Explorify guide to embed long-term understanding of Materials

Lower primary (5-7 years)

There is a guide to how to use this outline below the table.

Learning focus – to fit with any curriculum or scheme of work	Engage and elicit - what do children already know?	Possible activities from Explorify (you can use your existing plans which cover the learning focus)	Deepening learning
Review what the children already know	ZIZO Brown cracks - wood climbing frame ZIZO Silver spots - metal water fountain ZIZO Marked and bumpy - plastic chair ZIZO Tightly woven - fabric sofa ZIZO Speckled and shiny - pebble OOO Write away - wood pencil, plastic pen and feather quill	Assess what the children already know. With young children it is best to give them objects and materials to handle. Questioning and listening to the children's conversations will give you an idea of their prior knowledge. **Key questions:** What do you think this is made of? Can you find objects made of…? What words describe how this feels/looks? Why do you think this (object) is made of …? Sort these objects into different groups.	
Understand the difference between an object and a material	ZIZO Cosy comfort – a hat made of wool. ZIZO Rocky landscapes – a wooden pencil.	OOO A bowl full – three bowls made of glass, pottery and metal.	OOO Fascinating forks - three forks made of metal, plastic and wood OOO Write away - wood pencil, plastic pen and feather quill
Identify what an object is made of. Focus initially on wood, glass, metal, water and rock before looking at plastic. Extend with	OOO Through the looking glass – looks at three types of glass.	ZIZO Celebrating success - a bronze medal. ZIZO In disguise - a plastic strip that looks like wood. ZIZO See through - a puddle in the park. ZIZO Hard crust – a large rock.	WGO Playtime - children playing with objects made of different materials. OOO Wonderful water - water, ice and condensation.

paper, cardboard, brick and rubber.		WGO Fantastic fibres – a film showing how paper is made. PS Plastic fantastic - challenge to upcycle junk plastic.	ZIZO Mysterious material - a chalk cliff with a final image of some chalks.
Describe the properties of different materials	ZIZO Fuzzy friend - a fabric teddy bear	OOO Bits and pieces - metal coins, glass marbles and paper books. HYE had a favourite toy that broke? What if all your clothes were shiny?	What if every material was rigid? What if all your clothes were shiny? What if all the materials were transparent?
Identify similarities and differences between objects and materials and group them.	HYE sorted your toys in different ways?	OOO Is it plastic? - plastic ruler, plastic water bottle and plastic toys. What if all materials were transparent? MB Synthetic selection - create a mystery bag of plastic objects. Have you ever put something in the recycling bin?	OOO Good at the job - fabric towel, plastic bike helmet and a clay brick.
Understand that different materials behave in different ways, have different properties and can be used for different purposes.	OOO Fit for purpose - a chocolate teapot, glass hammer and cardboard trainers. OOO Fascinating forks - three forks made of metal, plastic and wood.	HYE squashed a sandwich in your bag? ZIZO The space in between - a sponge. Who is Charles Macintosh? OOO It's in the bag - a plastic bag, string bag and paper bag. Who is Milly-Hennayake? How would you make a shelter for a human? OOO Fun floating - a wooden rowing boat, sailing boat and a metal tanker.	OOO Dressed for action - a firefighter, police officer and doctor. What are the best shoes for running? What if your school banned paper? OOO Unusual homes - a wooden treehouse, ice igloo and fabric tent. OOO Functional footware - rubber wellington boots, leather shoes, and plastic flipflops. OOO Brushing up! - a wire brush, paint brush, toothbrush.
Explore how different materials can be changed by applying force.	MB Changing shape – create a mystery bag of hard and soft items that can be squashed.	HYE stretched a hair band or elastic band too far? What if every material was stretchy?	WGO Pottery - a potter's wheel OOO Flexible solids - playdough, balloons and hairbands WGO How long? - a child stretching a chocolate toffee sweet.

How to use this outline

The **learning focus** column gives one possible outline (and order) of how you could teach this unit using Explorify resources to support you, but you can easily use your current scheme of work and select the relevant Explorify activities to enhance your current planning.

The **Elicit and engage** column lists the Explorify activities you could use to find out what your children already know about the learning focus. It will enable you to assess what vocabulary and knowledge they have retained from previous science units. You can use these at the beginning of a lesson, in a spare 15 minutes before the lesson, or sometimes they might be appropriate at the end of a lesson.

The **Possible activities** column guides you to Explorify activities that will support your main teaching. Here you will want to look at the **Background science**, if you need to double check your own understanding, and the **Take it further** section of the Explorify activity for the ideas you can incorporate into your lesson.

The final column guides you to Explorify activities that will support your children in **Deepening their learning** and building those long-term memories that will help them remember and build connections between scientific ideas and concepts. **Retrieval practice** is 'bringing the information to mind from memory' (Weinstein et al 2019 p85[1]). Cognitive psychology research suggests that every time we draw on a memory, we increase its strength and longevity. Children should have to put some effort into retrieving that memory, this helps strengthen it, but at the same time it needs to be low stakes as too much anxiety interferes with memory function. We think Explorify Odd One Out activities are ideal for this, when enhanced with some additional questions after the initial activity, because it gets the children talking, making connections, comparing/contrasting and justifying their choices.

You could use the **Deepening Learning** Explorify activities at: the beginning of the lesson after you have taught a new concept; later in the week in a spare 15 minutes; further into the unit or even after the unit. We would encourage you to experiment and see what works for your class. As teachers, we have all experienced teaching children something and then, when you mention it a few weeks later, the children look at you blankly and don't remember. It is hardly surprising that children do not remember if they do not regularly revisit the ideas. As teachers, we have all experienced CPD sessions where we have quickly forgotten a lot of the content.

[1] Weinstein, Y., Sumeracki, M. and Caviglioli, O. (2019) Understanding how we learn: A visual guide. Abingdon and New York: Routledge