Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ HR: \_\_\_\_\_\_\_\_\_\_\_\_

Unit 2, Lesson 1: Measuring Motion

Speed Challenge Lab

**Lab Overview:** Our 2nd and 3rd units of the year are going to be on motion. As an introduction to this unit, you and your team are going to begin to discover qualities of speed. You will have a racetrack (10 meters long) on which you will perform four different events:

* Walking regularly
* Walking backwards
* Speed walking
* Hopping

You will time how long it takes you to go the 10 meters. Then, you will determine which task led to the fastest speed and which task led to the slowest speed.

**Part 1 – Introduction to the Lab (20 points total)**

What is a good scientific question that you can ask in response to this scenario? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Prove that your question is a good scientific question!

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*Hypothesis:* Choose the event that you think will lead to the fastest time! Only choose one!

The fastest overall average time will be in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ event. I think this because

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*Materials:* To effectively complete this activity, you will need the following items:

* Stopwatches
* Meter stick
* Blue painters tape
* Clipboard
* Markers

*Procedure:* Follow the procedure carefully to make sure that you meet all expectations. If you have any questions, be sure to ask!

1. Create your starting point. Place a blue piece of tape at the starting point and label it “START.”
2. Create your racetrack (10 meters). You can do this by measuring 10 meters with your meter sticks. Place a piece of blue tape at the finish line and label it “FINISH.”
3. Figure out an order in which you would like to perform each event (ie. Who goes first, second, etc.)
4. The first person performs Activity #1, Walking Regularly, two times. Record their time for Trial 1 and Trial 2 in the appropriate box. Repeat this until everyone does two trials for the event.
5. Take time for everyone to write down each group member’s time for the event.
6. Repeat Steps 4 and 5 for the remaining three events.

**Part 2 – Gather your Data (20 points total)**

Please gather all of your data in the following area. Be sure to place the data in the correct boxes. Show your work for the “average time” in the space provided below.

**WALKING REGULARLY**

|  |  |  |  |
| --- | --- | --- | --- |
| **Student Name** | **Trial 1** | **Trial 2** | **Average Time** |
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|  |  |  |  |
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| **AVERAGE TIME FOR GROUP** |  |  |  |

**WALKING BACKWARDS**

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| --- | --- | --- | --- |
| **Student Name** | **Trial 1** | **Trial 2** | **Average Time** |
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| **AVERAGE TIME FOR GROUP** |  |  |  |

**SPEED WALKING**

|  |  |  |  |
| --- | --- | --- | --- |
| **Student Name** | **Trial 1** | **Trial 2** | **Average Time** |
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| **AVERAGE TIME FOR GROUP** |  |  |  |

**HOPPING**

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| --- | --- | --- | --- |
| **Student Name** | **Trial 1** | **Trial 2** | **Average Time** |
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| **AVERAGE TIME FOR GROUP** |  |  |  |

**Part 3 – Organize your Data (20 points total)**

Please create two bar graphs. The first bar graph will be your team’s average time for each of the four events. The second bar graph will be your individual time for each of the four events.

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**Part 4 – Follow-up Questions (20 points total)**

Please answer each of the following questions. Refer back to Parts 2 and 3 for assistance.

1. What was the independent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What was the dependent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What were the controls? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which event had the slowest average speed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Which event had the fastest average speed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 5 – Conclusions (20 points total)**

What can you conclude from this activity? What event had the fastest average speed? Which one had the slowest? Prove your reasoning by using the data you gathered and analyzed in Steps 2 and 3. Why do you think this is the case? What human errors may have influenced your results?

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