Springdale First School

Imagine, Believe, Achieve

Year 2 Science - Materials

Children's prior learning in this area

Understanding the World - Reception

- Talk about the different forces they can feel
- Language of force – push, pull, float, sink
- Language of materials – plastic, wood, card, paper, waterproof. Objects around us are made from different materials.
- Can compare simple similarities and differences, e.g. observing objects are made from the same or different materials.
- Name of common weather patterns – snow
- Names of the seasons

Prior learning – Year One

- Distinguish between an object and the material from which it is made.
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock 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 simple physical properties.

Cultural Capital Opportunities

Find out how a material is made, e.g. glass, fabric or metal.

Raise awareness in their community about how that material can be recycled.

Key vocabulary and glossary

Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card, cardboard rubber, wool, clay, ceramic, hard, soft, stretchy, stiff, bendy, floppy, breaks/tears, rough, smooth, shiny, dull, see through, not see through, strong, weak, breakable

Properties, shape, absorbent, transparent, rigid, flexible, fragile, brittle

push/pushing, pull/pulling, twist/twisting, squash/squashing. Bend/bending, reflective, non-reflective, durable, opaque,

Enquiry Question How can recording results help us answer a question?	**Enquiry Question What makes a material suitable for an object?**	**Enquiry Question Why are different materials used for an object?**
Working scientifically skill Gather and record results; Interpret the results – answer the question **Enquiry type:** Identifying, grouping and classifying	**Working scientifically skill** Present and report findings	**Working scientifically skill** Present and report findings
Pupils should recall Yr 1 learning regarding names of everyday materials and be able to distiniguish between an object and the material it is made from.  **Children will know** some uses of materials ***Practise:*** *Match material to its use (e.g. match a sheet of metal to cutlery; wood to a chest of drawers)* **Children will know how to** gather and record data to help answer a question. Children should know that scientists carry out investigations to answer questions. **Enquiry question:** ***Are the materials used in a home different in each room?*** They should know that to answer the question they need to look at the results they have gathered. Pupils should know that when you need to compare data, tables can be a useful way to record as you can easily compare categories side by side. ***Practise:*** *I do/We do for adding objects under material headings on board for lounge and kitchen.* ***Apply:*** *Children add objects under corect material headings for bathroom and bedroom – (cut and stick?)* *Suggested way of recording:* 		Metal	Plastic	Wood	Ceramic	Fabric
---	---	---	---	---	---
Bathroom	Taps Towel rail	Bath	Cabinet	Toilet Sink Tiles	Towel
Bedroom		Toys	Wardrobe Chest of drawers Storage units Bed frame		Mattress Pillow Duvet Soft toys Carpet | ***Deepen:*** *Model interpreting the data from the I do/we do data table using sentence stems. This will begin to touch on next lesson's learning – suitability of materials. E.g.* ***I can see that*** *wood* ***is used in*** *both a kitchen and a lounge.* ***I can see that*** *fabric* ***is used more in a*** *lounge* ***than a*** *kitchen.* ***I think this is because*** *fabric is used for objects that need to be comfortable such as a sofa and a cushion. A kitchen does not need comfortable objects because it is a place where you cook.*	Pupils should recall Yr 1 learning regarding properties of materials. E.g. definition and match to property. **Children will know:** objects are made from materials that suit what the object will be used for.  They should know suitability is due to a material's properties. They should be able to identify the properties of materials that make them suitable or unsuitable for particular purposes. (Don't compare the same object with different materials). **Children will know how to:** Present and report findings using appropriate scientific language to communicate their ideas. ***Practise:*** *Complete a table where child has to circle the properties to show why a material is suitable for the object.* ***Apply:*** *Play the chocolate teapot game. Class practise and then in small groups, turn over a material card and an object card. Can you have a _____ _____? Discuss orally, explaining why/why not, referring to properties and discussing why those properties are useful/not useful. Properties word bank/word cards should be available to refer to. Record some similar examples in book – scaffolded.* ***Deepen:*** *Why are some objects made with more than one material? Present children with some objects where more than one material is used within it – e.g. a wooden chair with padded seat, a metal cheese grater with a plastic handle, scissors etc. Discussion recorded on a flipchart.*	**Children will know:** that an object can be made out of different materials, depending on its particular use. Pupils should be able to explain why, referring to the properties' suitability for the purpose.  *E.g. metal spoon – durable and long-lasting for regular use; wooden spoon – doesn't get hot when cooking; plastic spoon for toddler – light, safe, can be made brightly coloured to be attractive. Other objects made of different materials: chairs, cups, doors, bottles, bags, shoes etc.* Pupils should use appropriate scientific language to communicate their ideas. ***Practise:*** *For a given object, match suitable materials to its particular purposes.* ***Apply:*** *For a given object, have three different purposes. Choose an appropriate material for each purpose and explain why it suits that purpose, referring to properties.* ***Deepen:*** *Which is the odd one out? Explain why. Same object, made of three different materials. E.g. wooden ball, glass ball, rubber ball. Variety of options why they could be the odd one out – e.g. glass – only one that would break as glass is fragile. Rubber ball – only one that would bounce as rubber is bouncy. Rubber ball – only one that is suitable for playing catch with.*

Enquiry Question Which material is best for making a waterproof coat?	**Enquiry Question** Why is Charles Macintosh an important scientist?
Working scientifically skills: Plan, set up and perform an enquiry; observe closely; Gather and record results; Interpret the results – answer the question **Enquiry type:** comparative testing	**Working scientifically skill:** Present and report findings **Enquiry type:** Research using secondary sources
Children will know: that when choosing what to make an object from, the properties needed are compared with the properties of the possible materials and that we can perform simple tests to help us choose. **Children will know:** that scientists carry out investigations to answer questions. They will know that there are different ways in which we could find the answer. The teacher will pose the enquiry question and explain why comparative testing is the enquiry type. The teacher will present equipment for the children and suggest one way of carrying out the investiation, modelling their thinking about why this is an effective way of carrying out the enquiry. ***Practise:*** *Children should discuss in partners and suggest alternative ways of finding out.* **Children will know how to:** use a pipette to draw up water and emit measured drops of water. **Children will know how to** observe closely and record data. They will know that when you need to compare data, tables can be a useful way to record as you can easily compare categories. ***Practise:*** *Children will practise using a pipette and emitting measured drops of water onto a paper towel, counting the drops required. They will discuss what observations will be seen if the material is waterproof/not waterproof. They will use the paper towel practise to recognise an observation where something is not waterproof.* ***Apply:*** *Children will perform their enquiry after teacher demonstrates performing and recording with one material. Children will record the data they have gathered on a prepared table.* **Children will know:** that to answer the question they need to look at the results they have gathered. ***Deepen:*** *After modelling of how to refer to results to answer the question, refer to own results and answer question. Use sentence stems, e.g. _____ is the best material for a waterproof coat. I know because…. _____ is the worst material for a waterproof coat. I know because…* ***ASSESSMENT OPPORTUNITY: assess gathering and recording data to help answer a question and use this to inform future planning,***	**Children will know** that some questions cannot be carried out by an investigation but answered through research. **Children will know** that how you present findings depends on who and what it is for. They will be given the brief that they have to present information about Charles Macintosh for a display to teach other children. The teacher will model thinking through the ways of presenting findings and indicate that writing and labelled diagram will be the best way. **Children will know** Charles Macintosh is an important scientist because he invented waterproof fabric and this provided a solution to a problem. Charles Macintosh was born in 1766 in Scotland. He invented waterproof fabric by dissolving rubber in a liquid called naptha and then spreading this on fabric and layering another piece of fabric on top, like a sandwich. His invention became very popular and he used his fabric to make waterproof coats called Mackintoshes. Even today, we still call a raincoat a Mackintosh, or a 'Mac'. ***Practise:*** *Retrieval questions for*(7) The story of Charles Mackintosh - he invented rainwear! - YouTube ***Apply:*** *Present and report findings using a scaffolded template for writing and labelled diagram.* ***Deepen:*** *How did Charles Macintosh's invention change people's lives for the better? Has it impacted our lives? (Discussion – could discuss how his invention prompted other scientists to improve waterproof fabric).*

Enquiry Question Can we change the shape of solid objects?	**Enquiry Question** Which fabric is the stretchiest fabric?
Concept Gather and record results; Interpret the results – answer the question **Enquiry type:** comparative testing	**Working scientifically skills:** Plan, set up and perform an enquiry; observe closely; Gather and record results; Interpret the results – answer the question **Enquiry type:** comparative testing
Children will know: that the shape of some solid objects made by some materials can be changed by squashing, bending, twisting and stretching Squashing happens when we use a pushing force. Stretching happens when we use a pulling force. ***Practise:*** *Use playdough to practise the actions of squahing, stretching, bending and twisting. Practise vocabulary whilst doing actions, including pushing force and pulling force.* *Opportunity to give targeted support and challenge following AFL from prior investigation.*  **Children will know:** that the shape of some solid objects can be changed by putting force onto it but it will depend on the material's properties or how the material has been processed e.g. a thin metal paper clip can bend or a plastic straw but not a metal fork handle or a plastic lego brick. ***Apply:*** *Explore the actions on different objects and fill in a table with ticks/crosses to record findings. Answer questions such as: which was the most changeable object? What properties prevent an object from changing shape?* ***Deepen:*** *Why might it be useful to use a material that can change shape once it has been made into an object?*	*Opportunity to give targeted support and challenge following AFL from prior investigation.* **Children will know:** that when choosing what to make an object from, the properties needed are compared with the properties of the possible materials and that we can perform simple tests to help us choose. **Children will know:** that scientists carry out investigations to answer questions. They will know that there are different ways in which we could find the answer. The teacher will pose the enquiry question and explain why comparative testing is the enquiry type. The teacher will present equipment for the children and suggest one way of carrying out the investiation, modelling their thinking about why this is an effective way of carrying out the enquiry. ***Practise:*** *Children should discuss in partners and suggest alternative ways of finding out.* **Children will know how to:** measure length using non-standard units only if standard units have not been taught in maths. ***Practise:*** measuring lines or objects. **Children will know how to** record data. They will know that when you need to compare data, tables can be a useful way to record as you can easily compare categories. ***Practise:*** *Recording the measurements of practise measurements.* ***Apply:*** *Children will perform their enquiry after teacher demonstrates performing and recording with one material. Children will record the data they have gathered on a prepared table.* **Children will know:** that to answer the question they need to look at the results they have gathered. ***Deepen:*** *After modelling of how to refer to results to answer the question, refer to own results and answer question. Use sentence stems, e.g. _____ is the stretchiest fabric. I know because…. _____ is the least stretchy fabric. I know because…*