

<p>MPS Unit <u>1</u></p>	<p>Title: <u>AWARENESS</u> Date: <u>SEPT 16 /</u></p>	
<p>Objectives</p>	<p>Numbered on attached orange sheet. Plus personal objective of: <u>Being confident, thorough, and accurate in P. solving</u></p>	
<p>Key Concepts:</p>	<p>List five or six you feel were important: (Attach "Discovery" Sheet)</p> <ul style="list-style-type: none"> - learning how to be a good, methodical problem solver is important. - verbally expressing ideas - no matter how crazy they seem & is difficult - Getting feedback is important - difficult to apply skills to 204 questions - writing helps clarify problems 	
<p>Objective:</p>	<p>Before:</p> <ol style="list-style-type: none"> 1. I can give a definition. 2. I need to work on my ability to verbally describe mental processes used to solve problems. 3. I have never used the Whimbey pair method. I feel I could be a good listener in that I would be supportive and wouldn't interfere too much. 4. I believe I will have to be more active and methodical in verbally describing processes. 5. I think I will need to practice my skills of recording the actual process used in problem solving. Although I can solve many problems, I am not usually aware of the individual steps I am taking. 	<p>After:</p> <ol style="list-style-type: none"> 1. I was usually able to define the problem to be solved, but sometimes unclear definitions and terms in the problem created difficulties. 2. I am slightly aware of the process used to solve problems. I have always tried to do things in some type of logical order. 3. The Whimbey pair method is a good idea. Although being the listener was hard, it was interesting to watch someone going through the problem solving process. I believe I should have been more supportive. 4. I need to develop my skills of speaking aloud when I am solving problems. 5. I was more skilled than I thought at recording information during the problem process. I made charts and lists which made the problems clearer.
<p>Comments about pre & post test on orange sheets: I underestimated my skills slightly on the pre & post test in the awareness. I am aware of my problem solving process slightly. I usually gather information and then work on alternate methods of finding an answer. I also underestimated my skills. After really focussing on the way in which I solve problems, I saw that I was active in writing and I re-read the problem if confused. I do need to work on my verbal communication.</p>		

I solve problems, I saw that I was active in writing and I re-read the problem if confused. I do need to work on my verbal communication.

Table 2-15: Awareness: **DISCOVERY**

Activities	Discovered	Application
Problem Solving	Threatening Difficult to start but once got going, OK. Type of problem dictates how we use process. -	difficult if we don't know "subject topic" but talking aloud helped see when we didn't know. ∴ we must go learn the material. - charts, graphs, formulas - when written down on paper may clarify the problem.
Listening	Listener - hard not to jump in and ask questions "What other ways to look at it?" - I may be too quiet and passive. - Wanted to help, but didn't want to give away the answer.	- difficult to help someone if our knowledge of the subject is limited.
The TAPPS process	liked getting feedback	- assignment may take longer if all parties take turns being solver/listener. - seems like the problem solver is doing most of the work. ✓

1

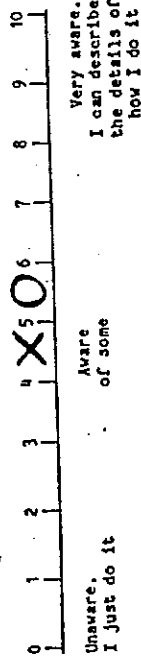
Unit 1: Awareness: Pretest

Definition:

Awareness is the ability to identify, and describe (to others) the process you use when you solve problems. You can slow the process down and do not have long periods when something just happens and you do not know what it is.

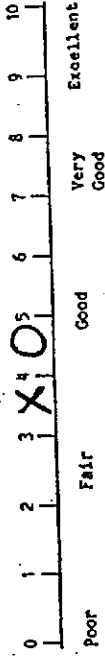
Awareness:

How aware are you of the process you use to solve problems? Use an "x" to indicate your assessment.



Skills:

How would you rate your skill at being able to write out or describe verbally the process? Use an "x" to indicate your assessment.



Comments:

1

Unit 1: Awareness

- given a term listed under concepts introduced, you should be able to give a word definition and to list pertinent characteristics and to cite an example.
- given an exercise, you will be able to verbally describe the mental process you are using to solve the problem such that there will be less than two silent periods of more than 10s duration.
- given an exercise in the Whimbe pair method, you will be able to play the role of a good listener; (you will not try to get the problem solver to use your method of solution or select your answer, you will be supportive, you will not be disruptive, you will positively encourage verbalization).
- given an exercise and your verbal description of the process you use, you will demonstrate that you are active, methodical, careful and that you check and double check as you describe the process.
- given an exercise, you will be able to record in writing the process used to solve a problem.

Concepts Introduced - Awareness, characteristics of "good" problem solvers, advantages of becoming aware of the process, Whimbe-pair Problem Solver, Whimbe-pair Listener.

Exercises

1. As a listener in the Whimbe pair method, the problem solver has misread the problem statement, has chosen an incorrect answer "D" and has said "That completes that problem". Your response is:
 - a. "You have misread the problem, please reread it and start again."
 - b. "I'm sorry; I should have told you earlier but you have misread the problem; let's reread it carefully again."
 - c. "You are wrong; the right answer is C; you can do better on the next problem."
 - d. "Can you check?"
 - e. "Are you sure?"
 - f. "OK, let's go on to the next problem."
 - g. Other (provide your specific response).
2. Record in writing the first 10 minutes of the process you use to solve the following exercises:

(exercises selected similar to those in section 1.7).

MPS Unit <u>1</u>	Title: <u>AWARENESS</u> Name: _____	Date: <u>SEPT 24/</u>
Observations & Evidence from the Workshop:	Green sheets from unit are attached and identified separately by Fig or table number. Discussion of this evidence: All problems for which I was the problem solver are attached, and are referenced as TABLES. ✓	
TABLE A	I was quite active in terms of written communication during this exercise. As seen, I made use of a chart to separate the main words I was looking for. Then, to double-check my answer, I drew arrows to relate the words.	
TABLES B and C	During the second time as a problem solver, I also wrote down information while solving the unit problem. I was stuck, so I began writing down other equations which may have helped me solve the problem. I believe that my written communication is fair-to-good.	
TABLE 1-1	During one of the first 'problem solver' exercises, I found that I rushed through reading the problem and clearly understanding it. But, second time as the problem solver was more efficient. I took time to read and re-read the problem, and I didn't expect to find an immediate answer. As the listener, I felt I was a little too quiet the first time. It was difficult to give the person hints, and not my own opinion as to how to solve the problem. I also found it hard to assist the person in one of the chemistry problems, since I was also unsure of terms and values.	
TABLE 1-4 Feedback Forms - Problem Solver	I underestimated some of my problem solving skills. For item 3, I thought I skimmed over the problem too quickly, while my partner felt I was fairly accurate in double checking answers. For item 6, I thought I spent too much time thinking silently. Although I did write things down, when I got stuck, I ran over ideas in my head rather than verbalizing or writing them down. Both my partner and I felt that I tackled problems enthusiastically, I tried to be accurate, I broke up the problem when tackling it, and I went back and checked things when stuck.	
TABLE 1-3 Feedback Forms - Listener	I found the listener to provide good input, and to be supportive in coaching me and helping me to verbalize. I didn't think I did a good job listening because I was too silent. However, my partner (Dr. Woods) found that I was attentive and unthreatening. I didn't want to interrupt the problem solver's train of thought, so I gave positive input when I could.	

Accable

Completed

Case 1 *

In a different language *luk eir lai* means "heavy little package," *bo lai* means "heavy man" and *luk jo* means "pretty package." How would you say "little man" in this language?

bo eir.

package	little	man	heavy
luk.	eir	bo	lai

Case 2 *

again working on this one

Salesmen who work for the Acme Wig Company are assigned to a different city each year. Henry began working for Acme in New York in 1965, and in the succeeding 4 years worked in Minneapolis, New Haven, Youngstown and Charleston, in that order. Peter worked for Acme in New Haven in 1963, and in succeeding years worked in New York, Charleston, Minneapolis and Youngstown. Fred worked for Acme in Charleston in 1967; the previous 2 years he had worked first in New Haven and then in Minneapolis. John worked in Charleston in 1968. Before that he was in New Haven, before that Youngstown, and before that New York. Which Acme salesmen were in New Haven in 1967? Which ones were in Minneapolis in 1966?

minneapolis 1966	Acme
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Case 3 *

On a certain day I ate lunch at Tommy's, took out 2 books from the library (*The Sea Wolf* and *Martin Eden*, both by Jack London), visited the museum, and had a cavity filled. Tommy's is closed on Wednesday, the library is closed on weekends, the museum is only open Monday, Wednesday and Friday, and my dentist has office hours Tuesday, Friday and Saturday. On which day of the week did I do all these things?

Case 4 *

Sally loaned \$7.00 to Betty. But Sally borrowed \$15.00 from Estella and \$32.00 from Joan. Moreover, Joan owes \$3.00 to Estella and \$7.00 to Betty. One day the girls got together at Betty's house to straighten out their accounts. Which girl left with \$18.00 more than she came with?

Hint: On your diagram, use arrows to show which person has to return money to which other person. Show the direction in which the money must be returned.

Case 5 *

The number of cows owned by farmer Smith is the number owned by farmer Thompson divided by the number owned by farmer Jones. Farmer Thompson, who owns 42 cows, would own 8 times as many cows as farmer Jones if he owned 14 more cows. How many cows does farmer Smith own?

Case 23: Worked on
ChE 2G2:

Week 32

Exercise 1:

The value of g_c in the American Engineering System is:

- a. 32.2
- b. 32.2 ft lb/lb s²
- c. 32.2 ft lbf/lbm s²
- (d.) 32.2 ft lbm/lbf s²
- e. 32.2 ft/s²
- f. depends on the location (for example, the moon)
- h. other

$$F = ma$$

$$1N = 1kg \cdot 1m/s^2$$

$$1lbf \cdot g_c \frac{32.2}{lbf} = 1lbm \cdot \frac{32.2 ft}{s^2}$$

Case 24

Exercise 2: Bernoulli's Eqn.

The following equation has the units of "ft lbf/lbm".

$$\Delta(v)^2 + \frac{\Delta p}{\rho} + \Delta z \quad [=] \quad ft \cdot lbf / lbm$$

- where v = velocity of the fluid, ft/s
- p = pressure, lbf/ft²
- ρ = density, lbm/ft³
- z = elevation or height, ft.

Consider the term Δz :

- a. since the units of z are not the same as the units in the equation, it should not be included;
- b. the term should be included; the units of "ft" are acceptable because the correct units are "understood".
- c. consistency of units does not apply to this equation; go ahead and use the term as it is.
- d. the term must be corrected by multiplying by g/g_c
- e. other.

$$\left(\frac{\text{ft}^2}{\text{s}^2} \right) \cdot \frac{\frac{\text{lbf}}{\text{ft}^2}}{\frac{\text{lb}_m}{\text{ft}^2}} \Rightarrow \frac{\text{lbf}}{\text{ft}^2}$$

$$\text{ft} \cdot x \frac{\frac{\text{ft}}{\text{s}^2}}{32.2 \frac{\text{lbf}}{\text{ft}^2 \text{lb}_m \cdot \text{s}^2}}$$

TABLE 1-1: Personal Evaluation

You have had a chance to experience Whimbey's method.

Exercise 1-1:

As the Problem Solver, what have you learned about yourself and how you solve problems? (For example, because you slowed down the process, what did you see yourself doing? How often did you check yourself? Look at your worksheet; did you do a lot of things? How often did you go back and re-read the problem? Did you clearly state what you were trying to solve for? Did you "hope" that an idea worked out or did you actually check it out? Was this fun? Should you do more of this?)

I learned that I don't always solve problems systematically. I try to find out what a possible answer might be before I clearly define the problem. I found it hard to verbally express the method of problem solving used. I re-read the problem once again. I clearly stated what I was trying to solve. I checked out my answer to see if my initial thought was correct. This process was fun and helpful. I should do more of this, since it prevents me from running circles around the problem, without actually clarifying anything. I'm more clear as to the objective

As the Listener, was it an easy task? What was the hardest thing to do? What did you learn about the process of solving problems? What surprises did you note in the approach taken by the problem solver? If the problem solver got stuck, what did he/she do?

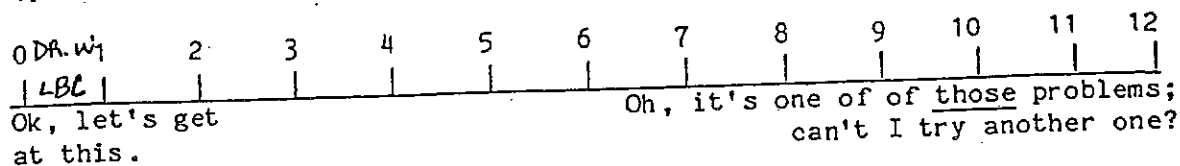
No, being the listener was not an easy task. The hardest thing to do was to keep ^{back} my own opinion about the answer, and to let the speaker go through the thought process. I learned that solving problems is a difficult process. When obstacles are encountered, it is hard to get on the right track. During the second session, I was the listener for the chemistry problem. This was difficult because I too was working out the problem as the problem solver was. I tried to give my own input when he was stuck. When stuck, he tried to work out a simpler form of the problem in order to clarify definitions stated in the problem.

TABLE 1-4: Problem Solving Style

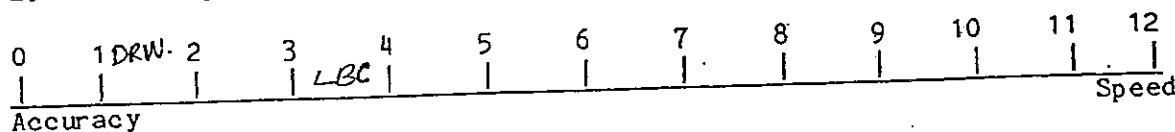
Exercise 1-3:

During this experience, you observed someone else solving problems and you became aware of what you did when you solved problems. Here are some of the characteristics that may be observed. Without consultation with your partner, characterize yourself by putting your initials on the following scales. Then, characterize your partner.

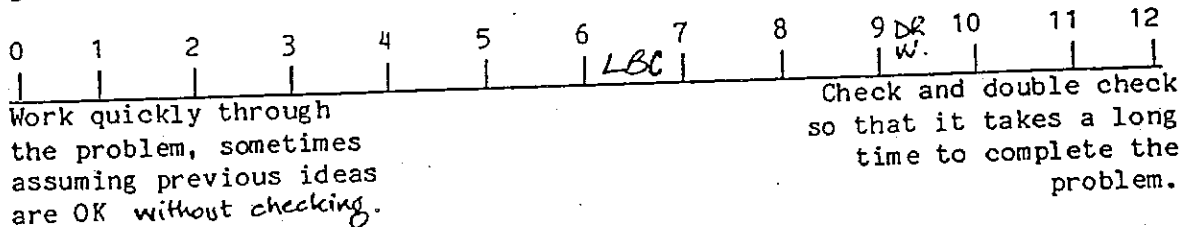
1. Initial response is:



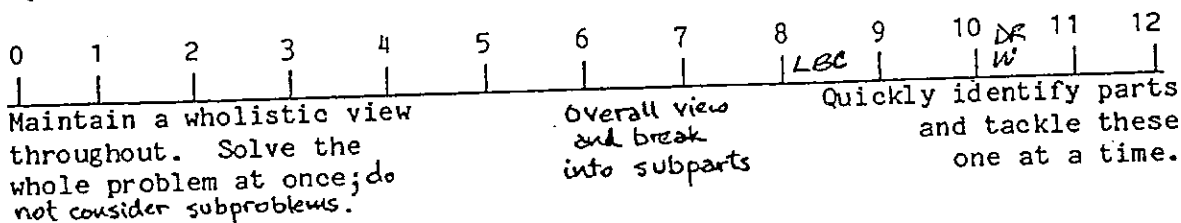
2. Your emphasis is on:



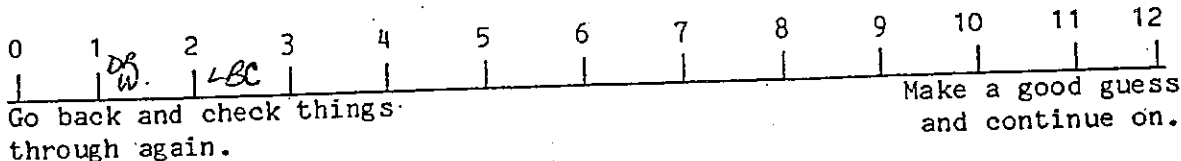
3. You:



4. You:



5. When stuck, you:



6. You do all your thinking:

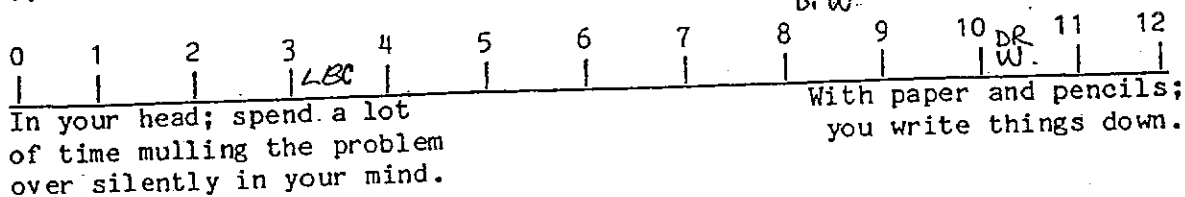


TABLE 1-3: Feedback for the Listener

Exercise 1-4:

Attitude of Listener Toward Me as I was the PS

~~LBC~~ Partner's result.

1. Mode of interaction:

	LBC			DR W.					
passive.	way	not	not	about	little	too	much	active	
hardly knew	not	enough	quite	what I	too	much	too	continually	
he/she was	enough		enough	wanted	much		much	interrupted.	
there								I could	
(ignored me).								hardly talk.	

2. I found the listener

~~LBC~~ Partner's result.

				DR W.				excessively
very	too		little	about	little	too	much	supportive
threat-	threat-	threat-	threat-	what I	too	suppor-	too	
ening	ening	ening	ening	wanted	suppor-	tive	suppor-	
					tive		tive	

3. I would characterize the listener as

- too silent LBC
 - coach DR. W.
 - leader
 - neutral sounding board
- L.B.C
↑
Partner's result

4. The listener's emphasis was on:

- listening to me
- helping me to verbalize
- helping me to solve the problem
- solving the problem for me

- LBC
 - DR. W
 -
 -
- Partner's
same
result

Every PS has different needs! Use this feedback as guidance!

MPS Unit 1	Title: <u>AWARENESS</u> Name: _____	Date: <u>SEPT. 26 19</u>
Observations & Evidence from Application to ChE 2D4, other courses [red] and to everyday events [green].	<p>Green sheet for the week is attached. Discussion of this evidence:</p> <p>The skills learned were applicable to CHE 2D4. The few sample questions involving units got us started. Even some of these unit questions can be intimidating if the theory or basis formulas are unknown. In doing the questions I tried to write down as much information as possible, and I referred back to notes and examples. Being 'aware' of the process I was using made me feel more confident in myself.</p> <p>Additional applications:</p> <p>In completing my math 2mb assignment and homework problems, I encountered many problems which I got stuck on shortly after attempting them. Instead of getting all nervous and thinking I just wasn't 'smart enough', I went back to the question and really tried to understand all the terms given. I drew a graph for one of the problems, which helped me to understand the theory behind the problem. I also broke one of the word problems down into steps. The main thing was that I realized I could do the problem, or most of it, so I maintained my confidence.</p> <p>Last week, I had an Organic Chemistry lab. The lab experiment seemed to be very lengthy. Instead of panicking right away about whether or not I would actually finish, I tried to get through it accurately and efficiently. I asked the T.A. questions, and I did complete the lab.</p> <p>This past week, something went wrong with my computer. When I turned it on, the message "Bad or missing command interpreter" appeared. At first I panicked and got nervous about not being able to use the computer for the "hundreds" of assignments. Since worrying didn't get me anywhere, I inquired about the</p>	

problem during school, and asked around for some help. I soon found out the problem was that DOS files had been deleted. I read some manuals, and before long the problem was solved. My problem solving activities in 262 helped me to tackle the problem efficiently, even though I'm not very computer oriented.

Week 30

Course Chem Eng

What I learned about PS from the assignment exercises & problems this week. Chapter 2-2, 6, 11, 14, 18 due Tues Sept. 22.

Assignment Before doing the assignment, it was necessary to read the entire chapter (Ch. 2) and it was helpful to attempt the 'Test Yourself' problems. This allowed me to understand the question asked, and to follow similar procedures used in previous example problems. I actively wrote down numbers, formulas and possible methods on the rough copy. After checking my own values over, I compared them to other's results. For 2 of the questions, I discussed them ~~with~~ and worked on them with another classmate.

About PS most of the assignment questions in

ChE 2D4 involved numerical calculations. I was not too comfortable with unit conversions before I began this course. By thoroughly reading the chapter and going through example problems, I became more clear on the topic. I found it useful to read through the problem slowly once, and then to go through it again, writing down all the relevant information such as numbers & terms. Somewhere on the page, I usually wrote, in point form, the general question or problem asked. I was never really aware of my problem-solving skills. I was just used to quickly reading the problem & getting right down to "what do they want to know?" and how can I get the answer? My skills have improved gradually. Now, I try to take more time to plan out and really try & understand the problem. I still need to stop thinking silently - instead, I should speak aloud or write those thoughts down. I attempted two problems with a classmate. We worked on the problems together - at times I listened to her ideas, and then she listened to mine. We maintained positive attitudes, and constantly checked back to confirm values and conversions. Being accurate the first time around saved a great deal of time later on!!!

Experience Factors I learned & will memorize.

Use SI units. $1 \text{ atm.} = 1.01325 \times 10^5 \text{ N/m}^2$
 $= 760 \text{ mmHg at } 0^\circ\text{C}$

Density of water = 1000 kg/m^3 (at 4°C)

Absolute Zero = $0 \text{ K} = -273.15^\circ\text{C}$

$g_c = 1 \text{ kg} \cdot \text{m/s}^2 = 1 \text{ g} \cdot \text{cm/s}^2 = 32.174 \text{ lbm} \cdot \text{ft/s}^2$ ✓

SI units →

N

dyne

lbf

1 mole of gas at STP (273K, 1atm) occupies 22.4L.

MPS Unit <u>1</u>	Title: <u>AWARENESS</u> Name: _____		Date: <u>SEPT 26/</u>	
Other Evidence & discussion:	<p>although most of the problems referred to in this class are chemical Engineering Problems, I feel that they <u>CAN</u> apply to everyday life. Any situation in which a decision must be made requires a thorough understanding of the facts. Maintaining confidence and being concerned with doing things properly rather than quickly is important in life.</p>			
Conclusions:	<p>I found the Whimsey pair method to be an enjoyable and interesting way of becoming aware of the skills needed in problem solving. I am more aware of the skills needed to solve problems, and of the vital process used. I am constantly working on the aspect of telling myself, and actually believing, that I <u>can</u> solve most problems. I feel that thoroughly reading and understanding the question and issue is the vital first step in problem solving. I used to tend to get flustered and nervous when I couldn't find the answer to a problem within 5 minutes of reading it. Now I understand that it takes time to go through the complete process. Even though I am fairly active in writing things down, I believe I can yet improve this skill. I must also improve my verbal communication of the thought processes I am going through.</p>			
Progress in Achieving Objectives:	Date: _____	_____	_____	_____

Indicate degree to which you have achieved the course objectives