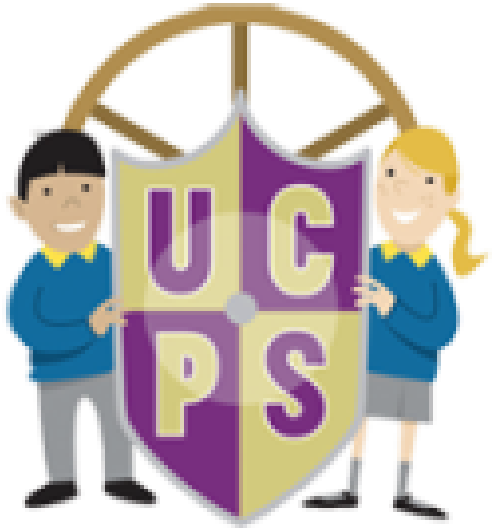


Science in Year 2

Working Scientifically

Year 1/ 2

Working Scientifically Skills

Key stage 1 programme of study – years 1 and 2

Working scientifically

Statutory requirements

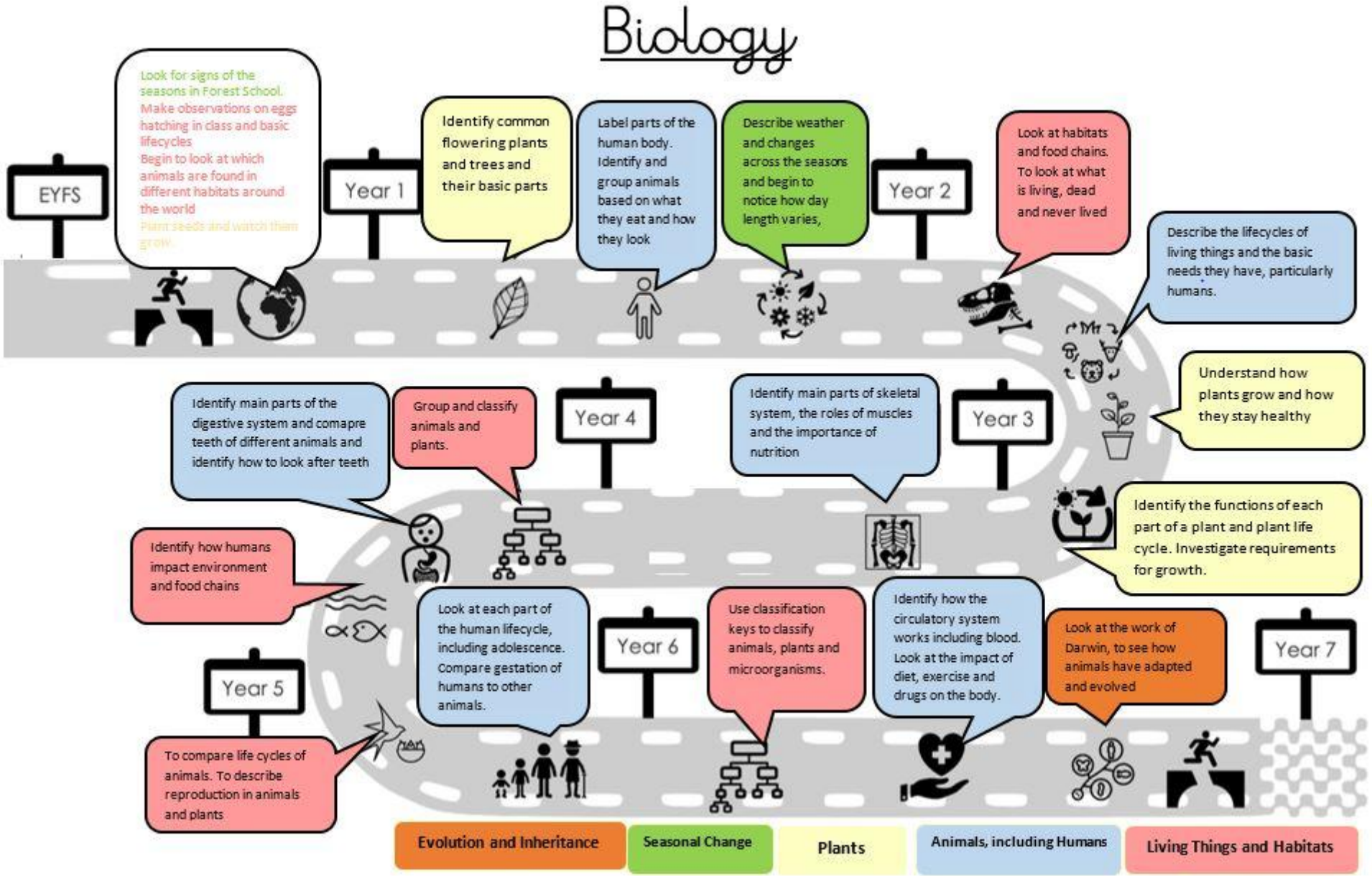
During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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.

Children must…

- Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science
- Know that we can use magnifying glasses to observe objects closely
- Know that we can test our questions to see if they are true
- Know that objects can be identified or sorted into groups based on their observable properties
- Know that we can write down numbers and words or draw pictures to record what we find

Biology


EYFS
Look for signs of the seasons in Forest School.
Make observations on eggs hatching in class and basic lifecycles
Begin to look at which animals are found in different habitats around the world
Plant seeds and watch them grow.
Year 1
Identify common flowering plants and trees and their basic parts
Label parts of the human body. Identify and group animals based on what they eat and how they look
Describe weather and changes across the seasons and begin to notice how day length varies,
Year 2
Look at habitats and food chains. To look at what is living, dead and never lived
Describe the lifecycles of living things and the basic needs they have, particularly humans.
Year 3
Understand how plants grow and how they stay healthy
Identify the functions of each part of a plant and plant life cycle. Investigate requirements for growth.
Identify main parts of skeletal system, the roles of muscles and the importance of nutrition
Year 4
Identify main parts of the digestive system and comapre teeth of different animals and identify how to look after teeth
Group and classify animals and plants.
Identify how humans impact environment and food chains
Year 5
To compare life cycles of animals. To describe reproduction in animals and plants
Year 6
Look at each part of the human lifecycle, including adolescence. Compare gestation of humans to other animals.
Use classification keys to classify animals, plants and microorganisms.
Identify how the circulatory system works including blood. Look at the impact of diet, exercise and drugs on the body.
Year 7
Look at the work of Darwin, to see how animals have adapted and evolved
Evolution and Inheritance
Seasonal Change
Plants
Animals, including Humans
Living Things and Habitats

Year 2	Area of NC: Animals, including humans (Biology)

Animals, including humans

Statutory requirements

Pupils should be taught to:

- notice that animals, including humans, have offspring which grow into adults
- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

<u>Pupils do not need to be taught the following content, which they will learn in later year groups:</u>

InY3 children will learn in more detail about a healthy diet and its nutritious impact on the human body, they will introduce the name of the specific food groups when doing this.

In Y5 children will look at how humans develop in more detail, looking at areas like puberty and how our body changes when we get to an elderly age.

In Y5 children will also look at the difference between animal lifecycles and how they differ for mammals, birds etc and they will look at the process of reproduction in animals and plants.

In Y6 children will look at exercise and the impact on the human body (in particular the heart)



- PMI – What if chocolate was considered healthy like fruit?
- PMI - What if chicken eggs hatched a dinosaur?
- Odd one out – pasta, orange and chocolate cake
- PMI – What if we didn't exercise?

PMI – What would it be like if we could always eat the snacks we wanted to?

SEE ALSO: RETRIEVAL IDEAS



- Explain that animals, including humans, have offspring which grow into adults
- Describe the life cycles of some living things, including humans
- Identify and describe the basic needs of animals, including humans, for survival
- Explain why exercise is important.
- Discuss the Eat Well Plate and what a balanced diet might look like.

TIER 3 VOCABULARY:

Offspring, survival, hygiene, exercise, oxygen, balanced diet, lifecycle, germs.

SEE ALSO: https://www.stem.org.uk/primary/resources

Learning Objective	Objective Broken Down into Differentiation		
	Below	***Expected***	***Above***
Explain that animals, including humans, have offspring which grow into adults	Pupil can match offspring to adult parents	Pupil recognises that humans are animals and all animals have young/offspring/babies which in time become adults	Pupil can independently explain and sort animals into different ways they are born (babies, eggs, frogspawn etc) as well as recognise that some young look similar to their adult form while others do not e.g. tadpoles and frogs.
Describe the life cycles of some living things, including humans	With support, pupil can sort the lifecycles of humans and another basic animal into the correct order.	Pupil can describe the life cycle of various common animals, including humans, and sequence them correctly using appropriate names for the stages. Pupil can describe the growth of the animal independently using the lifecycle.	Pupil compares the human lifecycle to that of another animal identifying any similarities and differences
Identify and describe the basic needs of animals,	Pupil can state the basic needs that all animals have for survival (water, food, air)	Pupil describes the basic needs of all animals, including humans, for survival and begins to recognise the reasons for these needs	Pupil is beginning to research and compare the basic needs of different animals and show their

including humans, for survival			understanding by explaining how to look after babies/animals (pets).
Begin to understand and describe the importance of exercise for humans	Pupil is beginning to recognise why exercise is important to humans	Pupil understands that exercise is important to humans to keep their body healthy	Pupil can begin to explain what would happen if humans did not exercise
Begin to understand and describe the importance of eating the right foods for humans	Pupil can sort healthy and unhealthy food	Pupils recognise that humans need a balanced diet to stay healthy	Pupil can begin to explain what would happen if humans had too much unhealthy food in comparison to a balanced diet
Begin to understand and describe the importance of hygiene for humans	Pupil can give simple examples of humans having good hygiene e.g. brush teeth and wash hands	Pupil can understand and give simple reasons for humans having good hygiene e.g. germs and other diseases can be spread by poor hygiene	Pupil can begin to explain how health might be affected if we did not have good hygiene and pupil can give some preventive ways to stop the spread of germs

Year 2	Area of NC: Living Things and Habitats (Biology)

Living things and their habitats

Statutory requirements

Pupils should be taught to:

- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including micro-habitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

<u>Pupils do not need to be taught the following content, which they will learn in later year groups:</u>

Y4 will look at more complex food chains using the vocab of producer, prey and predator. as well as begin to classify and group animals and plants in the local and wider environment



- Odd one out – cat, controller and car
- PMI – What if a polar bear lived in the desert?
- Is a flame alive?
- How do you know the person sitting next to you is alive?

SEE ALSO: RETRIEVAL IDEAS

Can you still?



- Know the difference between wild and domestic animals and how to care for some.
- Name some common animals and plants.
- Understand what omnivores, carnivores or herbivores are, what they eat, examples.
- Identify and name a range of habitats, including micro habitats, and name animals and plants found within them.
- Identify that most living things live in habitats to which they are suited and their basic needs met.

TIER 3 VOCABULARY:

Habitat, microhabitat, reproduction, decay, nutrients, consumption, food chain, environment, source.

SEE ALSO: https://www.stem.org.uk/primary/resources

Learning Objective	**Objective Broken Down into Differentiation**		
	Below	***Expected***	***Above***
Sort and compare the differences between things that are living, dead, and things that have never been alive. **Forest school**	Pupil can identify things that are living and dead	Pupil can identify most things as living, dead and never been alive	Pupil begins to use key features to identify living, dead and never been alive – e.g. living things grow, reproduce, use their senses, feed, move (they do not need to use all but may notice similarities of those things that are living) ***no need for full MRS GREN***

Identify and name a range of habitats, including micro habitats, and name animals and plants found within them. **Forest school**	Pupil can name some basic habitats and the names of some animals or plants found there	Pupil can name a wide range of habitats and some micro-habitats (local and globally) together with the names of animals/plants found here	Pupil can independently compare and contrast habitats and name a range of pants and animals found there
Identify that most living things live in habitats to which they are suited and their basic needs met	Pupil understands that a habitat is where an animal or plant lives when basic needs are met	Pupil can explain how a habitat provides the basic needs for an animal or plant and talk about how the features of these animals and plants make them suited or not suited to a habitat. Pupil begins to recognise that animals/plants may adapt to live in a habitat / micro-habitat	Pupil can provide multiple reasons, with scientific vocabulary, as to why animals or plants are suited to a habitat. Pupil can begin to describe the impact upon animals/plants of changing a basic need in a habitat/micro-habitat
Describes how animals obtain their food from plants and other animals	Pupil can, with support, construct a simple 3 part food chain that starts with a plant and has the arrows pointing in the correct direction	Pupil can independently construct a food chain that starts with a plant and has the arrows pointing in the correct direction and use it to explain what animals eat. Pupil begins to understand that plants make their own food and animals get their food by eating plants and/or other animals	Pupil can identify and/or create a range of food chains to show how animals obtain their food Pupil understands that plants make their own food and animals get their food by eating plants and/or other animals

Year 2	Area of NC: Plants (Biology)

Plants

Statutory requirements

Pupils should be taught to:

- observe and describe how seeds and bulbs grow into mature plants
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Pupils do not need to be taught the following content, which they will learn in later year groups:

In Year 3 children will learn the functions of different parts of a plant, they will also look at further conditions needed for plants to survive and grow well (air, room to grow and nutrients in soil).

In Y3 they will learn about the lifecycles of plants and how water is transported in plants.



- Odd one out – dandelions, leaves and daisies
- Odd one out – grown plant, bulb, seed
- PMI- What if plants could live without water?
- Odd one out – root, stem, flower
- Odd one out - Sunflower seed, sunflower seedlings and an amaryllis bulb

SEE ALSO: RETRIEVAL IDEAS



- Know the parts of a plant and trees,
- Know the difference between deciduous and ever green trees.
- Identify, compare, sort and group a range of seeds and bulbs.
- Observe and describe how seeds and bulbs grow into mature plants over time
- Begin to understand that plants grow in different ways.
- Name some of the things plants need to grow and stay healthy

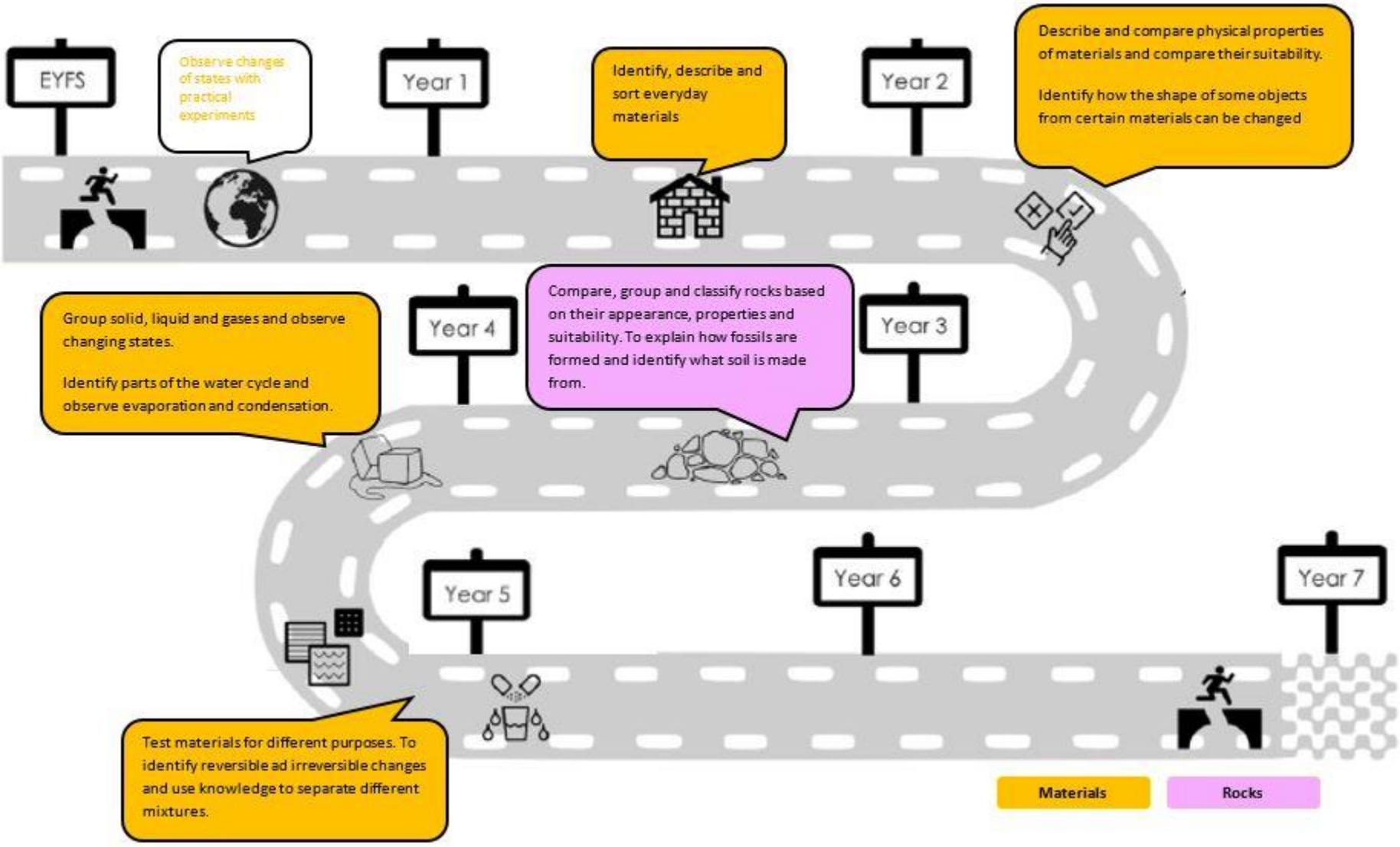
TIER 3 VOCABULARY:

Seedling, bulb, germinate, mature plant, growth, temperature, suitable conditions.

SEE ALSO: https://www.stem.org.uk/primary/resources

Learning Objective	Objective Broken Down into Differentiation		
	Below	***Expected***	***Above***
Identify, compare, sort and group a range of seeds and bulbs.	Pupil, with support, can say what they notice about seeds and bulbs	Pupil can identify the difference between seeds and bulbs and sort them accordingly	Pupil can spot similarities and difference between bulbs and seeds and give a number of ways to sort them
Observe and describe how seeds and bulbs grow into mature plants over time **Forest school**	Pupil can identify that seeds or bulbs can grow into plants when conditions are suitable	Pupil can describe with appropriate vocabulary the different stages of plant growth from a seed/bulb to mature plant. Pupils can use the word germinate correctly.	Pupil may be able to suggest how changing the conditions (water, light and temperature) may affect the growth of a plant
Begin to understand that plants grow in different ways.	Pupil recognises that plants can grow at different rates	Pupil can measure the rate of growth of a range of plants and notice patterns and relationships in different growth	Pupil can accurately measure the rate of growth of a range of plants and giving reasons for the differences in rate of growth they note
Name some of the things plants need to grow and stay healthy	Pupil can identify one condition a plant needs to grow and be healthy Pupil understands a seed/bulb will not grow if growing conditions are not correct	Pupil can identify most conditions needed for a plant to grow and be healthy (water, light and a suitable temperature) but may not name all.	Pupil can identify all conditions needed for a plant to grow and be healthy (water, light and a suitable temperature). They understand that seeds don't need the same conditions to grow as a seedling

Chemistry


EYFS
Observe changes of states with practical experiments
Year 1
Identify, describe and sort everyday materials
Year 2
Describe and compare physical properties of materials and compare their suitability.
Identify how the shape of some objects from certain materials can be changed
Year 3
Compare, group and classify rocks based on their appearance, properties and suitability. To explain how fossils are formed and identify what soil is made from.
Year 4
Group solid, liquid and gases and observe changing states.
Identify parts of the water cycle and observe evaporation and condensation.
Year 5
Test materials for different purposes. To identify reversible ad irreversible changes and use knowledge to separate different mixtures.
Year 6
Year 7
Materials
Rocks

Year 2	Area of NC: Uses of Everyday Materials (Chemistry)

Uses of everyday materials

Statutory requirements

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.

<u>Pupils do not need to be taught the following content, which they will learn in later year groups</u>:

In Year 4 and Year 5 they will learn about changes in states of solids, liquids and gases.

Irreversible changes do not need to be looked at until Year 5.



- Odd one out - Umbrella, jacket, hat
- Odd one out – card, glass window and brick
- PMI – What If all materials were waterproof?
- PMI – What if you could only build houses from glass?
- Odd one out – fluffy socks, paper clip and elastic band
- PMI – What if all beds were made from cotton wool?
- Odd one out - Plastic spoon, ball of wool and a wooden block



- Explain the difference between transparent, translucent and opaque.
- Identify how the shape of solid objects made from some materials can be changed
- Describe and compare the physical properties of a variety of everyday materials

• PMI - An umbrella made of glass, A house made of steel, Windows made of wood • PMI – What if humans were 100% waterproof? • PMI – What if glass was as strong as steel? **SEE ALSO:** RETRIEVAL IDEAS	• Identify and compare the uses and suitability of a variety of everyday materials (including wood, metal, plastic, glass, brick, rock, paper and cardboard)

TIER 3 VOCABULARY:

Conductor, friction, deformation, flexible, rigid, translucent, transparent, opaque, reflective, waterproof, stretch, twist, suitability, surface.

SEE ALSO: https://www.stem.org.uk/primary/resources

Learning Objective	**Objective Broken Down into Differentiation**		
	Below	***Expected***	***Above***
Identify the difference between transparent, translucent and opaque	With support, pupil can explain what transparent, translucent and opaque is.	Pupil can independently use the three terms correctly and identify objects that are transparent, translucent and opaque	Pupil can begin to explain when an object that is transparent, translucent or opaque would be suitable or unsuitable.
Identify how the shape of solid objects made from some materials can be changed	Pupil recognises that the shape of some solid objects can be changed and can use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those that cannot.	Pupil can use appropriate language about properties of materials to describe the change of shape of some solid objects when pressure is applied in different ways	Pupil can compare and contrast, using correct vocabulary, the materials that the shape can change as well as identify which materials cannot be changed back afterwards

Describe and compare the physical properties of a variety of everyday materials	Pupil can group objects made from similar materials based on their properties (may focus on recapping words/materials/properties from Y1)	Pupil can use their knowledge of materials to suggest different ways they could be grouped e.g. hardness; flexibility (a wider range of materials and properties from Y1) Pupil can recognise that a material may come in different forms which have different properties E.g. plastic, paper etc.	Pupil can describe why it is helpful to scientists to be able to classify and group materials according to their properties
Identify and compare the uses and suitability of a variety of everyday materials (including wood, metal, plastic, glass, brick, rock, paper and cardboard)	Pupil understands that some materials can be used for a variety of purposes Pupils begin to suggest which material would be suitable and which would not for a given scenario based on its properties. Pupil can, with support, follow a method to test a material for its suitability	Pupil can explain, using the key properties, what a material may be used for. Pupil can explain, using the correct vocabulary, the properties of materials which make them suitable for a purpose Pupil can begin to choose an appropriate method for testing a material for a particular property Can use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat?	Pupil can describe more than one use for a given material using accurate scientific vocabulary. Pupil can demonstrate how a wide range of materials are suitable for the same purpose and explain with reasoning which is the most suitable and why Pupil can use test evidence to suggest which material is the most suitable and which is the most unsuitable for an object, giving reasons for their conclusions