













## SP14 Particle Model




## SP14a Particles and density

Step	Learning outcome	Had a look	Nearly there	Nailed it!
 6 <sup>th</sup>	Describe the arrangements of particles in solids, liquids and gases.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 7 <sup>th</sup>	Use the particle model to explain the different properties of solids, liquids and gases.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 5 <sup>th</sup>	Recall the formula relating density, mass and volume.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 7 <sup>th</sup>	Use the formula relating density, mass and volume.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 7 <sup>th</sup>	Use the particle model to explain why solids, liquids and gases have different densities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 4 <sup>th</sup>	Describe what happens to the mass of a substance when it changes state.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>






## SP14b Energy and changes of state

Step	Learning outcome	Had a look	Nearly there	Nailed it!
 6 <sup>th</sup>	Explain how heating affects the particles in a substance or object, including changes of state.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Describe how the temperature of an object changes with time while being heated or cooled to make it change state.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Define the term specific heat capacity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Define the term specific latent heat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 8 <sup>th</sup>	Explain the difference between specific heat capacity and specific latent heat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Explain ways of reducing unwanted energy transfer through thermal insulation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>






## SP14c Energy calculations

Step	Learning outcome	Had a look	Nearly there	Nailed it!
 8 <sup>th</sup>	Use the formula relating change in thermal energy, mass, temperature change and specific heat capacity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 8 <sup>th</sup>	Use the formula relating thermal energy, mass and specific latent heat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Recall that the value of specific latent heat for a substance is different for melting/solidifying and for evaporating/condensing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## SP14d Gas temperature and pressure






Step	Learning outcome	Had a look	Nearly there	Nailed it!
 6 <sup>th</sup>	Explain how the movement of particles causes gas pressure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Explain how changing the temperature of a gas affects the speed of its particles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Explain how temperature affects the pressure of a fixed mass of gas at constant volume.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Explain the significance of absolute zero.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Convert temperatures between the Kelvin and Celsius temperature scales.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## SP14e Gas pressure and volume





Step	Learning outcome	Had a look	Nearly there	Nailed it!
 6 <sup>th</sup>	Explain how gases can be compressed or expanded by pressure changes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 6 <sup>th</sup>	Explain how the pressure of a gas produces a force at right angles to any surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 7 <sup>th</sup>	Explain why changing the volume of a gas changes the pressure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 7 <sup>th</sup>	Use the formula relating pressure and volume changes in a gas of fixed mass at constant temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 7 <sup>th</sup>	<b>H</b> Explain why doing work on a gas can increase its temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## SP15 Forces and Matter







## SP15a Bending and stretching

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Explain that more than one force is needed to distort an object.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Describe the difference between elastic and inelastic distortion.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Describe the relationship between force and extension for a spring.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Describe the relationship between force and extension for a rubber band.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Compare the force–extension relationship for different objects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>













## SP15b Extension and energy transfers

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Recall the equation that links force, extension and the spring constant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Use the formula relating force, extension and spring constant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Recall that work has to be done to stretch a spring.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Use the formula relating the energy transferred to the extension of a spring.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## SP15c Pressure in fluids

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Use a model of the Earth's atmosphere to explain why pressure varies with height.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Describe the pressure in a fluid as being due to the fluid and atmospheric pressure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Explain how pressure is related to area and a force normal to the surface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Recall the formula relating force, pressure and area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Use the formula relating force, pressure and area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Describe how pressure in fluids increases with depth and density.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## SP15d Pressure and upthrust

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	 Explain why the pressure in a liquid depends on density and depth.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	 Use the equation relating pressure in a fluid to height, density and gravitational field strength.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	 Explain how upthrust occurs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	 Relate the upthrust to the floating or sinking of objects immersed or partially immersed in fluids.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	 Recall that the upthrust is equal to the weight of fluid displaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	 Explain the factors that determine whether or not an object will float or sink.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>