DOCUMENT RESUME

ED 374 292 CE 067 230

AUTHOR Atkinson, Rhonda; And Others
TITLE Building Workplace Vocabulary for E & I: Structural Analysis.
INSTITUTION Associated Builders and Contractors, Inc., Baton Rouge, LA. Pelican Chapter.; East Baton Rouge Parish School Board, La.; Greater Baton Rouge Chamber of Commerce, LA.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, DC. National Workplace Literacy Program.
PUB DATE 31 Dec 93
CONTRACT V198A10155
NOTE 86p.; For documents related to this project, see CE 067 219-251.
PUB TYPE Guides - Classroom Use - Instructional Materials (For Learner) (051) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Adult Basic Education; Behavioral Objectives; Building Trades; *Electrical Occupations; Instrumentation Technicians; Learning Activities; Learning Modules; *Literacy Education; *Structural Analysis (Linguistics); Trade and Industrial Education; *Vocabulary Development
IDENTIFIERS *ABCs of Construction Project; *Word Attack Skills; Workplace Literacy

ABSTRACT

Developed as part of the ABCs of Construction National Workplace Literacy Project, this instructional module teaches word attack skills for use in understanding technical terms encountered by persons employed in electrical and instrumentation occupations. The following topics are covered: the principles of structural analysis, word parts and their use in determining the meanings of words, the limitations of structural analysis, and steps in using structural analysis. Included in the module are 26 exercises in which students are required to use word attack skills/structural analysis to determine the meanings of technical terms used in materials read by persons in electrical and instrumentation occupations. (MN)

These instructional materials were made possible through a National Workplace Literacy Grant funded through the U.S. Department of Education from November 1, 1992, to December 31, 1993, at the training center of the Pelican Chapter of Associated Builders and Contractors in Baton Rouge, Louisiana. The public/private partnership involved in the project included the East Baton Rouge Parish Schools Adult and Continuing Education Department and the Greater Baton Rouge Chamber of Commerce. The contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government.

Project Director: Pamela Wall, Adult and Continuing Education

Curriculum Writers: Dr. Rhonda Atkinson, LSU
Dr. Debbie Longman, SLU
Dr. Doreen Maxcy, LSU

Teaching Staff: D. Lynn Delahaye
Jeanne Chapman
Blaine Reynolds

ABC Training Center
19251 Highland Road
Baton Rouge, Louisiana 70809

MODULES OF INSTRUCTION DEVELOPED IN GRANT CYCLE

1. Writing Frames for Construction Workers (10 exercises)

for low-level readers; consists of 10 "paragraphs" with open-ended sentences for workers to complete and recopy in their notebooks. Topics deal with work and training, such as "My Job," "Classroom Behavior," and "Listening to Myself."

2. Writing About Your Craft (10 topics)

for all students; list of 10 topics, such as "My Boss," "The Main Beef About My Job," and "How Work Orders Are Delivered." Used for integrating reading and writing in a job-specific context.

3. Building Workplace Vocabulary for E & I: Structural Analysis (80 pages)
Building Workplace Vocabulary for Millwrights: Structural Analysis(79 pages)
Building Workplace Vocabulary for Pipefitters: Structural Analysis(79 pages)

5th grade level; teaches word attack skills for technical terms, utilizing word parts and root words; includes hints for retaining meanings by building card file with visual representations of terminology.

4. Building Workplace Vocabulary for E & I: General, Specialized, & Technical Terms (58 pages)
Building Workplace Vocabulary for Millwrights: General, Specialized & Technical Terms (29 pages)
Building Workplace Vocabulary for Pipefitters: General, Specialized, & Technical Terms (32 pages)

5th grade level; teaches different kinds of vocabulary words encountered in work-related texts; drills for remembering new words; tips for building vocabulary; some dictionary use.

5. Building Workplace Vocabulary for E & I: Compound Words (28 pages)
Building Workplace Vocabulary for Pipefitters: Compound Words (18 pages)
Building Workplace Vocabulary for Millwrights: Compound Words (22 pages)

5th grade level; strategies for finding the meanings of compound words used in technical writing; works with words in context

6. Improving Listening Skills: Hazards Communication (18 pages)
Improving Listening Skills: Fire Extinguishers (22 pages)

a viewing, study guide that accompanies a commercial training video used in the required 8-hour OSHA safety course; learning new words, main ideas, and drawing conclusions are covered.

7. Measuring Decimals: Millwright (28 pages)

instruction and application problems

8. Improving Study Skills/Test Taking (60 pages)

6th grade level; good study skills are needed for success in the ABC Training program; explores strategies for organizing class notes and study time; analysis sheet for determining weaknesses in test preparation; how to schedule to arrange study time and work time

Computer Program

"Math for Pipefitters" is an interactive, multi-media program that covers fractions, decimals, angles, and right triangle geometry in a pipefitting context (88 screens)

E & I-STRUCTURAL ANALYSIS 80 PAGES

<F1: Help>

Statistics for: B:\EANDISTR.DOC

Readability Statistics

Flesch Reading Ease:	78	Flesch-Kincaid Grade Level:	5
Gunning's Fog Index:	7		

Paragraph Statistics

Number of paragraphs:	839	Average length:	0.3 sentences

Sentence Statistics

Number of sentences:	305	Short (< 12 words):	794
Average length:	9.7 words	Long (> 30 words):	1
End with '?':	15		
End with '!':	0		

Word Statistics

Number of words:	4317	Average length:	4.27 letters
		Syllables per word:	1.40

<Enter: Next Screen> <Esc: Done>

<F1: Help>

Document Summary for: B:\EANDISTR.DOC

Readability Statistics	Interpretation
Grade level: 5 (Flesch-Kincaid)	Easy for most readers.
Reading ease score: 78 (Flesch)	This represents 6 to 10 years of schooling.
Avg. sentence length: 9.7 words	May indicate choppiness or lack of sentence variation. Try varying sentence length.
Avg. word length: 1.40 syllables	Most readers could understand the vocabulary used in this document, based on syllables per word.
Avg. paragraph length: 0.3 sentences	Avoid 1-sentence paragraphs in business or technical writing.

<Enter: First Screen> <Esc: Done>

BUILDING WORKPLACE VOCABULARY FOR E & I WORKERS: STRUCTURAL ANALYSIS

OBJECTIVE: To use word parts to define new terms.

Think about drills. They do many jobs. The work a drill does depends on the bit you add to it. If you want to drill a hole in concrete, you use one bit. If you want to drill a hole in wood, you use a different one. The parts you add to the drill change it so that it can do the work you need. Separate parts work together to get the job done.

In the same way, words have parts which build meanings. The parts combine "to get the job done." Here, the job is making meaning. Sometimes the meaning of a new word becomes clear when you look at its parts. Splitting words into parts to find meaning is called **STRUCTURAL ANALYSIS**.

ROOTS of words provide key meanings. The root may even be a word by itself. As such, it can be used alone. Other word parts cannot be used alone. They add to or change the meanings of the roots. These word parts are called **PREFIXES** and **SUFFIXES**. You always find prefixes at the beginnings of words. Suffixes come at the ends of words. Suffixes change how a word looks. They tell how a word is used in a sentence. They seldom change basic meaning. Roots are found after prefixes, before suffixes, or between the two. There is a trick to help you recall a word's structure.

Think of where the letters ***P, R,*** and ***S*** go in the alphabet. This is your clue. The order is the same in words. Prefixes come first. Roots are in the middle. Suffixes come last.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

R	O	U
E	O	F
F	T	F
I		I
X		X

Studying word parts tells you many things. The base of a word gives you an overall meaning for the unknown word. Prefixes and suffixes tell you more about the word. Sometimes they tell you about meaning. Sometimes they tell you about the part of speech of the word.

Read the sentence below:

> Forcing a tool to work beyond the limits of its design wears out the tool ***prematurely***.

Can you tell what ***prematurely*** means in this sentence? Look at the parts of the word.

PRE	MATURE	LY
(before)	(fully aged)	(adverb--tells about verb)

Pre comes first. It is a prefix. It means ***before***. In ***prematurely***, ***mature*** is a root word. It means ***fully aged***. ***Ly*** comes at the end. It is a suffix. It tells you ***prematurely*** is an adverb. Adverbs usually tell about verbs or other describing words. The parts tell you two things about the word. One, the word is an adverb. Two, it means ***before fully aged***. In this sentence ***prematurely*** tells when a tool may no longer work.

Structural analysis doesn't always show a word's entire meaning. Sometimes all you get is an idea of the word's meaning. But, often, an idea is all you need.

LIMITATIONS OF STRUCTURAL ANALYSIS.

Using word parts seems quick and easy. The bad news is that it doesn't always work. Some words contain sets of letters that are the same as common word parts. The letters, however, do not have the same meaning as the word parts they look like. Consider the word ***industry.*** Industry begins with the letters ***in***. ***In*** is a prefix meaning ***not***. In the word ***industry***, however, the ***in*** doesn't mean anything. It just happens to be the way the word begins.

Now you know that all words cannot be divided into parts and defined exactly. How can you know when to use structural analysis? There is one test that sometimes works. Mentally remove what seems like a prefix or suffix from the word. Does a "real" or base word remain? If so, you found a word you can define by its parts. For example, look again at ***industry***. Removing ***in*** leaves only ***dustry***. ***Dustry*** is not a word.

Using word parts works most of the time. Your skill in finding when they do and don't will improve with practice.

DEFINING WORDS USING STRUCTURAL ANALYSIS.

Despite its limits, using word parts is a good way to find new meanings. Now you need a plan for attacking new words with structural analysis. The steps which follow provide one.

STEPS IN USING STRUCTURAL ANALYSIS

1. Look at the unknown word. Do you see any set of letters you know from other words? Do you see any word parts you learned from these materials? If so, draw a line between them and the rest of the word. This line may or may not be where a word part begins or ends.

2. Look at the word part you marked. Think of words you know that contain this part. Do the meanings of these words have anything in common? What?

3. The common meaning of the words you know is probably the meaning of the word part. Use this meaning to help you define the new word.

4. Look at the rest of the word. Is what's left a word or word part you recognize? Do you know what it means? You might need to use a dictionary.

5. Now put these meanings together. The result should be the definition of the new word.

For example, read the paragraph below:

> Respirators used by only one person should be cleaned after each day of use and more often if necessary. Those used by more than one person should be cleaned and ***disinfected*** after each use.

What does ***disinfected*** mean? To find out, you use the steps listed on page 5. First, you identify any word parts you recognize. Now draw a line between the word part and the rest of the word.

D I S | I N F E C T E D

Dis is a word part that probably seems common to you. What are some other words that begin with ***dis***? What do they mean?

DISABLE -- not able

DISAPPROVE -- not approve

DISAPPEAR -- not appear

What is the common word in each of these meanings? ***Not*** appears in all three definitions. You think, then, that ***dis*** means ***not***. Now, you look at the second part of the word. You probably know that ***infected*** has to do with germs and sickness. When you put the two word parts together, you find the meaning of ***disinfected.*** ***Disinfected*** means ***not having germs or causing illness.***

LISTS OF WORD PARTS. Look at the prefixes, suffixes, and roots in the following tables. They contain lists of word parts by topics. They are not all the word parts in the English language. They are, however, a good start at learning structural analysis. The first three tables contain word parts which tell you position. The fourth group are word parts found in action words. The fifth table is a list of word parts that mean negative, or <u>not</u>. When these word parts occur in front of or behind a root, the word means the opposite of the root. For example, consider the word ***unsafe***. The negative prefix ***un*** tells you ***unsafe*** means ***not protected***. The sixth group contains word parts that tell how many. They show numbers. The seventh table shows size word parts. The final groups are from fields of science and technology. They are words you might often find in the field of electricity and instrumentation. Beside each word part is an example of a word containing that word part. As you look at each word part, try to think of an example you know. This will help you remember the parts.

TABLE 1

LIST OF WORD PARTS MEANING IN, OUT, & MIDDLE, DEFINITIONS AND EXAMPLES

Word Part	Definition	General Example	Your Example
en/em/in	in	enroll/incision	
inter	between	interstate	
trans	across	through	
med/mid	middle	median	
e/ex/exo	out	eject	

EXERCISE 1

Match the following:

1. ex			a. in
2. mid			b. between
3. trans . . .			c. out
4. em			d. across
5. med			e. middle
6. inter			
7. in			
8. en			
9. exo			

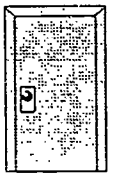
EXERCISE 2

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

e/ex/exo



Back

MEANING:

out

EXAMPLE:

exit

Front

inter

Back

MEANING:

EXAMPLE:

Front	Back
trans	MEANING: EXAMPLE:

Front	Back
en/em/in	MEANING: EXAMPLE:

Front	Back
mid/med	MEANING: EXAMPLE:

TABLE 2

LIST OF WORD PARTS MEANING ABOVE, & BEYOND, DEFINITIONS AND EXAMPLES

Word Part	Definition	General Example	Your Example
de	away/later than	devalue	
super	above/greater	superimpose	
sub	under	subsoil	
meta	beyond	metacenter	
over	over and beyond	oversimplify	

EXERCISE 3

Match the following:

1. de		a. down
2. super . . .		b. beyond
3. sub		c. away
4. meta . . .		d. under
5. over		

EXERCISE 4

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

sub

Back

MEANING:

under

EXAMPLE:

subway train

Front

de

Back

MEANING:

EXAMPLE:

Front

super

Back

MEANING:

EXAMPLE:

Front

meta

Back

MEANING:

EXAMPLE:

Front

over

Back

MEANING:

EXAMPLE:

TABLE 3

LIST OF RELATIVE POSITION WORD PARTS, DEFINITIONS AND EXAMPLES

Word Part	Definition	General Example	Your Example
pre	before	preheat	
post	after/later than	postmortem	
pro	in front/positive	proceed	
re	back/again	return	
circ/circum	around/round	circumference	
tele	far	telephone	
para	beside/equal	paramedic	
peri	around	periscope	
term	end	terminate	

EXERCISE 5

Match the following:

1.	term		a. end
2.	peri		b. before
3.	para		c. in front/positive
4.	tele		d. end
5.	circ		e. far
6.	re		f. back/again
7.	pro		g. after/later than
8.	post		h. around/round
9.	pre		i. beside/equal
10.	circum		

EXERCISE 6

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

tele

Back

MEANING:

far

EXAMPLE:

telephone

Front

pre

Back

MEANING:

EXAMPLE:

Front

post

Back

MEANING:

EXAMPLE:

Front

pro

Back

MEANING:

EXAMPLE:

Front	Back
re	MEANING: EXAMPLE:

Front	Back
circ/circum	MEANING: EXAMPLE:

Front	Back
para	MEANING: EXAMPLE:

Front	Back
peri	MEANING: EXAMPLE:

Front	Back
term	MEANING: EXAMPLE:

Front	Back
tele	MEANING: EXAMPLE:

TABLE 4

LIST OF ACTION
ROOTS, DEFINITIONS, AND EXAMPLES

Word Part	Definition	General Example	Your Example
vers/vert	turn	convert	
ject	throw	project	
port	carry	transport	
vis	see	vision	
rupt	break	disrupt	
junct	join	conjunction	
cede	go	precede	

EXERCISE 7

Match the following:			
1. cede . . .			a. thrown
2. vers			b. turn
3. junct			c. see
4. vis			d. join
5. vert			e. go
6. port			f. carry
7. ject			g. break
8. rupt			

EXERCISE 8

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

port

Back

MEANING:

carry

MEANING:

transport

Front

vers

Back

MEANING:

EXAMPLE:

Front

vert

Back

MEANING:

EXAMPLE:

Front

ject

Back

MEANING:

MEANING:

Front

vis

Back

EXAMPLE:

MEANING:

Front

rupt

Back

EXAMPLE:

MEANING:

Front

junct

Back

MEANING:

EXAMPLE:

Front

cede

Back

MEANING:

EXAMPLE:

TABLE 5

LIST OF NEGATIVE WORD PARTS, DEFINITIONS, AND EXAMPLES

Word Part	Definition	General Example	Your Example
neg	deny	neglect	
mis	bad/wrong	mistake	
non/a/		nonverbal/asexual/	
dis/il/	not	disarm/informal	
ir/im/in		irrational	

EXERCISE 9

Match the following:

1.	non		a. thrown
2.	neg		b. turn
3.	a		c. see
4.	mis		
5.	dis		
6.	il, ir, im, in . . .		

EXERCISE 10

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

neg

Back

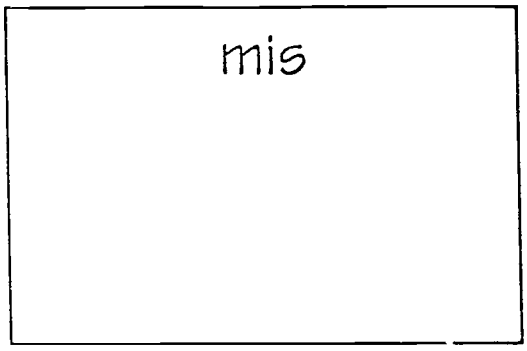
MEANING:

deny

EXAMPLE:

negative

Front

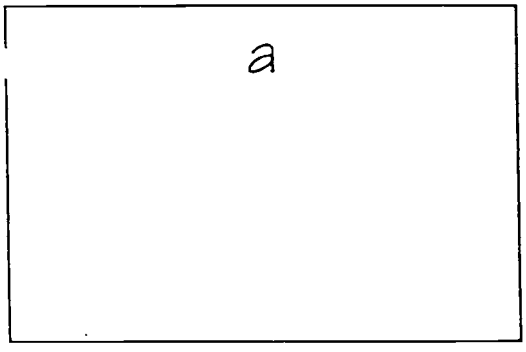


Back

MEANING:

EXAMPLE:

Front

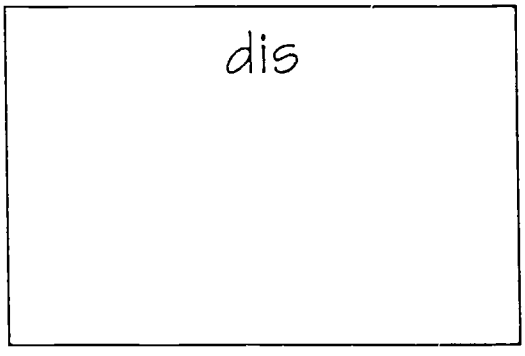


Back

MEANING:

EXAMPLE:

Front



Back

MEANING:

EXAMPLE:

TABLE 6

LIST OF NUMBER WORD PARTS, DEFINITIONS, AND EXAMPLES

Word Part	Definition	General Example	Your Example
uni/mono	one	universe	
bi/di/du	two	bisect/dual	
tri	three	triangle	
octa	eight	octagonal	
dec	ten	decade	
centi	hundred	centipede	
kilo	thousand	kilogram	
mega	millions	megaton	
milli	thousands (1'1000)	millimeter	

EXERCISE 11

Match the following:

1.	uni		a.	1/1000
2.	bi		b.	2
3.	tri		c.	3
4.	octa		d.	8
5.	dec		e.	1
6.	centi		f.	1,000
7.	kilo		g.	1,000,000
8.	mega		h.	100
9.	milli		i.	10
10.	du			

EXERCISE 12

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

bi

Back

MEANING:

two

EXAMPLE:

bicycle

Front

uni

Back

MEANING:

EXAMPLE:

Front

di

Back

MEANING:

EXAMPLE:

Front

tri

Back

MEANING:

EXAMPLE:

Front

octa

Back

MEANING:

EXAMPLE:

Front

centi

Back

MEANING:

EXAMPLE:

Front

milli

Back

MEANING:

EXAMPLE:

TABLE 7

LIST OF SIZE WORD PARTS, DEFINITIONS, AND EXAMPLES

Word Part	Definition	General Example	Your Example
micro	small	micrometer	
multi	many	multiply	
numer	number	numeral	
poly	many	polygon	
hemi/semi	half	hemisphere	
equi	equal	equivalent	

EXERCISE 13

Match the following:

1.	semi		a. equal
2.	micro		b. many
3.	multi		c. number
4.	numer		d. half
5.	poly		e. small
6.	hemi		
7.	equ		

EXERCISE 14

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

micro

Back

MEANING:

small

EXAMPLE:

microscope

Front

multi

Back

MEANING:

EXAMPLE:

Front

poly

Back

MEANING:

EXAMPLE:

Front

hemi

Back

MEANING:

EXAMPLE:

Front	Back
semi	MEANING: EXAMPLE:

Front	Back
numer	MEANING: EXAMPLE:

Front	Back
equi	MEANING: EXAMPLE:

TABLE 8

SCIENCE WORD PARTS OF WARMTH/LIGHT DEFINITIONS, AND EXAMPLES

Word Part	Definition	General Example	Your Example
therm/cal(or)	heat	thermometer/calorie	
chrom	color	kodachrome	
luc/lumen/lumin/cand/photo	light	lumination/photography	
helio/sol	sun	heliograph/solarium	
flagr/flam/pry/pyro	fire	flagrant	
rad/ray	ray	radiant	

EXERCISE 15

Match the following:

1.	term		a.	fire
2.	chrom		b.	sun
3.	luc		c.	color
4.	sol		d.	ray
5.	cal		e.	heat
6.	flagr		f.	light
7.	cand			
8.	rad			
9.	photo			

EXERCISE 16

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

flam

Back

MEANING:

fire

EXAMPLE:

flammable

Front

therm

Back

MEANING:

EXAMPLE:

Front

lumin

Back

MEANING:

EXAMPLE:

Front

helio

Back

MEANING:

EXAMPLE:

Front

pyro

Back

MEANING:

EXAMPLE:

Front

ray

Back

MEANING:

EXAMPLE:

Front

chrom

Back

MEANING:

EXAMPLE:

Front	Back
photo	MEANING: EXAMPLE:

Front	Back
cand	MEANING: EXAMPLE:

Front	Back
rad	MEANING: EXAMPLE:

TABLE 9

SCIENCE WORD PARTS OF EARTH DEFINITIONS, AND EXAMPLES

Word Part	Definition	General Example	Your Example
hydro/aqua	water	hydroplane/aquarium	
cav	hole	cavern	
geo	earth	geography	

EXERCISE 17

Match the following:

1.	hydro		a.	hole
2.	cav		b.	water
3.	geo		c.	earth
4.	aqua			

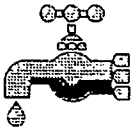
EXERCISE 18

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

hydro



Back

MEANING:

water

EXAMPLE:

hydraulic

Front

aqua

Back

MEANING:

EXAMPLE:

Front

cav

Back

MEANING:

EXAMPLE:

Front

geo

Back

MEANING:

EXAMPLE:

TABLE 10

SCIENCE WORD PARTS
OF POSITION OR MOVEMENT, DEFINITIONS & EXAMPLES

Word Part	Definition	General Example	Your Example
meter	measure	diameter	
fract	broken	fracture	
fus(e)	pour	interfuse	
struct	build or arrange	structure	
centri	center	centrifuge	
pel/pul	pull	propel	
flu/flux	flow	flux	
cycl	circle or wheel	kilocycle	
angle/angul	corner	triangle	
gon	angle	octagon	
lev	raise	leverage	
grad/gress	move by steps	gradual process	

EXERCISE 19

Match the following:

1.	fract		a.	build
2.	fus(e)		b.	circle
3.	struct		c.	center
4.	centri		d.	pull
5.	meter		e.	flow
6.	pel		f.	pour
7.	flu		g.	broken
8.	cyc		h.	corner
9.	angle		i.	move by steps
10.	gon		j.	raise
11.	gress		k.	angle
12.	lev		l.	measure

EXERCISE 20

Complete each of the following word cards by writing the meaning of the word part and your example on the back of the card. Then draw a picture that shows your example on the front. The first one is done for you.

Example

Front

struct

Back

MEANING:

build

EXAMPLE:

structure

Front

meter

Back

MEANING:

EXAMPLE:

Front

fract

Back

MEANING:

EXAMPLE:

Front

centri

Back

MEANING:

EXAMPLE:

Front

pel/pul

Back

MEANING:

EXAMPLE:

Front

flu/flux

Back

MEANING:

EXAMPLE:

Front

cycl

Back

MEANING:

EXAMPLE:

Front

angle/angul

Back

MEANING:

EXAMPLE:

Front

lev

Back

MEANING:

EXAMPLE:

Front

grad/gress

Back

MEANING:

EXAMPLE:

EXERCISE 21

Tyrone has spent many hours installing wires for electrical current. He's given little thought to how a bulb works. Then his young son learns about Thomas Edison. He asks his dad to tell him how a light bulb works. Tyrone is happy when he finds this information in his text:

> When many metals that are poor electrical conductors become hot from conducting current, they glow red and even white hot. Because of this flow, they give off light as well as heat. This is the way the ordinary ***incandescent*** bulb works.

1. Look at the word below. It has been divided into word parts.

I N | C A N D | E S C E N T

2. Listed below are three words that contain the word part ***cand***. Read their definitions.

CANDLE -- taper of wax that gives off light when lit

FOOTCANDLE -- a unit for measuring the amount of light

CANDELABRUM -- branched holder for candle lights

3. On the line below, write the common word(s) you see in them.

_____

4. Based on the meaning you found in #3, what kind of bulb is an incandescent one? Why do you think this bulb was named for this?

_____

_____

_____

❖

EXERCISE 22

Jacob is rewiring an older building at the refinery. It's cold in the building even on the warmest winter days. Jacob finds out that the building is warmed with radiant heating. He remembers reading:

> For a while the principle of ***radiant*** heating by passing warm air through ***cavities*** behind room surfaces and then back directly to the heater was popular. As in the case of other radiant forms, the slow ***thermal*** response of the structure made it sluggish.

1. Draw a line between the word part you recognize and the rest of the word.

R A D I A N T

2. Listed below are three words that begin with the word part ***rad***. Two are defined. you define the third.

RADIO -- a means of sending and receiving sounds through rays of sound

RADIATION -- the process of emitting radioactive rays

RADIAL -- _____

3. Look at the definitions in #2. On the line below, write the common word(s) you see in them.

_____

4. Based on your definition of ***rad***, what kind of heating is radiant heating?

_____

_____

_____

5. Draw a line between the word part you recognize and the rest of the word.

C A V I T I E S

6. Listed below are three words that begin with or contain the word part ***cav***. Define them. Use a dictionary, if needed.

CAVERN -- _____

EXCAVATE -- _____

CAVERNOUS -- _____

7. On the line below, write the common word(s) you see in the above definitions.

_____

8. Based on your definition of ***cav***, describe a cavity behind a room surface.

9. Draw a line between the word part you recognize and the rest of the word.

T H E R M A L

10. Listed below are three words that begin with or contain the word part ***therm***. Define them. Use a dictionary, if needed.

THERMOMETER -- _____

THERMOSTAT -- _____

THERMITE -- _____

11. Look at the definitions in #10. On the line below, write the common word(s) you see in them.

_____

12. Based on your definition of ***cav***, define ***thermal***?

_____

❖

EXERCISE 23

JMM Electrical Contractors plan to put a fire alarm system in the workshop of a plant. The room is very noisy. Bill, an electrician with JMM, sees there is no bell in the system. He checks his book and finds the following:

> Industrial building fire alarm systems are normally selective and fully supervised. ***Presignaling*** is used in structures where for any reason an evacuation alarm is ***undesirable***. In addition to manual stations at points of egress, these devices may also be used:
>
> 1. Temperature detectors in all storage areas and laboratories.
>
> 2. Smoke detectors in record rooms, continuous process laboratories, and other rooms with ***flammable*** materials.
>
> 3. Waterflow switches on all sprinklers.

1. Draw a line between the word part you recognize and the rest of the word.

P R E S I G N A L I N G

2. Listed on the shorter lines below are three words that begin with the word part ***pre***. Define them. Use a dictionary, if needed.

PREVIEW -- _____

PRESCHOOL -- _____

PREPOSSESS -- _____

3. Look at the definitions in #2. On the line below, write the common word(s) you see in them.

_____

_____

_____

4. Based on your definition of ***pre***, define ***presignaling***.

_____

_____

5. Draw a line between the word part you recognize and the rest of the word.

U N D E S I R A B L E

6. Listed below are three words that begin with or contain the word part ***un***. Define them. Use a dictionary, if needed.

UNKNOWN -- _____

UNFORGIVABLE -- _____

UNSTEADY -- _____

7. On the line below, write the common word(s) you see in the above definitions.

_____

8. Based on your definition of ***un***, define ***undesirable***.

_____

9. Draw a line between the word part you recognize and the rest of the word.

F L A M M A B L E

10. Listed below are three words that begin with or contain the word part ***flam***. Define them. Use if dictionary, if needed.

FLAMBE -- _____

FLAMBEAU -- _____

FLAMBOYANT -- _____

11. On the line below, write the common word(s) you see in the above definitions.

_____

12. Based on your definition of ***flam***, define ***flammable***.

_____

13. Should there be a bell in the system Bill is installing? If so, what action might Bill take?

_____

_____

EXERCISE 24

Christopher knows what brightness is. His teacher at ABC talked about luminance in the first class. Christopher hoped to find more about it in his text. He was happy to read:

> The terms brightness and ***luminance*** are almost entirely ***interchangeable***. The difference is slight. Brightness is the subjective perceived light coming from an object. Luminance is the light being emitted, ***transmitted***, or ***reflected*** from a surface.

1. Draw a line between the word part you recognize and the rest of the word.

L U M I N A N C E

2. Listed below are three words that begin with or contain the word part ***lumin***. Define them. Use a dictionary, if needed.

ILLUMINATION -- _____

LUMINARY -- _____

LUMINESCENCE -- _____

3. Look at the definitions in #2. On the line below, write the common word(s) you see in them.

_____

4. Based on your definition of ***lumin***, define ***luminance***.

_____

5. Draw a line between the word part you recognize and the rest of the word.

I N T E R C H A N G E A B L E

6. Listed below are three words that begin with or contain the word part ***inter***. Define them. Use a dictionary, if needed.

INTERIM -- _____

INTERMEDIATE -- _____

INTERMEDIARY -- _____

7. On the line below, write the common word(s) you see in the above definitions.

_____

8. Define changeable.

_____

9. Based on your definition of ***inter*** and ***changeable***, define ***interchangeable***.

10. Draw a line between the word part you recognize and the rest of the word.

R E F L E C T E D

11. Listed below are three words that begin with or contain the word part ***re***. Define them. Use a dictionary, if needed.

REABSORBED -- _____

REARRANGED -- _____

REACQUAINT -- _____

12. On the line below, write the common word(s) you see in the above definition.

_____

13. ***Flected*** is not a word. Based on your definition of ***re***, describe reflected light.

_____

_____

_____

❖

EXERCISE 25

Clinton has been working in the new conference room at the refinery. The conference room contains display cases. They will hold samples of products the refinery makes. the designer is very picky about where the lights will go. She even makes a big deal about ordering special, colored light bulbs. Clinton thinks she's nuts until he reads this in his text:

> A similar phenomenon occurs when the eye is exposed to a ***monochromatic*** scene where how good an object looks is due to coloration of the objects, rather than the ***illumination***. For example, a red light on meat in a meat market makes the meat look fresher.

1. Draw a line between the word part you recognize and the rest of the word.

M O N O C H R O M A T I C

2. Listed below are three words that begin with or contain the word part ***mono.*** Define them. Use a dictionary, if needed.

MONOGRAPH -- _____

MONOLITH -- _____

MONOLOGUE -- _____

3. Look at the definitions in #2. On the line below, write the common word(s) you see in them.

_____

4. Listed below are three words that begin with or contain the word part ***chrom***. Define them. Use a dictionary, if needed.

CHROMATIC -- _____

CHROMO -- _____

CHROMATICITY -- _____

5. Combine the meaning you wrote in #3 with the one in #4 to define ***chrom***.

_____

6. Based on your definition of ***mono*** and ***chromatic***, define ***monochromatic***.

_____

7. Draw a line between the word part you recognize and the rest of the word.

I L L U M I N A T I O N

8. Based on the meaning you found for ***lumin*** in Exercise 4, define ***illumination***.

_____

EXERCISE 26

Rick knows that magnets are used to make electricity. He never knew how exactly. He always wanted to know, however. Rick was happy to read the following in his Electricity One text:

> In order to ***demagnetize*** a magnet, the molecules must be again be ***disarranged*** so that their fields oppose each other.

1. Draw a line between the word part you recognize and the rest of the word.

D E M A G N E T I Z E

2. Listed on the shorter lines below, are three words that begin with the word part ***de***. Define them. Use a dictionary, if needed.

   DEMISTIFY -- _____

   DEFAME -- _____

   DEFOG -- _____

3. On the line below, write the common word(s) you see in the above definition.

   _____

   _____

4. What does ***magnetize*** mean?

   _____

5. Combine the definitions in #3 and #4 to define ***demagnetize***.

   _____

6. Draw a line between the word part you recognize and the rest of the word.

D I S A R R A N G E D

7. Listed below are three words that begin with or contain the word part ***dis***. Define them. Use a dictionary, if needed.

DISARRAY -- _____

DISASSEMBLE -- _____

DISCONNECT -- _____

8. On the line below, write the common word(s) you see in the above definition.

_____

9. What does ***arranged*** mean?

_____

10. Combine your definitions in #8 and #9 to define ***disarranged***.

_____

_____

❖ ❖