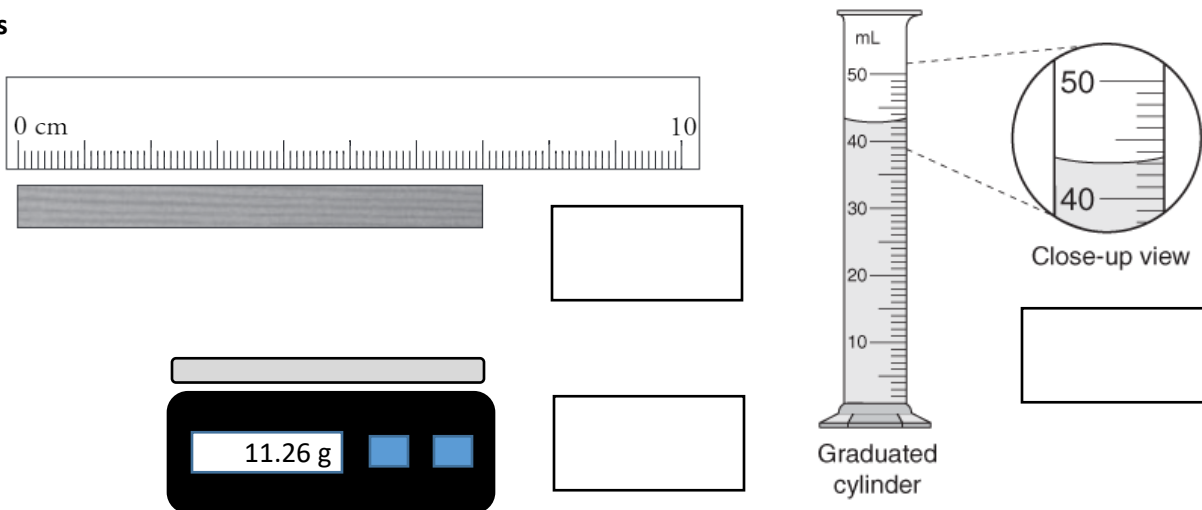


Name: \_\_\_\_\_

### Math Spotlight – Significant Digits/Figures

There are two types of numbers in the world – exact and inexact. For instance, counting is exact because you can safely say that there are exactly 12 eggs in a dozen. However, no measurement with a ruler, balance, or graduated cylinder is ever exact. Using significant digits in a measurement allow you to indicate the degree of certainty in the measurements. In general, *the last digit of any measurement is uncertain*. When you're recording measurement data, you need to include one uncertain digit at the end of your measurement.

#### Examples



#### Rules for Determining the Number of Significant Digits:

1. Nonzero digits always count
2. *Leading zeros*, such as those in 0.004728, never count as significant digits.
3. *Trapped zeros*, as in 1.08, always count as significant digits.
4. *Trailing zeros* count only when there is a decimal point. For example the zeros are significant in 500. and 20.0, but they are not significant in 500 and 20 because there is no decimal point in the number.

As you do calculations involving numbers with different numbers of significant digits, follow these two rules:

- Adding or subtracting: Your final answer will have only as many *decimal places* as the measurement with the fewest decimal places.
- Multiplying or dividing: The result can have only as many significant digits as the number with the fewest *total* significant digits.

**Practice Exercises:** (make sure to include units in your answer if units are given in the question)

1. How many significant figures are in each of these numbers?  
a. 20.1 \_\_\_\_\_ b. 300.0 \_\_\_\_\_ c. 0.0031 \_\_\_\_\_ d. 0.03010 \_\_\_\_\_
2. Complete these calculations:  
a.  $25.14 + 3.4 + 15.031 =$  \_\_\_\_\_  
b.  $100.04 \text{ cm} - 7.362 \text{ cm} =$  \_\_\_\_\_  
c.  $3005 \times 45.20 =$  \_\_\_\_\_
3. What is the volume of a box 14.5 cm by 15.9 cm by 21.1 cm?