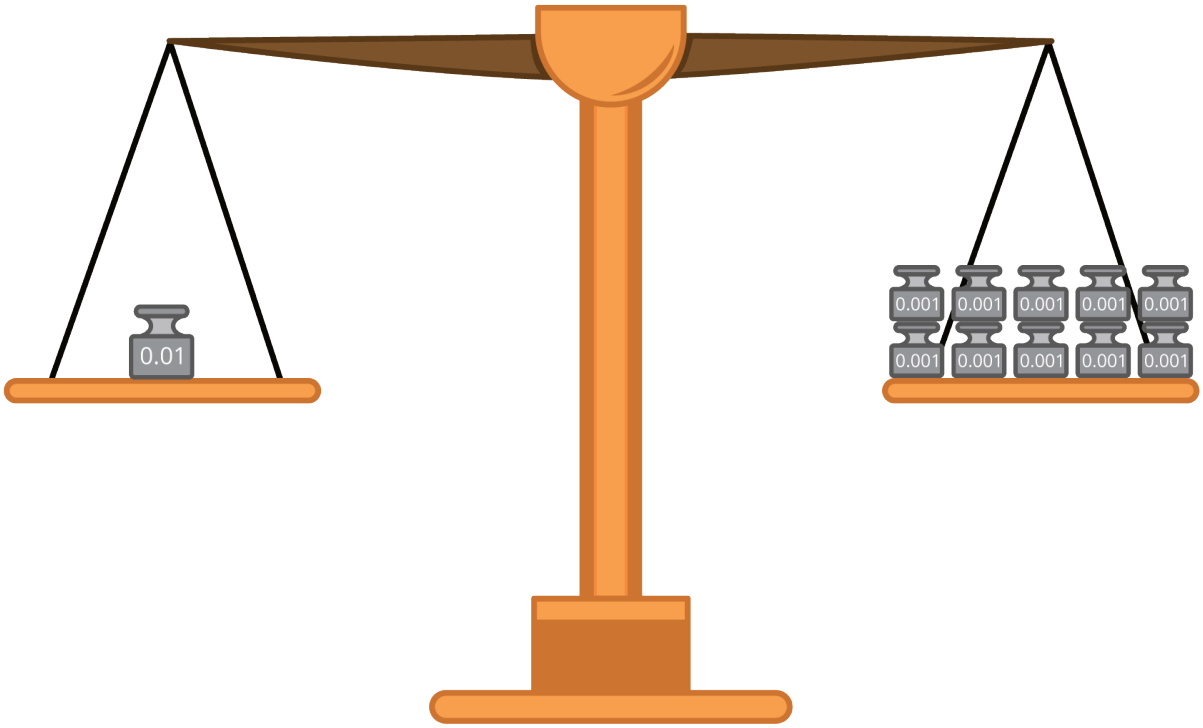
Lesson 4: Explore Place Value Relationships

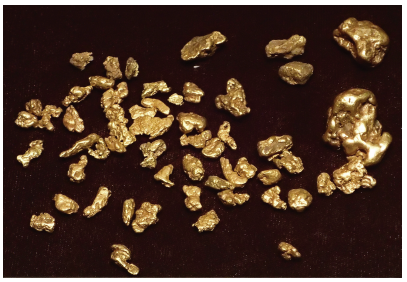
- Let's explore place value relationships.

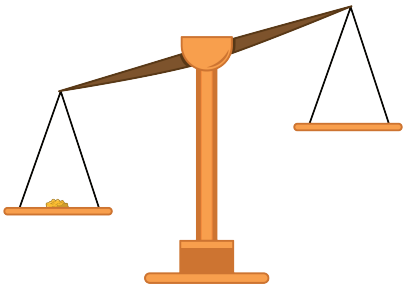
Warm-up: Notice and Wonder: Maintain Your Balance

What do you notice? What do you wonder?



4.1: Balance the Weight





For each problem, you have a balance and weights of 0.1 ounce, 0.01 ounce, and 0.001 ounce.

1. A gold nugget weighs 0.2 ounces.
   a. What is one set of weights you could use to balance the nugget? Explain or show your reasoning.

   b. What is another set of weights you could use to balance the nugget? Explain or show your reasoning.

   c. How many 0.01 ounce weights would you need to balance the nugget? What about 0.001 ounce weights?

2. Another nugget weighs 0.385 ounce.
   a. What is one set of weights you could use to balance the nugget? Explain or show your reasoning.

   b. What is the smallest number of weights you can use to balance the nugget? Explain or show your reasoning.

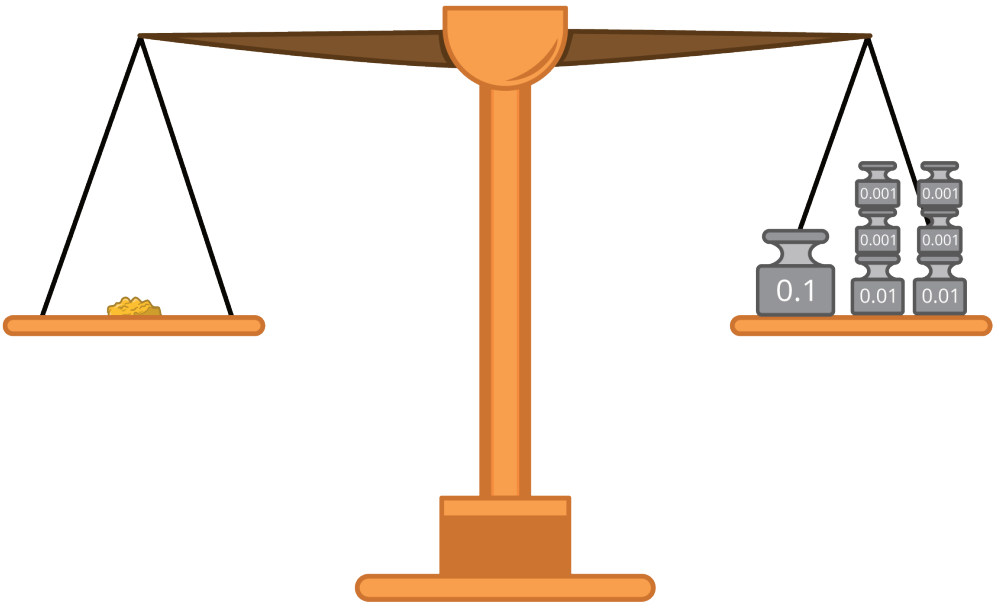
   c. What is the largest number of weights you can use to balance the nugget? Explain or show your reasoning.

3. Write a decimal number for the weight of the gold nuggets that balanced with:
   a. 266 of the 0.001 ounce weights

   b. 150 of the 0.01 ounce weights

   c. 27 of the 0.1 ounce weights

4.2: Weights and Place Values



1. Weights are used to balance some gold nuggets. Write the weight of each gold nugget in expanded form.
   a. three 0.1 ounce weights, five 0.01 ounce weights, and eight 0.001 ounce weights

   b. six 0.1 ounce weights and two 0.001 ounce weights

   c. two 0.01 ounce weights and six 0.1 ounce weights

2. Here are the weights of some gold nuggets in word form. Write the weights in expanded form.
    a. two hundred eighty three thousandths of an ounce

    b. four hundred nine thousandths of an ounce

3. A gold nugget weighs 0.527 ounces.
    a. What is the value of each of the digits in the decimal 0.527?

    b. How does the expanded form of 0.527 show the value of each digit in the decimal?

4.3: Comparing Place Values with Weights

1. How many 0.01 ounce weights will balance one 0.1 ounce weight? Explain or show your reasoning.

2. How many 0.001 ounce weights will balance a 0.1 ounce weight? Explain or show your reasoning.

3. The table shows the weights of 3 of the gold nuggets Diego and his friends found panning for gold.

   Fill in the blanks. Explain or show your reasoning.

gold	weight (grams)
nugget A	0.6
nugget B	0.06
nugget C	0.006

   a. Nugget A weighs _____ times as much as Nugget B.

   b. Nugget A weighs _____ times as much as Nugget C.

   c. Nugget C weighs _____ times as much as Nugget B.

   d. Nugget C weighs _____ times as much as Nugget A.