

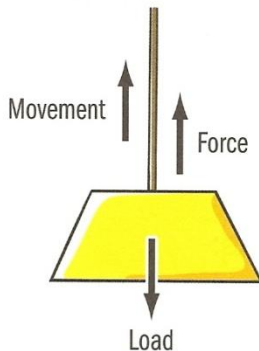
Name: \_\_\_\_\_

Date: \_\_\_\_\_

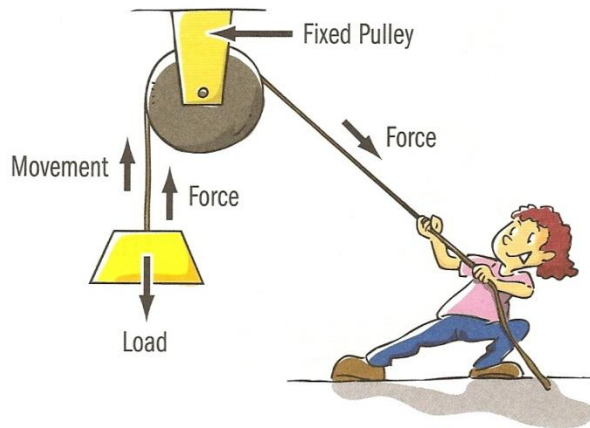
# Pulleys

Use the pictures to help you complete the paragraphs by filling in the blanks with the words provided.

**Lifting Alone**



**Lifting with a Fixed Pulley**



effort  
fixed  
force  
one  
down  
direction  
muscles  
weight

If we want to move something, we need to apply a force. We can use a fixed pulley system to do this. In a system like this, the pulley stays in one place. This system changes the direction of the force needed to move something, not the amount of force.

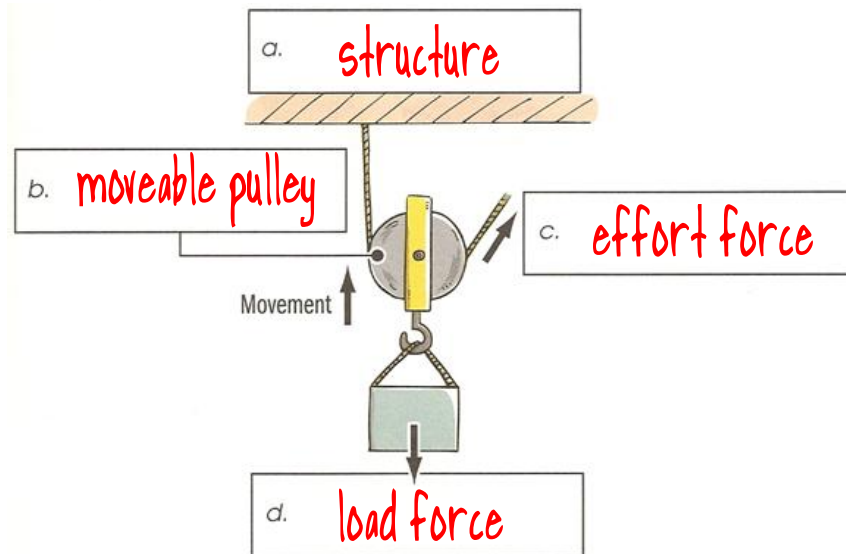
When we pull upwards to move something, we are pulling with our muscles alone. It is usually easier to pull something down rather than pull it up because we can use our weight as an additional force. Our muscles lift the load with less effort.

After reading the paragraphs to follow label the picture by using the bolded words.

If the pulley is allowed to move, then lifting a load becomes easier. The force needed to move the load is called the **load force**.

A **movable pulley** supports and moves with the load. The pulley is attached to the load, and the rope is attached to the **structure**. This makes lifting the load easier because the rope attached to the structure takes half the weight of the load. You only have to use half the **effort force** that you would use with a fixed

pulley system. For example, to lift a 100 kg load, you would only have to use an effort force of 50 kg.



1. What is a load force?

*The force created, by the load (the thing being lifted), on the system by the pulley.*

---

---

2. What is an effort force?

*The force applied to the system to move the load.*

---

---

3. How much effort force would you use to lift a 300 kg weight with a fixed pulley system?

*300 kg*

---

4. How much effort force would you use to lift a 300 kg weight with a movable pulley system?

*150 kg*

---

5. In a movable pulley system, where does the other effort come from?

*The rope being pulled is also attached to the structure (the ceiling). Half of the load is carried by this end of the rope. This means that the structure (ceiling) does half the effort.*

---

---