SHOLING INFANT SCHOOL

Science Learning Journey Planning

What properties do different materials have?

KEY QUESTION

What are properties of materials? Which materials have certain properties? How can we compare different materials based on their properties? What are the signs of Winter and Spring?

VOCABULARY (highlighted words – children have to know and explain):
properties (*hard, soft, bendy, squishy, flexible, rigid, dull, bright, see-through (transparent, opaque), smooth, rough, strong, tough, bumpy, waterproof*), compare, group, natural, man-made, seasons (Autumn, Winter, Spring, Summer), change, year, months, weather, temperature

PRIOR LEARNING: Children will already know: the names of at least 3 materials (e.g. wood, plastic, glass, metal, rock, paper) when they are shown them. They know that an object is made from a material and are able to give at least 3 examples e.g. the chair is made from wood. They know that there are four seasons in the UK: Autumn, Spring, Summer and Winter and they have begun to learn that weather changes with the seasons and how day-length changes throughout the year.

PROJECT: TBC

NC REFERENCE

Pupils will be able to:

- 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.

Pupils will be able to (*Disciplinary knowledge):*

- Identifying and classifying

WHAT (CONTENT)

Lesson 1: What are properties of materials?

Recap: *last term, we learnt about some examples of different materials (e.g. wood, plastic, glass, metal, rock, paper) and learnt how objects are made from different materials e.g. the chair is made from wood. We are going to build on this today by thinking about how we can describe the properties of different materials.*

Retrieval Practise: *complete the stem sentences using the provided words e.g. the window is made from _____.*

Explain that this half term we are going to be thinking about how we can describe different materials. When we describe materials, we are talking about their properties. In this lesson, we will be working scientifically by identifying different materials and classifying them based on their materials – remind children that we have already done some of this when we looked at the different animal groups.

Teach the vocabulary and definition of hard and soft. Share some examples of some objects that fit these criteria, making reference to the material that they are made from. The _____ is made from _____ and it is _____. Model sorting objects into either hard or soft and check children's understanding by getting them to indicate hard or soft for a couple of objects. Send children away to sort objects.

Bring children back to do the same process for the other properties (teach vocab + definition), sending away after each set of properties for children to sort the objects (flexible and rigid, smooth and rough, transparent and opaque).

HOW (PEDAGOGY)

Lesson 1: What are properties of materials?

Children to work in mixed ability groups to sort objects according to their properties, focusing on pairs of properties at a time – hard and soft, flexible and rigid, smooth and rough, and transparent and opaque.

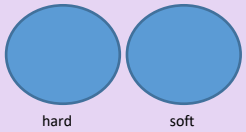
Children encouraged to verbalise using the different properties – e.g. the _____ is made from _____ and it is _____.

OUTCOME (EVIDENCE)

Lesson 1: photo evidence of children's sorting. Teacher to collect stickies for children stating the object, material and property, particularly for the lowest 20%.

Deepen: Children given additional objects to sort which don't fully fit the criteria. How would you describe these objects?

NC REFERENCE	WHAT (CONTENT)	HOW (PEDAGOGY)	OUTCOME (EVIDENCE)
Pupils will be able to: - 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. Pupils will be able to (*Disciplinary knowledge):* - Identifying and classifying - Gathering and recording data	**Lesson 2: Which materials have certain properties?** ***Recap:*** *last week, we learnt that we can describe materials based on the properties that they have. We are going to build on this today by looking at some more objects made from different materials and testing which properties they have.* ***Retrieval Practise:*** *pick one of the properties on the board and teach somebody else what it means, giving examples of materials that have that property.* Explain that today, we are going to be testing to see what properties some different materials have. Remind children of the properties that we explored last week (hard, soft, flexible, rigid, transparent, opaque, smooth, rough). Explain that we are going to gather and record data just like scientists do. Firstly, model thinking about flexibility of the materials – show children the table of objects to test. Model thinking about which material the object is made from and then testing whether the object can bend (i.e. whether it is flexible). Send children away to test some objects. Bring children back to model doing the same but testing whether something is see-through (transparent) or not (opaque). Send children away to test some objects and tick whether you could see-through the object. Introduce the property of waterproof/not waterproof and do the same process. Model writing a sentence to explain findings e.g. I found out that the pencil did not bend easily because it is rigid. I found out that you could see through the marble jar because it is transparent. **Lesson 3: Which materials have certain properties?** ***Recap:*** *last week, we were testing different objects made from a variety of materials to see whether they had certain properties. We are going to be building on this today by looking at a wider range of objects and materials and thinking about what properties they have.* ***Retrieval Practise:*** *multiple choice quiz on objects, materials and properties.*	**Lesson 2: Which materials have certain properties?** Children to test whether different objects made from a variety of materials can be bent (flexibility), whether you can see through them (transparency) and whether they are waterproof. Children to record their ideas in a pre-prepared table. **Lesson 3: Which materials have certain properties?** Children to select an object, name the material it is made from and then write a property of that material. This is a _____ (object) It is made from _____ (material) It is _____ (property)	**Lesson 2:** children to record the flexibility and transparency and ability to be waterproof of the provided objects made from a variety of materials in their table. Children to write sentences to explain their findings. Lowest 20% to have cloze procedure and can be scribed for it needed. Deepen: can you suggest some other objects/materials that would fit the criteria of being flexible or transparent? **Lesson 3:** children to name an object, material and corresponding property. Stem sentences provided to support writing, particularly for the lowest 20%. Deepen: find two objects made from different materials but that have the same property e.g. the pencil is made from wood and the key is made from metal but they are both hard.

NC REFERENCE	WHAT (CONTENT)	HOW (PEDAGOGY)	OUTCOME (EVIDENCE)
Pupils will be able to: - 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. Pupils will be able to (*Disciplinary knowledge):* - Identifying and classifying	Explain to the children that they will be selecting an object and identifying the materials they are made from and their properties. Model naming the materials the objects are made from. Then choose some words from the word bank that would best describe their properties e.g. The car is made from wood and it is hard. Children to practise verbally with a partner some of these examples. Knowledge Check: Miss Russell has had a go at writing down an object, material and its properties. Has she done this correctly? Children to name an object and its material, and then describe the material using the property language taught.		
	Lesson 4: How can we compare different materials based on their properties? ***Recap:*** *last week, we looked at different objects, the materials they were made from and the properties that they had. We are going to build on this today by grouping together materials that have got the same property and comparing materials that have got different properties.* ***Retrieval Practise:*** *odd one out (materials with the same property apart from one).* Explain that this half term, we have learnt about the properties of different materials. Explain that today we will group together materials that have got the same property. Model looking at the first set of chosen properties (hard and soft) and writing the objects in the correct place.   Knowledge Check – add some more objects into the groups (some correct and some incorrect) and get children to check whether these have been put in the right place. Children to go and sort the objects into the correct group based on which property they have – have a range of different properties that we have explored e.g. smooth, rough, transparent, opaque, flexible, rigid etc. Model writing a sentence to compare different materials e.g. The teddy is made from fabric and is soft but the ladder is made from wood and is hard.	**Lesson 4: How can we compare different materials based on their properties?** Children to sort the objects made from different materials into the correct place based on property (writing the name of the objects). Children to write sentences to compare the different materials.	**Lesson 4:** children sorting objects into the correct place based on the properties they have. Children to write sentences to compare different materials. Lowest 20% to have their ideas scribed. Deepen: can objects made from the same material have different properties?

Pupils will be able to:

- Observe changes across the 4 seasons.
- Observe and describe weather associated with the seasons and how day length varies.

Pupils will be able to (*Disciplinary knowledge):*

- Observing closely
- Gathering and recording data
- Present data

Lesson 5: What are the signs of Winter and Spring?

Recap: *last term, we learnt that there are 4 seasons in the UK and we thought about the signs of Autumn and how day length gets shorter in this season. We are going to build on this today by looking at Winter and Spring and seeing how these seasons are different.*

Retrieval Practise: *true/false statements about Autumn.*

Explain that we are in the season of Spring, and the months of the year that are in this season are March, April and May. Remind children of the sequence of the seasons – it has just been Winter (December, January and February) and after Spring, it will be Summer. Discuss how in Winter, the weather changed – the temperature fell and overnight temperatures sometimes fell low enough for it to freeze and we noticed frost and ice in the mornings. During winter, the days got shorter and the nights got longer. Winter has the shortest days and the longest nights of all the seasons. The leaves fell off of some trees. Children complete sentences about Winter.

Explain that we are now in Spring. When the seasons change from winter to spring, the temperature begins to rise, which means it gets even warmer. The days start to get longer and the nights get shorter. Plants start to grow and many flowers start to come out. Leaves begin to appear on trees and some begin to blossom.

Remind children that we are tracking a tree this year to see how it changes across the seasons. Take children outside to look at the chosen tree – they need to draw the outline of the tree whilst outside and adult to take photos using iPad. When the children come back inside, they can look at the photos to add more details.

Plenary: tell your partner three signs of Spring.

Lesson 5: What are the signs of Winter and Spring?

Discuss the signs of Winter. Children to complete the sentence stems about the signs of Winter.

In Winter, the leaves _____.

In Winter, the weather gets _____.

In Winter, the day gets _____.

Discuss the signs of Spring. Take children out to look at a chosen deciduous tree and talk about what they notice about the tree in Spring. Children to sketch their tree and take photos.

Children to complete the sentence stems about the signs of Spring.

In Spring, the leaves _____.

In Spring, the weather gets _____.

In Spring, the day gets _____.

Lesson 5: Children to draw a picture of the chosen tree. Children to complete the sentence stems to show their understanding of Winter and Spring. LA: provide with options of pictures that represent Winter and Spring and they have to select the correct ones.

Deepen: compare Spring with Winter – how has the weather/day length/plants changed?

Sticky Knowledge - All children will:

1. I know the simple properties of different materials e.g. hard, soft, flexible, squishy, strong, see-through
2. I know how to group materials that have the same property.
3. I know how to compare materials that have different properties.
4. I know that there are four seasons in the UK: Autumn, Spring, Summer and Winter.
5. I know that weather changes with the seasons and know how day-length changes throughout the year.