

Lesson	Developing T to 1	Secure 2 to 3	Extending 3 to 4
P1 1.1 Introduction to forces	Identify some forces acting on objects in everyday situations and identify an interaction pair.	Explain what forces do and describe what is meant by an interaction pair.	Explain the difference between contact and non-contact forces which explain pairs of forces are acting on an object.
P1 1.2 Squashing and stretching	State an example of a force deforming an object and recognise a support force. Use Hooke's Law to identify proportional stretching.	Describe how forces deform objects. Explain how solid surfaces provide a support forces and use Hooke's Law to predict the extension of a spring.	Explain how forces deform objects in a range of situations and explain how solid surfaces provide a support force, using scientific terminology and bonding. Apply Hooke's Law to make quantitative predictions with unfamiliar materials.
P1 1.3 Drag forces and friction	Identify examples of drag forces and friction and describe how drag forces and friction arise.	Describe the effect of drag forces and friction and why drag forces and friction arise.	Explain the effect of drag forces and friction in terms of forces and why drag forces and friction slow things down in terms of forces.
P1 1.4 Forces at a distance	Identify gravity as a force that acts at a distance and state that gravity changes with distance.	Describe the effect of a field and the effect of gravitational forces on Earth and in space.	Apply the effects of forces at a distance to different fields and explain how the effect of gravity changes moving away from Earth.
P1 1.5 Balanced and unbalanced	Identify familiar situations of balanced and unbalanced forces. Define equilibrium and when the speed or direction of motion of an object changes.	Describe the difference between balanced and unbalanced forces and situations that are in equilibrium. Explain why the speed or direction of motion of objects can change.	Explain the difference between balances and unbalances forces. Describe a range of situations that are in equilibrium and explain why the speed or direction of motion of objects can change using force arrows.
P1 2.1 Waves	State some features of waves and what happens when a wave hits a barrier.	Describe the different types of waves and their features and what happens when water waves hit a barrier. Describe what happens when waves superpose.	Compare the properties of waves and their features and explain how reflection of a wave occurs. Explain one effect of superposition of waves.
P1 2.2 Sound and energy transfer	Name some sources of sound and some materials that sound can travel through. State that sound travels more slowly than light.	Describe how sound is produced and travels. Explain why the speed of sound is different in different media and contrast the speed of sound and the speed of light.	Explain what is meant by supersonic travel. Describe sound as the transfer of energy through vibrations and explain why sound cannot travel through a vacuum. Compare the time taken for sound and light to travel the same distance.
P1 2.3 Loudness and pitch	State the link between loudness and amplitude and that frequency is measured in hertz. State the range of human hearing.	Describe the link between loudness and amplitude and the link between pitch and frequency. State the range of human hearing and describe how it differs from the range of hearing in animals.	Compare and contrast waves of different loudness using a diagram. Compare and contrast waves of different frequency using a diagram. Explain how animals hear the same sounds differently.
P1 2.4 Detecting sound	Name some parts of the ear. State some ways that hearing can be damaged and that a microphone detects sound waves.	Describe how the ear works and how your hearing can be damaged. Describe how a microphone detects sound.	Explain how parts of the ear transfer vibrations and how your hearing can be damaged. Compare and contrast the ear and the microphone.

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P1 2.5 Echoes and ultrasound	State simply what ultrasound is and some uses of ultrasound.	Describe what ultrasound is and some uses of ultrasound.	Explain how ultrasound can be analysed and some uses of ultrasound.
P2 3.1 Light	Describe some ways that light interacts with materials. State that light travels very fast.	Describe what happens when light interacts with materials. State the speed of light.	Predict how light will interact with different materials. Calculate the distance travelled by light in a light-year.
P2 3.2 Reflection	Describe the features of a mirror image. Identify examples of specular reflection and diffuse scattering.	Explain how images are formed in a plane mirror and the difference between specular reflection and diffuse scattering.	Draw a ray diagram showing how an image is formed in a plane mirror. Apply the concept of specular reflection and diffuse scattering to models and other examples.
P2 3.3 Refraction	Describe what happens when light is refracted and the features of the image formed by a lens.	Describe and explain what happens when light is refracted. Describe what happens when light travels through a lens.	Predict the path of light using a model of light refraction. Explain what happens when light travels through a lens.
P2 3.4 The eye and the camera	Name parts of the eye and the camera.	Describe how the eye works and a simple camera forms an image.	Explain how the eye forms an image and compare a simple camera with the eye.
P2 3.5 Colour	State what happens to light when it passes through a prism and the primary and secondary colours of light. State the effect of coloured filters on light.	Explain what happens when light passes through a prism. Describe how primary colours add to make secondary colours. Explain how filters and coloured materials subtract light.	Explain why a prism forms a spectrum and the formation of secondary colours. Predict how coloured objects will appear given different coloured lights and filters.
P2 4.1 The night sky	Name some objects seen in the night sky. Place some objects seen in the night sky in size order.	Describe the objects you can see in the night sky and the structure of the Universe.	Use the speed of light to describe distances between astronomical objects. Describe the structure of the Universe in detail, in order of size and of distance away from the Earth.
P2 4.2 The Solar System	Name some objects in the Solar System and the planets in the Solar System.	Describe how objects in the Solar System are arranged and some similarities and differences between the planets of the Solar System.	Explain how the properties and features of planets are linked to their place in the Solar System. Compare features of different objects in the Solar System.
P2 4.3 The Earth	Describe differences between season and the motion of the Sun, stars, and Moon across the sky.	Explain why seasonal changes happen and the motion of the Sun, stars, and Moon across the sky.	Predict the effect of the Earth's tilt on temperature and day-length how seasons would be different if there was no tilt.
P2 4.4 The Moon	Name some phases of the Moon. Explain simply why we see the Moon from Earth. Describe what a total eclipse is.	Describe the phases of the Moon. Explain why we see the phases of the Moon and why total eclipses happen.	Predict phases of the Moon at a given time. Explain how total eclipses are linked to phases of the Moon and why it is possible to see an eclipse on some of the planets in the Solar System but not others.