EYFS to KS2 Physics Progression Model (Space)

This progression map is intended to supplement your scheme or the national curriculum. You can use it to emphasise the key learning you want at each key stage.

Teaching space is about awe and wonder and models. There is a lot of factual knowledge which isn't necessary for assessments or progress, but provides rich background knowledge. And there are models.

Physics is all about models and space has some good ones. Every school should have a Solar System model (an orrery) - even if it's made from cornflake packets. Globes, spot lamps and various sized balls are all useful. As are decent window blinds.

The other big idea comes from the history of astronomy: how scientific ideas change. From the Ancient Greeks to the Renaissance, the models scientists have used have changed as new evidence is found. Space provides an opportunity to tell these stories to your pupils.

	Observing and Discussing 'Space'	Using Models	Stories	Misconceptions	Thinking Questions
EYFS/ KS1	The Moon - things to notice include: • Sometimes you can see it during the day (especially early morning and late afternoon - you might see it on drop off or pick up). • Moon phases - it	Introduce the globe as a model of the Earth. You can stick model people on the northern and southern hemispheres to point out people don't fall off.	There is no problem using myths and folktales about space. Some SciFi is good too.	Why don't people fall off the world?	What don't people in Australia just fall off? (Answer - gravity pulls everything towards the centre of the world).

	isn't worth trying to explain this yet - just notice with them.				
KS2	A key confusion learners have later on is the difference between rotation and orbiting. It is worth getting your pupils to act it out. When you go down in a lift, you feel momentarily weightless. That doesn't mean there's no gravity in the lift, it just means that the lift and you are falling together. Talk about that feeling, and the feeling of weightlessness you have on a roller coaster. Orbiting in space gives you the same feeling.	**Model Solar System.** If you can do this on a field, you can get a better scale. **Model Earth / Moon / Sun** "Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky" - NC To model this in a convincing way, you want a globe and a smaller ball to represent the Moon. Find a strong light source - something with a beam is best. Mobile phone torches are rarely strong enough. If you can make the room dark - even better. **Moon Phases**: there is no requirement to understand or explain Moon phases.	Copernicus and the heliocentric model. Galileo and the use of evidence to prove Copernicus was correct.	**Misconception - There is no gravity on the Moon** - there is! It's less than on the Earth, but if there was no gravity, the astronauts would just fall off! **Misconception: There is no gravity in space** - watching astronauts float about convinces most people that there's no gravity in space. However, gravity is the force which causes the Earth to move in a curved orbit around the Sun and the Moon to orbit around the Earth (remember - if there is no force, an object will travel in a straight line). The reason astronauts float about in spacecraft is because the spacecraft, the astronauts and everything else in the spacecraft are all following exactly the same orbit - it makes them look like	How do we know there is gravity in space? (Answer: you can tell when gravity is acting on a planet, moon or spacecraft if its motion is changing - is it speeding up or slowing down, or is it moving in a curve?) Why don't spacecraft use their engines when they are travelling between planets? (Answer - there's no air resistance to slow them down, so they turn their engines off to save fuel). **Advanced**: Why do astronauts seem weightless if there is still gravity acting on them? (Answer, they are just moving in exactly the same way as their spacecraft - it's like in the descending lift - you feel weightless, but gravity is making you and the lift / spacecraft accelerate

				there's not gravity acting on them. **Misconception: the speed an object falls depends on its weight.** This is incorrect, though it looks to be true. If it weren't for air resistance, it would be obvious that all objects fall at the same rate. However, air resistance makes it difficult to see this effect. The best way to demonstrate it is to drop two dense but different sized objects - e.g. a 1p piece and a 100g mass. They will land at the same time. Videoing it can be an effective way to show both fall at the same rate. **Misconception: Spacecraft need engines to keep moving through space.** They don't. This is a good link to the motion unit - objects continue in a straight line at a steady speed unless a force acts on them. There is no air resistance in space, so	together.

				most spacecraft travel without their engines on. They only need an engine to change speed (speed up or slow down) or change direction.	