FRACTIONS - DECIMALS - PERCENTS
Step 2 Connecting Fractions, Decimals and Percents

Purpose: To show equalities and relationships of fractions, decimals and percents

Materials: Master #10 - Blank Decimal Squares on page 122 and copies of Master #11 on page 123

TEACHER MODELING/STUDENT COMMUNICATION

Activity 1 Fractions and decimals

1. Show students the tenths grid with three parts shaded.
   - What is the fraction for this grid? (3/10)
   - What is the decimal for this grid? (.3)
   - Every fraction with a denominator of 10 can be written as a decimal with one digit, called a one-place decimal.
   \[
   \frac{3}{10} = .3
   \]

2. Show students the hundredths grid with 27 parts shaded.
   - What is the fraction for this grid? (27/100)
   - What is the decimal for this fraction? (.27)
   - Every fraction with a denominator of 100 can be written as a decimal with two digits, called a two-place decimal.
   \[
   \frac{27}{100} = .27
   \]

3. Distribute Master #11 "Grids for Fractions-Decimals-Percent" on page 123.
   - Complete #1 on your sheets.
   - All decimals for fractions with a denominator of 10 have one digit and are called one-place decimals, and all decimals for fractions with a denominator of 100 are called two-place decimals. Note that .07 is a two-place decimal.
   - Complete #2 on your sheets. When students finish, ask for other decimals for hundredths (two-place decimals) that are equal to tenths (one-place decimals). (.10 = .1, .20 = .2, .30 = .3, etc.)

Activity 2 Percents, fractions and decimals

1. Show students a hundredths grid with 16 parts shaded.
   - Percents, fractions and decimals are different ways of writing the same number.
   - What is the percent, fraction and decimal for this grid? (16%, 16/100 and .16)
   - Write a chain of equalities for these three ways of representing this shaded amount. (16% = 16/100 = .16)
Activity 3 Percents and decimals that equal 1/3 and 2/3

1. Show students this hundredths square and tell them it has 33 1/3 small squares shaded.
   - What fraction of this grid is shaded? Explain your reasoning. (1/3, because if you multiply 33 1/3 by 3 you get 1 whole square.)
   - What percent of this grid is shaded? (33 1/3 %)
   - Since one meaning of 1/3 is to divide 1 by 3, use your calculator to compute 1 ÷ 3 and write the resulting decimal. (0.333333333 . . .) Explain that this is called an infinite repeating decimal, and it is indicated by writing $\frac{1}{3}$.

2. Show students this hundredths square and tell them it has 66 2/3 small squares shaded.
   - What fraction of this grid is shaded? Explain your reasoning. (2/3, because 1/3 of the square is unshaded.)
   - What percent of this grid is shaded? (66 2/3 %)
   - Since one meaning of 2/3 is to divide 2 by 3, use your calculator to compute 2 ÷ 3 and write the resulting decimal. (0.666666666 . . .) Explain that this is also an infinite repeating decimal, and it is indicated by writing $\frac{2}{3}$.

3. Complete #3 on your sheets. Note that .20 can be written as .2, etc.

4. Discuss the convenience of sometimes replacing a decimal or percent by a fraction. After the two examples shown here, ask students to finish #4 on their sheets.
   - If a clock is losing .6 seconds every hour, how much time will it lose in 12 hours? (12 × .6 = 12 × 6/10 = 72/10 = 7 2/10 = 7 1/5, that is, 7 1/5 seconds.)
   - If 25% of the 120 people visiting the dentist's office had tooth cavities, how many of these people did not have tooth cavities? (25% of 120 = ¼ × 120 = 30, so 120 – 30 = 90 people did not have tooth cavities.)

5. Students play Fraction-Decimal Concentration (page 109).

INDEPENDENT PRACTICE and ASSESSMENT

Worksheets 98-99 from the Teacher Resource Package
decimalsquares.com Beat the Clock (writing decimals before time runs out)
Concentration (finding squares with the same shaded amount)
Place Value Strategy (spinning to obtain digits for place value table)