Chapter 14, Lesson 2 Newton's Second and Third Laws of Motion

mass
acceleration/force
acceleration/mass
balanced forces
unbalanced forces
momentum
action
reaction
work
simple machines
lever
fulcrum
effort arm
resistance arm
pulley
wheel and axle
inclined plane
wedge
screw

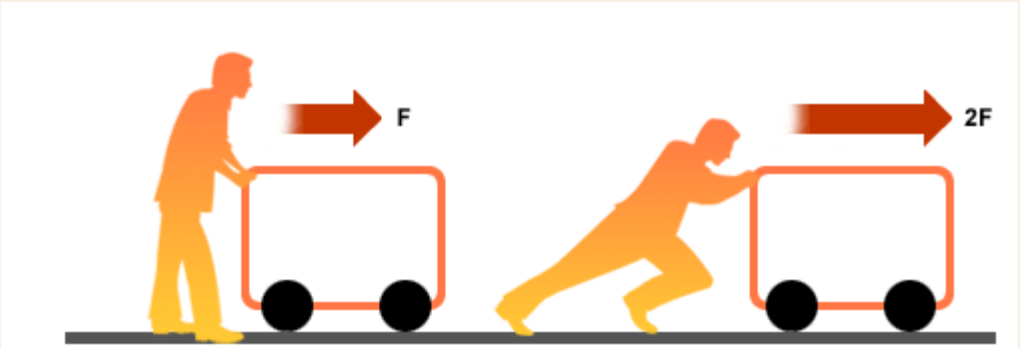
mass – A measure of the amount of matter in an object. The mass of an object is related to the force required to accelerate it.

acceleration/force – the more force you apply, the greater the acceleration

Question

Look at the diagrams They show an unbalanced force F acting on two loaded trolleys.

a How would doubling the size of the unbalanced force F affect the acceleration of the trolley?



Click on the picture for some great questions about acceleration and force!

acceleration/mass – the greater the mass, the more force necessary to get an object to accelerate

NEWTON'S LAWS

FIRST LAW OF MOTION
SECOND LAW OF MOTION
THIRD LAW OF MOTION

Newton's Second Law of Motion tells us that

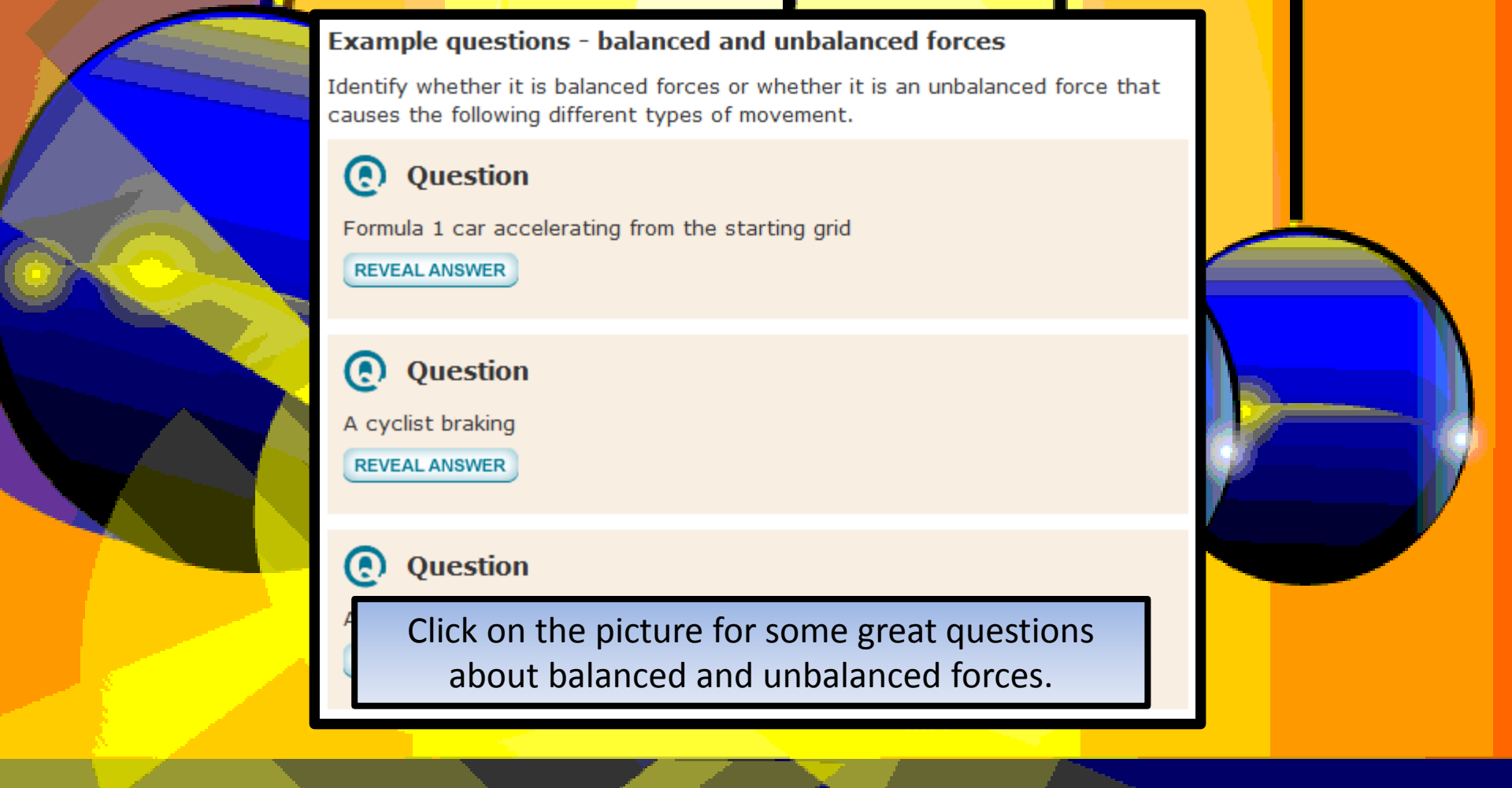
Force equals mass times acceleration.

You can tell how hard a moving object is going to hit by knowing how big it is (how much mass it has) and how fast it is speeding up (its acce

the pitcher throws the ball to

Click on the picture!

balanced forces – when all the forces on an object cancel each other out, you have balanced forces – no acceleration, no momentum



Click on the picture for some great questions about balanced and unbalanced forces.

unbalanced forces – when forces don't cancel each other out, there is movement. This is a result of unbalanced forces.

Unbalanced Forces

The seesaw is unbalanced because the forces are not equal.

Click on the picture for some information about unbalanced forces.

Some Types of Force

Gravity | Friction | Air Resistance

Turning | Moments | Pressure

Upthrust | Balanced Forces | Unbalanced Forces

Click on the picture for some information about kinds of forces.

momentum – momentum measures how difficult it will be to stop an object

Momentum

Surf Kidipede from A to Z

A-B-C-D-E-F-G-H-I-J-K-L-M-N-O
P-Q-R-S-T-U-V-W-X-Y-Z

aachen

abacus

Momentum describes how

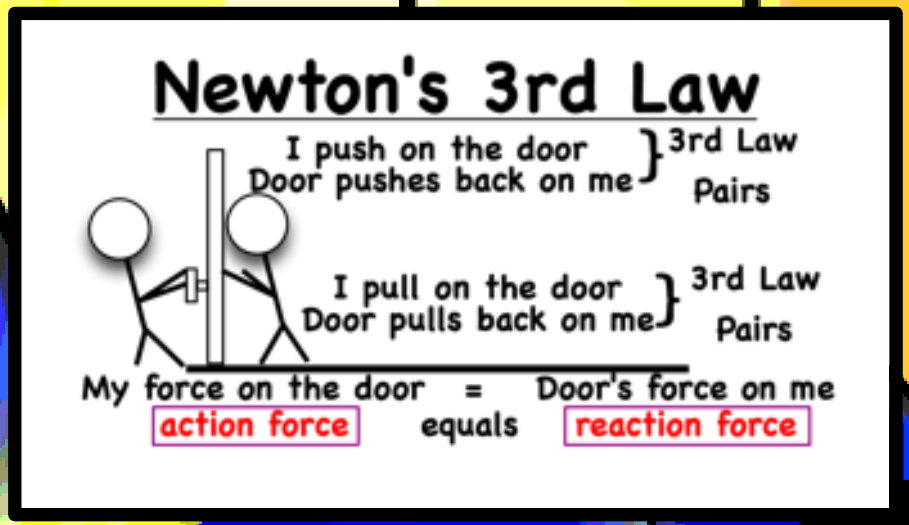
Because of momentum, a planet or a star that is moving in space will generally keep moving in the same direction unless something happens to push it another way. The Sun keeps going around the Milky Way, and the Earth keeps going around the Sun. But on Earth, friction with the ground or the air will gradually push an object and make it stop.

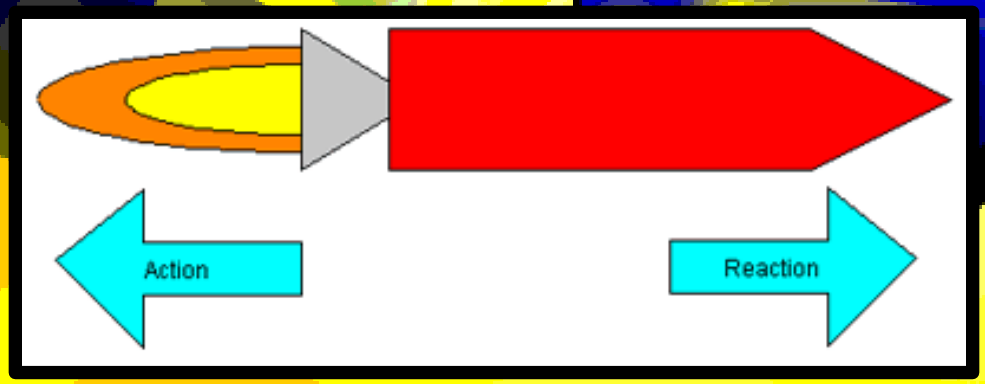
One way to think of momentum is that momentum measures how hard it will be to stop the object. An object has more momentum if it is bigger, or if it is going faster - momentum is equal to mass times velocity (speed). So if a car (something with a lot of mass) is rolling down the street towards you, it's hard to stop it even if it is going pretty slowly. Or, if someone hits a baseball at you, it's hard to stop it even though it is pretty small, because it is going so fast. But a car going fast will be even harder to stop - then the car will have both a big mass and a fast speed. That's why it's dangerous to walk on train tracks - a train is big and goes fast, and

the train as soon as he

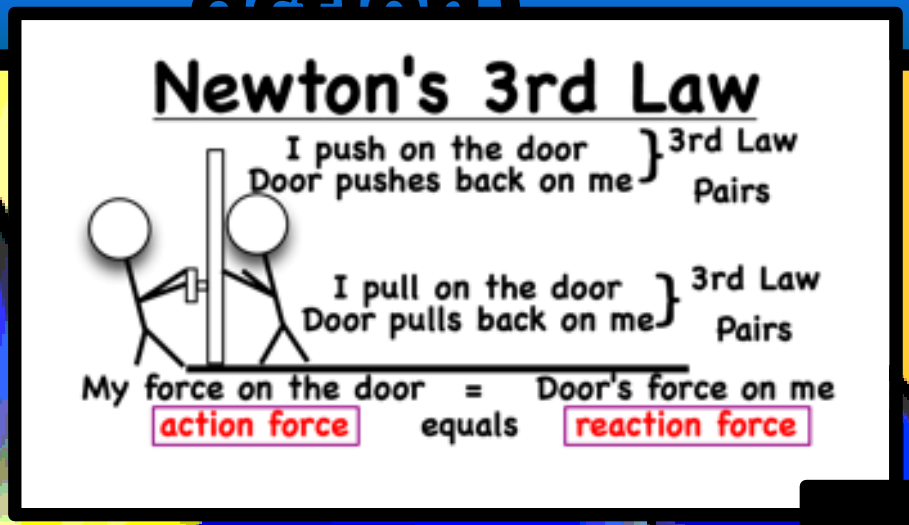
Click on the picture for some information about momentum.

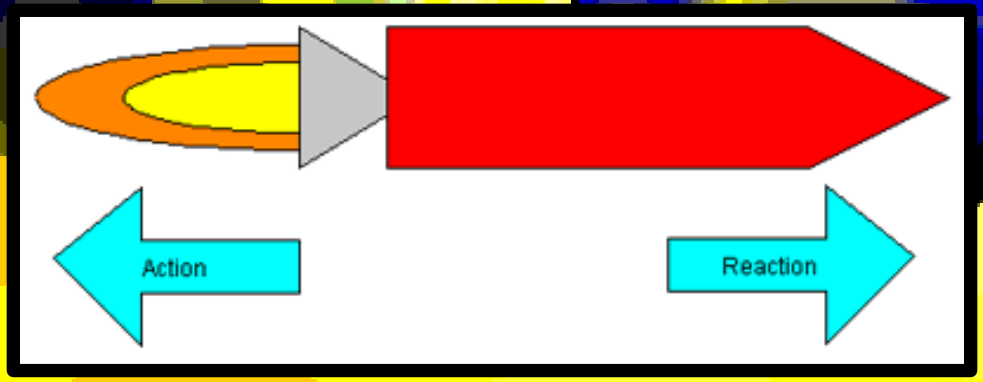
action – when one object applies a force to another object

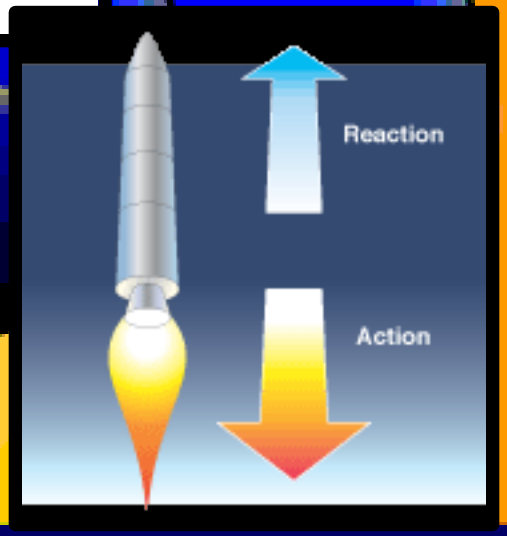




reaction – the force the second thing returns (the result of an action)

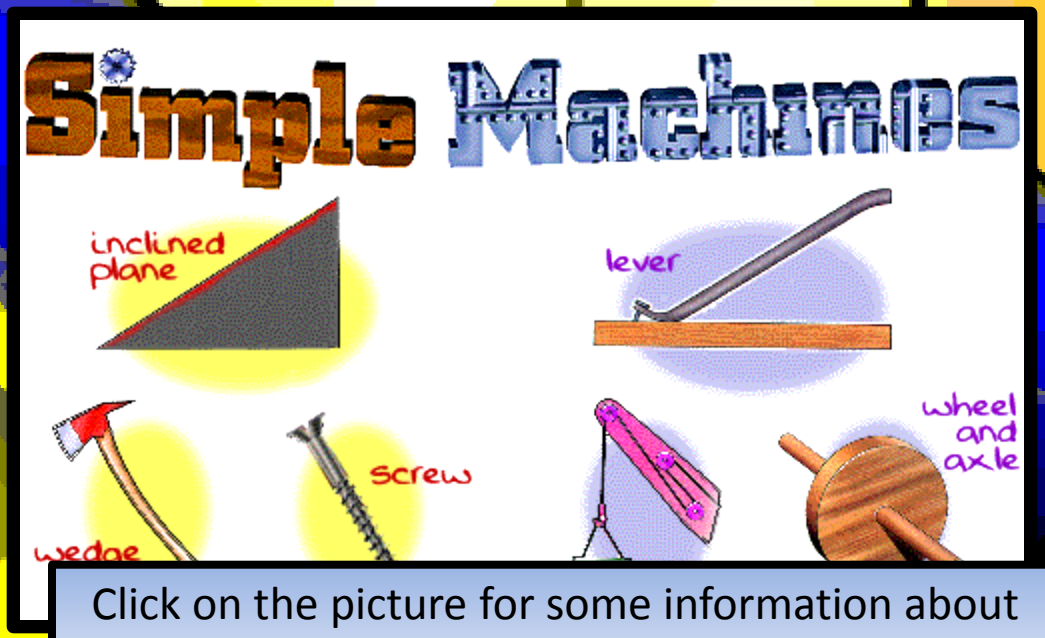






work – using force to move an object through a distance

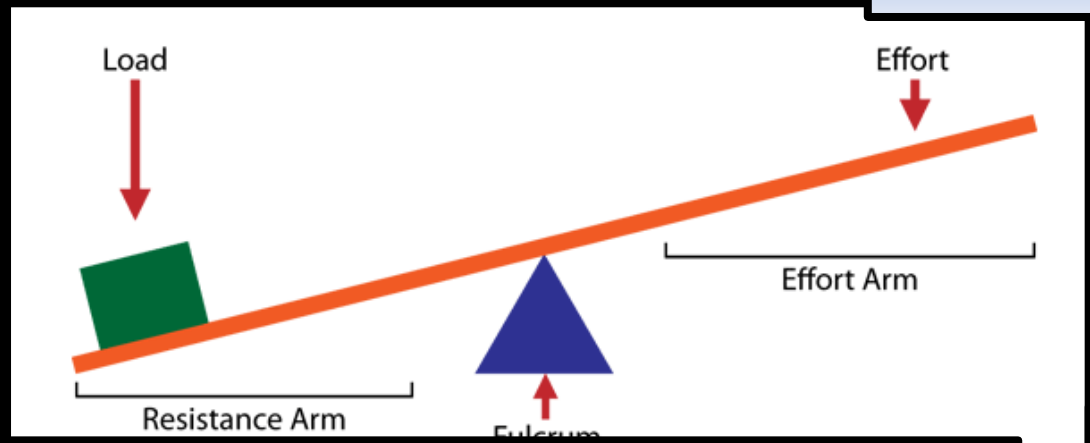
simple machines – devices with few moving parts that make work easier to do.



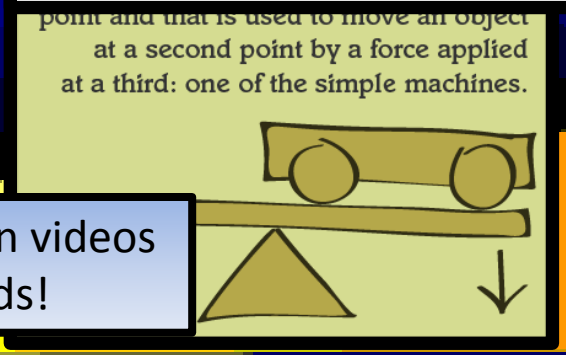
Click on the picture for some information about simple machines.

lever – a rigid (solid, hard) bar that rests on a pivot point

Click on the picture for a video on levers.

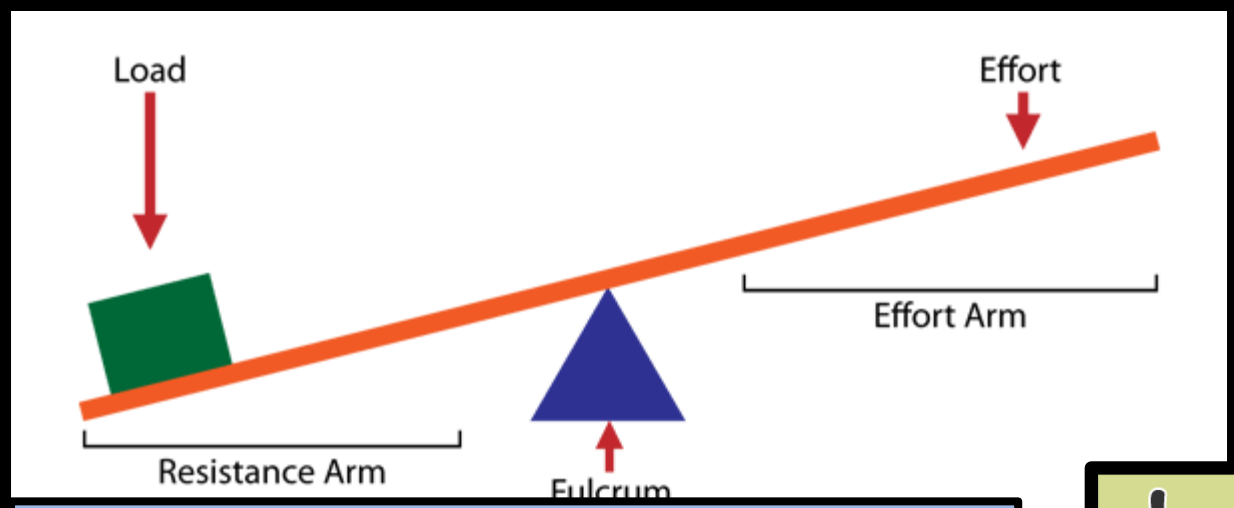


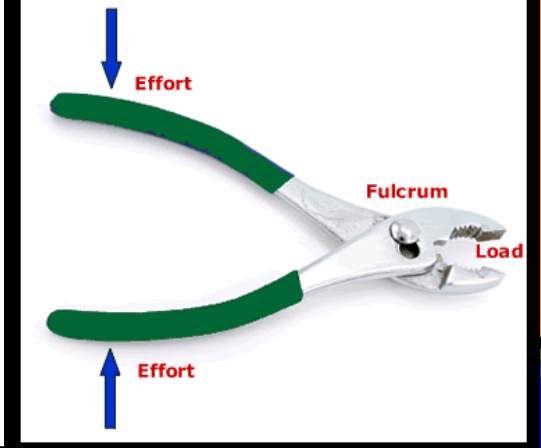
Click on the picture for directions on how to build a lever.



Click on the picture for some contraption videos using simple machines. Built by kids!

fulcrum – a pivot point that a lever rests on. The (triangle in the diagrams below.)

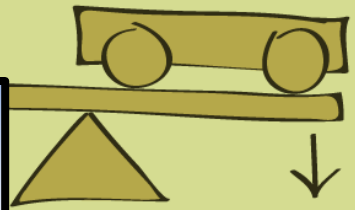




Click on the picture for directions on how to build a lever.

lever [lee-ver]

noun. a rigid bar that pivots about one point and that is used to move an object at a second point by a force applied at a third: one of the simple machines.



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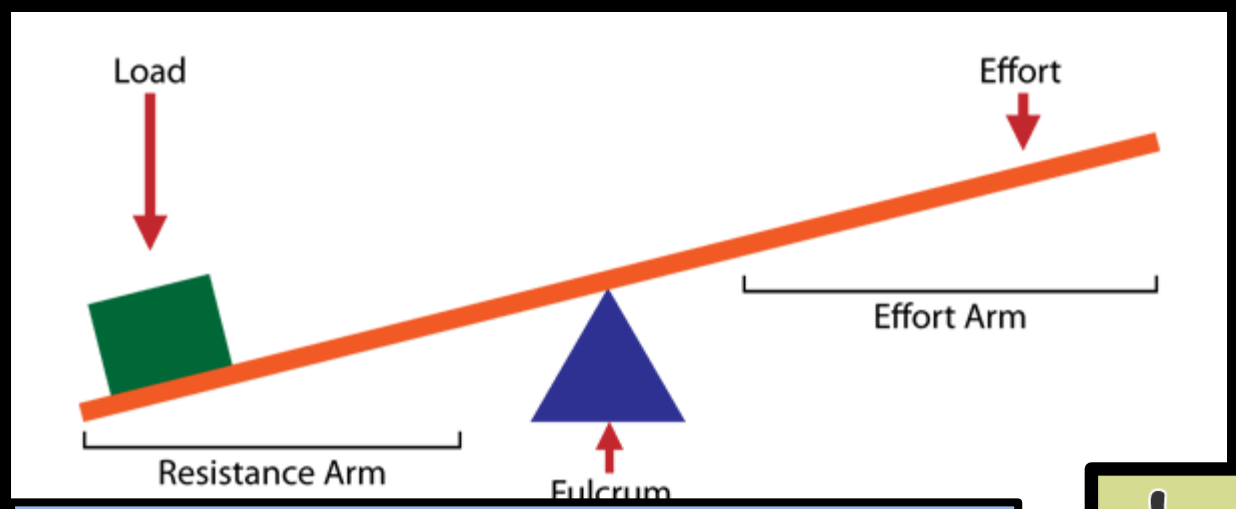
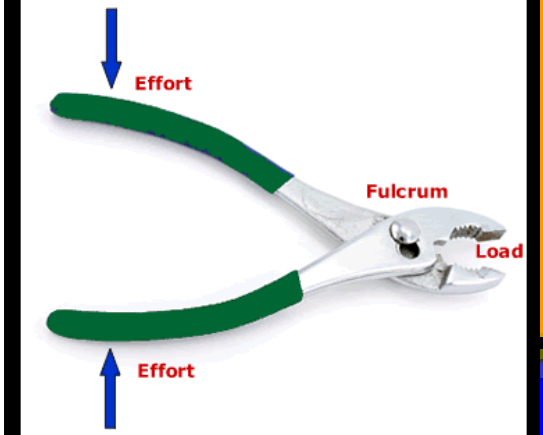
effort arm – the part of the lever that you apply force to (input force).





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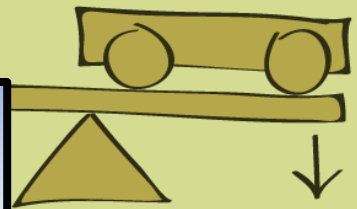
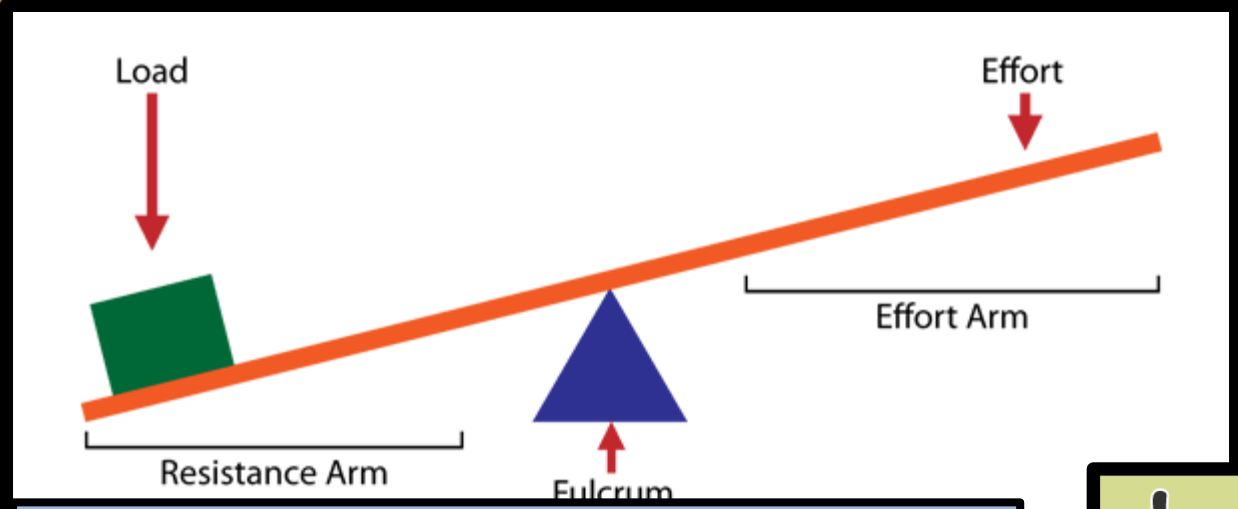
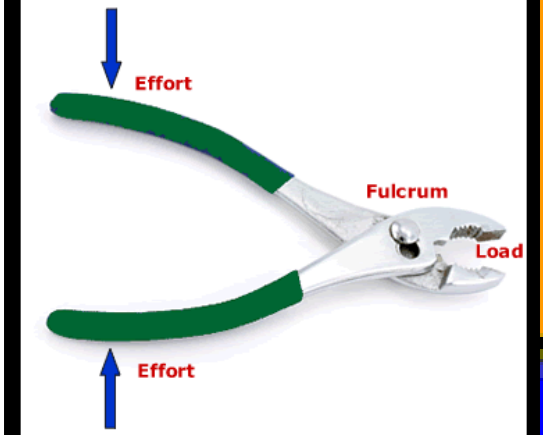


Click on the picture for some contraption videos using simple machines. Built by kids!

resistance arm – the part of the lever that lifts the load (output force.)





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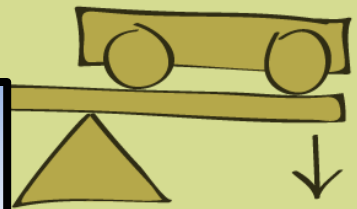

Click on the picture for some contraption videos using simple machines. Built by kids!

inclined plane – a ramp/slope

Click on the picture below watch a video incline planes.

The Inclined Plane

pulley – a wheel with a grove in the rim. A rope fits in the groove and helps lift the load.

Click on the picture below watch a video on pulleys.

wheel and axle – a wheel is a large diameter circle attached to a small diameter axle. A small amount of input force on the wheel creates a large amount of output on the axle.

Click on the picture to check out a video on screws and wheels.

screw – an inclined plane wrapped in a spiral around a cylinder or cone.

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screw – an inclined plane wrapped in a spiral around a cylinder or cone.

Click on the picture to check out a video on screws and wheels.

wedge – an inclined plane wrapped in a spiral around a cylinder or cone.

Simple Machines, part 1/2

View :
Part 1
Part 2

Simple Machines, part 2/2

View :
Part 1
Part 2

Click on the picture to check out a Bill Nye Videos on simple machines.