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ABSTRACT

This set of competency-based learning modules consists of four career exploration modules and three science modules for use with adults with limited English proficiency. The four career exploration models contain activities designed to introduce students to career opportunities and basic job skills and safety procedures in the following fields: woodworking, machine tool operation, electronics, and printing and publishing. Each career exploration module contains some or all of the following: course description; list of course competencies; course outline; and lesson plan detailing lecture topics, objectives/tasks, and laboratory/learning activities. The three science modules, which are intended for use with intermediate English-as-a-Second-Language students, deal with the following topics: physical science, earth science and geography, and life science. Each science module includes some or all of the following: course description; list of required books/supplies; list of competencies; list of resources; and tables outlining the performance objectives and tasks covered in each unit along with related activities, resources/instructional aids, and evaluation devices. (MN)

SOUTHEAST ASIAN CAREER EXPLORATION PROGRAM

MODULES: WOODWORKING
MACHINE TOOL
ELECTRONICS
PRINTING & PUBLISHING
ESL PHYSICAL SCIENCE
ESL EARTH SCIENCE AND GEOGRAPHY
ESL LIFE SCIENCE

Prepared by Mel Podolske

June, 1993

The mission of this course in woodworking is to provide the students with an opportunity to further explore various areas of woodworking. Within these areas, the students will have opportunities to develop and apply basic skills in both hand and machine operations, learn about careers in the woodworking field, and construct projects dealing with various types of wood materials. Students will learn the safe and correct use of basic hand tools, the jointer, surface planer, table saw, radial arm saw, band saw, drill press, router, and various sanding machines. They will also develop skills in organization and in following set procedure. They will learn the correct sequence of using these machines as they proceed through activities to square up boards to be used for a completed project. An appreciation of wood and quality workmanship will also be nurtured.

END OF THE COURSE LEARNER EXPECTATIONS

1. Develop safe general work habits.
2. Be able to measure to the closest 1/16 inch, measure angles, and compute board foot measurement.
3. Identify the parts and operation of the basic woodworking hand tools.
   - A. Hand saws
   - B. Planes
   - C. Boring and drilling tools
4. Identify the parts of the basic woodworking machines covered in this course.
   - A. Jointer
   - B. Surface planer
   - C. Table saw
   - D. Radial arm saw
   - E. Band saw
   - F. Drill press
   - G. Router
   - H. Sanding machines
5. List safety considerations pertaining to these machines.
6. Apply correct woodworking techniques to complete various woodworking projects.
7. Develop an understanding of careers and appreciation for the craftsman who creates attractive, durable furniture.
8. Apply problem solving skills to successfully complete a woodworking project.

COURSE OUTLINE

1. Project planning

   a. Objectives

      1. Be able to plan and complete a project in an organized manner
      2. Be able to read a working drawing

   Skills

      1. Be able to:
         a. Read a drawing
         b. Make a plan of procedure for the project
         c. figure board feet
         d. figure square feet
         e. figure linear feet
         f. complete a bill of material

2. Layout tools

   a. Objectives

      1. Students will be able to use layout tools
      2. Students will be able to use different layout tools with some kind of proficiency

   Skills

      1. Be able to:
         a. Measure accurately with a rule
         b. Make lines with pencil, awl, and knife
         c. Square a line with a try square and framing square
         d. Gauge a line with a marking gauge
         e. Use trammel points, divider on compass
         f. Use a tee bevel properly

3. Hand saws

   a. Objectives

      1. Students will be able to identify all types of hand saws
      2. Develop in each student proficiency and skills in the use of hand saws

   Skills

      1. Be able to:
         a. Rip saw to a line
         b. Cross cut to a line
         c. Saw with a back saw
         c. Saw with a coping saw

4. Hand planes

   a. Objectives

      1. Students will be able to adjust and set a plane properly
      2. Students will be able to sharpen a plane iron properly
      3. Students will know the proper uses for the different types of planes

   Skills

      1. Be able to:
         a. Assemble and disassemb a plane
         b. Grind a plane iron
         c. Whet a plane iron
         d. Adjust a double plane iron
         e. Plane a true edge
         f. Plane end grain
         g. Plane a chamfer and bevel

5. Boring and drilling tools

1. Bit
2. Braces
3. Hand drill
4. Twist drill
5. Electric hand drill
6. Battery powered hand drills

Skills

Be able to:
Select proper bit for the job
Assemble a bit in brace
Assemble twist drill in hand drill
Locate hole
Bore through hole
Bore a step hole
Counter-sink a hole

6. Fastening with screws and screwdrivers

Objectives

1. Be able to drive screws with a screwdriver
2. Be able to tell the size and types of screws
3. Be able to purchase screws properly
4. Use a power screwdriver in the assembly of a wood project

Skills

1. Drive screws into hardwood and softwood properly
2. Counter-sink for flat head screws
3. Drill a pilot hole
4. Drill an anchor hole
5. Select proper size of screws
6. Select proper size and type of screwdriver

7. Clamps

Objectives

1. Be able to identify common types of clamps used in woodworking
2. Be able to use each type of clamp properly

Skills

Clamp with bar clamps, band screw clamps, and C-clamps

8. Glue and gluing

Objectives

1. Acquaint students with the various types of adhesives used in the woodworking industry
   a. advantages and disadvantages of various adhesives
   b. Identify terms, set time shelf life and creep involved with adhesives
   c. Use adhesives in the construction of a woodworking project

Skills

1. Acquaint students with various adhesives used in woodworking
2. Demonstrate "creep" in using adhesives
3. Identify set time and shelf life in association with adhesives
4. Clamp and glue various wood joints using a proper sequence

9. Wood finishing

1. Stains
2. Shellac
3. Varnishes
4. Enamel paints
5. Latex paints
6. Thinners and solvents
7. Application of finishes
   a. brush
   b. roller
   c. wiping
8. Preparation for finishing

Skills

1. Students will know difference of various types of wood stain
2. Students will know of common sealers for wood finishing
3. Students will be acquainted with types of paint
   a. Oil base
   b. Latex
4. Students will understand vario types of finishes and their solvents
5. Students will be able to prepare and apply various finishes using two different types of application

MACHINE TOOLS

I. Jointer
   - A. Purpose
   - B. Size
   - C. Safety considerations
   - D. Parts
   - E. Using the jointer

II. Surface Planer
   - A. Purpose
   - B. Size
   - C. Parts
   - D. Safety considerations

III. Circular Saw
   - A. Purpose
   - B. Sizes
   - C. Types of blades
   - D. Parts
   - E. Safety considerations
   - F. Using the circular saw

IV. Radial Arm Saw
   - A. Size
   - B. Parts
   - C. Types of blades
   - D. Safety considerations
   - E. Using the radial arm saw
   - F. Using a portable circular saw

V. Band Saw
   - A. Purpose
   - B. Size
   - C. Parts
   - D. Safety considerations
   - E. Using the band saw
   - F. Using a portable electric saber saw

VI. Drill Press
   - A. Purpose
   - B. Parts
   - C. Safety considerations
   - D. Size
   - E. Using the drill press - machine bits, twist drills, brad point drills
   - F. Depth stop

VII. Router
   - A. Purpose
   - B. Parts
   - C. Safety considerations
   - D. Using the router

VIII. Sanding Machines

A. Purpose
B. Parts
C. Safety considerations
D. Various types of sanding machines

IX. Careers in woodworking

GOALS AND OBJECTIVES

WOODWORKING

Goal 1 - To familiarize the students with the jointer.

The student will:

a. List the purposes of the jointer.
b. Name the parts of the jointer.
c. Explain how the size of the jointer is determined and how this affects its use.
d. List various safety considerations to be followed when using the jointer.
e. Explain the things to check before using the jointer.
f. Explain how to face joint and edge joint.
g. Use the jointer in the making of a woodworking project.

Goal 2 - To familiarize the students with the surface planer.

The student will:

a. List the purposes of the surface planer.
b. Name the parts of the surface planer.
c. Explain how the size of the surface planer is determined and how this affects its use.
d. List various safety considerations to be followed when using the surface planer.
e. Explain the things which should be checked before using the surface planer.
f. Explain how to use the surface planer to surface a board to thickness.
g. Use the surface planer in the making of a woodworking project.

Goal 3 - To familiarize the students with the circular (table) saw.

The student will:

a. List the operations that the circular saw can be used for.
b. Name the parts of the circular saw.
c. Explain how the size of the circular saw is determined.
d. List various safety considerations to be followed when using the circular saw.
e. Explain the things to check before using the circular saw.
f. Explain how to crosscut, rip, and dado on the circular saw.
g. Use the circular saw in the making of a woodworking project.

Goal 4 - To familiarize the students with the radial arm saw.

The student will:

a. List the operations for which the radial arm saw can be used.
b. Name the parts of the radial arm saw.
c. Explain how the size of the radial arm saw is determined.
d. List various safety considerations to be followed when using the radial arm saw.
e. Explain how to rough crosscut on the radial arm saw.
f. Use the radial arm saw in the making of a woodworking project.

Goal 5 - To familiarize the students with the band saw.

The student will:

a. Name the type of cutting the band saw is used for.
b. Name the parts of the band saw.
c. List various safety considerations to be followed when using the band saw.
d. Explain the things to check before using the band saw.
e. Explain how to freehand cut on the band saw.
f. Use the band saw in the making of a woodworking project.

Goal 6 - To familiarize the student with the drill press.

The student will:

a. List the purpose of the drill press
b. Name the parts of a drill press.
c. Explain how the size of the drill press is determined and how this affects its use.
d. List various safety considerations to be followed when using the drill press.
e. Explain the things to check before using a drill press.
f. Explain how to insert drill bit, set depth gauge, and hold work for drilling on a drill press.
g. Use drill press in making a woodworking project.

Goal 7 - To familiarize the students with the router.

The student will:

a. Name various types of cuts that the router can do.
b. Name the parts of the router.
c. List various safety considerations to be followed when using the router.
d. Explain the things to check before using the router.
e. Explain how to use the router to rabbet and shape an edge.
f. Use the router in the making of a woodworking project.

Goal 8 - To familiarize the student with sanding machines.

The student will:

a. List the purpose of sanding machines.
b. Identify various parts of sanding machines.
c. Explain advantages and disadvantages of various types of sanding machines.
d. List various safety considerations to be followed when using sanding machines.
e. Explain how to change various shapes of abrasives for various sanding machines.
f. Use a sanding machine in the making of a woodworking project.

Goal 9 - To familiarzie the students with careers in woodworking.

The student will:

a. Name various careers in woodworking.
b. List various types of training needed to prepare for these careers.
c. Identify various skills needed to be successful in these careers.

DAY 1	DAY 2	DAY 3	DAY 4
Course introduction Introduction of 1st project Reading a drawing Set up job plan sheet Compute board feet Measuring	Hand saws demo Rip, cross cut coping layout Job plan sheet Computing board feet	Questions and answers on sawing (hand) Continue with layout Job plan sheet Introduce planes and planing Grinding plane irons	Planing questions and answers Layout of stretcher Coping saw work Job plan sheet Student work on preparing stock for stretcher
Check with students in completion of hand operations Introduction of radial arm saw Gluing operations face to face Students begin to cut stock for parts of bench	Introduction of jointer operations safety Students working on stretcher	Introduction surfaces/planed operation safety Students cutting stock Work on stretcher	Introduction circular saw safety operations blades Students complete stretcher Cutting of parts for bench
Students preparing stock for gluing Cutting of stock for parts of bench Gluing operations	Students preparing stock for gluing operations Squaring of stock	Students gluing Use of patterns Layout of parts already glued up Cut dado's for project work	Introduction band saw operations safety

	DAY 1	DAY 2	DAY 3	DAY 4
EK	Demonstration band sawing work associated with project Students working on project parts	Demonstration drill press work Students continue with project work	Demonstration drilling jig for doweling Go over material for fasteners nails/screws	Demonstrate sanding machine Preparation for finishing
EK 5	Introduction of second project Continue preparations for finishing	Demonstration of finishing Students prepare work for finishing Apply finish Work on second project	Continue with finishes not associated with project	Application of finishes Apply finish to 1st project
EEK 5	Work on second project Completion of 1st project	Completion of finishing of 1st project Work on second project Identify project	Work on second project	Demonstration of hand saber saw electric hand saw

	DAY 1	DAY 2	DAY 3	DAY 4
EEK 7	Work on second project	Demonstration router work	Work on second project	Work on second project
EEK 8	Work on second project	Work on second project	Work on second project	Discussion Types of wood Soft woods Hard woods Man-made Materials used in woodworking Wood joints
EEK 9	Work on second project	Discussion of careers in the woodworking field	Finish of the second project Install clock assembly in frame Identify project	Finish of work Clean shop area Completion of the course

INSTRUCTOR

MEL PODOLSKE

Telephone # - 359-4026

SOUTHEAST ASIAN
CAREER EXPLORATION PROGRAM

Machine Tool

Instructor: Steve Watzlawick
Office:
Phone: 675-3331 Ext.222

COURSE DESCRIPTION: The purpose of this course is to provide students with the opportunity to explore various aspects of the machining industry. The nine week course is designed to enable Southeast Asian students to develop and apply basic skills in benchwork, drill press, band saw, pedestal grinder and lathe operations. Proper procedures, safety and quality will be stressed throughout the course.

COURSE LENGTH: 9 weeks
HOURS PER WEEK: 12 hours, 4 sessions - 3 hours per session
TOTAL HOURS: 108 Hours

MATERIALS REQUIRED: Safety Glasses

Course Competencies

Career Exploration - Southeast Asian Students

1. Follow safety procedures.
2. Perform precision measurement operations. (English System)
3. Perform hand tool operations.
4. Set-up and operate a vertical band saw.
5. Set-up and operate a drill press.
6. Set-up and operate a pedestal grinder.
7. Calculate speeds and feeds for various operations.
8. Set-up and operate an engine lathe.
9. Set-up and operate a vertical milling machine.

UNIT #1 - SAFETY

Course Competency - Follow Safety Procedures

OBJECTIVES AND TASKS:

1.0 Wear eye protection when required
1.1 Identify various safety considerations
1.2 Identify possible safety hazards

ACTIVITIES:

The student will view video tape on general shop safety and discuss safety procedures.

UNIT #2 - PRECISION MEASUREMENT

Course Competency - Perform Precision Measurement Operations

OBJECTIVES AND TASKS:

2.0 Perform measurements with steel rule
2.1 Perform measurements with micrometers
2.2 Perform measurements with calipers
2.3 Perform measurements with height gage

ACTIVITIES:

The student will perform measurements on various objects using different measurement tools. Perform layout on Mating Block Project.

UNIT #3 - HAND TOOLS

Course Competency - Perform hand tool operations

OBJECTIVES AND TASKS:

3.0 Identify and use layout dye
3.1 Identify and use center punch
3.2 Identify and use ball peen hammer
3.3 Identify and use scriber
3.4 Identify and use hand hacksaw
3.5 Identify and use file and file card

ACTIVITIES:

The student will perform layout of Mating Block Project. Cut out and file to size per blueprint.

UNIT #4 - BAND SAW

Course Competency: Set-up and operate a vertical band saw.

OBJECTIVES:

4.0 Follow proper safety procedures
4.1 Select proper saw blade
4.2 Select proper saw speed
4.3 Install saw blade properly

ACTIVITIES:

The student will use the vertical band saw to cut on the Mating Block Project.

UNIT #5 - DRILL PRESS

Course Competency: Set-up and operate a drill press.

OBJECTIVES AND TASKS:

5.0 Follow proper safety procedures
5.1 Select proper drill speed
5.2 Center drill a hole
5.3 Drill a hole
5.4 Select proper tap drill
5.5 Hand tap a hole

ACTIVITIES:

The student will center drill, drill and tap holes in a project.

UNIT #6 - PEDESTAL GRINDER

Course Competency: Set-up and operate a pedestal grinder.

OBJECTIVES AND TASKS:

6.0 Follow proper safety procedures
6.1 Adjust tool rest and guards
6.2 Dress grinding wheel
6.3 Grind general purpose lathe tool

ACTIVITIES:

The student will use a pedestal grinder to grind a general purpose lathe tool bit.

UNIT #7 - SPEEDS AND FEEDS

Course competency: Calculate speeds and feeds for various operations.

OBJECTIVES AND TASKS:

7.0 Follow proper safety procedures
7.1 Calculate RPM for various operations
7.2 Select and use correct speeds and feeds

ACTIVITIES:

The student will calculate, select and use the proper RPM for various machining situations.

UNIT #8 - ENGINE LATHE

Course Competency: Set-up and operate an engine lathe.

OBJECTIVES AND TASKS:

8.0 Follow safety procedures
8.1 Face a part
8.2 Center drill a part
8.3 Turn to a specified diameter
8.4 Machine a shoulder
8.5 Chamfer a part
8.6 Knurl a part
8.7 Turn with a carbide insert

ACTIVITIES:

The student will perform various operations on an engine lathe using high speed tools.

UNIT #9 - VERTICAL MILL

Course Competency: Set-up and operate a vertical milling machine.

OBJECTIVES AND TASKS:

9.0 Follow safety procedures
9.1 Vertical mill components
9.2 End mill a part
9.3 Mill a part square
9.4 Mill a slot in a part

ACTIVITIES:

The student will perform various operations on a vertical milling machine using an end mill.

WEEK #1

Lecture Topics:
- -Introduction to machine tool
- -General shop safety
- -Precision measurement
- -Layout procedures

Lab:
- -Demonstration of lay out
- -Layout of Mating Block Project
- -Measurement of various objects

WEEK #2

Lecture Topics:
- -Lay out procedures
- -Drill press operation
- -Hand tool operations

Lab:
- -Continued production of Mating Block Project. Use of drill press, hack saw, file and other tools in order to complete project.

WEEK #3

Lecture Topics:
- -Pedestal grinder operation
- -Lathe tool angles
- -Grinding of lathe tool

Lab:
- -Demonstration on grinder
- -Practice grinding of "soft" tool bit
- -Grind general purpose tool bit

WEEK #4

Lecture topics:
- -Feeds and speeds
- -Engine lathe components

Lab:
- -Selection of speeds and feeds
- -Familiarization with engine lathe.

WEEK #5

Lecture Topics:
-Engine lathe operations
-Facing
-Turning
-Drilling

Lab:
-Work on Lathe Project #1. Turning and facing to proper dimensions on blueprint.

WEEK #6

Lecture Topics:
-Engine lathe operations
-Knurling
-Turning to a shoulder

Lab:
-Work on Lathe Project #2. Knurling and turning to a shoulder as per drawing.

WEEK #7

Lecture Topics:
-Carbide tools
-Chamfering on a lathe

Lab:
-Demonstration on carbide tools on engine lathe.
-Chamfering on lathe.
-Opportunity to trial turn with carbide inserts

WEEK #8

Lecture Topics:
-Vertical mill components
-Vertical mill operations

Lab:
-Familiarization with vertical mill.
-Start on Milling Machine Project.

WEEK #9

Lecture Topics:
-Milling cutters
-Milling machine operations

Lab:
-Continued production of Milling Machine Project.
-Use of end mill.

Course: Electronics Career Exploration

Instructor: Gordon Haggerty
Office: Rm. 560
Ph. 675-3331 ext. 262

Course Description:

This course will provide students with a broad view of the electrical and electronic career fields. The course covers general concepts of electricity, basic computer concepts, residential wiring concepts, soldering, and motors. The area of general concepts of electricity covers electrical terms, equipment usage, series circuits, parallel circuits, and series-parallel circuits. Basic computer concepts covers the components of a computer and basic DOS commands. Residential wiring concepts involves wiring basic house hold circuits to familiarize a student with the electrician career field. The soldering section involves using proper soldering techniques to solder terminals and printed circuit boards. The last portion of course will involve the wiring of motors and motor control circuits.

Materials Requirement:

Lab Material:

Laboratory Manual: Experiencing Electricity and Electronics by Hazen
Saunders Publishing
ISBN 0-03-096567-5

Wiring Manual: Step by Step Guide on Home Wiring
Available at Menards
Approx. $2.50

Motor Control Guide: The Square D Motor Guide
(Not Purchased)

SCHEDULE OF COURSE ACTIVITIES

COURSE LENGTH: 9 WEEKS
HOURS PER WEEK: 12 HOURS (4 SESSIONS 3 HOURS PER SESSION)
TOTAL COURSE: 108 HOURS

WEEK #1

Lectures Topics:
- Careers in electronics (video)
- Basic atomic theory
- Definitions of voltage, current and resistance
- Safety Procedures
- Common electronic components

Lab:
- Introduction to the analog and digital meter
- Introduction to DC and AC power sources
  - Ohmmeter - check fuses, wire, switches etc.
  - Voltmeter - DC
    - check battery voltages
    - check output of dc power supply
  - Voltmeter - AC
    - check outlet voltage
  - Ammeter - measure current in an AC and DC circuit consisting of a source and a bulb.
- Identify various electronic components mounted on the display boards and loose components.

WEEK #2

Lecture Topics:
- Resistors - variable and fixed
- Introduction to Ohm's law
- Breadboards

Lab:
- The Resistor Color Code and The Ohmmeter (Exp.#1)
- Variable Resistors and The Ohmmeter (Exp.#2)
- Multiturn Potentiometer (Handout)

WEEK #3

Lecture Topics:

- Ohm's Law
- Power and the power formulas
- Series Circuits

Lab:

- Ohm's Law and Power (Exp.3)
- Series- Aiding and Opposing DC Sources (Exp. 4)
- The Series Circuit and Kirchhoff's Voltage Law (Exp. 5)
- An AC series circuit handout

WEEK #4

Lecture Topics:

- Series circuits (voltage divider)
- Parallel circuits

Lab:

- Variable Voltage and Current (Exp.6)
- The Parallel Circuit and Kirchhoff's Current Law (Exp.7)
- Dividing Current (Exp.8)
- An AC parallel circuit handout

WEEK #5

Lecture Topics:

- Series-Parallel Circuits
- Troubleshooting Series Parallel Circuits

Lab:

- Series-Parallel Circuits Handout
- Series-Parallel Circuits (Exp.9)
- Parallel-Series Circuits (Exp.10)
- The Wheatstone Bridge (Exp.11)

WEEK #6

Lecture Topics:

- Digital Circuitry
- What makes up a computer for a block diagram point of view. (CPU, RAM, ROM, I/O)
- The function of peripheral computer equipment
- DOS commands

Lab:

- A digital handout lab activity
- A handout activity involving the identification of components of a computer system.
- A handout lab activity involving the DOS commands, and how programs are run.

WEEK #7

Lecture Topics:

- The power distribution system
- How a residential power distribution panel is wired
- Electrical Code
- Household circuits

Lab:

- Wire circuits shown in the Step By Step Guide On Home Wiring book.

WEEK #8

Lecture Topics:

- How motors operate
- Various types of motors in use today
- Protection of motors
- Basic Motor control circuits

Lab:

- DC Motors and Generators (Exp. 18)
- Transformers (Exp. 26)
- Connecting power to a split-phase capacitor start single phase motor

WEEK #9

Lecture Topics:

- Motor control circuits
- Review of material covered in course

Lab:

- Wire basic motor control circuits out of the square D motor control handbook

COURSE COMPETENCIES

Career Exploration - Southeast Asian Students

1. Follow safety procedures.
2. Identify various electronic components.
3. Define, calculate, and measure various resistances and resistors.
4. Define and measure DC and AC voltages and current in a circuit consisting of one source and one load.
5. Construct and analyze series circuits with a DC and AC source.
6. Construct and analyze parallel circuits with a DC and AC source.
7. Construct and analyze series-parallel circuits with a DC and AC source.
8. Identify physical computer components.
9. Use simple DOS commands for elementary computer operation.
10. Perform soldering and desoldering of terminal connections and components on printed circuit boards.
11. Discuss in general terms the electrical power distribution system from the generation of power to an end user of electrical energy.
12. Wire simple household circuits following wiring diagrams found in a guide book on home wiring.
13. Discuss the basic types of motors and protective devices used with motors.
14. Wire basic motor control circuits.

Unit No. 1 Unit Title - Safety

Course Competency - Follow safety procedures

Performance Objective(s) and Tasks

1.0 Wear eye protection when required.

1.1 Explain the cause of electrical shock and what determines the severity of an electrical shock.

1.2 Explain the procedure to follow when confronted with an electrical shock victim.

Activities

1. View video tape 815-01 "Introduction to safety in the Lab."

Unit No. 2 Unit Title - Electronic Components

Course Competency - Identify various electronic components.

Performance Objective(s) and Tasks

2.0 Identify of various types of switches.

2.1 Identify various types of fuses, and circuit breakers.

2.1 Identify various types of fixed and variable resistors.

2.2 Identify various types of capacitors.

2.3 Identify various types of inductors.

2.4 Identify semiconductor devices.

Activities

1. The student will be given various electronic components to separate into the broad categories of a switch, fuse, circuit breaker, fixed resistor, variable resistor, capacitor, inductor, or semiconductor.

Unit No. 3 Unit Title - Resistance

Course Competency - Define, calculate, and measure various resistances and resistors.

Performance Objective(s) and Tasks

3.0 Define and measure continuity as it relates to checking wires, fuses, and switches using and ohmmeter.

3.1 Measure the resistance of spools of wire.

3.2 Determine the resistance value and tolerance of color coded resistors.

3.3 Measure the resistance of various fixed and variable resistors using an ohmmeter.

Activities

1. View a video tape on resistors and resistance.

2. Students will perform a lab exercise on measuring various types of fixed and variable resistors.

Unit No. 4 Unit Title - Voltages and Currents

Course Competency - Define and measure DC and AC voltage in a circuit consisting of one source and one load.

Performance Objective(s) and Tasks

4.0 Measure DC voltages produced by connecting dry cell batteries in various combinations.

4.1 Measure DC voltages produced by a DC power supply.

4.2 Measure AC voltage produced by a variable AC source.

4.3 Construct and measure current in a simple circuit consisting of a DC source and light bulb.

4.4 Construct and measure current in a simple circuit consisting of an AC source and light bulb.

Activities

1. View video tapes "An Introduction to Electricity" and "Scientific Notation and Metric Prefixes"

2. Perform lab activities involving the operation of DC and AC sources, the constuction of basic circuits, and the measurement of current and voltages.

Unit No. 5 Unit Title - Series Circuits

Course Competency - Construct and analyze series circuits with DC and AC sources.

Performance Objectives(s) and Tasks

5.1 Construct series circuits with a DC source.

5.2 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in series circuit powered by a DC source.

5.3 Measure current and voltage drops in series circuits powered by a DC source.

5.4 Compare calculated and measured values in series circuits powered by a DC source.

5.5 Construct series circuits with an AC source.

5.6 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in series circuits powered by an AC source.

5.7 Measure current and voltage drops in series circuits powered by an AC source.

5.8 Compare calculated and measured values in series circuits powered by an AC source.

5.9 Observe AC voltages using an oscilloscope

Activities

1. View video tapes "Ohms Law and Power" and "Series Circuits"

2. Perform labs involving the connection and analyze of series circuits.

Unit No. 6 Unit Title - Parallel Circuits

Course Competency - Construct and analyze parallel circuits with DC and AC sources.

Performance Objectives(s) and Tasks

6.1 Construct parallel circuits with a DC source.

6.2 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in parallel circuits powered by a DC source.

6.3 Measure current and voltage drops in parallel circuits powered by a DC source.

6.4 Compare calculated and measured values in parallel circuits powered by a DC source.

6.5 Construct parallel circuits with an AC source.

6.6 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in parallel circuits powered by an AC source.

6.7 Measure current and voltage drops in parallel circuits powered by an AC source.

6.8 Compare calculated and measured values in parallel circuits powered by an AC source.

Activities

1. View video tape "Parallel circuits"

2. Perform labs involving the connection and analyze of parallel circuits.

Unit No. 7 Unit Title - Series-Parallel Circuits

Course Competency - Construct and analyze series-parallel circuits with DC and AC sources.

Performance Objectives(s) and Tasks

7.1 Construct series-parallel circuits with a DC source.

7.2 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in series-parallel circuits powered by a DC source.

7.3 Measure current and voltage drops in series-parallel circuits powered by a DC source.

7.4 Compare calculated and measured values in series-parallel circuits powered by a DC source.

7.5 Construct series-parallel circuits with an AC source.

7.6 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in series-parallel circuits powered by an AC source.

7.7 Measure current and voltage drops in series-parallel circuits powered by an AC source.

7.8 Compare calculated and measured values in series-parallel circuits powered by an AC source.

Activities

1. View video tape "Series-Parallel circuits"

2. Perform labs involving the connection and analyze of series-parallel circuits.

Unit No. 8 Unit Title - Computer Components

Course Competency - Identify physical computer components.

Performance Objectives(s) and Tasks

8.1 Identify the main computer an explain its usage.

8.2 Identify the location and types of disk drives in the system and explain its usage.

8.3 Identify the keyboard and explain its usage.

8.4 Identify the system monitor and explain its usage.

8.5 Identify the serial and parallel ports of a computer.

8.6 Identify the peripheral equipment connected to the system and explain the equipment usage.

Activities

1. Each student will go through a step by step procedure involving using a computer system and word processing software to use the keyboard, monitor, disk drives, and printer.

Unit No. 9 Unit Title - A Disk Operating System

Course Competency - Use simple DOS commands for elementary computer operation.

Performance Objectives(s) and Tasks

9.0 Explain what the term DOS means.

9.1 Explain the organizational structure for storing programs and data within a computer system.

9.2 Demonstrate the following DOS commands:

- Formatting a disk
- Moving for on directory to another
- Making a directory
- Storing data under a specific directory
- Deleting data in a specific directory
- Removing a directory

Activities

1. A step by step procedure will be followed so that each student performs the tasks listed above.

Unit No. 10 Unit Title - Soldering

Course Competency - Performing soldering and desoldering of terminal connections and components on

Performance Objectives(s) and Tasks

10.0 Prepare a soldering gun and iron for soldering.

10.1 Prepare surfaces and components for soldering.

10.2 Solder wire to terminal post using a soldering gun.

10.3 Mount and solder electronic components on a printed circuit board using a pencil soldering iron.

10.4 Desolder wires on terminal posts and electronic components mounted on a circuit board.

Activities

1. View video tape on soldering.

2. Perform the tasks listed above.

Unit No. 11 Unit Title - The electrical power distribution system.

Course Competency - Discuss in general terms the electrical power distribution system from the generation of power to an end user of electrical power.

Performance Objectives(s) and Tasks

11.0 Discuss the theory involved with the generation of electrical power.

11.1 Generate electricity by coupling two small DC motors using one as a motor and one as a generator.

11.2 Demonstrate the purpose of transformers.

11.3 Discuss how power is distributed from the generating plant to and individual home.

Activities

1. Perform a lab activity involving a small motor and generator.

2. Perform a lab activity involving the connection of a transformer to an AC source and measuring the input and output voltage.

3. Tour Weston power plant.

Unit No. 12 Unit Title - Household circuits

Course Competency - Wire simple household circuits following wiring diagrams found in a guide book on home wiring.

Performance Objectives(s) and Tasks

12.0 Discuss the construction of a residential circuit breaker box.

12.1 Discuss the types of wire and the color coding of wire used in household wiring.

12.2 Discuss the purpose of the electrical code and that actual household wiring should be performed by a qualified electrician.

12.3 Discuss the symbols associated with residential wiring.

12.4 Discuss the tools used in residential wiring.

12.5 Wire the following circuits following illustrations of the circuits in a step by step guide book on home wiring.

- outlets
- single-pole switch controlling lamps
- switched outlets
- three-way switch circuits controlling lamps

Activities

1. Discuss the power distribution display panel that is set up in the residential design lecture room.

2. Wire the circuits shown in Step by Step Guide Book on Home Wiring ISBN 0-9619201-0-6 available at Menards. Materials and tools for performing the wiring is available in the Physics room.

Unit No. 13 Unit Title - Electric motors

Course Competency - Discuss the basic types of motors and protective devices used with motors.

Performance Objectives(s) and Tasks

13.0 Discuss basic differences in construction between various A-C motors.

13.1 Wire a 120 volt a-c split phase-capacitor start motor.

13.2 Discuss common voltage and current ratings available for fuses and circuit breakers.

13.3 Discuss how motors are protected.

Activities

1. View a film strip cassette presentations on motors.
   (Video Tapes 725 A-C)
   - Split Phase induction motors
   - Capacitor Induction Motors
   - Repulsion Type Motors
   - Universal Motors
   - Squirrel Cage Motors

2. Read sections of BUSS BULLETIN SPD81
   Electrical Protection Handbook
   Identify various types of circuit protection devices.

3. Observe overload protection of motors.

Unit No. 14 Unit Title - Motor control

Course Competency - Wire basic motor control circuits.

Performance Objectives(s) and Tasks

14.0 Describe the components of a motor starter.

14.1 Describe the operation of a start/stop switch.

14.2 Discuss ladder diagrams.

14.3 Wire basic motor control circuits.

Activities

1. Wire basic motor control circuit out of Wiring Diagrams , Publisher Square D Company,

COURSE SYLLABUS
Preparatory Program for Southeast Asians
Printing & Publishing

Instructors: Desktop Publishing - Mr. Martens
Camera & Image Assembly - Mr. Swadner
Presswork - Mr. Grasse

The instructors can be reached by leaving a message for them during the hours of 8:00 A.M. to 4:00 P.M. A conference can be scheduled during the instructor's office hour by making an appointment with the instructor.

Student Expectations:
The student will perform hands-on work during all phases of instruction by doing assigned projects. The student will be expected to be present at all class sessions and to perform all tasks assigned by the instructor. Some of the tasks will include cleanup of work area and machines used by the student. The student will not be excused for the day until his/her work area is cleaned to the instructor's satisfaction.

Supplies Required for Course: 1 pr. rubber gloves
1 pr. chemical safety goggles
1 magnifying glass
1 line gauge
1 eraser(pink pearle)
1 makeready knife
1 set of register pins
1 pr. scissors
2 3 1/2" computer discs

Texts: (1) Title: Graphic Arts Photography: Black and White
Publisher: Graphic Arts Technical Foundation
Author: John E. Cogoli
Copyright: 1990

(2) Title: Stripping: The Assembly of Film Images
Publisher: Grahic Arts Technical Foundation
Author: Peck
Copyright: 1990

Course Name: Preparatory Program for Southeast Asians - Printing & Publishing

Course Description: An introduction to Printing & Publishing. Topics include Desktop Publishing, Pasteup, Camerawork/Darkroom Techniques, Platemaking, Presswork, and Finishing. Hands-on experience is used in all areas of instruction.

Texts: (1) Title: Graphic Arts Photography: Black and White
Publisher: Graphic Arts Technical Foundation
Author: John E. Cogoli
Copyright: 1990

(2) Title: Stripping: The Assembly of Film Images
Publisher: Grahic Arts Technical Foundation
Author: Peck
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Supplies Required for Course:

1 pr. rubber gloves
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1 eraser(pink pearle)
1 makeready knife
1 set of register pins
1 pr. scissors
2 3 1/2" computer discs

COURSE COMPETENCIES

PREPARATORY PROGRAM FOR SOUTHEAST ASIANS
PRINTING AND PUBLISHING

Performance Objectives:

01.00 Identify the parts of a microcomputer system.

02.00 Demonstrate the basic use of the microcomputer.

03.00 Identify the elements of a keyline paste-up.

04.00 Prepare job and mark copy for typesetting and page layout.

05.00 Identify the types of graphic images used for typesetting and line art.

06.00 Demonstrate the use of page layout software for the creation of single color layouts.

07.00 Demonstrate safe practices in the dark room and film assembly area.

08.00 Calibrate for and make line exposures for black and white originals developing film using the tray processing method.

09.00 Calibrate for and make reverses by the contact printing method.

10.00 Calibrate for and make halftones from black and white continuous tone originals.

11.00 Calibrate for and make duplicate negatives, spread/chokes, and outline type on the contact printer and micro modifier.

12.00 Assemble one up flats for surprints, reverses and dropouts.

13.00 Assemble one up flats with line and screened images for the small format.

14.00 Makeready, adjust, and print copies on one color duplicators.

15.00 Demonstrate safe practices in the press room.

16.00 Demonstrate the proper handling and disposal of hazardous materials.

Activities and Resources:

Participate in Lecture/Demonstrations.
Complete assigned exercises.

Evaluation Devices:
Performance projects.

t No. 1

nit Title: Microcomputer System Components

ourse: Preparatory Program for Southeast Asians - Printing & Publishing

ourse Competency: 01.00 Identify the parts of a microcomputer system.

erformance Objectives:

1.01 Given a component diagram of a microcomputer system, identify each of the parts.

1.01.01 Input Components
- a. Keyboard
- b. Mouse
- c. Scanner

1.01.02 Output Components
- a. Video display
- b. Laser printer
- c. Film recorder

1.01.03 System Components
- a. CPU (Central processing unit)
- b. Main board
- c. Add-on cards
- d. Storage devices
  1. Floppy disk drive
  2. Hard disk drive
- e. Memory
  1. Read only memory (ROM)
  2. Random access memory (RAM)

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance project.

Unit No. 2

Unit Title: Basic Microcomputer Operation

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 02.00 Demonstrate the basic use of the microcomputer.

Performance Objectives:

2.01 Given a microcomputer with a graphical user interface (GUI), a student shall be able to maneuver the mouse to control the operation of the computer.

2.02 Given a microcomputer with a graphical user interface (GUI), a student shall be able to organize the desktop.

2.03 Given a microcomputer with a graphical user interface (GUI), a student shall be able to create and replicate files and folders.

2.04 Given a microcomputer with a graphical user interface (GUI), a student shall be able to open and use a variety of computer software applications.

ivities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance project.

Unit No. 3

Unit Title: Paste-up Elements

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 03.00 Identify the elements of a keyline paste-up.

Performance Objectives:

3.01 Given typeset copy and illustrations, prepare a single-color manual paste-up including the following elements:

- 3.01.01 Ruled lines
- 3.01.02 Corner marks
- 3.01.03 Fold and cut marks
- 3.01.04 Typeset copy
- 3.01.05 Line illustrations

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance project.

U t No. 4

Unit Title: Marking up copy

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 04.00 Prepare job and mark copy for typesetting and page layout.

Performance Objectives:

4.01 Given the basic information for a finished printing job, mark copy for typesetting to include the following:

4.01.01 Type Sizes
a. Text
b. Display
4.01.02 Type Families
4.01.03 Type Styles
a. Normal
b. Italic
c. Bold
4.01.04 Leading
4.01.05 Rules
4.01.06 Element Position

I ivities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance projects.

Unit No. 5

Unit Title: Graphic and image modes.

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 05.00 Identify the types of graphic images used for typesetting and line art.

Performance Objectives:

5.01 Given examples of printed graphic images, distinguish between bit-mapped images and object oriented.

5.02 Given examples of bit-mapped graphic images, catagorize them by the following file types based in their visual resolution.

5.02.01 MacPaint (72 dpi)
5.02.02 Tiff (300 dpi)

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance projects.

Unit No. 6

Unit Title: Computerized page layout

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 06.00 Demonstrate the use of page layout software for the creation of single color pages.

Performance Objectives:

6.01 Given copy for image preparation, prepare finished single color layouts using PageMaker software utilizing the following elements:

6.01.01 Text copy
6.01.02 Display copy
6.01.03 Graphic images

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance projects.

Unit No. 7

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 07.00 Demonstrate safe practices in the dark room and film assembly area.

Performance Objectives:

07.01 Given references on hazardous materials, the student will be able to take and pass a test on handling and disposing of hazardous materials, with 90% or better accuracy.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 9 of text.

Evaluation Devices:

Observation.

Performance Projects.

Unit No. 8

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 9.00 Calibrate for and make line exposures for black/white using tray developing methods.

Performance Objectives:

8.01 Given the facilities used for training the student shall be able to arrive at the correct line exposure for black and white originals, in two attempts or less.

8.02 Given the facilities used for training the student shall be able develop line exposed film using tray developing methods.

8.03 Given the equipment used for training a student shall be able to reduce and enlarge copy using the constant time exposure method.

8.04 Given the equipment used for training a student shall be able to reduce and enlarge copy using the constant aperture method.

8.05 Given the equipment used for training a student shall be able to arrive at the correct exposure for copy containing both fine
and heavy lines.

8.06 Given the equipment used for training a student shall be able to arrive at the correct line exposure for copy with poor density range.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 9 of text.

Evaluation Devices:

Observation.

Performance Projects.

Unit No. 9

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 9.00 Calibrate for and make reverses by the contact printing method.

Performance Objectives:

09.01 Given the equipment used for training, the student, using the contact printing method, will make a spread negative, in two attempts of less.

09.02 Given the equipment used for training, the student using the contact printing method, will make a choke negative, in two attempts of less.

09.03 Given the equipment used for training, the student using the contact printing method, will make a spread positive, in two attempts or less.

09.04 Given the equipment used for training, the student using the contact printing method, will make a choke positive, in two attempts or less.

09.05 Given the equipment used for training, the student using the contact printing method, will make an outline negative, in two attempts or less.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 6 of text.

Evaluation Devices:

Observation.

Performance Projects.

Unit No. 10

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 10.00 Calibrate for and make halftones from black and white photographs.

Performance Objectives:

10.01 Using the Du Pont method for making halftones, the student will be able to create a halftone from a continuous tone black and white photograph, with a 5% highlight dot and a 95% shadow dot with no more than two tries.

10.02 Given the equipment used for training, the student will be able to reduce or enlarge a halftone with a 5% highlight dot and a 95% shadow dot using the constant aperture exposure method in two attempts or less.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 10 of text.

Unit No. 11

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 11.00 calibrate for and make duplicate negatives, spread/chokes, and outline type on the contact printer and micro modifier.

Performance Objectives:

11.01 Using the equipment trained on, position duplicate negatives, spread/chokes, and outline type on the flat as per instructions on the paste-up with 100% accuracy.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 9 of text.

Evaluation Devices:

Observation.

Performance Projects.

Unit No. 12

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 12.00 Assemble one up flats for surprints, reverses and dropouts.

Performance Objectives:

12.01 Using the equipment trained on, position surprints, reverses and dropouts images as per instructions on the paste-up with 100% accuracy.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 9 of text.

Evaluation Devices:

Observation.

Performance Projects.

Unit No. 13

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 13.00 Assemble one up flats with line, and screened images for the small format.

Performance Objectives:

13.01 Using the equipment trained on, position line and screened images as per the instructions on the paste-up with 100% accuracy.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 9 of text.

Evaluation Devices:

Observation.

Performance Projects.

Unit No. 14

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Unit Title: Duplicator Makeready

Course Competency: Demonstrate the ability to makeready, adjust, and print copies on a single color duplicator.

Performance Objectives:

14.01 Using a duplicator that was used for training, adjust the feeder, register, and delivery systems so that with 60 or 70lb. offset paper, there is no more than 25% waste.

14.02 Using a duplicator that was used for training, mount a plate and blanket according to the manufacturers specifications.

14.03 Using a duplicator that was used for training, prepare the inking and dampening systems for running a job with medium coverage.

14.04 Using a duplicator that was used for training, and using 60 or 70lb. offset paper, set up and maintain register and color so that there is no more than 25% waste.

Activities and Resources:

Participate in Lecture/Demonstrations.

Complete assigned exercises.

Evaluation Devices:

Performance projects.

Unit No. 15

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Unit Title: Pressroom Safety

Course Competency: Demonstrate safe practices in the pressroom.

Performance Objectives:

15.01 Using the facilities used for training, demonstrate fire safety awareness.

15.02 Using a duplicator that was used for training, point out the safeties and describe the possible consequence of an inoperable one, with 100% accuracy.

15.03 Using the facilities used for training, demonstrate safe housekeeping practices.

Activities and Resources:

Participate in Demonstrations.

Complete assigned exercises.

it No. 16

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Unit Title: Hazardous Materials

Course Competency: Demonstrate the proper handling and disposal of hazardous materials.

Performance Objectives:

16.01 Given an MSDS sheet, identify the risks associated with the substance.

16.02 Given the facilities used for training, demonstrate proper disposal of all waste products generated by the presswork.

Activities and Resources:

Participate in Demonstrations.

Read handout - "How to read and understand material safety data sheets."

Evaluation Devices:

Observation.

NORTHCENTRAL TECHNICAL COLLEGE

COURSE NUMBER:

COURSE TITLE: ESL Physical Science

CREDIT:

COURSE DESCRIPTION:

This course is a basic ESL physical science course. General topics covered include laboratory safety, measurement, properties of matter, chemical nature of matter, energy, heat energy, mechanical energy, electricity, magnets and electricity, light energy, sound energy, basic reading and study skills (including locating and interpreting resources), vocabulary building, and awareness of scientific strategies.

ESL – Science Curriculum
- life Science
- Earth Science
- Physical Science

Corequisites:

Prerequisites:

REQUIRED BOOKS:

Title: Hands-on Physical Science
Publisher: The Peoples Publishing Group, Inc.
Author: Marilynne W. Mathias and Robert A. Johnson, Ph.D.
Copyright: 1983

SUPPLIES REQUIRED FOR COURSE: (include approximate quantity per student)

Date of Review/Revision: 6/9/93
Reviewed/Prepared by: Frank Fernandes, Ellen Dell, Gail Hurd, and Mary Daly

NORTHCENTRAL TECHNICAL COLLEGE

ESL PHYSICAL SCIENCE

COURSE COMPETENCIES	COMMENTS
The student will be able to:	
01.00 ~~Develop and~~ demonstrate a general ~~understanding~~ of laboratory safety.	Unit 1
02.00 Understand the English and metric systems of measurement and learn to analyze data graphically.	Unit 1
03.00 ~~Recognize and~~ explain basic properties of solids, liquids, and gases.	Unit 2
04.00 Discuss basic methods of thermal energy transfer.	Unit 2
05.00 Understand mechanical energy as it relates to simple machines.	Unit 3
06.00 Understand the concepts of basic DC electricity.	Unit 3
07.00 Identify the concepts of magnetism and electromagnetism.	Unit 4
08.00 Recognize and ~~understand~~ the basic principles of light and sound.	Unit 4

PROGRAM	DEPARTMENT	DATE	PAGE
	Business Division	6/9/93	1 OF 1

ESL PHYSICAL SCIENCE

RESOURCES

Basic Physical Science, American Guidance Service, Inc., Circle Pines, MN 55014-1796, 1992, ISBN order number.

Bernstein, Leonard, Martin Schachter, Alan Winkler, Stanley Wolfe, Concepts and Challenges in Physical Science, Chemistry Book 1, CEBCO Standard Publishing, 1974, ISBN 88320-933-0.

Bernstein, Leonard, Martin Schachter, Alan Winkler, Stanley Wolfe, Concepts and Challenges in Physical Science, Physics Book 1, CEBCO Standard Publishing, 1974, ISBN 88320-933-0.

Christison, Mary Ann, Sharron Bassano, Earth and Physical Science, Addison-Wesley Publishing Company, 1992, ISBN 0-8013-0986-7.

Fathman, Ann K., Mary Ellen Quinn, Science for Language Learners, Prentice Hall Regents, Englewood Cliffs, NJ 07632, 1989, ISBN 0-13-794660-0.

Baecher, Charlotte, Anita Holmes, Geoffrey Martin, Consumer Reports Product Testing Activities Teaching Guide, Prentice Hall, 1993, ISBN 0-13-988122-0.

Echaore, Susan D., Budd Wentz, Machines, Janus Book Publishers, 1984, ISBN 0-88102-021-4.

Chan, Janis Fisher, Sound, Janus Book Publishers, 1982, ISBN 0-915510-78-2.

Sneider, Cary I., Henri Picciotto, Energy, Janus Book Publishers, 1984, ISBN 0-88102-020-6.

Katz, Elaine, Richard S. Kolbert, Electricity, Janus Book Publishers, 1982, ISBN 0-915510-77-4.

NTC teacher prepared Lab Manual, lab activities #1-15

Educational insights: Project kits with 35 experiments

EI-7154	Color and light
EI-7155	Magnetism
EI-7157	How Things Work
EI-7152	Electricity

Instructional Fair, Inc.: Resource books with posters

Logic Anyone, Blackline Master

Unit No: 1

Unit Title: What is Science? Overview of Science.

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency:

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Define science.	Discussion	Hands-on Science text series	Teacher-made quiz 75 percent mastery
Name and explain the general functions of the three branches of science.	List and define in a chart	Hands-on Science text series	
Name the five steps of the scientific method.	List and define Include in student notebook	Hands-on Science text series	

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Unit No: 2

Unit Title: Lab Safety

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (01.00) Develop and demonstrate a general understanding of laboratory safety.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Discuss the importance of safe conduct in the laboratory.	Video: Safety	Worksheets Text	Teacher observation
Identify safe and unsafe lab practices.	Examine pictures of lab students. List unsafe practices demonstrated by students.	Demonstrate Worksheets	Teacher observation
	Demonstrate for the instructor that the student can safely light a bunsen burner.		
Identify safe and unsafe chemicals in the home.	Display household items. Label each as safe or unsafe. Note safety first aid instructions on label.	Worksheets Text	Teacher observation
Identify fire extinguishers.	Locate and explain how and when to use.	Demonstrate	Teacher observation
Identify eye protection.	Indicate when safety glasses should be worn. Locate and explain how to use eyewash.	Demonstration Teacher-made worksheets	Teacher observation
Identify chemicals.	Correct procedure when handling chemicals	Demonstration Teacher-made worksheets	Teacher observation
Identify First Aid kit.	Locate and explain contents and use	Demonstration Teacher-made worksheets	Teacher observation

Unit No: 3

Unit Title: Systems of Measurement

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (02.00) Understand the English and metric systems of measurement and learn to analyze data graphically.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Calculate the area of a square and triangle.	Teacher-made worksheets involving student measurement skills	Teacher-made worksheets	Teacher-made test 75 percent proficiency
Understand units of mass, length, and volume in the English and metric systems.	Containers from supermarket. Compare English and metric units of mass, volume, and length. Calculate the volume of a cereal box.	Teacher-prepared Lab Manual	Teacher-made test 75 percent proficiency
	Lab Activities 1 and 2		
Calculate the density of an object using its mass and volume.	Determine the volume of a small wooden block. Weigh the block on a balance and calculate its density.	Teacher-prepared Lab Manual	Teacher-made test 75 percent proficiency
	Lab Activities 4 and 5		
Recognize temperatures in centigrade and Fahrenheit scales.	Students measure temperatures and record. Graph measured data.	Lab: Boil a small amount of water. Record the temperature in each scale. Record the room temperature in different locations in each temperature scale.	Teacher-made test 75 percent proficiency
Identify the steps of scientific method to everyday life problems.	Teacher-made worksheets on problem solving and sequencing	Teacher-prepared Lab Manual	Teacher observation
	Lab Activity		
Illustrate the difference between direct proportion and indirect proportion in data analysis.	Students compute ratio and proportion on teacher-made worksheets	Teacher-made worksheets	Teacher-made test 75 percent proficiency
Describe the effects of gravity, friction, and centripetal force.	Lift and drop a brick, rub your hands together, and spin a top.	Matter and Energy, p. 48	Teacher-made test 75 percent proficiency
	"Try This" #20 and 21		
Give examples of inertia.	Show inactive matter	Basic Physical Science	Teacher-made test 75 percent proficiency
Share information about Galileo and Sir Isaac Newton.	Library research and write a short paper		Teacher criteria for proper paper completion

Unit No: 4

Unit Title: Periodic Table

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (03.00) Recognize and explain basic properties of solids, liquids, and gases.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Discuss the purpose of the periodic table.	Research library for information about the significance of the periodic table		Teacher observation
Explain elements, compounds, and types of chemical bonds.	Look at samples of elements, compounds, and chemicals	Matter and Energy, p. 20	Teacher observation
Identify parts and arrangement of periodic table.	Locate and label on a periodic table metals, nonmetals, group, and period	Matter and Energy, p. 20 Reproduce periodic table	Teacher-made test 75 percent proficiency
Interpret information about selected elements.	Identify elements from their symbols Identify the elements that make up various compounds	Matter and Energy, p. 20 Use periodic table	Teacher-made test 75 percent proficiency

Unit No: 5

Unit Title: Chemical Bonding

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (03.00) Recognize and explain basic properties of solids, liquids, and gases.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Define a chemical.	Explain how atoms combine	Basic Physical Science	Teacher-made test 75 percent proficiency
Distinguish between the two main types of bonds.	Give examples of compounds that illustrate each type of bond	Matter and Energy, p. 24	Teacher-made test 75 percent proficiency
	Lab 10		
Identify which type of bond is chemically stronger.	Demonstrate the dissolution of salt in water to illustrate a weak bond	Basic Physical Science	Teacher-made test 75 percent proficiency

Unit No: 6

Unit Title: Chemical Reactions

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (01.00) Recognize and explain basic properties of solids, liquids, and gases.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Distinguish reactions and products in a chemical reaction.	Demonstrate for students how a chemical reaction is similar to following a set of cooking or baking directions. "Chemical reaction is a recipe for chemists."	Concepts and Challenges in Physical Science, p. 46	Teacher observation
Discuss the importance of balancing chemical reactions.	Illustrate how a recipe is balanced (similar to a chemical reaction)	Concepts and Challenges in Physical Science, p. 49	Teacher observation
Recognize some general types of chemical reactions.	Have students classify a group of reactions by identifying which type it represents Demonstrate various types of chemical reactions	Concepts and Challenges in Physical Science, pp. 48 and 49	Teacher observation

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Unit No: 7

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Unit Title: Properties of Solids, Liquids, and Gases

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (03.00) Recognize and explain basic properties of solids, liquids, and gases.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Explain what an atom is and identify its parts.	Draw a simple model of an atom; label nucleus, energy (or electron) ring	Concepts and Challenges in Physical Science, p. 3	Teacher-made test 75 percent proficiency
Explain what a molecule is and describe differences between an atom.	Draw a simple model of a molecule with a ball and stick	Concepts and Challenges in Physical Science, p. 40	Teacher-made test 75 percent proficiency
Share the history of the discovery of the atom.	List the four points in Dalton's atomic theory	Library research	Teacher observation
Describe the difference between mixtures and compounds, compounds and elements.	Look at samples of mixtures, compounds, and elements	Concepts and Challenges in Physical Science, p. 34	Teacher-made test 75 percent proficiency
List the properties of matter.	Teacher-made worksheets--students showing mass and weight	Matter and Energy, p. 8	Teacher-made test 75 percent proficiency
List and give examples of the states of matter.	Classify objects into liquid, gas, or solid Have students describe physical and chemical changes "Try This" #1-5	Matter and Energy, p. 9	Observation
Define density and explain why it is the same for different amounts of the same material.	Teacher-made worksheet	Teacher-made worksheets Text	Teacher-made test 75 percent proficiency
Describe what determines whether an object will sink or float in a fluid.	Provide different containers and a tub of water for student participation	Teacher-made worksheets Text	Teacher-made test 75 percent proficiency

Unit No: 8

Unit Title: Thermal Energy

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (04.00) Discuss basic methods of thermal energy transfer.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
List the ways heat moves.	Measure and record temperature at various locations in room using Fahrenheit and Celsius	Matter and Energy, p. 63	Teacher observation
List materials that are good insulators and those that are good conductors.	Have students group materials which are good conductors and poor conductors "Try This" #22 and 23 Lab 7	Matter and Energy, p. 65 Lab Manual	Teacher observation
Define temperature and explain how it is measured.	Demonstrate ring and ball bimetallic strips, various thermos bottles, dented ping-pong balls in boiling water, pyrometer Lab 7	Matter and Energy, p. 58 Lab Manual	Teacher observation
Understand how heat causes matter to change phases.	Discuss heat and contraction and heat and expansion use "Try This" #34-36 Solid and liquid examples	Matter and Energy, p. 83	Teacher-made test 75 percent proficiency
Define heat transfer by conduction, convection, and radiation.	Demonstrate heat moving by touching, heat rising, and heat rays "Try This" #22-28 Lab Manual Activity 7	Matter and Energy, p. 68	Teacher observation
Describe methods to save heat energy.	Discuss insulation "Try This" #29 and 30	Matter and Energy, p. 77	Chapter checkup Matter and Energy, p. 82, 75 percent proficiency
List and define different sources of energy.	Discuss fossil fuel, nuclear, solar, and wind energy	Matter and Energy	Teacher-made test 75 percent proficiency
Determine one benefit and one problem with each source of energy	Logical problem solving	Teacher made	Teacher made test 75 percent proficiency

Unit No: 9

Unit Title: Machines and Energy

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Courre Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (05.00) Understand mechanical energy as it relates to simple machines.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
List the six simple machines.	Provide examples of lever, pulley, screw incline plane, wedge, wheel and axle "Try This" #38-46	Matter and Energy, p. 93	Teacher-made tests 75 percent proficiency
Identify the simple machines that make up everyday tools.	Classify common tools into categories "Try This" #38-46	Matter and Energy, p. 93	Teacher observation
Explain the phrase "mechanical advantage."	Demonstrate using simple tools	Matter and Energy, p. 93	Teacher observation
Give examples in which the mechanical advantage of a machine is (a) greater than one and (2) less than one.			Teacher observation
Explain why no machine can have an efficiency of 100 percent.	Class discussion	Teacher-made	Teacher observation

Unit No: 10

Unit Title: Basic Concepts of Basic DC Electricity

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (06.00) Understand the concepts of basic DC electricity.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Understand that there exists two kinds of electricity--static and current.	Students determine static and current electricity Lab 10	Matter and Energy, p. 120 Lab Manual	Teacher observation
Determine whether current will pass through a bulb.	Provide diagram showing the bulb connected by wire to a battery "Try This" #48	Matter and Energy, p. 121 Lab Manual	Teacher observation
Predict what will happen in a series circuit if there is a break at any point.	Use a light bulb with a broken filament and a light bulb without a broken filament	Matter and Energy, p. 122	Teacher observation
Interpret a simple schematic diagram of a circuit.	Construct a circuit using a battery and light bulb "Try This" #49 and 50 Lab 12	Matter and Energy, p. 123 Lab Manual	Teacher observation
Distinguish between switches, fuses, and circuit breakers.	Show examples and have students label	Matter and Energy, p. 138	Teacher-made test 75 percent proficiency
Be able to read a kilowatt meter.	Provide kilowatt meter and let students measure kilowatts Lab 13	Lab Manual Lab Manual	Teacher observation
Explain the relationship between electrons and electricity.	Expand on conduction using scientific terms "Try This" #51	Matter and Energy, p. 127	Teacher observation

Unit No: 11

Unit Title: Magnetism and Electromagnetism

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (07.00) Identify the concepts of magnetism and electromagnetism.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Name the properties of magnets.	Students use magnets to attract or repel classroom objects "Try This" #57	Matter and Energy, p. 143 Video: Magnets	Teacher-made test 75 percent proficiency
Interpret the strength of a magnetic field at different points near a magnet from the pattern formed by the iron fillings.	Provide iron fillings for students to form a magnetic field	Matter and Energy, p. 146 Video: Magnetic Force Into Magnet's Magnetic Field	Teacher-made test 75 percent proficiency
Understand what is meant by an electromagnet.	Students measure electricity usage by various appliances Lab Activity #11 "Try This" #61	Lab Manual Matter and Energy, p. 61	Teacher-made test 75 percent proficiency
List factors that could destroy magnetism.	Teacher-made "Try This" #59	Matter and Energy, p. 147	Teacher-made test 75 percent proficiency
Explain and understand how the earth can be perceived to be a giant bar magnet.	Use maps to locate North and South Pole, provide compasses to show needle always points north Lab 9 "Try This" #60	Lab Manual Matter and Energy	Teacher-made test 75 percent proficiency
Understand the workings of motors and generators related to magnetism.	Diagram and label simple motor "Try This" #62	Matter and Energy, p. 152	Teacher-made test 75 percent proficiency

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Unit No: 12

Unit Title: Light and Sound

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Physical Science

Instructor(s): F. Fernandes, E. Dell, G. Hurd, and M. Daly

Course Competency: (08.00) Recognize and understand the basic principles of light and sound.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
List a few basic facts about light.	Teacher-made worksheets Showing importance of light, speed of light, and where we get "Try This" #66-68	Matter and Energy, p. 167 Lab Activities	Teacher-made test 75 percent proficiency
Define illumination and light intensity.	Teacher-made worksheets Lab Activity #14	Matter and Energy, p. 172 Video: Color Lab Manual	Teacher-made test 75 percent proficiency
Measure illumination with the help of a light meter.	Use light meter to measure light reflected off various surfaces "Try This" #71	Matter and Energy, p 73	Teacher observation
Understand the meaning of reflection and refraction of light.	Demonstrations showing refraction using He-Nelaser, color wheel, color mixer	Matter and Energy, p. 173	Teacher observation
Understand what color is and list factors that determine the color of an object.	Make a prism Label colors on a spectrum "Try This" #80-82	Matter and Energy, p. 187 Lab Activities	Teacher-made test 75 percent proficiency
Briefly explain the term "optical illusion" and give examples.	Lab Activity #15	Lab Manual	
Describe the properties of sound. List a few basic facts about sound.	Class discussion about sound Teacher-made worksheets showing how sound travels "Try This" #83-88	Matter and Energy, p. 195 Matter and Energy, p. 196	
Understand sound acoustics.	Class discusses echoes and how to avoid "Try This" #94 and 95	Matter and Energy. p. 210	

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Dell

NORTHCENTRAL TECHNICAL COLLEGE

COURSE NUMBER:

COURSE TITLE: ESL Earth Science and Geography

CREDIT:

COURSE DESCRIPTION:

This course is a basic ESL earth science course. General topics covered include makeup of the Earth, the changing earth, climate, weather and atmosphere, history of the earth, oceans, astronomy, maps, ecology, basic reading and study skills (including locating and interpreting resources), vocabulary building, and awareness of scientific strategies.

Corequisites:

Prerequisites:

REQUIRED BOOKS:

Title: Hands-on Science: Earth Below and Sky Above

Publisher: The Peoples Publishing Group, Inc.

Author: Marilynne W. Mathias and Robert A. Johnson, Ph.D.

Copyright: 1983

SUPPLIES REQUIRED FOR COURSE: (include approximate quantity per student)

Date of Review/Revision: 6/93

Reviewed/Prepared by: Gail Hurd and Ellen Dell

NORTHCENTRAL TECHNICAL COLLEGE

ESL EARTH SCIENCE AND GEOGRAPHY

COURSE COMPETENCIES	COMMENTS
The student will:	
01.00 Learn basic facts about the planet Earth.	General competency
02.00 Understand major rock forms that make up the Earth's crust and of the forces and processes that change the surface.	Units 1 & 2
03.00 Discuss the history of our planet and how scientists date rocks and fossils.	Unit 2
04.00 Expand knowledge of the Earth's atmosphere and of its importance.	Unit 3
05.00 Be able to discuss climate, the different kinds of weather, and the prediction of weather.	Unit 3
06.00 Expand knowledge of the features of the ocean floor, waves, tides, currents, and of the importance of the sea to life on Earth.	Unit 4
07.00 Learn of astronomical discoveries and obtain some perspective on where the Earth fits into the "big picture."	Units 5 & 6
08.00 ~~Observe~~ and use a variety of maps and globes.	Unit 7
09.00 Expand knowledge of environmental issues, including rain forests, wetlands, and water.	Unit 8
10.00 Identify toxic substances.	Unit 8
11.00 Identify sources of air pollution.	Unit 8
12.00 Recognize the benefits of recycling.	Unit 8

GOAL.078, 6/10/93

PROGRAM	DEPARTMENT	DATE	PAGE
	Business Division	6/10/93	1 1 OF

ESL EARTH SCIENCE AND GEOGRAPHY

RESOURCES

Mathias, Marilynne W. and Robert A. Johnson, Earth Below and Sky Above. The Peoples Publishing Group, Inc., 1983, ISBN 0-88336-852-8.

Earth Science, American Guidance Service, Inc., Circle Pines, MN 55014-1796, 1992, ISBN order number.

Bernstein, Leonard, Martin Schachter, Alan Winkler, Stanley Wolfe, Concepts and Challenges in Earth Science, Book 1, CEBCO Standard Publishing, 1974, ISBN 88320-917-9.

Christison, Mary Ann, Sharron Bassano, Earth and Physical Science, Addison-Wesley Publishing Company, 1992, ISBN 0-8013-0986-7.

Fathman, Ann K., Mary Ellen Quinn, Science for Language Learners, Prentice Hall Regents, Englewood Cliffs, NJ 07632, 1989, ISBN 0-13-794660-0.

Logic Anyone, Blackline Master

Educational insights: Project kits with 35 experiments

EI-7158	Weather and Space

Instructional Fair, Inc.: Resource books with posters

IF8806	Earth Science
IF8805	Our Solar System
IF880X	The Human Body

Unit No: 1

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Unit Title: What is Science? Overview of Science.

Instructor(s): G. Hurd and E. Dell

Course Competency: (01.00) Learn basic facts about the planet Earth.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Define science.	Discussion	Hands-on Science text series	Teacher-made quiz 75 percent mastery
Name and explain the general functions of the three branches of science.	List and define in a chart	Hands-on Science text series	
Name the five steps of the scientific method.	List and define Include in student notebook	Hands-on Science text series	

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Unit No: 2

Unit Title: Define Earth Science

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Course Competency: (01.00) Learn basic facts about the planet Earth.

Instructor(s): G. Hurd and E. Dell

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Define earth science.	General outline	Earth Below and Sky Above	

Unit No: 3

Unit Title: The Earth's Features

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Instructor(s): G. Hurd and E. Dell

Course Competency: (02.00) Understand major rock forms that make up the Earth's crust and of the forces and processes that change the surfaces. (03.00) Discuss the history of our planet and how scientists date rocks and fossils.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Name and describe the Earth's three layers.	List and identify crust, mantle, and core Use teacher-made worksheets showing cross section of the Earth	Earth Below and Sky Above, p. 8	Teacher-made test 75 percent proficiency
List the geological eras and characteristics of each era.	Teacher-made worksheets "Try This" #20	Earth Below and Sky Above, p. 54	Teacher-made test 75 percent proficiency
Explain ways scientists date rocks.	Class discussion	Text	Teacher observation

Unit No: 4

Unit Title: The Earth's Crust

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Instructor(s): G. Hurd and E. Dell

Course Competency: (02.00) Understand major rock forms that make up the Earth's crust and of the forces and processes that change the surface.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Describe the theory of plate tectonics.	Discuss possible theories how the Earth's surface was formed	Textbook	
Explain what causes earthquakes and volcanoes.	Define earthquake and fault. Locate on a map the San Andreas Fault. Explain Richter scale and how scientists use.	Earth Below and Sky Above, p. 45	Teacher-made tests 75 percent proficiency
	Define volcano, volcanic eruption, and lava. Locate active and inactive volcanoes on a map.	Earth Below and Sky Above, p. 51	Teacher-made tests 75 percent proficiency
	"Try This" #17 and 18	Lab Activity 19	
Explain how mountains are formed.	Discuss faulting and folding. Compare and contrast a volcano and a mountain.	Earth Below and Sky Above, p. 36	Teacher-made test 75 percent proficiency
		Lab Activity 18	
Name the three main types of rock in the Earth's crust.	Classify different rocks into igneous, sedimentary, and metamorphic. Identify minerals and use to help classify rocks.	Earth Below and Sky Above, p. 36	Teacher-made test 75 percent proficiency
	"Try This" #3, 4, 5, and 7		
Describe the process of weathering and erosion.	Discuss what makes up soil. Identify causes and effects of erosion.	Earth Below and Sky Above, p. 40	Teacher observation
	Class discussion		
	"Try This" #16		

Unit No: 5

Unit Title: The Earth's Atmosphere

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Instructor(s): G. Hurd and E. Dell

Course Competency: (04.00) Expand knowledge of the Earth's atmosphere and of its importance.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Describe the makeup of the atmosphere.	Teacher-made worksheets identifying components of atmosphere	Earth Below and Sky Above, p. 66	Teacher-made test 75 percent proficiency
Explain how air pressure is related to winds and convection currents.	Define air pressure and the effects on weather "Try This" #24-26	Earth Below and Sky Above, p. 68	Teacher-made test 75 percent proficiency
Describe the different cloud forms and precipitation.	Class discussion Identify different cloud forms over a period of time. Relate precipitation to temperature and seasons. "Try This" #36-38	Earth Below and Sky Above, p. 91	Teacher-made test 75 percent proficiency

Unit No: 6

Unit Title: Weather and Climate

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Instructor(s): G. Hurd and E. Dell

Course Competency: (05.00) Be able to discuss climate, the different kinds of weather, and the prediction of weather.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Explain the differences between weather and climate.	Define, compare, and contrast weather and climate "Try This" #22 and 23	Earth Below and Sky Above, p. 65	Teacher-made tests 75 percent proficiency
Describe air pressure and how it affects weather.	Class discussion Reinforcing concepts with lab activities "Try This" #24-26	Earth Below and Sky Above, p. 68	Teacher observation
Describe storms--cyclone, hurricane, tornado, and typhoon.	Discuss changes in the atmosphere which cause dangerous weather Read weather maps	Earth Below and Sky Above, p. 115	Teacher observation
Share information on the job of weather forecaster.	Guest speaker and library research	Earth Below and Sky Above, p. 107	75 percent completion of teacher criteria

Unit No: 7

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Unit Title: The Earth's Oceans

Course Number and Title: ESL Earth Science and Geography

Course Competency: (06.00) Expand knowledge of the features of the ocean floor, waves, tides, currents, and of the importance of the sea to life on Earth.

Instructor(s): G. Hurd and E. Dell

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Explain the importance of the sea to life on earth.	Teacher-made worksheets locating oceans List ocean resources	Earth Below and Sky Above, p. 121	Teacher-made test 75 percent proficiency
Define and explain waves, tides, and currents.	Discuss relationship of moon, sun, and earth Examine tide charts	Earth Below and Sky Above, p. 131	Teacher-made test 75 percent proficiency
Describe three features of the ocean floor.	Teacher-made worksheets identifying sections of the ocean floor	Text	Teacher-made test 75 percent proficiency

Unit No: 8

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Unit Title: Relationship of Earth in Our Solar System

Course Number and Title: ESL Earth Science and Geography

Course Competency: (07.00) Learn of astronomical discoveries and obtain some perspective on where the Earth fits into the "big picture."

Instructor(s): G. Hurd and E. Dell

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
List the nine planets in the solar system.	Identify planets and relationship to earth and the sun "Try This" #50	Earth Below and Sky Above, p. 144	Teacher-made test 75 percent proficiency
Share information on two important events in space exploration.	Class discussion Library research	Earth Below and Sky Above, p. 165	75 percent proficiency of teacher criteria
Explain the difference between meteors and meteorites.	Class discussion	Earth Below and Sky Above, p. 161	Teacher-made test 75 percent proficiency
Explain the movement of the Earth through the solar system.	Discuss day, night, and time "Try This" #46	Earth Below and Sky Above, p. 137	Teacher-made test 75 percent proficiency

Unit No: 9

Unit Title: Reading Maps and Globes

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Course Competency: (08.00) Observe and use a variety of maps and globes.

Instructor(s): G. Hurd and E. Dell

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Locate water and land forms on a globe.	Teacher-made worksheets with oceans and continents	Globe	Teacher observation
Identify symbols and direction on a map.	Locate local information on a map	Local, state, U.S., and world maps	Teacher observation and worksheets
Identify and interpret the map scale.	Teacher-made worksheets using local maps		Teacher observation and worksheets
Identify and differentiate between relief, political, and climatic maps.	Observation of a variety of maps	Maps--relief, political, and climate	Teacher observation and worksheets
Identify and compare elevations.	Define latitude, longitude, hemisphere, and related terms	Teacher-made worksheets Maps and globes	Teacher observation and worksheets
Identify and use a legend.	Preparing map of local area	Variety of maps	Teacher observation and worksheets
Identify time zones.	Mathematically determine time zones in given locations	U.S. and world maps showing time zones	Teacher observation and worksheets

Unit No: 10

Unit Title: Environmental Issues - Land Use

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Course Competency: (09.00) Expand knowledge of environmental issues, including rain forests, wetlands, and water.

Instructor(s): G. Hurd and E. Dell

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Describe results of destruction of the rain forests.	Locate rain forests on a map. Explain importance of rain forests.	Teacher-made worksheets	Teacher observation
Define two methods of logging.	Class discussion	Teacher-made worksheets	Teacher observation
Identify the importance of wetlands.	Define and illustrate effects on food chain	Teacher-made worksheets	Teacher observation
List three natural processes that reduce the amount of land available.	Class discussion	Teacher-made worksheets	Teacher observation

Unit No: 11

Unit Title: Environmental Issues - Water Resources

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Course Competency: (09.00) Expand knowledge of environmental issues, including rain forests, wetlands, and water.

Instructor(s): G. Hurd and E. Dell

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Water Resources			
Illustrate the hydrologic cycle.	Class discussion locating parts of the water cycle	Teacher-made worksheets Earth Below and Sky Above, p. 97	Teacher-made test 75 percent proficiency
Give examples of human use of water.	Class discussion involving real-life experiences using water	Teacher-made worksheets Earth Below and Sky Above, p. 97	Teacher-made test 75 percent proficiency
Describe the distribution of groundwater.	Teacher-made worksheets	Teacher-made worksheets Earth Below and Sky Above, p. 97	Teacher-made test 75 percent proficiency
List the benefits and drawbacks of dam construction.	Define dams and illustrate positive and negative features	Teacher-made worksheets Earth Below and Sky Above, p. 97	Teacher observation

Unit No: 12

Unit Title: Environmental Issues

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Course Competency: (10.00) Identify toxic substances. (11.00) Identify sources of air pollution. (12.00) Recognize the benefits of recycling.

Instructor(s): G. Hurd and E. Dell

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Identify toxic substances.	Class discussion about poisons	Teacher-made worksheets	Teacher observation
List sources of hazardous chemicals.	Define hazardous chemicals and identify	Teacher-made worksheets	Teacher observation
Define noise and its effects.	Class discussion drawing from real-life experiences	Teacher-made worksheets	Teacher observation
Contrast the two types of pesticides.	Define and discuss pesticides, both chemicals and natural	Teacher-made worksheets	Teacher observation
Describe the reason DDT was banned.	Class discussion	Teacher-made worksheets	Teacher observation
List and describe other methods of pest control.		Teacher-made worksheets	Teacher observation
Define herbicide.	Teacher-made worksheets showing different methods of controlling pests	Teacher-made worksheets	Teacher observation
List reasons why groundwater pollution is so serious.	Class discussion on pollution and effects	Teacher-made worksheets	Teacher-made test 75 percent proficiency
Describe the effects of groundwater pollution.	Class discussion	Teacher-made worksheets	Teacher-made test 75 percent proficiency
List sources of ocean pollution.	Class discussion on illegal dumping, chemical spills, and pollution	Teacher-made worksheets	Teacher-made test 75 percent proficiency
List the gases that make up the atmosphere.	Define air and properties	Teacher-made	Teacher-made test 75 percent proficiency
List sources of air pollution.	Class discussion on air pollution causes and effects	Teacher-made	Teacher-made test 75 percent proficiency
Describe the production of acid rain.	Draw from real-life experiences illustrating acid rain	Teacher-made	Teacher-made test 75 percent proficiency
List some effects of acid rain.	Class discussion	Teacher-made	Teacher-made test 75 percent proficiency
List ways to protect indoor air quality.	Class discussion	Teacher-made	Teacher-made test 75 percent proficiency

Unit No: 12

Unit Title: Environmental Issues

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Instructor(s): G. Hurd and E. Dell

Course Competency: (10.00) Identify toxic substances. (11.00) Identify sources of air pollution. (12.00) Recognize the benefits of recycling.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
List three methods of waste disposal.	Class discussion regarding waste management	Teacher-made	Teacher-made
Describe reasons for recycling.	Define landfills and problems of lack of decomposing waste	Teacher-made	Teacher-made
List methods of recycling.	Identify household items and how to recycle	Teacher-made	Teacher-made

NORTHCENTRAL TECHNICAL COLLEGE

COURSE NUMBER:

COURSE TITLE: ESL Life Science

CREDIT:

COURSE DESCRIPTION:

This course is a basic ESL biology course. General topics covered include the definition of life, cell studies, taxonomy, plant life, genetics, human and animal systems, health, the balance of nature, basic reading and study skills (including locating and interpreting resources), vocabulary building, and awareness of scientific strategies.

Corequisites:

Prerequisites:

REQUIRED BOOKS:

Title: Hands-on Life Science
Publisher: The Peoples Publishing Group, Inc.
Author: Stephan A. Martin and Joseph Starowicz
Copyright: 1988

SUPPLIES REQUIRED FOR COURSE: (include approximate quantity per student)

Date of Review/Revision: 6/9/93
Reviewed/Prepared by: Beth Dickinson, Ellen Dell, and Gail Hurd

NORTHCENTRAL TECHNICAL COLLEGE

ESL LIFE SCIENCE

COURSE COMPETENCIES	COMMENTS
The student will be able to:	
01.00 Explain, define, and/or give examples of the vocabulary words and terminology appropriate to each unit covered.	General competency
02.00 List and/or describe the major structures in each organ system covered and their functions.	General competency
03.00 Properly use and identify the parts of a light microscope and identify structures viewed on microscope slides.	General competency
04.00 Name the traits common to all living organisms.	General competency
05.00 Distinguish between plant and animal cells and between cells and tissues.	Unit 1
06.00 Define and understand the necessity of taxonomy.	Unit 2
07.00 Identify the major characteristics of the classes or phyla of the animal, plant, and protista kingdoms.	Unit 2
08.00 Discuss the importance of plants.	Unit 3
09.00 Identify the parts of plants, differences, and what the plant structures do.	Unit 3
10.00 Describe the importance of chlorophyll and photosynthesis, the purpose and function.	Unit 3
11.00 Identify and/or describe the structures and functions of the various organ systems.	Unit 4
12.00 Describe the importance of genes and traits and how they are passed on to future generations.	Unit 5
13.00 List the ways the body protects against diseases.	Unit 6

GOAL.070, 6/9/93

COURSE COMPETENCIES	COMMENTS
The student will be able to:	
14.00 ~~List or~~ describe the effects of drugs, alcohol, and tobacco on the body.	Unit 6
15.00 ~~List and~~ discuss the main forms of nutrition, what they supply, and where they are found.	Unit 6
16.00 List the seven basic requirements for good physical and mental health.	Unit 6
17.00 Explain the relationships of various communities, populations, and ecosystems.	Unit 7

GOAL.070, 6/9/93

ESL LIFE SCIENCE

RESOURCES

LaRue, Charles. Basic Biology, American Guidance Service, Inc., Circle Pines, MN 55014-1796, 1992, ISBN 0-88671-543-1, Order No. 80190.
(Lab Manual, Teacher's Guide, Student Workbook)

Bernstein, Leonard, Martin Schachter, Alan Winkler, Stanley Wolfe. Concepts and Challenges in Life Science, Book 1, CEBCO Standard Publishing, 1974, ISBN 88320-914-4.

Fathman, Ann K., Mary Ellen Quinn, Science for Language Learners, Prentice Hall Regents, Englewood Cliffs, NJ 07632, 1989, ISBN 0-13-794660-0.

Martin, Stephan A. and Joseph Starowicz. Hands-on Science: Life Science, The Peoples Publishing Group, Inc., 1988.

Animal Kingdom, Instructional Fair, Inc., 1991.

Plant Kingdom, Instructional Fair, Inc., 1991.

The Human Body, Instructional Fair, Inc., 1991.

Unit No: 1

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Unit Title: What is Science? Overview of Science.

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency: (01.00) Explain, define, and/or give examples of the vocabulary words and terminology appropriate to each unit covered. (02.00) List and/or describe the major structures in each organ system covered and their functions. (03.00) Properly use and identify the parts of a light microscope and identify structures viewed on microscope slides. (04.00) Name the traits common to all living organisms.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Define science.	Discussion	Hands-on Science text series	Teacher-made quiz 75 percent mastery
Name and explain the general functions of the three branches of science.	List and define in a chart	Hands-on Science text series	
Name the five steps of the scientific method.	List and define Include in student notebook	Hands-on Science text series	

Unit No: 2

Unit Title: Composition of Living Things

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency: (04.00) Name the traits common to all living organisms. (05.00) Distinguish between plant and animal cells and between cells and tissues.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
List the five main characteristics of life.	Read and discuss text, Chapters 1-5	Text	Chapter and unit checkups
Give three examples of how an organism responds to its environment.	Compare photos of living/inanimate objects	Microscope and slides	Teacher-made test
Describe cells and their parts. Contrast plant and animal cells.	Use a microscope to look at premade and fresh-mount slides	WPS video, Vol. 19, Issue 1, "Technology, the Microscope, an Indispensable Instrument"	Optional: Computer worksheets
Describe how cells get and use energy.		Optional: Computer program "Cells: Structure and Function," Scott, Foresman Biology Courseware Series for Apple II, 1985, Glenview, IL	
Identify the parts of the microscope and use it correctly.	Do "Try This" #1-8		
	Chapter 3, "Things to Do"		
Define tissue and list the main types.	Examine models		
	Examine "Typical Cells Chart"		
	Discuss unit review		

Unit No: 3

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Unit Title: The Kingdoms of Life

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency: (06.00) Define and understand the necessity of taxonomy. (07.00) Identify the major characteristics of the classes or phyla of the animal, plant, and protista kingdoms.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Explain why a classification system of organisms is important.	Read and discuss text, Chapters 6-9	Text	Chapter and unit checkups
Name the five kingdoms of life and give an example of each.	Classify a selection of plants and animals	Pond water Microscope and slides	Teacher-made tests
Name five important fields in biology.	Study Kingdoms handout for similarities among groups and 5 Kingdoms chart	Student handout "Kingdoms" 5 Kingdoms chart	
Give three examples of how an organism adapts to its environment.	Examine articulated skeleton, disarticulated vertebrae	Optional: WPS video, Vol. 22, Issue 3, "Fungi"	
Identify the main characteristics of the various animal classes.	"Things to Do," Chapters 6, 8, and 9 "Try This" #10-11		
Identify major characteristics of plant plyla.	View premade slides		
Identify major characteristics of protists.	Discuss unit review		

Unit No: 4

Unit Title: The Animal Kingdom

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency:

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
List characteristics common to all animals. Define an invertebrate and give three examples. Define vertebrate and give three examples. Describe what makes an animal a mammal.	See activities in unit, "Kingdoms of Life"	Text Microscope and slides 5 Kingdoms chart and handout	Chapter and unit checkup Teacher-made test

Unit No: 5

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Unit Title: The Plant Kingdom

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency: (08.00) Discuss the importance of plants. (09.00) Identify the parts of plants, differences, and what the plant structures do. (10.00) Describe the importance of chlorophyll and photosynthesis, the purpose and function.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Describe the appearance and function of plant roots, stems, leaves, flowers, seeds, and fruits.	"Try This" #13, 14, 16, 18, 19, and 21	Text	Chapter and unit tests
Explain the process of photosynthesis.	"Try This" #15, 17, 20, 22, 23, 24-28 are optional depending on time and availability of supplies	Seeds Seedlings Plant materials	Teacher-made tests
Give an example of the interdependence of plants and animals.		Optional: WPS video, Vol. 26, Issues 1 and 2, "Close-Up Photography: Reveals Mysteries of Pollination"	
Identify the reproductive parts of a flower.	Examine various plant materials		
	View video		
Discuss the importance of plants.	Read and discuss text, Chapters 10-15		
	Discuss unit review		

Unit No: 6

Unit Title: Genetics

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency: (11.00) Identify and/or describe the structures and functions of the various organ systems. (12.00) Describe the importance of genes and traits and how they are passed on to future generations.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Describe how traits are passed from one generation to the next.	Discuss unit review	Text	Computer worksheets (optional)
Define genes and chromosomes.	Read and discuss text, Chapters 26-29 "Things to Do," Chapter 26	Optional: Computer program "Meiosis, Mitosis, and Protein Synthesis," Scott, Foresman Biology Courseware Series for Apple II, 1985, Glenview, IL	Teacher-made test
Explain how genetics can help improve crops.	"Try This" #39		
Name several traits of a plant or animal and determine if these traits are caused by the environment or by genetics.	Optional: WPS videos, Vol. 28, Issue 1, "Biology: Genetic Engineering" and "Biology: Crop Genetics Yields Better Harvest"		
Define terms involved with sexual reproduction.	Examine models of male and female pelvis	Nova video "The Miracle of Life"	
Identify the reproductive structures and their functions.	View Nova video "The Miracle of Life"		

Unit No: 7

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Unit Title: How Life Evolves

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency: (12.00) Describe the importance of genes and traits and how they are passed on to future generations.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Define the theory of natural selection and give an example of its effect.	Read and discuss Chapters 26-29	Text	
Share information on an extinct species of plant or animal.	Research paper on teacher-selected topics	Library resources	Teacher criteria for completed paper

Unit No: 8

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Unit Title: The Human Body: Cells, Tissues, Organs, and Systems

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency:

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Identify two kinds of tissue.		Text	Chapter and unit checkups
Name the five senses.	Examine model of ear and eye	Models	
Name two body organs.			Teacher-made tests
Describe three important body systems and their functions.	Video: "The Incredible Machine"	Video: "The Incredible Machine"	
List and describe the structures of the nervous system.	"Try This" #29	Microscope and slides	
	Examine models of the brain, neuron, and spinal cord		

Unit No: 9

Unit Title: The Human Energy Systems

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency:

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Describe the path and organs of the circulatory system. Describe the path and organs of the digestive system. Describe the path and organs of the respiratory system. List glands and the hormones they make and what they do. List and describe the structures of the skeleton and muscles and their purposes.	View slides of human blood Models of heart, blood vessel chart "Try This" #30, 33, 34, and 35 Read and discuss text "Try This" #32 "Try This" #36, 37, and 38 Examine "Muscle Man" model Skeleton Skull Knee model	Text Microscope and slides Models Diaphragm jar Optional: WPS video, Vol. 22, Issue 1, "Human Blood"	Chapter and unit checkups Teacher-made tests

Unit No: 10

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Unit Title: Staying Healthy

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency: (13.00) List the ways the body protects against diseases. (14.00) List or describe the effects of drugs, alcohol, and tobacco on the body. (15.00) List and discuss the main forms of nutrition, what they supply, and where they are found. (16.00) List the seven basic requirements for good physical and mental health.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Explain what a disease is. Name four effective ways to help your body stay healthy. Explain how cigarettes, drugs, and alcohol harm the body. Define nutrition. List and discuss seven basic requirements for good physical and mental health.	Read and discuss text, Chapters 30-32 "Try This" #41 "Things to Do," Chapter 31 Students bring in media articles and discuss Research project on teacher-selected topics: oral presentations Discuss unit review Optional: Informational talks by doctors, health care center, NTC dental, etc.	Text Optional: WPS video, Vol. 26, Issue 3, "Biology: Immunology How the Body Defends Itself" Food package labels Library resources	Chapter and unit checkups Optional teacher-made tests Teacher evaluation

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Unit No: 11

Unit Title: Interdependence of Living Things

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Life Science

Instructor(s): B. Dickinson, E. Dell, and G. Hurd

Course Competency: (17.00) Explain the relationship of various communities, populations, and ecosystems.

Performance Objective(s) and Tasks	Activities	Resources (Ref., Instructional Aids)	Evaluation Devices
Explain what an ecosystem is made up of. Describe the food, water, and oxygen/carbon dioxide cycles. List three reasons for conserving natural resources. Define ecology, environment, population, community, ecosystem, biome, biosphere, and describe relationships.	Read and discuss text, Chapters 33-37 "Things to Do," Chapters 33 and 34 Hunting and fishing regulations and reasons Discuss city of Wausau recycling program, needs and benefits "Try This" #44 Discuss chapter Unit review	Text Optional: WPS video, Vol. 18, Issue 1, "Biology: The Biology of Water" DNR pamphlets City of Wausau pamphlets Optional: WPS video, Vol. 19, Issue 6, "Pharmacology: Medicines From Nature"	Chapter and unit checkups Optional: Teacher-made tests