



Science

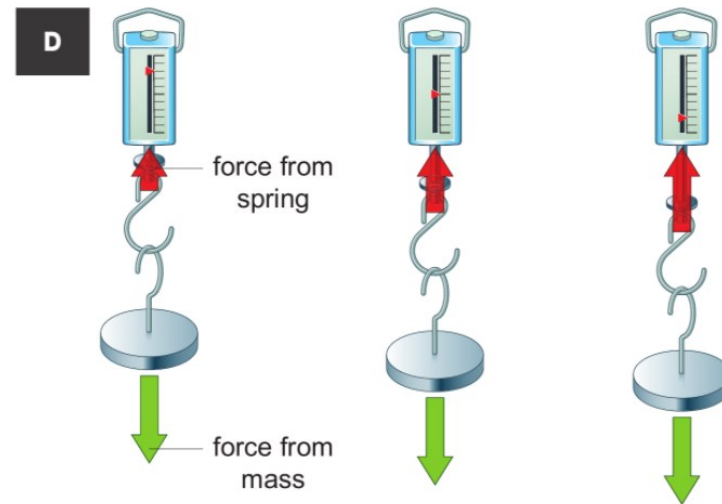
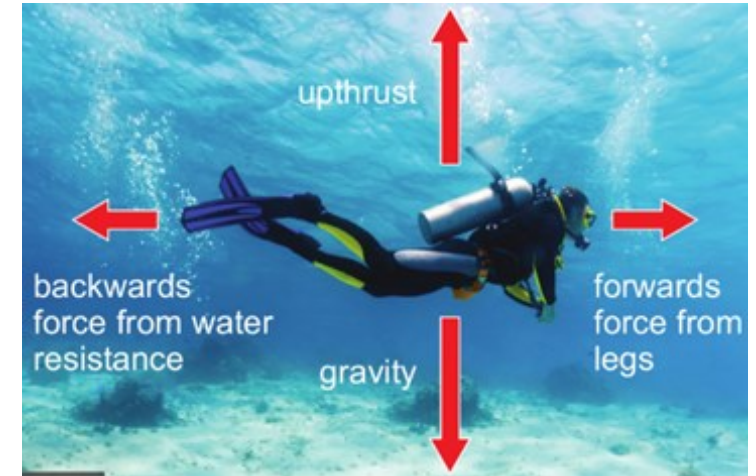
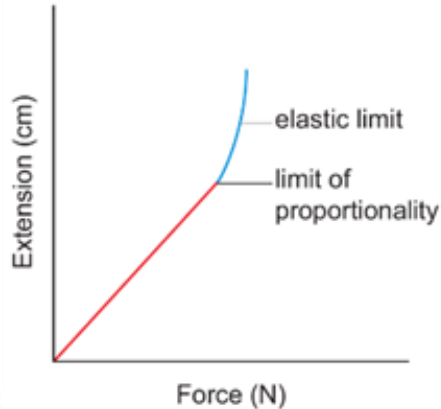
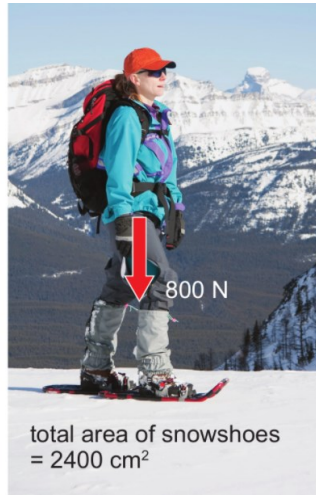
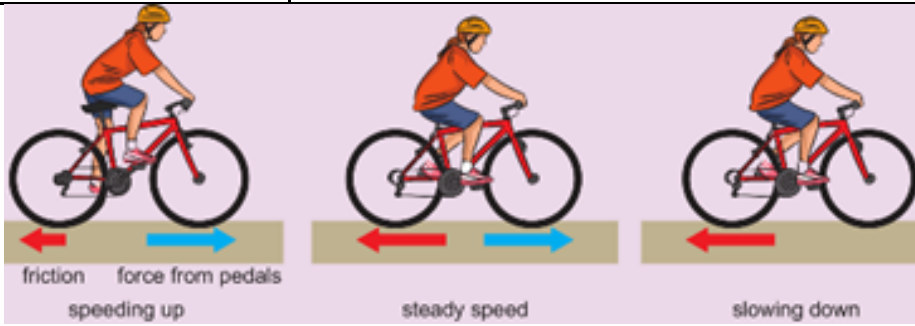
7K Forces

DEMAND EVIDENCE

ASK QUESTIONS

THINK CRITICALLY

- Lesson
- 1. Different Forces
- 2. Springs
- 3. Friction
- 4. Pressure
- 5. Balanced and Unbalanced Forces



When you first hang something on a force meter, the forces are not balanced, so the spring begins to stretch.

As the spring stretches, it produces a bigger force.

Eventually the forces are balanced. The force meter is showing the weight of the object.



1. Different Forces	
Force	A push or a pull.
Contact Forces	The thing providing the force needs to touch an object to affect it. <i>Friction, air resistance, water resistance, upthrust</i>
Upthrust	The force that makes things float.
Air Resistance	A force acting on objects moving through the air.
Water Resistance	A force acting on objects moving through water.
Non-Contact Forces	Forces that can affect an object from a distance. <i>Gravity, static electricity, magnetism</i>
Gravity	A force that pulls objects downwards.
Static Electricity	A force that attracts things.
Magnetism	A force that attracts objects made of iron, nickel or cobalt.
Newton (N)	The units for measuring forces.
Weight	The force of gravity pulling on something- measured in Newtons (N)
Mass	The amount of matter that makes up something- measured in kilograms (kg)

Representing Forces	We draw arrows on force diagrams to show the direction of a force; a bigger arrow shows a bigger force.
2. Springs	
Stretched	Made longer
Compressed	Made shorter
Spring	Made from coils of wire,
Extension	The difference between the original length and the stretched length.
Elastic	An object that returns to its original length when the force is removed.
Investigating Extension	Hang a spring from a clamp and measure its length. Add increasing numbers of masses and measure the extension each time.
Hooke's Law	Extension is proportional to the force applied.
Proportional	A relationship between two variables where if one doubles, the other will double.
Limit of Proportionality	The point at which the extension and force are no longer proportional.
Elastic Limit	The point at which the spring cannot return to its original length.
Force Meter	Springs are used inside to measure the force.

3. Friction	
Friction	Force between two touching objects.
Increasing Friction	Using certain materials like rubber (used on racing cars to stop them from sliding off the road).
Reducing Friction	Make surfaces smooth or by using lubricants such as oil or grease.
Lubrication	Adding a lubricant
Friction Damage	Friction can wear things away like brake pads on a bike. Friction between parts of a car can cause it to overheat and stop working
4. Pressure	
Pressure	The amount of force pushing on a certain area.
The Size of Pressure	Depends upon the size of the force and the size of the area it is pushing on.
Pressure in Sport	Snowshoes spread out weight, reduce pressure and stop people sinking into soft snow.
Pressure in Everyday Life	It is easier to cut something with a sharp knife because it has a smaller edge so the force is concentrated over a smaller area.
Pressure formula	
Pascal (Pa)	The units for measuring pressure. $1\text{Pa} = 1\text{N/m}^2$

5. Balanced and Unbalanced Forces	
Balanced Forces	Two forces of the same size acting upon an object in opposite directions. Balanced forces will not change the speed of a moving object.
Unbalanced Forces	When one of the forces acting upon an object is larger than the other. If acting on a moving object unbalanced forces will change its speed.
Stationary	Not moving- stationary objects have balanced forces acting on them.

