Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Materials	**Class 2**	**Year B Spring Term**

What should they already know?

From their 'Materials' unit in EYFS, children should be able to:

- make observations of common objects
- make very simplistic observations of materials
- arrange materials into groups
- identify when changes occur (e.g. when food is cooked)

Key vocabulary examples from EYFS:
hard, rough, lumpy, soft, crumbly, round, big(ger), small(er), sparkly, smooth, glittery, wrinkly, squishy, long, melted, colour, shape

Key vocabulary

opaque	You cannot see through something that is opaque at all.
transparent	You can see through something that is transparent.
waterproof	If something is waterproof, it keeps water out. It keeps things dry. If something is not waterproof, it lets water in.
object	A thing that can be used (e.g. door, chair, car, table).
material	Materials are what objects are made from.
absorbent	If something is absorbent, it soaks water up. If something is not absorbent, it does not soak water up.
magnetic	Objects/materials that are attracted to metal. They will 'stick' to a magnet if they are magnetic.
insulate	Insulate simply means to keep something warm by stopping the heat from going away.
flexible	Flexible (bendy) things can be folded easily.

Working Scientifically tasks that link to this unit:

Year 1 – Materials (floating and sinking)	How do I make predictions before an investigation? How do I carry out an investigation where I am looking for patterns?
Year 2 – Uses of everyday materials	How do I gather and record data to find out which material is the most waterproof?

Famous people that relate to this unit:			Writing ideas
Charles Macintosh		Charles Macintosh was born in Glasgow in 1766. In 1818, he started experimenting with materials and found a way to melt rubber. He used the melted rubber to join two pieces of cloth together and discovered that water didn't sink through. He made the fabric even better and went on to sell waterproof coats in 1824 (known as Macintosh raincoats or rain macs). He went on to make all sorts of waterproof things (bags, airbeds) and they were used for a trip to the Arctic and helped protect goods from the cold.	Write a letter/email to Charles to tell him which material he should use for his raincoat (following an investigation about waterproofing).

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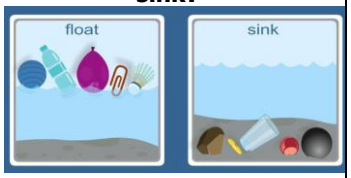
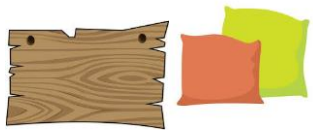
HFL ARE statements explained				
How do I name objects and identify what they are made out of? How can materials be made into different things? (examples)	**Plastic** rulers, sharpeners, drinks bottles, cups, scissor handles	**Paper** wrapping paper, tissue paper, writing paper, birthday cards	**Metal** scissor blades, sink, taps, some buttons	**Wood** tables, fences, decking outside, pencils
How are different materials made?	Children only need to be able to state that some materials are naturally occurring (such as wood, rock and water) and some materials are man-made (glass, metal, plastic).			
How do I describe the simple physical properties of a variety of everyday materials? (examples)	Children need the opportunities to handle a wide variety of objects and opportunities to describe them. hard, stiff, rigid, rough, not bendy, bendy, flexible, opaque, transparent, strong, soft, shiny, smoot, waterproof, stretchy, dull, bendy, absorbent, insulate/keep warm			
How can materials be grouped? (examples)	**Do the materials float or sink?** 	**Are they flexible or rigid?** 	**Are they waterproof or absorbent?** **Waterproof** 	**Absorbent** 
Are all materials suitable for everything?	Children need to be able to suggest reasons why a material may or may not be suitable for a particular purpose and why one material might be better to use than another.	**Jelly ladder?** 	**Wooden cushion?** 	**Chocolate tea-pot?** 

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<table>
<tr>
<td>Why should we reuse and recycle plastic?</td>
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Plastic isn't bio-degradable, so it doesn't rot like paper or food.
It can hang around the environment for hundreds of years.
Not all plastic can be recycled so we can try and reuse them instead.

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<td>
Oceans

8 million tonnes of plastic enter the ocean each year
It can be blown into the sea from ships, beaches, rivers and from being flushed down the toilet.
Experts think that by 2050, the amount of plastic in the ocean will weigh more than the amount of fish in the ocean.


Trash islands/garbage patches
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<td>
Animals

All animals, whether they live on land or in the sea, can be hurt by plastic.
They can get trapped in bigger items such as carrier bags or food packaging.
Birds, fish and shellfish can mistake plastic for food when it is broken down into smaller pieces and eat it (1/3 sea turtles, 90% sea birds).
They can't digest the plastic, so their stomachs become full, meaning there is no room for real food.
100,000 animals in the sea are killed by plastic.


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<td>
Why have some people switched to paper bags?

To stop as much plastic going into the ocean.
Paper is recyclable and it rots/breaks down after time.



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<tr>
<td>How can I change the shape of different solid objects?</td>
<td>
squashing

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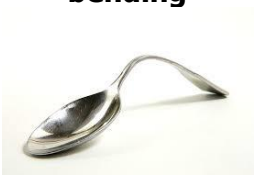
<td>
bending

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twisting

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<td>
stretching

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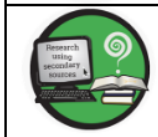
Types of enquiry you could cover in this topic about materials	
	• Which materials are the most flexible? • Which materials are the most absorbent? • Which material would be best for the roof of the little pig's house? • Which shapes make the strongest paper bridge?
	• What happens to shaving foam over time? • What will happen to our snowman? • Would a paper boat float forever? • What happens to materials over time if we bury them in the ground? • How long do bubble bath bubbles last for?
	• Which materials have been used to build our school? Are all the buildings built out of the same materials? • How can you change the shape of these materials? • What materials can you bend/twist?
	• How are building materials different now to when Queen Elizabeth 1 was on the throne? • How are bricks made? • How are plastics made? • Which materials can be recycled?
	• Which materials would be best to make an umbrella? Chair? • Which materials will float, and which will sink? • Which materials are shiny, and which are dull? • How can we group materials based on the changes that can be made to them?

Books and writing links
BOOKS • Billy Goat's Gruff • 3 Little Pigs • Dragon in a Wagon • Cinderella (shoes) • After the Storm by Nick Butterworth (floating and sinking) • The 3 Little Wolves and The Big Bad Pigs by Eugence Trivizas and Helen Oxenbury (which material would be best for the pigs to build their home?) • The 3 Billy Goats Gruff (what material could we build a bridge from?)
RECOUNT • Go on a material hunt and write a sentence or two about what they found out. • Floating and sinking investigation. Read Lost and Found and write to the penguin explaining what else he could have made a boat from.
NON-CHRONOLOGICAL • Contribution to a class guidebook about different materials and where they can be found.
INSTRUCTIONS • How to recycle at home
EXPLANATIONS • Explain what material(s) would be the best to use to make a bucket to put out the Great Fire of London. • After investigations write a letter to someone (for example the head teacher) to explain why they should choose a certain material • Where did the some of the pigs go wrong in the Three Little Pigs?