

**Physics Unit: Magnet and Forces**

Misconceptions

What some pupils think.....	Notes to aid misconception.....
All forces are contact forces	There are contact and non- contact forces. Gravity non-contact.
All metals are attracted to a magnet.	Only iron, nickel, cobalt, and their alloys are attracted to a magnet.
All silver coloured items are attracted to a magnet.	Only iron, nickel, cobalt, and their alloys are attracted to a magnet.
All magnets are made of iron.	Iron is a soft magnetic material - would not work!
Larger magnets are stronger than smaller magnets	When comparing two magnets made from the same material and shaped the same way then the larger magnet will be stronger than the smaller one. However, if you are comparing different types of magnets (made from different materials then the magnet's properties don't vary consistently with size
The magnetic and geographic poles of the earth are located at the same place.	Earth's geographic poles and magnetic poles are not located in the same place – in fact they are hundreds of miles apart
The magnetic pole of the earth in the northern hemisphere is a north pole, and the pole in southern hemisphere is a south pole.	The magnetic pole near the earth's geographic north pole is actually the south magnetic pole. When it comes to magnets, opposite attract.... Therefore, the magnetic field lines of the earth run from the southern geographic hemisphere towards the northern geographic hemisphere.
In a magnet, the magnetic field lines exist only outside the magnet.	Magnetic field lines are continuous loops. Outside a magnet the field is directed from the north pole to the south pole. Inside a magnet the field runs from south to north
Only magnets produce magnetic fields.	No. Magnets, produce magnetic fields but current-carrying wires also create magnetic fields
The positive pole of this magnet attracts the negative pole of the other one	Both magnetic and electric forces can attract and repel, but the mechanisms to account for these interactions are different; in one case involving magnetic poles and in other cases involving electrically charged objects.
The heavier the object the faster it falls, because it has more gravity acting on it	Mass does not affect the speed of falling objects, assuming there is only gravity acting on it.
Forces always act in pairs which are equal and opposite	According to Newton's third law of motion, whenever two objects interact, they exert equal and opposite forces on each other. This is often worded as 'every action has an equal and opposite reaction'. However, it is important to remember that the two forces: <ul style="list-style-type: none"> <li>• act on two different objects</li> <li>• are of the same type (eg both contact forces)</li> </ul>
Smooth surfaces have no friction	When two surfaces slide against each other, a force (friction)makes them stick very slightly together. Smooth surfaces, like ice and glass, are easy to slide over. They create very little friction but do have friction. Rough surfaces have more friction than smooth surfaces.
Objects always travel better on smooth surfaces	The amount of friction depends on the materials from which the two surfaces are made. The rougher the surface, the more friction is produced

A moving object has a force which is pushing it forwards and it stops when the pushing force wears out	Friction is the force that eventually brings your object to a stop unless you keep pushing on it. ... Friction always will slow a moving object
A non-moving object has no forces acting on it	False, Newtons third law of motion states that all objects in a surface of the earth exert a force onto each other and the force is the same but in an opposite direction
Heavy objects sink and light objects float	Objects are made up of very tiny molecules. Molecules can be packed in close together like in a rock or more spread out like in bubble wrap. The positioning of molecules affects the density of an object. Objects with tightly packed molecules are more dense than those where the molecules are spread out. <b>Density</b> plays a part in why some things float and some sink. Objects that are more dense than water sink and those less dense float.
Friction only occurs when things move	Friction exists between all surfaces.
Gravity is magnetic force that attracts things to the Earth	The Earth's gravity and the Earth's magnetic field are independent of each other.
Air resistance is not a contact force	Air resistance is a contact force
Things near the Earth fall toward the Earth unless something holds them up.	The Earth pulls any object towards the centre of the Earth without touching it
A continuous force is needed for continuous motion	While this is true, if you are, for example, pushing a grocery cart in a supermarket, again this is only because there is friction involved. The force you apply to keep an object moving is only to counteract the frictional force. If you were to throw a rock on outer space, it would travel with a constant velocity forever, unless it hits something, of course
<b>An object is hard to push because it is heavy</b>	This is one of the most common misconceptions because it's something we see and feel everyday. While a heavy object is really hard to push, it is not because of its weight, but because of its <a href="#">inertia or mass</a> . Inertia is an objects resistance to change in motion. It is important to note that inertia is resistance to "change motion" rather than just motion itself.
If the force is balanced, then an object will not move.	When forces are unbalanced, this will result in an object accelerating in the direction of the unbalanced force. If both forces are balanced then the object would continue to move in the direction it was previously, with no acceleration or deceleration.
Mass and weight are the same thing	Mass is a measure of how much matter is in an object. Weight is the measure of the size of pull of gravity, it is a force acting on the matter itself. Weight is measured in Newtons, mass is measured in kilograms.