DAY 6: Solving Percent Problems

Materials

Copies: 6.1 Estimating Percent with the Box Method II
6.2 Solving percent problems
Ticket Out the Door Day 6

Supplies: Calculators (1 per student)

Objective

Students will practice estimating percent using the box method and the 10% and 50% rules. Students will learn to use their picture to set-up a proportion to use to solve each percent problem.

Student Talk Strategy

Numbered Heads for 6.2

Academic Language Use

Percent- "out of 100". In this unit, percent will be understood as the number of boxes colored out of 100. Percent will be understood as an "elastic" number, meaning that the actual amount of a percent changes depending upon what the whole is.

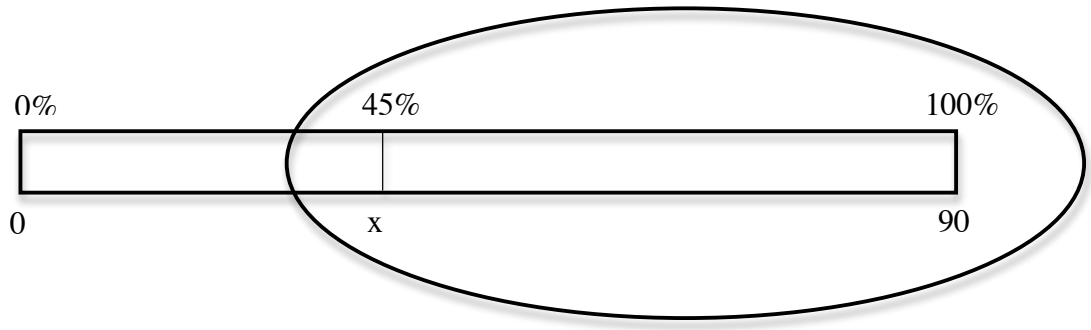
Activity Notes

15 minutes: Estimating with Percent

Today begins with a review of 5.2. Pass out activity sheet 6.1. Work through problem #1 as a class. Have a student read the problem aloud and then draw the box. Use random selection to have students tell you what numbers and percents to put on the picture and where. Once the picture is labeled, give the students 1 minute to each come up with an estimate for x. Use random selection to have students share methods to estimate. To help them share their answers, put the following sentence starter up: "I found the estimate by _____." Then allow them to work on the rest of the activity sheet. You can choose to have them work alone or in pairs. Circulate during this time to question students to help them think. Ask, "Where does 100% go?" "What is the total?" "Can you extend the box past 100%?" "What are you looking for?" "What would 10% of that be?" "What is 50% of that number?"

40 minutes: Solving Percent Problems

Pass out activity sheet 6.2 and calculators to each student. Direct the students' attention to problem #1. Give the class 1 minute to set up the box/picture. Call on a student to draw the box for the whole class. BEFORE you estimate today, ask the students if they see a proportion anywhere. Give them 30 seconds to study the box to look for this and then call on students to explain what they see. Look at the picture below as a reference. Note: there are many correct proportions that can be written. They are all listed below the picture.



Correct Proportions:

a) $\frac{45}{x} = \frac{100}{90}$

b) $\frac{45}{100} = \frac{x}{90}$

c) $\frac{x}{45} = \frac{90}{100}$

d) $\frac{90}{x} = \frac{100}{45}$

Have the students draw the box model for the remaining problems and then write a proportion for each (it can help to have them circle the proportion). Set the timer for 10 minutes for this part. Have students who finish early draw their pictures and proportions up on the board. Go through each one as a class to make sure the picture and the proportions are correct (Note: it is okay if you choose to work on only 8 or 10 problems and save the rest for those who finish early).

Now you will have the students go back to the SAME problems from 6.2, but this time, instruct them to make an *estimate* for the value of x in each problem. Set the timer for 8 minutes and have them do this individually. Then give them 5 minutes to check estimates in a group of 4. Let them know you'll be using numbered heads to select students to share and explain their estimates. During the 5 minutes, assign each group a number and assign each person in the group a number from 1-4. At the end of the 5 minutes, randomly select a person number (1-4) and then a group number. Have this person explain his/her estimate and then call on another student to share a different method/estimate. Try to get at least 2 explanations per problem.

Once all estimates have been shared, have the students go back and SOLVE the proportions they first wrote for each problem on 6.2. They can use calculators to solve. Encourage them to compare the solutions to the estimates. Give the students the remaining time to finish this. If students finish early, have them write up their work on the whiteboard.

5 minutes: Ticket out the Door

Pass out the Ticket out the Door and have the students raise their hands when finished (so that you can check it and then dismiss them).