Science Medium term plan
Uses of Materials Y2

Pupils should be taught to:

- 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.

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is related to the teaching of substantive science content, examples show how scientific methods and skills might be linked to specific elements of the content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions

gathering and recording data to help in answering questions

Prior Learning:

- Distinguish between an object and the material from which it is made. (Y1)
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock (Y1)
- Describe the simple physical properties of a variety of everyday materials. (Y1)
- Compare and group together a variety of everyday materials based on their simple physical properties. (Y1)

Future Learning:

- Compare and classify different rocks based on their appearance and simple characteristics (Y3)
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3)
- Compare and classify together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity, and response to magnets (Y5)
- Give reasons, based on evidence from comparative and fair tests, for the uses of everyday materials, including metals, wood and plastic. (Y5)

Key questions (Show how content and concepts link) Differentiated Learning Objectives	Teaching and learning activities (Linked directly to objectives)	Resources (To help pupils reach the learning objectives)	Written and non-written Outcomes (Assessment including homework's)
1)How are different materials used? **Science capital:** *How does this lesson connect with children in my class? What different objects do you have at home? Which material do you think it is made from?* **Science Working scientifically Skills:**	**Science reasoning task: explorify :zoom in zoom out** Creature comforts - Explorify **Activity 1:** Show children different objects and ask what materials are these objects made from? What does this material look like? What does it feel like? How does it behave? Once identified the different materials	**Activity 1:** Range of objects made out of different materials. Venn Diagram hoops. **Activity 2:** worksheet to identify different	Reasoning – explaining the suitability of different materials and linking to their properties. Classifying objects under chosen criteria.

Asking questions / observing  **Science Enquiry Type: Classify**  *Pupils use their Y1 knowledge to distinguish between an object and the material it is made from. Also, they can identify the various materials. Pupils will understand objects are made of one or more materials that are chosen specifically because they have suitable properties for the task*. **Misconception: only fabrics are materials, only building materials are materials, the word rock describes an object rather than a material, solid is another word for hard.**	as them what can they be used for? Use the word most **suitable** for? Look around the classroom are there any objects made from any of these materials? **Activity 2**: To complete sheet of identifying different materials and the different objects created from them. I.e., wood- table, chairs, bench etc To label different materials in the outdoor environment. Classify different objects into different materials. **Activity 3- suitability** Identify material and it's many uses. i.e metal- chair, spoon, car etc **Activity 4:** Reasoning- chair made out of chocolate or ice which would be better? Convince me	objects and materials they are made out of. **Activity 3:** matching the suitability and giving reasons. **Activity 4-** reasoning card.	**Homework**- list of objects and what materials are they made out of.
2) Should desks be made out of sponges? **Science capital:** what is in your house? What is it made out of? What would happen if remote control was made out of sponge? Etc. **Science Working scientifically Skills:** **Asking questions / observing**  **Science Enquiry Type: Classify**  *Pupils will understand the suitability of materials for a specific purpose and recall on their prior knowledge in Y1.* **Misconception: only fabrics are materials, only building materials are materials, the word rock describes an object rather than a material, solid is another word for hard.**	**Science reasoning task: explorify** The space in between - Explorify **Activity 1:** Link to story character - wants you to help him find out the different uses of different materials and classify them. Explain we are going to go on a short walk using our school map to help us to spot different materials and their uses. Ch will go out on a walk and write down what material they have spotted and then they are to identify the use for it. **Activity 2:** classify all the objects we spotted that were made out of wood and metal? Elicit one material can have many uses	**Activity 1:** Children to be in mixed ability and to be given a map to follow- and a log to write down what material they identified and the object made from it. **Activity 2:** Venn Diagram hoops.	Reasoning – explaining the suitability of different materials and linking to their properties. Classifying objects under chosen criteria. **Homework**- Designing an object but thinking about the materials being used and their suitability.
3) Which paper is most absorbent? **Science capital:**	**Science reasoning task: explorify** Fascinating forks - Explorify	**Activity 1:** Group post it note	Reasoning – explaining the properties of different materials

What is in your house that is absorbent? Why does it need to be? How is it useful? **Science Working scientifically Skills:**  **Science Enquiry Type: Comparative**  *Pupils will understand the properties of different materials in terms of absorbency. They will carry out a simple tests.* **Misconception: only fabrics are materials, only building materials are materials, the word rock describes an object rather than a material, solid is another word for hard.**	**Activity 1** What does absorbent mean? : Link to character would like you to find out which paper should he wrap his sandwiches in so they do not get soggy/wet easily? Ask ch how many different types of paper are there? (Kitchen paper, different brands of paper towels, school paper towels, squares of paper, Show children and say what are we trying to find out for x? What is our enquiry question? Explain they are scientists for x and need to have an answer by the end of the lesson. How can we test out absorbency of a material? Take ideas and then explain we are going to use Pipette puddle. will use a pipette to drop water on a table to make a small puddle. I will place the paper on top of it for a set period of time and see how much water is left on the table.	experiment write up.	using Y1 properties. (Prior knowledge) Comparing different materials and their properties.
4)How can we make absorbent materials waterproof? **Science capital What do you have that is waterproof? Why is it waterproof?** **Science Working scientifically Skills:**  **Science Enquiry Type: Comparative**  *Pupils will understand how to create absorbent materials. They will set up simple tests to find out which materials will become absorbent. They will be comparing the different types of paper and their properties.*	**Science reasoning task: explorify** Fit for purpose? - Explorify **Activity 1 -**Recap what does absorbent mean? Link to character wanting to make hat waterproof and climate of London. Ask how could we investigate this? **Activity 2-** Plan as a whole class the enquiry – how could we investigate this problem to find a solution to it? Model and share each step of the planning investigation process. D **Activity 3:** Discuss the concept cartoon, and discuss who do they agree with the most and why? (Prediction) **Activity 4**: Carry out the experiment and record the results in table.	**Activity 1-** Post it note ideas. **Activity 2-** Floor book evidence **Activity 3**- Post it notes / talk partner. **Activity 4 :** Photograph evidence and recording sheet.	Writing a short note, message to character about what they found out. DT/Science – creating hats for character to wear. **Homework**- Testing out findings on different materials/ fabrics at home to see if applying wax can make them waterproof.
5) Who was Charles Macintosh and why is he important? **Science capital What things do you have at home and how do they move?**	**Science reasoning task: explorify** Had a favourite toy that broke? - Explorify **Activity 1 –** Share the video of Charles Macintosh.	**Activity 1-** Whiteboards to write down any key facts learnt. **Activity 2-** Floor book evidence	Using research to write key facts in a fact file about Charles Macintosh

Science Working scientifically Skills:  **Science Enquiry Type: Research**  *Pupils will understand a scientist who created something out of his curiosity. They will be able to use secondary resources to find out key facts and create a fact file.*	**Activity 2**- Discuss some of the facts that they found out in the video, make note of some of the facts retrieved. **Activity 3-** Model using the different texts /sources to learn and answer questions about Charles Macintosh. **Activity 4-** Model writing a fact file about Charles Macintosh using some of the facts learnt through listening to a video and internet / book information.	**Activity 3**- Post it notes / talk partner. **Activity 4 :** Record on fact file template.	**Homework**- Research other scientists such as Dunlop.
6) How can materials change shape? **Science Working scientifically Skills:**  **Science Enquiry Type: Comparative/Classify**  *Pupils will understand objects made of some materials can be changed in shape by bending, stretching, squashing and twisting.*	**Activity 1 –** Discuss concept cartoon about different objects and do you agree or disagree. Why do you agree or disagree? **Activity 2**- use observation skills to test out the different materials to see if they twist, bend, stretch etc. **Activity 3-** Record observations in a results table. **Activity 4-** Classify different objects into opaque, translucent and transparent.	**Activity 1-** post it notes to write down thoughts. **Activity 2-** Floor book evidence **Activity 3:** Record on a given table. **Activity 4:** Venn diagram and objects/ pictures to classify.	Reasoning – explaining why we might need materials to change shape.
7) Why is recycling useful? **Science capital What bins do you have at home? What might you recycle?** **Science Working scientifically Skills:**  **Science Enquiry Type: Classify**  *Pupils will understand the importance of recycling, reuse and reduce of wate. Pupils will understand the process of recycling and what happens to objects once placed in the bin.*	**Science reasoning task: explorify** Seen rubbish where it shouldn't be? - Explorify **Activity 1 –** classify the different rubbish into appropriate bins. **Activity 2**- watch video/ PowerPoint of how rubbish goes from the bin to the recycling centre and gets reused. **Activity 3-** sequence steps of the recycling process and some to explain each step.	**Activity 1 –** Venn Diagram/ pictures to classify **Activity 2**- video/ PowerPoint **Activity 3-** sequence steps of the recycling process – writing frame.	Reasoning – purpose of recycling? Advantages and disadvantages. **Homework**- Making a list of all the things that are recycled at home.
8) Are bricks absorbent?	**Activity 1**-Go on a walk around school - Discuss the different	**Activity 1-** Clipboard and	

Science Working scientifically Skills:  **Science Enquiry Type: Comparative**  *Pupils will understand a scientist who created something out of his curiosity. They will be able to use secondary resources to find out key facts and create a fact file.*	purposes of materials and the things they are made out of inside school and outside on school grounds. Discuss the suitability of each material for the purpose of the object. **Activity 2-** set up the experiment as a class- Enquiry question- what are we trying to find out? Why? Equipment – choose from a selection – **Activity 3-** Prediction – write what they think and why. May draw on own experiences. **Activity 4-** Carry out experiment as group and record results- in table template provided. **Activity 5-** Conclude as a class and write a join conclusion.	pencil, camera to take pictures. **Activity 2-** template and vocabulary Working scientifically symbols and vocabulary. **Activity 3-** model and sentence stem to be provided. **Activity 4-** record results- in table template provided. **Activity 5-** sentence stem and vocabulary.	
9) Would you choose a ball of plasticine to play tennis or rubber? **Science capital What materials are balls made out f that you play with?** **Science Working scientifically Skills:**  **Science Enquiry Type: Comparative**  *Pupils will understand and apply their knowledge of the properties of materials and how they use the object to see if it is suitable.*	**Science reasoning task: explorify** Squashed a sandwich in your bag? - Explorify **Activity 1 –** Discuss concept cartoon about different materials the balls are made out of. Who do you agree with and why? **Activity 2- Guided** set up the experiment as a class- Enquiry question- what are we trying to find out? Why? Equipment – choose from a selection -Prediction as a whole class using the concept cartoon, Method – three steps to follow. **Activity 3-** Carry out the experiment following the method and to record result in a table already provided.	**Activity 1-** Concept cartoon **Activity 2**-Floor book or working wall to record. Templates and sentence stems, vocabulary to be provided. **Activity 3-** range of ball with various materials	Reasoning – prior knowledge of different materials and explaining suitability.
10) Which fabric can stretch the most? **Science capital What things do you have that are stretchy? Why do they need to be stretchy?** **Science Working scientifically Skills:**  **Science Enquiry Type: Comparative**	**Science reasoning task: explorify** Every material was stretchy? - Explorify **Activity 1 –** Discuss concept cartoon about different materials and who they agree with the most. Why? **Activity 2**- Enquiry question- what are they trying to find out- Equipment – choose from a selection -Prediction as a whole	**Activity 1 –** concept cartoon – sentence stems **Activity 2**- template, vocabulary and sentence stem frames.	Reasoning – what it the purpose of stretchy material?

 *Pupils will understand and set up simple test to investigate the how stretchy a fabric is. Pupils will understand the purpose of the materials being stretchy and it's uses.*	class using the concept cartoon, Method – three steps to follow. Conclusion -what did you find out.		
11)Which fabric is durable and flexible? **Science capital Why do materials need to be durable and flexible? What do you have at home which is made out of a tough and flexible material?** **Science Working scientifically Skills:**  **Science Enquiry Type: Comparative**  *Pupils will understand why objects need to be durable/tough and flexible. They will set up a simple test to investigate the durability of various materials.*	**Science reasoning task: explorify** Material world - Explorify **Activity 1 –** Discuss concept cartoon about different materials and who they agree with the most. Why? **Activity 2**- Enquiry question- what are they trying to find out- Equipment – choose from a selection -Prediction as a whole class using the concept cartoon, Method – three steps to follow. Conclusion -what did you find out.	**Activity 1 –** concept cartoon – sentence stems **Activity 2**- template, vocabulary and sentence stem frames.	Reasoning – understanding properties can be heard too.
12) Compare which bucket is best for a bucket to carry water? (GFOL) **Science capital What materials are used for what around you?** **Science Working scientifically Skills:**  **Science Enquiry Type: Comparative**  *Pupils will set up simple tests and use their knowledge of materials and their properties to make predictions.*	**Science reasoning task: explorify** Bottle it up - Explorify **Activity 1 –** Discuss concept cartoon about different materials and who they agree with the most. Why? **Activity 2**- Enquiry question- what are they trying to find out- Equipment – choose from a selection -Prediction as a whole class using the concept cartoon, Method – three steps to follow. Conclusion -what did you find out.	**Activity 1 –** concept cartoon – sentence stems **Activity 2**- template, vocabulary and sentence stem frames.	Reasoning – prior knowledge – understanding and explaining how material such as glass can be useful.
13) Which is the best material to stop a leak in the bucket? (GFOL)	**Activity 1 –** Discuss concept cartoon about different materials and who they agree with the most. Why?	**Activity 1 –** concept cartoon – sentence stems	Reasoning – prior knowledge make predictions.

Science Working scientifically Skills:  **Science Enquiry Type: Comparative**  *Pupils will set up simple tests and record results and drawing conclusions from what their results tell them.*	**Activity 2**- Enquiry question- what are they trying to find out- Equipment – choose from a selection -Prediction as a whole class using the concept cartoon, Method – three steps to follow. Conclusion -what did you find out	**Activity 2**- template, vocabulary and sentence stem frames.	
14) Identify and compare suitability of different materials **Science Working scientifically Skills:**  **Science Enquiry Type: Comparative**  *Pupils will be able to use their knowledge and scientific vocabulary to explain the suitability of the material and the purpose using material properties.*	**Assessment:** **Activity 1-** look at everyday objects from immediate environment and discuss what they notice. *Are children able to use scientific vocabulary to explain properties of different materials?* **Activity 2-** Independent task of children to complete their assessment of describing the suitability of different objects made out of different materials.	**Activity 1-** everyday materials, picture cards **Activity 2-** Independent sheet for assessment.	Assessment– identify everyday materials and describe their properties using scientific vocabulary.