

# PERCENT ERROR

## ABSOLUTE ERROR

- Absolute error measures the difference between the \_\_\_\_\_ (estimated) value and the \_\_\_\_\_ (true) value.
- It can be solved by finding the absolute value of the difference between the approximate value (A) and the exact value (E): \_\_\_\_\_

Use the bubbles at the right to brainstorm real-world terms that could also mean “approximate” and “exact”.

**APPROXIMATE**

**EXACT**

Use your understanding of absolute error to answer the questions below.

1. A science experiment calls for 150 mL of water, but Simon measures out 147 mL. What is the absolute error?

2. A student measured the mass of an object to be 56 g, but the actual mass was 53 g. What is the absolute error?

## PERCENT ERROR

- Percent error compares the absolute error to the \_\_\_\_\_ value.

Ex: \_\_\_\_\_

- It can be solved using a percent error equation in which the values are plugged into the formula below:

$$\% \text{ ERROR (AS A DECIMAL)} = \frac{|\text{APPROXIMATE} - \text{EXACT}|}{\text{EXACT}} \quad \text{or} \quad \frac{\%}{100} = \frac{|\text{APPROXIMATE} - \text{EXACT}|}{\text{EXACT}}$$

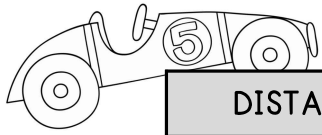
3. During a school assembly, Mrs. Quinn takes attendance and counts 356 students. In actuality, there were 376 students.

a. What was the absolute error? \_\_\_\_\_

b. What is the percent error to the nearest tenth?  
\_\_\_\_\_

Read each of the situations below and answer the questions using your understanding of absolute and percent error.

4. Several students are competing in a science club competition to build a car that will travel exactly 10 meters. The distance each student's car traveled is shown in the table below.



	EMILY	JEROME	MARISELA
DISTANCE (m)	9.2	10.6	9.8

a. What is the absolute error of each race car?

Emily: \_\_\_\_\_ Jerome: \_\_\_\_\_ Marisela: \_\_\_\_\_

b. What is the percent error of each race car?

Emily: \_\_\_\_\_ Jerome: \_\_\_\_\_ Marisela: \_\_\_\_\_

c. Based on this information, what does a small percent error indicate?

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d. Mark each of the following statements as true or false based on the data.

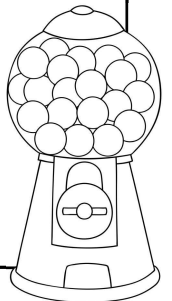
\_\_\_\_\_ Jerome has the smallest percent error.

\_\_\_\_\_ Emily's race car was the most accurate.

\_\_\_\_\_ Emily and Marisela had a negative percent error because their cars traveled less than the desired distance.

5. Mr. Brown's class guessed the number of gumballs in a gumball machine in the cafeteria. After counting, it was determined that there were actually 408 gumballs in the machine. Complete the table below to find the absolute error and percent error of the lowest and highest student guesses.

	LOWEST GUESS	HIGHEST GUESS
GUESS	382	456
ABSOLUTE ERROR		
PERCENT ERROR		



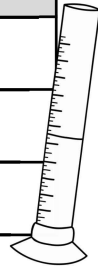
Summarize today's lesson:

## PERCENT ERROR

Use your understanding of percent error to answer the questions below. Be sure to show your work.

1. Students in the science lab are measuring the mass of an object on a triple beam balance. The object has a mass of 38 grams. Complete the table below with the absolute and percent error for each student's measurement. Round your answer to the nearest tenths place.

STUDENT	MEASUREMENT	ABSOLUTE ERROR	PERCENT ERROR
Danielle	40 grams		
Iris	34 grams		
HB	41 grams		



a. Order the students based on the most accurate measurement to the least accurate measurement.

2. A birthday party host planned for 20 people, but 17 actually attended. What is the percent error?

3. Each bag of cereal should contain 350 grams. A box was selected at random and weighed 342 grams. What is the percent error?

4. The distance around a neighborhood is 4 miles. When clocking it with an odometer, the distance was 3.8 miles. What is the percent error?

5. A postage box should weigh 1.0 pound. If there is a 5% error on the weight, what is the range of acceptable weight?

