PEARSON

Math Makes Sense 9

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Probability and Statistics

Welcome to

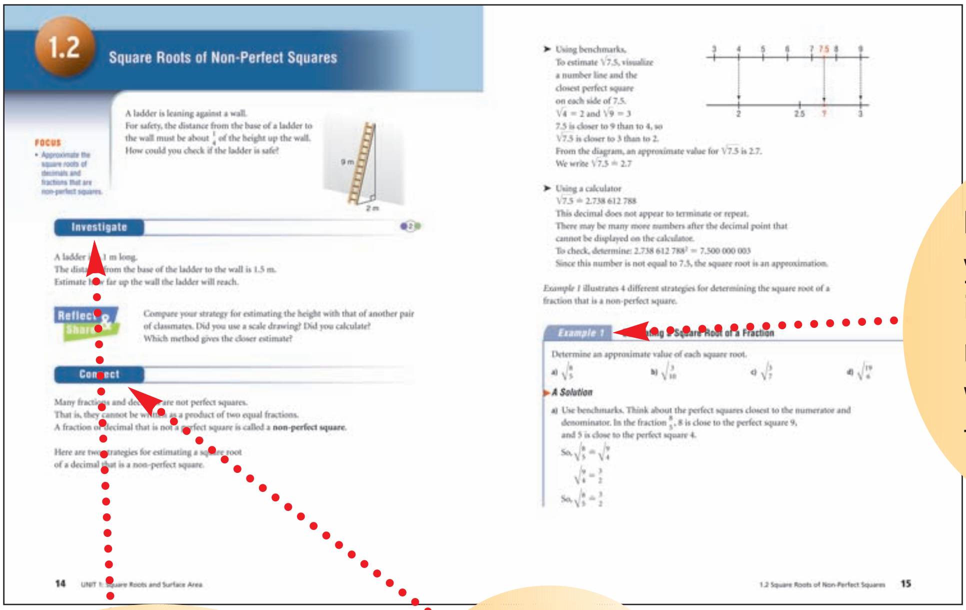
Pearson Math Makes Sense 9

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.

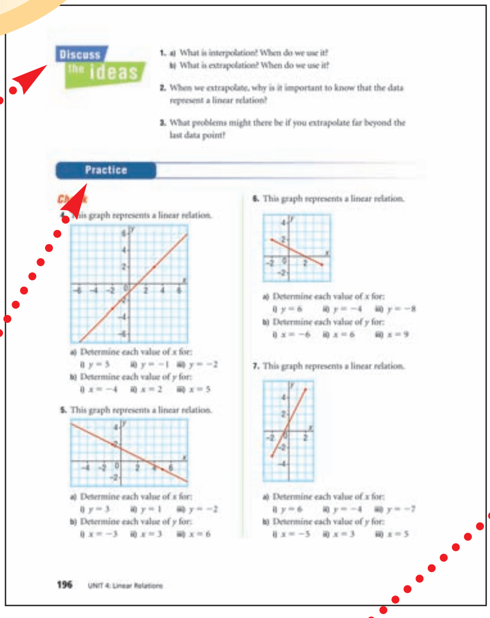
Find out **What You'll Learn** and **Why It's Important**. Check the list of **Key Words**.

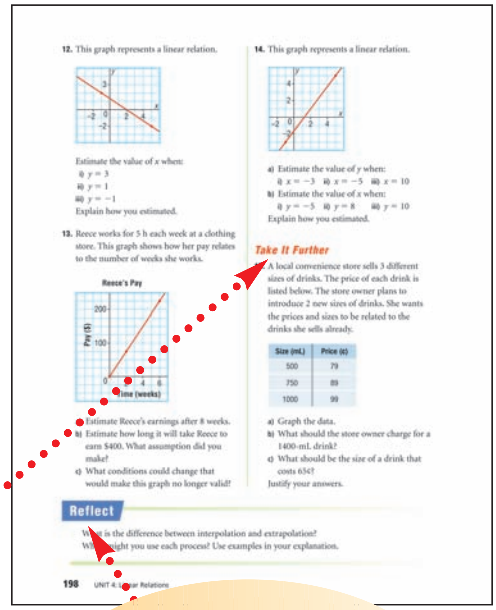


Examples show you how to use the ideas and that there may be different ways to approach the question.

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

Connect summarizes the math.



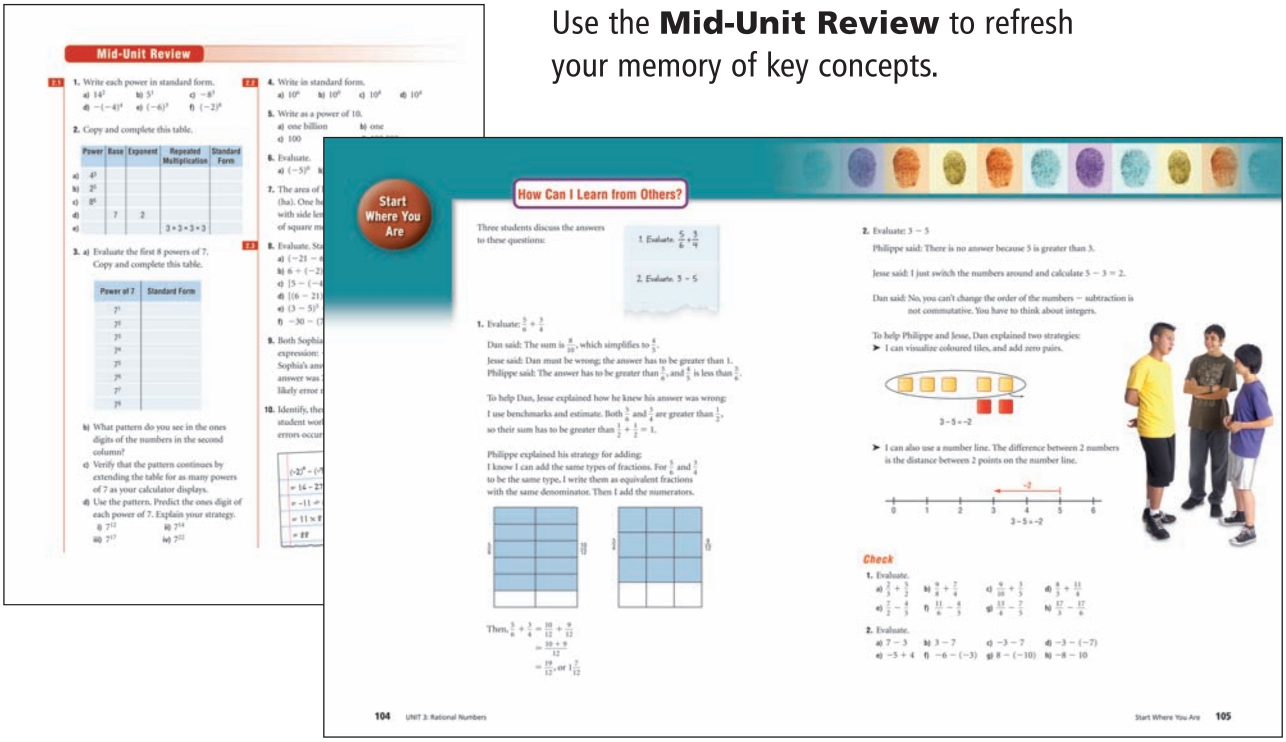


Discuss the Ideas invites you to talk about the math.

Practice questions reinforce the math.

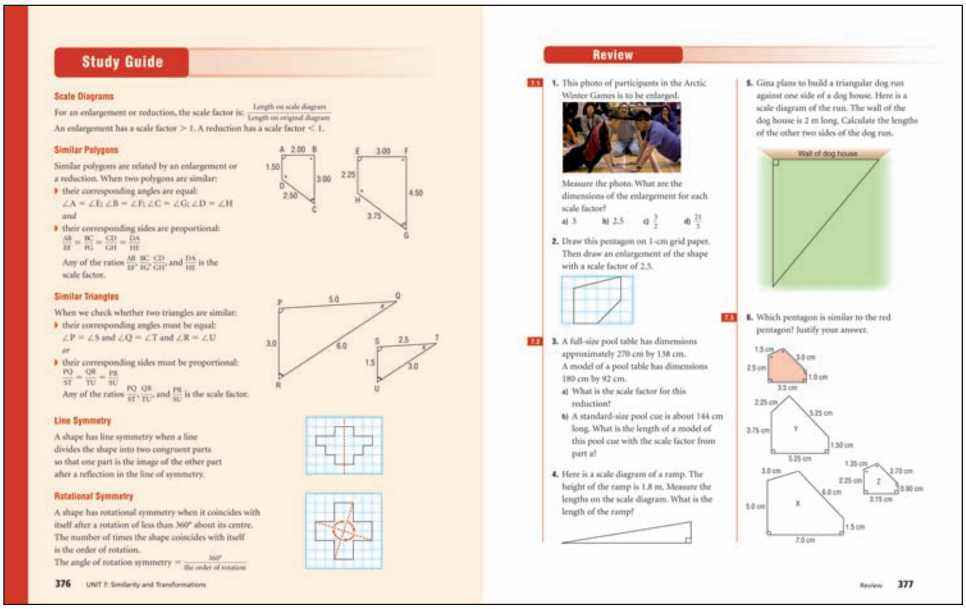
Take It Further questions offer enrichment and extension.

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



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

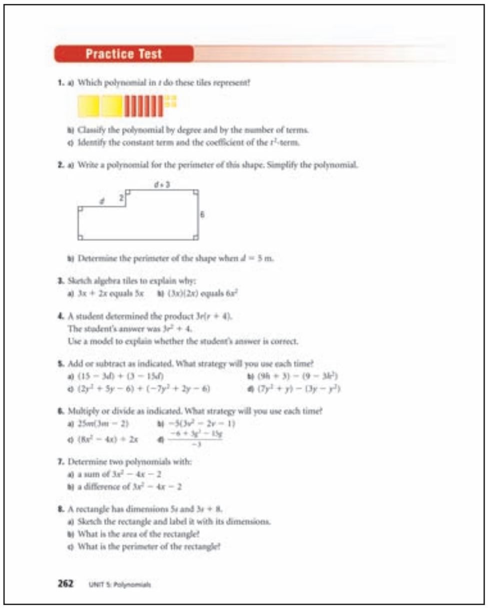
Start Where You Are illustrates strategies you may use to show your best performance.



Study Guide summarizes key ideas from the unit.

Review questions allow you to find out if you are ready to move on.

The *Practice and Homework Book* provides additional support.



Practice Test

1. a) Which polynomial in t do these tiles represent?
b) Classify the polynomial by degree and by the number of terms.
c) Identify the constant term and the coefficient of the t^2-term.

2. a) Write a polynomial for the perimeter of this shape. Simplify the polynomial.
b) Determine the perimeter of the shape when $d = 3$ m.

3. Sketch algebra tiles to explain why:
a) $3x + 2x$ equals $5x$ b) $(3x)(2x)$ equals $6x^2$

4. A student determined the product $3r(r + 4)$.
The student's answer was $3r^2 + 4$.
Use a model to explain whether the student's answer is correct.

5. Add or subtract as indicated. What strategy will you use each time?
a) $(15 - 3d) + (3 - 15d)$ b) $(9h + 3) - (9 - 3h^2)$
c) $(2y^2 + 5y - 6) + (-7y^2 + 2y - 6)$ d) $(7y^2 + y) - (3y - y^2)$

6. Multiply or divide as indicated. What strategy will you use each time?
a) $25m(3m - 2)$ b) $-5(3v^2 - 2v - 1)$
c) $(8x^2 - 4x) \div 2x$ d) $\frac{-6 + 3g^2 - 15g}{-3}$

7. Determine two polynomials with:
a) a sum of $3x^2 - 4x - 2$
b) a difference of $3x^2 - 4x - 2$

8. A rectangle has dimensions $5s$ and $3s + 8$.
a) Sketch the rectangle and label it with its dimensions.
b) What is the area of the rectangle?
c) What is the perimeter of the rectangle?

262 UNIT 5: Polynomials

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

Unit Problem Raising Money for the Pep Club

There are 25 students in the school's Pep Club.

1. The Pep Club can buy new uniforms from 2 different suppliers:
Company A charges \$500, plus \$22 per uniform.
Company B charges \$360, plus \$28 per uniform.
a) Define a variable, then write an equation that can be used to determine the number of uniforms that will result in equal costs at both companies.
b) Solve the equation. Verify the solution.
c) Which company should the Pep Club choose? Justify your recommendation.
d) How much money must the Pep Club raise to purchase the uniforms?

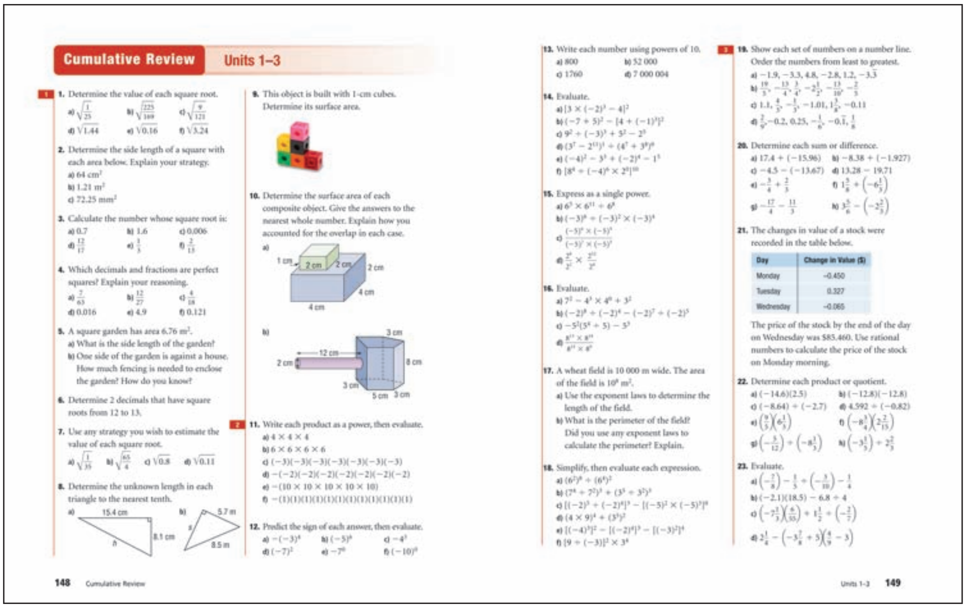
2. The Pep Club decides to raise the money for the uniforms by selling snacks at lunch time. The snacks cost the Pep Club \$6.00 for a box of 30.
a) Determine the cost per snack.
b) The Pep Club makes a profit of \$0.25 on each snack sold. Suppose the club does raise the money it needs. Define a variable, then write an inequality that can be used to determine how many snacks might have been sold. How many boxes of snacks did the members of the Pep Club need?
c) Solve the inequality.
d) Verify the solution.

Your work should show:
- an equation and inequality and how you determined them
- how you determined the solutions of the equation and the inequality
- clear explanations of your reasoning

Reflect on Your Learning
How is solving a linear inequality like solving a linear equation? How is it different? Include examples in your explanation.

Unit Problem 311

The **Unit Problem** presents problems to solve, or a project to do, using the math of the unit.



Cumulative Review Units 1–3

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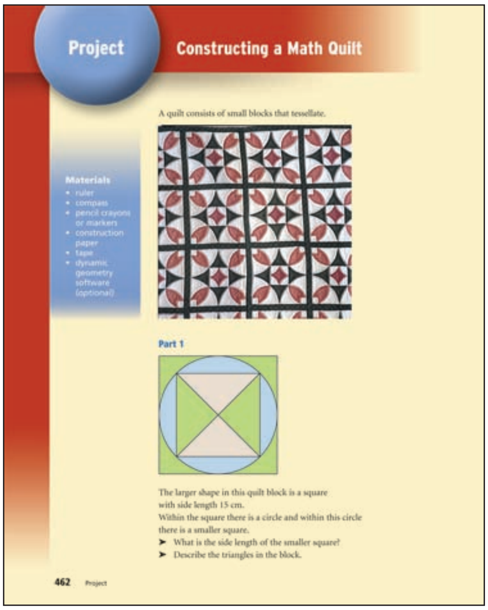
Keep your skills sharp with **Cumulative Review**.

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


Project

Constructing a Math Quilt

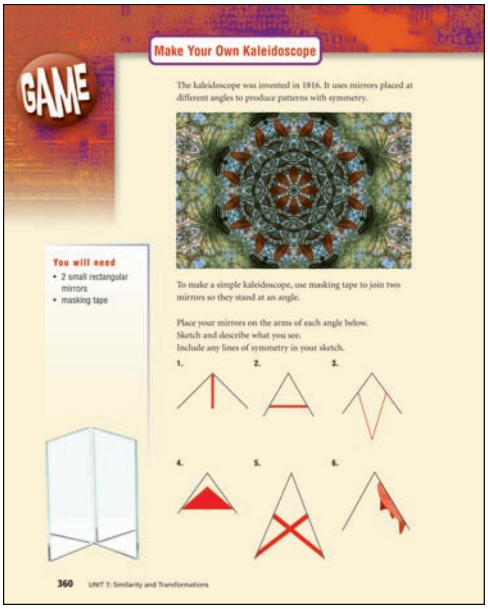
Materials
- ruler
- compass
- pencil crayons or markers
- construction paper
- tape
- dynamic geometry software (optional)

A quilt consists of small blocks that tessellate.

Part 1

The larger shape in this quilt block is a square with side length 15 cm.
Within the square there is a circle and within this circle there is a smaller square.
➤ What is the side length of the smaller square?
➤ Describe the triangles in the block.

462 Project


GAME

Make Your Own Kaleidoscope

The kaleidoscope was invented in 1816. It uses mirrors placed at different angles to produce patterns with symmetry.

You will need
- 2 small rectangular mirrors
- masking tape

To make a simple kaleidoscope, use masking tape to join two mirrors so they stand at an angle.

Place your mirrors on the arms of each angle below.
Sketch and describe what you see.
Include any lines of symmetry in your sketch.

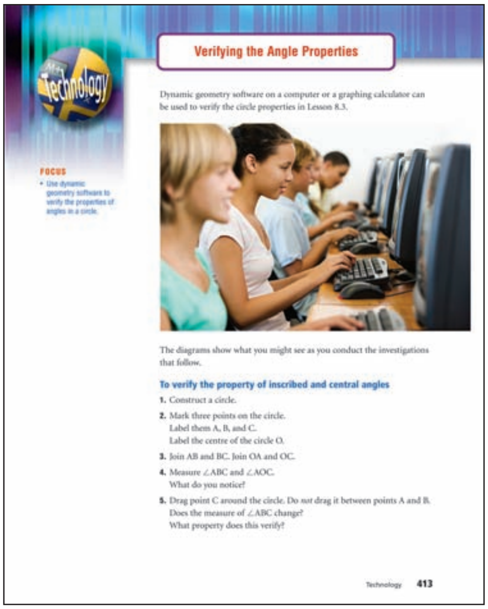
1. 2. 3.

4. 5. 6.

360 UNIT 7: Similarity and Transformations

Play a **Game** with your classmates or at home to reinforce your skills.

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


Technology

Verifying the Angle Properties

FOCUS
- Use dynamic geometry software to verify the properties of angles in a circle.

Dynamic geometry software on a computer or a graphing calculator can be used to verify the circle properties in Lesson 8.3.

The diagrams show what you might see as you conduct the investigations that follow.

To verify the property of inscribed and central angles
1. Construct a circle.
2. Mark three points on the circle.
Label them A, B, and C.
Label the centre of the circle O.
3. Join AB and BC. Join OA and OC.
4. Measure ∠ABC and ∠AOC.
What do you notice?
5. Drag point C around the circle. Do *not* drag it between points A and B.
Does the measure of ∠ABC change?
What property does this verify?

Technology 413


Illustrated Glossary

acute angle: an angle measuring less than 90°

acute triangle: a triangle with three acute angles

algebraic expression: a mathematical expression containing a variable: for example, $6x - 4$ is an algebraic expression

angle bisector: the line that divides an angle into two equal angles

angle of rotation symmetry: the minimum angle required for a shape to rotate and coincide with itself

approximate: a number close to the exact value of an expression; the symbol ≐ means "is approximately equal to"

arc: a segment of the circumference of a circle

Arc of a circle

area: the number of square units needed to cover a region

average: a single number that represents a set of numbers (see *mean*, *median*, and *mode*)

bar graph: a graph that displays data by using horizontal or vertical bars

bar notation: the use of a horizontal bar over a decimal digit to indicate that it repeats; for example, $1.\overline{3}$ means 1.333 333 …

base: the side of a polygon or the face of an object from which the height is measured

base of a power: *see power*

bias: a prejudice that is in favour of or against a topic

binomial: a polynomial with two terms; for example, $3x - 8$

bisector: a line that divides a line segment or an angle into two equal parts

capacity: the amount a container can hold

Cartesian Plane: another name for a coordinate grid (see *coordinate grid*)

census: a data collection method using each member of the population

central angle: an angle whose arms are radii of a circle

certain event: an event with probability 1, or 100%

chance: probability expressed as a percent

chord: a line segment that joins two points on a circle

circle graph: a diagram that uses sectors of a circle to display data

circumference: the distance around a circle, also the perimeter of the circle

coefficient: the numerical factor of a term; for example, in the terms $3x$ and $3x^2$, the coefficient is 3

common denominator: a number that is a multiple of each of the given denominators; for example, 12 is a common denominator for the fractions $\frac{1}{3}, \frac{5}{4}, \frac{7}{12}$

common factor: a number that is a factor of each of the given numbers; for example, 3 is a common factor of 15, 9, and 21

commutative property: the property of addition and multiplication that states that numbers can be added or multiplied in any order; for example, $3 + 5 = 5 + 3$; $3 \times 5 = 5 \times 3$

composite number: a number with three or more factors; for example, 8 is a composite number because its factors are 1, 2, 4, and 8

Illustrated Glossary 541

The **Illustrated Glossary** is a dictionary of important math words.