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ABSTRACT

Developed by the ABCs of Construction National Workplace Literacy Project, this fifth-grade level module teaches word attack skills for technical terms used by pipefitters, using word parts and root words. Basic information on structural analysis covers roots, prefixes and suffixes, its limitations, and defining words using structural analysis. Next, the module provides hints for retaining meanings by building a card file with visual representations of terminology. Twenty-seven exercises are included. (YLB)

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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)

BUILDING WORKPLACE VOCABULARY FOR PIPEFITTERS: 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 **not**. 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 pipefitting. 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			

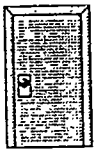
EXERCISE 2

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/exp



Back

MEANING:

out

EXAMPLE:

exit

Front

inter

Back

MEANING:

EXAMPLE:

Front

trans

Back

MEANING:

EXAMPLE:

Front

en/em/in

Back

MEANING:

EXAMPLE:

Front

mid/med

Back

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	Back
super	MEANING: EXAMPLE:

Front	Back
meta	MEANING: EXAMPLE:

Front	Back
over	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. ɔnd
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	Back
pre	MEANING: EXAMPLE:

Front	Back
post	MEANING: EXAMPLE:

Front	Back
pro	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	Back
vert	MEANING: EXAMPLE:

Front	Back
ject	MEANING: MEANING:

Front	Back
vis	EXAMPLE: MEANING:

Front	Back
rupt	EXAMPLE: MEANING:

Front	Back
junct	MEANING: EXAMPLE:

Front	Back
cede	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
mis	MEANING: EXAMPLE:

Front	Back
a	MEANING: EXAMPLE:

Front	Back
dis	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	Back
uni	MEANING: EXAMPLE:

Front	Back
di	MEANING: EXAMPLE:

Front	Back
tri	MEANING: EXAMPLE:

Front	Back
octa	MEANING: EXAMPLE:

Front	Back
centi	MEANING: EXAMPLE:

Front	Back
milli	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	Back
multi	MEANING: EXAMPLE:

Front	Back
poly	MEANING: EXAMPLE:

Front	Back
hemi	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	Back
therm	MEANING: EXAMPLE:

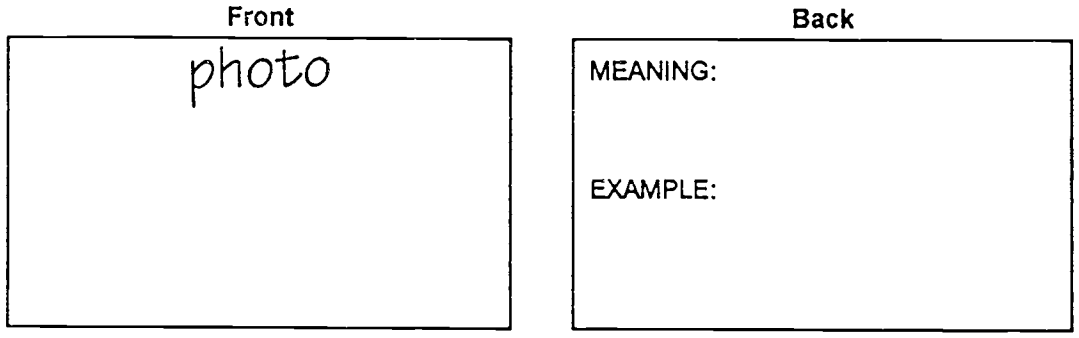
Front	Back
lumin	MEANING: EXAMPLE:

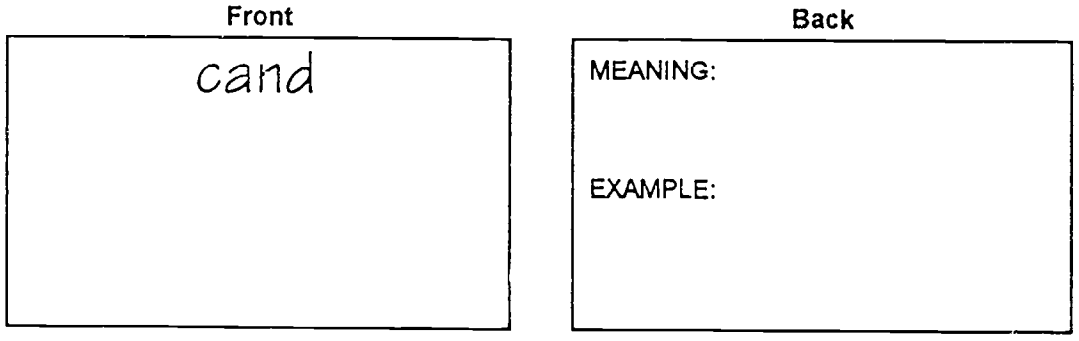
Front	Back
helio	MEANING: EXAMPLE:

Front	Back
pyro	MEANING: EXAMPLE:

Front	Back
ray	MEANING: EXAMPLE:

Front	Back
chrom	MEANING: EXAMPLE:


Front
photo
Back
MEANING:
EXAMPLE:


Front
cand
Back
MEANING:
EXAMPLE:

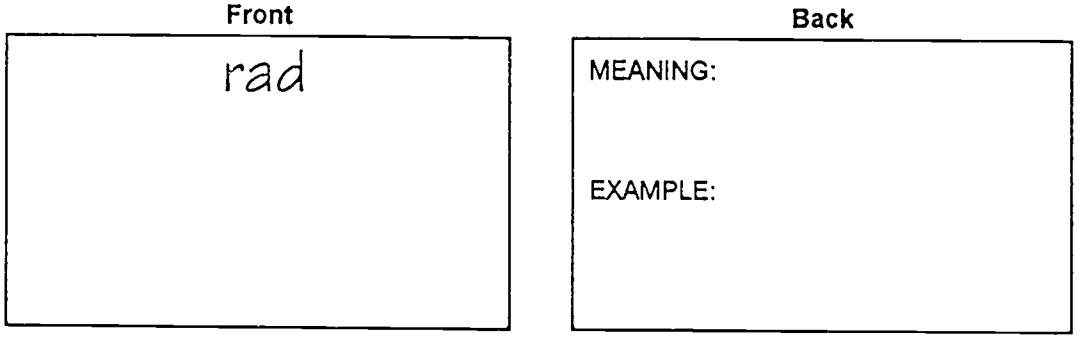

Front
rad
Back
MEANING:
EXAMPLE:

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	Back
meter	MEANING: EXAMPLE:

Front	Back
fract	MEANING: EXAMPLE:

Front	Back
centi	MEANING: EXAMPLE:

Front	Back
pel/pul	MEANING: EXAMPLE:

Front	Back
flu/flux	MEANING: EXAMPLE:

Front	Back
cycl	MEANING: EXAMPLE:

Front	Back
angle/angul	MEANING: EXAMPLE:

Front	Back
lev	MEANING: EXAMPLE:

Front	Back
grad/gress	MEANING: EXAMPLE:

EXERCISE 21

Jeannie's boss called her. He tells her to install a new T-bar to expand the refinery discharge system. When Jeannie goes home, she checks her text. This is what it says about T-bar installation:

> Installation of the T-bar clamps is quick and easy. The T-bar is placed between the pipe and/or fitting so that it is ***parallel*** to the run of pipe. This can be checked by noting the position of the handle in relation to the pipe. The pipe is then brought tight against the shaft about the T-bar. This sets the correct root opening. The clamp is tightened against the pipe by screwing down the torque lever. This butts the shoe against the pipe, tightening and aligning the pipe. Only hand tightening is necessary.

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

P A R A | L L E L

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

PARALEGAL -- Person who works beside a lawyer

PARATHYROID -- Gland on the side of the thyroid

PARADE -- People marching side-by-side

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

_____

4. Based on the meaning you found in #3, describe how the T-bar should look in relation to the run of pipe.

_____

_____

❖

EXERCISE 22

Joe is new to pipefitting. His boss tells him to get some backing rings from the supply truck. Joe sees the rings are split. He waits all day for the boss to yell at him. That night in class, Joe learns about backing rings.

> It is evident from the ***photographs*** that backing rings are split at one point along the ***circumference***. During welding, t he heat will draw the backing ring tight against the inner wall of the pipe, eliminating crevices and openings between the ring and the pipe. This insures a smooth ***unobstructed*** flow of material through the pipe.

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

P H O T O G R A P H S

2. Listed below are three words that begin with the word part ***photo***. Define them. Use a dictionary, if necessary.

   PHOTOJOURNALISM -- _____

   PHOTOSTAT -- _____

   PHOTOSYNTHESIS -- _____

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

   _____

4. What does ***graph*** mean?

   _____

5. Combine the meaning you wrote in #3 with that in #4.

   PHOTOGRAPH -- _____

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

C I R C U M F E R E N C E

7. Listed below are two words that begin with or contain the word part ***circ***. You supply a third. Define them. Use a dictionary, if needed.

CIRCULATE -- _____

CIRCLE -- _____

_____ -- _____

8. Look at the definitions in #7. On the line below, write the common word(s) you see in them.

_____

9. ***Umference*** is not a word.

10. Based on your definition of ***circ***, describe the place where the backing rings were split.

_____

_____

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

U N O B S T R U C T E D

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

UNKNOWN -- _____

UNFORGIVEN -- _____

UNSTEADY -- _____

13. Look at the definitions in #12. On the line below, write the common word(s) you see in them.

_____

14. ***Obstructed*** is a word. What does it mean?

_____

15. Combine the meaning you wrote in #13 and the one in #14 to define ***obstructed***.

_____

❖

EXERCISE 23

Leroy is installing pipe to an underground storage tank. The alignment needs to be exact. This is important all the time. It is even more important here. Why? Leakage from the tank could pollute groundwater. Leroy decides to check his text for alignment information:

> High-low refers to the alignment of one pipe or fitting in relation to the other. Ideally, there should be no ***misalignment*** between the internal ***diameters***. The pieces should be as concentric as two coins placed one over the other. However, because of this, a certain amount of variation from the ideal high-low is tolerated. High-low can be measured with a high low ***mismatch*** gauge.

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

M I S A L I G N M E N T

M I S M A T C H

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

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

4. ***Alignment*** and ***match*** are words. What do they mean?

5. Combine the meaning you wrote in #3 with the ones in #4 to define the following:

MISALIGNMENT -- _____

MISMATCH -- _____

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

D I A M E T E R

7. List below three words that begin with the word part ***di***. Define them. Use a dictionary, if needed.

_____ -- _____

_____ -- _____

_____ -- _____

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

_____

9. List on the shorter lines below three words that begin with the word ***meter***. Define them on the longer lines.

_____ -- _____

_____ -- _____

_____ -- _____

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

_____

11. Combine the meaning you wrote in #8 with the one in #10 to define ***diameter***.

_____

EXERCISE 24

Mic has to install stainless steel pipe in the plant's discharge system. He decides to TIG weld it because of what he's read in his text:

> Sometimes, gas tungsten-arc welding is used. This process is more commonly known as TIG welding, which stands for "Tungsten inert gas". This is an electric arc process that uses a ***nonconsumable*** tungsten electrode. An inert gas, usually argon or helium, shields the weld. The gas is supplied through the welding torch from an external cylinder. A filler rod os the same material as t he base metal is sometimes added to the weld. TIG welding produces very high quality welds on pipe with thin walls, on alloy pipe, and in other applications when the previously mentioned processes are ***undesirable***.

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

N O N C O N S U M A B L E

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

_____ -- _____

_____ -- _____

_____ -- _____

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

_____

_____

4. ***Consumable*** is a word. What does it mean?

_____

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

_____

6. 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

7. Based on what you learned in Exercise 22, what does it mean?

UNDESIRABLE -- _____

❖

EXERCISE 25

Molly needs to measure the wall thickness on several existing pipe risers. She decides to use a micrometer wrench to insure she gets the right measurement. A helper asks her why she choose this wrench. Molly tells him about what she knows about micrometer setting torque wrenches:

> The ***micrometer*** setting torque wrench is commonly called the click, or the breakaway, torque wrench. When the proper torque is reached, the wren***ch makes a*** click and the handle releases, or "breaks," and moves freely for a short distance. This makes sure that the proper torque has been applied.

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

M I C R O M E T E R

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

_____ -- _____

_____ -- _____

_____ -- _____

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

_____

4. Based on what you learned in Exercise 23, what does **meter** mean?

_____

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

MICROMETER - _____

_____

❖

EXERCISE 26

Lolly's daughter knows he cuts pipe. She wants him to bring home one of his "big pipe knives". Lolly tells her about dies. He used information he's read in his text:

> Dies do the actual cutting. Dies are ***interchangeable*** and vary according to the type of thread being cut. There are special dies that cut the tapered pipe thread.

1. 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

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

_____ -- _____

_____ -- _____

_____ -- _____

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

_____

_____

4. ***Changeable*** is a word. To best define it, look at its parts.

CHANGE -- _____

ABLE -- _____

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

INTERCHANGEABLE -- _____

_____

6. Could Lolly's daughter understand his text? Why or why not?

_____

_____

7. Rewrite the text description in words Lolly's daughter might better understand.

_____

_____

_____

❖

EXERCISE 27

Tobias and his crew are installing pipe from the holding tank to the refinery. The boss tells Tobias to check the angles at which pipe must be set. Tobias is not sure how he should do that. He asks one of his coworkers, Moe. Moe gets a protractor and tells Tobias what he learned in class:

> A protractor is a device used to measure or construct angles. It is usually ***semicircular*** in shape with ***graduations*** for various angles.

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

S E M I C I R C U L A R

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

   SEMIAUTOMATIC -- _____

   SEMIFINAL -- _____

   SEMICONSCIOUS -- _____

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

   _____

   _____

4. What does ***circular*** mean? To define it, examine its parts. Based on what you learned in Exercise 22, what does ***circ*** mean?

   _____

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

   SEMICIRCULAR -- _____

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

G R A D U A T I O N S

7. List on the shorter lines below, three words that begin with the word part ***grad***. Define them on the longer lines. Use a dictionary, if needed.

_____ -- _____

_____ -- _____

_____ -- _____

8. On the lines below, write the common word(s) you see in the above definitions:

_____

_____

9. ***Uations*** is not a word.

10. Use these meanings to rewrite the description of a protractor.

_____

_____

_____

❖ ❖