Unit 4: Percents
Grade 7 Math
6 Class Meetings

Revised June 2022

Essential Questions

- When is it most convenient to use percentages?

Enduring Understandings with Unit Goals

EU 1: Percentages can be used to understand the relationship between parts of quantities and the whole quantity, and how quantities change in relation to their starting values.
- Construct tables, tape diagrams, double numbers lines, proportion and percent equations to solve problems.
- Model real-world applications involving price change, simple interest, commissions, and fees using percentages.

Standards

Common Core State Standards:

- **7.RP.A.3:** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
- **7.NS.A.3:** Solve real-world and mathematical problems involving the four operations with rational numbers.
- **7.EE.2.A:** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.
Competency 2: Speak to diverse audiences in an accountable manner.
Competency 3: Develop the behaviors needed to interact and contribute with others on a team.
Competency 4: Analyze and solve problems independently and collaboratively.
Competency 5: Be responsible, creative, and empathetic members of the community.

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Unit Content Overview

1. **Percent, Part, and Whole**
    - Define the percent of a number
    - Solve percent problems mentally with benchmark percentages
    - Evaluate percent of a number when given percent and the whole
    - Evaluate the whole given a part and a percent
    - Evaluate the percent given a part and a whole
    - Solve percent problems using tape diagrams, double number lines, proportions, tables and percent equations
    - **Vocabulary and Key Terms –** Percent, Part, Whole, Is, Of, Proportion, Ratio, Percent Proportion, Tape Diagrams, Double number lines, Tables, Percent Equations, Equivalent

2. **Percent Increase and Decrease**
    - Solve for a new amount given the original amount and a percent increase or decrease.
    - Calculate for the original amount given new amount after a given percent increase or decrease.
    - Solve percent problems using tape diagrams, double number lines, proportions, tables and percent equations.
    - **Vocabulary and Key Terms –** Percent, Part, Whole, Is, Of, Proportion, Ratio, Percent of Change Proportion, Tape Diagrams, Double number lines, Tables, Percent Equations, Equivalent, Percent increase, Percent decrease, Difference, Change, Original Amount, New Amount

3. **Percent Application**
    - Solve for percent problems involving discounts, tax, and tip
    - Calculate percentages involving simple interest, commissions, and other fees
    - Solve for percent problems involving measurement and percent error
    - Solve percent problems using tape diagrams, double number lines, proportions, tables and percent equations
    - **Vocabulary and Key Terms –** Percent, Part, Whole, Is, Of, Proportion, Ratio, Percent of Change Proportion, Tape Diagrams, Double number lines, Tables, Percent Equations, Equivalent, Percent increase, Percent decrease, Difference, Change, Original Amount, New Amount, Discounts, Tax, Tip/Gratuity, Commission, Markup, Simple Interest, Fees, Percent Error, Markdown, Sales Tax, Interest

Interdisciplinary Connection:
- Language Arts - Word Problems
- Science – Word Problems

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Daily Learning Objectives with *Do Now Activities*

Students will be able to…

- Convert and relate fractions, decimals, and percentages
    - Interpret a coordinate point on a graph and solve multistep ratio and percent problems
- Solve percent problems to find the whole, part, or percent
    - Solve multistep real-world problems
- Investigate and explain how percentages can be used to represent increases and decreases in quantities
    - Solve multistep real-world problems
- Construct visual diagrams to model percent situations
    - Scale drawings of geometric figures
- Calculate total cost using tax and tip while using percentages
    - Scale drawings of geometric figures
- Solve and justify solutions using markups, markdowns, interest, and commissions that involve adding or subtracting percentages
    - Construct an equilateral triangle, name the triangle, & describe a 2-D shape as a slice of a 3-D shape
- Evaluate percentages involving sales tax and discounts
    - Construct an isosceles triangle, name the triangle, & describe a 2-D shape as a slice of a 3-D shape
- Synthesize the process for calculating measurement error and express it as a percentage of the actual length
    - Construct an obtuse scalene triangle, name the triangle, & describe a 2-D shape as a slice of a 3-D shape
- Solve percent error and values for the acceptable range
    - Construct an acute isosceles triangle, , name the triangle, & describe a 2-D shape as a slice of a 3-D shape
- Apply proportional relationships to solve multi-step percent problems
    - Solve area and circumference & find unknown angles in a figure

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Guided notes
- Student-led instruction
- Small group instruction
- Independent problem-solving
- Collaborative problem-solving

- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Homework
- Highlighted words
- Fill in the blanks
- Access to multiplication chart
- Access to calculator
- Color coded notes
- Pre-teaching/Reteaching

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments

Assessments

FORMATIVE ASSESSMENTS:

- Warm-ups (SBAC)
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Accountable Talk Discussions
- Do Now
- Student-led instruction
- Homework
- Performance Task - Design a Garden
    - Future Rubric Assessment in 2021-2022

SUMMATIVE ASSESSMENTS:

- FIAB: Ratios and Proportional Relationships
- Unit 4 Test (Edulastic)
- Performance Task - Iggy's Ice Cream

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Unit Task

Unit Task Name: Iggy's Ice Cream Performance Task

Description: Students will use information learned in this unit about percentages to plan how to sell ice cream at a school sporting event. They will use the survey to help calculate the quantities needed to buy the supplies and the profit they are expected to make on that day with the percentages of each favorite flavor (EU 1) and explain their reasonings clearly.

Evaluation: Summative Assessment and Future Rubric in 2021-2022 school year

Unit Resources

- Match FishTank
- Illustrative Mathematics
- Khan Academy
- SolvemeMobiles.org
- Flipped Google Classroom Videos
- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Performance Task - Design a Garden
- Blooket
- Edulastic
- 99math.com
- Legends of Learning