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

**Biology 9: Scientific Method Lab #2 – Which Sense has the fastest reaction?**

**Research Question:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Hypothesis:**(If…then…because)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Independent variable:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Dependent variable:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Controls:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Materials:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Procedure:** This lab will be conducted in groups of two. One student will drop the ruler and the other student will catch the ruler. The student, who is dropping the ruler, holds the top of the ruler vertical at the 30.0 cm end.

***Testing Sight:***

* The student, who is catching the ruler, puts the top of their index finger at the 0.0 cm mark and their thumb on the other side of the ruler. This allows the student to grab or pinch the ruler. The catching student has their fingers close to the ruler but not touching it.
* Once the student drops the ruler, the catcher tries to catch the ruler with their index finger and thumb as soon as they see it being dropped.
* Record the highest point on the ruler where the catcher’s index finger is located.
* Repeat this three more times and record in the data table.

***Testing Touch:***

* The student, who is catching the ruler, puts the top of their index finger at the 0.0 cm mark and their thumb on the other side of the ruler **AND** closes their eyes.
* The student who is dropping the ruler taps the catcher on the opposite arm and drops the ruler at the same time.
* Once the catcher’s arm is touched, they try to grab the ruler.
* Record the highest point on the ruler where the catcher’s index finger is located.
* Repeat this three more times and record in the data table.

***Testing Sound:***

* The student, who is catching the ruler, puts the top of their index finger at the 0.0 cm mark and their thumb on the other side of the ruler **AND** closes their eyes.
* The student who drops the ruler says “now” and drops the ruler at the same time.
* Once the catcher hears “now”, they try and grab the ruler.
* Record the highest point on the ruler where the catcher’s index finger is located.
* Repeat this three more times and record in the data table.

**Experiment:** *Data Table:* Measurements (cm) of reaction with a ruler regarding sight, touch and sound senses.

|  |  |  |  |
| --- | --- | --- | --- |
| Trial of dropping the ruler | Sight Measurements (cm) | Touch Measurements (cm) | SoundMeasurements (cm) |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| Mean (average) |  |  |  |

***Analysis Questions:***

1. What is the independent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ What is the dependant variable? \_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which sense was fastest? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Which sense was slowest? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Why did you perform four trials for each sense? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Were the results of the trials the same as the mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. If the results of the four trials were close in value, this is called precise or accurate.

**Graphing:** Create a bar graph with the mean of each of the senses as the independent variable and the means values (0-30cm) as the dependent variable.

