

Autumn Scheme of learning **Year 1**

The White Rose Science schemes of learning

Schemes of learning

Our research-based schemes of learning are designed to teach the aims and objectives of the National Curriculum.

Content over time

Our schemes are written for content rather than time. This ensures that children are developing a solid understanding of scientific processes and concepts.

Substantive knowledge

Our schemes of learning ensure full coverage of the scientific content as stated within the National Curriculum.

Disciplinary knowledge (Working scientifically)

Each step has a working scientifically skill focus. Working scientifically skills are developed across years and year groups.

Year 1 Autumn term Block 1 – The human body Step 1	
Identify and name parts of the human body	
Notes and guidance In Reception, or at home, children may have identified certain parts of the body through traditional songs and rhymes. In this small step, children build on this knowledge to identify and name a more extensive range of parts of the body. By the end of this step, children need to be able to identify the head, neck, arms, elbows, hands, legs, knees, feet, face, ears, eyes, nose, hair, mouth and teeth. Over the next two steps, children complete a simple pattern-seeking enquiry to explore whether the oldest children have the longest feet. At this point in the term, children have not yet looked at measuring length in centimetres. It is therefore more appropriate to draw around feet so that children can put the outlines in order from longest to shortest.	Key questions - Where is your _____? - How many eyes do you have? - How many ears does your partner have? - Do you have more toes or teeth? - How many knees/elbows do you have? - Are your feet longer or shorter than your partner's? Enquiry question - Do the oldest children have the longest feet?
Things to look out for - Children may think that age determines size. - Children can use different names for the same part of the body. For example, the area between the chest and hips can be called the stomach, tummy or belly.	National curriculum links - Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Working scientifically – Asking simple questions and recognising that they can be answered in different ways.

Working practically

Research shows that children learn best from a 'hands on and heads on' approach whereby practical activities are engaging and relevant. This features throughout our schemes of learning.

Experiments

Children carry out experiments following a plan, investigate and evaluate (KS2) model. Children plan their investigations, carry out their experiments and conclude and provide evaluations.



Modelling

Modelling is used wherever possible to explain abstract scientific ideas and concepts. This makes it easier for children to apply their knowledge and improve their understanding. In Upper KS2, children are introduced to the limitations of models.

Outdoor learning

Children are encouraged to work outside the classroom wherever possible to help provide relevancy to scientific concepts.



Scientific enquiry

There is one enquiry question per block covering the five enquiry types. This allows children to develop answers to a range of relevant scientific questions.



Teacher guidance

Every block in our schemes of learning is broken down into manageable small steps, and we provide comprehensive teacher guidance for each one. Here are the features included in each step.

Notes and guidance

that provide an overview of the content of the step and ideas for teaching, along with advice on progression and where a topic fits within the curriculum.

Things to look out for

which highlights common mistakes, misconceptions and areas that may require additional support.

Year 3 | Autumn term | Block 1 – Skeletons | Step 1

Identify and name bones in the human body



Notes and guidance

In this small step, children explore the human skeleton for the first time by identifying and naming bones. There are lots of bones in the human skeleton, many of which have complex names. The focus of this small step is on the skull, femur, pelvis, spine and ribcage. Some of these are made up of several bones, which will be covered in more detail in the following steps. By the end of this step, children should be able to identify, name and locate these bones in the human body.

The enquiry question for this block is "How can animals be sorted and grouped based on their skeletons?" This is an identifying, classifying and grouping enquiry. Within this step, children can create relevant questions to begin the enquiry process.

Things to look out for

- Children may think that the skeleton is one large bone, rather than lots of bones.
- Children may believe that bones in the body do not have specific names, for example, they may think all bones in the leg are called "leg bones".
- Children may think that the arms and legs have one long bone, rather than multiple bones.

Key questions

- How many bones are there in the human skeleton?
- Where is the skull?
- Where is the femur?
- Where is the pelvis?
- Where is the ribcage?
- Where is the spine?

Enquiry question

- How can animals be sorted and grouped based on their skeletons?

National curriculum links

- Identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- **Working scientifically** – Asking relevant questions and using different types of scientific enquiries to answer them.

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Key questions that can be posed to children to develop their scientific understanding and reasoning skills.

Enquiry questions are highlighted when children are undertaking the scientific enquiry process. Each block has one enquiry question and there is coverage of the five enquiry types across a year.

National Curriculum links

to indicate the objective(s) being addressed by the step.

Teacher guidance

During **experiment steps**, experiment variables and **equipment** are clearly identified.

The **key vocabulary** section highlights essential vocabulary and definitions.

Relevant and purposeful **practical ideas** to encourage a 'hands on and heads on' approach.

Year 5 | Autumn term | Block 1 – Forces | Step 3

Plan – parachute experiment

Experiment variables

- independent variable** (what is changed) – the size of the parachute
- dependent variable** (what is measured) – the time it takes for the parachute to fall to the ground
- controlled variables** (what is kept the same) – the material that the three parachutes are made from, the object that is attached to both parachutes, and the height that the parachutes are dropped from

Equipment needed

- plastic bags
- scissors
- 12 pieces of string 30 cm each
- ruler
- 12 paper clips
- stopwatch
- scales
- modelling clay to attach to the strings

Practical activity

- Put children in small groups.
- Give each group the equipment needed for the experiment.
- Children should identify what the equipment is and why it is used within the experiment.

Planning sentence stems

- I predict that ...
- I think this will happen because ...
- The independent/dependent variable is ...
- The controlled variables are ...

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Sentence stems to help promote the use of scientific talk in the classroom.

Year 3 | Autumn term | Block 1 – Skeletons | Step 2

Functions of the skeleton

Key vocabulary

- skeleton** – a collection of bones that provides protection and supports movement

Practical ideas

- Children work in pairs to draw around the outline of their partner's body on a large sheet of paper.
- Children then correctly identify and label the locations of the bones learnt in Step 1

Children should add labels to describe the functions of each of the bones.
(Note: If drawing around a partner's body is not appropriate, a printed outline could be used.)

Factual knowledge

- Bones have specific functions.
- The skull protects the brain.
- The femur helps humans to stand and move.
- The pelvis helps to support the spine.
- The spine helps humans to twist and stay upright.
- The ribcage protects the heart and lungs.

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Factual knowledge written in clear, child-friendly language.

Symbols

Key Stage 1 and 2 symbols

The following symbols are used to indicate:



Children are answering an enquiry question.



Highlights when and how health and safety measures need adhering to.



An outside activity or one that uses resources from nature.



Children talk about and compare their answers and reasoning.



A question that should really make children think. The question may be structured differently or require a different approach from others and/or tease out common misconceptions.

Sustainability

Sustainability blocks are highlighted with a leaf symbol.



Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	The human body					Materials						
Spring term	Animals					Caring for the planet						
	Plants					Growing and cooking						
Summer term	Planting A					Planting B						
	Planting C					Consolidation						

Note: Sustainability blocks (Caring for the planet, Growing and cooking, and Planting A/B/C) are highlighted with a leaf symbol.

Each year group has two blocks dedicated to sustainability. We want to help children to:

- Understand the current issues around sustainability and climate change.
- Identify that they have a role to play in creating a more sustainable future for themselves and others.
- Think of ways to make a positive impact on their local and wider environments.
- Have a positive and proactive mindset when it comes to making sustainable changes.

Premium supporting materials

Worksheets to accompany every small step, providing relevant practice questions for each topic that will reinforce learning at every stage.

Identify and name bones in the human body

1 Here is Mo.

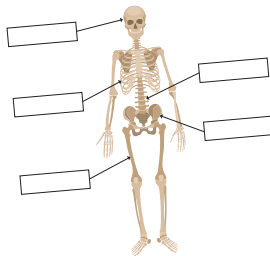


Label the parts on Mo's body.

head leg arm
shoulder hand knee

2 Use the words to complete the labels on the skeleton.

ribcage skull femur spine pelvis



3 Diddy has been looking at the human skeleton.

The ribcage is part of the leg.

Do you agree with Diddy? Explain your answer.

4 Match each part of the skeleton to its name.



femur
skull
spine
ribcage
pelvis

5 Use the words to complete the sentences. You can use each word only once.

skull skeleton femur

a) The collection of bones that supports a human body is called a _____.

b) The long bone in the upper leg is called the _____.

c) The bones in the head are called the _____.

6 Is the statement "always", "sometimes" or "never" true?

All human skeletons are the same.

Circle your answer.
always sometimes never

Explain your answer.

7 Annie and Kim are talking about human skeletons.

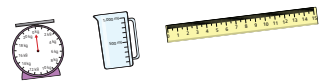
Annie: A skeleton is one large bone.
Kim: There are 206 bones in a typical skeleton!

Who do you agree with? Talk about it with a partner.

Investigate - parachute experiment

1 Max is setting up the equipment for his experiment. Circle the correct piece of equipment for each purpose.

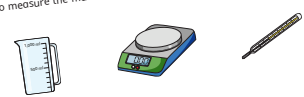
a) To measure the length of the sides of the parachute.



b) To measure the time taken for the parachute to drop.



c) To measure the mass of the modelling clay.



Evaluate - parachute experiment

1 The parachute is falling to the ground.



Air resistance is a type of friction force on an object moving through air.

A
B

Which letter shows air resistance acting on the parachute? _____

2 Circle the parachute that hit the ground first in your experiment.



3 Write your experiment prediction below.

4 a) Was your prediction correct? _____
b) How do you know? _____

5 Annie and Amir completed a parachute experiment.

Parachute length (cm)	Time taken in seconds
10	0.46
20	18.23
30	0.98

a) Circle the anomalous result in Annie and Amir's data.
b) In your own words explain what is meant by an anomalous result.

Meet the characters

Our class of characters brings the schemes to life and will be sure to engage learners of all ages and prior attainments. Follow the children and their class pet, Diddy the duck, as they explore new scientific concepts and ideas.



Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	The human body					Seasonal changes (autumn)	Materials					Seasonal changes (winter)	
Spring term	Planting A	Animals						Caring for the planet		Seasonal changes (spring)	Planting B	Consolidation	
Summer term	Plants					Planting C	Growing and cooking		Seasonal changes (summer)	Consolidation			

Autumn Block 2

Seasonal changes (autumn)

Small steps



Step 1

Changes in autumn

Step 2

Collect and record data

Key resources

Step 1 – Changes in autumn

- objects associated with autumn (e.g. conkers and different coloured leaves)

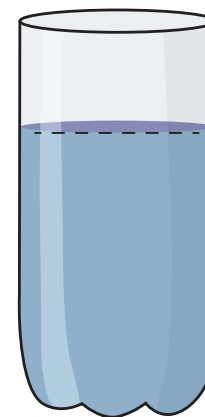


Step 2 – Collect and record data

- large display chart to record weather pictorially

Mon	Tues	Wed	Thu	Fri	Sat	Sun

- a two-litre bottle with the top cut off to make a rain gauge



Changes in autumn



Notes and guidance

In this block, children look at seasonal changes in autumn. They will explore changes related to the other seasons later in the year. Children should understand that there are four seasons in a year. Children should observe changes across a year and make comparisons between the seasons based on weather patterns, the hours of daylight and changes in plant and animal life. It is essential that children use their local area throughout the year to help them identify similarities and differences between the seasons.

In this step, children learn that, in autumn, some trees lose their leaves, the hours of daylight gradually decrease and the weather starts to become cooler. They are introduced to the enquiry question that will be revisited throughout the year.

In this block, children do not need to use the terms “deciduous” and “evergreen” trees as these terms are introduced later in the year. They can observe that the leaves of some trees change colour and fall off and some do not.

Things to look out for

- Children may think that if the leaves fall from a tree, then the tree is dead. They should understand that it is a process that happens to some trees annually.

Key questions

- How many seasons are there in one year?
- What are the names of the seasons?
- What happens to some trees in autumn?
- What is the weather like in autumn?
- How does the daylight change in autumn?
- What clothes would you wear outside in autumn?
- How are the hours of daylight changing?

Enquiry question

- What are the main changes in each season?

National curriculum links

- Observe changes across the four seasons.
- **Working scientifically** – Asking simple questions and recognising that they can be answered in different ways.

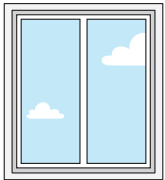
Changes in autumn

Key vocabulary

- **autumn** – the season after summer and before winter



- **daylight** – natural light from the Sun



- **night** – a period of darkness each day when there is no daylight



- **weather** – the conditions outside



- **season** – one of four parts of the year

Practical ideas

- Gather objects associated with autumn.



Ask children to feel the objects and observe them closely.

What questions do they have about the objects?

When might they see these objects outside?

- Take children outside to explore their local area.

What seasonal changes can they identify?

Repeat this task on different days to experience different weather conditions.

- Sing songs about the weather to help children learn how to describe the weather.

Factual knowledge

- There are four seasons in one year.
- The seasons are spring, summer, autumn and winter.
- In autumn, the hours of daylight start to become shorter and the nights start to become longer.
- Some trees lose their leaves in autumn.

Collect and record data

Notes and guidance

In this small step, children collect data during autumn. They describe and record the changes in weather over a week and comment on how this affects the clothing that is appropriate for each day. They also discuss how the hours of daylight are gradually decreasing and the nights are becoming longer.

As the year progresses, children should use this data to compare the similarities and differences between different seasons. It is important that children are given plenty of opportunities to do practical activities. They should use their outdoor space as much as possible to explore conditions associated with autumn.

Things to look out for

- Children may have preconceptions about weather patterns in certain seasons. Allow children to record the weather over a week to challenge any misconceptions they may have.
- Children may find it difficult to identify that the amount of daylight changes throughout a year. Link this with the idea that it is becoming darker when they wake up and as they leave school.

Key questions

- What are the names of the seasons?
- What happens to some trees during autumn?
- What is the weather like today?
- Is the weather the same as yesterday or different?
- How many times has it rained this week?
- How many days has it been sunny this week?
- How often has it been windy this week?
- How are the hours of daylight changing?

Enquiry question

- What are the main changes in each season?

National curriculum links

- Observe and describe weather associated with the seasons and how day length varies.
- **Working scientifically** – Gathering and recording data to help in answering questions.

Collect and record data

Key vocabulary

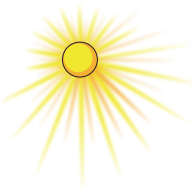
- autumn** – the season after summer and before winter



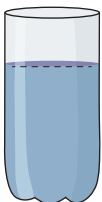
- rainfall** – the amount of rain that falls in one place



- weather** – the conditions outside



- rain gauge** – equipment that measures how much rain has fallen



Practical ideas

- Create a large visual table to add to the classroom wall.

Mon	Tues	Wed	Thurs	Fri	Sat	Sun

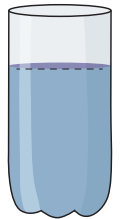
Each day, children draw a picture to record the weather.

Leave this data on display so children can use it to compare weather in later blocks.

- Make a rain gauge.

Leave an empty container outside for a week. Weigh it down so it does not blow over in the wind.

After a week, children mark the level of water on the container to show the amount of rainfall during that week in autumn.



Use the same rain gauge in other seasons to allow children to see if there is more or less rainfall.

Factual knowledge

- There are four seasons in one year – spring, summer, autumn and winter.
- In autumn, the hours of daylight start to become shorter and the nights start to become longer.
- The weather often changes in autumn.