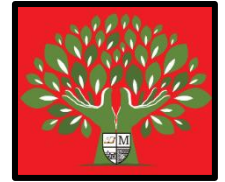






Mendell Primary School


Aspire Challenge Achieve



Medium Term Plan Science



Year Group: 2	Term: Autumn 1 - continued in Aut 2	Teacher: Sarah Bride	Subject lead: Sarah Bride	Overview: Everyday Materials:	Key End Points: By the end of this unit children will be able to:	
Common Misconceptions: Some children may think: <ul style="list-style-type: none"> • only fabrics are materials • only building materials are materials • only writing materials are materials • the word rock describes an object rather than a material • solid is another word for hard. 		Unit key Vocabulary: Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – opaque, transparent and translucent, reflective, non-reflective, flexible, rigid shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching		<ul style="list-style-type: none"> • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <div style="background-color: #e91e63; color: white; padding: 5px; margin-bottom: 5px;"> Identifying, grouping and classifying <small>Making observations to name, sort and organise items.</small> </div> <div style="background-color: #0070c0; color: white; padding: 5px; margin-bottom: 5px;"> Comparative / fair testing <small>Changing one variable to see its effect on another, whilst keeping all others the same.</small> </div> <div style="background-color: #4caf50; color: white; padding: 5px;"> Problem-solving <small>Applying prior scientific knowledge to find answers to problems.</small> </div>	Talk about and describe different objects/materials. Talk about the properties of everyday objects that we use. Understand different materials have different properties. Talk about the suitability of materials for different objects. Explore changing materials.	
Links to other learning: Design technology, Art.	Prior Learning: Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) <ul style="list-style-type: none"> • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) 	Future Learning: Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) <ul style="list-style-type: none"> • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets) • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials) • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials) 	High Quality Text: The Three Little Pigs and The Three Little Wolves and the Big Bad Pig, Michael Rosen's poem – Woolly Saucepan Scientist to study: John Dunlop	Risk Assessment:	Teacher CPD: ASE plan exemplification – Glory. Reach out CPD https://www.reachoutcpd.com/ sign up for free.	
Learning Intention	Real Life Links	Lesson Outline (Key Questions in colour)		Resources	Vocabulary	Lowest 20% Adaptation s

<p>1</p>	<p>L.I I can identify common materials and their properties</p> 	<p>This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is asking questions and making observations.</p> <p>Pre assessment task: What do we know about materials from last year? Encourage children to explain what a material is and give common examples – stretch children to consider properties of materials they can recall. record on working wall and return to this in lesson 6 to add what they now know.</p> <p>Explorify: Odd One Out – fascinating forks https://explorify.uk/en/activities/odd-one-out/fascinating-forks – assess do children discuss the different materials used?</p> <p>Big Question: How can we sort materials according to their properties?</p> <p>Activity: Identifying common materials</p> <p>Children work in small groups of no more than four. Give each group samples of wood, metal, hard plastic, glass, brick, rock, paper, cardboard, rubber and different fabrics. Allow them time to explore the different materials.</p> <p><i>The things in front of you are all examples of different materials. Everything in our world is made out of different kinds of materials.</i></p> <p>In their groups, children identify as many different materials as they can. Share their ideas and make a class list.</p> <p>Play a game of ‘Altogether, Show Me’. Ask children, on the count of three, to lift up a named material from those in their collection. (Include use of the term ‘fabric’.)</p> <p>Children go on different hunts in the classroom finding objects made entirely out of one material, e.g. rubber (an eraser) or hard plastic (a ruler). They then find objects made out of a combination of more than one material, e.g. plastic and metal (a pencil sharpener) or glass, plastic and metal (a computer).</p> <p>Ask children to name the different materials in the objects made out of more than one material. They could label these with sticky notes.</p> <p>Add some additional materials to the samples the groups have. This could include different types of wood, metal, card and fabric.</p> <p>Ask the question how can we sort these objects into two groups? Allow the children time to discuss and explore together in groups. The children will probably sort into soft and hard. Model flexible and rigid</p> <p>E.g.</p>  <p>Words of the week; Introduce the vocabulary: transparent, translucent and opaque. https://www.youtube.com/watch?v=P6Uihn8V3h4</p> <p>Share the Year 2 Materials key vocabulary list and allow the children to assess which words they are familiar with and can give a definition (colour these green) words they have heard of before but are unsure of their definition (colour orange) and words they haven't heard of before (colour red). Take time to discuss and visually model the vocabulary if possible to sort the children's independent sorting.</p> <p>Now stretch the children to sort their materials into categories of their choosing. Share the ways each group has classified the materials. Ask children to find as many other ways of sorting the materials into groups as they can. Use sorting hoops and labels, provide groups with paper speech bubbles for them to record their thoughts e.g. we have sorted wood, stone, glass and metal together because they are rigid and wool, plasticine, newspaper are flexible.</p> <p>Ask questions about the similarities and differences between different materials, e.g. Which two materials do you think are most similar? Why?</p> <p>Hold up a piece of metal and ask children to observe it closely. Choose children to share their observations about the properties of the metal (e.g. ‘shiny’, ‘cold’, ‘hard’, ‘strong’, ‘flexible’, ‘silver’, opaque).</p>	<p>Material samples, including different types of wood, different metals, hard plastic, glass, brick, rock, paper, different thicknesses of cardboard, rubber and different fabrics.</p> <p>Sorting hoops.</p>	<p>YR1: Properties hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p> <p>YR2: Properties opaque, transparent and translucent, reflective, non-reflective, flexible, rigid shape</p>
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		<p>In pairs, ask children to choose one of the materials you have given them and list as many of its properties as they can. Select pairs to share their lists of properties with the rest of the class, without saying which material it is. Can the other children guess which material it is? Ask them to think first and then lift up the material when they think they have identified it.</p>			
2	<p>L.I. I can explain why objects are made from certain materials.</p> 	<p>This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is making observations.</p> <p>Word of the week: recap flexible and rigid.</p> <p>Recap of prior learning: What natural materials can you name? What does opaque mean?</p> <p>Big Question: Why do we make things out of certain materials?</p> <p>Play true or false – provide each table with one material and a list of statements about those materials, challenge the children to sort the statements into true and false. Each group reports back and compares answers together.</p> <p>Use the story three little pigs as lesson stimulus – record pupil voice on working wall.</p> <p>Ask children to call out all the different materials they can see around the classroom.</p> <p>Ask them to state why they think different objects are made from different materials (e.g. ‘A chair is made from plastic because plastic is strong’ Windows are made from glass because it is transparent).</p> <p>Give children samples of wood, different metals, plastic, glass, brick, rock, paper, tissue paper, cardboard, rubber, different fabrics, catalogues, magazines and forks made out of plastic, metal and wood. Ask them to identify pairs they think are similar and why.</p> <p>Ensure children state what the similar properties are (e.g. ‘Wood and rock are similar because they are both hard’) and record their ideas on a flipchart.</p> <p>Ask children questions about why objects are not made out of particular materials. (E.g. Why is a toy for cuddling in bed not made from glass? Why are wellington boots not made from tissue paper?)</p> <p>Use Michael Rosen’s poem – Woolly Saucepan as a stimulus. What materials can you children spot in the poem? – use this to ensure there are no misconceptions at this stage about object over material. Has the person asked for the right material for each object? How do you know? Can you help him sort out his list of objects and which material he would like them made from? E.g. wooden chair, glass window.</p> <p>Why is our list more suitable? – reinforce previous learning about suitability of materials for certain objects.</p> <p>Show children the ‘what would happen if’ PowerPoint examining the pictures of objects made from very unsuitable materials. Ask pairs to discuss what would happen if the objects were made of the suggested materials. Take some suggestions before sharing the answer.</p> <p>Working in small groups, children list some unsuitable materials for some of the objects they use in the classroom (e.g. an eraser made from metal or a pencil made from fabric).</p>	<p>True or false statements</p> <p>samples of wood, different metals, plastic, glass, brick, rock, paper, tissue paper, cardboard, rubber, different fabrics, catalogues, magazines and forks made out of plastic, metal and wood.</p> <p>What would happen if... PowerPoint.</p> <p>Copy of poem for pairs.</p>	<p>wood, metal, plastic, glass, brick, rock, paper, cardboard reflective, non-reflective, flexible, rigid shape</p>	

		<p>In the same groups, ask children to generate their own “What would happen if ...?” questions similar to those on the PowerPoint. Groups share some of these questions with the other children in the class, discussing their answers.</p> <p>Exit pass; play properties snap, children have cards with different materials on when two materials have the same property e.g rigid it's a snap.</p> <div data-bbox="327 240 734 815" style="border: 1px solid green; padding: 10px; margin: 10px;"> <p>Woolly Saucepan</p> <p>Could I have a woolly saucepan a metal jumper a glass chair and a wooden window-pane please?</p> <p>Er-sorry – I mean a woolly chair a glass jumper a wooden saucepan and a metal window-pane please?</p> <p>Er-sorry – I mean Oh – blow it! You know what I mean, don't you?</p>  </div>			
3	<p>I.I. I can explain why objects are made from certain materials.</p> 	<p>This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is asking questions and making observations.</p> <p>Recap of prior learning: What soft materials can you name? What does transparent mean?</p> <p>Recap different properties of materials taught in the previous lesson. Hold up a materials and ask the children to name its properties. Explorify Odd one out – fit for purpose. https://explorify.uk/en/activities/odd-one-out/fit-for-purpose</p> <p>Big Question: Why do we make things out of certain materials?</p> <p>Play what's my material, provide pairs with the materials sheet and the teacher describes a material using its properties, allow children time to discuss and select a material from the sheet.</p> <p>Watch https://www.bbc.co.uk/bitesize/topics/zrssgk7/articles/z9pgcdm <i>Which materials do we use?</i> This interactive looks at how the properties of the materials make them suitable for their job. Discuss key vocabulary – flexible, bendy, waterproof, transparent.</p> <p>Show the children a teddy and ask: What materials are used to make the teddy? – Why? Encourage the children to provide answers similar to the interactive activity e.g. fur so it is soft when you cuddle it. Wool inside so you can squeeze it.</p> <p>Share and discuss STEM three little pigs unusual use PowerPoint to spark a conversation on materials used in unusual but suitable ways.</p>	<p>https://explorify.uk/en/activities/odd-one-out/fit-for-purpose What's my material? sheet</p> <p>https://www.bbc.co.uk/bitesize/topics/zrssgk7/articles/z9pgcdm <i>Which materials do we use?</i></p> <p>Stem three little pigs unusual use PowerPoint</p>	<p>flexible, bendy, waterproof, see through/transparent.</p>	

Give each table a picture of an object or a real object if possible and a list of materials cut up on card, ask the children to think about which material would be useful to make the object out of e.g. bucket could be matched to plastic, metal. Encourage the children to talk about why some materials are more suitable than others. – for any groups who are struggling provide them with some key words to spark conversation. Children draw and complete their own table see example below:

As a class, the children talked about objects in the classroom, what they were made from and their properties. The children were then asked to complete a worksheet.

EVIDENCE OF LEARNING		ASSESSMENT																		
Oral evidence	Examples of work	Knowledge																		
<p>Teacher observations</p> <p>During the class discussion, Glory used a wide range of words to describe the properties of materials, including transparent and opaque.</p> <p>The worksheet did not prompt the children to think about the properties of the materials used for each object and therefore did not capture evidence of this learning effectively.</p>	<p>25.09.15 LO: To identify materials that objects are made out of.</p> <table border="1"> <thead> <tr> <th>Object (draw or write the word)</th> <th>Material</th> <th>Why is it made out of this material?</th> </tr> </thead> <tbody> <tr> <td>bench </td> <td>Wood</td> <td>So we can sit on it and we can sit on it.</td> </tr> <tr> <td>Chair </td> <td>Plastic</td> <td>So the bottom does not break.</td> </tr> <tr> <td>math holder </td> <td>metal</td> <td>So you can hold a math.</td> </tr> <tr> <td>curtain </td> <td>Fabric</td> <td>So we can cover the sun.</td> </tr> <tr> <td>window </td> <td>glass</td> <td>So it does not blow away.</td> </tr> </tbody> </table>	Object (draw or write the word)	Material	Why is it made out of this material?	bench 	Wood	So we can sit on it and we can sit on it.	Chair 	Plastic	So the bottom does not break.	math holder 	metal	So you can hold a math.	curtain 	Fabric	So we can cover the sun.	window 	glass	So it does not blow away.	<p>The vocabulary used during the discussion is not reflected in Glory's written work. He does show how the properties of the materials make them suitable for the particular uses.</p>
Object (draw or write the word)	Material	Why is it made out of this material?																		
bench 	Wood	So we can sit on it and we can sit on it.																		
Chair 	Plastic	So the bottom does not break.																		
math holder 	metal	So you can hold a math.																		
curtain 	Fabric	So we can cover the sun.																		
window 	glass	So it does not blow away.																		
		Working scientifically																		

Exit Pass: children choose an object and sort the cards (cards name different materials) into suitable and unsuitable. Suitable un suitable – sorting

4

L.I. I can investigate which material is most absorbent.



This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is setting up a test and communicating results.

Big Question; which material is the most suitable for absorbing a spillage?

Recap of prior learning:

What can be made from plastic? why?

What does translucent mean?

Give each child or pair of children two transparent, 25 ml plastic cups and a coloured paper towel. One cup should contain one level teaspoon of instant snow and the other should be almost full of water. (Don't tell children that the powder is instant snow.)

Ask children to pour the water onto the powder and watch very carefully. **What do you notice?** (The powder has grown and the water has vanished.) **Where do you think the water has gone?** *When something soaks up water, it is said to 'absorb' it. Instant snow is a super-absorbent material.*



Recap – do children recall the meaning of the word absorbent from Year 1?

Wet your hands and dry them on a coloured paper towel. Show the children that your hands are now dry and that the water is now on the paper towel. **Why?** (The paper towel is absorbent.) **Can you name other absorbent materials you could use to dry your hands?**

Ask children to empty the instant snow onto the paper towel. Draw their attention to the fact that the paper towel stays dry because the water has already been absorbed by the instant snow.

Instant snow;
transparent 25ml plastic cups;
coloured paper towels
Cups of water;
spoons;
trays;
samples of different materials including kitchen roll, paper towel, cleaning cloth, thin

Absorbent/absorbency, soaks up,

		<p>Supply small groups of children with cups of water, spoons, trays and samples of different materials: kitchen roll, paper towel, cleaning cloth, thin washing-up sponge, cling film and metal foil.</p> <p><i>You are going to test all of the different materials to find out which are the most absorbent.</i> Ask children to predict which they think will be most absorbent. Give the children an opportunity to talk to each other about how they could find out which paper towel is best at absorbing water. Ask them to share their ideas. The 'Some Ways of Testing Absorbency' sheet gives some examples of ways to test the absorbency and to record the investigation. Show the children this resource and allow them to decide themselves which method they would like to pursue. When they have decided, arrange the children into a group with others wanting to use the same method. Show the children the resources and ask them to set up their investigation.</p> <p>Share each groups recording methods and results with the class. Which material was the most absorbent? Was it the one you expected? Did each group get the same results? Why do you think cling film and tin foil weren't absorbent?</p>	washing up sponge, cling film and tin foil		
5	<p>L.I. I can investigate a hypothesis.</p> 	<p>This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is setting up a test and communicating results.</p> <p>Recap of prior learning: What does waterproof mean? What objects are good to make using metal? why? Big Question – Are bricks absorbent?</p> <p>Meet the children at the door of the classroom and tell them that they are going on an investigative walk. They are going to look at their environment and observe certain things closely, just like scientists do! Walk them around the school, inside and outside, and focus their attention on the different building materials around them. Take photographs, talk about what you see and ask the children to feel the different bricks. Back in the classroom, say Do you think bricks are absorbent? Ask them to explain their answers. Then challenge them to think of their own questions about bricks and absorbency, such as: Are all hard things waterproof? Do things have to be soft to be absorbent? Alternatively, ask them to create their own hypothesis: <i>"All soft things are absorbent"</i> or <i>"Bricks are waterproof because they are hard and solid"</i>. Suggest the following hypothesis: <i>"Hard materials cannot absorb water"</i> and see what their reactions are. Ask them to give a 'thumbs up' if they agree and a 'thumbs down' if they don't.</p> <p>Give the children some time to talk to each other about the hypothesis using the Hypothesis Thinking Sheet to help them focus their discussion. Show the children a variety of hard materials (different type of wood, brick, plastics, metals). Arrange the children into groups and challenge them to devise an investigation to test a variety of materials. The more able may have ideas of their own. For example, stand each of the hard materials in a shallow bowl of water and observe, over time, to see if the material soaks up the water. Give the children plain pieces of paper to encourage them to record their observations in their own way and to explore what works best for them. Focus them by asking: <i>If someone comes in after the investigation, and looks at your recording, will they know what happened? And what you found out? Could they go away and redo your investigation, just by reading your notes? How could you make your recording even better, so they could do that?</i> Give them the investigation resource sheet to help them focus their thoughts.</p> <p>Ask the children to come, in their groups, to the front of the class and talk through their investigation. They should describe what they did and what they observed. Remind them of the hypothesis: <i>"Hard materials cannot absorb water"</i> and ask if they proved that to be true or not. Ask: Are you surprised by your findings? What can you learn from this?</p>	Hypothesis Thinking Sheet, a variety of hard materials (different type of wood, including balsa wood, brick, plastics, plaster, clay, metals), shallow bowls of water, timer	material, properties, absorbency, waterproof, strong	
6	<p>LI: I can explore and sort objects according to whether they can change shape.</p> 	<p>This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is observing and asking questions.</p> <p>Recap of prior learning: Why is paper not a suitable material for a spoon? What does rigid mean? Name a waterproof materials?</p> <p>In pairs, children think of examples to complete the following sentence: 'You can change the shape of ... by ...'. Collect children's initial ideas and record them for future reference.</p> <p>Activity: Creating shapes with modelling dough</p>	Modelling dough. Elastic bands; paper; pipe cleaners; modelling clay; plastic bags; plastic cubes; metal forks; wooden spoons; bath	bending twisting stretching and squashing	Display key vocabulary (bend, twist, squash, stretch) to remind children of the different ways they can change the shape of a material.

Organise children into pairs. Give each pair a generous lump of modelling dough. Allow children time to explore the material before asking them to mould the dough into a shape of their choice.

MLHN
Planning for assessment

Description of activity
In the previous activities, several children used the words "flexible", "rigid" and "stretchy", but not with consistent meaning. In this activity, children matched vocabulary to actions when manipulating playdough, and talked about how some materials can be changed.

EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
<p>Teacher: "How did you change this one?" [1]</p> <p>Glory: "I changed it by bending. Playdough is bendy."</p> <p>Teacher: "Is there another word for bendy?"</p> <p>Glory: "Flexible."</p> <p>Glory: "I twisted this one [2]. I pulled and stretched it. It is stretchy."</p> <p>"It nearly broke [3]."</p> <p>"I squashed it flat with my hand [4]."</p>		<p>Glory names and demonstrates the actions of squashing, bending, twisting and stretching, but does not confidently use flexible, rigid and stiff.</p>
Teacher observations		Working scientifically

Introduce or remind children of some of the key vocabulary used to describe how we mould things into shape: 'bending', 'twisting', 'stretching' and 'squashing'. Children look at their work and try to describe the different skills used to create their shapes to a partner, using the key vocabulary. They then annotate their work using 'bending', 'twisting', 'stretching' and 'squashing'.

Activity: Changing the shape of different materials

Organise children into groups of no more than four. Give each group the materials listed below. Allow children time to explore the different materials and think about how to change the shape of each one.

Hold up one of the objects, e.g. an elastic band. **Can you think of a word that describes how to change the object's shape?** Select one word from the children's suggestions, e.g. 'stretch'. Ask randomly selected children to identify another material with the same property. Repeat this, and the previous step, to identify materials that are bendy, twisty or squashy.

Provide the children with a range of objects in picture form and ask them to discuss and sort them into 'Can change shape', 'Can't change shape' or 'Not sure'. Ask other groups how they classified the same material and why.

Drag and drop the materials to show if you can change their shape.

sponges;
string;
stones;
tinfoil.

		post assessment: add to the working wall mind map.			
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