Unit # 6 : Percent Problems and Applications

Content Area: **Mathematics**
Course(s): **College Prep Math 1**
Time Period: **January**
Length: **15 days**
Status: **Published**

Unit Overview

This unit begins with the concept of writing percents as fractions and decimals and then covers writing decimals and fractions as percents. Continuing on in this unit, the parts of a percent problem (rate, base, and amount) are identified along with their respective functions. The end of the unit addresses applications with percent along with the topics of percent of increase and decrease. Solving interest problems is also included in this unit.

Enduring Understandings

- Decimals and fractions can easily be converted into percents.
- In order to compute with a fraction, it must be first converted into a fraction or a decimal.
- Percent applications are used frequently in everyday life.
- Percents can be easily converted to fractions or decimals in a few basic steps.

Essential Questions

- How do I set up and solve a basic percent problem ?
- How do you change a decimal to a percent ?
- How do you change a fraction or mixed number to a percent ?
- How do you set up and solve an application of a percent ?
- How do you solve a problem that involves a percent of increase or decrease ?
- How do you solve percent application problems involving interest
- What are the parts of a basic percent problem and what are their respective functions ?
- What procedure can be used to convert a percent into a decimal ?
- What procedures can be used to convert a percent into a fraction ?

Standards / indicators / Student Learning Objectives (SLOs) :

- SWBAT write a percent as a decimal
- SWBAT identify the amount in a percent problem
- SWBAT identify the base in a percent problem
- SWBAT identify the rate in a percent problem
- SWBAT solve a percent problem
- SWBAT solve an application of percents
- SWBAT solve applications involving interest
- SWBAT solve applications that involve percent of increase and decrease
- SWBAT write a decimal as a percent
- SWBAT write a fraction or mixed number as a percent
- SWBAT write a percent as a fracton or mixed number

MA.K-12.2	Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.
MA.K-12.4	Model with mathematics. Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.
MA.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.
MA.6.RP.A.3c	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

Lesson Titles/Objectives

- Identifying the Parts of a Percent Problem
- Solving Percent Problems

- Writing Decimals and Fractions as Percents
- Writing Percents as Fractions and Decimals

Career Readiness, Life Literacies & Key Skills

WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.

Inter-Disciplinary Connections

LA.RH.11-12.4	Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
LA.WHST.11-12.2.E	Provide a concluding paragraph or section that supports the argument presented.
PFL.9.1.12.B.8	Describe and calculate interest and fees that are applied to various forms of spending, debt, and saving.

Instructional Strategies, Learning Activities, and Blooms/DOK:

- Explanation , examples, and practice solving applications that involve percent of increase and decrease.
- Explanation , examples, and practice solving percent applications involving interest.
- Explanation , examples, and practice solving problems involving percent appilications.
- Explanation , examples, and practice with identifiying the amount in a percent problem.
- Explanation , examples, and practice with identifiying the base in a percent problem.
- Explanation , examples, and practice with identifiying the rate in a percent problem.
- Explanation , examples, and practice with solving a basic percent problem.
- Explanation , examples, and practice with writing a decimal as a percent.
- Explanation , examples, and practice with writing a fraction or mixed number as a percent.
- Explanation , examples, and practice with writing a percent as a decimal.
- Explanation , examples, and practice with writing a percent as a fraction
- Tutoring during Delsea One

Modifications

ELL Modifications

- 1:1 testing

- Assess ELL students continuously using formative assessment methods
- Intentional scheduling/grouping with student/teacher who speaks the same language if possible
- Repeat, reword, clarify
- Tap prior knowledge

IEP and 504 Modifications

- Allowing co-teaching with general education and special education teachers in the same classroom so that the special education teacher can re-teach students with special needs in a different way in a smaller group (pulled to the side)
- Allowing student to correct mistakes or answer wrong questions correctly for additional credit if failed the first test (another way to re-teach material)
- Math tests could have formula's available on the test and/or sample problems
- Providing study guides that don't lead the student to study too much extraneous information (less unnecessary details)/scaffolded study guides
- Rewording questions so that there are not higher level vocabulary within the question

G & T Modifications

- Graph analysis / interpretation
- Peer leadership or mentoring.
- Provide additional rigorous challenge problems for advanced students
- Specific career they are interested in? How would this apply to their interest?)

At Risk Modifications

- Additional help during tutoring/Delsea One/Academic Enrichment
- Review, restate, reword directions
- Visuals
- Guided notes
- Hands-on Instruction
- Modeling and showing lots of examples
- Study guides
- Tutoring during Delsea One

Formative Assessment

- Warm up - "Check Yourself" problems on writing decimals as perents
- Accuplacer practice problem
- Begin the homework assignment and periodically check answers together

- Class discussions
- Graded classwork
- Graded homework
- Guided practice
- Individual practice
- Oral questioning
- Oral response
- Teacher observation
- Warm up - "Check Yourself" problems on identifying the rate, base, and the amount in a percent problem
- Warm up - "Check Yourself" problems on solving applications incolving percent of increase and decrease
- Warm up - "Check Yourself" problems on solving different kinds of percent problems and related applications
- Warm up - "Check Yourself" problems on solving percent applications involving interest.
- Warm up - "Check Yourself" problems on writing a percent as a fraction, mixed number, or decimal
- Warm up - "Check Yourself" problems on writing fractions and mixed numbers as percents
- Written work

Summative Assessment

- Accuplacer practice test
- Accuplacer Test
- Quiz on the 3 basic types of percent problems
- Unit Test on Percent Problems and Applications

Resources & Materials

- "Check Yourself" warm up problems (see warm up section)
- Computer generated warm ups (see formative assessment section for specific topics)

- Internet worksheets (see formative assessment section for specific topics)
- Teacher made worksheets (see formative assessment section for specific topics)
- Text: Basic Mathematical Skills with Geometry (2008)

Technology

- Chrome book
- Internet Sources: http://accuplacer.collegeboard.org/students
- Math XL
- Smart board

TECH.8.1.12.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.12.D.CS2	Demonstrate personal responsibility for lifelong learning.