

Gravity: Learning pathway

	Activate	Acquire	Apply	Assess	Analyse
Weight	<ul style="list-style-type: none"> <input type="checkbox"/> Understand forces 	<ul style="list-style-type: none"> <input type="checkbox"/> Compare weights on different planets to test a relationship between weight and mass 	<ul style="list-style-type: none"> <input type="checkbox"/> Solve word problems using the formula $\text{weight} = \text{mass} \times \text{gravitational field strength}$ 	<ul style="list-style-type: none"> <input type="checkbox"/> Acquire <input type="checkbox"/> Apply 	<ul style="list-style-type: none"> <input type="checkbox"/> Draw conclusions about activities on different planets, from gravity data
Gravitational force	<ul style="list-style-type: none"> <input type="checkbox"/> Forces 	<ul style="list-style-type: none"> <input type="checkbox"/> Draw conclusions from data about the relationship between gravity and distance between objects. 	<ul style="list-style-type: none"> <input type="checkbox"/> Explain effects of gravity on different planets 	<ul style="list-style-type: none"> <input type="checkbox"/> Acquire <input type="checkbox"/> Apply 	<ul style="list-style-type: none"> <input type="checkbox"/> Compare and contrast gravity with other forces
Solar system	<ul style="list-style-type: none"> <input type="checkbox"/> Earth movement 	<ul style="list-style-type: none"> <input type="checkbox"/> Use a model to explain the apparent motion of the sun and moon, and day and night 	<ul style="list-style-type: none"> <input type="checkbox"/> Explain why places on Earth experience different daylight or amounts of sunlight, from diagrams 	<ul style="list-style-type: none"> <input type="checkbox"/> Acquire <input type="checkbox"/> Apply 	<ul style="list-style-type: none"> <input type="checkbox"/> Interpret patterns in the properties of planets, from data



Act

Explore how scientists discover properties of exoplanets, by simulating the transit method



Gravity: Big ideas

Forces

What expert understanding do we want after 5 years?

Fields produce forces

Big idea

Gravitational, electric, and magnetic forces act at a distance. These can be explained by force fields that extend through space and can move other objects. Objects with mass cause attractive gravitational fields
Electric and magnetic forces are different aspects of one interaction. Magnets cause magnetic fields and changing magnetic fields cause electric fields. Many devices use this interaction to generate motion and electricity.

How does the unit develop this?

Gravitational force

Key Concept

Every object exerts a gravitational force. Gravity holds planets and moons in orbit around larger bodies but depends on distance and mass



Facts

- Gravity decreases with distance

Weight

Key Concept

Weight is the force an object exerts on its support and which causes it to fall. It is mass x gravitational field strength



Sub-concepts

Gravitational field strength

Facts

- Weight = mass x g (field strength)
- Weight is in N, mass in kg

Solar system

Key Concept

The solar system is modelled as planets rotating on tilted axes, orbiting the Sun. It explains day and year length, seasons and how planets and moons appear



Sub-concepts

Planet, orbit, satellite

Facts

- Axis, day and year length



Forces

Gravity: Scientific thinking, maths & literacy

How are investigation skills integrated with the concepts?

Gravitational force

Solar system

Draw conclusions

Deduce patterns and relationships in data and observations

How are maths skills integrated with the concepts?

Weight

Algebra

Substitute values into equations, with units and symbols

Apparatus and techniques

AT.1.P



Gravity: Curriculum links

Forces

Which parts of KS3 are covered?

AQA KS3 syllabus: 3.1.1 Gravity, 3.7.2 Universe

Which parts of GCSE are covered?

(AQA Trilogy combined science)

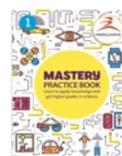
Gravitational force	✓ 6.5.1.3 Gravity	
Weight		
Draw conclusions	✓ WS 3.5 Draw conclusions from data	
Develop models	✓ WS 1.2 Use a variety of models	
Maths	✓ 3a Substitute numerical values into algebraic equations using appropriate units for physical quantities	

What resources are there to teach this unit?

Visit shop.masteryscience.com



[CPD](#)



[Teaching](#)



[Assessment](#)



Astro physicist

Act Use a lamp as the star, a ball on a stick as the exoplanet, and a webcam or light probe to measure light intensity. Students investigate the effect of size and speed of the exoplanet. Then, given light intensity plots for 'new' exoplanets, they make deductions.