

Name: _____

Date: _____

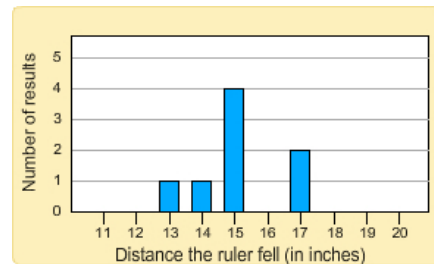
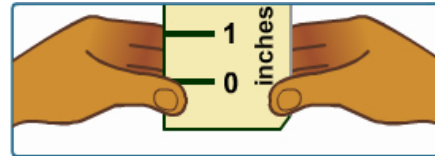
Student Exploration: Reaction Time 1

Vocabulary: bar graph, data, dot plot, median, mode, range

Prior Knowledge Questions

(Do these BEFORE using the Gizmo.)

Sally holds a yardstick in the air, and Mark gets ready to catch it when it drops. When Sally drops the yardstick, Mark tries to catch it as fast as possible. The distances that the yardstick dropped before being caught are shown on the graph.



1. What was the most common result? _____

2. What was Mark's best result? _____

3. How many times did Mark catch the ruler at 17 inches? _____ 15 inches? _____

4. If you had to summarize Mark's results with a single number, what would you use? _____

Explain. _____

Gizmo Warm-up

The *Reaction Time 1* Gizmo™ allows you to test your reaction time. Check that **Catch the ruler (no sound)** is selected and that the **Display** is a **List**.


1. Press **Start**. Hit the spacebar on your keyboard to catch the ruler when it drops. After 5 catches, click **Stop**. List your results below. (Don't forget to include the unit, inches.)

2. These results form a **data** set. What was your best result? _____ Worst result? _____

3. The **range** of your data set is the difference between the best result and the worst result.

What was the range of your data? _____ - _____ = _____

Turn on **Show statistic** and select **Range** to check your answer.

Activity A: Click that target!	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> • Select Click the target (stationary). • Click Reset, and select the List display. 	
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1. In the **Click the target (stationary)** experiment, you will try to click your mouse on the target as many times as possible. Click **Start**, try the experiment 10 times, and click **Stop**.

Results: _____

2. Select **Click the target (moving)**. In this experiment, the target will move around as you try to click it. Do you think this will increase or decrease the number of clicks? _____

3. Click **Start**. Create a data set with 10 values, and click **Stop**. Record your results below.

Results: _____

4. Compare the two sets of results. How did the moving target affect your number of clicks?

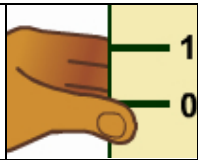
5. Select the **Dot plot** display. One way to describe a data set is the **mode**, or the most common value. (Note: A data set can have more than one mode. In fact, a data set can also have no mode at all, if all the data values occur the same number of times.)

A. What was the mode of your stationary target clicking experiment? _____

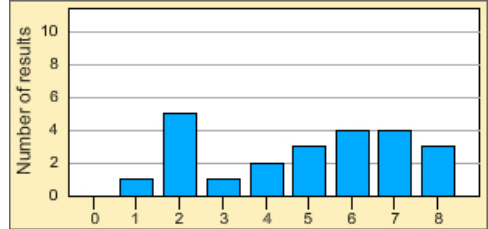
B. What was the mode of your moving target clicking experiment? _____

C. Do you think mode is a good way to summarize a data set? Explain why or why not.

6. Turn on **Show statistic** and select **Mode**. Compare the different data displays (list, table, bar graph, dot graph). Which displays make it easiest to see what the mode is? Explain why.

Activity B: Sight vs. sound reflexes	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> • Select the Catch the ruler (no sound) experiment. • Click Reset, and turn off Show statistic. 	
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1. Look at the “click the target” data set shown at right.



A. What is the mode of this data? _____

B. Do you think that the mode is the best way to summarize this data set? _____

C. Explain: _____

2. The **Catch the ruler (no sound)** experiment tests your sight reflexes. Click **Start**, and catch the ruler 5 times. (To catch the ruler, hit the **spacebar** on your keyboard.) Then click **Stop**.

A. List your results, in inches: _____

B. Sort the data from smallest to largest: _____

C. One way to summarize a data set is the **median**, or middle number. What is the median of this data set? _____ Turn on **Show statistic** and **Median** to check.

3. Turn off **Show statistic**. Now you will test your reactions to sounds. Select the **Catch the ruler (with sound)** experiment. Check that the sound is on for your computer and speakers. (If there are many people doing the experiment at once, use headphones if possible.)

Click **Start**, close your eyes, and hit the **spacebar** on your keyboard when you hear the sound. After 5 catches, open your eyes and click **Stop**.


A. List your results from smallest to largest: _____

B. What is the median of this data set? _____ (Turn on **Show statistic** to check.)

4. Based on median, which is faster, your reaction to sight or to sound? _____

5. In this experiment, is median or mode a better way to summarize the data? _____

Explain: _____

Activity C: Left hand vs. right hand	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> • Click Reset. • Turn off Show statistic. 	
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- Choose one of the four experiments—**Catch the ruler (no sound)** or **(with sound)**, **Click the target (stationary)** or **(moving)**—from the dropdown list in the Gizmo.
 - Which experiment did you pick? _____
 - Are you left-handed or right-handed? _____
 - Do you think you will have better scores with your left or right hand? _____

- Do the experiment with your right hand. Record your first 10 results. Check that the **Display** is a **List**. Select **Show results from smallest to largest**, and list them in order below.

Results: _____

What is the unit of your data? _____

- Look at the ordered list of data. Is there a single number in the middle of this list? _____
- When there is an even number of values in a data set, the median is halfway between the two middle numbers. Circle the two middle numbers in your data set above.

Which number is halfway between the two middle numbers? _____

This is the median of this data set. To check, turn on **Show statistic** and select **Median**.

- Turn off **Show statistic**, and click **Reset**. Repeat the experiment, but this time use your left hand. Record your results in order, from least to greatest. Circle the two middle numbers.

Results: _____

- What is the median of your left-hand data? _____ (Turn on **Show statistic** to check.)

- Based on the medians, which hand achieved better results? _____

- Look at the four types of **Display**. Which does the best job of showing median? _____

Explain: _____