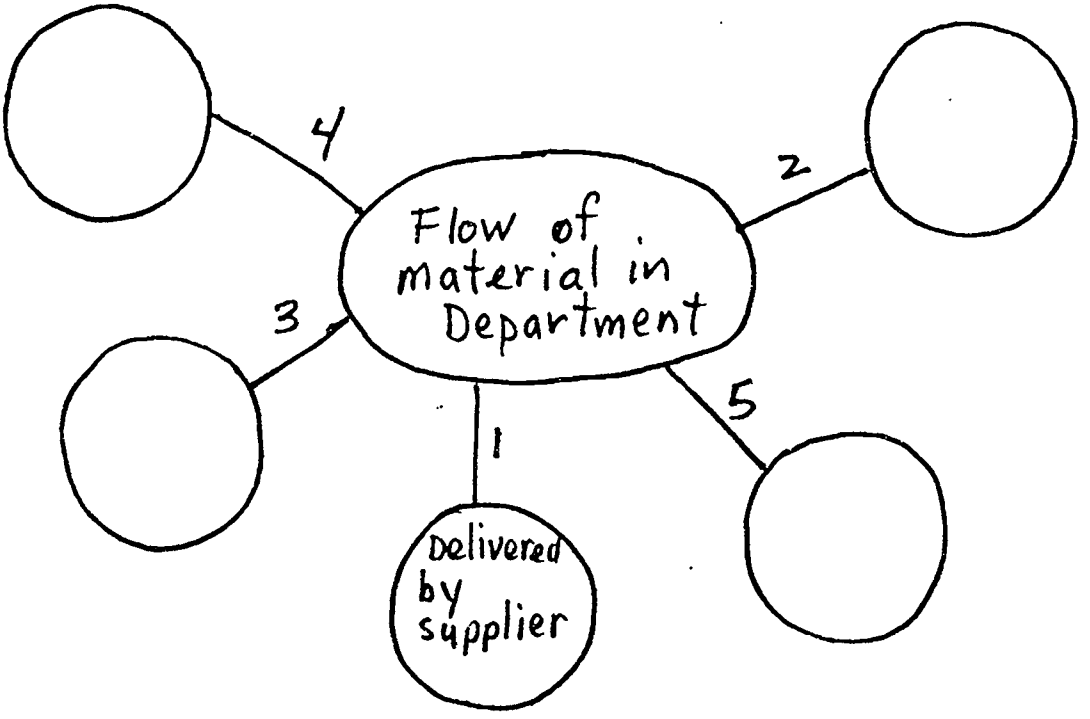
CHECKING FOR MISSING PARTS: 1=_____; 2=_____; 3=_____
1_____
2_____
3_____

3. Recording English and Non-English conversations on the job.

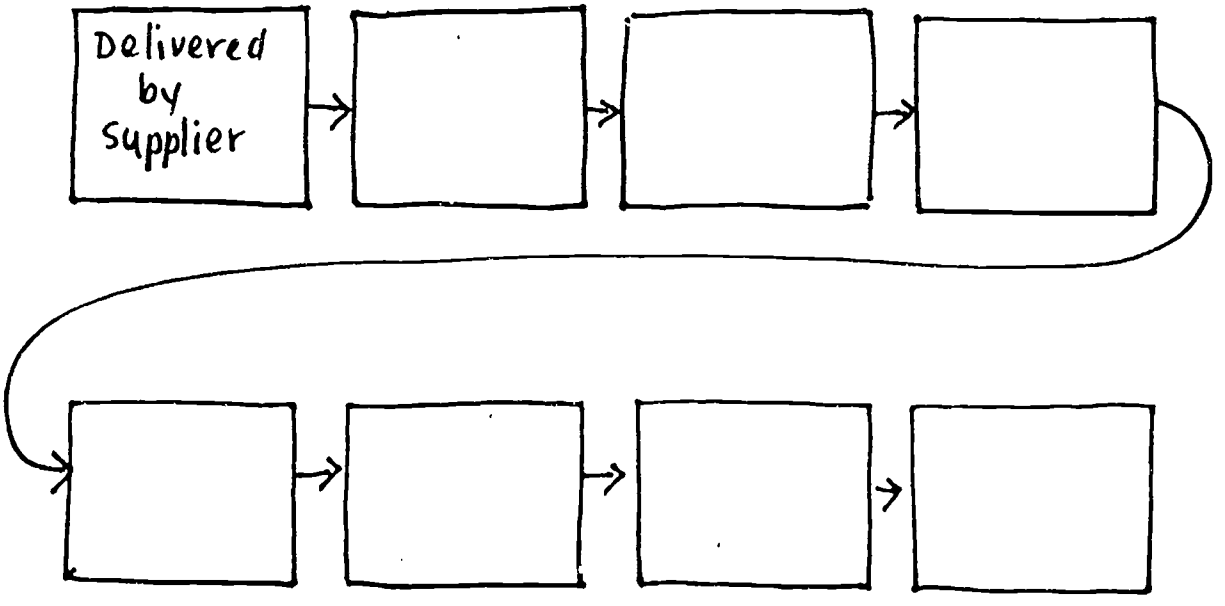
Dot plots are easy to make, show all the data points, and quickly show you the range of information you need to know before making further analysis.

Make a Sequence Flow Chart

1. Make a Mind Map
2. Number the circles in the correct order.



3. Write "1" in the first box, "2" in the next, and so on.



LESSON PLAN: ENGLISH AS A SECOND LANGUAGE

TARGET GROUP	Advanced VESL
Workplace Competency	Lesson 6: Write an article for the company publication
Technical and/or Sub-technical Vocabulary	article, spontaneous, model, sentence, paragraph
Grammatical Patterns	it (non-human pronoun), he, she; present, past tenses
Thinking Skills	Categorizing; prioritizing
Team Skills	Taking turns
Graphic Organizer	Mind map

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Many companies publish a weekly, monthly, quarterly newsletter to disseminate and highlight team accomplishments. Editors of these publications are always looking for employee generated copy.

2. **INTRODUCTION/PRESENTATION:** Instructor reintroduces the model mind map developed during Week 1, explaining that it will provide the basis for the first paragraph of an informational article.

3. **PRACTICE:** The class examines the map bubbles for similarities and creates groupings of similar elements (e.g. education, job experience, interests). They label such groupings by letter (A, B, C) and group remaining elements together as additional/optional information (D). Instructor hands out *How to Write an Interview* and guides students in prioritizing each grouping of elements modeled in the handout. Teams then write a paragraph using Group A elements in priority order. Instructor comments and checks team paragraphs as necessary.

4. **APPLICATION:** Teams work with the mind map of the least proficient writer and take turns grouping and prioritizing the map's A elements. They use the prioritized elements to write a paragraph which the least proficient writer can copy. Other team members quickly categorize and prioritize the remaining B, C, and D groupings and generate these paragraphs. The instructor edits or okays the drafts for submission to the supervisor for approval before submitting to the newsletter editor.

   Team members categorize and prioritize their own maps and write brief articles from them.

5. **EVALUATION:**
   - Instructor observation of categorizing, prioritizing, and writing skills.
   - Student oral self-evaluation of Dot Plot
   - Routine evaluation on Practice Log
   - Choice of IEP Goal

6. **ATTACHED MATERIALS:** *How to Write an Interview*

HOW TO WRITE UP AN INTERVIEW

Purpose: To develop interview questions and organize the information so it can written for publication.

1. Write 10 to 20 questions. They can
   a) be any questions that come to your mind
   b) focus on work
   c) focus on numbers and dates
   d) focus on anything NOT connected with work
   e) focus on family
   f) be anything interesting you want to tell about someone

   Write them on lined paper and leave 2 to 3 lines so you can write in the answer.

2. Talk to the person. Write down short answers to each question. If the person doesn't want to answer some of the questions, that is alright. Maybe you will think of other questions to ask. In fact, these **spontaneous** questions sometimes get the most interesting answers!

3. Organize your questions and answers by using alphabet letters. Questions that ask about the individual's childhood are preceeded by the letter A. Questions about the individual's family are lettered B. Questions about work are lettered C. Remaining questions are lettered D. There should be at least 3 questions for each letter.

   Look at the A questions. Prioritize by putting 1 by the question you want to write first, 2 by the second question, and 3 by the third question.

   Example:
   A 1. When did you come to America?
   2B 2. How long have you been married?
   1B 3. Are you married?
   C 4. What are your hobbies?

4. Write part of the question and the answer to make each sentence. Always include the name of the person you interview in the first sentence.

   Example using the above questions:

   Jean was born in California, USA in 1944. She is married and has been married 29 years. Her husband's name is Gary and he is 6' 3" tall. Her hobbies are reading, aerobics, and baking bread.

   If our example was longer, we would have at least three paragraphs. A paragraph has at least 3 sentences. Paragraph A would include Jean living in America. Paragraph B would include information about Jean's marriage. Paragraph C would give more examples about her hobbies.

   Remember to indent the first word of each paragraph about 5 letters (see the paragraph about Jean). (wrteintr.vew)

LESSON PLAN: ENGLISH AS A SECOND LANGUAGE

TARGET GROUP	Advanced VESL
Workplace Competency	Lesson 7: Generate a Pareto Chart from a Dot Plot Lesson 8: Identify job skills and duties
Technical and/or Sub-technical Vocabulary	Frequency of occurrence
Grammatical Patterns	More often than, most often, less often than
Thinking Skills	Selecting relevant information
Team Skills	Taking Roles
Graphic Organizer	Dot Plot, Pareto Chart, Top Down Flow Chart

INSTRUCTIONAL ACTIVITIES

Lesson 7

1. **COMPANY CONTEXT:** Companies collect data on such issues as productivity and represent the information on various charts including the Pareto. One method of collecting information for the Pareto is to use the Dot Plot.

2. **INTRODUCTION/PRESENTATION:** Instructor models the use of a student Dot Plot from Lesson #5 to create a Pareto Chart. (S)He elicits the purpose of this chart (track frequency of student's English language use) and asks class for other types of information which might be presented in Pareto form, using a mind map to record them.

3. **PRACTICE:** Each student converts his/her daily Dot Plot of English language use to a daily Pareto Chart. (S)He gives an oral report of progress contrasting English language usage between days. For example, phrases such as "I spoke to my supervisor in English more often on Wednesday than on Saturday."

4. **APPLICATION:** Teams will assign roles of recorder, timekeeper and reporter. Teams will select any work-related information/topic to present on a Pareto. Members discuss which elements to include and probable frequency of occurrence. Teams select one member each to summarize Pareto chart for class. Evaluate team skills at end of activity.

5. **EVALUATION:**
   - Instructor observation of oral production
   - Routine self-evaluation on Practice Log
   - Choice of IEP goal

Lesson 8

1. **COMPANY CONTEXT:** Many companies are trying to meet quality standards for customers. Employees are asked to explain their job tasks so a relevant job description can be developed.

2. **INTRODUCTION/PRESENTATION:** The person **doing** the job is the **expert** for that job. Utilize a Top Down Flow Chart to determine the major and sub categories of each employee's job.

3. **PRACTICE:** Model how to set up a Top Down Flow Chart by having the whole group contribute information. Use, as an example, a job in a department which is not represented in the class such as a forklift driver in the Shipping Dept.

   Identify major components by first deciding which machines Employee X uses. Then identify any other major categories like paperwork, inventories, etc. Limit the number of major categories to 7. Try to put these into the order in which they are performed.

   The group will then list up to 7 tasks necessary to accomplish the major category, i.e., what are the steps necessary to grind scrap metal for reuse?

4. **APPLICATION:** 4-5 member groups are constituted. The group is to develop a Top Down Flow Chart for one member of the group designated by the teacher. Pick a member who has the lowest reading and writing skills. Through group discussion, the group will determine the major and sub components of the designated member's job and will represent it in the Flow Chart.

5. **REINFORCEMENT:** Each member of the class develops his/her own Top Down Flow Chart Description. The Designated Member copies his chart for practice in reading and writing. The charts are homework and are turned in the next class session.

6. **EVALUATION:**
   - Use the grammatical patterns to report on a Top Down Flow Chart.
   - Team Skill Evaluation: Taking Roles

7. **ATTACHED MATERIALS**
   - Team Skill Evaluation: Taking Roles

TEAM SKILL EVALUATION: TAKING ROLES

Circle your response.

	Always	Often	Sometimes	Never
We chose someone to produce our activity. **(RECORDER)**	4	3	2	1
We stayed on schedule. **(TIMEKEEPER)**	4	3	2	1
We chose someone to summarize to the class. **(REPORTER)**	4	3	2	1

Areas for improvement: _____

_____

_____

_____

LESSON PLAN: ENGLISH AS A SECOND LANGUAGE

TARGET GROUP	Advanced VESL
Workplace Competency	Lesson 9: Review of Graphic organizers Lesson 10: Write job-related sentences
Technical and/or Sub-technical Vocabulary	noun, verb, idea, verb tense, condition, action, punctuation
Grammatical Patterns	Student generated present and past verb tense sentences
Thinking Skills	Categorizing
Team Skills	Equitable participation
Graphic Organizers	Review of Mind Map, Dot Plot,Sequence Flow Chart, Pareto Chart, Top Down Flow Chart

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** As employees become more competent in spoken English, companies expect better reading comprehension, writing fluency, and graphic literacy. Employees need to read and understand graphic reports of production, waste, and injury. They also need to communicate on work-related topics.

LESSON 9

2. **INTRODUCTION/PRESENTATION:** Instructor elicits, from the class, all the graphic organizers that have been used to date. Represent these on a mind map.

3. **PRACTICE:** Model the use of a graphic organizer in different applications. Use the mind map to show how it can be used either at work or at home. Explain Equitable Participation and the *Looks Like - Sounds Like* worksheet

4. **APPLICATION:** The class divides into pairs or triads. Each team is given a different graphic organizer. Team members find an application for the organizer which has not been explored in class. The organizer should reflect a work theme. If time, the team can develop a non work application for that graphic organizer.

5. **REINFORCEMENT:** Teams present their organizers to the class. If time allows, and if the students are able, have each team elicit from the class another application of that particular organizer.

6. **EVALUATION:**

   - Quality of graphic organizers produced and of presentation.
   - Equitable Participation worksheet

2. **INTRODUCTION/PRESENTATION:** Instructor explains the features of a noun. Have each member of the class give an example of a job-related noun. Explain the features of action verbs. Each member of the class gives a job-related verb. Draft several sentences using these verbs and nouns. Turn these into present, past, and future tense constructions. Remind students that sentences begin with a capital letter, and end with a period for a statement or a question mark for a question.

3. **PRACTICE:** Divide class into small groups. Members of each team work together to fill out the *Writing Sentences* worksheet. Instructor facilitates teamwork and is available for questions.

4. **APPLICATION:** The team writes a memo to a supervisor on the company memo form. Each member contributes a sentence to the memo using the work-related nouns and verbs.

5. **REINFORCEMENT:** For homework class members draft a memo to a supervisor, co-worker, administrator, or the instructor explaining something related to the job. Ideas can be elicited from the class on topics appropriate to write about. Some examples might be a suggestion, telling about a mechanical or process problem, requesting a day off, etc.

6. **EVALUATION:**
   - Routine evaluation on Practice Log
   - Teacher evaluation of student memos
   - Choice of IEP Goal

7. **ATTACHED MATERIALS:**
   - Writing Sentences
   - Team Skills Evaluation Sheet: Equitable Participation

WRITING SENTENCES

1. A sentence is a complete thought. It must have a **subject** and a **verb**. A subject is a noun or a pronoun (a word which takes the place of a noun). A sentence begins with a capital letter and ends with a . or ?.

   Complete: A sentence is a _____ _____. It must have a _____ and a _____. A sentence begins with a _____ _____ and ends with a _____ or a _____.

2. A noun is a **person**, **place**, **thing**, or **idea**. Write 5 examples of each type of noun in the table below.

person					
place					
thing					
idea					

3. A verb is a condition or action. Write 9 examples of action verbs.

walk				

Some examples of condition verbs are is, are, be, have. "She is kind." "They are happy." "He has a good job."

4. Verb tense tells when something is going to happen.

   a. Present: something happening now
   b. Past (usually formed by adding -ed to the present tense): something that already happened or is finished
   c. Future (usually formed by "will be" or "is going to" in front of the present tense verb): something that will happen but hasn't happened yet

Write 3 present tense sentences using the nouns and verbs from above.
Change the present tense sentences into the past tense.
Using the present tense sentences, change two into the future tense.

EQUITABLE PARTICIPATION:

- Consciously taking and giving up the floor
- Inviting others to equally share their ideas

LOOKS LIKE:	SOUNDS LIKE:
Making eye contact with all team members while speaking	Could you rephrase that for me, please? I want to make sure I understand.
Moving forward sometimes and sitting back sometimes.	Thanks for sharing, Beth. We haven't heard from Matt yet. Matt, what do you think?
Raising eyebrows and extending open hand, palm up (encouraging another to speak).	Anybody else have a comment?
Slowly raising hand, palm out. (Discouraging another from speaking)	My ideas on the issue are still forming, but one thing I can say is.....

TEAM SKILL EVALUATION SHEET: EQUITABLE PARTICIPATION

	Always	Mostly	Sometimes	Hardly Ever	Never
1. I made eye contact with all team members.					
2. I took turns listening and sharing ideas.					
3. I encouraged others to participate.					
4. My gestures encouraged equitable participation.					
5. Others made eye contact with me.					
6. Others took turns listening and sharing ideas.					
7. Others encouraged me to participate.					
8. Their gestures encouraged equitable participation.					

NEXT TIME WE CAN IMPROVE BY:

LESSON PLAN: ENGLISH AS A SECOND LANGUAGE

TARGET GROUP	Advanced VESL
Workplace Competency	Lesson 11: Write job related questions Lesson 12: Answer questions verbally and in written form
Technical and/or Sub-technical Vocabulary	Review of verb, noun, subject-verb agreement, punctuation
Grammatical Patterns	Questions and answers about work; focus on subject-verb agreement
Thinking Skills	Assuming another's role
Team Skills	Taking roles
Graphic Organizer	Question Information Chart

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** There is a need for employees to clearly ask questions and report on job status. LEP speakers are particularly hard to understand because of non-standard English grammatical patterns and pronunciation. Many are afraid to ask questions for clarification.

2. **INTRODUCTION/PRESENTATION:** Using nouns and verbs from Lesson 10, each class member makes up a statement or question.

LESSON 11

3. **PRACTICE:** Instructor checks each sentence for subject-verb agreement, punctuation, and spelling. Write down any questions that students ask during this part of the lesson. Each student reads a sentence orally. If it is a question, (s)he asks a classmate to answer it. The students pick a different verb tense and take turns rereading orally all the sentences in that tense.

4. **APPLICATION:** Instructor divides students into groups of 4. Two will write questions that supervisors ask employees and the other two will generate questions that employees ask supervisors. When finished, teams categorize questions on the information chart. Note that "Is" questions are YES/NO questions. Retaining their respective roles, those who wrote supervisor questions, will (on a separate sheet of paper) answer the Employee Questions the way they think a supervisor would answer the question. In the same way, those who wrote employee questions, will answer the Supervisor Questions the way they think employees would answer such questions.

5. **REINFORCEMENT:** Students take turns being "supervisors" and "employees" asking questions from the lists to each other. Answers are spontaneous and not those written on the separate sheets of paper.

MATHEMATICS SKILLS	JOB-RELATED COMPETENCIES	JOB-RELATED COMMU-NICATION SKILLS	JOB-RELATED READING SKILLS	THIN-KING SKILLS	GRAPHIC ORGANI-ZER	TEAM BUILDING SKILLS	LESSON PLAN NUMBER
Recognize numbers	Locate a part, given a 10 - digit part number.	X	X	X			1
Perform basic operations on whole numbers.	Count production orders. Determine amount of materials to requisition. Find the amount of pay that will be added to a savings account during a one-year period.		X			X	2
Understand and use place values.	Differentiate, in writing and orally, between tens, tenths, thousands, thousandths, etc.	X	X		X	X	3
Perform basic operations on decimal numbers.	Check accuracy of paycheck (deductions, overtime, etc.) Calculate shipping weights. Translate an hourly pay increase to a monthly/annual basis.	X				X	4
Set up ratios and proportions.	Find fraction of an hour that is needed to produce a small number of parts. Determine how many pieces (measured in fractions) can be cut from a given length of material.			X	X	X	5
Perform basic operations on fractions.	Determine dollar amount of materials needed to produce an order of parts measured in fractions. Determine how many pieces (measured in fractions) can be cut from a given length of material.		X			X	6
Set up and use percentages.	Determine dollar amount deducted for a percent-of-pay retirement plan contribution. Calculate percent scrap that was caused by a certain process.	X	X	X			7
Perform conversions among fractions, decimals, and percents.	Find percentage earnings on a retirement plan for a given period. Find the decimal measurement for 6/32 inch. Determine how many parts scrapped will constitute a 5% scrap rate for a process.		X	X			8

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Analyze problems to determine unknown quantities.	Find how many items are still needed to complete a partially-filled order. Find amount of materials used in production if 150 lbs are left at completion. Determine how many runs can be completed given the amount of raw materials available.			X		X	9
Know when and how to use estimation as a tool.	Estimate how many days will be required to complete a task. Estimate whether enough materials are available to warrant starting a process. Estimate the size of item before a measurement is taken.	X		X			10
Take measurements.	Use appropriate instrument to measure size or weight of an object. Use correct number of decimal places when recording a measurement.	X				X	11
Convert measurements to common units.	Determine how many yards of material are needed for 10,000 objects, each 3 1/2 inches long. Convert a part measurement from millimeters to centimeters.				X		12
Calculate SPC statistics given a set of data.	Calculate average size (mean, median or mode as needed) of a sample of objects. Find the range of sizes in the sample.	X		X			13
Plot and read data on a graph.	Graph x and r an SPC chart. Identify a point on x or r chart that is out of tolerance.	X			X	X	14
Read and understand blueprint.	Obtain measurements and material data from a product's blueprint. Calculate the amount and type of material needed to run 500 pcs, given the part's blueprint.				X		15

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PROJECT EASE

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 1a
Mathematics Skills	Perform basic operations on whole numbers
Workplace Competency	Determine amount of materials to requisition
Team Skills	Participating equally, respecting all points of view

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Owner/Operators at some companies need to be able to determine the amounts of raw materials to be ordered in order to complete work orders.

2. **INTRODUCTION/PRESENTATION:** Using plastic straws, ask students to guess at how many straws laid end to end it would take to cover a desk or table top. Use this as an opportunity to practice team skills. Then ask students for specific job tasks in which they have to determine raw materials needed, and how they go about doing that.

3. **PRACTICE:** When you have gleaned specific workplace examples of necessary material requisition, explain the division and/or multiplication process needed in different situations.

4. **APPLICATION:** As homework before the class, have students bring in material requisition forms that they use on the job. You may wish to assign one form to each small group or groups of two people. Have students work together to calculate needed materials.

5. **REINFORCEMENT:** Have students devise situations (orders) where materials are needed and write out the scenario.

6. **EVALUATION:** Using the students' homework, have them switch scenarios and requisition materials as appropriate.

7. **ATTACHED MATERIALS:** Skills Observation Sheet

Social Skills Observation Sheet

	Skills 1:	Skills 2:	Skills 3:	Skill 4:
Team 1				
Team 2				
Team 3				
Team 4				
Team 5				
Team 6				
Team 7				
Team 8				

Observation Date_____

INSTRUCTOR:

Stand by each group for one minute. Do not interact with group members. Record each use of each skills with a mark.

SKILLS TO OBSERVE:

Clarifying goals, staying on task, participating equally, getting consensus, respecting all points of view, listing actively, Giving explanations, checking for understanding, modeling how to get an answer, receiving help

Spence Kagan: Cooperative Learning
Publisher: Resources for Teachers, Inc. 1 (800) Wee Co-op

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 1b
Mathematics Skills	Understand and use place values
Workplace Competency	Differentiate, in writing and orally, between tens, tenths, thousands, thousandths, etc.
Team Skills	Brainstorming
Graphic Organizer	Place Value Chart

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Company "x" makes a product which must meet very specific design tolerances. The tolerances on some parts are as small as one thousandth of an inch. Employees must understand how to read this number on design specifications.

2. **INTRODUCTION/PRESENTATION:** Write six numbers on the board --- each having at least one decimal place --- that are commonly confused. (Examples: .500, .0505, .5500, .5, .51, .515) Ask students to place these in ascending order.

3. **PRACTICE:** Using things like money, notebook paper, folders, etc., have students measure thickness and diameter with the micrometer, while writing out the measurements on the board. Keep in mind that with some companies, in order to make things "simpler", zeroes are removed from the written numbers (eg,. 00356 becomes 356). If this is the case, let a student take the lead in showing how things are written at the company, while making sure everyone understands that this is a shortcut, not the standard way of writing numbers.

4. **APPLICATION:** Using the place value chart, help students brainstorm on the job items that would approximate the size of whatever number you place in each place value chart. For example, if you are explaining that something that measures one tenth of an inch is ten times the size of something that measures one hundredth of an inch, try to solicit examples of these items from the students.

5. **REINFORCEMENT:** Have student complete worksheet at home which requires matching number to their decimal names. They should use the place value chart for assistance.

6. **EVALUATION:** Encourage small groups to brainstorm ways of demonstrating the place values of numbers and measurements; this could take the form of money, products, or inventory items. Encourage small groups to share their visual displays and/or examples.

7. **ATTACHED MATERIALS:** Place Value Chart

PLACE VALUE CHART

NUMBER OF PLACES	DECIMAL NAMES	EXAMPLES	PROPER FRACTION
one place	tenths	.6	$\frac{6}{10}$
two places	hundredths	.10	$\frac{10}{100}$
three places	thousandths	.005	$\frac{5}{1,000}$
four places	ten-thousandths	.0069	$\frac{69}{10,000}$
five places	hundred-thousandths	.00183	$\frac{83}{100,000}$
six places	millionths	.000073	$\frac{73}{1,000,000}$

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 2a
Mathematics Skills	Perform basic operations on decimal numbers
Workplace Competency	Translate an hourly pay increase into an annual pay increase
Team Skills	Numbered Heads

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Employees are sometimes given the choice between an hourly and a salaried position. They need to be able to compare the two to find out which would suit their needs the best.

2. **INSTRUCTION/PRESENTATION:** Ask students (if they are comfortable discussing this) whether they would prefer an hourly wage job or a salaried position and why.

3. **PRACTICE:** After discussing matters of preference, demonstrate the manner in which you could compare the two types of jobs. (Just a note: Any time you discuss money, be very sensitive to the students, and make it clear that you do not know their wages nor do you wish to know their wages. Usually it is a very safe bet to use extraordinarily low amounts in your calculations, so that no one feels inferior.) For the purposes of this lesson, you would not calculate overtime, or benefit percentages, but encourage discussion of this in the class so that students understand that there may be more to career decisions than just dollar calculations.

4. **APPLICATION:** Have students make up hypothetical "friends" who are making career decisions. This can be done in groups. Encourage the group process in this by utilizing "numbered heads". Have each small group calculate the friend's choices for both a salaried and an hourly group. Some groups may feel prepared to introduce overtime into the calculations. It they want to do this, that is fine; that would be the next logical step in terms of instruction.

5. **REINFORCEMENT:** Have students prepare a table of values which contains base salaries on one axis and percent pay increases on the other. The table could then represent the dollar increase (per week, month, or year, as desired) based on the original salary.

6. **EVALUATION:** Utilizing "numbered heads", have one member of each group describe their "friend", his/her career choices, and how they as a group would advise this friend. Have a second member of the group discuss the process the group used in order to come to the conclusions that they made.

7. **ATTACHED MATERIALS:** Numbered Heads

NUMBERED HEADS TOGETHER

The Numbered Heads structure involves four basic steps. These steps are offered and described below.

STEP #1: THE STUDENTS NUMBER OFF.

Each student on the team receives a number. Accommodations are made if teams are made up of different numbers of students. For example, if only one or two teams have seven members, and the rest of the teams have only six members, then either student #6 or student #7 may answer when number 7 is called. In this way, all teams have an equal chance to answer each question.

STEP #2: THE TEACHER ASKS A QUESTION.

The Teacher asks a questions, such as, "How many inches are in six feet? You have 45 seconds to make sure everyone on your team knows the correct answer." By doing this, the teachers is asking a question upon which the entire team must reach consensus as to the correct answer.

STEP #3: THE STUDENTS PUT THEIR HEADS TOGETHER.

At this point, the students literally "put their heads together," discuss the question, and make certain that each team member knows the correct answer. One student on each team may be assigned the role of the "checker" to be certain that each team member is able to express the correct answer if called upon to do so.

STEP #4: THE TEACHER CALLS A NUMBER.

At this point, the teacher calls a number at random. Students with that number raise their hands to be called upon. The teacher then selects one student to provide the answer to the question.

If, for example, the answer can be answered by most teams, but only two or three students with the number that was called raise their hands, the teacher may say, "Not enough number threes have their hands raised. I will give you one more minute to make sure that all number threes know the correct answer."

Adapted from: Kagan, S. (1989). Cooperative learning resources for teachers. Riverside, CA: University of California.

CL: H-6

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 2b
Mathematics Skills	Set up ratios and proportions
Workplace Competency	Determine the reject ratio for a certain process
Team Skills	Brainstorming
Graphic Organizers	Fishbone
Thinking Skills	Analyzing, making inferences, generalizing

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Keeping reject ratios low is a key goal of the company. The employee must know what a reject ratio is and why it is important.

2. **INTRODUCTION/PRESENTATION:** Have groups brainstorm on the meaning of the word ratio and think of some common ratios. The ratio of frozen orange juice concentrate to worker is a good example.

   Propose scenario in which one student produces 500 pieces of scrap in a shift, while his co-worker produces 400. Who has higher scrap ratio. It depends on the number of pieces run during the shift.

   Next focus on meaning of reject ratio. Have groups determine what information is necessary to compute a reject ratio. Discuss standards of measurement, including PPM (part per million). Discuss reason for rejects and how to lower the ratio using the fishbone diagram. Ask them how many cans of concentrate and how many cans of water are needed for now "batch", then for two, then for three. What if you needed juice for a hundred people? Note that using the same ratio for each situation makes juice with the same mixture, or taste.

   When students are comfortable with PPM, explain that 100 can be used or baric instead of 7,000.000. The sam calculator are used, but the key is 100 instead of 1,000,000

3. **PRACTICE:** Explain equivalency of ratios; i.e. 1/10 = 10/100 = 2/20, etc., using common examples (colored marbles, make up of class, etc.) Show how this extends to PPM.

4. **APPLICATION:** Have students suggest numbers of parts produced and numbers of parts that have to be scrapped. Use these numbers to calculate PPM's.

5. **REINFORCEMENT:** Help students to integrate various forms of ratios. Provide ratio grid to students. Have them complete the first four rows. Then ask them to look for relationship among the entries on the rows. Note that another way to find PPM or percent scrap is by finding decimal equivalent of the ratio, then moving decimal point appropriate number of places - 2 for hundred (%) or 6 for millions (PPM).

   Suggest students use the grid when solving future ratio problems. Enter the ratio(fraction) in the first column, then work across the row.

6. **EVALUATION:** Have students calculate the PPM for various processes.

7. **ATTACHED MATERIALS:** The Fishbone, Computation Example, Ratio grid.

COMPUTATION EXAMPLE

Reject Parts per million means: $\frac{\text{Reject Parts}}{\text{Million}}$

If a batch of 650,000 parts are produced and 130 of them are rejected, what is the reject PPM?

Set ratios equal: $\frac{\text{rejects}}{\text{Total}} = \frac{130}{650{,}000} = \frac{?}{1{,}000{,}000}$

Now, how to solve?

1. Cross-multiply: $130 \times 1{,}000{,}000 = 650{,}000{,}000 \times \_\_\_\_\_$

   $130{,}000{,}000 = 650{,}000{,}000 \times \_\_\_\_\_$

2. Then divide: $\frac{130{,}000{,}000}{650{,}000} = 200$ PPM

FRACTION	DECIMAL	PERCENT	PPM
Example: $\frac{2}{5}$	.4	40%	400,000 PPM
$\frac{3}{20}$			
$\frac{7}{8}$			
	.25		
	.065		

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 3
Mathematics Skills	Perform basic operations on fractions
Workplace Competency	Determine amount of materials needed to produce an order of parts measured in fractions
Team Skills	Jigsaw

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** The total amount of steel strip which needs to be ordered must be identified by the materials requisition clerk.

2. **INTRODUCTION/PRESENTATION**: Depending on the level of the class, an introduction to finding common denominators may need to be taught prior to the lessons on adding and subtracting fractions.

   Bring in several cut up straws marked with measurement in inches. Allow students to estimate total length. Depending on the level, the straw measurements may or may not have a common denominator.

3. **PRACTICE:** After you have demonstrated the proper method of adding fractions, ask students for examples of measured materials and the measurements of such. Students can work in any variety of groupings to calculate the total length of materials needed.

4. **APPLICATION:** Ask students to bring in material requisition forms in which they are requested to order a total amount of strip or other continuous material. Utilizing the jigsaw method of cooperative learning, have one small group of students determine the lengths of needed materials, and another group add the total amount of material needed, then reverse the process.

5. **REINFORCEMENT:** Provide practice problems for homework that require addition, subtraction, multiplication, and division of fractions.

6. **EVALUATION:** Using student - generated situations, ask each student to calculate for himself/herself the total amount of continuous material needed. Dyads can share and compare answers. Make sure students discuss the process of getting the answer as well as the answer.

7 **ATTACHED MATERIALS:** Jigsaw

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 4
Mathematics Skills	Set up and use percentages
Workplace Competency	Determine dollar amount deducted for a percent of pay retirement plan contribution
Thinking Skills	Making comparisons, prioritizing, evaluating

INSTRUCTIONAL ACTIVITIES

1. **COMPANY:** Company has a profit sharing and savings plan in which employees can participate but do not because they do not understand the calculations used to derive sample figures.

2. **INTRODUCTION/PRESENTATION:** It is often good to have a member of management come in to give a brief overview of the plan itself. As an instructor, you must thoroughly study the plan. Depending on the level of the class, an overview, (or several lessons) of the mathematical concepts in performing operations with decimals may be necessary.

3. **PRACTICE:** Have small groups develop fictitious "friends" whom they will advise on investment issues. The use of fake money in this process is also good because it involves more of the total physical response concept.

4. **APPLICATION:** Have students study two scenarios to determine which is the more prudent use of their money. Have them discuss their reasons.

5. **REINFORCEMENT:** Have students bring in samples of investment advertisements. They should be prepared to identify key elements of the ad.

6. **EVALUATION:** After groups have made calculations and developed an investment plan for their fictitious "friend", the groups should report to the class what they have advised their "friend" to do. Using the numbered heads concept, one member of the group can explain the bibliographic information of their "friend", another can discuss how they performed the calculations necessary, another can discuss the advice they gave to their "friend", and the last member can explain the reasons they chose to advise what they did.

7. **ATTACHED MATERIALS**: Numbered Heads

NUMBERED HEADS TOGETHER

The Numbered Heads structure involves four basic steps. These steps are offered and described below.

STEP #1: THE STUDENTS NUMBER OFF.

Each student on the team receives a number. Accommodations are made if teams are made up of different numbers of students. For example, if only one or two teams have seven members, and the rest of the teams have only six members, then either student #6 or student #7 may answer when number 7 is called. In this way, all teams have an equal chance to answer each question.

STEP #2: THE TEACHER ASKS A QUESTION.

The Teacher asks a questions, such as, "How many inches are in six feet? You have 45 seconds to make sure everyone on your team knows the correct answer." By doing this, the teachers is asking a question upon which the entire team must reach consensus as to the correct answer.

STEP #3: THE STUDENTS PUT THEIR HEADS TOGETHER.

At this point, the students literally "put their heads together," discuss the question, and make certain that each team member knows the correct answer. One student on each team may be assigned the role of the "checker" to be certain that each team member is able to express the correct answer if called upon to do so.

STEP #4: THE TEACHER CALLS A NUMBER.

At this point, the teacher calls a number at random. Students with that number raise their hands to be called upon. The teacher then selects one student to provide the answer to the question.

If, for example, the answer can be answered by most teams, but only two or three students with the number that was called raise their hands, the teacher may say, "Not enough number threes have their hands raised. I will give you one more minute to make sure that all number threes know the correct answer."

Adapted from: Kagan, S. (1989). Cooperative learning resources for teachers Riverside, CA University of California.

CL: H-6

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 5
Mathematics Skills	Perform conversions among fractions, decimals, and percents
Workplace Competency	Determine the decimal measurement for 6/32 inch
Thinking Skills	Making comparisons

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Employees take measurements as fractions. Occasionally, that measurement must be used by another worker in decimal form, or an employee must be able to determine the size of a decimal relatve to that fraction.

2. **INTRODUCTION/PRESENTATION:** Ask students if and how they take measurements. Are they in fractions or decimals? Discuss the answers. What would you do if your tools were in decimals sizes, but the parts were in fractions?

   Have half the students write any fraction on an index card. Have the other half write a fraction. Have them work together to line up all the cards in ascending order. Encourgage them to use any method they can to do this.
   Explain/remind students that the line or bar in a fraction is really a division sign. Simply divide to find the decimal.

   Explain that when you read a decimal number, the "ths" word used (see place value lesson) is the denominator. Then simplify the fraction to lowest terms.

3. **PRACTICE:** Use common fractional measurements (1/2, 1/10, etc.) to convert to decimals. Note correspondence to currency.

4. **APPLICATION:** Using common tool sizes and/or part sizes, compute corresponding fractions/decimals Return to the index cards from the introduction. Have them use newly - equired skills to try to line up the cards.

5. **REINFORCEMENT:** Provide worksheet which allows practice of the operations required to convert back and forth between fractions and decimals.

6. EVALUATION: In pairs, have one student convert fraction to decimal and the other convert the same decimal to fraction. Then have students check each other's answer.

7. **ATTACHED MATERIALS:** None

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 6
Mathematics Skills	Analyze problems to determine unknown quantities
Workplace Competency	Determine how much material is still needed to complete a partially - filled order
Team Skills	Equal participation, consensus - building
Thinking Skills	Analyzing, generalizing

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Several pieces of continuous strip exist from which pieces must be cut. In order to fully maximize each piece, the employee must be able to subtract the amount of material he/she wants to cut from each piece to see if the remainder is enough to cut another piece.

2. **INTRODUCTION/PRESENTATION:** Bring in several cut up straws marked with their measurements. Leave out one segment and let students estimate the measurement of the missing piece. Discuss how this activity relates to maximizing the usage of the strip material.

3. **PRACTICE:** Have small groups devise scenarios which involve making choices about pieces of strip material. Allow the groups to switch scenarios and solve each others' word problems. Have the groups consciously practice equal participation, and consensus - building.

4. **APPLICATION:** Using company work orders, propose a scenario in which you now need 500 fewer pieces of material than called for in the order. Now how much do you need?

5. **REINFORCEMENT:** Have students devise problems which require assembly of components of various weights. Find the total, then write the problem in a form that requires the reader to find a missing weight given total weight.

6. **EVALUATION:** Pay close attention to steps 3 and 4 to see if any groups came up with different solutions to the same scenario, if so, ask either individuals or groups to come up with the reasons the answers were different.

7. **ATTACHED MATERIALS:** Skills Observation Sheet

Social Skills Observation Sheet

	Skills 1:	Skills 2:	Skills 3:	Skill 4:
Team 1				
Team 2				
Team 3				
Team 4				
Team 5				
Team 6				
Team 7				
Team 8				

Observation Date_____

INSTRUCTOR:

Stand by each group for one minute. Do not interact with group members. Record each use of each skills with a mark.

SKILLS TO OBSERVE:

Clarifying goals, staying on task, participating equally, getting consensus, respecting all points of view, listing actively, Giving explanations, checking for understanding, modeling how to get an answer, receiving help

Spence Kagan: Cooperative Learning
Publisher: Resources for Teachers, Inc. 1 (800) Wee Co-op

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 7
Mathematics Skills	Know when and how to use estimation as a tool
Workplace Competency	Estimate the size of an object before a measurement is taken
Thinking Skills	Estimations, generalizing

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** When recording measurements, sometimes digits are erroneously added or transposed. E.g.: 1.15" may be recorded as 1.51". The employee should have noticed the part was closer to 1.0" than 1.5".

2. **INTRODUCTION/PRESENTATION:** Discuss when estimates are used at work and at home. Help group to "discover" the rule of estimating: rounding to the appropriate places.

   Use straws cut and marked at pre-determined lengths to estimate total length of the straws laid end to end.

3. **PRACTICE:** Use the suggested situation from above to find estimates. Then do the precise calculations to determine if answer is close. Discuss importance of being 'low' or 'high' in the estimate and how to achieve.

4. **APPLICATION:** Have students estimate the amount of time and/or materials an employee needs to complete as given order.

5. **REINFORCEMENT:** Provide problems for student to work at home that require a high estimate, a low estimate and a best estimate.

6. **EVALUATION:** Using the application problem, have students calculate exact amounts and compare to estimates. Have them note if rounding produced a 'best estimate.'

7. **ATTACHED MATERIALS:** None

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 8
Mathematics Skills	Take measurements
Workplace Competency	Use correct number of decimal places when recording a measurement
Thinking Skills	Predicting, inferring, evaluating

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Various measurement tools are used by employees. Employees should not only learn the mechanics of their use, but the implications of recording inaccurate measurements for the rest of the process.

2. **INTRODUCTION/PRESENTATION:** Discuss with group what types of measuring instruments they use. If possible, group employees so that each person in a group uses a different instrument. Have students demonstrate use of their instruments.

   Explain rounding as used in measurements, where necessary.

3. **PRACTICE:** To integrate skills, have students measure separate items. Add together the measurements. Then add some error to each measurement and re-add. Note the discrepancy in the totals. Note the compounding effect of inaccuracy.

4. **APPLICATION:** Have students measure various items in the room using each others' instruments. Give teams a 5 identical measurable items [pencil, paper clip, etc.]. Each member should measure on objective and add that measurement to the precious measurement(s). When finished, teams compare their totals. The totals will probably be different; note the discrepancies in totals and in individual measurable. Have groups reconcile the differences.

5. **REINFORCEMENT:** Provide students with a worksheet that integrates measurement with basic operations and problem-solving. Students should have to take measurements, then add or subtract parts, or multiply by quantity desired.

6. **EVALUATION:** The group "expert" should evaluate the accuracy of students' measurements in the application exercise.

7. **ATTACHED MATERIALS:** Skills Observation Sheet

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 9
Mathematics Skills	Convert measurements to common units
Workplace Competency	Convert a part measurement from millimeters to inches
Graphic organizer	Fishbone

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Blueprint measurements may be shown in metric measurements. Workers are tooled with standard units. A conversion must be calculated before measurements may be taken.

2. **INTRODUCTION/PRESENTATION:** Note the differences between the standard and metric systems. May also discuss the pension for using decimals with metric units and fractions with standard measures. May use fishbone to explore types of measures.

3. **PRACTICE:** Explain the conversion formulas from standard to metric and the reverse. Incorporate the concept of ratios, if possible, from prior lessons.

4. **APPLICATION:** Using measurements taken from the measurement lesson, convert to metric units. Practice with other numbers converting from metric to standard.

5. **REINFORCEMENT:** Provide students with practice worksheets containing conversion problems.

6. **EVALUATION:** Pair students. Give each the same measurement, one metric, one standard, and have them convert. They can check their answers with each other.

7. **ATTACHED MATERIALS:** The Fishbone

TARGET GROUP	ADVANCED ESL,PRE-GED, GED Week 10
Mathematics Skills	Calculate SPC statistics given a set of data
Workplace Competency	Calculate mean of a sample of objects
Thinking Skills	Predicting, comparing, evaluating

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Company "B" requires its employees to be able to chart their own SPC (Statistical Process Control) data.

2. **INTRODUCTION/PRESENTATION:** Begin by asking the students what the SPC process involves for them at their company. The answer would determine the direction the lesson would take. As an introduction to SPC concepts, gather data on something like: how long have you worked for the company, how far you drive to work, what age you were when you got married, etc., from every student in the class. At that point, with all of the data on the board, determine and explain the concepts of mean, middle of the highway, so too is the median in a batch of numbers; the mode is the most often used number.

3. **PRACTICE:** Using quality charts available from the company (thickness measurements, etc.,) help students to determine the mean, median, mode, and range.

4. **APPLICATION:** Within groups have students individually calculate on each - mean, median, mode & range. Then they should compare their results and determine implications or draw inferences from this information.

5. **REINFORCEMENT:** Ask students to be aware of any SPC data they see or use in the workplace. Bring samples/ideas back to class.

6. **EVALUATION:** Have small groups switch charts with another small group and compare the SPC data they were able to derive from the charts. Discuss any differences.

7. **ATTACHED MATERIALS:** None

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 11
Mathematics Skills	Plot and read data on a graph
Workplace Competency	Graph x and r on an SPC chart
Team Skills	Giving explanation, checking for understanding
Graphic Organizer	SPC charts

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTEXT:** Employees need to be able to plot points, as well as read others' plotted points, on SPC (Statistical Process Control) graphs.

2. **INTRODUCTION/PRESENTATION:** Provide stick-up notes to each student, and instruct them to write down the number of months they have worked at the company (or number of miles travelled to work.) Then have them form lines in the back of the room according to their numbers (e.g. lines of single digits, tens, twenties, etc.)

   Have student volunteers visually present the data, in any way they wish, on the board. Discuss the accuracy and readability of the student-generated charts, graphs, etc.

   Review statistical terms of mean, median, mode, range. Have students consider how the visual representations relate to these statistics. Solicit other ideas from students of graph designs.

3. **PRACTICE:** Using data from class on calculating statistics, create graphs of various types, with emphasis on the company's SPC graph form.

4. **APPLICATION:** Group students in pairs. Have students devise statistics, which might be representative of their processes, to be graphed by other students. Encourage them to be creative when creating statistics, so that trends might be present.

5. **REINFORCEMENT:** Ask students to bring in any graphs from job or home and have others explain the importance of graph and decipher it.

6. **EVALUATION:** Have other students use the data represented on the new graphs to create a different type of graph.

7. **ATTACHED MATERIALS:** Skills Observation Sheet

TARGET GROUP	ADVANCED ESL, PRE-GED, GED Week 12
Mathematics Skills	Read blueprints
Workplace Competency	Calculate the amount and type of material needed to run 500 pieces, given the part's blueprint
Team Skills	Sharing ideas, getting consensus, giving explanations
Thinking Skills	Identifying structure, inferring

INSTRUCTIONAL ACTIVITIES

1. **COMPANY CONTACT:** Employees need to be able to discern from a blueprint how many inches of materials are needed to create a particular tool.

2. **INTRODUCTION/PRESENTATION:** Using overhead projector (so that part sizes are amplified) go over all points of a simple blueprint. Then using a second blueprint, ask students for the specifications shown.

3. **PRACTICE:** Demonstrate the use of measurements on the blueprint; not all lengths are always shown, so some computation may need to be done. Practice determining lengths using basic operations.

4. **APPLICATION:** Pose a situation for the student: If an order called for 500 parts and the blueprint was given, could they calculate how much and what type of material was needed?

5. **REINFORCEMENT:** Provide students with blueprints to take home. Have students identify particular parts of the product and give specific lengths.

6. **EVALUATION:** Grouping the students into teams of 4, have them develop a blueprint for a simple item (maybe a pencil). Then ask another group to identify parts and lengths on that blueprint. Groups evaluate each other. Have students practice productive group skills.

7. **ATTACHED MATERIALS:** Skills Observation Sheet

QUESTION CHART

WHO	
WHAT	
WHEN	
WHERE	
WHY	
HOW	
?	

MATHEMATICS IN PREPARATION FOR SPC TRAINING
ADMIRAL TOOL AND MANUFACTURING COMPANY

Preliminary Curriculum Outline *
Monday/Wednesday 2:30 to 4 P.M.

2 DAYS/WEEK	10 Weeks** @ 90 minutes/class	30 Class Hours

WEEK 1	Math Goals: Importance of Accurate Calculations Individualized Educational Plan
WEEK 2	Math Basics: Whole Number Operations in Job-Related Functions Estimating
WEEK 3	More Math Basics: Use of Fractions And Their Relationship to Decimals
WEEKS 4 & 5	Decimal Operations: Adding, Subtracting, Multiplying, Dividing Decimals and SPC
WEEK 6	Place Value in Tolerances and Specifications
WEEK 7	Review
WEEK 8	Calculating the Average And Range Calculator Usage
WEEK 9	SPC Vocabulary Computational Review
WEEKS 10 & 11**	In-House SPC training
WEEK 12	Assess Learning Gains Evaluate And Set Future Goals

* This curriculum is preliminary and subject to revision according to company and student needs.

** 30 hours of class are delivered by NIU-OAI Instructor; remainder of course delivered in-house

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)
Instructor: Nick De Genova

WEEK # 1
DATES March 7 and 9, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Assessment of workplace-related math competencies, and introduction of English-language mathematical terminology (which will be reinforced during every session, throughout the course).

SITUATION Course curriculum must be customized around specific workplace-related mathematical applications as well as specific educational needs of course participants. Likewise, course participants must be familiarized with the English-language terminology for these mathematical applications.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: In preparation for Statistical Process Control training, workers must set appropriate goals for course based upon an accurate assessment of basic math skills. Given that course participants speak English as a second language, this also requires that they become acquainted with the "language" of math -- in English.

2. INTRODUCTION / PRESENTATION: Overview of course curriculum and discussion of purpose of course -- to reinforce basic math operations in preparation for SPC training. Discussion of relationship between accuracy and quality.

3. PRACTICE: Individual Education Plan (I.E.P.) mathematical competency checklist, demonstration, and goal-setting; customized pre-course assessment of SPC-relevant math competencies.

4. APPLICATION: Collective goal-setting for course.

5. EVALUATION: Survey of class skills and supervisor input.

6. ATTACHED ADDITIONAL MATERIALS: IEP competency checklist and assessment form.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 2
DATES March 14 and 16, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Addition, subtraction, multiplication, and division of whole numbers -- calculation and estimation (rounding up/down).

SITUATION Basic operations with whole numbers are the foundation for calculations in SPC, as well as for computing wages, hours, overtime, etc.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: Most of the workers in the course had very little formal education in their countries of origin; few had finished primary school. Pre-course assessment revealed the need to reinforce whole-number operations. Since computation is typically performed with calculators, it is important that workers be able to estimate the correct results of their calculator computations. Furthermore, rounding up and down with whole numbers provides an introduction to an understanding of place values (which is critical in decimal operations for accurate calculations in SPC).

2. INTRODUCTION / PRESENTATION: Solicit job-related information from workers in order to devise contextualized example problems.

3. PRACTICE: Mutually-reinforcing numerical examples and word problems (with clarification in Spanish).

4. APPLICATION: Class is divided into teams who work together to devise their own math problems for each operation. Instructor consults with each team to verify groups' accuracy and individuals' comprehension.

5. EVALUATION: Teams present their problems to each other, and work cooperatively to solve the problems. Discuss answers as a whole class.

6. ATTACHED ADDITIONAL MATERIALS: Table of English-language math terms with appropriate mathematical symbols.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 3
DATES March 21 and 23, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Understanding decimal numbers and their relationship to whole numbers; naming and understanding decimal place values; estimation and quantitative comparison (greater than / less than / equal to) for decimal values; addition and subtraction of decimal numbers -- calculation and estimation.

SITUATION A thorough acquaintance with decimal numbers and accuracy in all basic operations with decimals is required for SPC computations.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: Actual company documentation for Quality Control reveals considerable inconsistencies in workers' mathematical calculations, undermining efforts toward effective Statistical Process Control.. These calculations primarily involve basic operations with decimal-number measurements to three decimal places (thousandths).

2. INTRODUCTION / PRESENTATION: Use of monetary examples draws upon most meaningful pre-existing familiarity with decimal numbers, and facilitates broader generalizations about decimals in relation to whole numbers and the significance of place values. Place-value names are clarified in Spanish and English. Addition and subtraction of decimal numbers is presented symmetrically with same operations for whole numbers, emphasizing decimal point location and alignment.

3. PRACTICE: Estimation (rounding up and down) and quantitative comparisons among decimal values verifies comprehension of introductory material, while also reinforcing job-related skills for predicting correct results and verifying accuracy in computation for quality control procedures.

4. APPLICATION: Class is divided into teams who work together to devise their own math problems for each operation. Instructor consults with each team to verify groups' accuracy and individuals' comprehension.

5. EVALUATION: Teams present their problems to each other, and work cooperatively to solve the problems. Discuss answers as a whole class.

6. ATTACHED ADDITIONAL MATERIALS: Place value chart.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 4
DATES March 28 and 30, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Multiplication and division of decimal numbers -- calculation and estimation.

SITUATION Accuracy in all basic operations with decimals is required for SPC computations.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: Actual company documentation for Quality Control reveals considerable inconsistencies in workers' mathematical calculations, undermining efforts toward effective Statistical Process Control. These calculations primarily involve basic operations with decimal-number measurements to three decimal places (thousandths).

2. INTRODUCTION / PRESENTATION: Multiplication and division of decimals are demonstrated symmetrically with same operations for whole numbers, emphasizing decimal places and decimal point location, while also reinforcing whole number operations.

3. PRACTICE: Class participants do example problems with whole numbers and then adjust their work when decimal points are introduced into the same problems.

4. APPLICATION: Class is divided into teams who work together to devise their own math problems for each operation. Instructor consults with each team to verify groups' accuracy and individuals' comprehension.

5. EVALUATION: Teams present their problems to each other, and work cooperatively to solve the problems. Discuss answers as a whole class.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 5
DATES April 4 and 6, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Understanding fractions as ratios of whole numbers; understanding fractional ratios as whole-number division problems; understanding fractions in relationship to decimal numbers; conversion between decimals and fractions, and using an understanding of decimal place values to find equivalents among fractions.

SITUATION Fractions and decimals are different ways of expressing the same quantitative values, and can be mutually reinforcing mathematical competencies.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: Fractions are used in the rounding up and down of decimal values in company documentation for SPC. Workers' understanding of fractional ratios between parts and wholes is also necessary to efficiently fill job orders.

2. INTRODUCTION / PRESENTATION: Solicit job-related information from workers in order to devise contextualized example problems of ratios between parts and wholes at several steps in the production process. Adapt these for an explanation of decimal and fractional equivalencies, and demonstrate conversion between the two. Reinforces whole-number division and the names of decimal place values, and anticipates forthcoming discussion of common denominators among fractions.

3. PRACTICE: Mutually-reinforcing numerical examples and word problems (with clarification in Spanish).

4. APPLICATION: Class is divided into teams who work together to devise their own math problems for each operation. Instructor consults with each team to verify groups' accuracy and individuals' comprehension.

5. EVALUATION: Teams present their problems to each other, and work cooperatively to solve the problems. Discuss answers as a whole class.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 6
DATES April 11 and 13, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Multiplication and division of fractions.

SITUATION Since these operations with fractions do not involve the necessity of common denominators, they are discussed before addition and subtraction with fractions.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: Workers must multiply and divide fractional ratios among quantities in order to fill job orders.

2. INTRODUCTION / PRESENTATION: Solicit job-related information from workers in order to devise contextualized example problems of the multiplication and division of ratios between parts and wholes.

3. PRACTICE: Mutually-reinforcing numerical examples and word problems (with clarification in Spanish). Reinforce multiplication and division for decimal equivalents of fractional values, and reinforce conversion between fractions and decimals.

4. APPLICATION: Class is divided into teams who work together to devise their own math problems for each operation. Instructor consults with each team to verify groups' accuracy and individuals' comprehension.

5. EVALUATION: Teams present their problems to each other, and work cooperatively to solve the problems. Discuss answers as a whole class.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 7
DATES April 18 and 20, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Conversion of fractions to equivalent fractions; finding common denominators; addition and subtraction of fractions.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: Workers must add and subtract fractional ratios among quantities in order to fill job orders.

2. INTRODUCTION / PRESENTATION: Review significance of decimal places and equivalences among decimals, and convert those decimals to fractions, in order to demonstrate the multiple equivalences among fractions (e.g. tenths, hundredths, thousandths). Review multiplication of fractions to demonstrate the conversion of fractions to equivalent fractions. Discuss the importance of common denominators in the adding and subtracting of fractions.

3. PRACTICE: Randomly distribute "pie pieces", representing two halves, three thirds, and five fifths, cut from three paper circles of equal size -- and ask the class participants to compare and combine their various fractional parts in order to produce circular wholes. This exercise illustrates the impossibility of combining unlike parts. Discuss how these parts of different size and shape are representative of fractions with different denominators.

4. APPLICATION: Teams work together on exercise problems to convert to common denominators for addition and subtraction of fractions; then teams convert the fractions to decimals and reinforce addition and subtraction of decimals.

5. EVALUATION: By team partners and by instructor.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 8
DATES April 25 and 27, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Conversion of improper fractions to mixed numbers; addition, subtraction, multiplication, and division of mixed numbers.

SITUATION Mixed numbers provide a useful illustration of the ways that whole numbers, fractions, and decimals can be understood in an integrated manner through which versatility in one set of operations can facilitate the apprehension of others.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: Operations with mixed numbers are necessary for the filling of customer orders.

2. INTRODUCTION / PRESENTATION: Use mixed numbers to review relations among whole numbers, fractions, and decimals; demonstrate all four basic operations with mixed numbers, reinforcing the same operations with equivalent fractions as well as decimals.

3. PRACTICE: Numerical examples and exercises

4. APPLICATION: Teams devise quizzes for each other -- deploying all four operations with whole numbers, mixed numbers, fractions, and decimals.

5. EVALUATION: Teams collaborate to check each other's work.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 9
DATES May 2 and 4, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY SPC-related mathematical operations: calculation of range, median, mode and arithmetic mean (average), for whole numbers and decimals (to three places).

SITUATION This week will be followed by two weeks of company training in SPC concepts and procedures.

INSTRUCTIONAL ACTIVITIES

1. COMPANY CONTEXT: All workers are being trained to regularly and effectively perform SPC procedures which will require the calculation of range and mean for decimals in the thousandths.

2. INTRODUCTION / PRESENTATION: Discussion (with clarification in Spanish) of the math concepts involved in SPC, and introduction of the calculation of averages.

3. PRACTICE: Collection of various numerical data from the sample which is the class itself (e.g. ages, sizes, etc. for all of the class participants), and analysis of the mean, median, mode, and range for each set of numbers (includes the calculation of averages).

4. APPLICATION: Teams generate their own data samples and perform SPC calculations.

5. EVALUATION: By team partners and by instructor.

6. ATTACHED ADDITIONAL MATERIALS: Company SPC chart.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEKS # 10 and 11
DATES May 9, 11, 16, 18, and 23, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Statistical Process Control

SITUATION Company trainer instructs class in English and Spanish, in collaboration with course instructor.

LESSON PLAN

Pre-SPC Math for Limited English Proficient (Admiral Tool)

WEEK # 12
DATES May 25, June 1, 1994

TARGETED GROUP Pre-SPC Math for Limited English Proficient (Admiral Tool)

WORKPLACE COMPETENCY Review of course

INSTRUCTIONAL ACTIVITIES

1. INTRODUCTION / PRESENTATION: Review of all math topics covered in the course.

2. PRACTICE: Each class participant devises an example problem for each basic competency developed in the course, according to instructor's directions, thereby producing a unique "final exam" to share with a partner.

3. APPLICATION: Post-course assessment.

4. EVALUATION: IEP competency checklist; TABE math.

NIU/OAI COMPETENCY CHECKLIST

[redacted]

BASIC AND TECHNICAL SKILLS FOR BLUEPRINT READING

AINEE _____ TRAINER(S)_____ DATE_____

Literacy/Workplace Skills	50% Accuracy	50-80% Accuracy	80%+ Accuracy
Listening			
1. Follows multiple instructions related to a classroom task			
Speaking			
2. Expresses inability to understand			
3. Asks clarifying questions related to instruction			
4. Requests assistance related to blueprint exercises			
5. Describes function of basic blueprint lines			
Reading			
6. Uses coordinates to locate information on			
• Blueprints			
• Standard tables (abbreviations, tolerances, symbols)			
7. Locates and understands key components of a blueprint			
• Title			
• Drawing number			
• Title block and notes			
• Revisions			
• Parts specifications			
8. Understands common blueprint abbreviations			
9. Comprehends common blueprint symbols			
Identifies blueprint lines: *object line			
Math *hidden line *dimension line *leader line			
10. Rounds decimals to nth place *break line *section view			
11. Estimates to verify calculator readouts lines			
12. Converts fractions to decimals			
13. Calculates tolerance ranges from blueprint specifications			
14. Reads/understands angular measurements			
15. Sets up math computations from work-related scenarios			
Team Skills			
16. Assists peers in blueprint reading activities			
17. Works cooperatively with others in team or pair practice exercises			
Learning to Learn Strategies			
18. Sets Learning Goals			
19. Monitors Progress			
20. Recognizes Learning Gaps			
21. Identifies Resources			
22. Recognizes Achievement			
Technical Skills*			
23. Identifies and explains critical specifications on blueprint			
24. Discriminates among views of a part (top, front, side)			
25. Identifies isometric and orthographic views and their functions			
26. Accurately draws an ~~orthographic shape~~ isometric view			
7. Identifies different types of metal and their properties			
8. Metrologically verifies gages of metals			

* **Competencies 23 through 28 are skills to be developed by a technical trainer. All others are basic skills competencies.**

Northern Illinois University

Office of Applied Innovations

at

Victoria Hathaway
and Matt Huseby,
Northern Illinois University

and

Randy Chodorowski,

1994

FOREWORD

This curriculum was a cooperative venture between Northern Illinois University/Office of Applied Innovations and [redacted] Funding for the original course was provided by the EASE (Employee Assistance and Skills Enhancement) Workplace Literacy Grant from the US Department of Education.

The need to train the [redacted]line workers in elementary blueprint reading skills has been hampered in the past by deficits in basic skills and knowledge of English as a second language. For this reason, the course serving as a pilot for this curriculum was team taught by a basic skills instructor and a technical trainer.

The trainees selected to participate in the pilot were at SPL VII and above, a level necessitated by the concept load and the monolingualism of the technical trainer. This group was quite verbal about their eagerness to begin technical training as soon as possible, without the typical four week period of up-front basic skills.

In the interest of capitalizing on trainee motivation, only a few basic skills were taught prior to the introduction of technical concepts, and -- in the opinion of this curriculum developer -- could easily have been integrated with some intensive pre-planning. An ongoing observation of the classes and close collaboration with the technical trainer has made it possible to fuse the basic skills and technical strands seamlessly. Design elements such as structured pair reviews and transfer tasks reinforce skills within and between classes. The integrated nature of the following curriculum should provide flexiblility in the delivery of basics: they can be pre-viewed *or* reinforced by the basic skills instructor without risk of having deficits interfere significantly with the technical portion. Pull-out basic skills are listed on the following page.

NORTHERN ILLINOIS UNIVERSITY-OFFICE OF APPLIED INNOVATIONS
ELEMENTARY BLUEPRINT READING COURSE FOR [redacted]

- 12 Customized Lessons, 90-120 Minutes each = 18-24 hours
- 2 Customized quizzes
- Customized pre/post test

LESSON OBJECTIVES - Trainees will be able to:

1
- Assess their current knowledge of Blueprint Reading skills by completing the pre-test
- Recognize the importance of precision dimensions in product quality
- Distinguish visually between metric and English dimensions
- Record linear dimensions on a simple sketch
- Recognize that dimensions do not change with scale

2
- Identify basic blueprint lines and their functions
- Use coordinates to locate information in main sections of print:
  - * title block
  - * body of print
  - * revisions list
  - * notes
- Relate information in Revisions list to dimesions in body of print
- State 2 reasons for customer revisions

3
- Recognize role of tolerance range in quality
- Calculate tolerances for width, height, and depth of part
- Recognize gross angular dimensions - 180°, 90°, 45°
  - as parts of a 360° circle
- Recognize 3 notations for a 90° angle
- Apply skills practiced in Lesson 2 to locate a variety of print information

4
- Recognize the 3 basic views (front, top, side) within the isometric view
- Given a front view, rotate a simple object or metal part to the top and side views
- Given a front view, rotate a simple object or metal part to all possible views

5
- Shape 3 dimensional objects from modeling clay using basic view drawings
- Identify/explain correct and incorrect features in clay models

6	•	Correctly use basic drafting tools to draw simple shapes
	•	Use object lines to draw the 3 views in sequence and in correct spatial relationship
	•	Extend lines of front view to draw other views
	•	Use hidden lines to draw unseen features of a part
	•	Recognize that hidden lines in one view may appear as object lines in another view
7	•	Orally review lessons 1 - 6
	•	Complete Quiz #1
8	•	Identify cutting plane lines and their functions
	•	Cut a clay model along cutting plane lines and correctly rotate to section view
	•	Accurately complete clay model of section view
	•	Correctly copy cutting plane view AA
	•	Locate and interpret section view and any reference notes appearing on the blueprint
9	•	Explain or demonstrate which part of cutting plane to represent as Section AA
	•	Correctly utilize section lines
	•	Draw top and side views of section view
	•	Distinguish between drawings of hollow and solid cylinders
)	•	Draw a 10X (10:1) enlargment to clarify narrow surfaces
	•	Draw a simple shape at full scale using a 12" rule
	•	Correctly note dimensions of shape utilizing dimension and extension lines
	•	Draw shape to enlarged scale
	•	Note enlarged scale in title block.
	•	Explain **scale noted** and locate various scales on print
	•	State the 2 functions of the T.S.C. notation
11	•	Draw Revision B - front, top and side - given Revision A data
	•	Draw Revision C - front, top and side - given Revision B data
	•	Record Revisions A, B, and C as: WAS _____; NOW_____ on Revisions List
	•	Orally review lessons 1 - 11
12	•	Present/Demonstrate an assigned concept to classmates
	•	Assess increased knowledge of Blueprint Reading skills by completing the post-test

Pull-out Basic Skills

- Measurement conversions: Metric <--> English
- Locating and relating information:
  - * title block
  - * notes
  - * revisions list
  - * body of print
- Calculating tolerance limits from print specifications
- Angular dimensions as parts of a circle
- Ratios (blueprint scale)
- Note-taking skills
- Teamskills
- Study skills
- Test-taking skills

[redacted] LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 1	DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Assess their own knowledge of Blueprint Reading skills by completing the Blueprint Reading Pre-/Post-Test
- Recognize the importance of precision dimensions in product quality
- Distinguish visually between metric and English dimensions
- Record linear dimensions on Heatsink sketch
- Recognize that dimensions do not change with scale

KEYWORDS:

* Leader lines
* Dimension lines
* Extension lines
* Scale

TOOLS/MATERIALS:

* [redacted] Blueprint Reading Pre-/Post-Test
* [redacted] print #00735244
* Cardboard mock-up of multiviews
* Handout: Revisions (blank)

INTRODUCTION: A blueprint is a visual record of customer specifications for a part. It is drawn using precision drafting equipment and standardized techniques. Three basic views -- front, top, side,-- enable the precision metalworker to visualize a part in 3 dimensions. Linear and angular dimensioning provides information which is essential to monitoring and maintaining product quality. Blueprint reading is a critical skill in precision metalwork.

ACTIVITIES:

- Hand out Blueprint Reading Pre-/Post-Test and the 4 specified prints. Allow 30 - 45 minutes for Ts to complete.

- Discuss relation of blueprint to product quality.

- Pair Ts. Provide each pair with 2 prints: one with English dimensions and one with metric (e.g. [redacted]). Pairs decide which uses inches and which millimeters. Ask how they decided. (Used tolerance information? scale information? a measuring device?) Discuss the print convention *.XX* (English) vs *0.XX* (metric).

- Demonstrate the multiview cardboard mock-up and discuss the need for multiple view drawings to guide the metalworker.

- Sketch 3 basic views of heatsink, providing extension lines, dimension lines, and dimensions for front view. Provide dimensions for width, depth and height. Pairs decide which dimension is entered where. If unable to agree, they can consult another pair. Did all interpret *width, depth, height* the same way?

- Provide customer revision of heatsink *width*. Pairs record as *WAS/NOW* data on Revisions List.

- Discuss the need to enlarge scale (e.g. [redacted], Detail, D-1) Have pairs enlarge this detail to 4x (4:1) scale and add dimensions. Did they double the dimensions? keep them the same?

EVALUATION:	IMPROVE NEXT TIME BY:
• Performance on Blueprint Reading Pre-/Post Test • Participation in pair activities and class discussions	

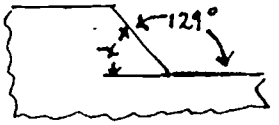
[redacted]

BASIC BLUEPRINT READING PRE-\POST-ASSESSMENT

1. Convert 42.5 millimeters to inches.

2. Convert 1.820 inches to millimeters.

3. Calculate the angle:



▸▸▸ Refer to Attachment A (Blueprint #00735862, Philips Heatsink) to answer the following:

4. What are the coordinates of the *Isometric view?*

5. What does *TYP* mean?

6. What is the scale of *Detail D-1*?

7. How many revisions appear on the print?

TRUE OR FALSE?

8. If you draw an object *2x scale*, you must also change the dimensions of the part. T F

9. All blueprint drawings are made *to scale.* T F

▸▸▸ Refer to Attachment B (Blueprint #5443A122, [redacted] Bracket) to calculate the following upper and lower tolerance limits:

DIMENSION	UPPER LIMIT	LOWER LIMIT
10. 75^0		
11. .56		
12. .632		
13. .125		
14. .33 .32		

▸▸▸ Refer to Attachment C (Arbor print), to identify each view:

15. _____ 17. _____

16. _____ 18. _____

▸▸▸ Refer to Attachment D (Blueprint #00735956, [redacted]) to answer the following:

19. In the side view, by how many degrees was the angle revised on 4-5-94?

20. How many samples must be approved by the customer before production of the part?

21. What is the maximum allowable burr?

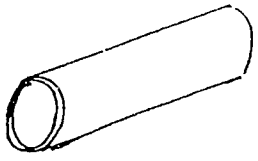
22. What scale is the print?

23. Are the print dimensions in inches or in millimeters?

▸▸▸ Refer to Attachment E (Punch print) to locate and record 3 *sharp corner* dimensions

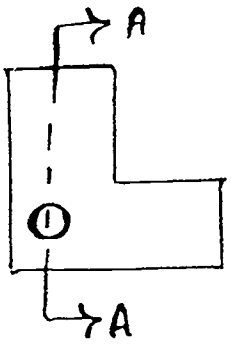
24. _____ 25. _____ 26. _____

27. The *isometric* and *front* views of a hollow cylinder are drawn for you. Draw the *side* view.



Front Side

28. Draw *Section view AA* of the figure below:

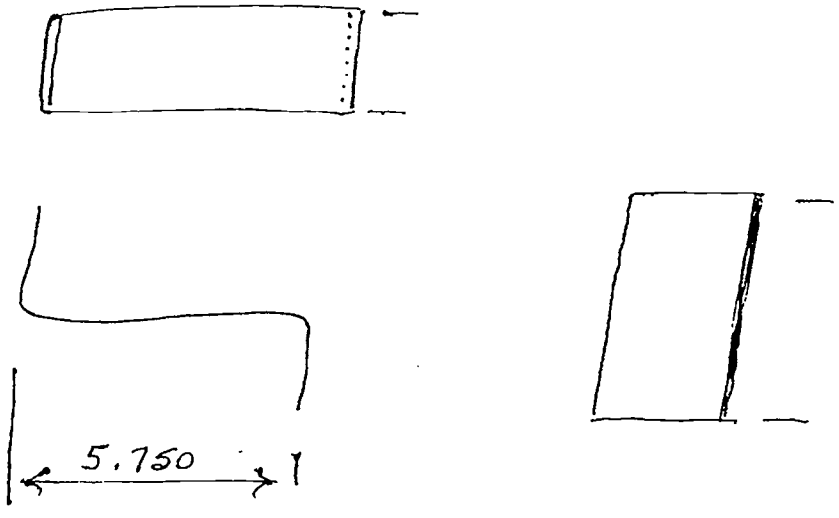


1/2 inch DIA hole thru

(Lesson 1)

(Trainer notes)

Heat sink sketch



Width 5.75 inches

Depth 2 inches

Height 3 inches

Customer changes dimension:

5.750 → 5.000

Note this in Revisions

REVISIONS	

[redacted] LESSON PLAN

TECHNICAL AREA:	BLUEPRINT READING LESSON 2	DURATION OF LESSON:	90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Identify basic blueprint lines and their functions
- Use coordinates to locate information in main sections of print:
  - * Title Block
  - * Body of Print
  - * Revisions List
  - * Notes
- Relate information in Revisions list to dimensions in body of print
- State 2 reasons for customer revisions

KEYWORDS:

- * Object line
- * Leader line
- * Cutting plane line
- * Coordinates
- * Revisions List
- * Hidden line
- * Center line
- * Break line
- * Title Block

TOOLS/MATERIALS:

- * Heatsink print
- * Handouts:
  - Blueprint Lines and their Functions (one blank/one completed version)
  - Coordinates Exercise

(Blueprint Reading Lesson 2, continued

REVIEW: When drawing a print in enlarged scale, do you enlarge the dimensions? Why? Which of the following is English and which is metric? *.957* *0.957* How do you know? What other way can you determine if print dimensions are Ennglish or metric? What do these lines signify and what are they called? / ←————→ / When the customer changes a part specification, where/how is it recorded on the print?

INTRODUCTION: The different appearance of blueprint lines helps to distinguish the separate functions the lines perform. While some lines depict the visible and hidden features of a part, others relate to the part dimensions. Coordinates are provided on some prints to assist the reader in locating information quickly. The title block, Notes, and Revisions List contain information vital to the interpretation of the print. Revisions are made in prints for 2 reasons:

- to reduce the cost of materials
- to meet new needs of customers

ACTIVITIES:

- Pair TS. Hand out Blueprint Lines & Their Functions (blank) and a Heatsink print -- 1 set to each pair. Have pairs look at print and:
  * identify an example of each type of line on the print, using the described functions
  * copy the lines in the APPEARANCE column of the handout

  TS come to board and draw an example of each type of line. Hand out the Blueprint Lines & Their Functions (completed version) for each T to file in his/her notebook.

- Form new pairs and ask them to identify/locate the coordinates A,B,C, and 1,2,3 on the Heatsink print. Do they know why these appear along the print borders? Hand out Coordinates Exercise and call out coordinates while passing around room to watch TS connect dots. If anyone is struggling, have a proficient T take over the callouts as you work with strugglers. At end of exercise, have TS compare their dots visually with those of others. Everyone should have the same configuration of lines.

- Ask same pairs to find as much familiar information as they can in each section and to be ready to report it to whole group (example: customer name appears in the Title Block). Allow 5 minutes to locate information and 10-15 minutes to share and discuss other critical data, symbols, and abbreviations.

- Discuss 2 reasons for customer revisions. Ask pairs to look at Revision List on Heatsink and to locate changes in Rev B by using coordinates given. In their opinion, which reason might the customer have had for each revision?

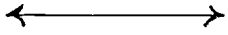
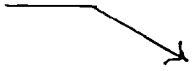
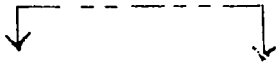
- Homework: Each T will report next class on data from his/her current blueprint: customer name, part number, scale, English or metric dimensions

EVALUATION:	IMPROVE NEXT TIME BY:
• Performance in pair exercises • Participation in discussions and class activities	

BLUEPRINT LINES AND THEIR FUNCTIONS

NAME OF LINE	APPEARANCE	FUNCTION
1. Object line		Indicates the visible features of a part
2. Hidden line		Indicates the hidden features of a part
3. Extension lines		Extend from the part to establish parameters of a dimension
4. Dimension line		Locates the size of a feature
5. Leader line		Connects a small feature and a reference note
6. Center line		Indicates the center of a hole or other circular feature
7. Cutting plane line		Indicates the portion to be cut away when making a section view
8. Break line		Shows that a portion of the part has been broken off

BLUEPRINT LINES AND THEIR FUNCTIONS

NAME OF LINE	APPEARANCE	FUNCTION
1. Object line		Indicates the visible features of a part
2. Hidden line		Indicates the hidden features of a part
3. Extension lines		Extend from the part to establish parameters of a dimension
4. Dimension line		Locates the size of a feature
5. Leader line		Connects a small feature and a reference note
6. Center line		Indicates the center of a hole or other circular feature
7. Cutting plane line		Indicates the portion to be cut away when making a section view
8. Break line		Shows that a portion of the part has been broken off

COORDINATES EXERCISE

Put a dot in the center of each square.

Listen to the trainer and follow his instructions:

	A	B	C	D	E	F	G	H	I
1									
2									
3									
4									
5									
6									
7									
8									
9									

Cut here to duplicate

TRAINER NOTES: Allow time for TS to enter a dot in each square. Then ask them to connect the dots as follows:

Locate A3

Connect A3 to B7

Connect B7 to C4

Connect C4 to F1

Connect F1 to E9

Connect E9 to G8

Connect G8 to H2

Connect H2 to I6

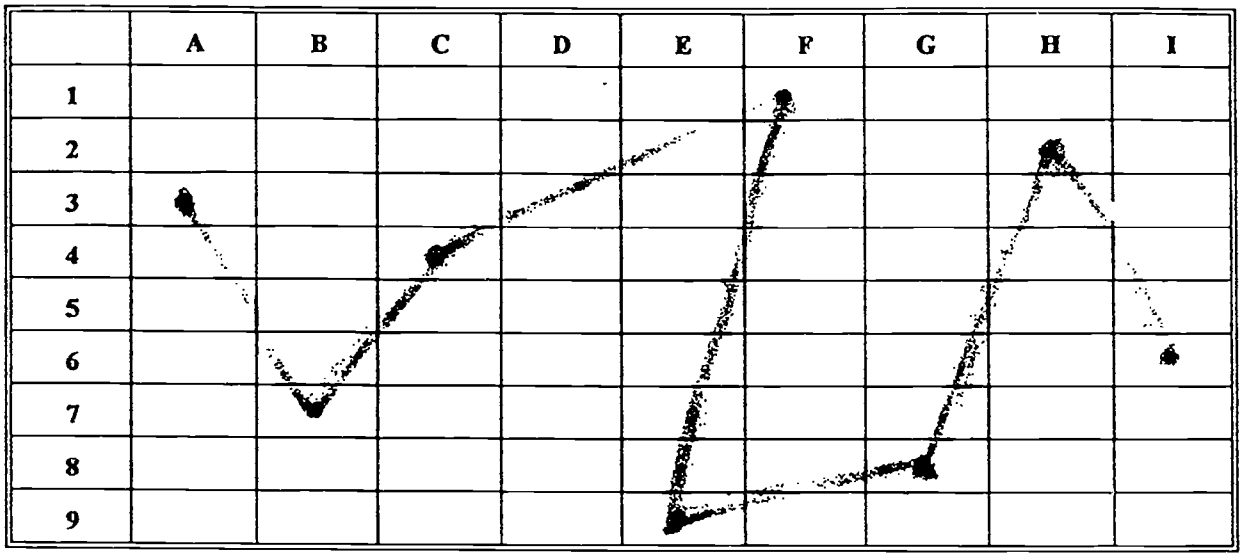
Does everyone have the same configuration?

Key

COORDINATES EXERCISE

Put a dot in the center of each square.

Listen to the trainer and follow his instructions:



	A	B	C	D	E	F	G	H	I
1									
2									
3									
4									
5									
6									
7									
8									
9									

Cut here to duplicate

TRAINER NOTES: Allow time for TS to enter a dot in each square. Then ask them to connect the dots as follows:

Locate A3

Connect A3 to B7

Connect B7 to C4

Connect C4 to F1

Connect F1 to E9

Connect E9 to G8

Connect G8 to H2

Connect H2 to I6

Does everyone have the same configuration?

[redacted] LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 3	DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Recognize role of tolerance range in quality
- Calculate tolerances for width, height, and depth of part
- Recognize gross angular dimensions - 180°, 90°, 45° - as parts of a 360° circle
- Recognize 3 notations for a 90° angle
- Apply skills practiced in Lesson 2 to locate a variety of print information

KEYWORDS:	TOOLS/MATERIALS:
* Tolerance range * Width * Height * Depth	* Handout: Pair Exercise in Blueprint Reading * [redacted] print #E068400-00 * A second selected print

REVIEW: Each T will report information from his/her current job print: Customer name/part name/ scale of print/metric or English dimensions

INTRODUCTION: Tolerances set the outer limits that a dimension can vary from its specification. These limits may apply to either linear or angular dimensions. Generally, tolerances are noted in the title block, but they may appear with the dimensions they apply to.

ACTIVITIES:

- Discuss the relation of tolerances to quality
- Sketch heatsink on board with dimensions for width, height, and depth along with Revisions List. As a review, change a dimension and ask a T to note the revision on the board.
- Put tolerance specifications on board and have Ts calculate the tolerance ranges for width, height, depth.
- Draw a circle, marking the perimeter as having 360°. Draw a second circle, bisected, labeling the 2 parts 180° each. Ts copy and label these. Have Ts draw 2 more circles, one divided in 4 parts and the other in 8. Can they correctly label each angle?
- Sketch a heatsink showing 3 ways to note a 90° angle. Ts copy.
- Pair Ts and hand out Pair Exercise for Blueprint Reading. Have them complete the 13 (boxed) questions.
- If time permits, form 2 teams for the Team Exercise. Allow 10 minutes for each team to formulate questions for the other team. Score 1 point for each question correctly answered.

EVALUATION:	IMPROVE NEXT TIME BY:
• Completion of written exercises • Participation in team exercise	

PAIR EXERCISE IN BLUEPRINT READING

INSTRUCTIONS: Work in pairs, entering your names here _____

_____

See attachment: PSS Blueprint #E0684-700-00, Retainer Wire

	QUESTIONS	ANSWERS
1.	What is the part number?	
2.	What material is specified?	
3.	What are the tolerance specifications?	
4.	Is the drawing larger or smaller than the part?	
5.	Are there any revisions? How many?	
6.	What does  mean?	
7.	Where else do you find  ?	
8.	What do A, B, and C refer to?	
9.	Where else do you find these letters?	
10.	What does R mean?	
11.	What does 30° signify? Draw a circle and indicate the approximate portions for 30° and 60°.	
12.	How does 01B relate to the revisions section?	
13.	Why are DIM A, B, and C different for each part?	

TEAM EXERCISE: Using the second blueprint provided, ask another team questions regarding:

- the coordinates of information you want them to locate
- the meaning of various symbols used
- linear or angular dimensions given in the print
- any of the revisions listed

[redacted] LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 4	DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Recognize the 3 basic views (front, top, side) within the isometric view
- Given a front view, rotate a simple object or metal part to the top and side views
- Give a front view, rotate a simple object or metal part to all possible views

KEYWORDS:	TOOLS/MATERIALS:
* Isometric view	* Lifesavers
* Front view	* Hollow cylinders
* Top view	* Books of matches
* Side view (right, left)	* Heatsink parts
* Bottom view	* Rotation Exercise: Trainer Notes

(Blueprint Lesson 4, continued)

REVIEW: Ts refer to Allied Retainer Wire print and answer questions regarding typical tolerances and specified tolerances for angles and linear dimensions.

INTRODUCTION: Metal parts are typically drawn from 3 basic views: front, top, and side. Occasionally, an isometric view is provided to show the 3 views simultaneously. Sometimes other views reveal features that can only be seen from one perspective of the part. Manually rotating a metal part as it might appear on a print can help the production worker visualize the part as it changes from position to position. Later he/she will be more able to "see" parts in 3 dimensions using only the basic print views.

ACTIVITIES:

- Demonstrate the multiview cardboard mock-up and discuss the necessity of providing multiple views to the metal worker
- Sketch an object in isometric view and label front, top, and side view features. Use these features to draw each view. Ts copy freehand in noteboks
- Provide each T with a Lifesaver and lead the group through the Rotation Exercise (front->top->front->side) (See: Trainer Notes)
- Repeat with a hollow cylinder, adding the left side (front->top->front->R side->front->L side)
- Repeat with a book of matches, adding the bottom (front->top->front->R side->front->L side->front->bottom)
- Do again with heatsink part using:
  * 3 basic views * all 5 views
- Optional reinforcement: Ts rotate heatsink to views called out, then compare with heatsink print: Were their rotations correct?

EVALUATION:	IMPROVE NEXT TIME BY:
• Rotation of objects to specified views • Performance on written pair exercise	

ROTATION EXERCISE: TRAINER NOTES

Lifesaver: front->top->front->side

- Model while Ts watch, 3 times
- Model while Ts imitate, 3 times
- Call out rotations while Ts flip Lifesaver, then check with partner: Is partner's view the same?

Hollow cylinder: front->top->front->R side->front->L side

- Model while Ts watch, 3 times
- Model while Ts imitate, 3 times
- Call out rotations while Ts flip cylinder, then check with partner

Book of Matches: front->top->front->R side->front->L side->front->bottom

- Same sequence as above

Heatsink part: front->top->front->side

- Same sequence

Heatsink part: front->top->front->R side->front->L side->front->bottom

- Same sequence

[redacted] LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 5	DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Shape 3 dimensional objects from modeling clay using basic view drawings
- Identify/Explain correct and incorrect features in clay models

KEYWORDS:	TOOLS/MATERIALS:
* Modeling clay	* Matching exercise: Iso and basic views * Basic view drawings * Modeling clay * Simple tools for cutting, shaping and boring clay

REVIEWS: Provide each T with a heatsink part and have them rotate as you call out views

Hand out Matching exercise: Iso and basic views. Ts complete, then justify their choices.

INTRODUCTION:

Forming objects in clay from simple drawings provides a hands-on experience of the relationship of 2 dimensional drawings to 3 dimensional objects.

ACTIVITIES:

- Provide clay and tools to cut, shape, and bore. Hand out basic views of simple objects, one set at a time. Do not include isometric views. Ts shape 3-dimesional models of each in clay. Draw attention to any differences in the models. Which ones accurately represent the 2-dimensional data and why? Where model features are incorrect, how do they misrepresent the data?
- Optional: Have Ts draw objects from the incorrect models and compare these drawings to the originals. Allow time to reshape features which are incorrect.

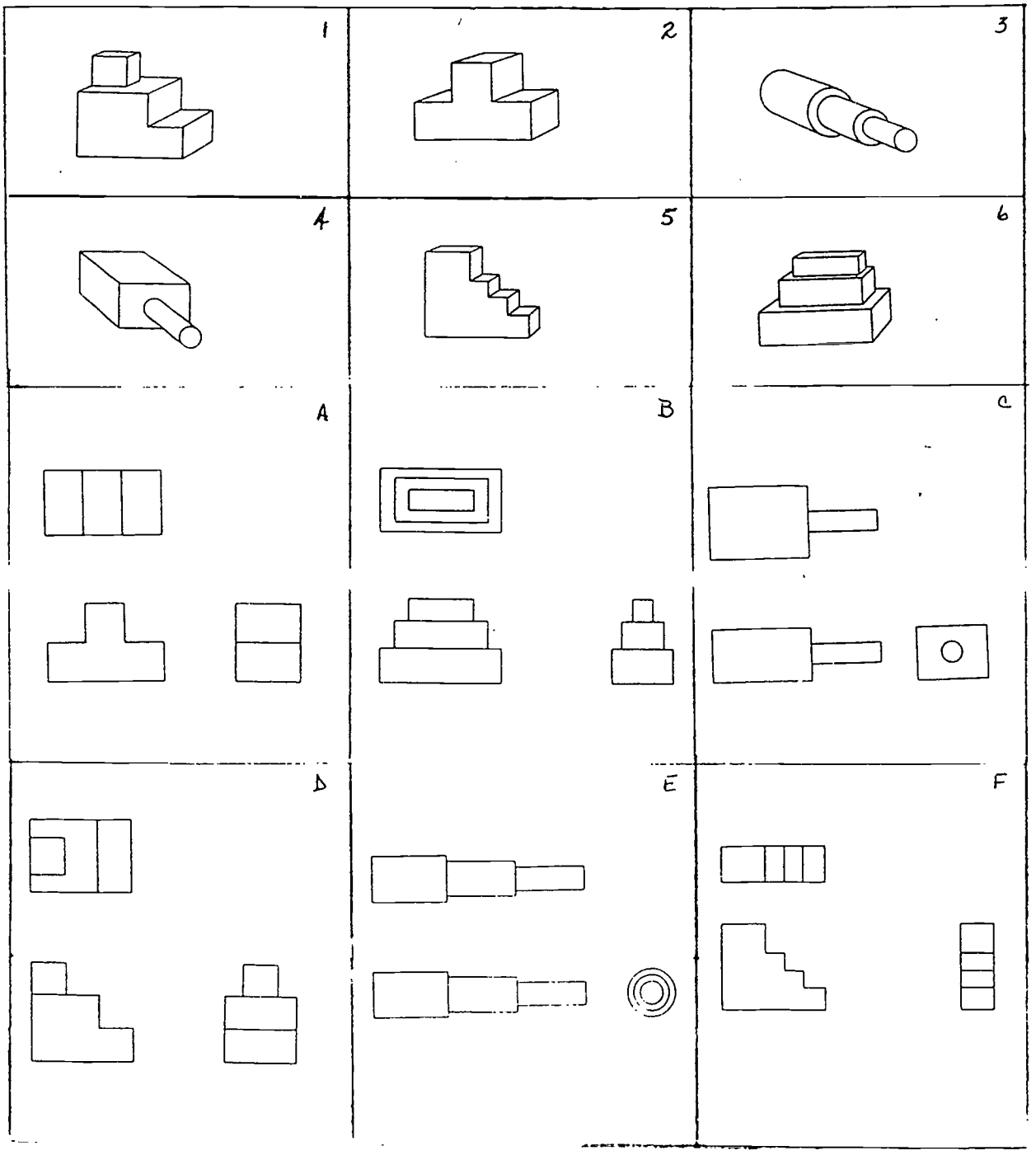
EVALUATION:	IMPROVE NEXT TIME BY:
• Construction of clay models • Participation in class discussions	

Matching Exercise

Below are six isometric views. Match each with the appropriate set of basic views.

View 1 _____ View 3 _____ View 5 _____

View 2 _____ View 4 _____ View 6 _____



Adapted from MACHINE SHOP FUNDAMENTALS, PART 1 (1982). M. Kelly and P. Menges. Springfield: Illinois State Board of Education.

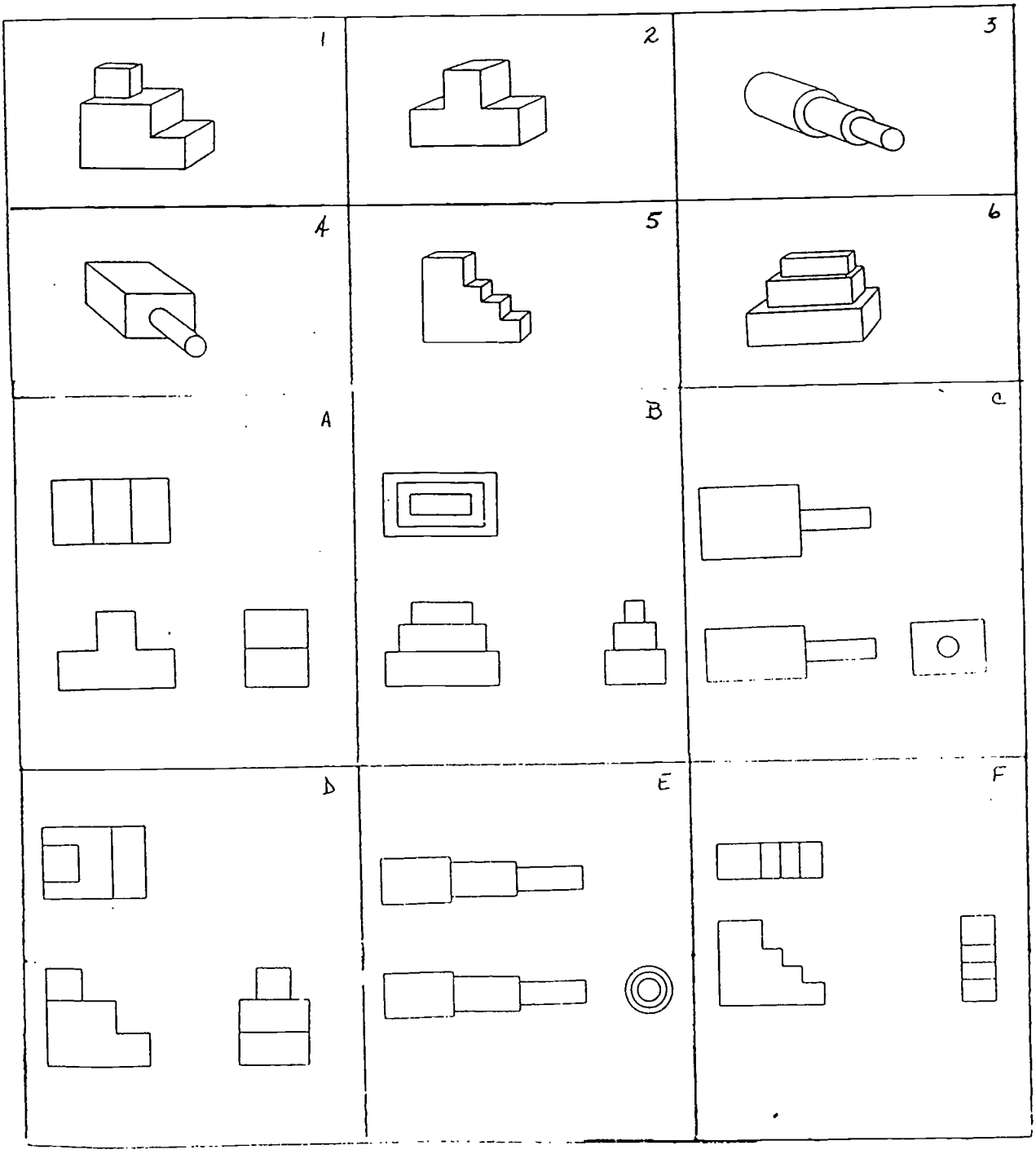
4e

Matching Exercise

Below are six isometric views. Match each with the appropriate set of basic views.

View 1 D View 3 E View 5 F

View 2 A View 4 C View 6 B



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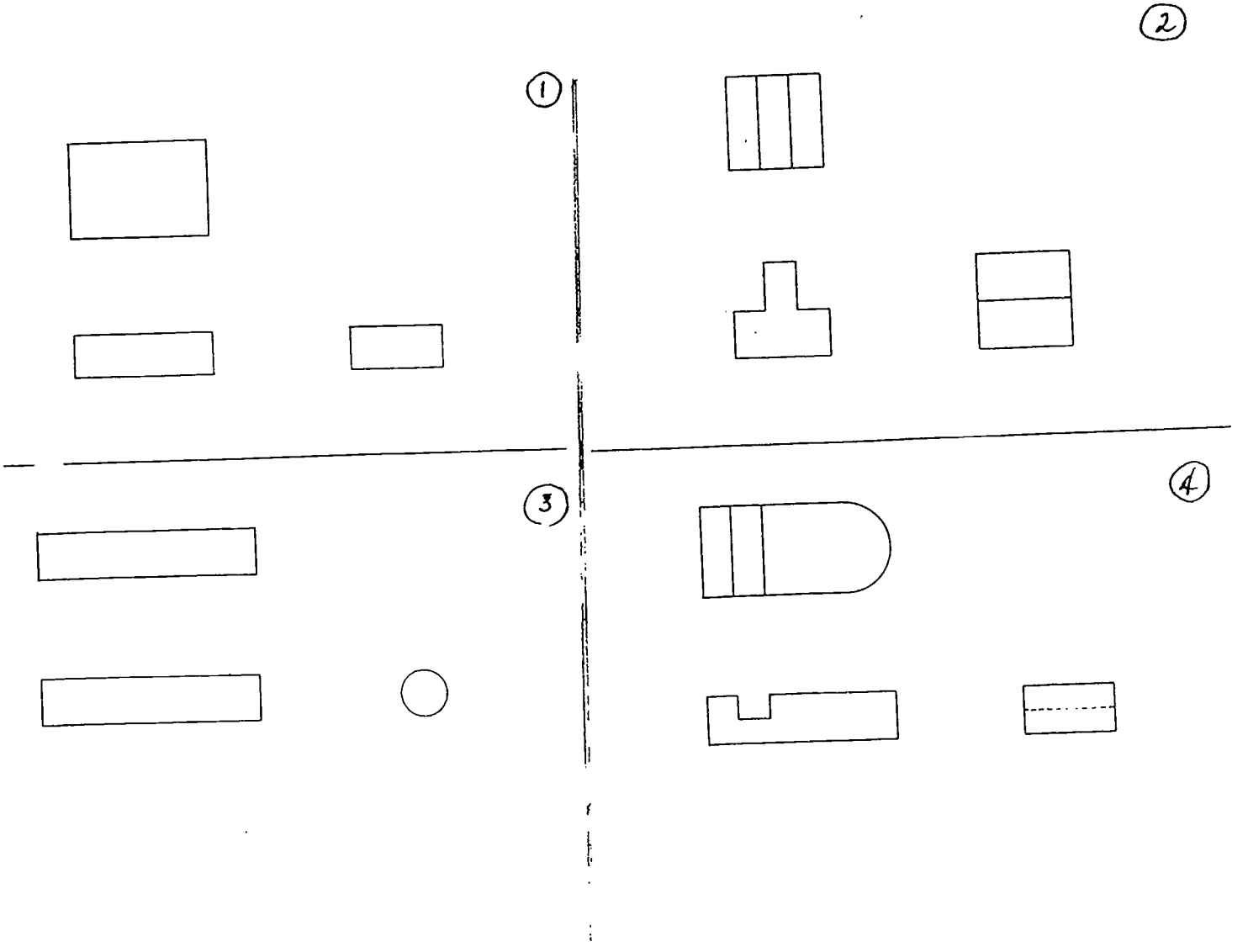
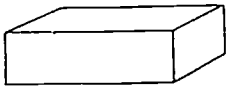


Adapted from MACHINE SHOP FUNDAMENTALS, PART 1 (1982).
M. Kelly and P. Menges. Springfield: Illinois State Board of Education.

Key

(1)



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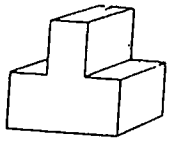

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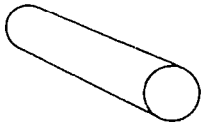

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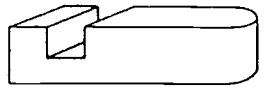


PERFECTION SPRING AND STAMPING LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 6

DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Correctly use basic drafting tools to draw simple shapes
- Use object lines to draw the 3 views in sequence and in correct spatial relationship
- Extend lines of front view to draw other views
- Use hidden lines to draw unseen features of a part

KEYWORDS:

- Drawing board
- T-square
- Triangle (90^0, $30^0/60^0$)
- Object lines (review)
- Hidden lines (review)

TOOLS/MATERIALS:

- Matching exercise: front and top with side view
- Board
- T-square
- Triangles (90^0 and $30^0/60^0$)

REVIEW: Trainees complete matching exercise: front and top with side view and defend their choices.

INTRODUCTION: Basic drafting equipment such as board, T-square, and triangles enable the metalwork engineer to represent parts with very precise visual information.

ACTIVITIES:

- Draw a simple isometric view of stairway, labeling front, top and side. Ts copy using board, T-square, and triangle.
- Have Ts extract the 3 bacis views from the isometric view, using the labels as guides. Have 3 Ts come to the front, each to draw one of the 3 basic views.
- Draw a circle, representing a quarter. Ts draw top and side views.
- Draw the 90 triangle. Ts draw top and side views.
- Draw an L-shaped part, specifying 1" DIA HOLE THRU. Ts draw top and side views using hidden lines to represent hole.
- Revise the hole specification to 1" DIA HOLE $^1/_2$" DEEP. Ts draw revised top and side views. They then record revision: WAS 1" DIA HOLE THRU; NOW 1" DIA HOLE $^1/_2$" DEEP.

EVALUATION:

- Completion of drawings and use of equipment
- Participation in class activities and discussions

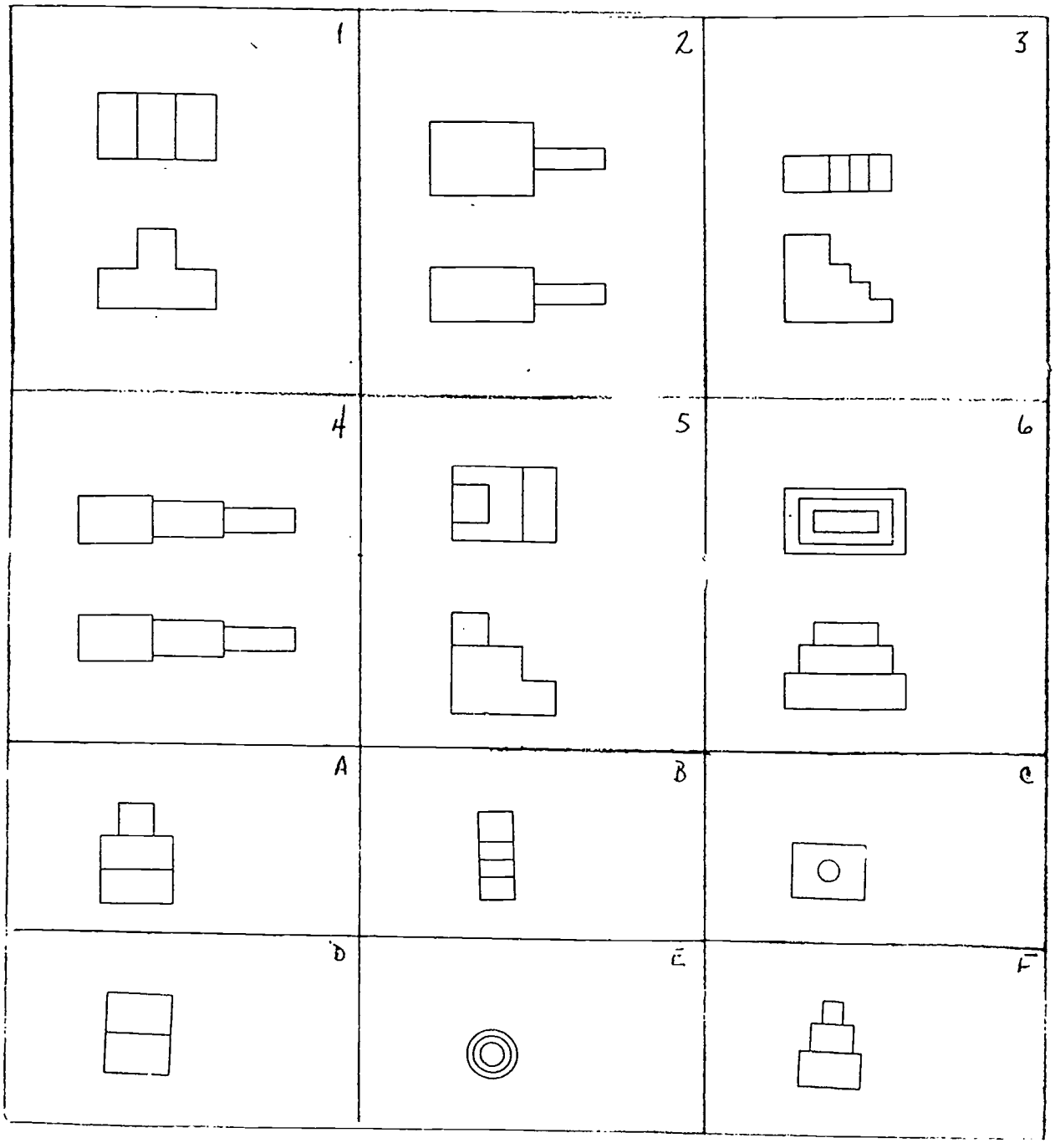
IMPROVE NEXT TIME BY:

Matching Exercise 2

Match the following front and top views with the correct side view.

View 1 _____ View 2 _____ View 3 _____

View 4 _____ View 5 _____ View 6 _____



Adapted from MACHINE SHOP FUNDAMENTALS, PART 1 (1982). M. Kelly and P. Menges. Springfield: Illinois State Board of Education.

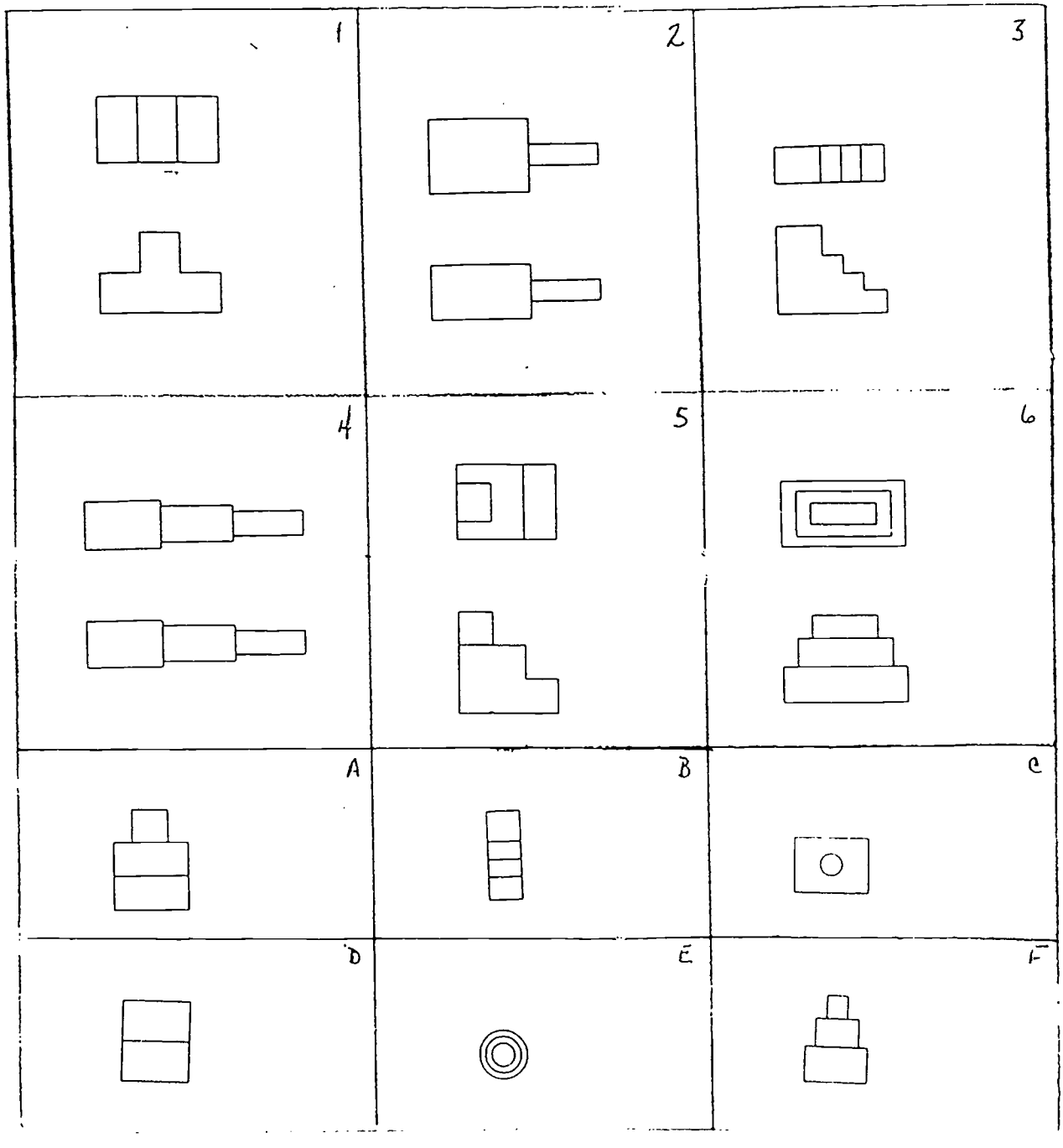
Key

Matching Exercise 2

Match the following front and top views with the correct side view.

View 1 D View 2 C View 3 B

View 4 E View 5 A View 6 F



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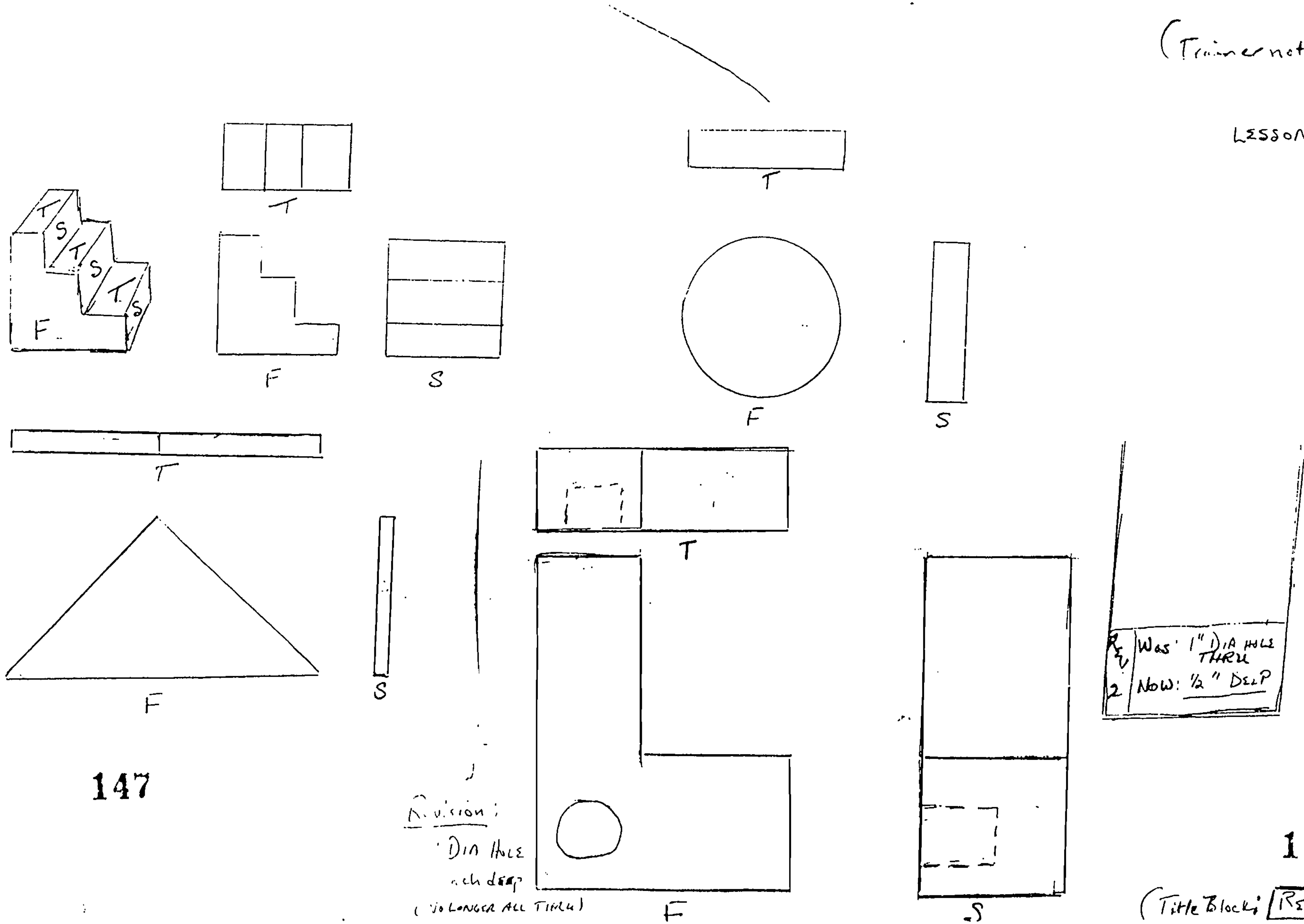
(Trainer notes)

LESSON #6.



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(Title Block: REV.2)

[redacted] LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 7	DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Recognize that hidden lines in one view may appear as object lines in another view
- Correctly use these 3 types of lines to draw simple shapes and views
- Complete Quiz #1

KEYWORDS:	TOOLS/MATERIALS:
* Knob	* Basic drawing equipment * Simple knob * L-shaped metal part * Handouts: ▸ Pre-Quiz Pair Review ▸ Quiz #1

REVIEW: Provide each T with a simple knob. Have Ts draw the 3 basic views.

INTRODUCTION: Metalworkers need to recognize when object lines in one view will become hidden lines in another and the reverse.

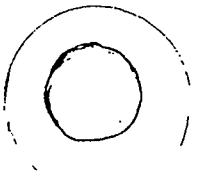
ACTIVITIES:

- Show Ts an L-shaped metal part having a concave slot and a V-cut running the width of the bottom
- Draw the front view giving dimensions of all features and representing the slot and V-cut with hidden lines
- Ts copy front view and draw top and side, using hidden lines for both slot and V in top view but object lines for V in side view
- Provide a blueprint and Pair Review to each pair. Allow 15 minutes for pairs to locate information.
- Ask individuals to come to board and demonstrate one item, saying something about its importance in metal formation. Discuss any questions before the Quiz.
- Hand out Quiz #1. Allow 20-30 minutes to complete

EVALUATION:	IMPROVE NEXT TIME BY:
• Participation in class discussion and pair review • Performance on quiz	

(Trainer note

Lesson #7



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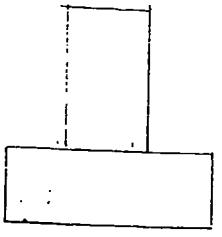

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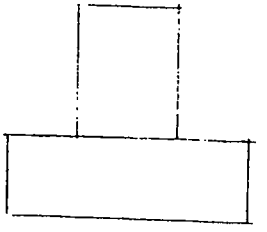

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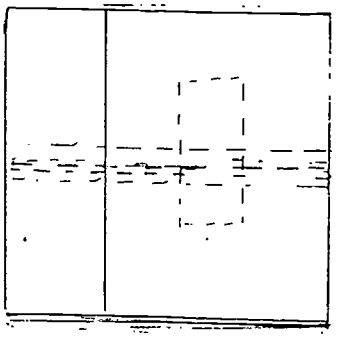

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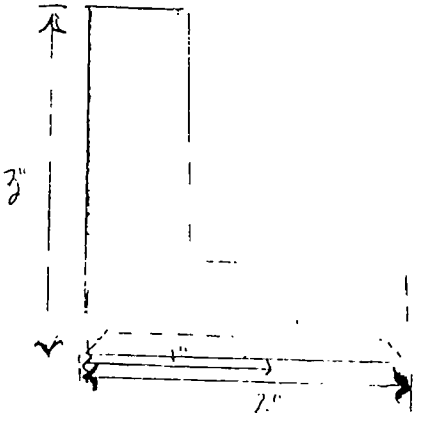

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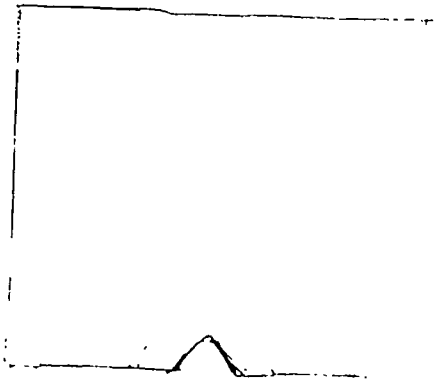


S

Pre-Quiz Pair Review

Work with your partner to locate the following items of information on the blueprint. Be prepared to show each item to the class and tell why the information is important to the metalworker.

Item	Located on print? (Yes or No)	Why important
1. Revisions list		
2. Object lines		
3. Hidden line		
4. Dimension lines		
5. Extension lines		
6. An angular dimension		
7. A linear dimension (metric or English)		
8. Top view		
9. Side view		
10. Isometric view		
11. Tolerance specs		

Name _____ Date _____

Quiz #1: 20 points

****

Part A Draw the following lines:

1. Object line

2. Hidden line

3. Dimension line

4. Extension lines

5. Leader line

****

Part B

1. Select two reasons for customer revisions. Circle them.

   a. reduction of scrap

   b. reduction of material

   c. reduction of labor

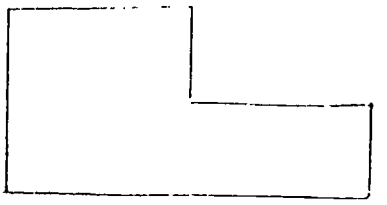
   d. reduction of cycle time

   e. change in customer needs

2. Name the 3 basic views on a blueprint:

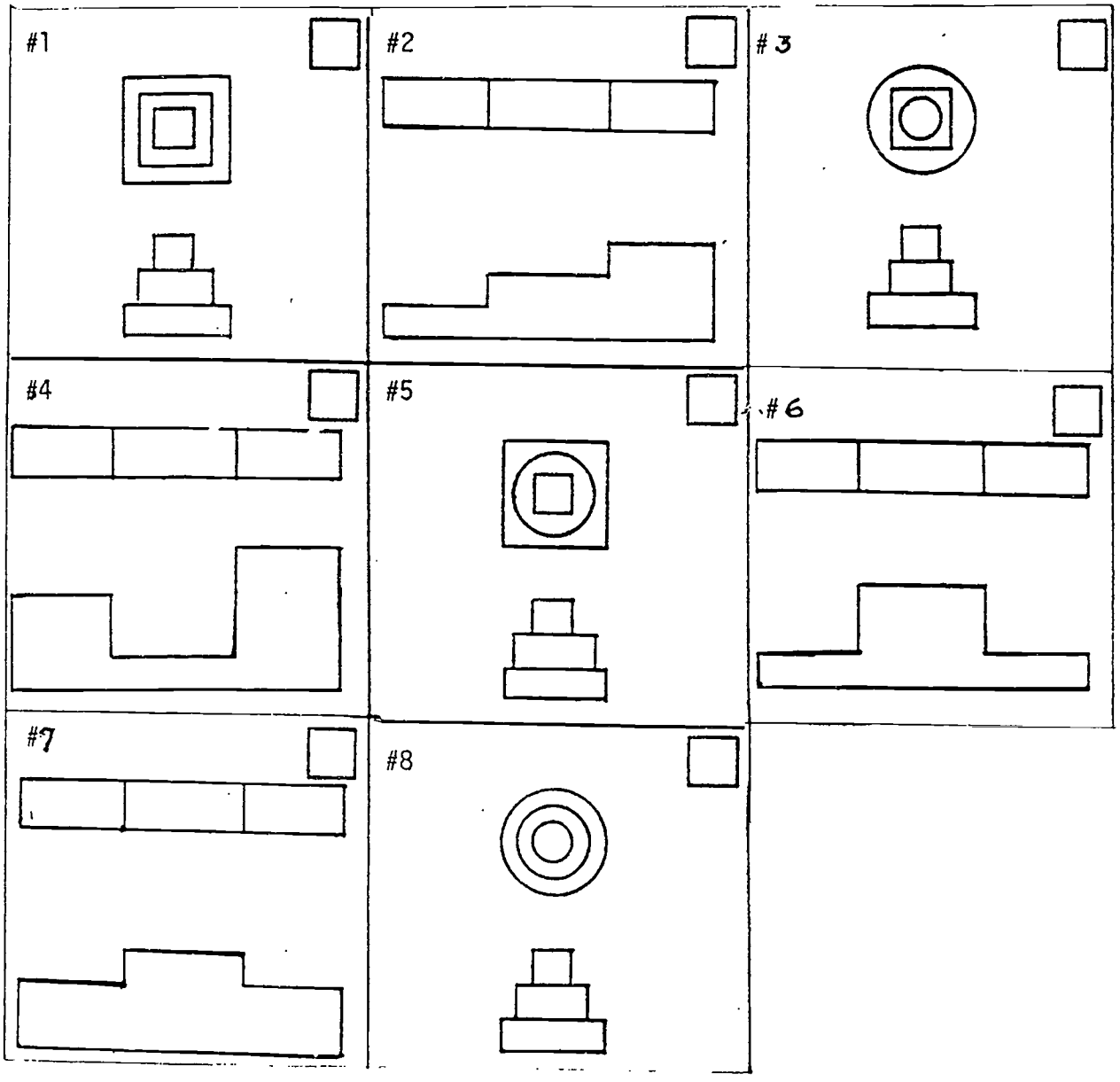
   a._____ b._____ c._____

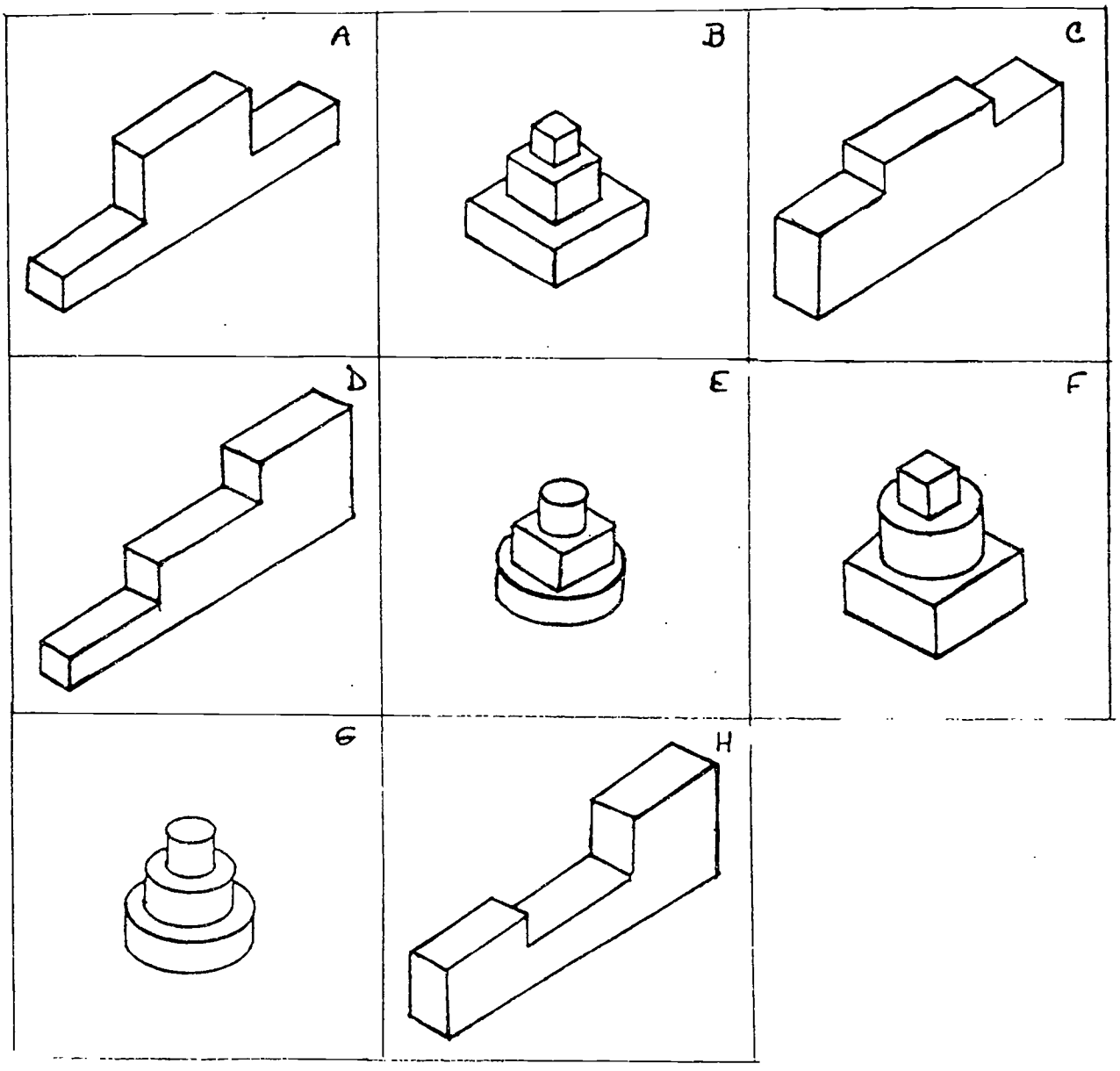
3. Draw the other 2 views of the part:



front view

4. Match each pair of basic views on this page with the appropriate isometric view on the next page. Place the correct letter in the small square inside each box.





Adapted from MACHINE SHOP FUNDAMENTALS, PART 1 (1982).
M. Kelly and P. Menges. Springfield: Illinois State Board of Education

Key

Name _____ Date _____

Quiz #1: 20 points

****

Part A Draw the following lines:

1. Object line
2. Hidden line
3. Dimension line
4. Extension lines

} See Lesson #2

5. Leader line

****

Part B

1. Select two reasons for customer revisions. Circle them.

   a. reduction of scrap

   (b.) reduction of material

   c. reduction of labor

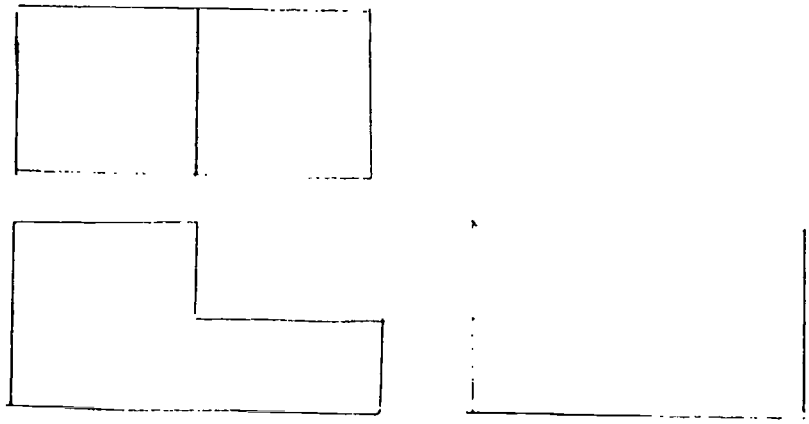
   d. reduction of cycle time

   (e.) change in customer needs

2. Name the 3 basic views on a blueprint:

   a. front b. top c. side

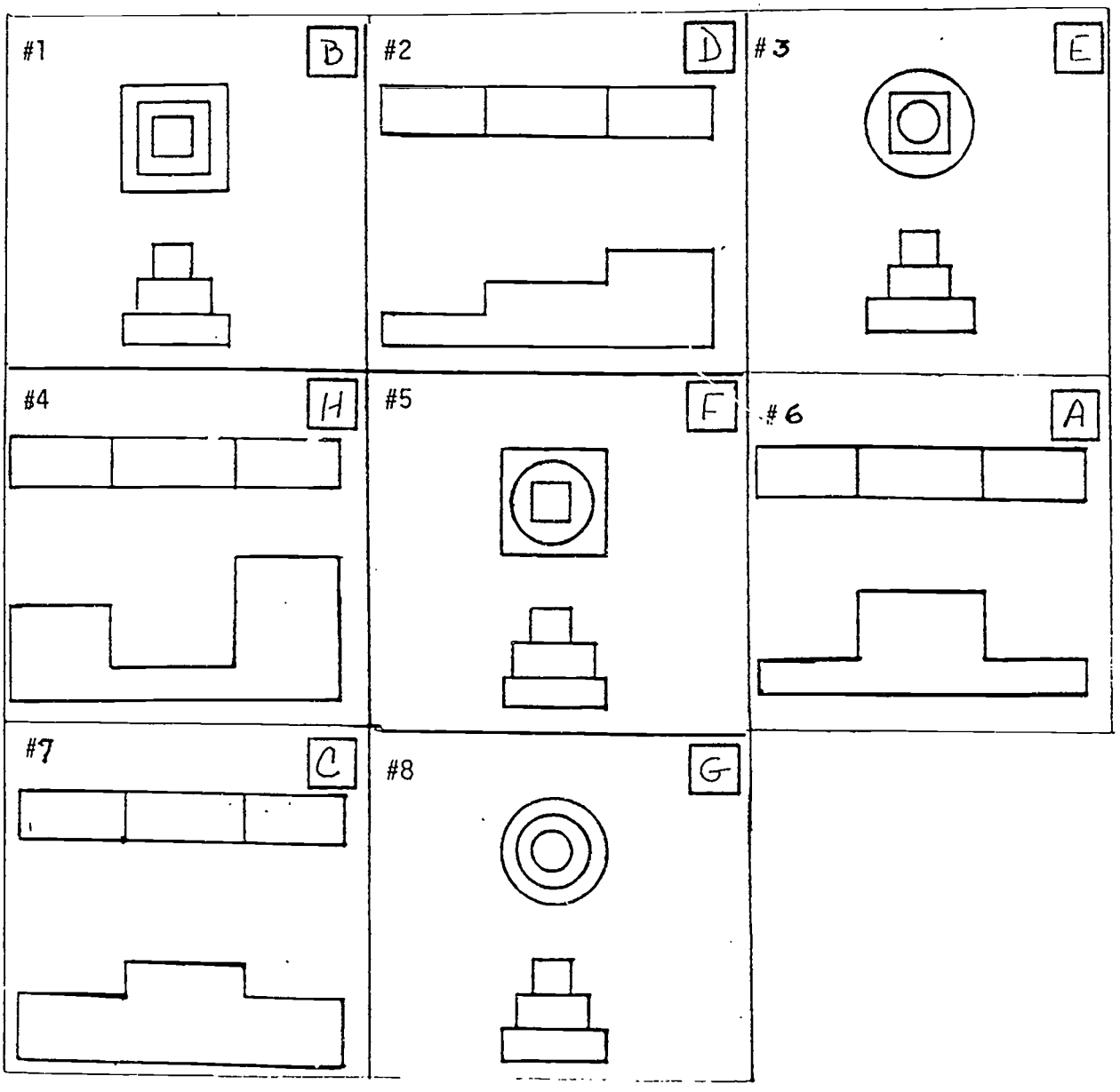
3. Draw the other 2 views of the part:

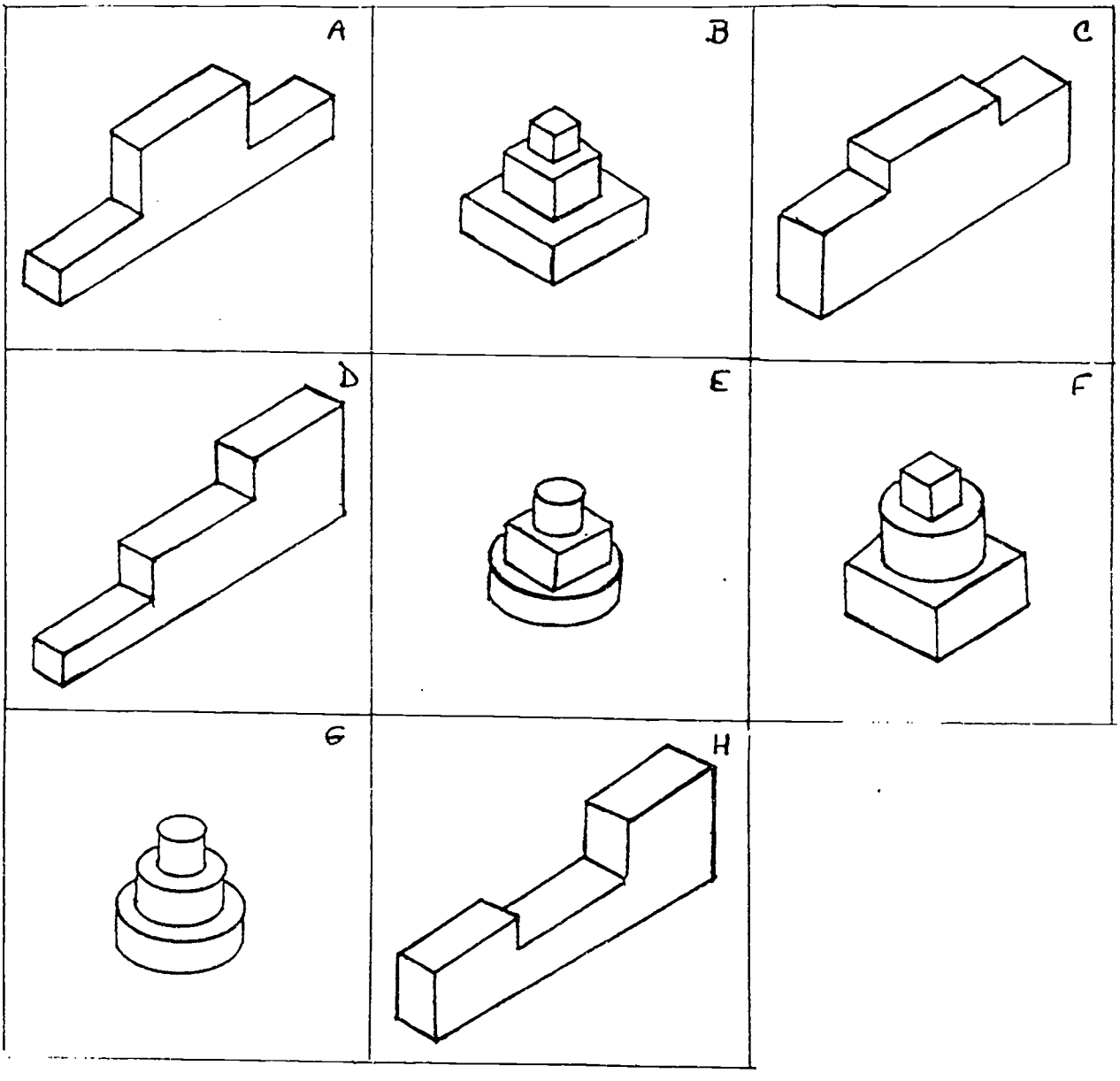


front view

Key

4. **Match each pair of basic views on this page with the appropriate isometric view on the next page. Place the correct letter in the small square inside each box.**





Adapted from MACHINE SHOP FUNDAMENTALS, PART 1 (1982).
M. Kelly and P. Menges. Springfield: Illinois State Board of Education.

[redacted] LESSON PLAN	
TECHNICAL AREA: Blueprint Reading Lesson 8	**DURATION OF LESSON:** 90 minutes

COMPETENCY OBJECTIVES: Trainees will be able to:

- Identify cutting plane lines and their functions
- Cut a clay model along cutting plane lines and correctly rotate to section view
- Accurately complete clay model of section view
- Correctly copy cutting plane view, AA
- Locate and interpret section view and any reference notes appearing on the blueprint

KEYWORDS:	**TOOLS/MATERIALS:**
* Cutting plane lines * Cutting plane view * Section view	* Modeling clay * Basic drawing equipment * Cardboard mock-up of object with section view cut away * Blueprint with section view

(Blueprint Reading Lesson 8, continued)

REVIEW: Discuss correct answers to Quiz #1.

INTRODUCTION: The cutting plane draws attention to the interior of an important detail, or feature of a part. The arrows at each end of the cutting plane line tell the reader which cutaway portion to view. The resulting section view is enlarged rather than drawn to scale.

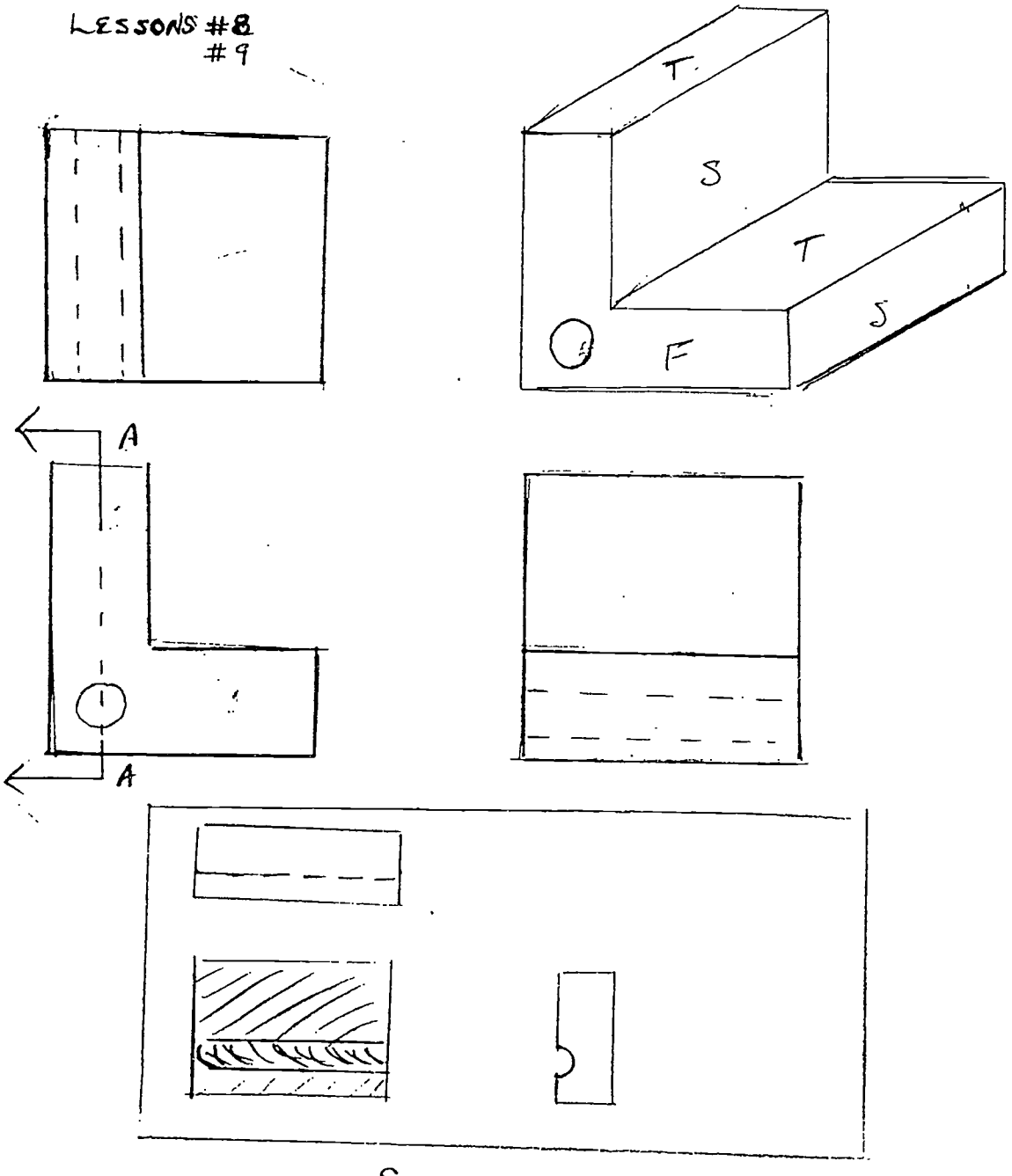
ACTIVITIES:

- Use the cardboard mock-up to demonstrate how a section of a part can be cut away to reveal interior features. Relate mock-up to section view on print, especially to arrows on cutting plane line indicating which section is to be viewed and from what direction
- Draw a simple L-shaped object on board. Ts create a clay model
- Use hidden lines to represent unseen features. Add cutting plane lines and explain function of arrows. Ts cut clay model along cutting plane and rotate correct section to section view.
  Pair Ts. Do their rotations agree? Each pair checks with another pair: do all agree? Discuss any disagreements.
- Ts carve hidden element into section view of clay model, checking with partners and another pair. Do all agree?
- Draw section view showing hidden features now visible. Ts compare their clay models.
- Ts copy cutting plane view and section view from board or clay model
- Hand out a familiar print having a section view. Can Ts locate it? Explain why it appears on the print?

EVALUATION:	IMPROVE NEXT TIME BY:
• Completion of drawings • Participation in class activities	

(Trainer notes

LESSONS #8
#9



Sec AA

PERFECTION SPRING AND STAMPING LESSON PLAN

TECHNICAL AREA: Blueprint Reading Lesson 9

DURATION OF LESSON: 90 minutes

COMPETENCY OBJECTIVES: Ts will be able to:

- Explain or demonstrate which part of cutting plane to represent as Section AA
- Correctly utilize section lines
- Draw top and side views of section view
- Distinguish between drawings of hollow and solid cylinders

KEYWORDS:

* Section view (review)
* Section lines

TOOLS/MATERIALS:

* Basic drawing equipment
* Metal cylinder, solid
* Cardboard cylinder, hollow
* Cardboard model of L-shaped part cut along cutting plane lines

INTRODUCTION: Section views are often drawn with diagonal lines called section lines. These lines represent the interior surface of a part that would be exposed if an actual cut were made. Diagonal lines of differing directions help distinguish separate features of the section view. A complete section view, like a basic part view, will include front, top, and side views.

ACTIVITIES:

- Show cardboard model complete and as cutaway for section view. Insert hollow cardboard cylinders to represent HOLE 1/2" DEEP, 2 PLACES. Ts draw 3 views of complete model

- Ts draw Section View AA twice in 3 views, using section lines to represent cut surfaces:
  * first with cutting plane arrows directed to the left
  * second with cutting plane arrows directed to the right

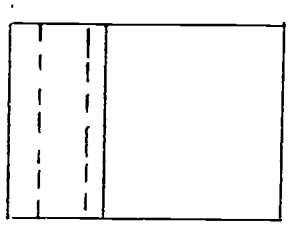
  Discuss how the direction of the arrows affects Section View AA

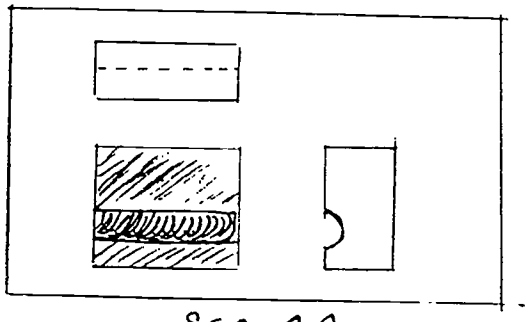
- Show cylinders, hollow and solid and ask how drawings would differ. Ts draw 3 views of each

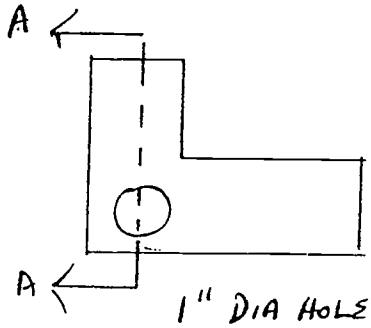
EVALUATION:

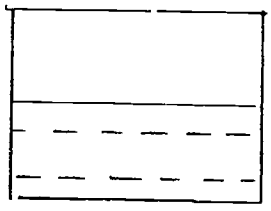
- Completion of drawings
- Participation in class discusssions

IMPROVE NEXT TIME BY:

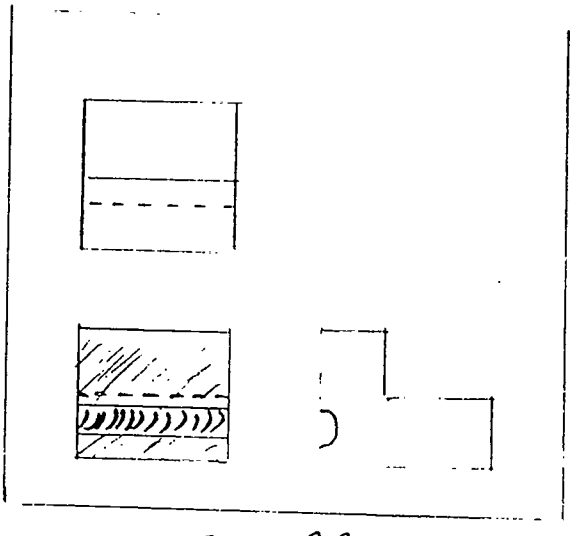


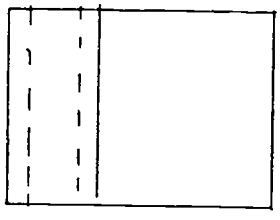


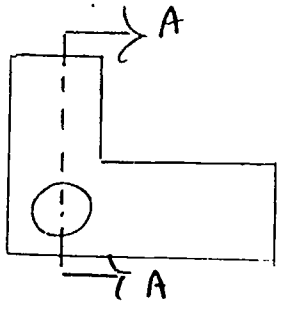


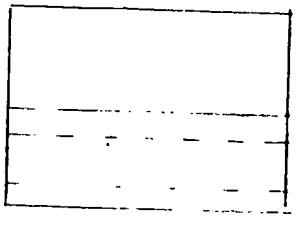


1" DIA HOLE THRU



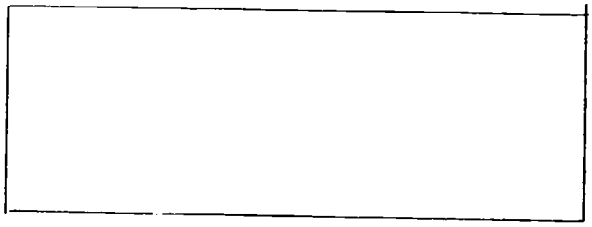


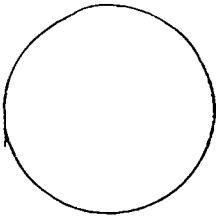




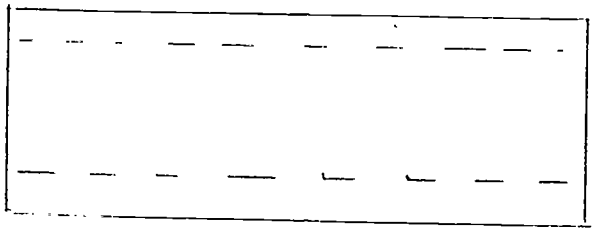
1" DIA HOLE THRU

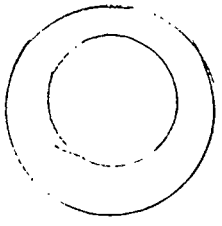
(Trainer notes)





Solid cylinder





Hollow cylinder

[redacted] LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 10	DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Draw a simple shape at full scale using a 12" rule
- Correctly note dimensions of shape utilizing dimenison and extension lines
- Draw a shape to enlarged scale
- Draw a 10x (10:1) enlargement to clarify narrow surfaces
- Note enlarged scale in title block
- Explain "scale noted" and locate various scales used on print
- State the 2 functions of the T.S.C. notation

KEYWORDS:	TOOLS/MATERIALS:
* Scale * Title block (review) * Detail view * Leader lines (review)	* Basic drawing equipment * 12" rule

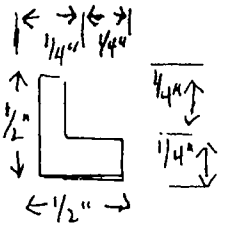
REVIEW: Draw a simple shape with cutting plane lines on board. Have Ts come to board in pairs to collaborate on a full section view.

INTRODUCTION: Blueprints utilize large scales to represent parts or part details which may be too small to see if drawn at full scale. An enlarged scale is represented by the number of enlargements followed by *x (2x, 3x, etc.)* While this accommocation is made for the eye of the blueprint reader, the original dimensions do not change with the enlarged scale. The term "scale noted" indicates that scales vary throughout the blueprint and will be noted where they are enlarged.

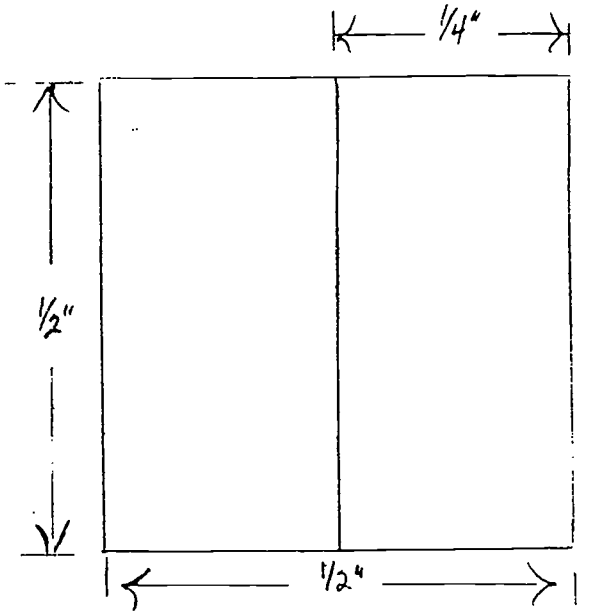
ACTIVITIES:

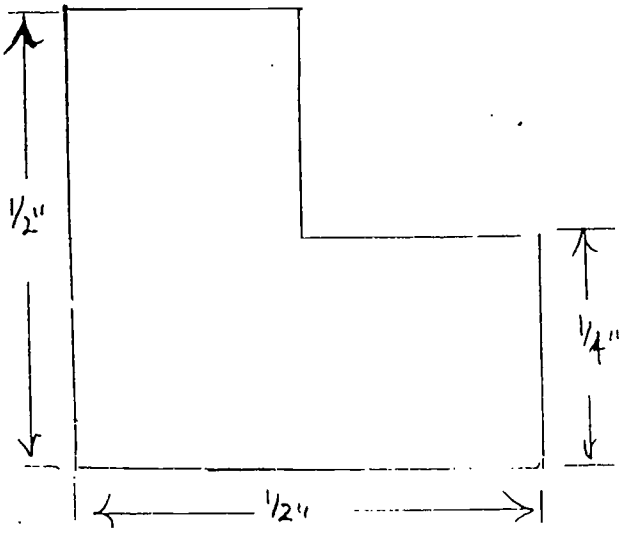
- Draw L-shaped part on board, specifying dimensions. Ts use 12" rule to copy at full scale, correctly utilizing dimension and extension lines
- Ts draw 3 views of part to 5x scale. Provide a mock title block on board and have Ts note the scale in the correct spot
- Have Ts enter dimensions on the 5x scale drawing (Did they keep the original dimensions?)
- Ts examine their $30^0/60^0$ triangles and discuss how to draw 3 basic views. Demonstrate a 10x enlargement of the top view, allowing reader to see hidden lines representing the triangular center. Ts copy this and draw a 10x side view
- Provide sketches illustrating the 2 functions of the "too sharp corner" or T.S.C. notation. Discuss familiar blueprints which bear this note.

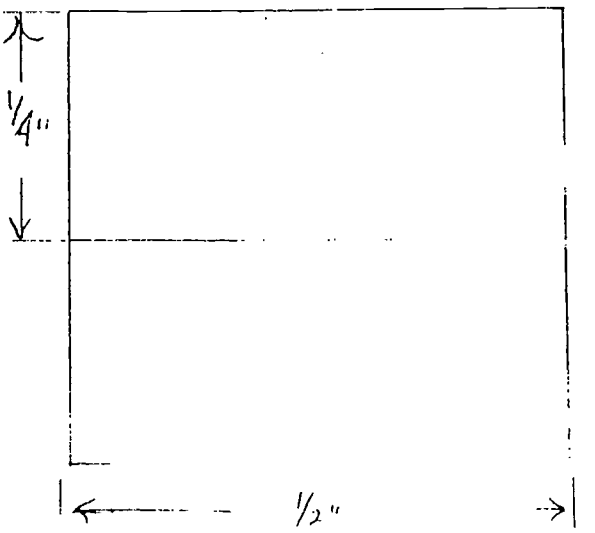
EVALUATION:	IMPROVE NEXT TIME BY:
• Completion of drawings and dimensional notes • Participation in class discussions	



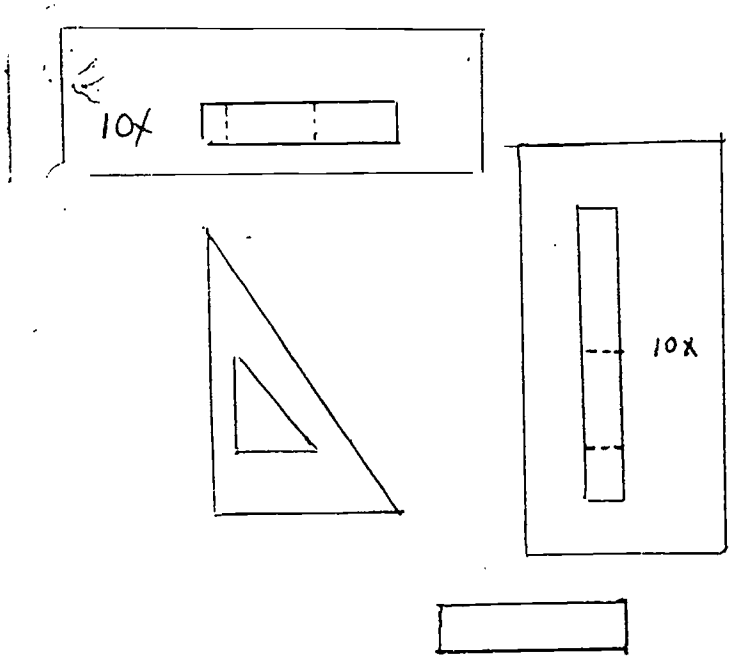
3 views @ 5X scale:



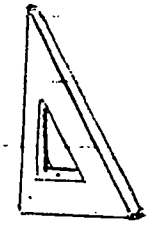




Lesson 10



OPTIONAL:
Draw Iso view



[redacted] LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 11

DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Draw Revision B - front, top, and side - given Revision A data
- Draw Revesion C - front, top, and side - given Revision B data
- Record Revisions A, B, and C as: WAS_____;NOW_____ on Revisions list
- Coach a partner in a review of the course to date

KEYWORDS:

- Center line
- 2 places (2 PLCS)

TOOLS/MATERIALS:

- Basic drawing equipment
- Handouts:
  - Blank Revisions list
  - Pre-Quiz Pair Review

INTRODUCTION: Revisions may be recorded in one of several ways:

- as A,B,C
- as 1,2,3

The original specification is shown as Revision A or 1 and the first change as Revision B or 2

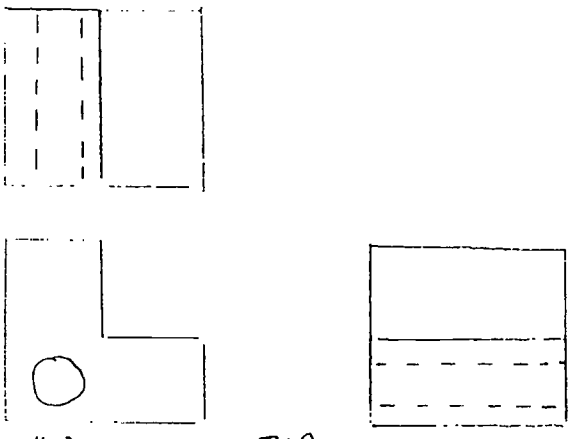
ACTIVITIES:

- Given Revision A data, Ts draw Revision B, front, top, and side: NOW 1" DIA HOLE $^1/_2$" DEEP and record this data on Revisions list
- Ts draw Revision C, front, top, and side: NOW 1" DIA HOLE $^1/_2$" DEEP, 2 PLACES, ON SAME CENTER LINE and record on Revisions list
- Ts again draw Revision A, front, top, and side: WAS 1" DIA HOLE THRU
- Hand out Pair Review #2. Allow pairs 30 minutes to complete

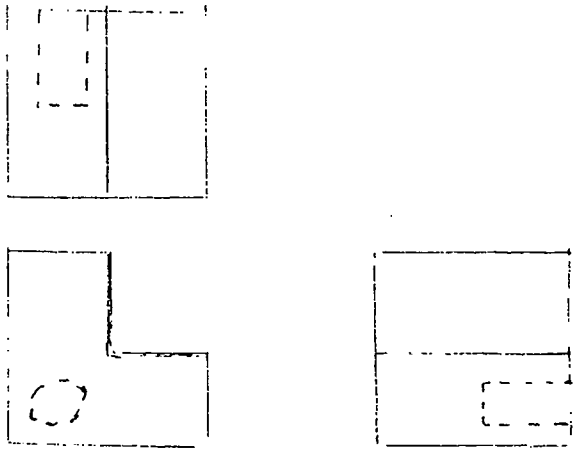
EVALUATION:

- Completion of drawings and Revisions lists
- Participation in Pair Review

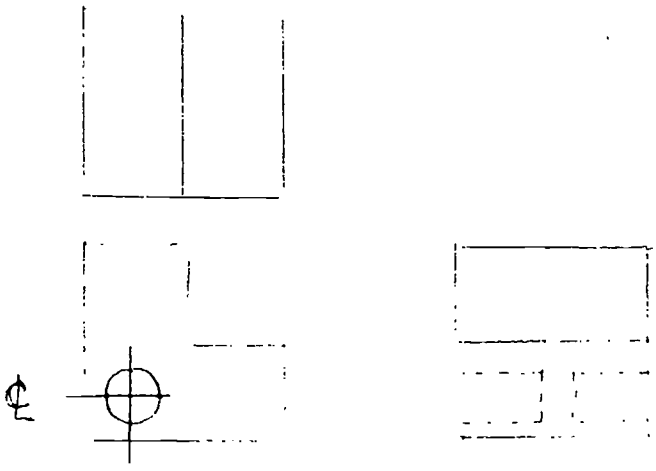
IMPROVE NEXT TIME BY:



1" DIA HOLE THRU



1" DIA HOLE 1/2" DEEP



1" DIA HOLE 1/2" DEEP
ON SAME [illegible] IE
2 PLACES

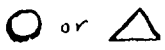
REVISIONS			
#	Description	DATE	APP'D
A	WAS: 1" DIA HOLE THRU		
B	WAS: 1" DIA HOLE THRU NOW: 1" DIA HOLE 1/2" DEEP		
C	WAS: 1" DIA HOLE 1/2" DEEP NOW: 1" DIA HOLE 1/2" DEEP 2 PLCS, SAME ℄		

(label illegible)
REV C

REVISIONS	

Pre-Quiz Pair Review #2

Work with your partner to locate each item on the print. Be prepared to show an example of each to the class and explain its importance.

Item	Definition	Example
1. PLCS		
2. R		
3. DIA		
4. 		
5. TYP		
6. REF		
7. 		
8. Scale: 2x		
9. Scale noted		
10. T.S.C.		
11. Cutting plane		
12. Cutting plane lines		
13. Section lines		
14. Section view		

[redacted] LESSON PLAN

TECHNICAL AREA: BLUEPRINT READING LESSON 12	DURATION OF LESSON: 90 MINUTES

COMPETENCY OBJECTIVES: Trainees will be able to:

- Formulate questions to clarify points not clearly understood or recalled
- Complete [redacted] Blueprint Reading Pre/Post Test* with at least 80% accuracy

KEYWORDS:	TOOLS/MATERIALS: * Blueprint Reading Pre/post Test

REVIEW: Elicit any questions regarding concepts covered in the course and clarify as necessary. Assign each T one concept to explain to the class. Allow 10 minutes to prepare notes and/or drawings to illustrate concepts. Allow 2-3 minutes for each T to present/demonstrate his concept. Clear up any misconceptions that surface. Commend all Ts on their presentations.

ACTIVITIES:

- Hand out Pre/Post Test. Allow 30-45 minutes to complete.

EVALUATION:	IMPROVE NEXT TIME BY:
• Presentation of assigned concept • Performance on Pre/Post Test *	

* First use Lesson #1

Northern Illinois University/Office of Applied Innovations
Commitment to Quality Support

This 12 hour Train the Trainer workshop has been developed to meet goals of delivering quality technical training in-house by personnel. Participants will learn basic techniques of adapting instruction to the diverse educational, cultural and learning style needs of Sloan employees.

The manual represents 33 years of professional expertise on the part of the NIU/OAI instructors and is designed to be a dynamic tool for trainers.

OAI pledges to provide follow-up support to this workshop by on-site consultation within 45 days as well as by phone consultations initiated by any workshop participant within 1 year.

Victoria Hathaway
Jean Olthoff
312-939-8696
August 1994

NORTHERN ILLINOIS UNIVERSITY
OFFICE OF APPLIED INNOVATIONS

CUSTOMIZING FROM WITHIN: TRAIN THE TRAINER

Company

August 15, 17, 19, 1994

Agenda

Day 1:

INTRODUCTION

ISSUES IN ADULT WORKPLACE TRAINING

TECHNIQUES OF INSTRUCTION I

- Adapting Oral Instruction
- Presentation Skills Refresher
- Adapting Handouts

Day 2:

TECHNIQUES OF INSTRUCTION II

- Adapting Assessments: Tests, Quizzes, Hands-On Demonstrations

TRAINING DESIGN SEQUENCE

CURRICULUM AND LESSON DESIGN

Day 3:

PARTICIPANT LESSON PRESENTATIONS

DIVERSITY IN TRAINEE EXPECTATIONS

EVALUATION OF TRAINING

Presenters:

Victoria Hathaway
Project EASE Curriculum and
Staff Development Coordinator

Jean Olthoff
Project EASE Master Teacher

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

TABLE OF CONTENTS (cont.)

APPENDICES

FIND SOMEONE WHO(SE):

Overhead projector bulb blew out _____	Forgot the visual aids _____	Only marker for whiteboard dried up _____
Trainee fell asleep in class _____	Dog ate lesson (or other such stories- record for our amusement) _____	Spilled coffee on the handouts _____
Flip chart collapsed _____	Top these..... _____	Trainer fell asleep in class _____

CHARACTERISTICS OF TODAY'S AND TOMORROW'S WORKPLACE

Traditional Model	High Performance Model
Strategy	
• mass production • long production runs • centralized control	• flexible production • customized production • decentralized control
Production	
• fixed automation • end-of-line quality control • fragmentation of tasks • authority vested in supervisor	• flexible automation • on-line quality control • work teams, multi-skilled workers • authority delegated to worker
Hiring and Human Resources	
• labor-management confrontation • minimal qualifications accepted • workers as a cost	• labor-management cooperation • screening for basic skills abilities • workforce as an investment
Job Ladders	
• internal labor market • advancement by seniority	• limited internal labor market • advancement by certified skills
Training	
• minimal for production workers • specialized for craft workers	• training sessions for everyone • broader skills sought

CHARACTERISTICS OF TODAY'S AND TOMORROW'S WORKPLACE

Traditional Model	High Performance Model
Strategy	
• mass production • long production runs • centralized control	• flexible production • customized production • decentralized control
Production	
• fixed automation • end-of-line quality control • fragmentation of tasks • authority vested in supervisor	• flexible automation • on-line quality control • work teams, multi-skilled workers • authority delegated to worker
Hiring and Human Resources	
• labor-management confrontation • minimal qualifications accepted • workers as a cost	• labor-management cooperation • screening for basic skills abilities • workforce as an investment
Job Ladders	
• internal labor market • advancement by seniority	• limited internal labor market • advancement by certified skills
Training	
• minimal for production workers • specialized for craft workers	• training sessions for everyone • broader skills sought

ACTION PLAN

Write 3 to 5 ideas that you have acquired today,
and how you think you will use them.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

TRAINING ENVIRONMENT NEEDS

1. ADEQUATE LIGHTING

2. ADEQUATE SPACE

3. CONTROLLED NOISE

4. CONTROLLED TEMPERATURE

5. TABLES FOR SMALL GROUP WORK

6. BASIC CLASSROOM EQUIPMENT

7. OTHER

Training Environment

1. Adequate lighting

2. Controlled temperature

3. Controlled noise

4. Adequate space

5. Tables for small group work

6. Basic classroom equipment (see handout)

Scheduling Factors

- Availability of the trainer
- Other meetings/training
- Availability of training room
- Shift(s) of trainees
- Fatigue vs. Alertness
- Proficiency levels of trainees
- Hot jobs

Issues in Adult Workplace Training

Do you agree or disagree?

1. On-the-job training is an optional benefit.

2. It is more beneficial to the company to train younger employees than older ones.

3. The company lunchroom is a good place for training.

4. Experienced supervisors make good trainers.

5. The shift change is the best training time.

6. Experienced workers should have no trouble with technical training.

7. Skills learned in training need to be applied immediately.

8. ESL workers who communicate easily in English should have no difficulty understanding the trainer.

TRAINEE ATTRIBUTES

OH

- AGE
- EDUCATION
- LEARNING DISABILITIES
- CULTURAL VALUES
- PREFERRED LEARNING STYLE

A LEARNING disABILITY IS:

- Average to above average intelligence or ability to learn
- Processing disorder that affects how an individual receives information through the senses
- Effects intake, retention, integration, and expression of information
- Causes difficulty with oral, written, and non-verbal expression
- Commonly recognized a deficit in one or more of the following:
  - reading (word recognition and/or comprehension)
  - spelling
  - written language/expression (verbal and/or non-verbal)
  - math computation and/or problem solving
- Sometimes expressed as difficulty with organizational skills, time management, and social skills
- Often inconsistent- The one consistency is inconsistency!
  - May have a problem on Monday but not on Tuesday
  - Marked discrepancy between ability and achievement or performance
  - Characterized by high to very high aptitude and achievement in one area and below average to low performance in another area
- A chronic lifelong condition
- Presumed to be of a neurological origin
- Varied in its manifestations and in degree of severity
- Is a quality of life issue, often affecting
  - Self-esteem
  - Interpersonal relationships
  - Independent living skills
  - Social skills
  - Employment
  - Education
- FRUSTRATING!

A LEARNING disABILITY IS NOT:

- A form of mental retardation
- An emotional disorder
- A type of mental illness
- Below average intelligence or ability to learn
- Laziness, lack of motivation, or irresponsibility
- A set of behaviors that have been acquired

Adapted from Wyland: NIU-CARR 1994

Trainee Attributes

1. Age

2. Education

3. Learning disabilities

4. Cultural values

5. Preferred learning style

Trainer_____ Course Name_____

Date_____

BASIC AND OPTIONAL CLASSROOM EQUIPMENT

Basic Equipment	Optional Equipment
____1. Lesson plan-in 3 ring binder	____1. Case to carry "must have" materials. Saves time to have standard equipment ready for each lesson.
____2. Attendance sheet	____2. Extra overhead bulb
____3. Handouts for the lesson	____3. Extra paper
4. Visual aids ____ a. Pictures ____ b. Graphic Organizers ____ c. Actual pieces to manipulate ____ d. Transparencies ____ e. Examples	____4. Additional clean transparencies
____5. White or black board, markers/chalk, eraser	____5. 3-hole punch
____6. Overhead projector, vis a vis markers, eraser	____6. Pencil sharpener
____7. Flip chart and paper	____7. Stapler/staples
____8. Tools and equipment for student use (measuring, drafting, calculator, etc.)	____8. Tape
____9. Pencil/pen	____9. VCR
	Decide in advance who (company or employee) provides: Course workbook 3 ring binder Pencil/pen Paper Ruler _____ _____

LEARNING CHANNELS

BEHAVIORS	LEARNING TIPS
VISUAL • Prefers to see information- needs to see it to know it. • Strong sense of color. • May have artistic ability. • Difficulty with spoken directions. • Overreaction to sounds. • Trouble following lectures. • Misinterpretation of words.	
AUDITORY • Prefers to get information by listening- needs to hear it to know it. • Difficulty following written directions. • Difficulty with reading. • Problems with writing. • Inability to read body language and facial expressions.	
KINESTHETIC-TACTILE • Prefers hands-on learning. • Can assemble parts without reading directions. • Difficulty sitting still. • Learns better when physical activity is involved. • May be very well coordinated and have athletic ability.	
MULTISENSORY:	

Adapted from "Unlocking Potential.." by Scheiber & Talpers

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MULTISENSORY:	

Adapted from "Unlocking Potential..." by Scheiber & Talpers

Preferred Channel of Learning: The TRAINER

Most shop workers learn best by "hands-on" (kinesthetic-tactile) experience. However, most trainers are visual learners and will feel most comfortable using visual methods to teach. As a trainer, you need to be aware of your learning channel. Then, you can provide enough demonstration and hands-on activities to insure the trainees' mastery of the course material. This inventory is to be used only b ' trainers for self-assessment.

Read each sentence carefully and think if it applies to you. On the line, write:
3 often applies **2** sometimes applies **1** never applies .

Preferred Channel: VISUAL

____1. I enjoy doodling and even my notes have lots of pictures, arrows, etc. on them.
____2. I remember something better if I write it down.
____3. When trying to remember someone's telephone number, or something new like that, it helps me to get a picture of it in my head.
____4. If I am taking a test, I can "see" the textbook page and where the answer is.
____5. It helps me to LOOK at the person when listening. It keeps me focused.

Visual total____

Preferred Channel: AUDITORY

____1. It helps to use my finger as a pointer when reading to keep my place.
____2. Papers with very small print or blotchy dittos or poor copies are tough on me.
____3. I understand how to do something if someone tells me rather than having to read the same thing myself.
____4. I remember things that I hear, rather than things that I see or read.
____5. If I had the choice to learn new information via a lecture or a textbook, I would choose to hear it rather than read it.

Auditory total____

Preferred Channel: KINESTHETIC-TACTILE

____1. I don't like to read directions; I'd rather start doing.
____2. I learn best when I am shown how to do something and I have the opportunity to do it.
____3. Before I follow directions, it helps me to see someone else do it first
____4. I do not become easily lost, even in strange surroundings.
____5. I think better when I have the freedom to move around.

Kinesthetic-tactile total___

Adapted from "Unlocking Potential...." by Scheiber & Talpers

ADVANTAGES OF HAVING A LEARNING disABILITY

Many adult students with learning disabilities are intelligent, talented, and capable. Typically, they have developed compensation strategies in dealing with their learning differences. Everyone has an inherent pattern of strengths and weaknesses, but for the adult with a learning strengths assist in the compensation process. Therefore, it is important to focus on the advantages.

- **CREATIVITY**- Many of the most creative people have been learning disabled: Einstein, Edison, Patton, Hans C. Anderson, Churchill, Leonardo da Vinci, Whoopi Goldberg, Tom Cruise.
- **SPATIAL ORIENTATION COORDINATION**- Some of our greatest athletes have had learning disabilities: Bruce Jenner, Greg Louganis.
- **EMOTIONAL STRENGTHS**- Many individuals with learning disabilities are more emotionally sensitive to the problems and needs of others.
- **VERBAL ABILITY**- Exceptional verbal ability may help to compensate for deficits in written language.
- **MATH ABILITY**- Sometimes learning disabled individuals have superior mathematical ability- an obvious asset.
- **ENERGY**- Hyperactive children can become adults with endless amounts of energy that can be channeled wisely with guidance.
- **VISUAL THINKING**- Superior ability to think in images or pictures and to visualize may accompany a learning disability. Some of our most visual thinkers who had learning disabilities were Albert Einstein, Thomas Edison, Lewis Caroll, Winston Churchill, and William Butler Yeats.

Despite the advantages and special talents that are often inherent with a learning disability, adult students frequently find themselves fighting frustration, anxiety, and sometimes even depression. School is often the most difficult part of the person's life. Consequently, low self-esteem and lack of confidence are often evident. Too often, the "self-fulfilling prophecy" takes over and students begin to punish themselves with negative thoughts, which have an obvious detrimental effect on their academic performance. Therefore, fostering confidence and increasing self-esteem is essential for success.

Adapted from Wyland NIU-CAAR 1994

QUIZ (Unadapted version)

The Refrigeration Cycle

1. What is the definition of a refrigerator?

2. What is the function of the evaporator?

3. Where is the refrigerant and what does it do?

4. Which mechanism of the refrigerator unit is responsible for giving off heat?

CHECKLIST OF PRESENTATION TECHNIQUES

Name_____ Date_____

These techniques for presenting information orally are good for any audience, but they are especially effective when working with special needs students.

1. Use this list to present your lesson.

2. AFTER YOU TEACH EACH LESSON, EVALUATE YOUR OWN EFFECTIVENESS BY COMPLETING THIS CHECKLIST. CIRCLE THE NUMBER (1,2,3) WHICH BEST DESCRIBES YOUR OWN PERFORMANCE.

3. To use as a peer evaluation, write the peer's name by the number which best describes his/her performance for each technique.

DID YOU.....

1.	Write a brief outline of the lesson on white board, chalkboard, or flip chart?	Y	N
2.	Use a high contrast marker or chalk on your board or flip chart?	Y	N
3.	Write clearly & large enough?	Y	N
4.	Introduce the topic before starting the lesson?	Y	N

		HARDLY EVER	SOMETIMES	CONSISTENTLY
5.	Use short sentences with no slang expressions?	1	2	3
6.	Repeat important points in different ways?	1	2	3
7.	Follow key points with comprehension questions?	1	2	3
8.	Use visual aids: tools, parts, materials, pictures, diagrams, overhead?	1	2	3
9.	Use body language to demonstrate a point or procedure?	1	2	3
10	Invite questions from the audience?	1	2	3

Building Competencies to Serve LEP (1989) by Jeanne Lopez-Valadez and Tipawan T-Q Reed

HOW TO USE THE OVERHEAD

- Do not read transparencies
- Paraphrase each point briefly
- Maintain eye contact
- Try not to turn to the screen for each point
- Provide worksheets of transparencies as handouts
- Keep transparencies simple
- Integrate transparencies with presentation
- Change transparencies smoothly
- Turn off overhead when there is no transparency

PLATFORM SKILL TIPS

- Face the audience while speaking.
- Project voice to furthest student.
- Stand clear of board/overhead.
- Be sure **all** students can see the overhead.
- Have all necessary materials on hand.
- Use gestures and sound effects to direct attention, clarify, or to emphasize.
- When introducing key words:
  * say (auditory)
  * show (visual--see)
  * write (visual--read)

HANDS-ON TRAINING: WHYS AND HOWS OH

Whys

1. Transfers readily

2. Maximizes involvement

3. Keeps learners awake

4. Uses kinesthetic channel

Hows

1. Use manipulatives

2. Demonstrate

3. Set up teams

Easy-to-Read Handouts

USE SHORT, SIMPLE SENTENCES

Long sentence: Examining the system includes checking for and repairing leaks, which left undetected can cause problems in the future.

Revision: Also, check for leaks.
Repair leaks immediately.
Unrepaired leaks can cause problems in the future.

Locate: *Circle a lengthy sentence on your hand-out. Revise it below.*

_____
_____
_____
_____
_____

USE SIMPLE VERB CONSTRUCTIONS

Complex verb: Low temperature may have been the reason for the leak.

Simple verb: Low temperature was possibly the reason for the leak.

Locate: *Circle a sentence with a string of verbs. Revise the verbs below.*

_____

_____

AVOID PASSIVE CONSTRUCTIONS (Replace with imperative commands for procedures.)

Passive: ...filters must be replaced
...this is done by turning

Active(includes commands):
Replace the filter...
Turn the ...

Locate: *Circle a passive sentence. Revise using active verbs.*

_____

_____

Adapted from "Strategies for Modifying Text" by Jeanne Lopez Valadez

HANDS-ON TRAINING: WHYS AND HOWS

Whys

1. Transfers readily from class to plant

2. Maximizes active involvement in learning process

3. Keeps learners awake/aware

4. Capitalizes on the preference for kinesthetic (muscle memory) learning

Hows

1. Design training around things that can be manipulated (parts, models, M & Ms, bananas)

2. Increase use of demonstrations

3. Set up teamwork activities to include:
   - Data collection
   - Graphic representation
   - Reporting to large group
   - Teamskills
     * Turn Taking
     * Taking Roles

QUIZ (Adapted Version)

The Refrigeration Cycle

INSTRUCTIONS: Fill in the blanks with the correct word.

1. A refrigerator operates by removing _____.

2. A refrigerator has an evaporator and a _____.

3. The _____ absorbs heat inside the refrigerator.

4. The condenser _____ heat outside the refrigerator.

5. This _____ repeats itself over and over again.

6. The substance inside the evaporator and the condenser is called _____.

7. It changes from a liquid to a _____ inside the evaporator.

8. Then it changes back to a liquid inside the _____.

ADD NOUNS WHERE THEY ARE IMPLIED OR HAVE BEEN REPLACED WITH PRONOUNS

Implied noun/pronouns:

Provide them with some lubrication and tighten them with a wrench.

Specified noun:

Put some oil on the bolts.
Tighten the nuts with a wrench.

Locate: Circle a sentence with an implied noun or pronoun. Rewrite with the noun.

_____

_____

SIMPLIFY VOCABULARY

Difficult:	Simple:	*Difficult:*	*Simple:*
denote	show	_____	_____
displace	move	_____	_____
rectify	_____	_____	_____
communicate	_____	_____	_____
facilitate	_____	_____	_____

STANDARDIZE VOCABULARY

Synonyms: part
piece
piece part
workpiece
(All used in same paragraph)

Synonyms: _____
_____
_____
_____

Consistent expression: part

Consistent expression: _____

Adapted from "Strategies for Modifying Text" by Jeanne Lopez Valadez

READABILITY CHECKLIST

Evaluate the readability of technical training handouts by using this checklist.

		HARDLY EVER	SOMETIMES	CONSISTENTLY
SENTENCES STRUCTURE:				
1.	Short sentences	1	2	3
2.	Active voice	1	2	3
3.	Nouns are expressed, not implied	1	2	3
4.	One word verbs	1	2	3
VOCABULARY:				
1.	Simple	1	2	3
2.	Standardized vocabulary	1	2	3
3.	No slang	1	2	3
CONTENT/ORGANIZATION:				
1.	Logical order of presentation	1	2	3
2.	Examples of concept	1	2	3
3.	Application of concepts	1	2	3
FORMAT:				
1.	Clearly readable print	1	2	3
2.	Uncrowded page	1	2	3
3.	Headings	1	2	3
4.	Bold faced/ underlined	1	2	3
5.	Bullets	1	2	3

Adapted from Building Competencies to Serve LEP (1989)
Jeanne Lopez-Valadez and Tipawan T-Q Reed

ACTION PLAN

Write 3 to 5 ideas that you have acquired today,
and how you think you will use them.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

TEAM SKILL EVALUATION: TAKING ROLES

Circle your response.

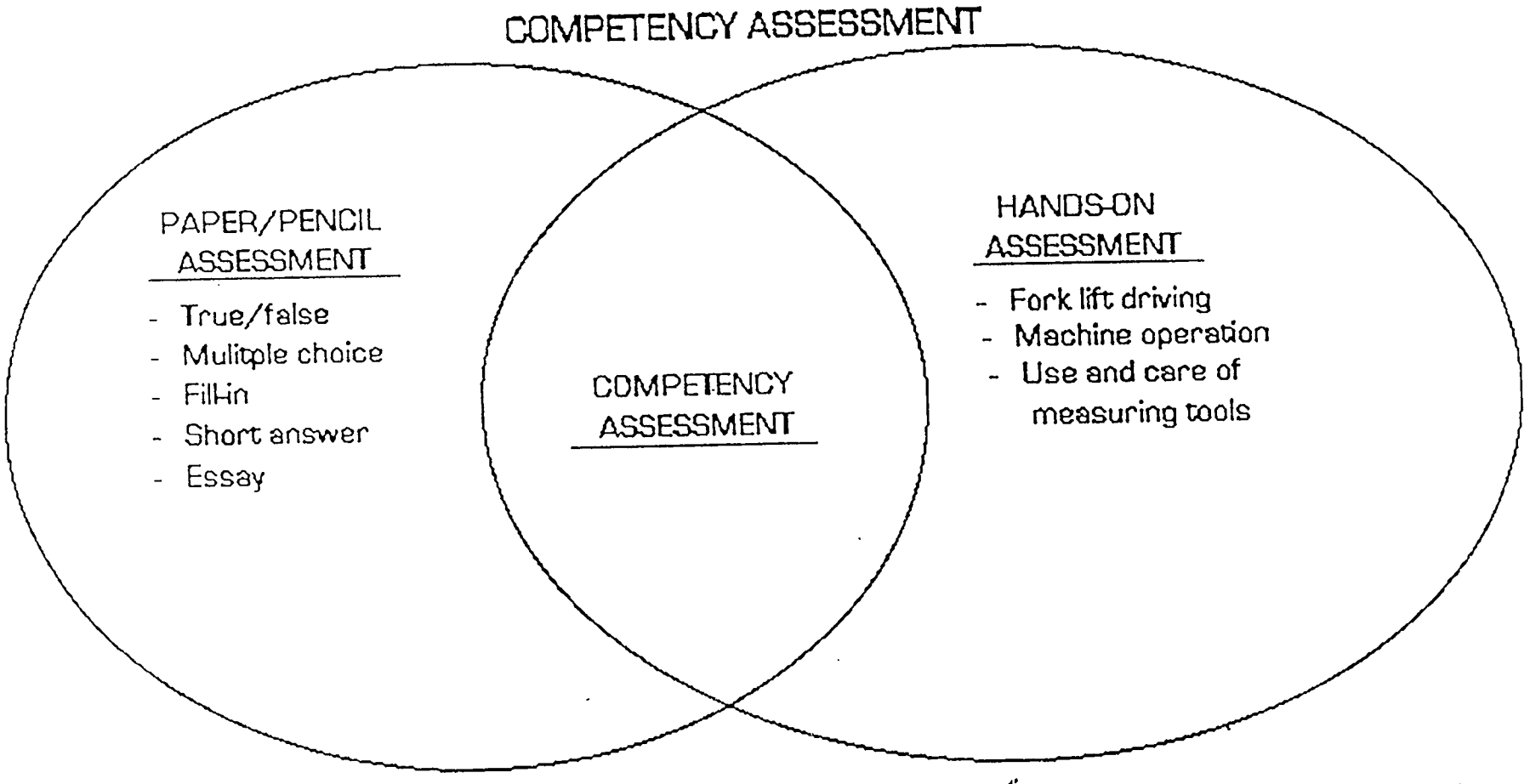
	Hardly Ever	Sometimes	Consistently
RECORDER took accurate notes.	1	2	3
TIMEKEEPER kept us on schedule.	1	2	3
TASKMASTER kept us on the subject.	1	2	3
REPORTER accurately summarized our discussion.	1	2	3

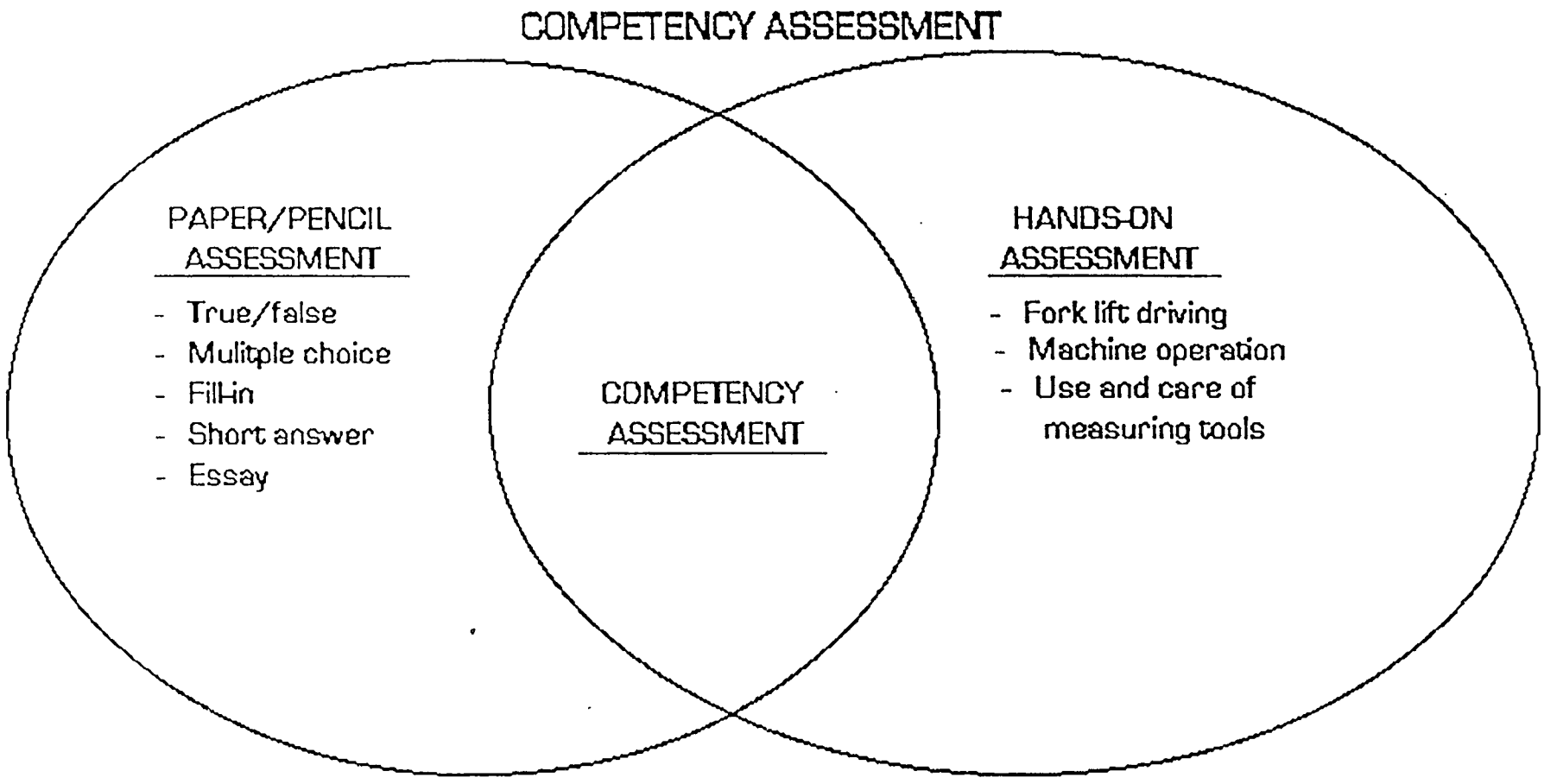
Areas for improvement:_____

_____

_____

_____





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TRADITIONAL PAPER / PENCIL ASSESSMENTS

TYPE	ADVANTAGE	DISADVANTAGE	SAMPLE
COMMERCIAL • true -- false • fill-in the blank • matching • multiple choice • short answer	• ready-made • may correspond with promotional tests • objective • easy to grade • answer key provided	• not specific to company • may test for skills or knowledge not relevant to job • may be difficult • may produce anxiety for low level readers	page 32
TRAINER-- DEVELOPED • matching • fill in the blank • multiple choice	• customized for company, jobs, and learners • provides evaluation of training	• takes time • requires some skill to design • multiple choice is confusing	pages 26-28
TRAINEE-- DEVELOPED • matching • fill in the blank	• specific to own job • provides practice / mastery of course • develops critical thinking • can be used as a sponge	• may be hard to read • answers may not be correct • requires guidance	pages 27-28
SELF-ASSESSMENT	• raises trainee's awareness of own skills • helps trainee set skill goals	• requires an evaluation tool (see examples in manual)	page 30
PEER-ASSESSMENT	• less anxiety than trainer evaluation • develops team skills	• requires an evaluation tool (see examples in manual)	page 31

COMMERCIAL PAPER / PENCIL ASSESSMENT -- MATCHING

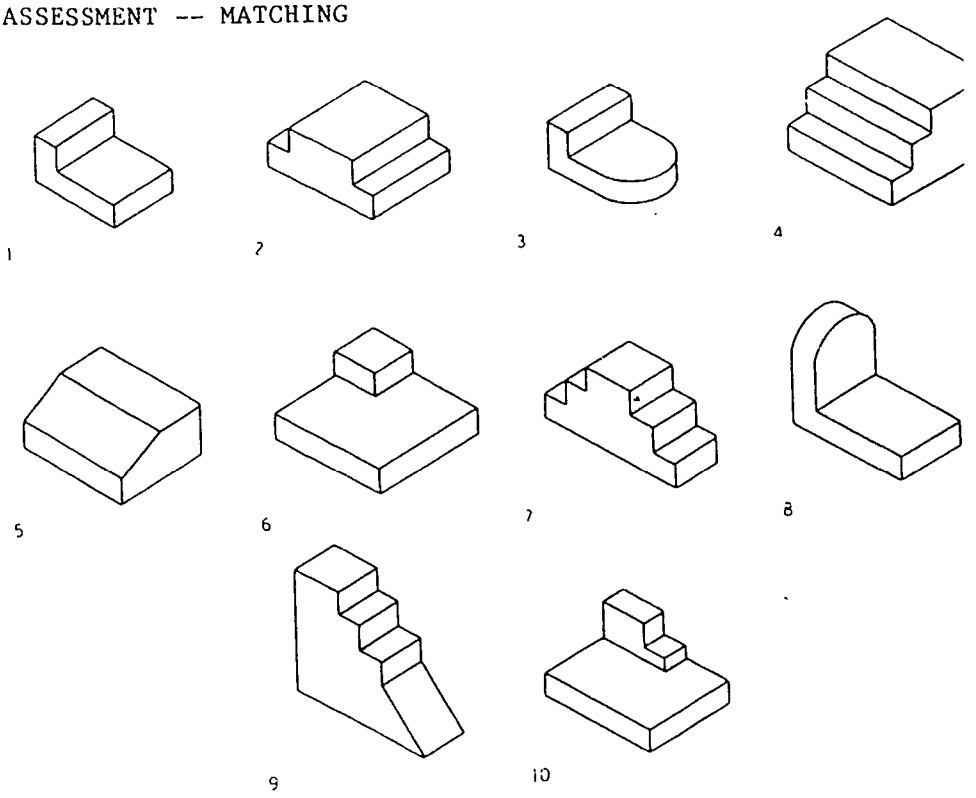
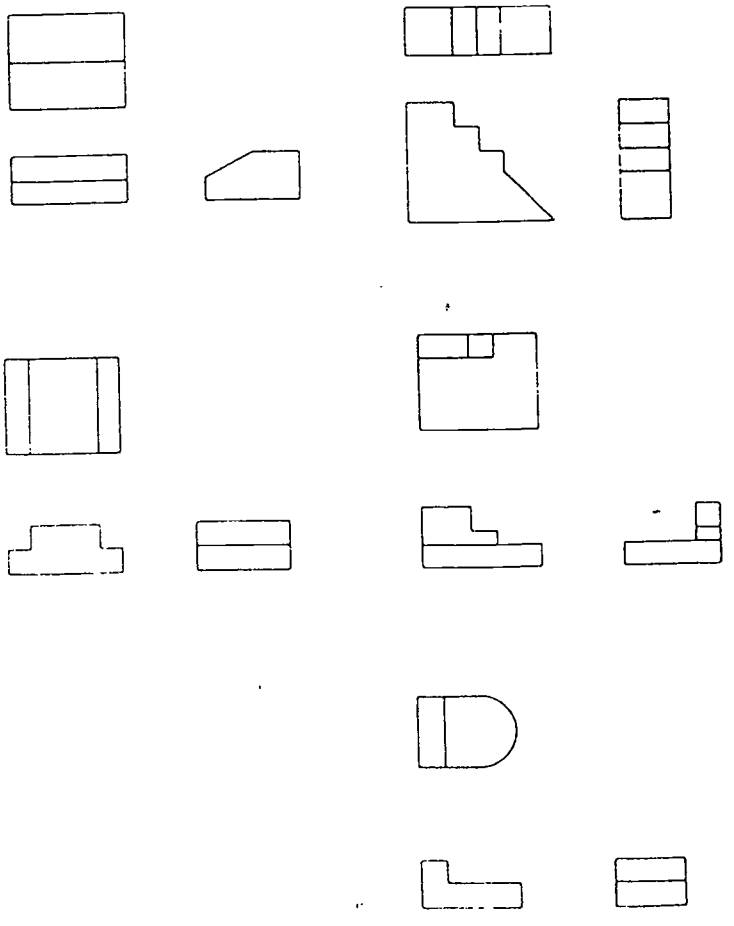


Figure 2-23*a*

Figure 2-23*b*



Blueprint Reading, National Machine Builder's Association (1983), K.O. Hoffman, NY: John Wiley & Sons.

TRAINER OR TRAINEE DEVELOPED PAPER/PENCIL ASSESSMENTS

Trainer developed assessments (tests, quizzes, demonstrations) apply directly to the material presented in the course. They allow the trainer and trainee to evaluate progress and mastery. Whenever possible, the trainee should be able to **demonstrate** mastery of the skill desired.

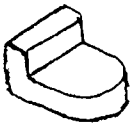
Trainee developed assessments provide relevant practice and/or items for post-assessment "tests or quizzes." In addition, they help the trainee master the information or skills for which he / she is making the assessment.

I. Matching: This test skill requires associating two elements that go together. Keep the number to 5 pairs. Below are a variety of matching exercises:

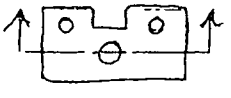
A. Key words and definitions:

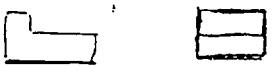
d 1. evaluation		a. imparts principles
_____ 2. training		b. sealed
_____ 3. hermetic		c. imparts skills
_____ 4. pre-/post-assessment		d. judgement on a scale
_____ 5. education		e. appraisal of skills before and after training

B. Picture to picture



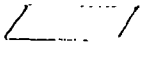
C. Pictures to words





section view

D. Symbols to words or pictures



flatness

E. Abbreviations to words

TSC

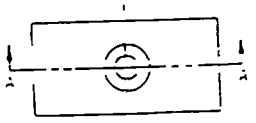
to. sharp corner

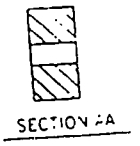
II. Fill-in the Blanks: Pick the 5 most important words for answers. Leave only one blank per sentence. Write the answer choices, out-of-order, below the sentences to assist low-level readers and writers.

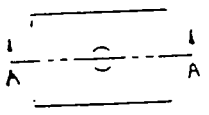
III. Multiple Choice: **Not recommended unless promotional tests use this format.** Use no more than 5 questions or statements. The possible answers should be short: a word or simple phrase.

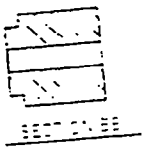
NOTE: True / False are not recommended because these items are difficult to interpret, and guessing can net as much as 50%.

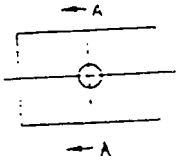
TRAINER DEVELOPED PAPER / PENCIL ASSESSMENT -- CUT AND PASTE

1. 

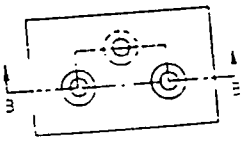
A. 

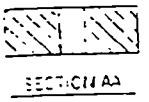
2. 

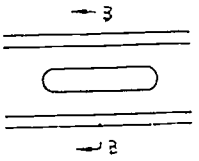
B. 

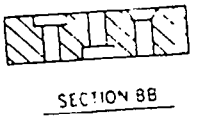
3. 

C. 

4. 

D. 

5. 

E. 

Adapted from Blueprint Reading, Nat'l Machine Builders Assoc. (1983)
K.O. Hoffman, NY: John Wiley & Sons

SELF ASSESSMENT - SAMPLE

CHECKLIST OF PRESENTATION TECHNIQUES

Name _____ Date _____

These techniques for presenting information orally are good for any audience, but they are especially effective when working with special needs students

1 Use this list to present your lesson

2 AFTER YOU TEACH EACH LESSON, EVALUATE YOUR OWN EFFECTIVENESS BY COMPLETING THIS CHECKLIST. CIRCLE THE NUMBER (1,2,3) WHICH BEST DESCRIBES YOUR OWN PERFORMANCE.

3. To use as a peer evaluation, write the peer's name by the number which best describes his/her performance for each technique.

DID YOU.....

1.	Write a brief outline of the lesson on white board, chalkboard, or flip chart?	Y	N
2.	Use a high contrast marker or chalk on your board or flip chart?	Y	N
3.	Write clearly & large enough?	Y	N
4.	Introduce the topic before starting the lesson?	Y	N

		HARDLY EVER	SOMETIMES	CONSISTENTLY
5.	Use short sentences with no slang expressions?	1	2	3
6.	Repeat important points in different ways?	1	2	3
7.	Follow key points with comprehension questions?	1	2	3
8	Use visual aids: tools, parts, materials, pictures, diagrams, overhead?	1	2	3
9	Use body language to demonstrate a point or procedure?	1	2	3
10	Invite questions from the audience?	1	2	3

Building Competencies to Serve ELP (1989) by Jeanne Lopez-Valadez and Tipawan T-Q Reed

TEAM SKILL EVALUATION: TAKING ROLES

Circle your response.

	Hardly Ever	Sometimes	Consistently
RECORDER took accurate notes.	1	2	3
TIMEKEEPER kept us on schedule.	1	2	3
TASKMASTER kept us on the subject.	1	2	3
REPORTER accurately summarized our discussion.	1	2	3

Areas for improvement: _____

_____

_____

_____

HANDS-ON ASSESSMENTS

TYPE	ADVANTAGE	DISADVANTAGE	SAMPLE
TRAINER-DEVELOPED • demonstrate skill • complete • calculate • measure • show and explain • one-on-one • team activity	• customized to job tasks • shows individual's mastery of skill • provides team problem solving	• one-on-one takes time to administer	pages 33-35
TRAINEE--DEVELOPED • use real parts, measuring devices • draw • collect data and show results in charts • solve problems in teams	• increases self-esteem • encourages critical thinking • raises awareness • provides skill practice • in a team format, promotes team skills		page 33 page 36
TRAINER-OBSERVATION • individuals • teams	• can be done at any time • quick assessment of mastery level	• subjective; soft data	page 37

TRAINER OR TRAINEE DEVELOPED HANDS-ON ASSESSMENTS

EXAMPLES

1. Calculations:

   - calculate the tolerance ranges of all critical specs in a blueprint
   - convert an English fraction to a decimal

2. Completions:

   - chart the average measurement of a 5 part sample, taken each hour
   - fill out a reject slip or machine log

3. Skill Demonstration:

   - measure the diameter of a hole of using an inside micrometer or caliper
   - key in all required data for computerized SPC
   - locate a revision on a blueprint

4. Drawings / Graphic Organizers:

   - draw top and side views of a single shape
   - create a flow chart for press maintenance procedures
   - show data on a histogram

5. Labeling / Naming:

   - name the key components of the dial caliper
   - identify blueprint lines and symbols

6. Problem Solving:

   - Use cause and effect diagram to identify probable causes of a plant problem
   - brainstorm solutions and prioritize

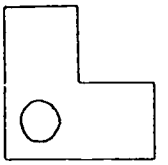
SELF ASSESSMENT BLUEPRINT READING COMPETENCY

Name_____ Date_____

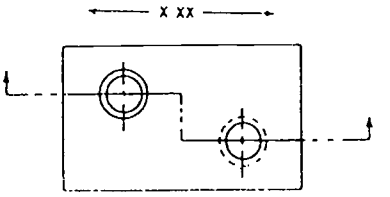
Circle one: Pre-assessment Post-assessment

I CAN_____

1. Draw the top and side views of this object:



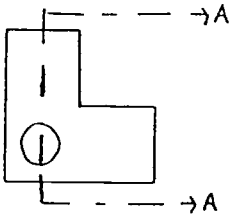
2. Label basic blueprint lines:
   - Dimension line
   - Center line
   - Hidden line
   - Cutting plane line
   - Leader line



3. Label the basic symbols and abbreviations on the attached blueprint: (Use simple company print)

Symbol or Abbreviation	Meaning

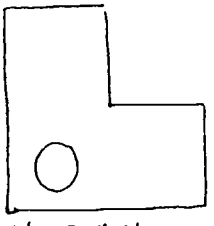
4. Use simple drawing equipment to draw Section AA:
   - 3 basic views-label
   - Show hidden elements



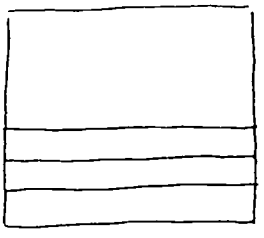
5.	Find and record revision information	Dimension revision was _____; now is _____. ●			
6.	Calculate the specific tolerance ranges for the following figures:	Detail size .503 _____ _____ _____ _____	Tolerance .001 _____ _____ _____ _____	+ _____ _____ _____ _____ _____	- _____ _____ _____ _____ _____
7.	Use coordinates to locate information	number plate revision list _____ _____ Information		_____ _____ _____ _____ Coordinates	
8.	Identify different types of metals and their properties	_____ _____ _____ Metal		_____ _____ _____ Properties	
9.	Use the comparator to check first piece	YES	NO	SOMETIMES	

TRAINEE DEVELOPED ASSESSMENT

1. The side view below has a drawing error. In the blank space on the right, redraw the side view correctly.



½" DIA HOLE THRU FRONT



SIDE

2. Make a different drawing of front and side views. Include a mistake in the side view for other students to find.

TRAINER OBSERVATION ASSESSMENT

PARTNER REVIEW: ASK YOUR PARTNER A QUESTION. THEN ANSWER A QUESTION FROM YOUR PARTNER.

1. Ask your partner to find an example of any of the following words or phrases in his/her class notes. Then ask for an explanation (How is it used? or What does it mean?)

section view	hidden line	second revision
scale	first revision	tolerance range
dimension line	detail view	radius

2. Now ask a question of your own.

3. Have your partner calculate and explain:

   a. Converting an English fraction to a decimal fraction, such as:

   3/16=
   1/8=
   23/32=

   b. Now create a problem of your own.

Trainer circulates during the partner review and looks for such things as:

- taking turns
- using class notes
- performing math skills
- discussion

HOW DOES YOUR ASSESSMENT STACK UP?

1.	Can a **non-literate or low level reader** complete the assessment ?	Y	N
2.	Would a mainly **auditory** learner do well?	Y	N
3.	Would a mainly **kinesthetic** learner do well?	Y	N
4.	Would a **limited English proficient** learner do well?	Y	N
5.	Could the trainee **guess** his way through?	Y	N
6.	Is there a way to re-assess for competency using **hands-on demonstration** for low scorers?	Y	N
7.	Can the assessment be completed in 10-30 minutes?	Y	N
8.	Could your **trainees** have come up with a more tailored, more relevant assessment?	Y	N

NORTHERN ILLINOIS UNIVERSITY/OFFICE OF APPLIED INNOVATIONS
Lesson Plan Feedback Sheet

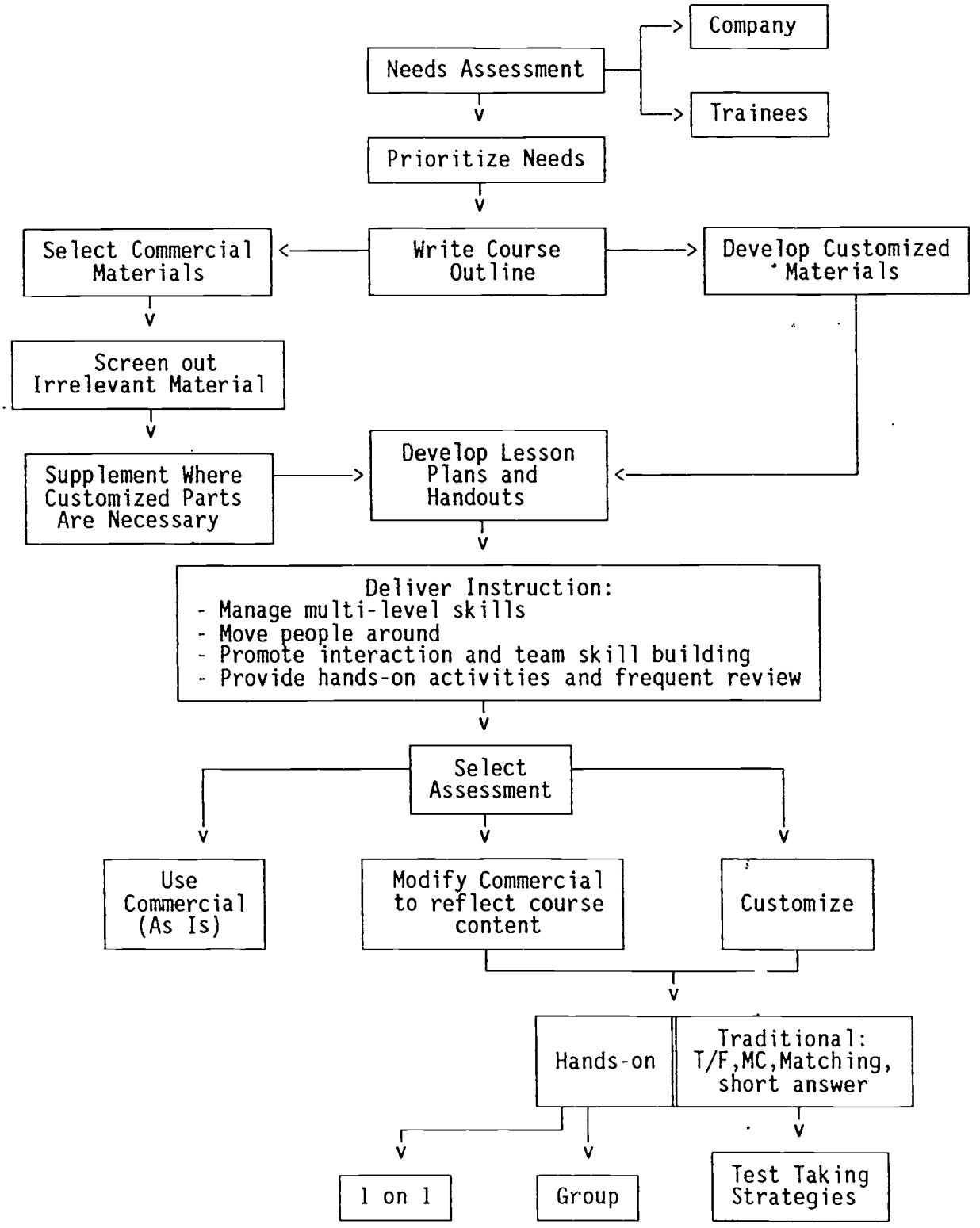
Name_____

Did the written lesson plan _____?

1.	Define clear, measurable objectives?		Y	N	NA
2.	Include:	• a list of materials	Y	N	NA
		• key words	Y	N	NA
		• a handout	Y	N	NA
3.	Set scenario for new lesson with				
		• a leading question	Y	N	NA
		• a high-interest statement	Y	N	NA
		• another device such as _____	Y	N	NA
4.	Include activities which				
		• are related to the objectives	Y	N	NA
		• provide trainees with hands-on experience	Y	N	NA
5.	Evaluate trainees in a variety of ways		Y	N	NA
6.	Provide sponges		Y	N	NA

COMMENTS:

Training Design Sequence



PLANNING TEAM SURVEY

Location_____

Rating: 1=very important 2=moderate value 3=unimportant or does not apply	Topic: Shop Math
	Understanding decimal place values and performing basic operations (addition, subtraction, multiplication, division) on decimal numbers
	Understanding fraction notation and performing basic operations (addition, subtraction, multiplication, division)
	Converting between fractions and decimals, or metric and English measurements, or yards to inches
	Reject ratio, scrap rates-calculations, determining reasons for scrap, and ways to prevent
	Machine run-time-calculating run-time
	Practice completion of forms
	Materials requisition-calculating amounts and costs of materials
	Material suppliers-considering all factors: cost, reject PPM, timing
	Packaging the product- calculating the number of parts (or weight) per package, case, skid, etc.
	Product Shippers- role of shippers, determining relevant information, calculating cost
	Situation analysis/problem solving- using math skills to determine unknown quantities, sizes, times, etc.
	Quality assurance-reasons for QA, taking measurements accurately
	Statistics intro- SPC terms, calculations w/decimals, chart-reading
	No defect-theory is applied to _____ operations
	Blueprint reading- understanding terms, calculating tolerance limits

KEY WORDS

CURRICULUM:

- Very structured commercially developed material. Will have elements irrelevant to the company. Examples: TQM, SPC, Blueprint Reading, Math

- Material adapted from commercial materials or developed by the trainer to meet specific needs (promotions, improved job skills, higher communication skills, etc.) needs of a company such as Sloan Valve and its employees. All elements will reflect job orientation and can be easily revised.

- Always guided by a sequence
  1. Easy to difficult such as reading blueprints or math
  2. Natural chronology of information such as this workshop

COURSE OR CURRICULUM OUTLINE:

LESSON PLAN:

- DURATION:
- TECHNICAL AREA:
- OBJECTIVES:
- KEY WORDS:
- TOOLS / MATERIAL:
- INTRODUCTION / ACTIVITIES:
- SPONGE ACTIVITIES:
- EVALUATION:
- CONTINUOUS IMPROVEMENT:

CURRICULUM OUTLINE -- OBJECTIVES FORMAT

Week 1	Introduce course Interview for video presentation
Week 2	Set goals Maintain practice log
Week 3	Identify customers, suppliers, and workflow Write an article for company newsletter
Week 4	Collect data and represent in a Pareto Chart Identify the key elements of a job
Week 5	Review Create job-related sentences
Week 6	Communicate with supervisors
Week 7	Develop a job description Explore crosstraining and promotions
Week 8	Solve problems using a cause and effect diagram
Week 9	Prepare a presentation with visual aids
Week 10	Practice the presentation Videotape Peer Training Project
Week 11	Continue videotaping
Week 12	Review course and discuss learning strategies Evaluate course -- students and instructors

LESSON PLAN	
TECHNICAL AREA:	DURATION OF LESSON:
COMPETENCY OBJECTIVES:	
KEYWORDS:	TOOLS/MATERIALS:
INTRODUCTION: ACTIVITIES: SPONGES:	
EVALUATION:	IMPROVE NEXT TIME BY:

LESSON PLAN	
TECHNICAL AREA:	DURATION OF LESSON:
COMPETENCY OBJECTIVES:	
KEYWORDS:	TOOLS/MATERIALS:
INTRODUCTION: ACTIVITIES: SPONGES:	
EVALUATION:	IMPROVE NEXT TIME BY:

COURSE OVERVIEW FOR TRAINEES -- DESCRIPTIVE FORMAT

MATH YOU CAN USE
What's in this class???

1. **Decimals.** We'll help you to become comfortable using decimal basic operations -- adding, subtracting, multiplying, and dividing. You'll learn (or relearn) the rules that make it easy to perform these operations without making any mistakes.

2. **Fractions.** People often treat fractions and decimals as two very different topics. Actually, they are very closely related. We won't spend much time working with fractions alone, but we will be discussing their relationship to decimals.

3. **Scrap rates.** Using what we learn about decimals and fractions, we will discuss the concept of ratios. We'll go over different ways of finding reject ratios, or scrap rates. We'll figure out, mathematically, what would have to change in order to lower scrap rates.

4. **Forms.** We're going to look at the forms that most of you have to use day in and day out. An error on a form can cause huge problems as the product moves down the line. Errors can be due to incorrect calculations or simply bad handwriting. We're going to discuss ways to check numbers for accuracy, so that further problems can be avoided.

5. **Packaging.** Not only do the parts you sell have to be made correctly, the correct amount needs to be sent to the customer. We'll practice doing calculations involving amounts and weights. A customer receiving 5000 pieces whren he ordered 50,000 won't be too happy! We'll discuss ways to avoid this seemingly small error.

6. **Situational analysis.** Even if you have basic skills mastered, solving problems can still be difficult. Determining how many pieces will be needed to complete an order, and how many hours it will take to run that order can be confusing. In many of these problems, division is involved. But it may be tough to figure out which number goes on the inside and which goes on the outside. We have some information that will make it easier for you to think through these problems and come up with the right answers.

7. **Quality assurance.** We're going to practice using some measurement tools -- calipers and micrometers, for example. Although many of you may use these tools everyday, others have less experience with them. In our cooperative classroom, you can increase your skills by helping others to learn what you know. In this session, we also show what happens when measurements are off, and how this can lead to huge errors in production.

8. **Statistical process control (SPC)/precontrol charting.** You may have heard of SPC and some of you may even be using SPC. But, in general, it seems to be somewhat of a mystery We will de-mystify SPC by going over the basic concept, terms you'll need to use, and the basic math that it takes to do SPC. Then, we'll cover the "no defect" theory that applies to _____'s operations.

9. **Blueprint reading.** Blueprints have all of the vital statistics for _____'s products We'll discover what the important measurements are, and exactly what tolerance means

CURRICULUM OUTLINE --TOPIC OUTLINE

MATH YOU CAN USE
Class Outline

Sessions	Week of:	Topic
1 & 2	Jan. 31	Decimal Numbers
3 & 4	Feb. 7	Place Values & Conversions
5 & 6	Feb. 14	Scrap Rates (Ratios)
7 & 8	Feb. 21	Situation Analysis
"Spring Break"	Feb. 28	No Class
9 & 10	Mar. 7	Quality Assurance (Measurements)
11 & 12	Mar. 14	Review & Exam
13 & 14	Mar. 21	Forms
15 & 16	Mar. 28	Product Packaging
17 & 18	Apr. 4	Statistics
19 & 20	Apr. 11	No Defects
21 & 22	Apr. 18	Blueprints
23 & 23	Apr 25	Review & Exam Wrap-Up

LESSON PLAN

TECHNICAL AREA: Blue print reading

DURATION OF LESSON: 90 minutes

COMPETENCY OBJECTIVES: S will be able to:

- Correctly use board, T-square, 45°triangle to draw part views
- Use object lines to draw metal part, 3 basic views
- Use hidden lines to represent slot
- Use hidden and object lines to draw a "V"
- Use cutting plane to draw detail of section where slot and "V" intersect

KEYWORDS:

* Object line
* Hidden line
* Cutting plane line
* Cutting plane view

TOOLS/MATERIALS:

* Drawing board
* T-square
* 45° triangle
* Metal part having contoured slot and "V"

INTRODUCTION:

Time: 10 mins.

Review questions from previous lesson:

* What are 3 basic views of part?
* What visible elements with view?
* What is basic drawing equipment and how is it used?

Distribute drawing equipment and ask S to think about how hidden elements of part would be represented on blueprint

ACTIVITIES

Time: 70 minutes

- Review previous lesson by having S demonstrate competency in
  * Basic use of drawing equipment
  * Drawing 3 views of part
  * Drawing visible elements of part, each view
- Ask how slot (hidden element) would be drawn on blueprint. Have S draw, each view
- Ask how "V" differs from slot (Hidden element, front and top; visible element, side view) Have S draw, each view
- Demonstrate cutting plane view and cutting plane line, giving purpose sample reference note (AA)

EVALUATION:

- T observation of drawings and equipment use
- S participation in class activities

IMPROVE NEXT TIME BY:

WRITING COMPETENCY OBJECTIVES

1. STATE ACTION SPECIFICALLY AND IN DETAIL

2. ACTION MUST BE MEASURABLE

3. OBJECTIVE MUST DESCRIBE ACTION THE TRAINEE WILL PERFORM

4. ACTION MUST BE REALISTIC

Adapted from Train the Trainer materials by Mary Ann Mings-Tennant 1994

EXAMPLES OF OBJECTIVE VERBS

DRAW	LOCATE
INTERPRET	CREATE
EXPLAIN	DEMONSTRATE
IDENTIFY	LIST
MAKE	PRESENT
MEASURE	SHOW
SOLVE	USE
CONVERT	CALCULATE
READ	UNDERLINE

Adapted from Train the Trainer materials by Mary Ann Mings-Tennant

SAMPLE UNIT OBJECTIVES: METROLOGY

- identify the discrimination of any English steel rule
- demonstrate correct use of a steel rule
- accurately read a steel rule

PREPARE THE LESSON

1. Introduction
   - Review prior lesson
   - Stimulate interest
   - Activate prior knowledge

2. Body-Divide into logical, easily assimilated segments
   - Include questions and answers
   - Use examples
   - Ask for examples from trainees
   - Demonstrate
   - Reinforce with team activities

3. Conclusion
   - Structure an activity so use what they have learned
   - Preview next lesson
   - Leave no doubt you are finished

QUESTION TIPS

1. Prepare some questions in advance.
2. Ask questions equally and randomly.
3. Use easier questions to start.
4. Ask concise questions.
5. Include questions in your lesson plan.
6. Be prepared to say the question another way.
7. Use either/or questions.
8. Use information questions (who, what, where, when, why, how).
9. Use questions occasionally to test for knowledge, skills, and attitudes.
10. Invite questions.
11. Occasionally refer questions back to participants.
12. Occasionally guide participants to reach answers themselves.

Adapted from Train the Trainer materials by Mary Ann Mings-Tennant

SPONGE ACTIVITIES

Use these for:

- Individuals who complete class assignments more quickly than others
- The whole class when the class time remaining is too short to begin anything new

Have trainee(s) complete ready-made versions of the following or create their own to challenge classmates:

- Quadrants

Name a measuring instrument	What are the discriminations?
What would you measure on your job with this instrument? * * *	Describe how you would clean this instrument.

- Work sheets or quizzes
  - * matching
  - * fill in the blank
  - * labeling
  - * number the sequence

- Technical Vocabulary Puzzles (See sample)

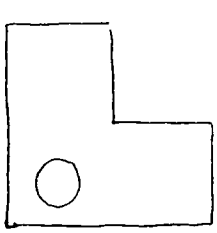
- Description of a problem (safety, production, communication, paperwork) requiring:
  - * identification of people, methods, materials, and machines involved
  - * analysis of which component might contain the problem (and solution) elements

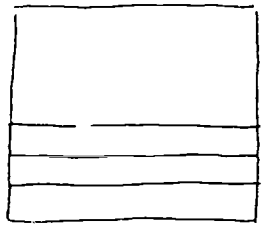
- Pair review: Partner A writes 5 informational questions about the lesson and trades these for another 5 written by partner B. Each answers the other's questions orally or in writing.

- Individual review:
  Have trainee identify at least one lesson idea from the day's class and explain how it can be applied on his/her own job.

SAMPLE SPONGE ACTIVITY

1. The side view below has a drawing error. In the blank space on the right, redraw the side view correctly.





2. Make a different drawing of front and side views. Include a mistake in the side view for other students to find.

THE MULTI-LEVEL CLASS AND COPING STRATEGIES

PROBLEM: Trainees finish class assignments at various speeds.

STRATEGIES:

1. Have early completers assist slower trainees.
2. Use "sponges" to fill next set of gaps (while waiting for remainder of class to finish the assignment).
3. Decide basic minimum practice for the skill. Assign this to slower trainees and increase the amount for the faster ones.
4. Conduct practice in small groups (where each group member takes turns answering questions / solving problems and others agree or disagree.

PROBLEM: Trainees understand at varying levels.

STRATEGIES:

1. Repeat the information (T)
2. Write the information (T, t)
3. Rephrase the information (T)
4. Draw an example (T, t)
5. Demonstrate (T, t)
6. Ask for a paraphrase (T)
7. Ask the most proficient trainee to explain, demonstrate, etc., to the least proficient (T)

T = trainer
t = trainee

BASIC PRINCIPLES OF GOOD TEACHING

INTRODUCTION

1. **REVIEW** the previous lesson.

2. State your teaching **OBJECTIVES** and trainee **EXPECTATIONS.**

3. Tell **WHAT** you are going to teach and **WHY** it is important.

ACTIVITIES

4. **PRESENT** the current lesson.

5. Explain **HOW** the trainee will learn the material (teamwork, hands-on practice, trainer demonstration...)

CONCLUSION

6. **EVALUATE** and **REVIEW.**

7. **PREPARE** trainees for the next lesson

adapted from Wyland. NIU-CARR 1994

ACTION PLAN

Write 3 to 5 ideas that you have acquired today,
and how you think you will use them.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

CHECKLIST OF PRESENTATION TECHNIQUES

Name_____ Date_____

These techniques for presenting information orally are good for any audience, but they are especially effective when working with special needs students.

1. Use this list to present your lesson.

2. AFTER YOU TEACH EACH LESSON, EVALUATE YOUR OWN EFFECTIVENESS BY COMPLETING THIS CHECKLIST. CIRCLE THE NUMBER (1,2,3) WHICH BEST DESCRIBES YOUR OWN PERFORMANCE.

3. To use as a peer evaluation, write the peer's name by the number which best describes his/her performance for each technique.

DID YOU.....

1.	Write a brief outline of the lesson on white board, chalkboard, or flip chart?	Y	N
2.	Use a high contrast marker or chalk on your board or flip chart?	Y	N
3.	Write clearly & large enough?	Y	N
4.	Introduce the topic before starting the lesson?	Y	N

		HARDLY EVER	SOMETIMES	CONSISTENTLY
5.	Use short sentences with no slang expressions?	1	2	3
6.	Repeat important points in different ways?	1	2	3
7.	Follow key points with comprehension questions?	1	2	3
8.	Use visual aids: tools, parts, materials, pictures, diagrams, overhead?	1	2	3
9.	Use body language to demonstrate a point or procedure?	1	2	3
10	Invite questions from the audience?	1	2	3

Building Competencies to Serve LEP (1989) by Jeanne Lopez-Valadez and Tipawan T-Q Reed

DIVERSITY IN TRAINEE EXPECTATIONS

Regarding:

CONTENT AND PROCESS	Expects general idea of program and requirements; good grades possible.	Expects clear requirements; practical information.	Expects to learn something new each class; wants simple explanations.	Expects trainers to provide individual attention and care; seeks instructor's praise.
AUTHORITY	Respects trainer based on amount of knowledge or degrees in his field.	Respects trainer for being a human being and having the knowledge to teach.	Trainee maintains a polite attitude of politeness because the trainer has the power of "grading."	Wants trainer to have complete authority (some trainees are internally rebellious)
TESTS / QUIZZES	"I am an adult; why do I need to show the trainer what I know?" Essays are more popular.	Oral exams and essay tests are most popular. No MC or T/F tests.	Expects MC, quizzes, and homework; but is unfamiliar with essay tests	MC and T/F are most common. Essays are given but are often feared due to subjective nature
CLASS MANAGEMENT	Trainee wants freedom to be creative	Trainee respects the trainer as an authority but doesn't like to be controlled.	Trainee expects and needs control.	Trainee wants to be controlled. Expects the trainer to correct every mistake.
EMBARRASSMENT	If embarrassed, trainee will remain quiet most of the time.	If embarrassed, trainee will hesitate to participate.	Trainee is easily embarrassed. Tries to maintain composed appearance and is distressed if he/she can't.	Trainee is easily embarrassed but pretends not to be; may behave rudely towards the trainer
DISPLAY OF KNOWLEDGE	Trainee avoids displaying knowledge; thinks only the trainer should display knowledge.	Trainee may show superior knowledge, if asked directly; but may hesitate to volunteer the answer when someone else has not been able to give one.	Trainee likes to participate if prepared; wants to be liked by the trainer.	Trainee will answer questions as long as he/she doesn't dominate the class.

TRAINEE DIVERSITY (cont.)

Regarding:

TRAINER EXPERTISE	Trainer is knowledgeble but doesn't have to know everything; sometimes acceptable for trainee to know something trainer doesn't know.	Trainer not expected to be all-knowing, but is expected to find out any answers.	Trainer is absolute authority in his/her field. There will only be a few questions trainer is unable to answer.	Trainee expects trainer to know everything. Doesn't trust trainers who don't know everything about the subject.
TIME	Trainer expects trainee to come on time; but some trainees don't pay attention to time.	Trainee expects class to begin on time but it is acceptable to come late sometimes.	Trainee expects class to begin on time and assignments to be completed.	Trainee expects class to begin and end on time. Trainee expects to come on time, and turn in completed assignments.
GROUP PROJECTS	Trainee doesn't like group projects; prefers to work individually under the trainer's control.	Trainee is not accustomed to group projects (not part of his/her educational experience).	Trainee likes group projects for the experience of sharing concepts and knowledge with peers.	Trainee likes group projects because responsibility for project is shared.
DISAGREEMENT	Trainee avoids disagreement with trainer; when it is unavoidable, trainee will disagree gracefully.	No direct disagreement with trainer; will try to clarify the problem by asking indirect questions.	Trainee will hesitate to disagree with the trainer.	Trainee will not hesitate to disagree with the trainer
PRIVACY	Trainee is very open-minded and likes to discuss even the most controversial issues.	Within individual limits, almost any subject may be discussed.	Among peers the trainee will discuss anything, but may hesitate to discuss some subjects with those not seen as peers, such as the trainer.	Trainee may be embarrassed by personal issues.

CHECKLIST OF PRESENTATION TECHNIQUES

Name_____ Date_____

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1. Use this list to present your lesson.

2. AFTER YOU TEACH EACH LESSON, EVALUATE YOUR OWN EFFECTIVENESS BY COMPLETING THIS CHECKLIST. CIRCLE THE NUMBER (1,2,3) WHICH BEST DESCRIBES YOUR OWN PERFORMANCE.

3. To use as a peer evaluation, write the peer's name by the number which best describes his/her performance for each technique.

DID YOU.....

1.	Write a brief outline of the lesson on white board, chalkboard, or flip chart?	Y	N
2.	Use a high contrast marker or chalk on your board or flip chart?	Y	N
3.	Write clearly & large enough?	Y	N
4.	Introduce the topic before starting the lesson?	Y	N

		HARDLY EVER	SOMETIMES	CONSISTENTLY
5.	Use short sentences with no slang expressions?	1	2	3
6.	Repeat important points in different ways?	1	2	3
7	Follow key points with comprehension questions?	1	2	3
8.	Use visual aids: tools, parts, materials, pictures, diagrams, overhead?	1	2	3
9	Use body language to demonstrate a point or procedure?	1	2	3
10	Invite questions from the audience?	1	2	3

Building Competencies to Serve LEP (1989) by Jeanne Lopez-Valadez and Tipawan T-Q Reed

READABILITY CHECKLIST

Evaluate the readability of technical training handouts by using this checklist

		HARDLY EVER	SOMETIMES	CONSISTENTLY
SENTENCES STRUCTURE:				
1.	Short sentences	1	2	3
2.	Active voice	1	2	3
3.	Nouns are expressed, not implied	1	2	3
4.	One word verbs	1	2	3
VOCABULARY:				
1.	Simple	1	2	3
2.	Standardized vocabulary	1	2	3
3.	No slang	1	2	3
CONTENT/ORGANIZATION:				
1.	Logical order of presentation	1	2	3
2.	Examples of concept	1	2	3
3.	Application of concepts	1	2	3
FORMAT:				
1.	Clearly readable print	1	2	3
2.	Uncrowded page	1	2	3
3.	Headings	1	2	3
4.	Bold faced/ underlined	1	2	3
5.	Bullets	1	2	3

Adapted from Building Competencies to Serve LEP (1989)
Jeanne Lopez-Valadez and Tipawan T-Q Reed

TEAM SKILL EVALUATION: TAKING ROLES

Circle your response.

	Hardly Ever	Sometimes	Consistently
RECORDER took accurate notes.	1	2	3
TIMEKEEPER kept us on schedule.	1	2	3
TASKMASTER kept us on the subject.	1	2	3
REPORTER accurately summarized our discussion.	1	2	3

Areas for improvement: _____

_____

_____

_____

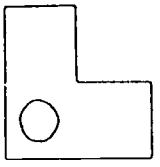
SELF ASSESSMENT BLUEPRINT READING COMPETENCY

Name_____ Date_____

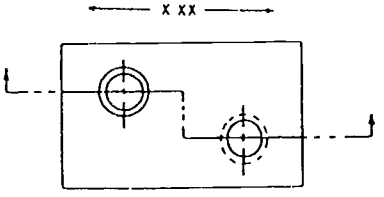
Circle one: Pre-assessment Post-assessment

I CAN_____

1. Draw the top and side views of this object:



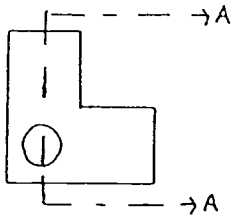
2. Label basic blueprint lines:
   - Dimension line
   - Center line
   - Hidden line
   - Cutting plane line
   - Leader line



3. Label the basic symbols and abbreviations on the attached blueprint: (Use simple company print)

Symbol or Abbreviation	Meaning

4. Use simple drawing equipment to draw Section AA:
   - 3 basic views-label
   - Show hidden elements



5. Find and record revision information

Dimension revision was _____;
now is _____.

-

6. Calculate the specific tolerance ranges for the following figures:

Detail size	Tolerance	+	-
.503	.001		

7. Use coordinates to locate information

Information	Coordinates
number plate	
revision list	

8. Identify different types of metals and their properties

Metal	Properties

9. Use the comparator to check first piece

YES NO SOMETIMES

LESSON PLAN	
TECHNICAL AREA:	DURATION OF LESSON:
COMPETENCY OBJECTIVES:	
KEYWORDS:	TOOLS/MATERIALS:
INTRODUCTION: ACTIVITIES: SPONGES:	
EVALUATION:	IMPROVE NEXT TIME BY:

Trainer_____ Course Name_____

Date_____

BASIC AND OPTIONAL CLASSROOM EQUIPMENT

Basic Equipment	Optional Equipment
____1. Lesson plan-in 3 ring binder	____1. Case to carry "must have" materials. Saves time to have standard equipment ready for each lesson.
____2. Attendance sheet	____2. Extra overhead bulb
____3. Handouts for the lesson	____3. Extra paper
4. Visual aids ____ a. Pictures ____ b. Graphic Organizers ____ c. Actual pieces to manipulate ____ d. Transparencies ____ e. Examples	____4. Additional clean transparencies
____5. White or black board, markers/chalk, eraser	____5. 3-hole punch
____6. Overhead projector, vis a vis markers, eraser	____6. Pencil sharpener
____7. Flip chart and paper	____7. Stapler/staples
____8. Tools and equipment for student use (measuring, drafting, calculator, etc.)	____8. Tape ____9. VCR
____9 Pencil/pen	Decide in advance who (company or employee) provides: Course workbook 3 ring binder Pencil/pen Paper Ruler _____ _____

APPENDIX A

DUPLICATION MASTERS

APPENDIX B

HANDOUT SAMPLES

CHARACTERISTIC 6 Adults have habit needs.

HOMEWORK: Use the Readability Checklist to revise this handout.

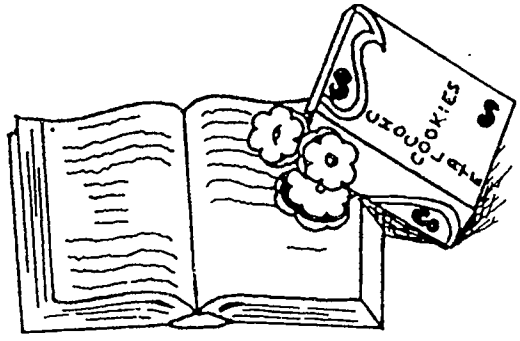
Recently during a workshop when we took orders for coffee, one participant said, "I need a cup of coffee." Another said, "No, thanks, I never eat between meals." Two persons with different food habit needs.

EXERCISE 11

List your habit needs when you are the learner in a learning situation.

HABIT NEEDS

Habit needs include such things as drinking coffee or tea with or without a snack at 10 a.m.; drinking only decaffeinated coffee or tea; munching on something when studying; learning best in a formal or informal atmosphere; reading the paper before starting the day; exercising or relaxing for some part of the day.



Some people learn best with munchies.

Habit needs create a sense of familiarity and comfort for the individual. If such needs are not satisfied, they may dominate the person's thoughts and may interfere with learning. During a workshop not long ago two adults excused themselves because after a four-hour car ride and another four hours of sessions, they needed to jog. The need was interfering with their ability to concentrate. Turner (1970) found that teachers prefer a relaxed and informal atmosphere during the learning situation called inservice. Dunn and Dunn (1972) have integrated habit needs into their learning style theory. They report that such things as food, comfort, lighting, and noise affect ability to learn and that effectively accommodating desires associated with them paves the way for uninterrupted concentration during the learning

The Adult Learner (1982) by Judy-Arin Krupp, Ph.D.

Adults Have Habit Needs

What is a Habit Need?

A routine or pattern that has become necessary to you

Mary Jones says:

I need at least three cups of strong coffee to start my day!

John Smith says:

I never drink coffee in the morning, only orange juice!

Examples of Habit Needs

- Reading the morning paper before work
- Drinking coffee or tea at 10:00 a.m.
- Exercising after work
- Snacking while studying

Satisfying habit needs create a sense of familiarity and comfort.

Unsatisfied habit needs may dominate your thoughts and interfere with your learning.

To aid concentration, satisfy the following needs:

Food

Comfort

Lighting

Noise

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WORKSHOP EVALUATION

Name of Workshop_____

Date_____ Location_____

1.	How applicable to your needs was the workshop content?	Very applicable	5	4	3	2	1	Innapropriate
2.	How much did you learn?	More than anticipated	5	4	3	2	1	Less than anticipated
3.	How would you rate the organization and structure of the workshop?	Excellent	5	4	3	2	1	Poor
4.	How would you rate the workshop overall?	Excellent	5	4	3	2	1	Poor

5. What did you find most helpful?

6. What did you find the least helpful?

7. What changes would you recommend?

8 General comments

Northern Illinois University/Office of Applied Innovations

EASE II Staff Development

Month/Year	Faculty-led Staff Development	Instrumental Enrichment	Conferences/Seminars P = participants Pr = presenters
▸ November 1993			11/22 Ricardo Semlar: Rethinking the Possibilities: Developing Your Own Unique Workplace (P)
▸ December 1993	"Designing the nested lesson: Integrating graphic organizers, higher order thinking and teamskills into the manufacturing content lesson"	12/14 Rueven Feuerstein: Introductory presentation on Instrumental Enrichment	Secretary of State Business Roundtable: "Staff Development for ESL Instructors"(Pr) Tooling & Manufacturing Assn: OAI Workplace Literacy Services (Pr)
▸ January 1994	"Higher order thinking: Developing through questions, graphic organizers, and problem posing		
▸ February 1994	"Hands on with Cooperative Learning"		2/2 - 4 IL Workforce Education Conference: • "Workplace Literacy: A model for economic development"(Pr) • Assessment issues in workplace literacy (Pr) National Alliance of Business Focus Group: "Workplace education"(Pr)
▸ March 1994		2/ 3 - 7 Meier Ben-Hur: Instrumental Enrichment, Level I	AOE Conference: " The Supervisor as Literacy Partner"(Pr)

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EASE II Staff Development

Month/Year	Faculty-led Staff Development	Instrumental Enrichment	Conferences/Seminars P = participants Pr = presenters
▸ April 1994	• "The Rassias Language Method" • " Three Cognitive Development Theorists: DeBono, Gardner, and Feuerstein"		
▸ May 1994	"Teaching Learning Strategies: Social, Metacognitive, Cognitive, Affective"		5/9 Dr. Warren Bennis: Leadership for the 90's (P) 5/12 IL Resource Development Center Workplace Literacy Conference: • The Bilingual Vocational Training (BVT) Model (Pr) • Marketing Workplace Literacy (Pr)
▸ June 1994	• " Introduction to Instrumental Enrichment: Teaching Organization of Dots" • Two-day staff retreat: Creating a New Vision		
▸ August 1994	"Recognizing and Accommodating Learning Disabilities in the Classroom" (guest speaker from DeKalb campus)		
▸ September 1994	• "Learning Disabilities: Implications for Workplace Training" • "Best-loved Lessons for ELDG Groups"	9/13 Strategic Planning with Meier Ben-Hur: Infusing Instrumental Enrichment into Workplace Literacy	9/29 Tooling and Manufacturing Assn: Strategic planning meeting

Northern Illinois University/Office of Applied Innovations

EASE II Staff Development

Month/Year	Faculty-led Staff Development	Instrumental Enrichment	Conferences/Seminars P = participants Pr = presenters
▸ October 1994	"OAI's Customized ESL Oral Test"		
▸ November 1994	"Technical (Metalwork) Vocabulary for Workplace Teachers: Tools, Workmanship, SPC, Blueprint, Dimensional Metrology"		11/15 Steven Covey: Principle-Centered Leadership (P)
▸ December 1994		12/3 and 12/16 Instrumental Enrichment, Level II	12/8 Tooling and Manufacturing Assn: Instrumental Enrichment (Pr)
▸ January 1995	"Utilizing Cooperative Learning Structures in Workplace Lesson Plans"		1/23 IL Resource Development Center Workplace Literacy Conference: "Year two and Beyond in Workplace Literacy" (Pr)
▸ February 1995	"Accessing Critical Program Information from OAI Computer Files"	2/3, 2/10 and 2/17 Instrumental Enrichment Level II (completed)	2/2 IL Resource Development Center on-site interview: How OAI intergrates basic skills into vocational training
▸ April 1995	• "The Partner, the Customer, and the Frontline Provider" • " Working with ELDG Groups: Strategies for Retention and Instruction"		

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ADDENDUM TO STAFF DEVELOPMENT: EASE II

Shadowing Activities

- New faculty shadow :
  - Master teachers in high frequency courses (VESL I, Basic Math)
  - Program Manager in literacy audit and assessment
- Experienced faculty shadow peers in newly developed courses (Oral Skills for ISO 9000 Audits, Problem Solving, Infusion of Instrumental Enrichment)
- Experienced faculty shadow Program Manager in corporate client planning team meetings

Mentoring Activities

- New/inexperienced faculty take over instruction in steps via the Graduated Delegation Model (observation, team teaching, instruction under guidance)
- Experienced faculty work under continuous, on-site guidance of Curriculum Coordinator in Bilingual Vocational Training (BVT) model of pre-technical and technical-concurrent reinforcement of basic skills

Full-time Staff Meetings (Bi-weekly) - Sample Topics (always infused into monthly all-staff meetings)

- Customized assessment/research and development
- Integrating Instrumental Enrichment into workplace programming
- New grants
- Marketing OAI services
- [illegible] for service products/research and development

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Staff Meeting Agenda

April 21, 1995

10:00 am - 11:00 am	▸ The Partner, the Customer, and the Frontline Provider (Vicki) ▸ Working with the ELDG group: Strategies for retention and instruction
11:00 am - 11:30 am	Project Update (Tippi)
11:30 am - 12:00 noon	Miscellaneous issues (Teddi)
12:00 noon - 1:00 pm	Lunch
1:00 pm - 1:30 pm	Course files: The whys and hows (Jean)
1:30 pm - 2:30 pm	Round Robin Sharing: Best Ideas from Fall '94 and Spring '95 Classes
2:30 pm - 4:00 pm	Networking and Resourcing

STAFF MEETING & VISION RETREAT
JUNE 8 & 9, 1994

-Agenda formulation (Brainstorming and Prioritization)

-Icebreaker (personal sharing)

Some items to be discussed:

-Practical Visions (visualization activity)

-OAI Mission (philosophy, management style, approaches, etc.)

-Roles and Responsibilities (individual's perceptions, strengths and weaknesses)

-Service focus and direction (stop, start, keep/revise)
(Brainstorming and Prioritization)

-Project Updates and Progress Reports from the field

-Staffing issues (Prasong, performance reviews, salaries, etc.)

-Action Planning (Force Field Analysis)

RAMS ◆ PROGRAMS ◆ PROGRAMS ◆ PROGRAMS ◆ PROGRAMS ◆ PROGRAMS ◆ PROG

CALENDAR

MARCH, 1994

Minneapolis, MN
Authentic Learning
March 2–3, 1994

New York
Violence In Schools
March 18–19, 1994

APRIL, 1994

San Francisco, CA
Rewards & Punishments: Practices Whose Times Have Passed
April 15–17, 1994

Battle Creek, MI
New Concepts of Learning
April 22–24, 1994

MAY, 1994

Richmond, VA
Integrating the Curricula
May 12–13, 1994

JUNE, 1994

Chicago, IL
Including the Difficult Student into the Classroom
June 20–23, 1994
Training of Trainers
June 24–25, 1994

Palatine, IL
Instrumental Enrichment
June 20–24, 1994

Chicago, IL
Creating the Learner-Centered Classroom Through Whole Language Instruction
June 27–30, 1994

Bloomfield Hills, MI
Integrating the Curricula
June 27–28, 1994
Training of Trainers
June 29–30, 1994

Authentic Classroom Assessment
June 27–28, 1994
Training of Trainers
June 29–30, 1994

JULY, 1994

Bloomington, IN
Total Quality Leadership
July 10–15, 1994

Chicago, IL
Meeting Learners' Needs Through Multiple Intelligences
July 6–9, 1994
Training of Trainers
July 10–11, 1994

ILLINOIS

Instrumental Enrichment Seminar

Level 1

Intelligence, once thought of as fixed and unchanging, is now being viewed differently. Psychological theory and research supports the idea that intelligence is modifiable and changable.

Presenter
Meir Ben-Hur

Based upon this view, Professor Reuven Feuerstein created *Instrumental Enrichment,* an intense program designed to mediate cognitive development. This theory-based curriculum is used in more than thirty countries and allows teachers to identify and correct inadequacies in student thinking. The most valuable part of the program comes from the mediational role of the trained teacher. The program provides students with concepts, skills, and techniques that help them learn how to learn. In this practical Level 1 course, participants will concentrate on four student skills: organization of dots, orientation in space, comparisons, and analytic perception.

You will learn how to:

- Understand the theory and principles of Instrumental Enrichment.
- Provide your students with mediated learning experiences that will increase their cognitive capabilities.
- Integrate *Instrumental Enrichment* activities within your curriculum.
- Acquire methods that will motivate students to learn.
- Transform students from passive recipients of information into active and self-confident learners.
- Produce growth in skills that will help students succeed in school and in life.
- Diagnose and correct a student's problem with his thinking skills.

DATES AND LOCATIONS

Date:	June 20–24, 1994
Site:	To be announced, Palatine, IL
Program No.:	SC-94-06-20-0915
Cost	Before May 20th—$395*, after—$445*
	Optional three graduate credit hours $120.00

*Price includes 5-day training and materials

For more information about any program call

IRI SkyLight EDUCATIONAL TRAINING AND PUBLISHING
200 East Wood Street, Suite 274, Palatine, IL 60067
800-348-4474 • 708-991-6300 • FAX 708-991-6420

Denis Waitley

EMPIRES OF THE MIND

Lessons to Lead and Succeed in a Knowledge-Based World