

LessonTitle: Percentage Sense		Pre 0.9
Utah State Core Standard and Indicators Pre-Algebra Standards 1, 3.1 Process Standards 1-5		
Summary		
We have traditionally placed much emphasis on computation with percentages. If we place more emphasis on “what makes sense,” we will help student understanding significantly. The activities below help students gain a sense for the size of percentages, arrive at estimates and explain why the estimates are reasonable. Activities below are adapted from <u>Developing Number Sense in the Middle Grades</u> from NCTM.		
Enduring Understanding	Essential Questions	
Percentages are everywhere in our world. Estimation with percentages is very valuable in this world. Learning to estimate with percentages also improves understanding of percentages.	What are percentages? How do we use them?	
Skill Focus	Vocabulary Focus	
<ul style="list-style-type: none"> • Estimating with fractions 		
Assessment		
Materials		
Launch		
Explore		
<ul style="list-style-type: none"> • How do we use benchmarks to estimate solutions to problems using percentages? • What does “in the ball park” mean when estimating? 		
Summarize		
Apply		

Directions:

Please access the following sources to give students further meaningful opportunities to understand fractions.

1. PROPORTIONAL REASONING, Representing Proportional Relationships, The Aims Education Foundation, 2000

I. Percents in the Grocery Store: In October 1989, *Harper's Magazine* included this statistic in a list of statistics:

“Percentage of supermarket prices that end in the digit 9 or 5: 80%.”

Is this statement true? Let's find out. If we collect data, we can compare our data to this statement. Please note that you may wish to eliminate produce items since they are sold by the pound without specifically states prices.

- 1) Save and bring in grocery store receipts—each person should bring at least one receipt.
- 2) Examine your grocery store receipts in your group.
- 3) Prepare a presentation about your investigation. Be prepared to present your findings. Include the following:
 - Your data, shown neatly and organized well
 - Your calculations about percentages.
 - Your conclusion, explained clearly.

II. Percents in the Newspaper & Comparing Advertisements:

- a) Look for articles (not advertisements) in which percentages are used. Choose one to present to the class. Explain the meaning of percentages in your presentation.
- b) As a group, bring in different advertisements that offer discounts for items. Select four and paste them on sheets of paper. Include one that indicates the percent the customer will save, one that gives the sale price, and two of your choice.

Decide which of the advertisements gives the customer the best deal. Make a cover sheet and explain your “best deal” in writing. Trade with other groups and decide on the best deal for the advertisements in the class. Compare your “best deal” votes with the thinking of other groups.

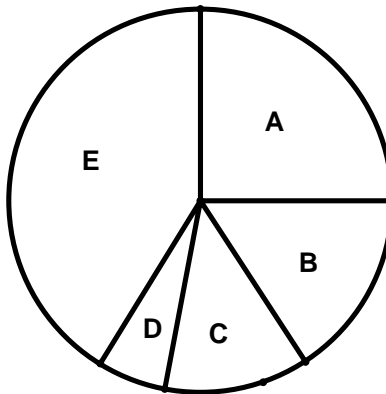
III. Estimating Percents with Benchmarks

Use the following benchmarks to estimate the percentages in the statements below.

- | | |
|-------------------|--|
| • 0 %, | 1) _____ of the students in my class have red hair. |
| • Less than 10 %, | 2) _____ of the students in my class like hamburgers. |
| • About 25 %, | 3) _____ of the students in my class are wearing sneakers. |
| • Less than 50 %, | 4) _____ of the people in my town own a car. |
| • About 50 %, | 5) _____ of the people in my state are male. |
| • More than 50 %, | 6) _____ of the people in my town 10 years or younger. |
| • About 75% , | 7) _____ of the students in my school like soccer. |
| • At least 90 %, | 8) _____ of the girls in my class take dancing lessons. |
| • 100%. | 9) _____ of the boys in my class like baseball. |

IV. Estimating the Percent of a Whole

Estimate the size (as a percentage) of each section of the circle.



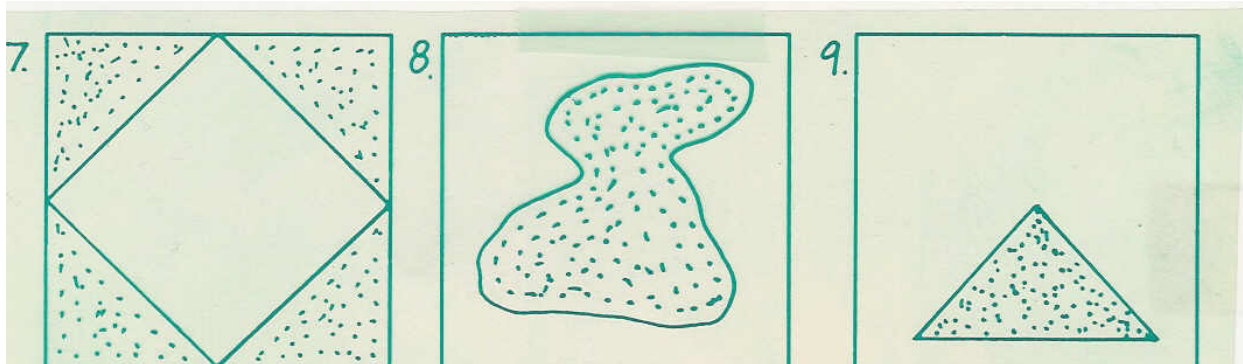
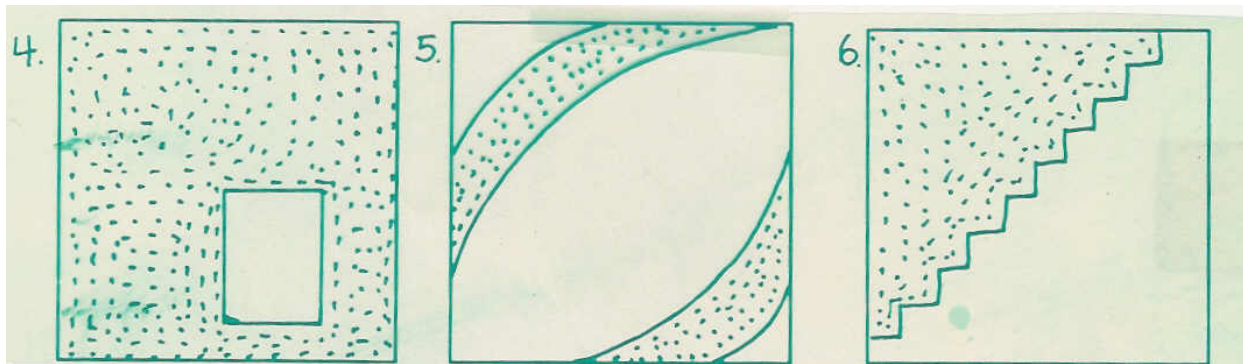
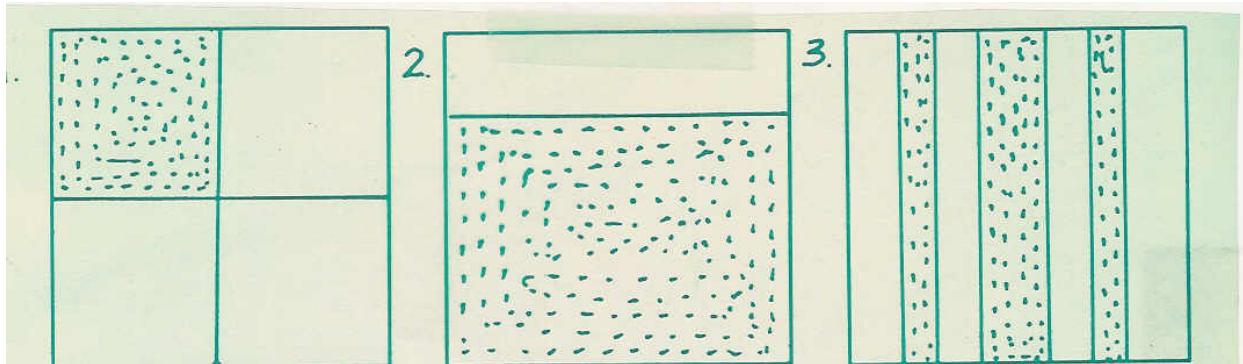
Explain your estimates.

V. Photocopying Percentages (The teacher needs to prepare six copies of a cartoon or drawing, one full size, three reductions, and two enlargements)

Figure what percent was used for each reduction and enlargement. Record your answers as well as your thinking. Explain your procedures.

VI. What Percent is Shaded

Estimate the percentage of area shaded in each square below. Discuss your estimates in your group. Devise a method for checking. Be prepared to share your estimates and your checking method.



VII. Do We Match the Percentages from American Averages? (Mike Feinsilber and William B. Mead, Dolphin Books)

- 1) Do you bite your fingernails? (Between 25% and 37% of college students do.)
How many students in our class do? _____ Is this more or less than 50%? _____
About what percent of the class? _____ How did you figure this percent? _____
How do we compare? _____
- 2) How many hours a day do you sleep? (63% of adults sleep between 7 and 8 hours a day.)
How many students in our class sleep 7 or 8 hours a day? _____
Is this more or less than 50%? _____ About what percent of the class? _____
How did you figure this percent? _____ How do we compare? _____
- 3) Do you get a regular allowance? (50% of 12 to 17 year olds do.)
How many students in our class do? _____ Is this more or less than 50%? _____
About what percent of the class? _____ How did you figure this percent? _____
How do we compare? _____
- 4) Are you wearing athletic shoes or sneakers? (25% of shoes worn by Americans are athletic shoes or sneakers.) How many students are wearing athletic shoes? _____
Is this more or less than 50%? _____ About what percent of the class? _____
How did you figure this percent? _____ How do we compare? _____
- 5) Which do you generally take, a shower or a bath? (59% of teenage girls and 78% of teenage boys take showers rather than baths.) How many students in our class shower? _____ Girls _____ Boys _____ Is this more or less than 50%? _____ About what percent of the girls shower? _____ Boys? _____ How did you figure these percentages? _____ How do we compare? _____
- 6) What is your favorite animal? (9% of children report that the horse is their favorite animal). How many students in our class do? _____ Is this more or less than 50%? _____
About what percent of the class? _____ How did you figure this percent? _____
How do we compare? _____
- 7) What animals live in your home? (33% of U.S. households have a dog; 12.5% have a cat; 10% have both, 6.2% have fish.) How many students in our class have a dog? _____, a cat? _____, both? _____, a fish? _____ About what percent of the class has a dog? _____, a cat? _____, both? _____, a fish? _____ How did you figure these percentages? _____
How do we compare? _____
- 8) Have you ever taken piano lessons? (40% of American children take piano lessons at some time or other.) How many students in our class have? _____ Is this more or less than 50%? _____ About what percent of the class? _____ How did you figure this percent? _____ How do we compare? _____
- 9) Which soft drink would you order: Coke, Pepsi, Other? (26% order Coke, 17% Pepsi)
How many students in our class order Coke? _____, Pepsi? _____
About what percent of the class orders Coke? _____, Pepsi? _____ How did you figure this percent? _____ How do we compare? _____