**Figure 1: Lab accommodations made for students with occupational therapy needs**

**Energy Lab "Ball Bounce": 30 points (original version)**
**Due Monday, April 1 @ 8:00 AM**

**Problem question:** What is the effect of the starting height of a ball on the height that the ball bounce?

**Material:** Tennis ball, meter stick, 3" wide masking tape and pen

**Hypothesis (1 point):**

**Independent variable (1 point):**
**Dependent variable (1 point):**
**Experimental constants (2 points) (List at least 2):**
**Control group (1 point):**

**Procedure:**
1. Starting at the floor, tape the meter stick vertically against the wall or table leg.
2. Draw lines across the tape to mark 25 cm, 50 cm, 75 cm, and 100 cm above the floor.
3. Hold the ball at the 25 cm mark and drop it. Observe carefully as the ball bounces.
4. Mark the height of the bounce on the tape.
5. Use the meter stick to measure the height of the bounce and record it in the data table.
6. Repeat steps 3 – 5 for a total of 4 trials.
7. Hold the ball at the 50 cm mark and repeat steps 3 – 6.
8. Hold the ball at the 75 cm mark and repeat steps 3 – 6.
9. Hold the ball at the 100 cm mark and repeat steps 3 – 6.

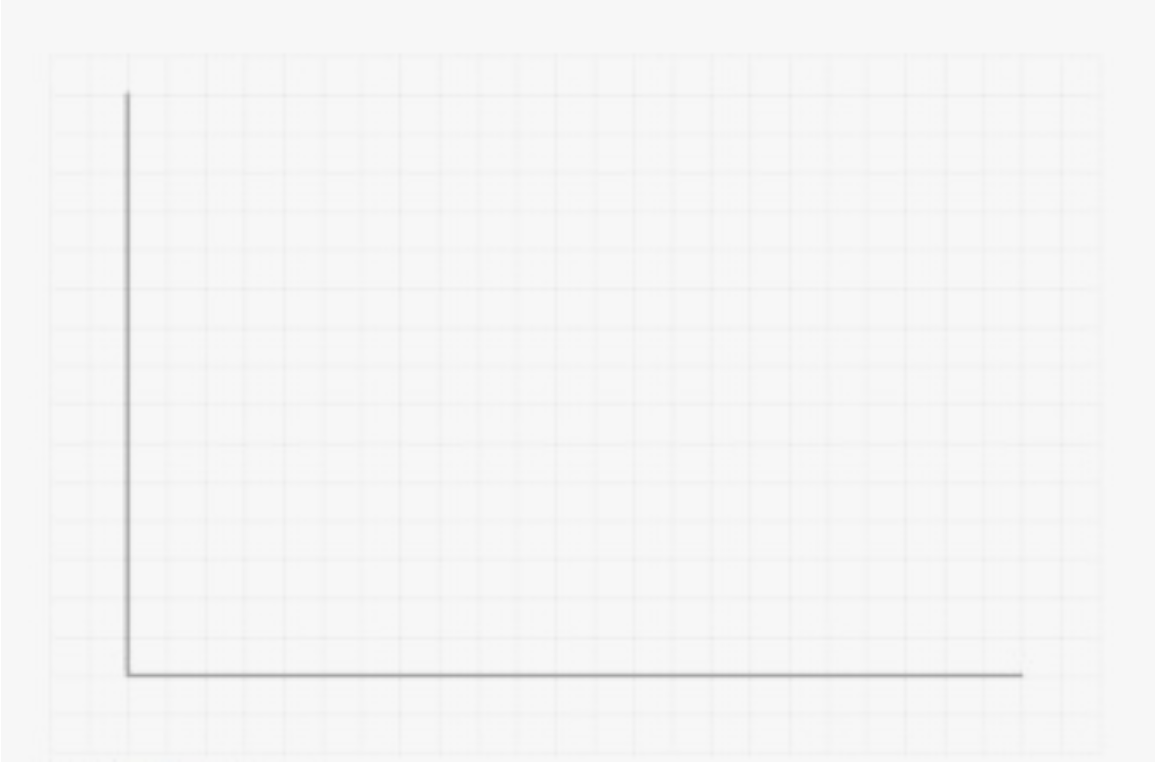
**Data table:**

**Bounce height (cm)**

| | Trial 1 | Trial 2 | Trial 3 | Trial 4 | Average height |
|---|---|---|---|---|---|
| Starting height drop (cm) | | | | | |
| 25 | | | | | |
| 50 | | | | | |
| 75 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 100 | | | | | |

**Graph (5 points):** Create a **line graph** that shows the independent and dependent variables. Only graph the average height and not the trials. Make sure to give your graph a title and label both axes (with correct units).



**Conclusion statement (6 points):** Explain the change of variables that occurred in detail and use data to support your claim (4 points). Why did this occur? What relationship do you see between kinetic and potential energy? (2 points).

**Energy Lab "Ball Bounce": 30 points (with OT accommodations)**
**Due Monday, April 1 @ 8:00 AM**

**Problem question:** What is the effect of the starting height of a ball on the height that the ball bounce?

**Material:** Tennis ball, meter stick, 3" wide masking tape and pen

**Hypothesis (1 point):**

_____

_____

**Independent variable (1 point):**

_____

**Dependent variable (1 point):**

_____

**Experimental constants (2 points) (*List at least 2):**

1. *_____
2. *_____
3. _____

**Control group (1 point):**

_____

**Procedure:**

1. Starting at the floor, tape the meter stick vertically against the wall or table leg.
2. Draw lines across the tape to mark 25 cm, 50 cm, 75 cm, and 100 cm above the floor.
3. Hold the ball at the 25 cm mark and drop it. Observe carefully as the ball bounces.
4. Mark the height of the bounce on the tape.
5. Use the meter stick to measure the height of the bounce and record it in the data table.
6. Repeat steps 3–5 for a total of 4 trials.
7. Hold the ball at the 50 cm mark and repeat steps 3–6.
8. Hold the ball at the 75 cm mark and repeat steps 3–6.
9. Hold the ball at the 100 cm mark and repeat steps 3–6.

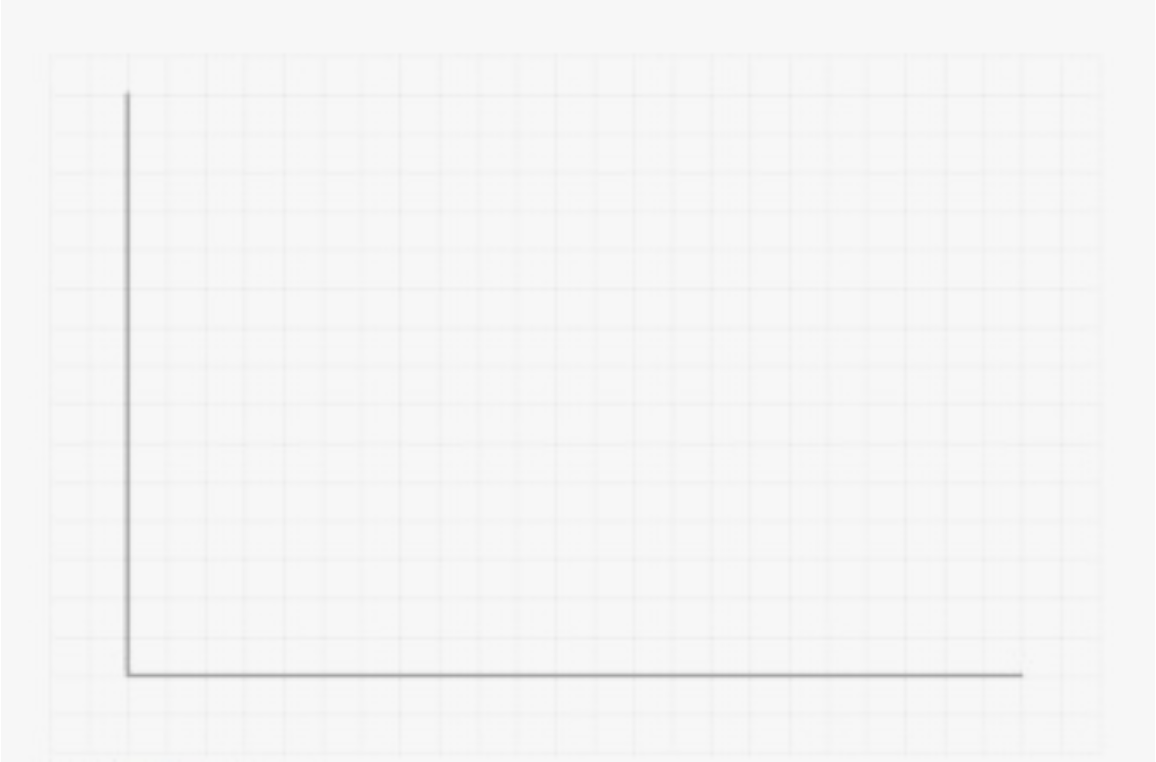
**Data table:**

**Bounce height (cm)**

| | Trial 1 | Trial 2 | Trial 3 | Trial 4 | Average height |
|---|---|---|---|---|---|
| Starting height drop (cm) | | | | | |
| 25 | | | | | |
| 50 | | | | | |
| 75 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 100 | | | | | |

**Graph (5 points):** Create a **line graph** that shows the independent and dependent variables. Only graph the average height and not the trials. Make sure to give your graph a title and label both axes (with correct units).



**Conclusion statement (6 points):**

• Explain the change of variables that occured in detail and use data to support your claim (4 points).

• Why did this occur?

• What relationship do you see between kinetic and potential energy? (2 points)

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**Figure 2: Sample lab modifications**

***Determining density: 36 points*** **(original version)**

**Problem question:** How does the density of a small amount of a substance relate to the density of a larger amount of the same substance?

**Hypothesis:**

**Independent variable:**

**Dependent variable:**

**Constants (name 2):**

**Control group:**

**Experimental group:**

**Data table: Create in sheets and copy to here:**

| Mass of each marble (g) | Total mass of the marbles (g) | Volume of water and marbles (mL) | Volume of marbles (cm3) | Density of marbles (g/cm3) |
|---|---|---|---|---|
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**Analyze the results:**

1. Examine the data in your table. As the number of marbles increases, what happens to the total mass of the marbles? What happens to the volume of the marbles? What happens to the density of the marbles?

2. Graph the number of marbles (x-axis) versus the density of the marbles (y-axis) below. Change the vertical axis minimum value to 0 and change the maximum value to 10. Is the graph a straight line or a curved line?

**Graph title (Create in sheets and copy here):**

**Draw conclusions:**

1. Does the density of a substance depend on the amount of substance present? Explain how your results support your answer.

*In viewing the modified version of this lab below, please keep in mind that this lab was designed for students to complete on their Chromebooks. Therefore, there was no need to include more white space or lines to assist this student with handwriting.*

***Determining density: 36 points*** **(modified version)**

**Problem question:** How does the density of a small amount of a substance relate to the density of a larger amount of the same substance?

**Hypothesis:**

**Independent variable:**

**Dependent variable:**

Constants (name 2):

Control group:

Experimental group:

Data table: Create in sheets so that it looks like the table below. Then, copy and paste here:

| Mass of each Marble (g) | Total mass of marbles (g) | Volume of water and marbles (mL) | Volume of marbles (cm3) | Density of marbles (g/cm3) |
|---|---|---|---|---|
| (should be almost the same) | (should increase) | (should increase) | (3rd column- original water volume) | (2nd/4th) |
| | | | | |
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Analyze the results:

1. Look closely the data in your table. Then, answer the following questions:
    a. As the number of marbles increases, what happens to the total mass of the marbles?

    ***When I <u>increased</u> the number of marbles, the <u>total mass</u> of the marbles _____.***

    b. What happens to the volume of the marbles? What happens to the density of the marbles?

*When I <u>increased</u> the number of marbles, the <u>volume</u> _____.*

*When I <u>increased</u> the number of marbles, the <u>density</u> _____.*

2. Graph the **number of marbles (x-axis)** versus the **density of the marbles (y-axis)** below.
    - Change the vertical axis minimum value to 0 and change the maximum value to 10.

**Paste your graph here:**

- Is the graph a straight line or a curved line?

**Draw conclusions:**

1. Does the density of a substance depend on the amount of substance that's there?

*Yes/No (circle one)*

2. How do you know? (use numbers from your data table to support your answer)

*I know the density of a substance depends on the amount of substance that's there because*