



SCANS Work Readiness Kit



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SCANS Work Readiness Kit

Introduction

The SCANS Work Readiness Kit provides instructional and supplemental activities designed to build the student's skill levels in the essential areas needed prior to employment. Working through the prescribed activities helps prepare individuals for the workplace by raising their performance levels in the following skill areas:

- ★ Applied Math Skills
- ★ Applied Technology Skills
- ★ Applied Writing Skills
- ★ Basic Skills - English
- ★ Basic Skills - Math
- ★ Listening Skills
- ★ Locating Information Skills
- ★ Observation Skills
- ★ Reading for Information Skills
- ★ Teamwork Skills
- ★ Teamwork and Problem Solving Skills

The instructional nature of the activities creates a unique experiential learning opportunity. Because the activities are work-based, individuals are exposed to a broad selection of career pathways including Business & Marketing, Industrial & Engineering, Health & Human Services, Agriculture & Environmental. This method of instruction has proven to be more successful than the perfunctory 'practice test' format.

The SCANS Work Readiness Kit is arranged for ease of use. The materials provided for each skill area are separated into color coded tabs that are marked accordingly. Multimedia components, i.e. DVD and audio CDs are clearly marked and stored in the same binder as the reproducible activities. Each skill area includes an introduction page outlining the activities, and where appropriate, a correlation to the skill levels established by ACT for their Work Keys® Assessment. Each activity contains a brief overview of the activity and a list of any necessary materials, i.e., pencils, paper clips, rulers etc.

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Applied Mathematics

Applied Mathematics is the skill of applying mathematical reasoning and problem-solving techniques to work-related problems. Solving mathematical problems in the workplace can differ from solving problems in the classroom. While the math skills needed are the same, math problems in the workplace are not usually laid out neatly in a textbook format. Instead, the worker is often responsible for determining the important information and the best method for setting up and solving the problem. It is, therefore, critical to strengthen each learner's core mathematics skills and to develop his or her repertoire of problem-solving strategies. Individuals possessing these Applied Mathematics skills will be able to successfully tackle novel situations involving mathematics problems in the workplace.

The following activities strengthen problem solving techniques and build basic math skills.

Work Keys [®] Level	3	4	5	6
Activity 1 - Filling out travel Expense Report	X			
Activity 2 - Average Inventory		X		
Activity 3 - Measuring Plots of Land			X	
Activity 4 - Building a Roof - Rafter Lengths				X

APPLIED MATHEMATICS

OVERVIEW

Filling Out A Travel Expense Report

In this activity, students simulate the task of an administrative assistant or secretary who helps a company employee to complete a travel and expense report. The teacher introduces the simulation by emphasizing the prevalence and importance of this office function. With assistance from the teacher, the students invent reasons for their own business trips, and they write notes to be used later. The teacher reviews common trip expenses and ranges of costs, and goes over the form to be used in the simulation. Then, students are paired, one in the role of traveler, and the other in the role of assistant. The assistant "interviews" the traveler and enters information on the form. When all the necessary information is entered, the students exchange roles and repeat the process. Each student completes his own arithmetic, but students check and approve each other's work. The activity concludes with a restatement by the teacher on the invaluableness of reading and arithmetic skills to successful execution of office tasks. Skills emphasized in this activity include following oral and printed (procedural) instructions and handling of basic arithmetic functions with sums of money.

- This exercise corresponds to Work Keys® Applied Math level 3

CHARACTERISTICS OF LEVEL 3 SITUATIONS

- Translate easily from a verbal setup to a mathematical equation
- All information provided is necessary to solve the problems and is presented in logical order
- Units of measurement not involved in actual calculations (i.e., function solely as labels), except dollars and cents

LEVEL 3 APPLIED MATHEMATICS SKILLS

- Perform single-step basic operations (addition, subtraction, multiplication, and division) using whole numbers
- Change a number from one form to another, using whole numbers, fractions, decimals, and percentages
- Add and subtract negative numbers as well as positive numbers

MATERIALS

1. Pencils and erasers
2. A Student Activity for each student
3. Additional copies of Student Activity p. 2. (approximately one per student, separately stored).
4. A sheet of scratch paper for each student.

TEACHER'S GUIDE

1. This activity starts with the students working individually, but at a certain point they work in pairs. The teacher's short introduction on accountability of employee travel sets the stage for the simulation. The point is made because business travel can be a significant part of a company's overhead, meticulous care is taken by administrative assistants, secretaries, and accountants in reviewing expense reports. Each student receives a travel and expense report form and guide. With help from the teacher, the students individually "create" a business trip for themselves and jot down preliminary information on scratch paper. When the students have organized their data, they are paired. In "interview" fashion, one student asks the traveler questions and enters information on the form, referring to the guide as necessary. When this task is completed, except for the arithmetic, roles are exchanged and the exercise is repeated. When both students have obtained all necessary information from each other, they complete the arithmetic. Then they check and approve one another's work. If time remains, the exercise is repeated with new trips conceived, and students paired differently. A short, teacher-led discussion stresses the indispensability of certain office skills. Emphasis in this activity is on following printed instructions and carrying out arithmetic operations (addition and subtraction) with money figures.

2. Begin by asking the students to tell you which travel charges they believe would be reimbursed to an employee traveling on business for his company. Write the items on the chalkboard. Also, ask the students to estimate the cost of lodging, meals, transportation (air and surface), etc. Point out that most companies are extremely careful about travel and expense reports. Explain that there are two reasons for this. First, travel can be extremely costly. Unless it can be proved that employee travel is absolutely essential, travel costs can cut deeply into a company's earnings. Second, legitimate travel and accompanying business entertainment costs can be deducted as costs of doing business. This is helpful at income tax time. But records must be absolutely accurate.

3. Estimate a few travel expenses for the students. Indicate that transcontinental air travel and overnight lodgings in fine hotels of large American cities can bring the cost of a few day's business travel to well over \$1,000.

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TEACHER'S GUIDE

As the students may not be familiar with travel costs, it may be helpful to write a few of them on the chalkboard, thus:

Hotels - \$30 to \$100 a night

Meals - Breakfast, \$5; Lunch \$5; Dinner varies, can be as high as \$30

Rental Cars - Varies; \$50 charges are common

Entertainment of customers - Varies; \$100 expenses are common

Tell the students that unless a company closely monitors its travel and expense costs, it can find itself "run into the ground."

4. Mention that companies, institutions, organizations, and bureaus develop their own policies on travel. Some are very strict about the employee personal expenses on a trip (ex., laundry, hairdresser, barber, telephone calls to family, etc.). Other companies are lenient, and accept certain reasonable personal expenses. Policies are as variable as the people who manage the organization.
5. In one respect, however, all organizations are the same. They require detailed, accurate accountability of travel expenses, for they know how these can mount and impose a heavy financial burden on budgeting. Traveling employees therefore customarily submit travel and expense reports. These serve as both a trip and financial record. Often the reports are reviewed by the highest financial officer in the company (treasurer, controller, chief accountant, etc.).
6. Hand out a sheet of scratch paper to each student and tell the class to imagine that they work for organizations which require that they travel in connection with work. Tell the students to choose a kind of work or profession that could necessitate a trip of a few days' duration to one or more cities. Have the students write the kind of work they do and their reasons for travel on the scratch paper. Ask a few students to read what they have written.
7. Accept all but the most outlandish reasons for business travel. Encourage the students to think in terms of real-life reasons for business travel, such as discussing business plans with associates or customers, attending

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TEACHER'S GUIDE

professional meetings, attending conventions or shows where goods or merchandise will be displayed, etc.

8. When the class has spent a few moments deciding on their destinations and reasons for travel, hand out a Student Activity to each student. This consists of a Travel and Expense Report and a Travel and Expense Report Guide. (An additional supply of separate Travel and Expense Reports should be on hand for students who finish the first exercise early.)
9. Tell the students to listen to your oral instructions and not look at the Guide during your explanation. Review each numbered block on the Travel & Expense Report, referring to the Guide. Blocks 1 and 2 are self-explanatory. Tell the students that usually an employee either receives a travel ticket (already paid for by the company), or he uses a travel credit card. In either case, travel is furnished by the company. Tell the students that if they wish, they may assume that they have traveled by personal car. In that case, they should claim reimbursement on a separate sheet of paper, charging (arbitrarily) 28 cents per mile and all parking and toll charges.
10. Block 4 should be explained in detail. Point out that the dates are entered with "slash" lines separating the month and day. It is unnecessary to write the year. After the individual expenses are entered, they are summed both vertically and horizontally. The rectangle marked with the single arrowhead contains all room and meal expenses.
11. As the traveler incurs other expenses beside those for rooms and meals, it is necessary to transfer the total just calculated to the first "Amount" space in Block 5 and continue. Tell the student to invent legitimate additional expenses and enter them in Block 5. If the number of Additional Expenses for any one day is large, they may be noted on a separate sheet of paper and their total written under "Amount" for that date.
12. Stress that Block 5 is a continuing accounting of the traveler's expenses. It "picks up" the previous room and meal expenses and adds other expenses.

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TEACHER'S GUIDE

13. Finally, tell the students that if they wish, they may assume that they began their trip with money left over from a previous trip. A reasonable amount might be two hundred dollars. For the present trip, a reasonable advance might be one hundred to two hundred dollars for each day. This information goes in Block 6.
14. Point out that if the Total Expenses in Block 6 exceeds the cash total, the company owes money to the employee. Tell the student to check the appropriate word at the bottom of Block 6. Conclude the review of the Travel and Expense Report by telling the class that the report must be signed by the employee who traveled. Customarily, reports are reviewed by someone else in the company. In many instances, an administrative assistant or secretary helps the traveler to compile the report.
15. Tell the students to examine the Travel and Expense Report Guide for a few moments. Assign students to work in pairs in the manner of traveler and aide who assists in entering information on the Travel & Expense Report. The traveler should only refer to his scratch paper notes and provide information. The student entering the information should not do the arithmetic. When he has entered all the traveler's information, he gives the report to the traveler.
16. At this point, roles are reversed and the steps are repeated. When all the information has been entered, each student does his own arithmetic. If one of the pair falls behind, the student who finishes may be paired with any other student who has finished and is awaiting the check and approval step.
17. Each student reviews another's report and checks it for correctness. A student may not sign the check and approval line of his own report.
18. If time remains, the teacher may wish to have students conceive of a different kind of trip, incurring different types of expenses, and so on. Again, students should be paired and given blank Travel and Expense Reports. The "interview" procedure is repeated, and the process is carried to completion of arithmetic, checking, and approval.
19. Conclude the activity with a short discussion on the importance of reading and arithmetic skills in filling out travel and expense reports.

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TEACHER'S GUIDE

Ask the students to speculate on the likely outcome of a situation where an employee makes frequent errors, always in favor of himself. Stress the fact that although someone may be the most honest person in the world, a succession of self-serving arithmetic errors could raise doubts. Finally, ask the students to speculate on the likely results of a situation where an employee fails to read and follow a printed procedure correctly, and repeatedly makes disallowed claims.

- 20. Collect the student materials, and check for Demonstrated Performance.

TRAVEL & EXPENSE REPORT

1 Employee Name _____ Address _____
Home Telephone No. _____ City _____ State _____ Zip _____

2

Purpose of Trip	Cities Visited	Dates

3

Travel Method (s)	Transportation Furnished by

4

Expenses	Dates					Total
Room (incl. tax)						
Breakfast (incl. tip)						
Lunch (incl. tip)						
Dinner (incl. tip)						
Total						

5

Additional Expenses					
Date	Item	Amount	Date	Item	Amount
	Room and meal expens.			Total carried forward	
	Carry total forward			Total Expenses	

6

Balance	
Cash Remaining Since Last Report	
Cash Received for This Trip	
Total	
Total Expenses	
Amt. Owed _____ Employee _____ Company _____	

All of the above expenses were for business reasons. Travel & Expense Report checked and approved by:
Signature _____ Date _____

TRAVEL & EXPENSE REPORT GUIDE

Name

This Guide tells how to fill in the Travel & Expense Report form. All employees who travel on company business must fill in that form and have it checked and approved.

BLOCK 1
Fill in all the information called for.

BLOCK 2
Fill in each separate purpose for each trip. If the reasons for going to more than one city are the same, write only one Purpose, but enter the names of all cities and dates you were there.

BLOCK 3
Travel Methods are as follows: airline, train, and bus (or a combination). Indicate whether transportation was furnished by company or employee. **Do not** request payment for transportation on the Travel & Expense Report. Refunds are handled through a different form.

BLOCK 4
On the row titled "Expenses," under the heading "Dates," write each date on which you traveled for the company, thus: 2/15 (February 15), etc. Enter each expense called for. Total all columns. Then total all rows, and check your calculations. Write the Total under "Amount" in Block 5.

BLOCK 5
Carry the Total from Block 4 (see arrowhead), and place it under the "Amount" heading. Enter such expenses as the following (along with the dates when the expense was met):
Taxicab fares, telephone calls, rental car, materials and supplies, and entertainment of customers for business purposes.
DO NOT ENTER PERSONAL EXPENSES SUCH AS LAUNDRY, DRY CLEANING, ETC.

BLOCK 6
If you have cash remaining since your last trip, enter the amount in the top space. If you have cash remaining from this trip, enter the amount in the space below the previous one. Add the two amounts. Now, enter the Total Expenses (Block 5, double arrowhead). Determine whether the Amount is owed to the employee or company. Sign and date the form, and have it checked and approved.

SCANS Work Readiness Kit

Writing

Applied Writing skills are the skills employees need in order to write clear and appropriate work-related messages. Writing skills also provide a good basis for other workplace writing tasks such as memo, letters, reports, proposals and correspondence.

The following activities provide practice applications through exercises designed to improve workplace writing abilities.

Work Keys® Level	2	3	4	5
Activity 1 - Writing About Career Exploration	X			
Activity 2 - Public Service Message	X			
Activity 3 - Goal Setting And Writing Instructions		X		
Activity 4 - Problem Solving			X	
Activity 5 - Writing a Business Letter				X

WRITING

OVERVIEW

Writing A Business Letter

This activity consists of four “programmed” exercises that deal with discretion and tone in business letters. After the teacher's brief statements on the importance of language in business letters, the students are led through both an exaggeratedly poor example of a business letter and an edited, softened version. Following this, the students read a coarsely written letter and rewrite it, moderating its tone. These are read aloud, and a discussion is held on effectiveness of the refined versions. Then, the students refer to a list of conditions that describe a business situation, and write a letter designed to make the recipient angry. These letters are exchanged, and each student writes a moderated version of the one he received. Finally, the student chooses a “situation” from a group of four, and again writes a letter intended to annoy the recipient. These, too, are exchanged, and once again the student writes a discreet version. Volunteers are invited to read the paired versions aloud. The activity concludes with a few remarks by the teacher on the importance of careful use of language in business letters. Emphasis is on following oral and printed instructions, written business communication, and vocabulary.

- This exercise corresponds to Work Keys® Applied Math level 5

CHARACTERISTICS OF LEVEL 5 SITUATIONS

- Message clearly conveyed
- Highly appropriate for the business setting of the prompt
- No mechanical errors
- Good sentence structure
- Smooth and logical style

LEVEL 5 WRITING SKILLS

- Write messages that are clear and highly consistent with standard business English

MATERIALS

1. Pencils
2. A Student Activity for each student
3. (*Optional*: Several discarded business letters)

WRITING

OVERVIEW

Writing A Business Letter

This activity consists of four “programmed” exercises that deal with discretion and tone in business letters. After the teacher's brief statements on the importance of language in business letters, the students are led through both an exaggeratedly poor example of a business letter and an edited, softened version. Following this, the students read a coarsely written letter and rewrite it, moderating its tone. These are read aloud, and a discussion is held on effectiveness of the refined versions. Then, the students refer to a list of conditions that describe a business situation, and write a letter designed to make the recipient angry. These letters are exchanged, and each student writes a moderated version of the one he received. Finally, the student chooses a “situation” from a group of four, and again writes a letter intended to annoy the recipient. These, too, are exchanged, and once again the student writes a discreet version. Volunteers are invited to read the paired versions aloud. The activity concludes with a few remarks by the teacher on the importance of careful use of language in business letters. Emphasis is on following oral and printed instructions, written business communication, and vocabulary.

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MATERIALS

1. Pencils
2. A Student Activity for each student
3. (*Optional*: Several discarded business letters)

TEACHER'S GUIDE

1. This activity engages the student in four short exercises that involve reading, writing, and rewriting business letters. The activity starts with a short preface by the teacher on the importance of a business letter's tone. This explanation is facilitated by leading the students through an exaggerated, amusing "before and after" example. Following this, the student reads both the brief account of a business situation and the business letter written to reconcile the situation. The student rewrites the letter, editing out the unwanted content. Then, the student reads a more detailed account of a business situation and writes a letter intended to annoy the recipient. These letters are exchanged, and each student writes a discreet, edited version. Students are invited to read the paired letters aloud. Finally, the student chooses one "sour situation" (from a group of four) and, again, writes a letter intended to displease the receiver. Once again, letters are exchanged, and each student writes a moderated version. A short discussion on the importance of language in business letters concludes the activity. Emphasized skills are following oral and printed instructions, letter writing, and vocabulary.
2. A few days before the activity, the teacher may wish to invite the students to bring one or two discarded business letters to class. These may be read aloud and used to start the activity by focusing on the tone of the business letters. The point should be made that regardless of a situation, the experienced business letter writer never resorts to improper use of language, personalities, outright threat, or denouncement.
3. Hand out a Student Activity to each student, and lead the students through the first exercise, entitled "Improving a Business Letter." Ask for opinions as to the customer's likely response to the first business letter.
4. Encourage the students to read the instructions and complete the next exercise ("The Watchdog and the Meter Reader") on their own. When most of the students have finished writing the second letter, gain the attention of the class and invite a few students to read their second letter aloud. Invite the students to discuss whether the second versions communicated the essential message to the customer discreetly and politely.

TEACHER'S GUIDE

5. Again, for the third exercise (“Right Rewrite”), encourage the students to read the instructions and start on their own. Offer assistance to individuals and small groups as necessary. When most of the students have finished writing the required business letter, gain the attention of the class, and explain what will be done next. Designate a desk or table top where all finished products will be delivered. Each student will pick up a letter (not his own) and return to his desk. Then he will read the letter (intentionally written to annoy the recipient) and rewrite it, applying what he has learned in the two preceding exercises.
6. When most of the students finish the writing and rewriting tasks, gain the attention of the class, and invite volunteers to read both versions. For the sake of suspense and amusement, the teacher may insist that the original authors not be identified.
7. Again invite the students to comment on the paired “before and after” treatments of the subject. Ask the students to identify commonalities in the rewritten versions (brevity, directness, politeness, etc.).
8. Assign the final exercise (“Choose a Situation”), again encouraging the students to read the instructions and start on their own. When most of the students have finished writing the business letter, once more call for an exchange and rewrite. When most of the students have finished their rewrites, ask for a few volunteers to read both versions aloud. Solicit comments on aptness of the edited versions.
9. Conclude the activity by stressing that frequently a business letter is virtually the only means by which a business, institution, organization, or bureau communicates with its clients or customers. For this reason, the language of a business letter must be carefully chosen to produce an atmosphere of “getting on with it,” but without leaving the feeling that the author was completely impersonal or machine-like.
10. Collect the student materials, and check for Demonstrated Performance.

IMPROVING A BUSINESS LETTER

Name _____

Instructions:

1. Read the business situation below.
2. Then, read the first letter.
3. Finally, read the improved business letter.

BUSINESS SITUATION

- a. A customer has not paid a department store bill.
- b. The store manager wants the bill paid right away.
- c. The store does not want to earn a bad reputation.
- d. The store does not want to lose customers.

FIRST BUSINESS LETTER

Dear Cheapskate:

Last month you bought an alligator cage from our pet department. We thought you were an honest person. But we have not received payment for the cage. You must be a dishonest person to buy something and not pay for it.

But do not think you are going to get away with it. We will start out by sending a bill collector every day. What do you think your neighbors will think of that? If you do not pay him, we will call up the place where you work. We will tell your boss that you are a dishonest person. Also, we will ask him to take the money you owe us out of your paycheck.

If that does not work, we will call the police and tell them to arrest you. Do not sit there and think you will get away with this because you will not!

IMPROVED BUSINESS LETTER

Dear Customer:

Our records show that we have not received payment for the alligator cage you bought last month. Is it possible that you have forgotten about the bill? This happens once in a while.

We would be grateful if you would send payment as soon as possible. We value you as a customer, and we hope you will continue to shop at our store.

If you are having any problems in making payment or finding a record of your purchase, please call me. I will be happy to offer my help.

THE WATCHDOG AND THE METER READER

Name _____

Instructions:

1. Read the business situation and first business letter below.
2. Write a second business letter, improving on the first one.

BUSINESS SITUATION

- a. An employee of the electric power company was reading a homeowner's meter.
- b. The homeowner's dog charged the employee and knocked him down.
- c. The electric power company wishes to warn the homeowner of his responsibility to keep the dog in the house or on a chain when the meter reader comes.

FIRST LETTER

Dear Mrs. Doan:

Last Friday an employee of the power company was about to read your electric meter. He was attacked by your large, vicious dog. It was only by luck that the man escaped without being chewed up by your mutt.

You have broken a law. You are supposed to keep your dog under control at all times. When our employee went to read your meter, he did not see a dog. So you were surely at fault.

It was a good thing our employee was not injured. If he had been, we would sue you. And we would have your ugly dog locked up.

You had better call us right away and tell us when it would be safe to read your meter. If you do not cooperate, we will cut off your electricity. How would you like that?

SECOND LETTER (Use reverse side of this page if you wish.)

RIGHT REWRITE

Name _____

Instructions:

1. Read the business situation below.
2. Write a business letter likely to annoy the receiver.
3. Do not write under the heading "Rewrite."

BUSINESS SITUATION

- a. You are the owner-manager of a large supermarket.
- b. Yesterday a garbage truck broke down in front of your market.
- c. The driver jumped out of the cab to see what was wrong.
- d. Suddenly the truck rolled back and smashed into your store.
- e. The whole load of smelly garbage was dumped all over your store.
- f. No one was injured, but it has taken a dozen workmen a day to clean up.
- g. You want the sanitation company to pay for the cleanup job.

BUSINESS LETTER

REWRITE (Use reverse side of this page if you wish.)

CHOOSE A SITUATION

Name _____

Instructions:

1. Look at the Sour Situations below.
2. Choose one Sour Situation, and write a letter that you would not like to receive.
3. Write the letter under the heading "Business Letter."

SOUR SITUATIONS

- | | |
|--|--|
| <p>1. You own a store that sells clothing for adults. You have just advertised a sale. But the shipping company accidentally sent you a large shipment of children's clothing and diapers.</p> | <p>3. You own a trucking company. You had ordered 50 new trucks to be delivered as soon as possible. An error was made at the factory. Your order was confused with another that was to go to England. The trucks just arrived. They all have their steering wheels on the right side.</p> |
| <p>2. You own the local newspaper. The company that supplies your paper and ink made a mistake last week. This forced you to print the paper with purple ink on pink paper.</p> | <p>4. You are the president of a youth club. You have just brought your club to a city 500 miles from home to see a sports contest. The game was canceled, but no one at the stadium called to tell you so.</p> |

BUSINESS LETTER

SCANS Work Readiness Kit

Applied Technology

Applied Technology is the skill of applying principles of technology to practical problems. The Work Keys Applied Technology assessment covers the basic principles of mechanics, electricity, fluid dynamics, and thermodynamics as they apply to machines, equipment, and mechanical systems found in the workplace. Because the Applied Technology skill scale is oriented toward reasoning rather than mathematics, the emphasis is on problem solving and troubleshooting.

The following activities strengthen problem solving techniques and build basic math skills.

Work Keys® Level	3	4	5	6
Activity 1 - Field Simulation Engineer	X			
Activity 2 - Cutting Speed and Feed		X		
Activity 3 - Thermal Expansion			X	
Activity 4 - Fluids - Principles of Pressure				X

APPLIED TECHNOLOGY

OVERVIEW

Cutting Speed And Feed

This exercise contains a short lesson in the basic principles of machine work. The student studies the student information and then applies these new concepts to situations that are presented in the questions that follow. The questions require the student to apply their existing knowledge of the basic physical and technological principles of temperature, pressure and gravity. Questions are posed in short answer format.

- This exercise corresponds to Work Keys® Applied Math level 4

CHARACTERISTICS OF LEVEL 4 SITUATIONS

- One moderately complex system or more than one uncomplicated system
- Elementary physical principles, such is heat transfer or the flow of fluids through pipes

LEVEL 4 APPLIED TECHNOLOGY INFORMATION SKILLS

- Understand the operation of moderately complex tools, machines, and systems, such as appliances, pulley-driven equipment, or piping systems that carry more than one fluid
- Apply elementary principles underlying the operation of physical systems, such as a block and tackle or cooling fins

MATERIALS

1. Pencils and erasers
2. Activity sheets and student information for each student

CUTTING SPEED AND FEEDS

Student Information

In order to make the correct cut, a machine such as the lathe or drill must be run at the proper cutting speed. Trade handbooks and formulas usually provide the proper cutting speed for the Metals worker.

Recommended Cutting Speeds For Milling Cutters (Speed and Surface Feet Per Minute...FPM)		
<u>Material</u>	<u>High Speed Steel Cutter</u>	<u>Carbide Cutter</u>
Aluminum	500 - 1000	1000 - 2000
Brass	70 - 175	350 - 600
Bronze	65 - 130	200 - 425
Low Carbon Steel	60 - 90	150 - 250
Free Cutting Steel	65 - 95	200 - 300
Alloy Steel	30 - 50	100 - 150
Cast Iron	50 - 80	230 - 325
Titanium (Comm. Pure)	85 - 100	150 - 175
Titanium (Alloy)	60 - 70	100 - 120

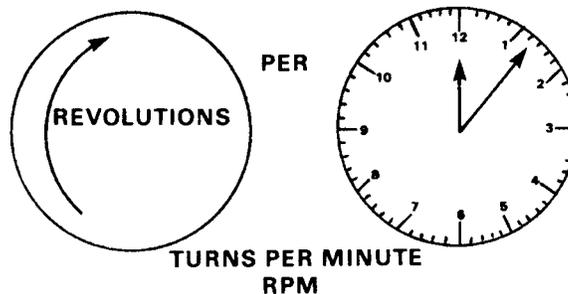
CUTTING SPEED AND FEEDS

Student Information

Cutting speed and feed is the time required to complete a milling operation and the quality of the finish of the machined surface.

Cutting speed refers to the distance, measured in feet that the cutter moves in one minute. Therefore, speed is expressed in terms of feet per minute (FPM) and is directly dependent on the revolution per minute (rpm) of the cutter.

Feed is the rate at which the work moves into the cutter and is given as feed per tooth per revolution (FTR).



Cutting speeds for lathes, drills, grinding wheels, and milling cutters are determined by using the same formula. The difference in cutting occurs because on the lathe the workpiece turns, while on the other machines, the tool turns. The cutting speed is determined according to how fast the tool turns. The formula to use is:

$$CS = \frac{\pi \times \text{Diameter in Inches} \times \text{rpm}}{12} \quad \pi \text{ in Metals} = 3.1416$$

Example: A grinding wheel with a 9-inch diameter turns at 1,850 rpm.
What is its cutting speed?

$$\begin{aligned} \text{Solution: } CS &= \frac{3.1416 \times d \times \text{rpm}}{12} \\ &= \frac{3.1416 \times 9 \times 1850}{12} \\ &= \frac{52,307.64}{12} \\ &= 4358.97 \end{aligned}$$

The cutting speed is about 4,359 feet per minute.

CUTTING SPEED AND FEEDS

Application Problems

Using the following formula, find the cutting speed for the workpieces described in the problems below.

$$CS = \frac{\pi \times d \times \text{rpm}}{12}$$

1. A circular saw blade, 12 inches in diameter, rotating at 3,450 rpm.

2. A grinding wheel, 6 inches in diameter, rotating at 1,750 rpm.

3. A surface planer with blades 4 1/2 inches in diameter, rotating at 3,600 rpm.

4. A router with a 3/8 inch diameter cutting bit, rotating at 25,000 rpm.

5. A 5/8 inch drill bit, rotating at 400 rpm.

6. A grinding wheel with an 8 inch diameter, rotating at 2,500 rpm.

CUTTING SPEED AND FEEDS

Application Problems

Using the following formula, find the cutting speed for the workpieces described in each problem below.

$$CS = \frac{\pi \times d \times rpm}{12}$$

7. What is the cutting speed for a workpiece of cast iron 1 1/4 inches in diameter turning at 150 revolutions per minute?

8. Find the cutting speed for a given workpiece whose diameter is 2 inches and is turning at the rate of 100 revolutions per minute?

9. What is the cutting speed when the workpiece has a diameter of 1 1/2 inches and revolves at 155 revolutions per minute?

10. Find the cutting speed for a workpiece whose diameter is 1.5 inches and whose rpm is 140.

11. What is the cutting speed for a workpiece with a diameter of 1 inch and a rpm of 200?

CUTTING SPEED AND FEEDS

Student Information

RPM

This same formula can be used to solve for rpm when the cutting speed and diameter of the workpiece are known.

$$\text{Since CS} = \frac{\pi \times d \times \text{rpm}}{12}$$

$$\begin{aligned}\text{CS} &= \text{surface feet per minute} \\ d &= \text{diameter of workpiece} \\ \pi &= 3.1416\end{aligned}$$

$$\text{CS} \times 12 = \pi \times d \times \text{rpm}$$

$$\text{rpm} = \frac{\text{CS} \times 12}{\pi \times d}$$

This formula indicates that the surface inches per minute is divided by the length (circumference) the workpiece travels in one revolution. Examples are given to help you understand the relationship.

Example 1: Find the rpm for a workpiece that has a cutting speed of 80 surface feet per minute with a diameter of 1 1/2 inches.

$$\text{rpm} = \frac{\text{CS} \times 12}{\pi \times d}$$

$$\text{rpm} = \frac{80 \times 12}{3.1416 \times 1.5}$$

$$\text{rpm} = 203.7178 \text{ or about } 204 \text{ revolutions per minute}$$

Example 2: What is the rpm of a 2 inch diameter workpiece that has a cutting speed of 75 surface feet per minute?

$$\text{rpm} = \frac{\text{CS} \times 12}{\pi \times d}$$

$$\text{rpm} = \frac{75 \times 12}{3.1416 \times 2}$$

$$\text{rpm} = 143.2391 \text{ or about } 143 \text{ revolutions per minute}$$

CUTTING SPEED AND FEEDS

Student Information and Application Problems

The rpm can be read directly from a table that will be available in your Metals textbook or in reference books. Part of such a table is illustrated below.

Feet per Minute	30	40	50	60	70	80	90	100	110	120	130	140	150
Diameter in Inches	Revolutions per Minute												
3/4	153	203	255	306	357	407	458	509	560	611	662	713	764
1	115	153	191	229	267	306	344	382	420	458	497	535	573
1 1/8	102	136	170	204	238	272	306	340	373	407	441	475	509

Find the rpm for the following problems:

1. What is the rpm for a workpiece that has a cutting speed of 90 surface feet per minute and a diameter of 1 1/4 inches?

2. Find the rpm for a workpiece with a diameter of 2 inches and a cutting speed of 70 surface feet per minute.

3. If a workpiece has a diameter of 1 1/2 inches and a cutting speed of 65 surface feet per minute, find the rpm of the workpiece.

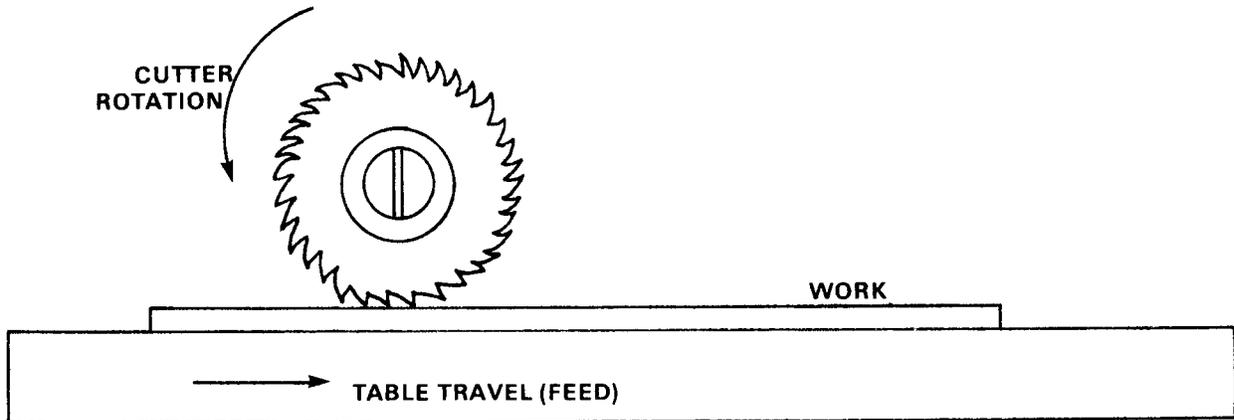
4. What is the rpm for a workpiece whose diameter is 1.75 inches and whose cutting speed is 68.5 surface feet per minute?

5. Find the rpm for a workpiece whose diameter is 1.3 inches and whose cutting speed is 78 surface feet per minute.

CUTTING SPEED AND FEEDS

Student Information

Calculating Speed (Table Travel)



The formula for determining the feed (table travel) would be:

$$\text{Table Travel} = \text{rpm} \times \frac{2}{3} \text{ width of the wheel}$$

Example 1: What is the table travel for a 1-inch wheel that has a work speed of 320 revolutions per minute?

$$\text{Table travel} = \text{rpm} \times \frac{2}{3} \text{ wheel width}$$

$$\text{Table travel} = 320 \times .67 \times 1$$

$$\text{Table travel} = 214.4 \text{ inches per minute}$$

Example 2: What is the table travel for a 2 1/2- inch wheel that has a work speed of 100 revolutions per minute?

$$\text{Table travel} = \text{rpm} \times \frac{2}{3} \text{ wheel width}$$

$$\text{Table travel} = 100 \times .67 \times 2.5$$

$$\text{Table travel} = 167.5 \text{ inches per minute}$$

CUTTING SPEED AND FEEDS

Application Problems

Find the table travel for the lathe grinding wheels given below:

1. What is the table travel for a 1 1/2-inch wheel that has a work speed of 300 revolutions per minute? _____

2. Find the table travel for a 2-inch wheel whose work speed is 275 revolutions per minute. _____

3. What is the table travel for a 1 1/4-inch wheel whose work speed is 250 revolutions per minute? _____

4. Find the table travel when the wheel has a diameter of 1 inch turning 290 revolutions per minute. _____

5. Find the table travel when a 2 1/4-inch wheel is turning 260 revolutions per minute. _____

Answers to Application Problems

Cutting Speeds and Feeds

- | | | |
|--------------|------------|-------------|
| 1) 10,838.52 | 2) 2,748.9 | 3) 4,241.16 |
| 4) 2,454.375 | 5) 65.45 | 6) 5,236 |
| 7) 49.0875 | 8) 52.36 | 9) 60.8685 |
| 10) 54.978 | 11) 52.36 | |

RPM

- | | | |
|-----------------|-----------------|-----------------|
| 1) 275.0191 rpm | 2) 133.6898 rpm | 3) 165.5208 rpm |
| 4) 149.509 rpm | 5) 229.1826 rpm | |

Calculating Speed (Table Travel)

- | | | |
|--------------------|---------------------|----------------------|
| 1) 301.5" per min. | 2) 368.5" per min. | 3) 209.375" per min. |
| 4) 194.3" per min. | 5) 391.95" per min. | |

SCANS Work Readiness Kit

Listening

Listening Skill may be defined as skill in listening to work-related messages and accurately recording the information heard. This assessment is administered via audio CD. Scoring is based on the examinee's written responses.

Because scoring depends on the outcome of the written response, the following Listening Activities are not subdivided into Work Keys® Levels. Administrators and students should be aware that accuracy can be improved by practicing listening skills in a manner that is progressive in levels of difficulty.

Activity 1 - Making a "Live" Business Telephone Call

Activity 2 - What's My Job - Quiz Show

Activity 3 - Telephone Skills*

** Activity 3 includes a audio CD and related reproducible print material.*

LISTENING

OVERVIEW

Telephone Skills

Each learning activity is designed to help the student listen to verbal information on a cassette tape and then record that information on various types of forms according to directions given on the Student Direction Card. The activities simulate real life and work situations. The audio CD in your kit is highlighted below:

- ☞ Audio CD #1 Taking Messages-Part 1 & Part 2
- ☞ Audio CD #2 Appointment Making
- ☞ Audio CD #3 Fast Food Orders
- ☞ Audio CD #4 Restaurant Orders
- ☞ Audio CD #5 Business Telephone Orders
- ☞ Audio CD #6 Consumer Telephone Orders

The activities are designed to be self-directed. Each individual student should be able to read the Student Direction Card and carry out the procedures. The CD contains progressively complex messages. Every CD addresses students at all performance levels because the skill level is judged by the effectiveness of the student's recorded message. Practicing listening skills under a variety of circumstances familiarizes students with the type of recorded information required to create a relevant and useful message. Remember that poor writing mechanics and style do not count against a student's skill rating; however, some students may be unable to express themselves in writing and therefore cannot receive a valid listening score.

CHARACTERISTICS OF LEVEL 1 SITUATIONS

- Minimal pertinent information
- Enough context to provide clues as to gist of situation OR source of further information
- Written information does not include enough information to give the receiver a correct understanding of the situation described in the message

LEVEL 1 LISTENING SKILLS

- Based on a spoken communication, write down a small amount of useful information

LISTENING

OVERVIEW

CHARACTERISTICS OF LEVEL 2 SITUATIONS

- Some pertinent details
- May have incorrect primary details, but sketch of the situation is correct

LEVEL 2 LISTENING SKILLS

- Give a fair amount of useful information by correctly writing down the basic ideas of a spoken message
-

CHARACTERISTICS OF LEVEL 3 SITUATIONS

- Response substantially correct
- All the primary details present are correct and relationships among them are correct
- May be missing a few primary details

LEVEL 3 LISTENING SKILLS

- Listen to a spoken communication and record messages that are basically correct
-

CHARACTERISTICS OF LEVEL 4 SITUATIONS

- Response correct in that all primary details and relationships among details are given and correct
- May be missing supportive details or have incorrect supportive details that do not interfere with accurate communication

LEVEL 4 LISTENING SKILLS

- Accurately convey the central idea of a spoken message
- Correctly record all the important information and the relationships among

- Continued Next Page

LISTENING

OVERVIEW

CHARACTERISTICS OF LEVEL 5 SITUATIONS

- All primary and supportive details are present and correct, including all relationships among details

LEVEL 5 LISTENING SKILLS

- Correctly record all the important information and the relationships among pieces of information from a spoken message
- Use supportive details to convey insight into the particular situation the message involves

MATERIALS

1. Audio CD player with *optional* headphones
2. Copies of forms for each student (masters provided)
3. See activity descriptions for detailed materials list.

SCANS Work Readiness Kit

Locating Information

Locating Information is the set of skills involving the use of one or more related graphics, such as tables, graphs, and diagrams, to locate, insert, compare, and summarize information. At the highest level, Locating Information includes the ability to make decisions, apply information, and draw conclusions based on information contained in one or more graphics.

The following exercises have been selected to develop skills in reading and understanding graphic representations such as tables, graphs, maps and other diagrams.

Work Keys® Level	3	4	5	6
Activity 1 - Transportation Consultant	X			
Activity 2 - Computer Aided Management of Retail Store		X		
Activity 3 - Electrical Engineering Input Into Environmental Impact Study			X	
Activity 4 - Mystery Epidemic				X

LOCATING INFORMATION

OVERVIEW

Computer Aided Management Of A Retail Store

In this two-part activity, students work individually in the role of owner of a chain of retail stores who uses computer-generated data to determine the number of salespersons required in a particular store. The teacher begins the activity with a short account of the difficulties in maintaining good control over cost factors (such as salespeople's salaries) in relation to sales. In the first exercise, the student works with a completely drawn flowchart that depicts the process of a customer entering a shoe store and seeking service. The task is to match a set of randomly ordered statements to the logical symbols. In the second exercise, which is related in theme, but not in content, the student examines a table of computer "output" data that projects the buying responses of customers under varying conditions of one, two, three, and four salespeople. By performing simple arithmetic operations and answering printed questions, the student discovers a logical basis for fixing the number, of salespeople in a particular store, so as not to exceed the "point of diminishing return." The activity concludes with a short, teacher-led discussion on the value of the applied skills in solving a retail sales managerial problem. These include following oral and printed instructions, using addition and subtraction, finding averages, extracting data from a table, and working with a flowchart.

- This exercise corresponds to Work Keys® Applied Math level 4

CHARACTERISTICS OF LEVEL 4 SITUATIONS

- Straightforward workplace graphics such as basic order forms, line graphs, tables, instrument gauges, maps, flowcharts, and diagrams

LEVEL 4 LOCATING INFORMATION SKILLS

- Find several pieces of information in these types of graphics
- Summarize and/or compare information and trends in a single graphic
- Summarize and/or compare information and trends among more than one workplace graphic, such as a charge slip and an invoice showing related information; in order to accomplish this, the examinee must determine the relationship among the graphics

MATERIALS

1. Pencils and erasers
2. A Student Activity for each student
3. (*Optional*: Pairs of scissors)

TEACHER'S GUIDE

1. In this activity, the student works individually as the owner of a chain of retail shoe stores. In this role, the student determines the best number of salespeople to use in one of the stores. The teacher starts the activity with a brief introduction on the problem of matching retail store overhead with sales. The point is made that, unless the retail store owner can identify and control costs and earn a profit, he may find himself out of business without even knowing why this happened. There are two separate exercises, both with computer "scenarios." In the first, the student endeavors to match supplied statements with the symbol blocks of a flowchart. The reason for doing so is to assist a computer programmer who is studying the store owner's problem: Busy stores have few customers and vice versa. In the second exercise, the student examines a table of data produced by a computer, and he answers printed questions which lead to the solution of the customer-salesperson problem in one store. After reviewing the correct method of solution, the teacher concludes with a few comments on the value of the applied skills in solving retail store problems. Principal skills include following oral and printed instructions, using a flowchart, adding and subtracting columns of figures, finding averages, and extracting data from a table.
2. Begin the activity by asking the students whether they have ever walked out of a store because they were dissatisfied with the service. Ask whether the reasons were unavailable salespeople or salespeople who left them to serve others.
3. Ask the students how a retail store owner decides on the number of salespeople required for good service. Lead the discussion in the direction of exploring uneven customer loads, rising labor costs, and decreased profit margins. Invite the students to suggest how a shoe store owner can determine the best number of salespeople to have.
4. After receiving and commenting on the student's suggestions, point out that a store owner has no way of predicting how many customers will come into the store or how much money they will spend. The owner can only estimate such numbers by examining past performance and observing the general state of the economy (Do people have money to spend?). The intelligent retail store owner tries to develop his own statistics. By doing so, he can reasonably plan on the amount of stock to purchase, schedule his purchases to coincide with peak buying seasons, and determine how many salespeople to hire.

TEACHER'S GUIDE

5. Point out that the observation of one day's business would show fluctuation in a random way. Twenty minutes might go by without any customers. Then, in a minute or two, several customers might come in. The salespeople must adjust to the continually changing condition. The store owner must be sure that useful work is being done during slack periods. This can entail rearranging stock, bringing written records up to date, and so on. The salespeople must always be prepared to serve numerous customers during peak periods.
6. As this activity contains two separate exercises, the teacher has a number of options. The exercises are related in theme, but not in content. Either one can be done first. The Computer Shoe Sales Analysis exercise is the easier of the two, and it serves for "stage setting" for the more analytical One Hour in a Shoe Store exercise.
7. Tell the students that they are individual owners of a chain of shoe stores. Although their business is successful, they have reason to believe it could be better. For this reason they have enlisted the aid of a company that specializes in making computer studies of store operations.
8. Hand out a Student Activity to each student, and lead the students through the printed instructions of the Computer Logic Guide. Emphasize that before the computer can be instructed to produce the required data, it is necessary to complete the flowchart. Tell the students that the most difficult work has already been done by the computer programmer. Their task is simply to "fit" the statements to the flowchart (blank) symbols.
9. The students can use pencil and eraser, but if this is too unwieldy, the statements can be separated with a pair of scissors and "tried" on the flowchart. Tell the students that the correctly assembled statements will comprise a logical expression of what happens when a customer enters a shoe store and seeks service. If the students are totally unfamiliar with flowcharts, it may be worthwhile to spend a moment or two demonstrating how such charts can be used to give instructions, for example to someone negotiating a busy intersection (e.g., look to left, traffic coming? -yes or no; look to right, traffic coming? -yes or no; etc.).

TEACHER'S GUIDE

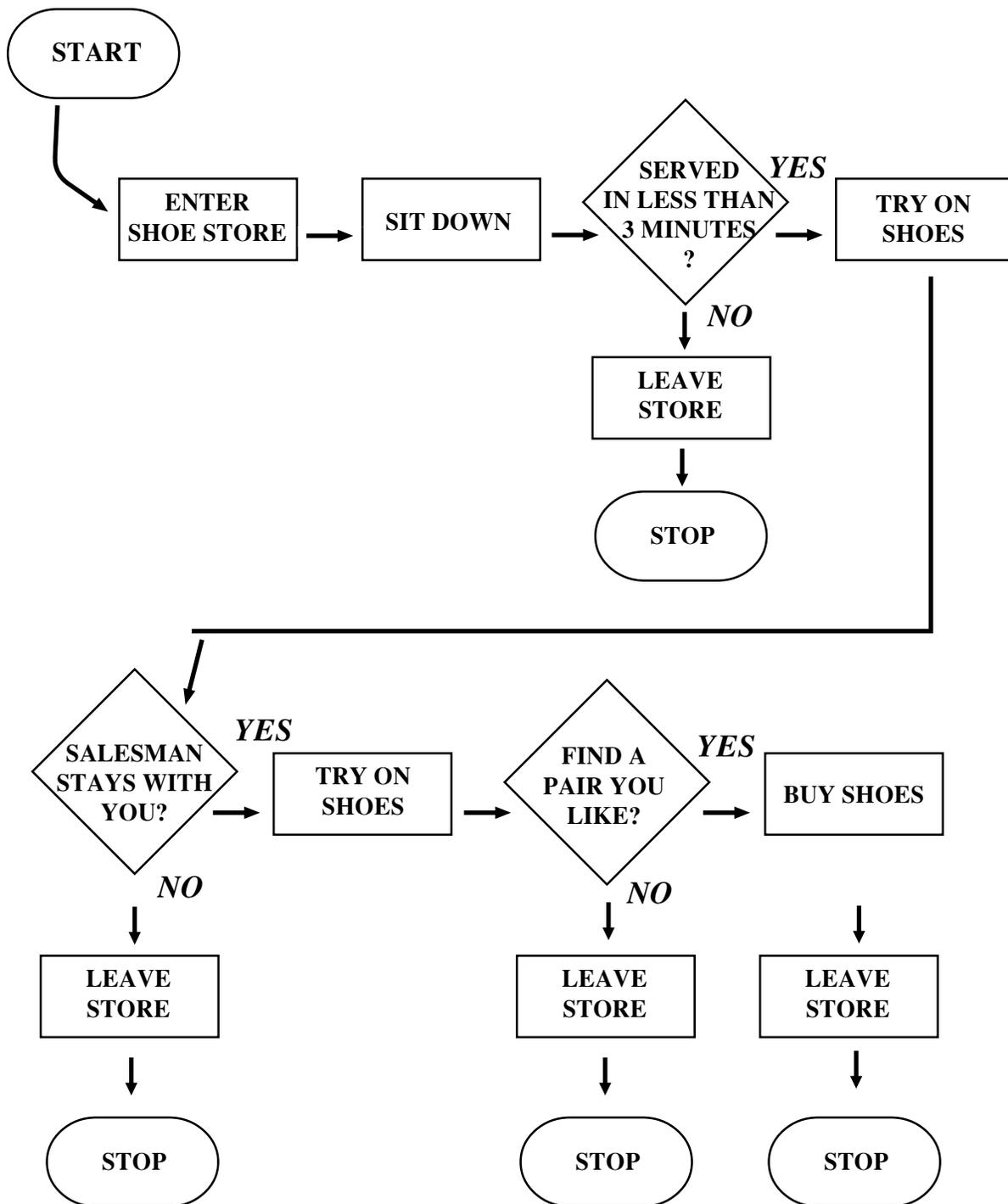
10. Circulate among the students and offer assistance to individuals and small groups. When most of the students have finished, go over the correctly drawn flowchart, referring to the figure in this Guide.
11. In preparation for the second exercise, tell the students that the computer company has obtained data from one of the shoe stores and they have produced a report (One Hour in a Shoe Store). Point out this is an “output,” the end result of numerous instructions and figures that were fed into the computer. The table shows how customers might respond in a particular shoe store with a varied number of salespeople. Mention that this is a common use of computers, to find the results of varied conditions.
12. Direct the students’ attention to the table on p.3 of their activity, and review both the headings and numerical entries. Ask the students to speculate on the experience of Customer J. Explain that with only one salesperson in the store, Customer J may have become impatient and left without spending any money (notice the “\$0”). When there are two or more salespeople, however, the computer shows that Customer J makes a purchase.
13. Point out the case of Customer B, whose purchases increase when there are more salespeople, indicating perhaps they can devote more time to him or her.
14. If the students observe and comment on the “reverse” behavior of Customer G, announce that they will have a chance to speculate on the reasons later. Avoid discussion at this time.
15. Finally, stress the fact that the computer-produced data is the outcome of certain assumptions about nonexistent customers. There is no absolute way of knowing how people will behave in sales situations involving different numbers of salespeople. The numerical data reflects a statistical examination of imaginary, not real, situations.
16. Having completed the introduction to the second exercise, tell the students to start. Circulate among them, and offer assistance to individuals and small groups.

TEACHER'S GUIDE

17. Unless the students sum the initial four columns of figures correctly, their following results will be wrong. The teacher may wish to provide the correct sums after all the students have completed the addition and are proceeding with the next part.
18. Toward the end of the classroom period, gain the attention of the class, and invite the students to read their findings. Go over the correct answers, which are provided in this Guide.
19. To conclude the activity, invite the students to comment on the validity of using computer data to arrive at such important decisions as numbers of people to hire. Assure the class that computers are routinely used for producing the bases for such decisions. Stress the fact that, ultimately, the decisions on what to do is made by a human being, not the computer. In making a decision of the type just demonstrated, a store owner would employ the same skills that the students used in answering the five questions of the exercise.
20. Collect the student materials, and check it for Demonstrated Performance.

TEACHER'S ANSWERS

COMPUTER SHOE SALES ANALYSIS



TEACHER'S ANSWERS

ONE HOUR IN A SHOE STORE

ROW 1	\$146	\$232	\$231	\$238
ROW 2	\$4	\$8	\$12	\$16
ROW 3	\$142	\$224	\$219	\$222

QUESTIONS

1 Customers A, D, F, and I

2 Customer D

3 1 \$14.60 2 \$23.20 3 \$23.10 4 \$23.80

4 Typical answers could be as follows:

* Customer G prefers to be left alone to make up his or her own mind.

* Customer G likes to take time examining shoes. This is easier to do when salespeople are too busy to come right away.

* Customer 7 is a hermit.

* The computer "glitched" (malfunctioned).

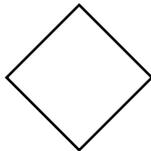
5 2 (salespeople)

COMPUTER LOGIC GUIDE

(Name)

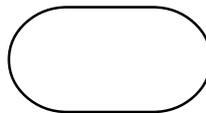
Instructions:

1. You own a chain of shoe stores.
2. Business has been good. But you believe it could be better. You have called in a computer company to help you study sales.
3. You believe the problem is this: Some stores have many customers, but they may not have enough salespeople. Other stores do not have many customers, and they have too many salespeople.
4. You wish to find out what happens when customers enter the busy and not-so-busy stores.
5. The person who will use a computer to solve your problem needs your help. The first task is to write instructions for the computer. The computer programmer (person who writes instructions for the computer) has asked you to complete a Computer Shoe Analysis diagram.
6. Look at the programmer's Computer Shoe Sales Analysis diagram. Also, look at the set of symbols and statements below. (The statements are in no particular order.)
7. Copy the statements onto the correct symbols of the diagram. Only you can tell whether the completed diagram "makes sense."



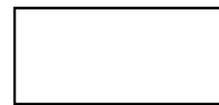
DIAMOND
(A Question)

- * Salesman stays with you?
- * Served in less than 3 min.?
- * Find a pair you like?



OVAL
(Start or Stop)

- * Stop
- * Start
- * Stop
- * Stop
- * Stop



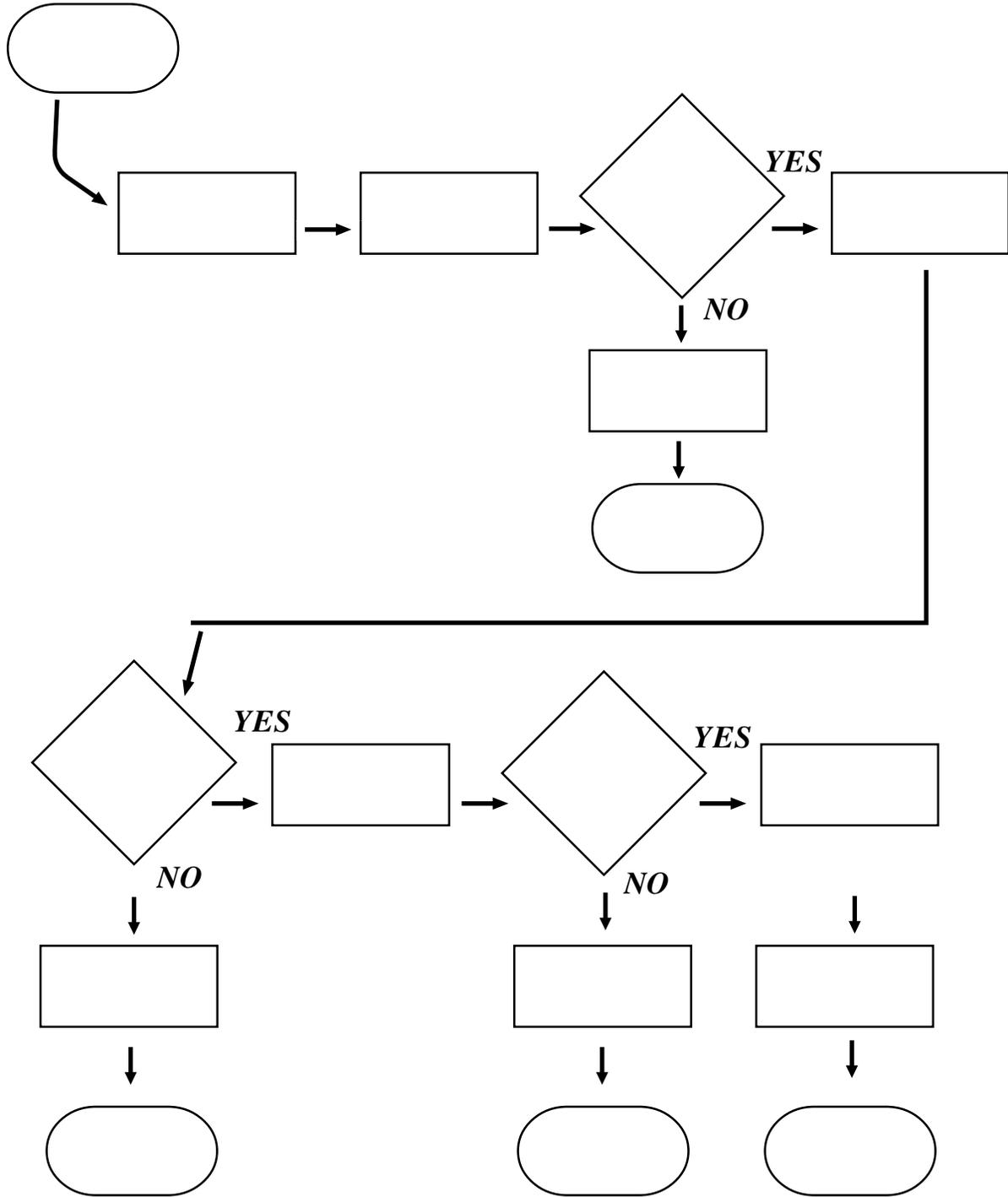
RECTANGLE
(An Operation)

- * Try on shoes
- * Try on shoes
- * Leave store
- * Sit down
- * Leave store
- * Enter shoe store
- * Leave store
- * Leave store
- * Buy shoes

COMPUTER SHOE SALES ANALYSIS

(Name)

COMPUTER SHOE SALES ANALYSIS



ONE HOUR IN A SHOE STORE

	Name				
<u>CUSTOMER</u>	Total \$ Spent with this No. of Salespeople				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	
A	\$32	\$32	\$32	\$32	
B	15	18	20	37	
C	0	25	25	25	
D	0	0	0	0	
E	28	39	39	39	
F	9	9	9	9	
G	20	15	10	0	
H	0	34	36	36	
I	0	18	18	18	
J	<u>0</u>	<u>18</u>	<u>18</u>	<u>18</u>	
ROW 1	\$___	\$___	\$___	\$___	Total Spent
ROW 2	\$___	\$___	\$___	\$___	Total Salaries for sales people in this hour, at \$4 per hour for each one
ROW 3	\$___	\$___	\$___	\$___	\$ Spent by customers <u>minus</u> salaries paid to salespeople

Questions

- 1 Which customers would have spent the same amount, no matter how many salespeople there were? _____
- 2 Which customer was not about to buy shoes, no matter how many salespeople there were? _____
- 3 How much money did the average customer spend when the number of salespeople was:
 1 \$_____ 2 \$_____ 3 \$_____ 4 \$_____
- 4 Most customers seem to spend the same amount of money (or more) when there are more salespeople. This is likely because they are waited on sooner and get attention.

If this is true, how do you explain customer G? (Write a short sentence or two of your idea.) (Use other side of page, too.)

- 5 Accepting the above table, how many salespeople should you have on your payroll? 1 _____ 2 _____ 3 _____ 4 _____

SCANS Work Readiness Kit

Observation

Observation skill may be defined as paying attention to instructions and demonstrations, and noticing details of people, circumstances, or objects. Good observation skills enable one to make comparisons to specific criteria and to make sure that what they observe matches an established workplace standard.

The following activities have been selected to exercise observation skills. Emphasis is placed on attention to detail and the ability to convey detailed information after an observation has taken place.

NOTE: Students should complete the learning brief found in the Introduction folder at least one time before advancing to the video or other classroom activity which focuses on observation skills. Classroom discussion of the learning brief is suggested so that students can share their ideas about the various types of observation skills and the circumstances under which they become important.

Work Keys® Level	3	4	5	6
Activity 1 - Nervous Noisy Newsroom (<i>Multiple Levels</i>)	X	X	X	X
Activity 2 - Light Bulb Template Inspection	X			
Activity 3 - Criminal Investigation		X		
Activity 4 - Level 6 Video				X

SCANS Work Readiness Kit

Observation

LEARNING BRIEF:

All day, every day, people consciously and subconsciously make observations. To understand how observations are made we must look at what influences our observations and the many types of observations we make.

Influences:

The accuracy of an observation is influenced by many factors. Some influencing factors are:

- *Need or Interest*
- *Motivation*
- *Distracters*

These influences may be described as follows:

Need or Interest - Interest is a strong factor in observation. You may ask yourself, “Am I interested in what is going on?” or “Do I need to know about this process or event?”. If you are not interested or do not have a need to know, chances are that you may be less observant. If you know that you lack interest, you can approach the subject matter with determined concentration overcoming your lack of natural interest.

Motivation - Motivation is also a strong factor in observation and often driven by interest. Ask yourself, “Is there some reason I feel I must take notice.” For example, if you work in a dangerous environment, the safety of your coworker/friend may depend on your observation skills. In this case, danger is a motivator. Determine what motivates you to make good observations.

Distracters - Distracters are things that reduce your attention or concentration. Many things may be happening at once so that you find it impossible to concentrate on any one event. New environments and uncomfortable conditions such as too hot or too cold are also distracters. Some people are more susceptible to distracters than others. Identify the distracters that have the most impact on you. Avoid these as much as possible when you know you need to make accurate observations.

Types of Observation:

Observation is conducted in many ways. We observe our environment through our senses. Even though we have been using our senses since birth, there are still methods we can use to improve our observation and memory skills. Largely, we can improve these skills by recognizing the types of observation along with the factors that influence them. By increasing our own awareness, we improve our interest, motivation and concentration and learn to recognize and limit distracters.

Observation is continuously linked to memory. We make an observation by utilizing our senses, then it becomes part of our memory of an event, task or condition. We rely on our memory for comparing our first observation with later observations, or for recalling steps in a process. Listed below are the types of observation.

- **Visual (sight)**
- **Auditory (hearing)**
- **Olfactory (smell)**
- **Gustatory (taste)**
- **Tactile (touch)**
- **Kinesthetic (body movement)**

All of these types of observation store information into memory. Memory can be described as long term and short term in nature. Repetition of an observation helps store it to long term memory. Emotional factors can have a positive or negative impact on the degree to which an observation is stored to memory. For example, there are people who, after having experienced a traumatic event, cannot remember any of the details. Conversely, there are people who experienced a traumatic event many years ago, who can still recall in vivid detail, the observations they made at the time the event took place.

Visual Observation

Visual observation is done through sight alone. The brain records pictorial messages received by the optic nerve. You may look at a job being done and observe the steps you see being performed. *To improve your visual observation and memory, practice breaking events, tasks and conditions down into steps or parts. Next, close your eyes and visualize what you have just seen, rehearsing the steps or parts in the correct order. This visualization exercise repeats the pictorial message to the brain to increase the likelihood of accurate observation and memory.*

Auditory Observation

Auditory observation is performed through hearing. Good listening skills increase auditory observation ability. Listening to spoken words is very important when receiving verbal directions of any kind. Equally important is listening to sounds of the environment, such as equipment motors, sirens and alarms. *To improve your auditory observation and memory, repeat important statements, phrases and numbers aloud to yourself, creating a better observation and memory of what you hear. Listen carefully to sounds*

made by new equipment. Make a mental note of what sounds occur under normal operating conditions. Familiarize yourself with warning signals and sirens and their meanings.

Olfactory Observation

Olfactory observation is performed through smelling. Recognizing smells and odors can be an important type of observation. For example, early detection of fire by smelling smoke or detection of chemical reactions by smelling chemical odors, is essential to personal safety. *To improve your olfactory observation, familiarize yourself with normal odors of your environment and with odors of those items around you that are potentially hazardous. By paying special attention to normal odors and scents, you will be better prepared to recognize the abnormal by means of comparison with your first observations.*

Gustatory Observation

Gustatory observation is performed through taste. Recognizing tastes is second nature to most people. We recognize the taste of sour milk because we have earlier observed and memorized the taste of unspoiled milk. We make an instant comparison and assessment without conscious thought. A chef, however, uses gustatory observation to detect subtle differences in the affect of a single ingredient on a recipe. Advertising agencies use double blind taste tests to see if individuals can detect taste differences in products. *To improve your gustatory observation, taste a very small portion of a variety of good foods, then describe their flavor, texture and consistency in words. Pay attention to the taste of colas or other brand name products that are the same or very similar and describe their taste differences in words. Putting the flavor and texture into words makes you think more about exactly how the foods vary.*

Tactile Observation

Tactile observation is performed through touching or 'hands on' experience. Many people learn better by letting them try a task, rather than asking them to watch it being performed repeatedly. Small children and even adults often say 'let me try' when learning new information. Performing the task reinforces the observation through the sense of touch. *To improve your tactile observation, describe how the sense of touch is used to perform certain tasks, i.e. typing on a keyboard. Break tasks down into steps and think about how each step involves the sense of touch and describe that step in words i.e. what motions are made and what fine motor skills are required.*

Kinesthetic Observation

Kinesthetic observation involves the sense of bodily position and/or bodily movement. Some tasks require a greater sense of balance and we observe through kinesthetic observation exactly how to position oneself in order to perform the task. Imagine yourself riding a bicycle. Finding the point of balance is at first difficult, and then gets easier. At first try, one thinks about balance and concentrates on observing where balance is achieved. Once determined, this bodily position is stored into memory and becomes second nature, requiring no conscious effort to recall. Kinesthetic observation is used by

everyone, but has special significance in the performing arts such a dance, and music. It is also significant in construction and other very physical occupations. *To improve kinesthetic observation think about how ones body should be positioned to perform a physical feat. Describe the position in words only, in a way that would allow another person to understand and then attempt the feat, i.e. how to jump rope. Describe how to ride a bicycle, or how to dance a ballet. Putting the motion and positioning into words makes you think more about exactly how the task is performed.*

REVIEW QUESTIONS
OBSERVATION LEARNING BRIEF

NAME _____ DATE _____
CLASS _____ INSTRUCTOR _____

1. What are the primary influences that have an impact on making an observation.

2. What type of things are most distracting to you, so that they might interfere with your ability to make good observations.

3. Name six types of observation and describe them in your own words and give an example of each.

ANSWERS TO REVIEW QUESTIONS
OBSERVATION LEARNING BRIEF

1. Need or Interest

Motivation

Distracters

2. Answers will vary. This question is designed to encourage students to think about what factors are most distracting to them. There is no right or wrong answer.

3. Visual (sight)

Auditory (hearing)

Olfactory (smell)

Gustatory (taste)

Tactile (touch)

Kinesthetic (body movement)

Definitions will vary but should be consistent with the introductory text.

OBSERVATION

OVERVIEW

The Video Segment For Level 6 Observation

The video segment for Level 6 Observation Skills is designed to create a Level 6 situation with several distractors and minimal explanation of details. Students are then asked to report their observations on the Response Sheet provided.

(**NOTE:** Students should not review the response sheet prior to watching the video segment!) The video may be reviewed and discussed after the Response Sheet is completed.

- This exercise corresponds to Work Keys® Observation level 6

CHARACTERISTICS OF LEVEL 6 SITUATIONS

- Several component steps
- Several strong distractors and/or extra details
- No attributes or details specifically highlighted, and only some directly discussed or explained

LEVEL 6 OBSERVATION SKILLS

- Notice and remember several details that are relevant to the process or procedure being shown
- Take in and recall incoming sensory information so it can be used to make predictions, comparisons, or evaluations
- Visualize how a detail or task fits into the entire process or procedure demonstrated
- Interpret if-then and cause-effect relationships

MATERIALS

1. A DVD player
2. Pencils and erasers
3. A Response Sheet for each student

SCANS Work Readiness Kit

Reading For Information

Reading for Information is the skill in reading and understanding work-related instructions and policies. Such material, known as procedural text, differs from the expository and narrative text on which most reading programs are based. This difference is one impediment for many employees in reading and understanding much of the material they encounter on the job.

In addition, unlike reading and content-area texts, which are usually organized to facilitate reading, workplace communication is not necessarily designed to be easy to read. It may even be poorly or ambiguously written.

The following activities develop skills in analyzing written materials for meaningful information. By presenting the reader with multiple formats of written material, these exercises expand the readers' ability to glean information from written sources.

Work Keys® Level	3	4	5	6
Activity 1 - Tightwad Telegram Terminal	X			
Activity 2 - Air Accident Investigation		X		
Activity 3 - Industrial Safety Referee			X	
Activity 4 - Buyer-Seller Case File				X

READING FOR INFORMATION

OVERVIEW

Buyer-Seller Case File

This two-day activity casts students (either individually or grouped) in the role of consumer-seller case worker. The teacher begins the activity by reviewing the types of documents ordinarily referred to in consumerist controversies (contracts, correspondence, receipts, etc.). After the students are orally instructed in the way the activity will be performed, they read the cases one at a time and decide who is in the right. Then they write a short summary statement, including advice for the aggrieved party. The statements are read aloud and discussed. Drawing from source materials provided in this Guide, the teacher punctuates each case discussion with a few remarks based on current practices. The activity may be conducted as a competition, with two or three groups of students (two or three to a group) assigned to a case and contending for recognition as the most reasonable advisors. The activity ends with the teacher's comments on the value of the applied skills in settling buyer-seller disputes. These skills include reading for specific content, summary writing, and oral communication.

- This exercise corresponds to Work Keys® Applied Math level 6

CHARACTERISTICS OF LEVEL 6 READING MATERIALS AND QUESTIONS

- More complex presentation of information
- Excerpts from regulatory and legal documents
- More elaborate procedures and concepts described
- Advanced vocabulary, jargon, and technical terms
- Most necessary information not clearly stated in the passages

LEVEL 6 READING SKILLS

- Generalize beyond the stated situation and recognize implied details and the probable rationale behind policies and procedures
- Recognize the application of jargon or technical terms to new situations
- Recognize the application of complex instructions to new situations
- Recognize, from context, the less common meaning of a word with multiple meanings
- Generalize from the passage to situations not described in the passage
- Identify implied details
- Explain the rationale behind a procedure, policy, or communication
- Generalize from the passage to a somewhat similar situation

MATERIALS

1. Pencils
2. A Student Activity for each student (if students are not grouped). (If students are grouped, one activity may be shared by two or three.)

SCANS Work Readiness Kit

Teamwork

Teamwork skills are task skills, which contribute to reaching the work goal, and relationship skills, which contribute to the smooth working of the team. Employees who can form and maintain positive relationships while accomplishing work tasks have behaviors essential for productivity. Students and employees should understand that employers prize and demand these productive behaviors.

The following activities build Teamwork skills by addressing individual components such as Teambuilding, Employee Relations, Compromise, Brainstorming, Division of Labor and Cooperation. The “Teamwork Tactics” workbook contains numerous exercises with reproducible workpages to involve individuals in activities that address specific components of teamwork. The book “Toward Active Learning” provides teambuilding activities on pages 41-58.

Work Keys® Level	3	4	5	6
Activity 1 - Classroom Teaching Contest	x	x	x	x
Activity 2 - Teamwork Tactics	x	x	x	x

TEAMWORK

OVERVIEW

Classroom Teaching Contest

This four-to-five-day effort places students in role-oriented teaching teams that consist of chartmakers, materials specialists, scheduling and supplies specialists, and team teachers. Each student receives a set of instructions and a copy of the lesson that the team will teach to the rest of the class. The students read the materials and discuss them with each other. Each carries out his responsibilities, which require a high degree of coordination. Each team produces its own instructional plan and materials. Before a team presents its lesson, it pre-tests the class. After the lesson is presented, the class is post-tested. The team that produces the largest improvement in score is declared the most proficient. A follow-up discussion is held to allow students to critique their approaches to teaching. Emphasis is on interpreting printed instructions, oral communication, and creativity.

CHARACTERISTICS OF LEVEL 3 SITUATIONS

- Simple work situations involving one problem or source of difficulty
- Clear team goals and consequences
- All the resources necessary for addressing the problem readily available
- Good team relationships

LEVEL 3 TEAMWORK SKILLS

- Identify team goals and ways to work with other team members to accomplish team goals
- Recognize that a team is having problems finishing a task and identify the cause of those problems
- Choose actions that support the ideas of other team members in a positive way to accomplish team goals
- Recognize the need for trust and dependability in a team environment

MATERIALS

1. Pencils and erasers
2. Black crayons
3. Rulers
4. Chart paper
5. Scratch paper
6. A Student Activity for each student
7. Reproduced "lessons" (see "Reproduction Requirements" in the Teacher's Section)

Applied Math Digital Workbooks

Introduction

The *Applied Math Digital Workbook* makes the process of integrating basic math and vocational skills a snap. Everything you need to start teaching applied vocational math is at your fingertips. The activities include a pre-post test, basic math instruction and practice, vocational word problems, applied vocational problems and vocabulary activity sheets.

Pre/Post Test: The Pre/Post Test consists of 72 multiple choice questions which assess students in Addition, Subtraction, Multiplication, Division, Fractions, Decimals, Percents, Rounding, Ratio/Proportion, Scales, Linear Measure, Perimeter, Area, Volume, Temperature and Angles.

Math Review: This section provides procedures and practice problems for 21 Skill Areas.

Word Problems: This section provides students with practice word problems for each of the 21 Skill Areas.

Vocabulary Activities: Each major area contains seven different types of vocabulary activities.

Applied Problems: These activities are based on work related competencies specific to a trade area.

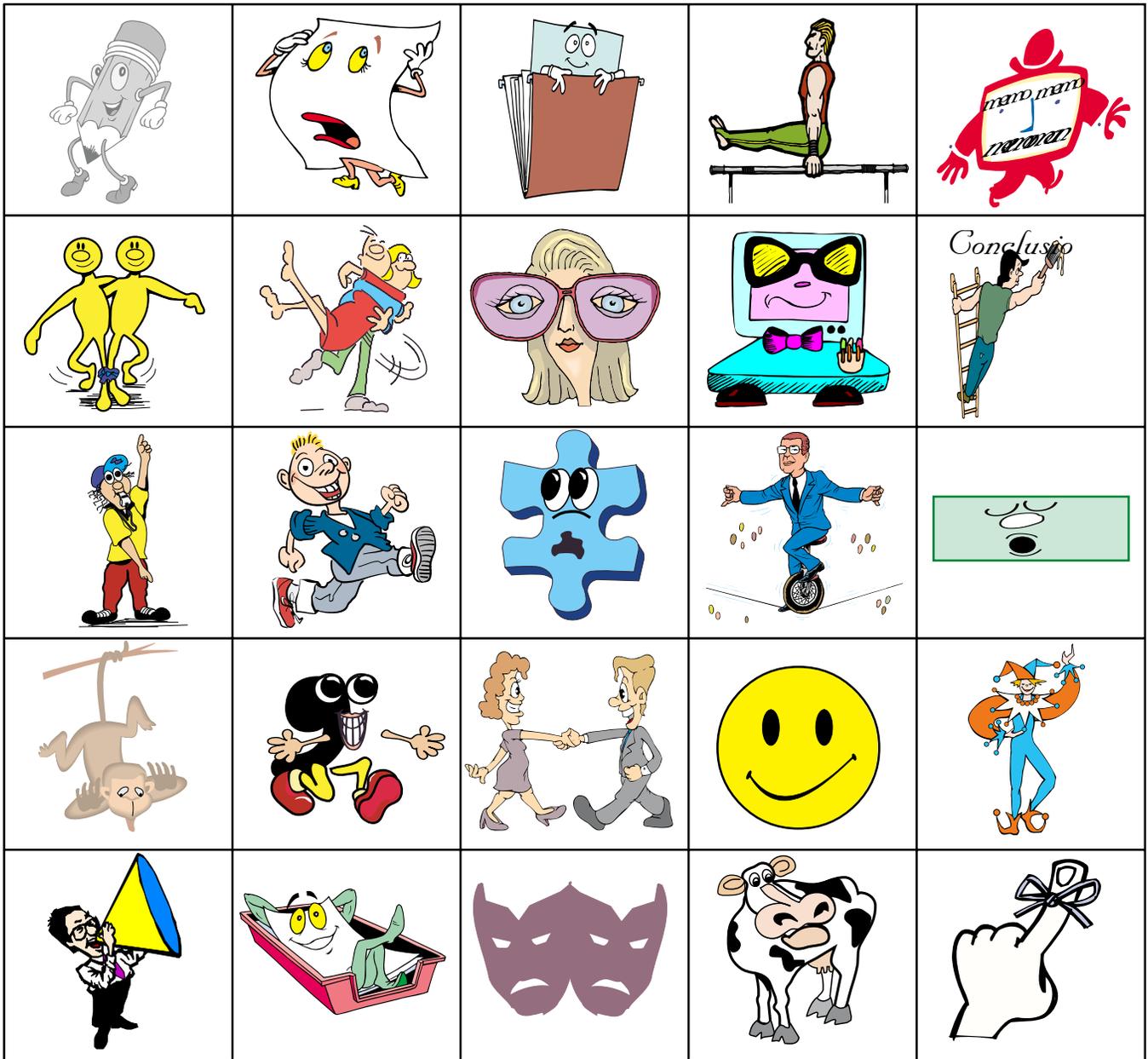
Skill Areas

- Addition of Whole Numbers
- Subtraction of Whole Numbers
- Multiplication of Whole Numbers
- Division of Fractions
- Addition of Fractions
- Subtraction of Fractions
- Multiplication of Fractions
- Division of Fractions
- Addition/Subtraction of Decimals
- Multiplication of Decimals
- Division of Decimals
- Fractions/Decimals/Percents
- Rounding Numbers
- Ratio and Proportion
- Scales
- Linear Measure
- Perimeter
- Area
- Volume
- Temperature
- Angles

Workplace Language POWER

Partnering Outstanding Writing With Efficient Reading

By Ellen McPeck



Program Overview

Workplace Language P.O.W.E.R. (Partnering Outstanding Writing with Efficient Reading) is a criterion referenced program that teaches thirty different reading/writing competencies using skill work and practical practice. Each competency is presented within the context of these four pages:

1. Teacher's Manual Page—Includes objectives, an introduction, teaching suggestions, and an answer key
2. Topic Overview Page—Uses an explanatory chart as a means of introducing a skill
3. Skill Practice Page— Provides an activity designed to teach the competency
4. Practical Practice Page—Incorporates real-life workplace documents and tasks to provide transference of the skill from the classroom to the real world

Workplace Language P.O.W.E.R. is the perfect curriculum to ensure that traditional school students understand how to use these basic skills and why the skills are important. The workplace nature of the program also makes it an ideal program for working adults who need to refresh their language skills.

A pretest and a posttest are included.

Objectives

- Unit 1 Students will write sentences in the active voice.
- Unit 2 Students will replace slang words with conventional wording.
- Unit 3 Students will sort possibilities into categories.
- Unit 4 Students will write in parallel form.
- Unit 5 Students will write a memo using the memo-writing steps.
- Unit 6 Students will verify the correct format of compound words.

- Unit 7 Students will use the correct version (one-word or two-words) when writing.
- Unit 8 Students will design a front page for a newsletter.
- Unit 9 Students will create a professional resumé.
- Unit 10 Students will make conclusions.
- Unit 11 Students will write facts and opinions.
- Unit 12 Students will extrapolate on business-related issues that are new to them.
- Unit 13 Students will write and use both sentences and fragments correctly.
- Unit 14 Students will use correct tenses while writing about events that took place in different time frames.
- Unit 15 Students will use all ten hyphenation rules.
- Unit 16 Students will identify and correct clarity issues created by dangling modifiers.
- Unit 17 Students will write sentences using fifteen comma rules correctly.
- Unit 18 Students will use correct person and number when writing.
- Unit 19 Students will write using positive wording.
- Unit 20 Students will write meaningful e-mail subject lines.
- Unit 21 Students will summarize to create advertisements.
- Unit 22 Students will write concise memos and e-mails.
- Unit 23 Students will write sentences that include negative words without using double negatives.
- Unit 24 Students will use plurals and possessives correctly.
- Unit 25 Students will use homophones correctly and will provide clues to support the usage.



Unit 13 Finding Fragments

Objectives

- Students will understand what a fragment is.
- Students will recognize sentence fragments, will be able to identify acceptable and unacceptable uses for fragments, and will be able to identify whether subject or verb is missing.
- Students will write and use both sentences and fragments correctly.

Introduction

Ask a volunteer to describe a *sentence fragment*.
A sentence fragment is a group of words that do not have both a subject and a verb, and, therefore, do not form a sentence.

Discuss the fact that fragments are acceptable in some situations and not in others. Ask students to list acceptable and unacceptable uses.

Some examples of acceptable uses: short notes of a personal nature, explanatory notes in situations such as check registers, wording on signs, resumés

Some examples of unacceptable uses: business letters, business e-mails, business reports, research papers

Write the following sentences on the board and ask students to identify each as a fragment or a sentence:

Alice loves daisies and roses. (sentence)

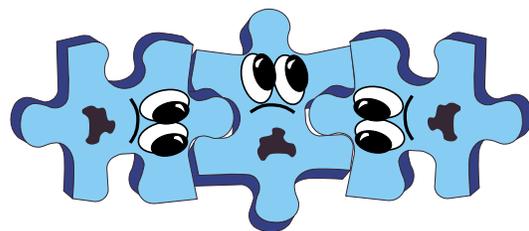
Of all the flowers Alice enjoys, daisies and roses. (fragment)

Additional Teaching Suggestions

- Professional works such as textbooks and newspapers should not contain fragments within flowing text. Neither should most business communications such as memos, reports, and letters. Since the creators of such materials are only human, fragments do find their way into final printings. Set up a class contest to run for the rest of the year. Each time a student finds a fragment where it should not be, record the source, the fragment, and the student's name. Award a prize to the student who finds the most fragments.
- If it would work well in your class, add fragments found during peer-editing to the contest laid out above.
- Brainstorm to create a list of acceptable uses for sentence fragments. Decide whether to include single words as fragments. If you choose to include single words, items such as name tags and class lists could be included as uses.
- Fragments are mainly an issue with written words. However, it is interesting to listen for the use of fragments in oral speech. Secretly tape a class discussion. Then, play it back slowly and record all the fragments. Discuss the differences between oral and written language. Discuss situations where fragments in oral speech are more and less acceptable.

Answer Key: Skill Practice

(Where used)	Is a Sent needs to be	Is a Sent but frag OK	Is a Frag but is OK	Is a Frag (Missing Part) One Possible Rewrite
1. (check register)			x	
2. (resumé)			x	
3. (part of a story)				(verb) The day the squirrel found the hole in the garage was the start of all the trouble.
4. (instructions / product)	x			
5. (research paper)				(verb) The small brown bird with yellow and red wings ate the seeds from my hand.
6. (check register)		x		
7. (business letter)				(subject and verb) When the new sales person gets on board, I will have more time for writing reports.
8. (greeting card)			x	
9. (report to boss)	x			
10. (yard sign)		x		



Answer Key: Practical Practice

Answers will vary. Students are to write:

- A memo including two sentences and a fragment. The fragment is to be crossed out and replaced with a sentence.
- A shipping label with Allen's name on it and a request for him to read the document and give his opinion. (Should be in complete sentences)
- An e-mail to a coworker. The first sentence should be a fragment and the rest should be complete sentences.



Recognizing Incomplete Sentences

Sentences must have both a subject and a verb. If either one is missing, the words create a fragment, not a sentence. Subjects and verbs in clauses or in introductory phrases do not count toward making a sentence. Study the chart below to understand the difference between sentences and sentence fragments.

Fragment	Missing Part	Sentence
The dog with the brown stripe	Verb (What did the dog with the brown stripe do?)	The dog with the brown stripe sat next to me through the whole movie.
Was running down hill as fast as he could go	Subject (Who was running down hill?)	Cesar was running down hill as fast as he could go.
The day that I lost my wallet	Verb (What about the day that you lost your wallet?)	The day that I lost my wallet was cold and miserable.
Laughed about politics, like all the people I knew at the time	Subject (Who laughed like all the people I knew?)	Aaron laughed about politics, like all the people I knew at the time.



Unit 13

Finding Fragments

Skill Practice

Directions

Decide if each group of words in the first column is a sentence or a fragment. For each sentence, place a check in either the second or third column. For each fragment, place a check in the fourth column if that fragment is acceptable in the situation. When a fragment is not acceptable, complete column five: Identify the missing part as a subject or a verb and rewrite the fragment so it is a sentence.

(Where used) fragment or sentence	Is a sentence and needs to be a sentence	Is a sentence but a fragment could be used	Is a fragment but is OK	Is a fragment but needs to be a sentence
1. (note on check register) Girl Scout cookies from Andrea.				Missing part: Rewrite:
2. (comment on resumé) Graduate of Willow High School.				Missing part: Rewrite:
3. (part of a story) The day the squirrel found the hole in the garage.				Missing part: Rewrite:
4. (new product instructions) Open the box and remove the red light bulb.				Missing part: Rewrite:
5. (part of a research paper) The small brown bird with yellow and red wings.				Missing part: Rewrite:
6. (note on a check register) This deposit is money I won in the lottery.				Missing part: Rewrite:
7. (part of a business letter) When the new sales person gets on board.				Missing part: Rewrite:
8. (note on a greeting card) Best wishes in the years to come.				Missing part: Rewrite:
9. (part of a report to your boss) Half the department plans to work late Tuesday.				Missing part: Rewrite:
10. (wording on a yard sign) This sale will run from 9:00 a.m. until 4:00 p.m.				Missing part: Rewrite:

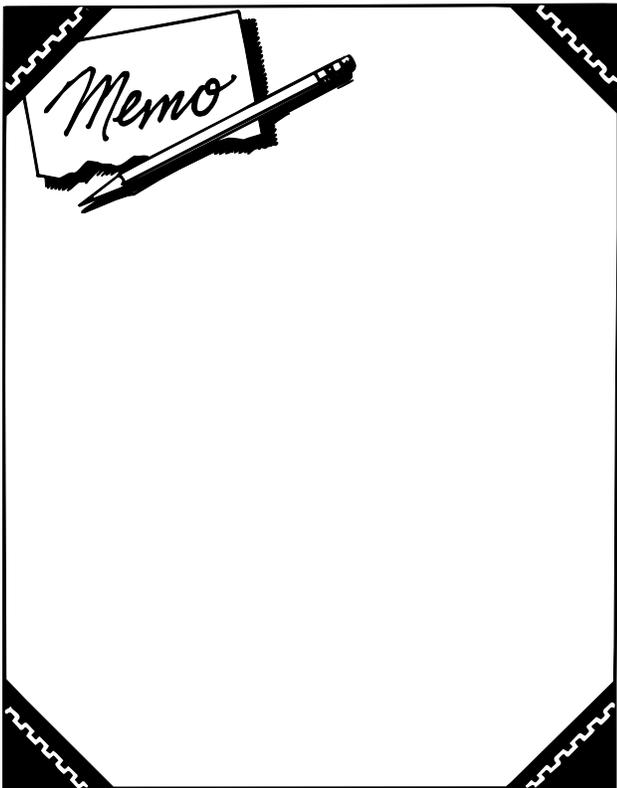


Unit 13

Finding Fragments

Practical Practice

Directions Follow the directions below to write a memo, a shipping label with a message, and an e-mail. You will be using a combination of complete and fragmented sentences.



Write a memo to a coworker letting him/her know that you will be gone tomorrow. Start with two complete sentences and a fragment. Cross the fragment out and replace it with a complete sentence.

Use this shipping label to send a document from you to Allen in the next department. Explain that you would like him to read the document and give you his opinion. Use complete sentences.

FROM	_____

TO	_____

Write an e-mail to a coworker who is also a friend. Send your friend best wishes for a big meeting she has in a half hour. Make your first sentence a fragment and the rest of the sentences complete.

Mail Folder "In box"			
Get Msg	New Msg	Send	Print
Trash			
<input type="checkbox"/> Local Mail	<input type="checkbox"/> New Idea	esmith@rivalnet.com	4/2 3:11 AM
<input type="checkbox"/> Unsent Messages	<input type="checkbox"/> Pictures	dbeeth@galenanet.com	4/9 4:23 AM
<input type="checkbox"/> Sent	<input type="checkbox"/> Paint Has Arrived	psnyder@sticnet.com	4/9 6:14 AM
<input type="checkbox"/> Trash			
Subject: _____			