

**Physics Unit: Earth and Space****Misconceptions**

What some pupils think.....	Notes to aid misconception.....
It always snows in winter	The weather is variable in United Kingdom so it has been to snow in Spring (Late April)
It is always sunny in the summer	The sun is visible (when no clouds) all year round. In the Summer the energy from the sun is concentrated in a smaller area of the earth.
There are only flowers in spring and summer	There are flowering plants that are able to survive in the Autumn and winter
It rains most in the winter.	There is a variable amount of rainfall all year round. The weather is being impacted by climate change
It is winter because it is cold	It is cold because it is winter
Rocks are all hard in nature	Some rocks are soft e.g chalk
Rock-like, man-made substances such as concrete or brick are rocks	The scientific name for man-made rocks is anthropic rocks. Anthropic rocks are made, modified or moved by humans. Concrete is a mixture of water, aggregate (either sand, rock or gravel) and cement (a mixture of chalk and clay). Bricks are usually made of clay, soil, sand and lime or concrete materials. They can be air-dried or fire-hardened.
Materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural'	The shape has been carved/cut from the natural rock. These have not been modified by humans.
Certain found artefacts, like old bits of pottery or coins, are fossils	A fossil is any preserved remains, impression, or trace of any once-living thing from a past geological age. Pottery and coins are not living things and have never been alive
A fossil is an actual piece of the extinct animal or plant	Fossil is any preserved remains, impression, or trace of any once-living thing from a past geological age. It is a mould of what was in the soil and no part of the animal or plant remains.
Soil and compost are the same thing.	Soil is a mixture of organic matter, minerals, gases, liquids, and organisms that together support life. Compost is decayed organic material used as a fertiliser for growing plants.
The Earth is flat	The earth is not flat it is an oblate spheroid (a squashed ball)
The Sun is a planet	The sun is a star
The Sun rotates around the Earth	The sun does not move. The earth and other planets orbit the sun.
The Sun moves across the sky during the day	From Earth, the Sun looks like it moves across the sky in the daytime and appears to disappear at night. This path is known as the sun path, or the day arc and it is a consequence of the earth orbiting the sun and rotating about its axis. The sun does not move it is earth.
The Sun rises in the morning and sets in the evening	
The Moon appears only at night	The moon is always present. The degree to which the moon is visible during the day is closely linked to its phase. During full moon, the moon is opposite the sun in the sky. Therefore, the moon will be in the sky roughly while the sun is not. During other phases, the moon may be more visible during the day because it is closer to the sun in the sky.
Night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.	The sun does not move. Day and night are due to the Earth rotating on its axis, not its orbiting around the earth.
Isaac Newton invented gravity and objects floated before this invention.	Isaac Newton was the first person to describe and quantify gravity. Gravity still existed before this point, but it was not understood.
The moon rotates which is why we see the phases of the moon.	The moon does not rotate on an axis, its phases are caused by its revolution around Earth meaning that only certain parts can be seen during its cycle.

Pluto is a planet.	Pluto is now classed as an exoplanet due to its size and erratic orbit around the Sun.
The sun will never burn out.	The Sun is a nuclear fusion reaction (fusing hydrogen nuclei to make helium) when it runs out of hydrogen it will fuse larger atoms, this will release less energy and so it will cool down and eventually stop.
The universe is static, not expanding.	The Big Bang theory states that the universe is expanding which is explained by red and blue shift.
The universe contains only the planets in our solar system.	There are many galaxies and therefore theoretically many solar systems and planets.
Mass and weight are the same thing.	Mass is the amount of matter present in an object whereas weight measure of the size of the pull of (mass x gravitational field strength).
All rocks are the same.	Rocks have different properties depending on how they were formed; sedimentary, igneous and metamorphic.
Mountains are rapidly created.	Landforms occur over a very long period of time (millions of years in some cases).
The soil we see today has always existed.	This is in a constant cycle of erosion, transportation, nitrogen fixing.
Rocks must be heavy.	This depends on how the rock was formed and what it is made from, e.g. porous rocks like pumice are relatively light.
The Earth is molten, except for its crust.	The inner core is solid due to high pressure.
Gravity is selective; it acts differently or not at all on some matter.	It is constant.  It is a non-contact force so does not require a medium to act through
Gravity increases with height.	
Gravity can't exist without air.	
Gravity requires a medium through which to act.	
Continents do not move.	The Earth's crust is comprised of tectonic plates which shift due to currents in the mantle, the causes continents to shift.