

**Lesson 51****Lesson Objectives**

- **Negative Exponents**
  - **Scientific Notation for Small Numbers**
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- Understand the Law of Exponents for Negative Exponents.
  - Simplify expressions involving negative exponents.
  - Use negative exponents to write very small numbers in scientific notation.

**Materials**

- Power Up K (in Instructional Masters)
- Teacher-provided material: calculators

**Standards**

**8.1 (A):** Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations.

**8.1 (D):** Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations.

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**Lesson 52****Lesson Objectives**

- **Using Unit Multipliers to Convert Measures**
- **Converting Mixed-Unit to Single-Unit Measures**

- Use unit multipliers to convert between units of measure.
- Solve word problems that require unit multipliers.
- Convert between mixed-unit measures and single-unit measures with and without using unit multipliers.

**Materials**

- Power Up K (in Instructional Masters)

**Optional**

- Teacher-provided material: measuring tools (rulers, yardsticks)

**Standards**

**8.2 (D):** Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions.

**8.3 (B):** Patterns, relationships, and algebraic thinking. The student identifies proportional or non-proportional linear relationships in problem situations and solves problems.

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**Lesson 53****Lesson Objectives****• Solving Problems Using Measures of Central Tendency**

- Interpret and create line plots and histograms to display data.
- Calculate the mean, median, mode, and range of a data set and choose the most appropriate measure of central tendency to convey an idea about the data.
- Discuss how certain measures of central tendency might be misleading in some situations.

**Materials**

- Power Up K (in Instructional Masters)

**Standards**

**8.4:** The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).

**8.5 (A):** Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems.

**8.12 (A):** Probability and statistics. The student uses statistical procedures to describe data.

**8.13 (A):** Probability and statistics. The student evaluates predictions and conclusions based on statistical data.

**8.13 (B):** Probability and statistics. The student evaluates predictions and conclusions based on statistical data.

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**Lesson 53**

**8.15 (B):** Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models.

**Lesson 54****Lesson Objectives****• Angle Relationships**

- Understand the relationships between angles formed by two intersecting lines and apply the knowledge to solve geometry problems.
- Understand the relationships between angles formed by parallel lines intersected by a transversal and apply the knowledge to solve geometry problems.

**Materials**

- Power Up K (in Instructional Masters)

**Optional**

- Teacher-provided material: isometric dot paper
- Manipulative kit: protractors

**Standards**

**8.7 (B):** Geometry and spatial reasoning. The student uses geometry to model and describe the physical world.

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**8.15 (A):** Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models.

**8.16 (B):** Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions.

**Lesson 55****Lesson Objectives**

- **Nets of Prisms, Cylinders, Pyramids, and Cones**
- Sketch a geometric solid when given its net.
- Understand how nets are related to formulas for surface area.
- Sketch a net for a given geometric solid.

**Materials**

- Power Up K (in Instructional Masters)
- Manipulative kit: compasses, rulers
- Teacher-provided material: unlined paper, scissors, glue or tape

**Optional**

- Teacher-provided material: grid paper

**Standards**

**8.7 (A):** Geometry and spatial reasoning. The student uses geometry to model and describe the physical world.

**8.8 (A):** Measurement. The student uses procedures to determine measures of three-dimensional figures.

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**Test Day**

**Lesson 56****Lesson Objectives**

- **The Slope-Intercept Equation of a Line**
- Describe the graph of a linear function given its equation in slope-intercept form.
- Write an equation for a linear function in slope-intercept form given its graph.
- Graph linear equations given in slope-intercept form.

**Materials**

- Power Up L (in Instructional Masters)
- Lesson Activity 7 (in Instructional Masters) or graph paper

**Standards**

**8.4:** The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**Lesson 57****Lesson Objectives**

- **Operations with Small Numbers in Scientific Notation**
- Multiply and divide numbers written in scientific notation with both positive and negative exponents.
- Multiply and divide numbers written in scientific notation to solve word problems.

**Materials**

- Power Up L (in Instructional Masters)

**Standards**

**8.1 (B):** Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations.

**8.1 (D):** Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations.

**8.2 (B):** Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions.

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**Lesson 58****Lesson Objectives****• Solving Percent Problems with Equations**

- Write equations to solve percent word problems.

**Materials**

- Power Up L (in Instructional Masters)

**Optional**

- Fraction-Decimal-Percent Equivalents poster

**Standards**

**8.2 (A):** Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions.

**8.2 (B):** Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions.

**8.2 (C):** Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions.

**8.3 (B):** Patterns, relationships, and algebraic thinking. The student identifies proportional or non-proportional linear relationships in problem situations and solves problems.

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**Lesson 59****Lesson Objectives****• Experimental Probability**

- Calculate experimental probabilities.
- Compare the experimental probability of an event with its theoretical probability and offer explanations for any differences.
- Use a model to simulate an event to calculate an experimental probability.

**Materials**

- Power Up L (in Instructional Masters)

**Standards**

**8.11 (A):** Probability and statistics. The student applies concepts of theoretical and experimental probability to make predictions.

**8.11 (B):** Probability and statistics. The student applies concepts of theoretical and experimental probability to make predictions.

**8.11 (C):** Probability and statistics. The student applies concepts of theoretical and experimental probability to make predictions.

**8.14 (A):** Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school.

**Lesson 60****Lesson Objectives**

- **Area of a Parallelogram**
- Use the formula  $A = bh$  to calculate the area of parallelograms.
- Verify the formula for the area of a parallelogram by using a model.
- Compare the perimeters and areas of similar parallelograms.

**Materials**

- Power Up L (in Instructional Masters)
- Manipulative kit: inch rulers
- Teacher-provided material: graph paper, scissors

**Standards**

**8.6 (A):** Geometry and spatial reasoning. The student uses transformational geometry to develop spatial sense.

**8.6 (B):** Geometry and spatial reasoning. The student uses transformational geometry to develop spatial sense.

**8.10 (A):** Measurement. The student describes how changes in dimensions affect linear, area, and volume measures.

**8.15 (A):** Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models.

**Test Day**

**Investigation 6****Lesson Objectives****• Collect, Display, and Interpret Data**

- Understand why it is usually necessary to conduct a survey over only a sample population.
- Conduct surveys and display the results in an appropriate manner.
- Distinguish between qualitative and quantitative data.
- Create bar graphs, circle graphs, and histograms from given and collected data.

**Materials**

**None**

**Standards**

**8.4:** The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).

**8.12 (C):** Probability and statistics. The student uses statistical procedures to describe data.

**8.13 (A):** Probability and statistics. The student evaluates predictions and conclusions based on statistical data.

**8.13 (B):** Probability and statistics. The student evaluates predictions and conclusions based on statistical data.

**8.15 (B):** Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models.