

# Lesson **B** *Business Terms and Money*

## Thinking KAP



You and your friends want to make some money selling video games. What would you need to do to make a profit?

**B**

# Lesson B: Business Terms and Money

## Task

Students will use a real-world situation to initiate a discussion about profit.

## Delivery

***Have students complete the Thinking KAP activity independently.***

Alternatively, you may choose to have students complete this activity in pairs.

***Lead a discussion about profit.***

Have students share their responses to the activity. The discussion should be guided by student responses, but you may wish to address the following points.

- Students may identify that *profit* is how much money is earned. In this scenario, students will need to spend money buying video games before they sell them. It is important for them to sell the video games at a higher price to earn money in the process.
- Students may discuss other expenses that may be incurred when starting a business. If they want to advertise, send out brochures, or rent a booth at a game convention, it will require money. It is important that the earnings are enough to cover those expenses.

## Moving On

*“Today we’re going to learn more about running a business and calculating profit.”*

## Strategy Instruction



### Calculating Profit

In the Thinking KAP, you discussed profit. You probably concluded that you would need to earn more money from selling things than you spent to purchase them.

One of the most basic WorkKeys tasks is calculating profit.

*keep in mind*

Profit is a logical concept. It's simply the difference between what you earned and what you spent.

Term	Definition	Example
Revenue	Total income received	If you sell 12 melons for \$3.00 each, your revenue is \$36.00.
Expenses	Money spent	If you purchase 10 peaches for \$0.70 each, your expenses are \$7.00.
Profit	Revenue minus expenses	If you pay \$0.30 each for 5 apples, pay \$0.10 for advertising, then sell the apples for \$0.40 each, your profit is \$0.40.

### Try It Out!

1. You own a grocery store and are updating your financial records for yesterday's sales. Among your sales, you sold a spiral ham for \$37.50. If you paid \$22.75 for the ham, and had no other expenses, what was your profit?
  - A. \$14.75
  - B. \$22.75
  - C. \$30.13
  - D. \$37.50
  - E. \$60.25

B

## Task

Students will calculate profit using common business terms.

## Delivery

***Help students make the connection between the Thinking KAP and calculating profit.***

In the Thinking KAP activity, students thought about starting a business selling video games. It was important to spend less money than they took in to make a profit. Similarly, business owners everywhere work to make money on top of their expenses.

***Review profit.***

Read the introductory text with students. Emphasize that profit and profitability are important concepts on the WorkKeys Applied Mathematics test. Students will see many questions relating to profit.

***Introduce common business terms.***

Read the table with students. Point out the differences between revenue, expenses, and profit. Use the real-world examples in the last column to help students understand these concepts.

***Guide students through the Try It Out exercise, using business terms to solve the problem.***

Read the problem with students. Have them solve the problem individually and discuss the answer as a class.

## Try It Out: Answers

1 A

## Moving On

*“It is also important to understand discounts and markups.”*

## Calculating Discounts and Markups

The other common business calculations on the WorkKeys Applied Mathematics test are discounts and markups.

Term	Definition	Example
Discount	Amount by which the original price is reduced	If you sell fresh pears for \$0.50 each, and sell pears that have been on the shelf for at least a week for \$0.25, then the discount on old pears is 50%.
Markup	Amount added to the cost price to determine the selling price. The markup is the profit if there are no other expenses.	If you purchase grapes for \$1.00 per pound, and sell them for \$1.10 per pound, the markup is \$0.10 per pound.

*keep in mind*

You can check your solution to a discount problem by adding the amount saved to the discounted price to make sure it yields the original price.

### Try It Out!

2. You are a tailor and normally charge \$25.00 to hem a dress. Today, you are offering a special and will charge only \$19.00 to hem a dress. What is the percent discount you are offering?
- A. 6%
  - B. 15%
  - C. 19%
  - D. 24%
  - E. 25%

B

## Task

Students will analyze percent discounts and markups.

## Delivery

***Review the concept of markup and discount.***

Read the introductory text and table with students. Point out that when items go on sale, they are being sold at a discount. When business owners calculate the profit they need, they mark up items to make more money.

### **Teacher's Note**

Consider encouraging your students to speak with local store owners to learn more about markup, discount, and profitability. If time permits, you may wish to invite a business expert into your classroom to discuss these important topics. Invite students to consider the balance between markup and discount. If prices are too elevated, customers will probably not buy the items. If the discounts are too steep, store owners make less profit.

***Guide students through the Try It Out exercise, using the definition of discount to solve the problem.***

Read the problem with students. Allow students to solve the problem individually and discuss the solution as a class.

## Try It Out: Answers

2 D

## Moving On

*"It is also important to understand sales tax."*

## Calculating Sales Tax

Sales tax is a percentage of a purchase price that is added to the purchase price. Remember that *percent* means *per 100*, so a percent is a number out of 100. For example, 8.6% is equal to  $\frac{8.6}{100}$ , or 0.086.

If asked to compute the sales tax on a purchase, multiply the purchase price by the sales tax percent. For example, suppose you sell a loaf of bread for \$1.50 and the sales tax is 6%. The sales tax would be:

$$\$1.50 \times 0.06 = \$0.09$$

If asked to calculate the total amount of money due for a purchase, including sales tax, calculate the amount of the sales tax and add it to the purchase amount. In the example above, the customer would have to pay \$1.59 for the loaf of bread.

*keep in mind*

Be sure to answer the right question. Some problems will ask for the tax; others will ask for the total price, including the tax.

### Try It Out!

3. You run a charity organization and want to purchase posters for a fundraising event. If the total price of the posters is \$268.35, and sales tax is 7.2%, how much will you pay for the posters, including tax?
- A. \$ 7.20
  - B. \$ 19.32
  - C. \$275.55
  - D. \$287.67
  - E. \$294.72

# Task

Students will calculate sales tax.

## Delivery

### *Lead a discussion about sales tax.*

Read the introductory text with students. Remind students that sales tax is usually discussed as a percentage, which is a fraction with a denominator of 100. To find a percentage of a certain value, students should multiply the value by the percent in decimal form. Students should remember that to convert percents into decimal form, they need to move the decimal point two places to the left. For example, 6% is equal to 0.06.

### **Teacher's Note**

Estimating is a particularly helpful tool in solving sales tax problems. Students should practice estimating 10% of any given value by shifting the decimal point one place to the left. This can help them eliminate answer choices and confirm their solution. Students should notice whether they are looking for values greater or less than 10%.

### *Guide students through the Try It Out exercise, calculating the sales tax to solve the problem.*

Read the problem with students, and find the solution together as a class. Students should first calculate the amount of tax on the posters and then add that amount to the original cost.

## Try It Out: Answers

3 D

## Moving On

*"It is also important to be able to compare different price structures."*

## Comparing Deals

The WorkKeys Applied Mathematics test challenges your ability to analyze different deals and compare the results. If you remember the definitions of business terms, organize the data, and make careful calculations, you will be able to compare deals. It is often helpful to construct a chart.

### Try It Out!

4. You are comparing prices from two computer distributors. Your office will purchase 12 personal computers. The XYZ Computer Store sells a computer with the specifications your office needs for \$749.95, excluding a 15% discount on every computer for purchases of 10 or more computers. The Computer Discount Store sells a computer with the specifications your office needs for \$695.99, excluding a 10% discount on every computer for purchases of 10 or more computers. Delivery costs \$20 per computer from The XYZ Computer Store, and \$200 per order from The Computer Discount Store. What is the least amount that your office will have to pay for the computers if your office purchased from either The XYZ Computer Store or The Computer Discount Store?
- A. \$7,299.10
  - B. \$7,516.69
  - C. \$7,716.68
  - D. \$7,889.49
  - E. \$8,551.88

Analyze the important information by creating a chart with a column for each company, and rows for the price of the computers and the price of delivery.

*keep in mind*

Making a chart is a great way to rewrite important information when you need to compare categories of information.

**B**

## Task

Students will compare deals to identify the best value.

## Delivery

### ***Review comparing deals.***

Read the introductory text with students. Emphasize that the WorkKeys Applied Mathematics test may ask them to compare different price structures to find the better value. Students should read the scenarios carefully and keep records of their calculations. Frequently, there will be a great deal of information provided, and students may get confused. Encourage them to keep track of their work in an organized fashion, putting special emphasis on Step 2 of the 4-Step Method for Problem Solving.

### ***Guide students through the Try It Out exercise, using organized calculations to solve the problem.***

Allow students to complete this problem individually or in small groups. Ask students to consider how they can best organize the information in the problem.

## Try It Out: Answers

4 C

## Moving On

*“Now let’s practice together.”*

## Guided Practice



### The 4-Step Method for Problem Solving



**STEP 1: Understand the problem.**



**STEP 2: Analyze important information.**



**STEP 3: Plan and solve.**



**STEP 4: Check your work.**

# Guided Practice

***Briefly review the content and strategies from this lesson.***

Ask a student to summarize what the class has learned. You may wish to use the board or chart paper to record these ideas, particularly the names of new strategies.

There are several recommended ways to present the Guided Practice problems, as listed below. However you choose to deliver this section, be sure to emphasize the systematic and strategic thinking that will help students succeed on Test Day.

1. Model expert test-taking strategies by giving students a window into your thought process. Think aloud as you work through the problems.
2. Allow students to guide you through the systematic approach to the test-taking strategies they have learned. You can serve as a scribe, recording the ideas of the class and facilitating their thought processes.
3. Balance teacher and student interaction by modeling how to approach the first problem, then inviting students to take a more active role in approaching the next one.

## **Teacher's Note**

**In this portion of the lesson, it is critical that you model and reinforce systematic and strategic thinking. Be sure to follow the 4-Step Method for Problem Solving for each problem. Also, be sure to model the strategies suggested by the reference text. Although there is always more than one way to solve a math problem, these problems were designed as vehicles for specific strategies in this lesson.**

1. You are a hot-dog vendor and sold 4,200 hot dogs at \$1.50 each last month. If it costs you \$46.00 to purchase each pack of 100 hot dogs, and you have to pay \$3,800 in other expenses per month, what was your profit last month?
- A. \$ 460.00
  - B. \$ 568.00
  - C. \$ 932.00
  - D. \$2,500.00
  - E. \$4,368.00

# Guided Practice

1 B



## **STEP 1: Understand the problem.**

**Scan:** This problem is basically about calculating profit.

**Restate:** This question can be restated as, “What is the value of the income minus the expenses?”



## **STEP 2: Analyze important information.**

Students should calculate the total income and expenses of the hot-dog vendor. Since hot dogs cost \$1.50 and 4,200 were sold last month, students should multiply to find the total income. They can use their calculators to find that  $\$1.50 \times 4,200$  is equal to \$6,300.

Students then need to calculate the cost of the hot dogs. Since 4,200 were sold and there are 100 hot dogs in each package, students can divide to find that they used 42 packages, each with a value of \$46. Students can use their calculators to multiply \$46 by 42 to find the total cost of the hot dogs. They will find that the value is \$1,932.

Students should also note that there were \$3,800 in other expenses.



## **STEP 3: Plan and solve.**

Students can subtract the expenses from the total income to find the profit.

$$\$6,300 - \$1,932 - \$3,800 = \$568$$

The total profit is \$568.



## **STEP 4: Check your work.**

Model the check question, “Did you answer the right question?” Students should verify that the question asked them for the profit rather than the total income or expenses.

2. You own a candy store and want to purchase a new kind of candy. If 1,000 boxes of the new candy cost a total of \$220.88, and there is an 8.3% sales tax, how much will you pay per 1,000 boxes of the new candy?
- A. \$13.18
  - B. \$18.33
  - C. \$212.65
  - D. \$239.21
  - E. \$286.50

## Guided Practice

2 D



### **STEP 1: Understand the problem.**

**Scan:** This problem is basically about calculating sales tax.

**Restate:** This question can be restated as, “What is the total cost including tax?”



### **STEP 2: Analyze important information.**

The important information in this problem is the value of \$220.88 and the 8.3% sales tax.



### **STEP 3: Plan and solve.**

Students should multiply the original price by the percent tax to find the amount of tax.

$$\$220.88 \times 0.083 = \$18.33$$

Students should then add the amount of tax to the original cost.

$$\$220.88 + \$18.33 = \$239.21$$

Students should identify that the total cost of the candy with sales tax is \$239.21.



### **STEP 4: Check your work.**

Model the check question, “Is your answer reasonable?” Students can estimate that 10% tax would be \$22, so \$18 is a reasonable amount for 8.3% tax.

## Shared Practice



Use the 4-Step Method for Problem Solving and your calculator to solve the problems in this section.

1. You manage a day care center that charges \$52.50 per day to care for one child. If the Jacobsons have two children and there is a 6% sales tax, what will be their total bill for 4 days of child care?
- A. \$445.20
  - B. \$315.00
  - C. \$111.30
  - D. \$ 55.65
  - E. \$ 52.50

**hint** → Calculate the total cost per day for two children before solving.

2. You publish a consumer magazine and typically charge \$3.98 an issue. However, this month you are offering a special and will only charge \$3.27 an issue. How much of a discount are you offering your customers?
- A. 7.1%
  - B. 14.3%
  - C. 17.8%
  - D. 22.4%
  - E. 32.7%

**hint** → Begin by subtracting the smaller value from the larger value.

## Shared Practice

*Have students solve the problems in pairs or small groups.*

Give students approximately 8 minutes to complete the Shared Practice. Then review.

*As students work, observe and assist when necessary.*

Circulate and assess students' progress. Provide support for students who may be having difficulty.

## Shared Practice: Answers

1 A

**Students should first identify that since it costs \$52.50 for one child per day, it will cost \$105.00 for two children per day. Students can multiply this number by 4 to find the cost for two children over four days.**

$$\$105.00 \times 4 = \$420.00$$

**Students should then calculate the tax for this amount, with a 6% rate. Students can multiply \$420.00 by 0.06 and add that value to the cost.**

$$\$420.00 \times 0.06 = \$25.20$$

$$\$420.00 + \$25.20 = \$445.20$$

**It will cost \$445.20 for two children to be in day care for four days, including tax.**

- B Students may not fully understand this problem or may have guessed.
- C Students may have calculated the cost of two children for one day of day care including tax.
- D Students may have calculated the cost of one child for one day of day care including tax.
- E Students may have calculated the cost of one child for one day excluding tax.

2 C

**Students should first find the difference between the two prices of the magazine.**

$$\$3.98 - \$3.27 = \$0.71$$

**Students can then find the ratio of the difference in price to the original price to identify the percent discount.**

$$\frac{\$0.71}{\$3.98} = 0.178 = 17.8\%$$

**Students should identify that there was a 17.8% discount on the magazine price.**

- A Students may have only moved the decimal in the difference in prices instead of finding the percent discount.
- B Students may have multiplied the difference between the prices by 2.
- D Students may not fully understand this problem or may have guessed.
- E Students may have moved the decimal in \$3.27 instead of calculating the percent discount.

Name \_\_\_\_\_

Date \_\_\_\_\_

3. You work as a cashier at a cheese market and have to calculate the tax to charge a customer. The customer's total purchase amount is \$11.37, and tax is 7.9%. How much tax should you charge?
- A. \$ 0.79
  - B. \$ 0.90
  - C. \$ 1.37
  - D. \$ 7.90
  - E. \$12.27

**hint** → Convert the percent to a decimal to solve.

4. You play in a five-member jazz band. Last night, you had a performance, and each member earned \$236.40. However, a 3.2% federal tax was then taken out of the paychecks. How much money did each band member receive after tax?
- A. \$ 228.84
  - B. \$ 236.40
  - C. \$ 878.31
  - D. \$1,144.20
  - E. \$1,182.00

**hint** → Calculate the net amount of money made by each band member first.

**B**

## Shared Practice: Answers

3 B

**Students should multiply the original price, \$11.37, by the percent tax, 7.9%, in decimal form.**

$$\$11.37 \times 0.079 = \$0.90$$

**Students should identify that there will be \$0.90 in tax.**

- A Students may have moved the decimal point in the percent tax.
- C Students may have used part of the purchase amount as the tax.
- D Students may not fully understand this problem or may have guessed.
- E Students may have calculated the new price of the purchase, including the tax.

4 A

**Students should first find the amount of tax by multiplying the money earned by the percent tax. Students can then subtract the amount of tax from the income to find how much was left after tax.**

$$\$236.40 \times 0.032 = \$7.56$$

$$\$236.40 - \$7.56 = \$228.84$$

**Students should find that the band members will earn \$228.84 after tax.**

- B Students may have selected this because it is the amount earned before tax.
- C Students may not fully understand this problem or may have guessed.
- D Students may have figured out the amount the whole band made after taxes were taken out.
- E Students may have calculated the total amount the band made before taxes were taken out.

Name \_\_\_\_\_ Date \_\_\_\_\_

5. You are an interior designer and typically charge \$75 per hour. However, you want to increase your fee to \$85 per hour. If a customer needs your services for 17 hours, and sales tax is 7.1%, what is the percent increase in the amount she would pay based on the old charge versus the new charge?
- A. 7.1%
  - B. 11.8%
  - C. 13.3%
  - D. 15.9%
  - E. 17.2%

**hint** → Calculate the total cost of your services before tax. Then compute the tax.

6. You work at an auto repair shop, and have been working on Ms. Graybill's car for two weeks. The shop's rules are that bills should include a 25% markup on all parts. If the store paid \$120.00 for parts for Ms. Graybill's car, what should you charge Ms. Graybill for the parts?
- A. \$125.00
  - B. \$145.00
  - C. \$150.00
  - D. \$210.00
  - E. \$250.00

**hint** → Write an equation to find the amount that she will pay before tax.

**B**

## Shared Practice: Answers

5 C

Students should recognize that this problem involves comparing deals. Students should first find the complete cost of both fee structures.

Old pay structure	New pay structure
$\$75.00 \times 17 \text{ hours} = \$1,275$	$\$85.00 \times 17 \text{ hours} = \$1,445$
$\$1,275 \times 0.071 = \$90.53$	$\$1,445 \times 0.071 = \$102.60$
$\$1,275 + \$90.53 = \$1,365.53$	$\$1,445 + \$102.60 = \$1,547.60$

Students can then find the difference between the two prices, and divide it by the total with the old pay structure. This will show the percent increase.

$$\$1,547.60 - \$1,365.53 = \$182.07$$

$$\frac{\$182.07}{\$1,365.53} = 0.133 = 13.3\%$$

- A Students may have selected this because this is the percent tax.
- B Students may have selected this answer because it uses the new pay structure as the denominator.
- D Students may not fully understand this problem.
- E Students may have guessed.

6 C

Students should first find the amount of the markup on \$120.00 of parts.

$$\$120.00 \times 0.25 = \$30.00$$

Students can then add this value to the original price to find out how much Ms. Graybill should be charged.

$$\$120.00 + \$30.00 = \$150.00$$

- A Students may have thought that the original cost of parts was \$100.00.
- B Students may have added the price of the parts plus the percent markup.
- D Students may have calculated the price charged by a 75% markup.
- E Students may not fully understand this problem or may have guessed.

Name \_\_\_\_\_

Date \_\_\_\_\_

7. You want to print an advertisement in the local newspaper, which charges \$3.74 per square inch for advertisements. If your advertisement is 34 square inches, and sales tax is 6.6%, what will be your total cost to advertise in the paper?
- A. \$135.55
  - B. \$127.16
  - C. \$ 84.37
  - D. \$ 37.40
  - E. \$ 24.08

**hint** → Calculate the total cost for the size of the advertisement before adding the sales tax.

8. You are a motivational speaker and charge a total of \$735.00, including 5% sales tax, per appearance. How much do you charge per appearance before tax?
- A. \$ 35.00
  - B. \$695.00
  - C. \$700.00
  - D. \$730.00
  - E. \$735.00

**hint** → Write an equation and solve for the amount of money made before tax.

**B**

## Shared Practice: Answers

7 A

First, students should multiply to find the cost for 34 square inches of advertisement space.

$$34 \text{ square inches} \times \$3.74 \text{ per square inch} = \$127.16$$

Then students can multiply to find the amount of tax and add it to the price to identify the total cost of the advertisement.

$$\$127.16 \times 0.066 = \$8.39$$

$$\$127.16 + \$8.39 = \$135.55$$

- B Students may have forgotten to calculate tax.
- C Students may have guessed.
- D Students may have thought the advertisement was only 10 square inches.
- E Students may not fully understand the problem.

8 C

Students may find it easiest to think of \$735.00 as 105% of the original price. Students can set up an equation in which  $x$  is the original fee.

$$x + 0.05x = \$735.00$$

$$1.05x = \$735.00$$

- A Students may not fully understand the problem or may have guessed.
- B Students may have calculated the correct answer and then subtracted \$5.
- D Students may have subtracted \$5.00 from the total charge instead of subtracting 5%.
- E Students may have forgotten to subtract the tax.

### Teacher's Note

When you review these problems, focus on how students organize their work. Though tax and percent tax problems may seem similar, there are many different kinds. For example, make sure that in Problem 8, students understand that they need to find the cost *before* tax. Similarly, in Problem 5, students should be careful to calculate both scenarios fully before comparing them.

Name \_\_\_\_\_ Date \_\_\_\_\_

## KAP Wrap



Choose two of the business terms you learned in this unit and explain what they mean in your own words.

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Why is it important to write out each step that you take as you solve problems involving money and tax?

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**B**