Pioneer Federation
Medium term plan
KS1- Cycle 1 Term 4
Science

Subject: Science

Key question: why do we have different materials?

Key Concept/ Theme:

- Describe the simple physical properties of a variety of everyday materials.
- Compare and group together a variety of everyday materials on the basis of their physical properties.
- 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.

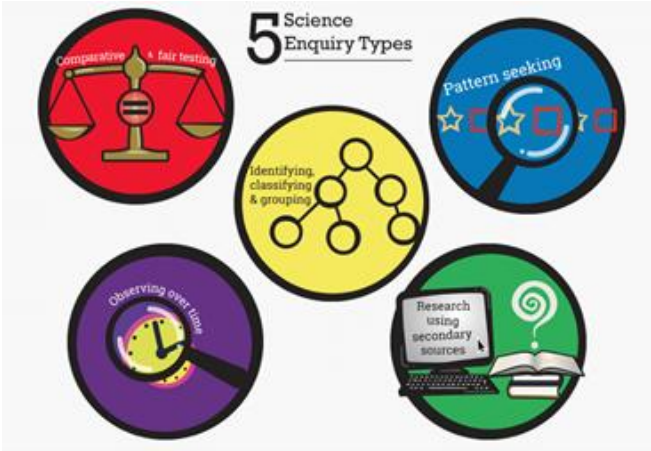
Prior Learning links:

EYFS: Term 3,4 and 6 materials is covered in Understanding the World

Working Scientifically skills:

- Recording
- Predicting
- Fair tests
- Conclusions

Types of enquiry:



Vocabulary:

Types of materials: wood, plastic, glass, metal, water, rock, brick, fabric, sand, paper, flour, butter, milk, soil

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Properties of materials: hard/soft, stretchy/not stretchy, shiny/dull, rough/smooth, bendy/not bendy, transparent/not transparent, sticky/not sticky **Verbs associated with materials**: crumble, squash, bend, stretch, twist **Senses**: touch, see, hear, smell and taste	
1.	**Prior learning reconnection (year group, cycle & term):** EYFS Terms 3,4 and 6 and Cycle 2, KS1, Term 4 and 6 **LO:** To know the properties of materials they use in their everyday lives. To name materials they use in their everyday lives. **Resources:** Use white blouses/shirts, Digital microscope, A variety of objects made from various materials, Hoops (possibly PE ones) **Activity:** **Hook – The Science Laboratory!** In order to get the children engaged in this area of science, try to create a laboratory within your classroom. A 'Careful, scientists at work' sign could be placed on the door. On entering the 'laboratory' for the first time the children could be faced with tables on which you have placed a range of scientific equipment. A digital microscope could be showing something interesting on the white board. 'Lab jackets' (used white blouses/shirts) could be hung up on the back of each of the children's chairs. **Observe, identify and classify – What are objects made from?** Establish with the children that all things are made from materials. Play 'Kim's game'. Hold up one object at a time and ask the children to name the object and then what material/s it is made from. Now (without the children seeing) take away one of the objects and ask the children to work out which one is missing and what it is made from. You can repeat this, but this time take away two objects, etc. Challenge the children to find many different materials. They could collect the objects and place them on their tables. Provide the children with hoops in which to place objects made from the same material. Some of the children might be able to work out that some of the hoops might have to overlap if there is an object made from 2 different materials. **Recording** Children could simply take a photo of their sorting circles that could then be printed and stuck in their book or a whole class big book/learning log. Alternatively the children could draw and label their circles and then draw the objects in each of them.
2.	**Reconnection**: Start the lesson by showing the pictures of the different objects. Can children name the objects? **LO:** To compare the physical properties of materials. **Working Scientifically Skill:** predicting **Enquiry skill:** identifying, classifying and grouping **Resources:** items from a range of materials **Activity:** Start the lesson by showing the pictures of the different objects. Can children name the objects? Once the objects have been identified, discuss the materials from which they are made.

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	Can children name what the objects are made from? Are any of the objects made from the same material? Discuss how we use different materials to make different objects and that we use the best material for the job. We use glass to make windows, as it is see-through so allows light into your house and allows you to see outside. It also stops the wind and the rain from entering your house. What would happen if windows were made from fabric? We use rubber to make wellington boots because rubber is strong, waterproof and bendy. What would happen if wellington boots were made from glass? We use fabric to make clothes because fabric is soft and flexible. what would happen if clothes were made from wood? We use bricks to build houses because they are strong and difficult to break. What would happen if houses were made from paper? Play 'which material is it made from?' Show the children the pictures. The material munchers will only eat one type of material. Can the children match them up? Sorting activity – children to sort the objects into the correct materials from which they are made. Plenary – share and discuss the answers from the sorting activity.
3	**Reconnection:** start the lesson by showing the pictures of the different objects. Can you remember the names of the materials? Class discussion. **LO:** To know the suitability of wood, metal, plastic, glass, brick, rock, paper and cardboard in their everyday lives and objects they use. **Working Scientifically Skill:** conclusions **Enquiry skill:** pattern seeking **Resources:** wood, plastic, fabric, metal, rubber, glass, brick, rock, paper, The three little pigs story **Activity:** **What material should the Three Little Pigs make their house from?** What makes a good house? Discuss with partners before sharing as a class. We have been learning about homes in different parts of the world this term and last, read to the children 'A Place called home', discuss some of the materials the houses have been made out of (wood, bricks, mud) What do you think would make a good material for a house? A house needs to be strong. It needs to keep you dry and safe. It needs to protect you from the wind. Question to discuss – why is it important to have a strong house? Introduce the Three Little Pigs. It would be good for you to read the first part of the story where the mother pig tells the three little pigs to go and build houses. Class discussion – what would make a good house? Discuss how the house would need to be strong, it needs to keep the three little pigs dry and it needs to not blow over when the Big Bad Wolf huffs and puffs. Discuss different ways we could test the materials to find the best material for the job. (First, we need to see which materials are strong and which are not – we could try to break/tear each material to see which breaks the easiest. Then we need to investigate which will keep us dry – we could pour water on each and see what happens. If it is waterproof the water will run off. Finally, we need to see which ones will protect us from the wind – we could build something with each material and blow on it to see which falls over.) Give children time to complete the investigation by exploring the different materials.

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	You could have them set up around the classroom or do it in stations, either as a class, in groups or individually record what they found about the materials. questions on their sheet. As the children go around, ask them these questions: • Is it strong? • Will it keep the three little pigs dry? • Will it fall over if the Big Bad Wolf huffs and puffs? • Would it make a good house? Plenary – children can share what they found out from their investigation. You could do a class vote on which material would be the best. Did all groups come to the same conclusion? Write a letter to the Little Pigs to state which material you think is the best and why.
4	**Reconnection:** Start the lesson by showing the pictures of the different objects. Can you remember the names of the materials? **LO:** To compare the suitability of wood, metal, plastic, glass, brick, rock, paper and cardboard in their everyday lives and objects they use. **Working Scientifically Skill:** Recording, Predicting, Fair tests and Conclusions **Enquiry skill:** Comparative and fair test **Resources:** A range of different materials for the children to investigate such as wood, metal, plastic, glass, brick, rock, paper and cardboard, Boiled eggs to mimic Humpty Dumpty, A 'wall' for Humpty Dumpty to fall of **Activity:** **Which material will protect Humpty Dumpty?** Start the lesson by showing the pictures of the different objects. Can you remember the names of the materials? Class discussion. What makes a good house? Discuss with partners before sharing as a class. • **You have a new email!** Read through the email from Humpty Dumpty. He has heard how we helped the Three Little Pigs, and he needs our help. He is tired of falling off the wall and having to be put back together again. He wants us to investigate which material would be best to wrap around him to protect him from breaking. The material has to be comfortable to wear, not too heavy and be able to protect Humpty Dumpty from breaking if he falls off the wall. **How can we help Humpty?** We need to investigate a material that will be good to wrap around Humpty Dumpty. It needs to protect Humpty from the fall. It needs to be comfortable to wear. It can't be too heavy. Ask the children – why should it not be heavy? How can we investigate this? How can we find the best material?

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	What do we think could be the best material? Let's make a prediction for our results. First, we need to see which materials will protect Humpty. We could wrap an egg in each material and drop it to see which one stops the egg from breaking. Then, we need to investigate which will be comfortable to wear. We could feel each of the materials to decide which ones would be comfortable to wear. Finally, we need to see which one is not too heavy. We could weigh each material to see which ones are the heaviest. Children to carry out the investigation to find the best material for Humpty Dumpty. Ask the children complete this go around and ask: • Could it protect an egg? • Would it be comfortable to wear? • Is it heavy? Plenary – groups can share their findings from their investigation with the rest of the class.
5	**Reconnection:** start the lesson by showing the pictures of the different objects. Can you remember the names of the materials? **LO:** To identify solid shape changing by describing: squashing, bending, twisting and stretching. To know how the shapes of solid objects made from some materials can be changed. **Working Scientifically Skill:** Recording, Predicting, Fair tests and Conclusions **Enquiry skill:** Comparative and fair test **Activity:** Class Discussion – what makes a good house? Discuss with partners before sharing as a class. Different objects are made from different materials. Can children name the object and the material it is made from? We can change the shape of some materials by squashing them, bending them, twisting them and stretching them. Look at the materials we have been investigating during this topic. Which of these materials do you think we can change the shape of by squashing, bending, twisting or stretching You are going to explore objects that are made from different materials. You are going to try to squash them, bend them, twist them and stretch them and see which ones change shape. Investigation – children to be given a range of objects made from different materials and answer the questions: Can you squash it? Can you bend it?

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	Can you twist it? Can you stretch it? Plenary – each group can share what they found when they were exploring the different materials.
	Quiz/assessment

End points:

- To know the properties of materials they use in their everyday lives.
- To name materials they use in their everyday lives.
- To compare the physical properties of materials.
- To know the suitability of wood, metal, plastic, glass, brick, rock, paper and cardboard in their everyday lives and objects they use.
- To compare the suitability of wood, metal, plastic, glass, brick, rock, paper and cardboard in their everyday lives and objects they use.
- To know how the shapes of solid objects made from some materials can be changed.
- To identify solid shape changing by describing: squashing, bending, twisting and stretching.

Future learning links:

Year 3 – Children will study rocks in more detail looking at the properties of different types of rock.
Year 4 – Children will study 'States of Matter' where they will look at a variety of solids, liquids and gases.
Year 5 – Children will study 'Properties and Changes of Materials' where they will explore deeper into states of matter and reversible and irreversible changes.
KS3 – Children will study 'States of Matter and Changes' in more depth as well as focusing on the use of different metals, polymers, ceramics and composites.