FLINN SCIENTIFIC

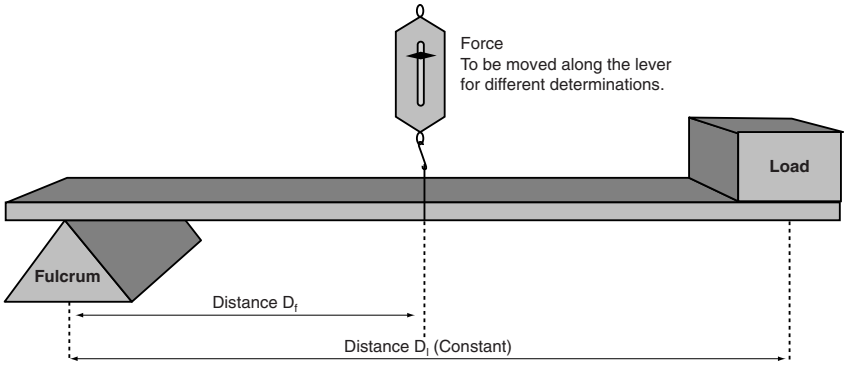
Name_____

Observation Record Sheet #1

Lever Type III

Effect of moving the position of force while the fulcrum and load are held in fixed positions.

Trial	Force Expressed as Weight (Grams)	Load (Grams)	Distance D_f (cm)	Distance D_l (cm)	Mechanical Advantage
1					
2					
3					
4					



Questions

1. What happens to the force required to lift the load as the force gets further from the load?

2. What happens to the mechanical advantage as the force gets closer to the fulcrum?

3. Is the mechanical advantage of the biceps muscle on the arm high or low? What is the advantage of its location?

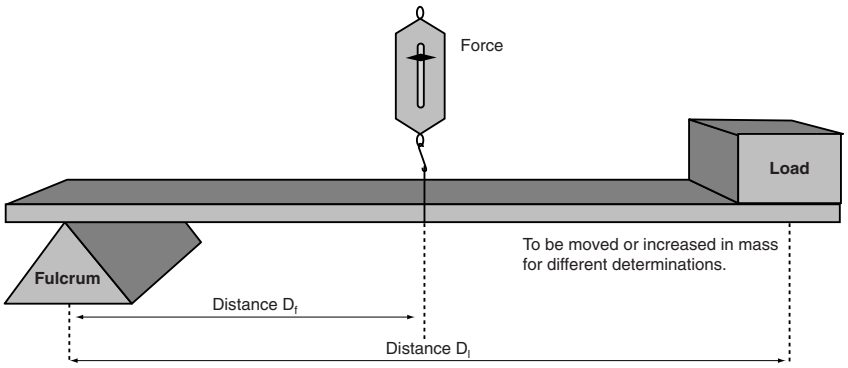
4. What would be lost if the biceps were attached more in the middle of the forearm? What would be gained?

Observation Record Sheet #2

Lever Type III

Effect of moving or increasing the load when the fulcrum and force are held in fixed positions.

Trial	Force Expressed as Weight (Grams)	Load (Grams)	Distance D_f (cm)	Distance D_l (cm)	Mechanical Advantage
1					
2					
3					
4					



Questions

1. What happens to the force required to lift the load as the load is moved further from the fulcrum?

2. Relate this answer to the force the bicep must exert to lift a load. How does bicep "strength" depend on arm length? Explain your answer.

3. How does the distance the force moves compare to the distance the load moves?

4. Identify other Lever Type III setups in the human body.

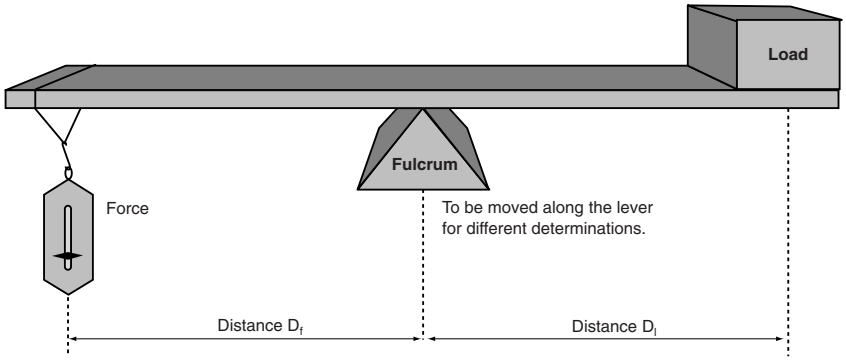
5. Which items (wheelbarrow, shovel, or rake) utilize Lever Type III in their normal functioning? Explain.

Observation Record Sheet #3

Lever Type I

Effect of moving the fulcrum along the lever

Trial	Force Expressed as Weight (Grams)	Load (Grams)	Distance D_f (cm)	Distance D_l (cm)	Mechanical Advantage
1					
2					
3					
4					



Questions

1. In a Type I Lever, where is the fulcrum when the force and load are equal?

2. What is the relationship between the force needed and the position of the fulcrum?

3. Diagram an arm and include a biceps and triceps muscle and explain how they move the arm as they work in opposition.

4. Based upon the size of the biceps and triceps and their apparent functions, explain how the two lever types work efficiently to operate the arm.

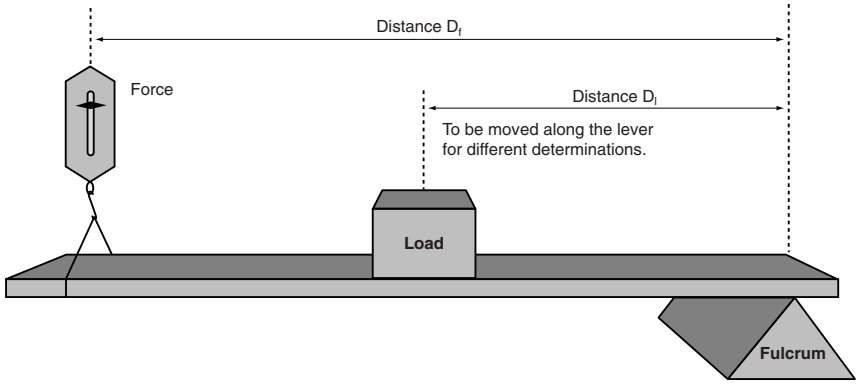
5. Which items (wheelbarrow, shovel, or rake) utilize Lever Type I in their normal functioning? Explain.

Observation Record Sheet #4

Lever Type II

Effect of moving the load along the lever

Trial	Force Expressed as Weight (Grams)	Load (Grams)	Distance D_f (cm)	Distance D_l (cm)	Mechanical Advantage
1					
2					
3					
4					



Questions

1. Where would you place a load with this lever system to spend the least force to lift the load?

2. Would Lever Type II be a good system for moving a load a long distance? Explain.

3. Think of at least one common item that illustrates a Lever Type II system and explain how it works. What are the advantages and disadvantages of the device for the job?

4. Diagram a person's foot standing on the "ball" of her foot with her heel off the ground. Where is the force, fulcrum, and load? What lever type is illustrated?