FLINN SCIENTIFIC

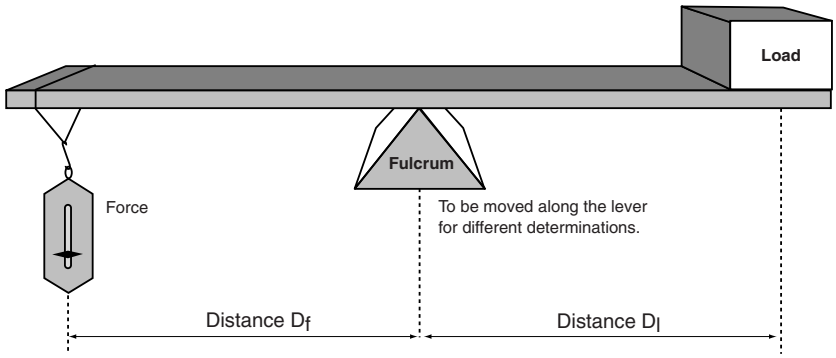
Name_____

Lever Class I Worksheet

Effect of moving the fulcrum along the lever while the load and force positions remain constant.

Trial	Force to Hold Lever Balanced (Newtons)	Load* (Newtons)	Distance D_f (cm)	Distance D_l (cm)	Mechanical Advantage (MA)
1					
2					
3					
4					

*Load is equal to the total weight of the slotted weights. W = m·g, where g = 9.8 m/s^2. 1N = 1 kg·m/sec^2.



Questions

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

2. In a Class I Lever, what happens to the force required to lift a load as the fulcrum gets closer to the load? What happens to the mechanical advantage?

3. When the fulcrum is very close to the load and the force is far from the fulcrum, how does the distance the force moves compare to the distance the load moves?

4. True or False? Defend your answers.

   a. Lever Class I system would be good for moving a heavy object a small distance using less force compared to the weight of the load.

   b. Lever Class I system would be good for moving an object with great speed.

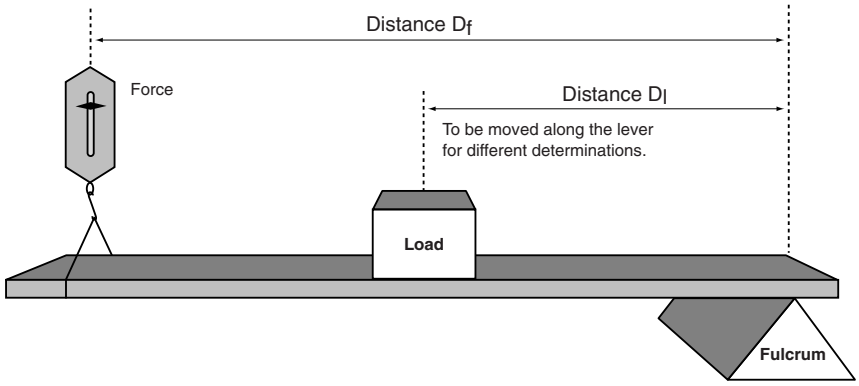
   c. A shovel is an example of a Lever Class I.

Lever Class II Worksheet

Effect of moving the load along the lever while the fulcrum and force positions remain constant.

Trial	Force to Hold Lever Balanced (Newtons)	Load* (Newtons)	Distance D_f (cm)	Distance D_l (cm)	Mechanical Advantage (MA)
1					
2					
3					
4					

*Load is equal to the weight of the slotted masses. $W = m \cdot g$, where $g = 9.8\ m/s^2$. $1N = 1\ kg \cdot m/sec^2$.



Questions

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

2. Would Lever Class II be a good system for lifting a heavy load with minimal force? Explain. How might the position of the lever be a problem with a Class II lever?

3. Would Lever Class II be a good system for moving a load a long distance? Explain.

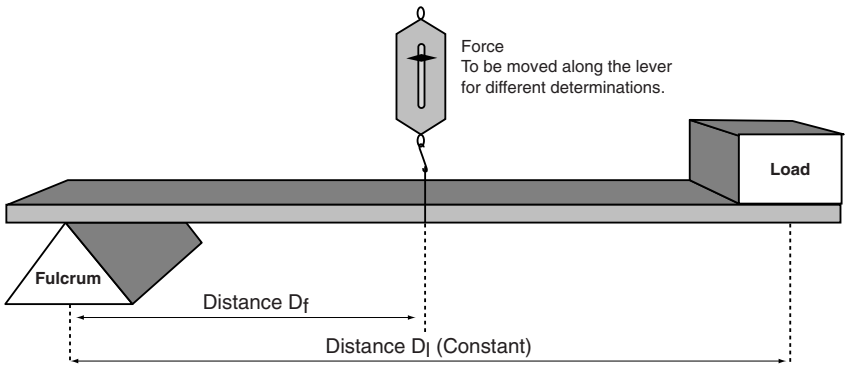
4. Think of at least one common item that illustrates a Lever Class II system and explain how it works. What are the advantages and disadvantages of the device for the job?

Lever Class III Worksheet

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

Trial	Force to Hold Lever Balanced (Newtons)	Load* (Newtons)	Distance D_f (cm)	Distance D_l (cm)	Mechanical Advantage (MA)
1					
2					
3					
4					

*Load is equal to the weight of the slotted masses. $W = m \cdot g$, where $g = 9.8\ m/s^2$. $1N = 1\ kg \cdot m/sec^2$.



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?

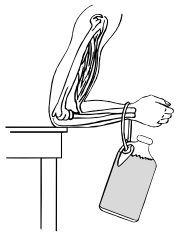
3. When the force is close to the fulcrum and a load is lifted, how does the distance the force moves compare to the distance the load moves? When might such an arrangement be advantageous?

Lever Class III Worksheet (Con't)

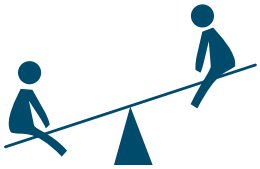
4. For each diagram below, determine what lever class is illustrated and how the lever system is advantageous.

a. Wheelbarrow Lever Class _____

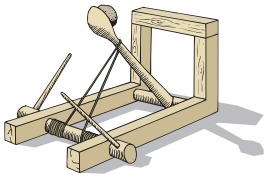
b. Biceps in Arm Lever Class _____



c. Children's Teeter Totter Lever Class _____



d. Catapult Lever Class _____



e. Person Shoveling Lever Class _____

f. Hammer Pulling Nail Lever Class _____