

Planning Examples

Materials Y1–2; P2–3

Pre-requisite understanding	Learning objective / skills to develop	Activities that help children explore this objective	What will children do/say to demonstrate their learning?	Applying learning and understanding
Explore toys, everyday objects, name the materials they are made from. Fuzzy Friend Bonkers Bubbles Rocky Landscapes Sort and group objects made of different materials thinking about physical properties. Mystery bags	<i>Choose appropriate materials for a purpose according to the properties explored and observed</i> <i>Observe closely and compare</i> <i>Identify and classify / sort and group</i>	Children need opportunities to look at different objects and think about the materials they are made from. What are the materials used to make these Unusual houses and Bridges Why have they been chosen? Look at different types of footwear and match the material and design to the function. Functional footwear will get you started.	Children name and talk about the different materials and begin to relate the properties of the material to the purpose – wellington boots made of waterproof but strong material; a tent being made of fabric that is light and easy to move; concrete and steel are very strong for bridge building.	Give children the chance to try out what they have learned by designing and making things to solve problems. Encourage them to explain why they have chosen materials in their design and to test them too. Unusual Plant Pots Bird Feeders House Hunting Hogs
	<i>Carry out simple tests</i>	Explore materials to find out which are waterproof, which let light pass through them etc.	Children need opportunities to get hands-on to test materials and their properties. These questions might help them get started: What if - • all materials were transparent? • every material was rigid? They could physically sort materials into groups after testing using Venn diagrams.	

Light Y3–4; P4–5

Pre-requisite understanding	Learning objective / skills to develop	Activities that help children explore this objective	What will children do/say to demonstrate their learning?	Applying learning and understanding
Light passes through some materials/objects; these are transparent. Materials that do not let light pass through them are opaque.	<i>Shadows are made when light is blocked by an opaque object</i>	Explore shadows: go outside to see shadows. Play shadow tag – can children work out where to stand so their shadows cannot be tagged? Use torches to make shadows with objects/themselves in the classroom. Shadow shapes	Children explain how they've moved so their shadows cannot be seen or are out of bounds. They explain that shadows form because sunlight cannot pass through their bodies. Children explain that shadows are formed from shining torches at opaque objects.	Children predict that only opaque objects will form shadows and can select appropriate objects/materials to form clear shadows. Children can transform a space so that no shadows can be seen, understanding that if there is no light, shadows are not formed. Lightproof your secret den Children might create a shadow puppet play to demonstrate how they can make shadows change in size for dramatic effect.
Light comes from a range of sources and we need light to see things. Sources of light	<i>Ask relevant questions; record findings; report on findings from enquiries</i>	Investigate: how can I produce the clearest shadow?	Children may draw the outlines of shadows, take photographs, measure shadows. They realise that clear shadows are formed from opaque objects.	
	<i>Set up simple practical enquiries; make careful observations; use results to draw conclusions.</i>	Investigate: how can I make a shadow bigger or smaller?	Children realise that they must move the light source or the object, record the distance of the light from the object and record the different size of the shadow formed. They look for patterns and generalise: when the light moves away from the object, the shadow gets smaller.	Skills: Focus on children recording their findings and then writing a short explanation with a diagram to show what is happening. (Remember that writing can form part of English or literacy sessions; measuring and presenting data links with maths/numeracy).

Forces Y5-6; P6-7

Pre-requisite understanding	Learning objective / skills to develop	Activities that help children explore this objective	What will children do/say to demonstrate their learning?	Applying learning and understanding
Identifying the forces at work in Take your turn or Blocks , will encourage talk about what the children know already about making objects move and about the effect of gravity. The Big Squeeze will provide opportunities for children to test their understanding further.	<i>Identify the effects of friction and resistance on the movement of objects and relate it to what they see around them.</i>	Children need opportunities to see air resistance in action, such as in Shoot the breeze and to experience it themselves. Revisit Blocks to see how the blocks sink or float and explore how things move through water, including ourselves. Bladerunner raises lots of questions about friction.	Children need to see and feel the effects of air resistance exploring it as much as possible to describe what is happening. They should use scientific vocabulary when explaining why a paraglider or paper plane stays up in the air, for example. Explore water resistance when swimming and understand why in races swimmers choose front crawl as their freestyle stroke because its easier to move through the water (more streamlined, less water resistance and drag).	Use their observations and experience of air resistance in designing, making and testing parachutes and extend their understanding by applying their learning to making a parachute for a hard-boiled egg, predicting what will happen and using outcomes to refine their ideas. Examine different materials and make predictions about the level of friction that might be encountered (Black bobbles).
	<i>Planning enquiries, taking measurements, recording data.</i>	Test how an object (toy car) moves on different surfaces for example, controlling variables for comparative tests.	Record the amount of force used to pull a toy car on different surfaces OR record the time it takes for a toy car to travel the same distance on a slope covered in different materials. Children should present their data clearly (link to maths).	Use their test results to predict what might happen on further surfaces, or when using a heavier car. Present and explain their results and findings (explanations in literacy).