Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_ Block \_\_\_\_\_\_\_\_\_

**Penny Weight**

**Lab**

A **lever** is a simple machine where a bar rotates around a fixed point, **fulcrum**. The **effort force** is the force being applied to a machine. The **Load**, resistance force, is what the effort force is working against. To keep a lever in balance the location of the fulcrum would need to change as the resistance force changes thus changing the length of the effort arm. There are three classes of levers; **1st class** – the fulcrum is between the effort and the load, **2nd class** – the load is between the fulcrum and the effort and **3rd class** – the effort is between the fulcrum and the load.

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**Procedure**:

1. **Balance the meter stick**, with the cup attached to the 100 cm end, on a pencil.
	1. **Record the length of the effort arm** on the data table for the **0 penny measurement**.
2. **Add 5 pennies** to the cup, rebalance and record the new effort arm length onto the data table.
	1. **Determine the difference of the effort arm distances** by subtracting the prior distance from the new distance (5 penny effort arm distance - 0 penny effort arm distance).
3. **Continue to add 5 pennies at a time and find the new location of the effort arm**. Be sure to record these measurements on your data table.
4. **Construct a Bar Graph of your results** on the graph paper provided.
	1. **Remember: Title, X axis label, Y axis label, proper spacing, neat!**

**Data Table:**

|  |  |  |
| --- | --- | --- |
| **# of Pennies** | **Effort Arm Length****(cm)** | **Difference****(cm)** |
| **0** |  |  **--------** |
| **5** |  |  |
| **10** |  |  |
| **15** |  |  |
| **20** |  |  |
| **25** |  |  |
| **30** |  |  |
| **35** |  |  |
| **40** |  |  |
| **45** |  |  |
| **50** |  |  |

**Analysis**:

1. What is a **lever**? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Label the diagram of the meter stick with the following labels: **Fulcrum, Effort Force, Effort Distance, Resistance Force and Resistance Distance**.

 **Effort Arm**

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 **Resistance Arm**

1. What **type of lever** does this represent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	1. Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. As you added more pennies to the cup, what happened to:
	1. The **length of the effort arm**? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. The **length of the resistance arm**? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. The **location of the fulcrum**, as compared to the load? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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