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Welcome to

Pearson Math Makes Sense 7

Math helps you understand your world.

This book will help you improve your problem-solving skills and show you how you can use your math now, and in your future career.

The opening pages of **each unit** are designed to help you prepare for success.



The image shows the opening page of Unit 8, Geometry. The page features a large, colorful illustration of a traditional wooden building with intricate carvings and a large, stylized face on the wall. The text on the page includes the unit number '8' and the title 'Geometry'. There are three main sections: 'What You'll Learn', 'Why It's Important', and 'Key Words'. The 'What You'll Learn' section lists four bullet points: 'Identify and construct parallel and perpendicular line segments', 'Construct perpendicular bisectors and angle bisectors, and verify the constructions', 'Locate and plot points on the four quadrants of a grid', and 'Graph and describe transformations of a shape on a grid'. The 'Why It's Important' section lists one bullet point: 'A knowledge of the properties of lines and angles is essential in art and sports, and is common such as in carpentry, plumbing, building, engineering, interior design, and architecture'. The 'Key Words' section lists eight terms: 'parallel lines', 'perpendicular lines', 'bisect', 'bisector', 'perpendicular bisector', 'line with grid', 'Cartesian plane', 'quadrant', 'x-axis', 'y-axis', and 'square'. Red dotted lines with arrows point from the 'What You'll Learn' and 'Why It's Important' sections to the 'Key Words' list.

Find out **What You'll Learn** and **Why It's Important**. Check the list of **Key Words**.

3.3 Solving Percent Problems

When shopping it is often useful to be able to calculate discounts on the sale price for the final price or to decide which of two offers is the better deal.

Explore

A pair of sneakers cost \$100.00. A store has a 20% off sale. How much is your price for the sneakers? How much do you pay for the sneakers? How much money did the store lose? How much money did the store gain? How much money did the store lose? How much money did the store gain?

Next Steps

Look for patterns with these and another pair of sneakers. What happens when you add 20% off to the sale price? What happens when you subtract 20% off from the sale price?

Example

Let's say you have a pair of sneakers that cost \$100.00. The store has a 20% off sale. How much is your price for the sneakers? How much do you pay for the sneakers? How much money did the store lose? How much money did the store gain?

Practice

1. Calculate the sale price of a pair of sneakers that cost \$100.00 if the store has a 20% off sale. How much money did the store lose? How much money did the store gain?

Examples show you how to use the ideas and that there may be different ways to approach the question.

Explore an idea or problem, usually with a partner, and often using materials.

Connect summarizes the math.

Practice questions reinforce the math.

Practice

1. Write the product for each percent equation. Explain your answer to a partner.

2. Use Base Ten Blocks to find each product. Show your work on grid paper.

3. Write each percent equation. Explain how the Base Ten Blocks show the product.

4. Multiply. Use a calculator to check.

5. An irregular pair of sneakers costs \$120.00. What is the price of the sneakers if the store has a 20% off sale? How much money did the store lose? How much money did the store gain?

6. Multiply. Describe the patterns you see.

7. **Take It Further** An online store is having a sale on sneakers. A pair of sneakers costs \$120.00. How much money did the store lose? How much money did the store gain?

8. Multiply. Use a calculator to check.

9. **Take It Further** The store has a 20% off sale. How much is your price for the sneakers? How much do you pay for the sneakers? How much money did the store lose? How much money did the store gain?

10. **Take It Further** The store has a 20% off sale. How much is your price for the sneakers? How much do you pay for the sneakers? How much money did the store lose? How much money did the store gain?

Take It Further questions offer enrichment and extension.

Reflect on the big ideas of the lesson. Think about your learning style and strategies.

Mid-Unit Review

1. The railroad likes to make sure it gets to see different parts of the city.

How far did it go?

15 20
 18 12
 17 11

2. Suppose you have 8 and the other party offers the conditions listed in table A or B. How do you choose?

3. What are the solutions of the equation?

How do you know you are correct? Show the addition equation.

3 and 5 1 and 6
 2 and 6 1 and 7
 4 and 4 1 and 8

4. The railroad likes to go to the station of the city.

Show the addition equation.

1 + 1 = 2 1 + 1 = 2
 1 + 1 = 2 1 + 1 = 2
 1 + 1 = 2 1 + 1 = 2

5. Use a number line to add.

1 + 1 = 2 1 + 1 = 2
 1 + 1 = 2 1 + 1 = 2
 1 + 1 = 2 1 + 1 = 2



6. Add 1 + 1 = 2.

Show 10 different ways of showing that from the number line.

7. Write an addition equation for each situation.

Popovered 100 and spent 200. How much did they have left?
 The temperature is 2°C, then drops 10°C. What is the final temperature?
 The population of a city was 100,000, then it dropped by 100,000 people. What was the population then?
 A train was moving at an altitude of 10,000 ft. How high is it now if it has descended 10,000 ft? What was the starting altitude then?

8. Show the addition equation represented by each number line.

Describe a situation that each number line represents.
 
 

9. Each integer below is written as the sum of two other integers.

11 = 1 + 10 1 + 1 = 2
 12 = 1 + 11 1 + 1 = 2
 13 = 1 + 12 1 + 1 = 2
 14 = 1 + 13 1 + 1 = 2

10. Write each of these integers as the sum of two other integers.

15 16 17
 18 19 20


Use the **Mid-Unit Review** to refresh your memory of key concepts.

Reading and Writing in Math helps you understand how reading and writing about math differs from other language skills you use. It may suggest ways to help you study.

Using a Frayer Model

Many math words have their own special meanings. We use a **Frayer Model** to help you understand math words and to better understand how they are used in math. A Frayer Model helps you understand math words.

Here is an example of a Frayer Model:



Check

Work with a partner.

1. Write your partner's name in the Frayer Model for 2 of these words:

- Algebra
- Equation
- Integer
- Number line
- Operation
- Positive
- Negative
- Zero

2. Show the Frayer Model your partner looks at and read.

3. Work on your own.

- Choose a word you did not use in question 1. Each of you should choose a different word. Write a Frayer Model.

4. Show your Frayer Model with your partner.

- Suggest ways your partner could improve the Frayer Model.
- Make changes to reflect your partner's suggestions.

5. Discuss with your partner.

- Did making a Frayer Model help you understand the math words and their uses?
- Do you think your Frayer Models will be a useful review tool?

Math

Unit Review

What Do I Need to Know?

Adding Integers

- How do you add integers?
 - $2 + 3 = 5$
- How do you add a number line to add integers?
 - $2 + 3 = 5$

Subtracting Integers

- How do you subtract integers?
 - $5 - 2 = 3$
- How do you subtract integers using a number line?
 - $5 - 2 = 3$
- How do you subtract integers by adding the opposite?
 - $5 - 2 = 5 + (-2) = 3$
- How do you add or subtract integers?
 - $5 - 2 = 3$

What Should I Be Able to Do?

- Explain your work. Find the sum or difference.
 - $15 + 27$
 - $-12 + 37$
 - $-23 + 17$
- Write the integer suggested by each of the following situations. Draw a number line to model each integer. Explain your choice.
 - The temperature rises 4°C .
 - The price of 100 g of gum falls 10¢.
 - The deposit 100 in your bank account.
 - The movie 1 hour backwards.
 - The time 10 to before take-off.
- What word does each set of tiles model?
 - 3 red tiles and 2 yellow tiles
 - 2 yellow tiles and 1 red tile
 - 2 yellow tiles and 1 red tile
 - 3 yellow tiles and 2 red tiles
- Represent each combination with integers that add to zero.
 - The temperature rises -4°C , then rises 4°C .
 - Subtract 100 from 100.
 - A bank deposit 100.
 - Withdraw 100.
 - A submarine rises 100 in the ocean and descends 100 m.
- Find 3 pairs of integers that have the sum -10.
 - Find 3 pairs of integers that have the sum 14.
- The temperature is 6 and is -10°C . During the day the temperature rises 17°C . What is the new temperature? Write an addition equation to represent the situation. Use a number line to represent your work.
- Write an addition equation representing each situation. Describe the situation that each number line could represent.
 - $2 + 3 = 5$
 - $5 - 2 = 3$
- Use tiles to add or subtract.
 - $17 + 10 = 27$
 - $12 + 2 = 14$
 - $1 - 2 = -1$
 - $11 - 5 = 6$

What Do I Need to Know? summarizes key ideas from the unit.

What Should I Be Able to Do? allows you to find out if you are ready to move on. The Practice and Homework book provides additional support.

Practice Test

- Draw a circle. Measure its radius. Calculate its diameter, circumference and area.
- The radius of one of the wheels on a bicycle is 15 cm.
 - How much more is needed to make the whole wheel?
 - What is the circumference of the wheel?
- A circle is divided into 4 sectors. What is the size of the central angles of the circle? Justify your answer.
- Find the area of each shape. Explain your strategy.
 - Rectangle
 - Triangle
- How many different rectangles and parallelograms can you sketch with area 20 cm²? How many different squares can you sketch with area 20 cm²? Can you draw a circle with area 20 cm²? If your answer is yes explain how you would do it. If your answer is no explain why you would do it.
- The table shows the ages of 50 students in a school.
 - Complete a histogram of the total ages.
 - Show a circle graph.
 - Will you prefer to know the area of Canada or draw the circle graph? Explain.
 - Why? (Think you know both meanings of the graph.)

Age (in years)	Number of students
10-12	10
13-15	15
16-18	12
19-21	8
22-24	5
25-27	3
28-30	2
31-33	1
34-36	1
37-39	1
40-42	1

The **Practice Test** models the kind of test your teacher might give.

Explore some interesting math when you do the **Investigations**.

Investigation Making a Booklet

Work with a partner.

A book is made up of **signatures**. A signature has 10 or 15 pages. A signature is a sheet of paper printed on both sides.

In a general arrangement, the sheets are numbered in order. The sheets of paper to form folded into sections of 16 or 32 pages. When the sheets of paper are folded and sewn or stapled together, the pages read in the correct sequential order.

The dimensions for the sheets in this investigation are 21 inches by 35 inches. This is approximately 8 1/2 inches by 14 inches.

As you consider this investigation, think of your work in terms of what you will need to:

Part 1

How are both sides of a 16-page signature? The pages are 17 by 14.

There are patterns in the numbers on a signature. These patterns help the printer decide which page numbers go on each side of a sheet when it goes to press.

Your challenge will be to find the patterns in the numbers on a signature. How would knowing these patterns help you create a book with more than 10 pages?

How many folds are needed to make a 16-page signature? How do you know? Which pieces of paper do you need to use to make one?

When the page numbers (consecutive) on the pages open the front of a book.

What are all the page numbers?
What are all the odd numbers?
What are all the even numbers?
What are all the numbers on the page numbers?
When patterns do you see in the page numbers?
A second 16-page signature has pages 71 to 82. What is the pattern? How do both sides of this signature with page numbers to show?
Fold the patterns in the numbers.
How do these patterns compare with those in the 16-page signature?

Part 2


How are both sides of a 32-page signature?

Repeat the steps in Part 1 for this 32-page signature. Describe all the patterns you discover.

How many folds in the school in class? How many signatures have these signatures each book should have?

Take It Further

Suppose you have to create a 64-page signature. How can you use the number patterns in Part 1 and Part 2 to help you create a 64-page signature?



Icons remind you to use **technology**. Follow the instructions for using a computer or calculator to do math.

Using a Computer to Transform Shapes

Geometry software can be used to transform shapes. Use available geometry software.


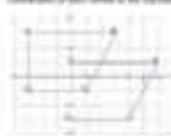
Open a new window. Check that the distance units are centimeters. Display a coordinate grid.

Draw a rectangle? Help or any time use the software's help menu.

Constructing a Shape

Construct a quadrilateral ABCD. Record the coordinates of each vertex.

Select the quadrilateral. Use the software to translate the quadrilateral 3 units right and 2 units down. Record the coordinates of each vertex of the translated image A'B'C'D'.



Using Spreadsheets to Investigate Averages

How can you determine whether to find the mean, median, and mode of a set of data?

A spreadsheet program allows us to calculate the average for large sets of data more quickly and efficiently. The data also use the software for our first three averages are efficiently collected.

How would you find the mean, median, and mode of the following data set: 100, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200?

Use your spreadsheet software.

- Input the data into a column of the spreadsheet.
- Use the statistics functions of your software to find the mean, median, and mode. Use the Help menu if you have any difficulty.
- Investigate the effect of an outlier on the mean, median, and mode. Input 200. What happens to the mean? Median? Mode? Explain.
- Suppose one member of the basketball team with height 75 cm is replaced by a student with height 180 cm. How does this substitution affect the mean, median, and mode? Explain.

Notice that when you add or remove data, not only the average change, but also the distribution.

