Year 2

Statutory Requirements:

- 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

Working Scientifically:

- 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

Key Knowledge:

The uses we can make of materials depends upon their properties.

Elasticity– Elastic materials can be stretched and they return to their original shape (e.g. rubber and nylon). However, materials have an elastic limit, a point at which the material is permanently changed in shape.

Texture – This is the feel of a material. Smooth means that it doesn't have lumps so things slide easily on it. Rough means it has an uneven surface. Sharp means its edges cut things easily. Abrasive means that it will wear away other surfaces if rubbed against them.

Hardness – A soft material is easy to scratch or dent. Hard materials are more difficult to scratch or dent.

Strength – A strong material is one that is difficult to break. In order to test strength we need to apply a force.

Viscosity – This is the thickness and how easily things move through it.

Key Vocabulary:

- Types of materials: wood, plastic, glass, metal, water, rock, brick, fabric, sand, paper, flour, butter, milk, soil
- Properties of materials: hard/soft, stretchy/not stretchy, shiny/dull, rough/smooth, bendy/not bendy, transparent/opaque, sticky/not sticky
- Verbs associated with materials: crumble, squash, bend, stretch, twist
- Senses: touch, see, hear, smell and taste

Key Scientists:

Leo Hendrik Baekeland (1863 -1944) Belgian inventor of photographic paper and Bakelite.

Charles Goodyear (1800 – 1860) American self-taught chemist who developed vulcanised rubber.

Preparing for the Unit:

- Make sure you have plenty of materials of different types and properties available for use beforehand. You could even set up a tactile area or display in the classroom.
- Think about links using stories and rhymes where materials are appropriate or inappropriate for a job such as the Jumblies by Edward Lear.

Suggestions for Working Scientifically:

- Comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs).
- Observing closely, identifying and classifying the uses of different materials, and recording their observations.

Objectives	Possible Activities	Assessment
Identify and compare the suitability of a variety of everyday materials for particular uses.	Discuss – Why are my spinners silly? Make two types of spinners. On one there are drawings and labels of different materials – e.g. wood, plastic, metal, glass. On the other are drawings and labels of objects. Spin each of the spinners. Read out what each of them lands on. So, you might end up with 'plastic' and 'playground'. Children can talk about what they think about a 'plastic playground'. Which of its properties will make it suited to its role and which of them would not? Record The children can choose some of their favourite combinations. Each time they can record the object, the material and what they think about the combination. Ask – What do you want to know about materials? Gather children' questions about what they want to know about materials. These could be recorded in a class book.	

Objectives	Possible Activities	Assessment
Identify and compare the suitability of a variety of everyday materials for particular uses.	Survey – What are the different uses of wood? Children could have a range of picture of objects made from wood. For each picture they will need to suggest why wood was chosen, if another material would have been as good, and which materials would not have worked. Then, take the children for a walk around the school. Discover how many things are made from wood. The children could suggest reasons why wood was chosen in each of the cases. Record The children could draw each of the objects made from wood and explain why wood was chosen for these objects. Compare – Which is the best wood for making a fence? Test types of wood and boards – balsa, timber, chipboard, mdf, cardboard - to find out which would be best for making a fence. Use a carousel of activities Strength (against wind)– Place the material between two small piles of books. Using a hair dryer, find out what happens when fast air hits the wood panel. They could then try out other types of materials. How easy it is to put nails into it – Carefully try pressing drawing pins (or sharp pencils) into each material. Weight. Attach an elastic band around a piece of each material and try picking it up with only a finger and thumb. Alternatively, measure the materials using scales. How hard it is. Place the materials on the floor with a card tube stood on top. Drop small heavy metal objects down the tube and look to see if any marks are made.	

<table>
<tr><th>Objectives</th><th>Possible Activities</th><th>Assessment</th></tr>
<tr><td>Identify and compare the suitability of a variety of everyday materials for particular uses.</td><td>Survey – What are the different uses of plastic?
Take the children around the school to find out all the objects that are made from plastic. The children can take it in turns to pretend that they were the designer of the object and explain why they chose plastic for that object.

Record
Photos of the objects found can be taken and placed in the whole-class floor-book. Children's explanations can be recorded on thought bubbles and stuck around the pictures.

Classify – What are the different types of plastic?
What is plastic? Use videos or explain to the children how plastic is made by people from oil. Explore different plastic packaging and products and look at their recycling codes to sort them. What properties does each set have in common?

Apply – What can different types of plastic be used for?
Provide the children with samples of different types of plastic – for example, cling film, acetate sheets, flexible plastic sheets and acrylic. As inventors they can now suggest uses for the different plastics, explaining their reasons.</td><td></td></tr>
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<tr><th>Objectives</th><th>Possible Activities</th><th>Assessment</th></tr>
<tr><td>Identify and compare the suitability of a variety of everyday materials for particular uses.</td><td>Discuss – Which material is best at letting light through?
Provide children with a selection of materials and ask them how they can test which materials let light through them.

Compare – How much light do materials let through?
Shine torches through materials at white paper and observe which materials let light through and how much they let through, and which materials do not allow light through.

Record
Complete a table like below

<table><tr><th>Type of material</th><th>Amount of light that past through</th></tr><tr><td>Glass</td><td>Some</td></tr><tr><td>Plastic</td><td>Lots</td></tr><tr><td>Aluminium foil</td><td>Some</td></tr><tr><td>Wood</td><td>None</td></tr><tr><td>Paper</td><td>Lots</td></tr></table>
Classify – Which materials are transparent, translucent and opaque?

Introduce the children to the terms opaque, translucent, transparent and ask them to classify the materials by these.</td><td></td></tr>
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Objectives	Possible Activities	Assessment
Identify and compare the suitability of a variety of everyday materials for particular uses.	Hook – There's a hole in my bucket! Sing the song 'There's a hole in my bucket'. Discuss – How can we stop a bucket from leaking? Show the children a container with a hole in the bottom. Ask them to suggest materials that would be good at preventing water from leaking through the hole and how they could find out which is the best material for doing this. Test – Which material is best for plugging a hole? The children could measure the amount of water that goes into the container, and then measure the amount of water that passes through the hole when plugged with each material. Record Children record their findings and then suggest which material was best for plugging the bucket, explaining the properties it has (waterproof, pliable).	

Objectives	Possible Activities	Assessment
Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Discuss – What does solid mean? Begin by discussing what they think the term 'solid' means. Establish that a solid has a definite shape that remains the same unless a force is acting upon it. Hook – Let's get gooey Make some home-made goo – Using only salt, plain flour, water and cooking oil the children can make their own stretchy material. Ask them to make a variety of shapes e.g. by twisting, stretching, bending, or squashing the materials. Compare – How well can we change the shape of some solids? Do the same with other objects e.g. Plasticine, Blu Tack, elastic bands, foam sponges, rubber, paper, fabric, metal/wood, and to describe what happens. Compare and rate according to how flexible, pliable and stretchy they are.	

Objectives	Possible Activities	Assessment
Identify and compare the suitability of a variety of everyday materials for particular uses.	Apply – Which materials are best for a toy? Challenge children to design a toy and annotate their design with the materials they would use for each part and the properties that the materials have / need. Apply – Which materials are best for building a boat? Look at images of large boats together. Discuss the different materials that have been used to build the boat and why different materials are used for the different part. Give the children time to annotate an image with their ideas.	

KNOWLEDGE ASSESSMENT	EVERYDAY MATERIALS (YEAR 2)		
Target	Below	Above	Notes
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			

SKILLS ASSESSMENT	EVERYDAY MATERIALS (YEAR 2)		
Target	Below	Above	Notes
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			