Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

Topic: Levers

*Pre-lab*

A lever is made up of a \_\_\_\_\_\_\_\_\_\_\_ rod that is free to \_\_\_\_\_\_\_\_\_\_\_ around a fixed point. The fixed point is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Drawing:

Levers in the human body:

*Lab Procedure*

*\*Lever arm is the distance of the yellow dot from the fulcrum (red dot).\**

1. Find the correct data sheet for the station that you are at.

2. Use the weighing scale to pick up the weight by itself. Record the number of newtons (N) into the data sheet.

3. Place the weight at the blue sticker on the meter stick.

4. Attach the weighing scale to the paperclip at yellow dot #1. Pull the weighing scale to raise the weight until the meter stick is balanced. Record the number of newtons (N) into the data table. Also record the lever arm (distance of the yellow dot from the fulcrum).

5. Repeat step 4 for yellow dots #2-4.

Station 1

Force required to lift weight: \_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Dot # | Lever arm (cm) | Force (N) | Lever arm ∙ force |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |

What part of the human body do you think behaves like this lever?

Station 2

Force required to lift weight: \_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Dot # | Lever arm (cm) | Force (N) | Lever arm ∙ force |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |

What part of the human body do you think behaves like this lever?

Station 3

Force required to lift weight: \_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Dot # | Lever arm (cm) | Force (N) | Lever arm ∙ force |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |

What part of the human body do you think behaves like this lever?

*Analysis*

1. What did you notice about how much force was required at each dot? (Which dot required the least amount of force? Why do you think that is?)

2. Fill out the last column in each data table by multiplying the lever arm by the force. What do you notice about the numbers in this column?

3. To decrease the amount of force required to raise a weight, what should you do to lever arm length?

4. Which would require more force, a shorter or longer lever arm?