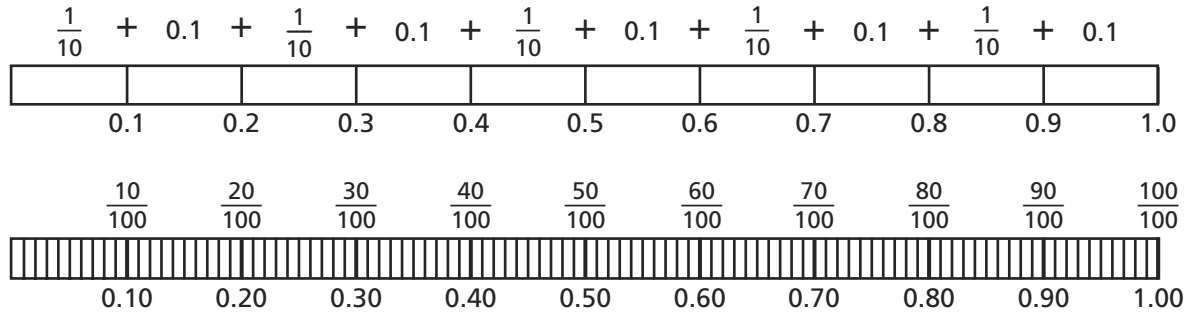


# Math Background

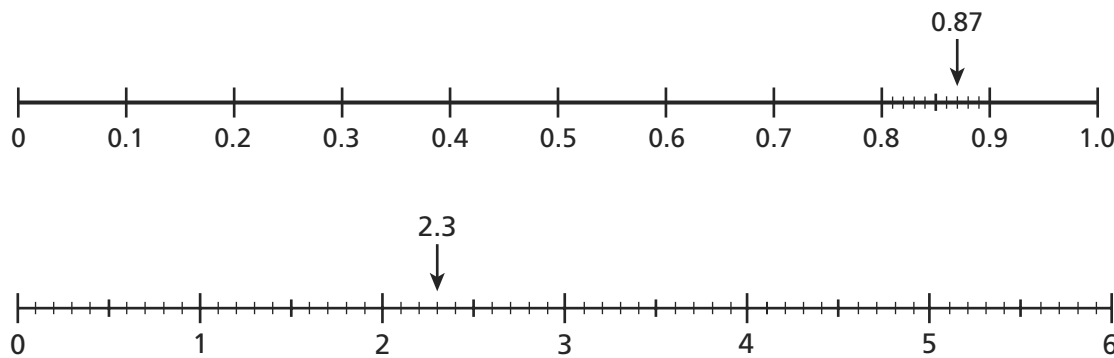
## Representing Decimal Numbers

**Decimal Numbers on Bars Divided Into Tenths and Hundredths** Students will explore decimal numbers by using bars divided into tenths and hundredths. They will relate decimals to fractions, which are also used to represent parts of a whole. Decimal tenths are shown on a bar as a whole divided into 10 equal parts. Decimal hundredths are shown as a whole divided into 100 equal parts.



**Relating Decimal Fractions to Regular Fractions** Students may want to relate the number of decimal places to the number of zeros in the fraction unit. For example, if the denominator is 10, there will be one place to the right of the decimal point since the number 10 has one zero.

**Rounding Decimal Numbers Using a Number Line** Students will find the position of decimal numbers on a number line to help them round. They will round decimal hundredths to the nearest decimal tenth. They will also round numbers with tenths or with hundredths to the nearest whole number. Rounding frames with the possible rounding numbers above and below help with the place values involved in the rounding.



### Rounding Frame

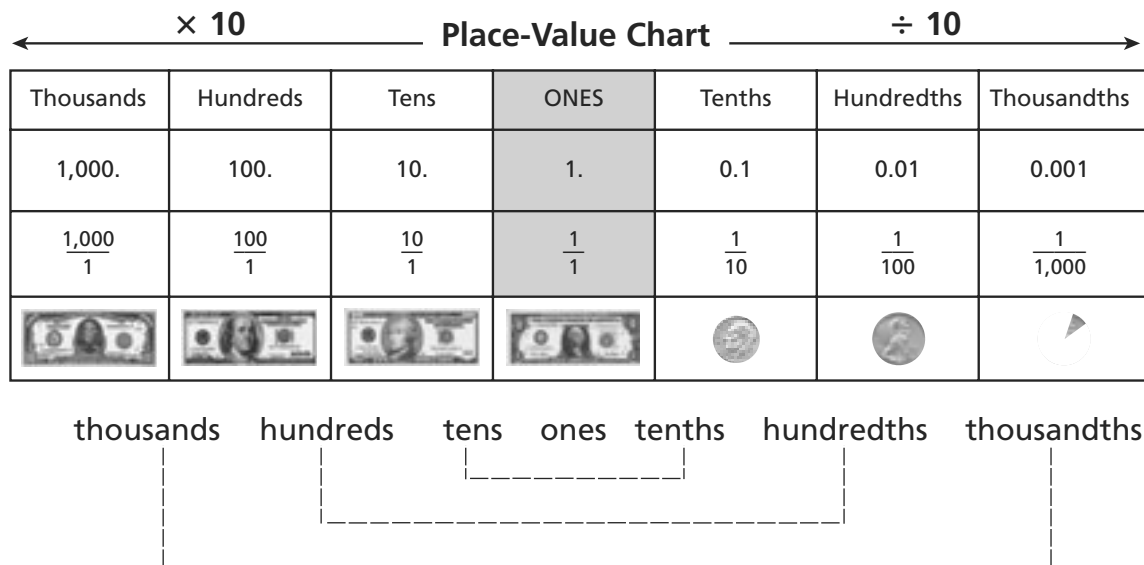
0.9  
0.87  
 0.8

3.0  
2.3  
 2.0

## Teaching Unit 6 (Continued)

### Place Value and Addition and Subtraction of Decimal Numbers

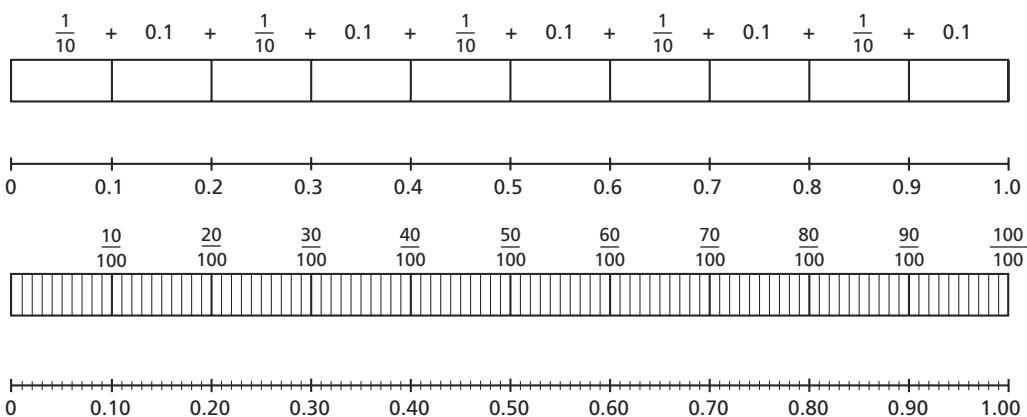
**Symmetry in the Place Value Chart** Students use a place value chart to discuss the symmetry of the base-ten system about the ones place (not about the decimal point).



Students observe that tens and tenths, hundreds and hundredths, and thousands and thousandths are symmetric about the ones place.

Students also discuss the general “multiply by ten” relationship as one moves one place to the left and the relationship of tenths to dimes and hundredths to pennies.

**Adding and Subtracting Decimals** Students use fraction bars and number lines to visualize the difference in size between tenths and hundredths. Students observe that 1 tenth is 10 times larger than 1 hundredth, so you need to add or subtract tenths to tenths and not to hundredths.



Note that on the fraction bars the label is in the middle to show it is labeling that length. On the number line the total so far is labeled.

Students also connect their understanding of money to adding and subtracting decimals. You wouldn't add or subtract dimes and pennies without thinking of each dime as 10 pennies.