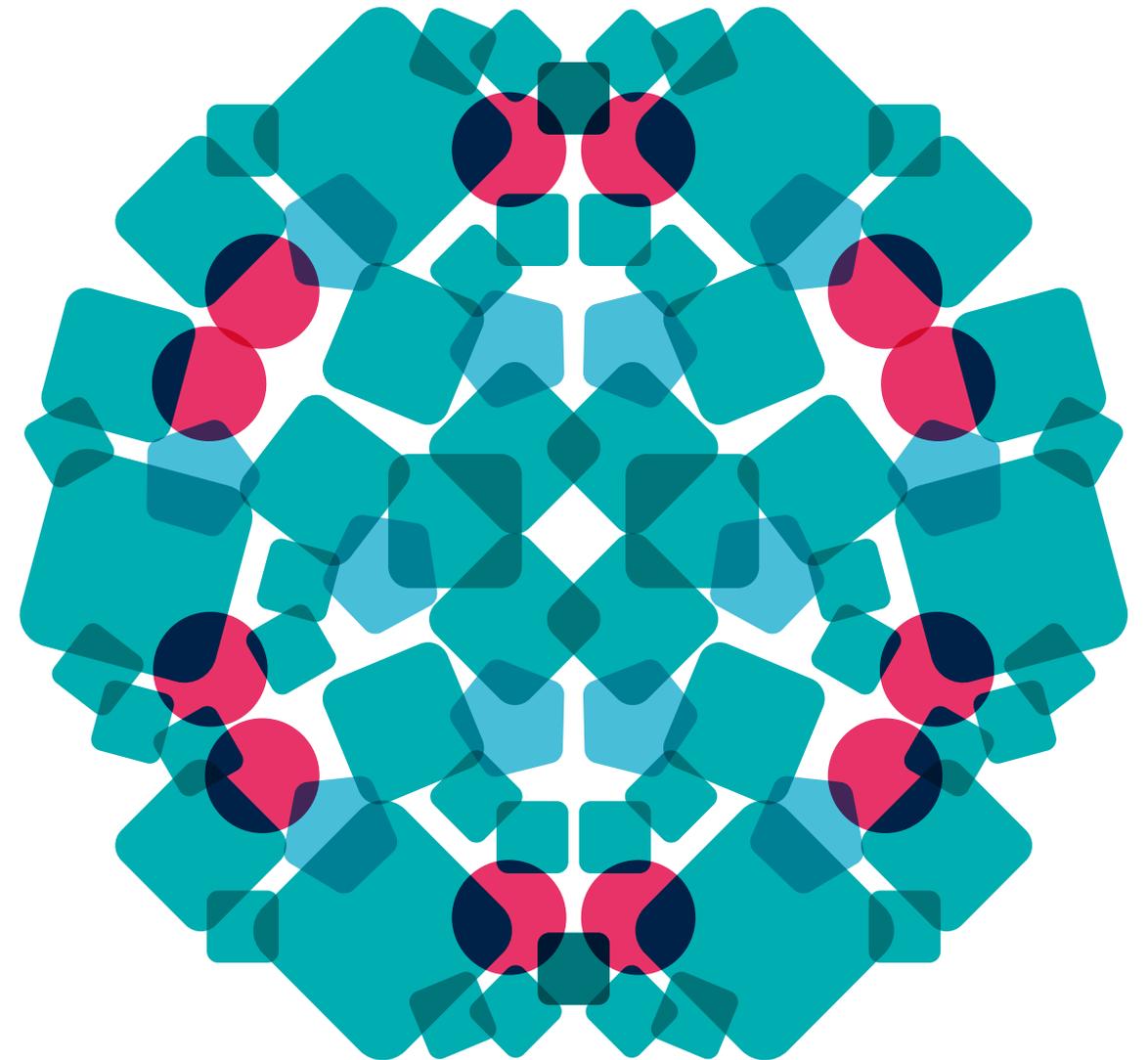


Oxford
*International
Curriculum*

Science

Subject Guide



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I see students who question the world around them with a sense of excitement and curiosity

The Oxford International Curriculum is a new approach to teaching and learning focused on wellbeing, which places joy at the heart of the curriculum and develops the skills your learners need for their future academic, personal and career success.

Science is one of six subjects that make up the curriculum, part of a coherent and holistic approach that ensures continuity and progression across every student's educational journey.

Four strands encompass the full spectrum of scientific skills and understanding that students need to develop at primary and lower secondary level:

- Biological science
- Chemical science
- Physical science
- Investigative science

What does the Oxford International Curriculum for Science offer you?

- An enquiry-based curriculum, with problem-solving and real-world applications at its heart.
- A practical framework with a strong investigative strand, encouraging students to question the world around them, and to engage with topical environmental and scientific issues.
- A strong emphasis on research skills that equips students with the skills they need to be the scientists of the future.



Curriculum at a glance

The Oxford International Curriculum for Science offers end-to-end teaching and learning support with year-on-year progression of learning outcomes for nine year groups.

The spiral development model means that learning themes are revisited each year, building on previous achievement, and giving coherence and structure to the learning journey.

Compact, concise and accessible learning outcomes are easy to use for today's busy educators.

Strand	Year 1	Year 7
	Students can:	Students can:
1 Biological science	<p>1.1a: Find out about the basic parts of flowering plants and trees</p> <p>1.1b: Name and compare common animals, including vertebrates</p> <p>1.1c: Name the basic parts of the human body</p>	<p>7.1a: Explain how cells are organized in multicellular plants and animals</p> <p>7.1b: Explain how the human skeleton provides support, protection and movement</p> <p>7.1c: Describe the main steps that take place during plant reproduction</p>
2 Chemical science	<p>1.2a: Explore the materials that objects are made from</p> <p>1.2b: Name some everyday materials, including wood, plastic, glass, metal, water and rock</p> <p>1.2c: Explore the simple physical properties of some materials</p> <p>1.2d: Sort materials into groups</p>	<p>7.2a: Use the particle model to explain the properties of materials and changes of state</p> <p>7.2b: Investigate techniques to separate mixtures</p> <p>7.2c: Describe the Earth's structure and the processes leading to rock formation</p> <p>7.2d: Describe the properties and reactions of acids</p>
3 Physical science	<p>1.3a: Describe and investigate the weather</p> <p>1.3b: Look closely at changes in the four seasons</p>	<p>7.3a: Explore and measure a range of balanced and unbalanced forces</p> <p>7.3b: Explain energy transfers between energy stores</p> <p>7.3c: Explain how sound travels in waves</p> <p>7.3d: Explain how thermal energy is transferred</p>
4 Investigative science	<p>1.4a: Carry out simple comparative tests</p> <p>1.4b: Observe and record changes over time</p> <p>1.4c: Group and classify given specific criteria (for example the properties of a material)</p>	<p>7.4a: Estimate the risks to yourself and others</p> <p>7.4b: Suggest a hypothesis for the observation</p> <p>7.4c: Identify patterns in data</p> <p>7.4d: Draw and communicate valid conclusions from investigations</p>

Sample from Science Curriculum at a glance, Years 1 and 7

Assessment framework

Year 3

Introduction

In Year 3, children extend their learning of the scientific world that they live in. Children are encouraged to formulate their own questions and use their knowledge to find the answers through observations and investigations. The investigative science skills should be taught throughout the learning of the main content. Children should now use a growing scientific vocabulary, both written and verbalized.

Learning outcomes

These learning outcomes set out a programme of study in science for Year 3. During the year, every student will:

- 3.1a:** Explore what plants need for life and growth and investigate how water is transported in plants
- 3.1b:** Investigate the part flowers have in the life cycle of flowering plants
- 3.1c:** Identify how humans obtain the right types and amounts of nutrition, and use exercise and hygiene to be healthy
- 3.1d:** Describe how skeletons and muscles give humans and some animals support, protection and movement
- 3.2a:** Compare and group together different kinds of rocks using observations and simple physical properties
- 3.2b:** Describe how fossils are formed when things that have lived are trapped in rock
- 3.2c:** Explore how soils are made from rocks and organic matter
- 3.3a:** Describe how light is needed to see things
- 3.3b:** Investigate the formation of shadows
- 3.3c:** Investigate magnetic materials and the force of magnetism
- 3.4a:** Set up simple practical enquiries, comparative and fair tests
- 3.4b:** Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables
- 3.4c:** Use oral and written reports to present findings from enquiries, including displays of results and conclusions

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student and inform future planning to ensure that all students are prepared for the next key stage of learning science.

- 3.1a:** *Explore what plants need for life and growth and investigate how water is transported in plants*
 - Developing:** Understand that plants need water and light to grow.
 - Secure:** Describe the function of the roots and stem.
 - Extended:** Use dyes to explain how water is transported in plants.

Access Testbase's online question bank and tailor assessment to support the needs of you and your students.

testbase

Built-in end of year tests support the assessment framework.

Aligned to the requirements of the Science examination syllabi, including OxfordAQA's International GCSEs, AS and A-levels.



3.1b: *Investigate the part flowers have in the life cycle of flowering plants*

- Developing:** Describe the life cycle of a flowering plant.
- Secure:** Explain how seeds are dispersed.
- Extended:** Observe how plants are pollinated.

3.1c: *Identify how humans obtain the right types and amounts of nutrition, and use exercise and hygiene to be healthy*

- Developing:** Understand that animals cannot make their own food.
- Secure:** Explain the importance of exercise.
- Extended:** Design a healthy diet.

3.1d: *Describe how skeletons and muscles give humans and some animals support, protection and movement*

- Developing:** Explain how muscles and the skeleton give support.
- Secure:** Describe how muscles and the skeleton help movement.
- Extended:** Describe how the skeleton gives protection.

3.2a: *Compare and group together different kinds of rocks using observations and simple physical properties*

- Developing:** Use a microscope or hand lens to make observations of the structure of rocks.
- Secure:** Classify different types of rocks according to their physical properties.
- Extended:** Describe how different rocks are formed.

3.2b: *Describe how fossils are formed when things that have lived are trapped in rock*

- Developing:** Identify fossils in rocks.
- Secure:** Describe how fossils are formed.
- Extended:** Explain how fossils can give us information about things that once lived on Earth.

3.2c: *Explore how soils are made from rocks and organic matter*

- Developing:** Make observations of soils in the environment.
- Secure:** Describe different soil samples from investigations.
- Extended:** Explain how soils are formed.

3.3a: *Describe how light is needed to see things*

- Developing:** Compare and describe areas in dark and light.
- Secure:** Describe that dark is the absence of light.
- Extended:** Explain simple properties of light.

3.3b: *Investigate the formation of shadows*

- Developing:** Identify shadows.
- Secure:** Describe and investigate the formation of shadows.
- Extended:** Discuss the factors that change a shadow.

Lesson plans and worksheets

YEAR 1, Term 2, Unit 1: Animals including humans
Week 2, Lesson 1: Name parts of our body
Learning outcome: 1.1c

Context

- Where is my elbow? This lesson encourages children to consider answers to such questions.
- This is the third lesson in the biological science unit 'Animals including humans'. Children have been introduced to humans and some of the names of the different parts of the body. They have discussed how some parts of the body can be used to protect us from the world. Children will learn more about the sensory system later in this unit.
- In this lesson, children continue to name the different parts of the body.
- Children use enquiry-based learning through observation and discussion. Children work together to name and identify the key parts of the human body.
- This lesson is designed to take 1 hour to complete. You can extend the lesson using the additional tasks.

Equipment

- Large pieces of paper (e.g. rolls of backing paper); writing equipment

Lesson summary

Children name the key parts of the human body.

Joy of Learning

- Global Skills Projects
 - 1.1a: Solve puzzles
 - 1.1b: Model respect and courtesy to classmates
- Wellbeing
 - 1.1c: Move their bodies in different ways

Vocabulary
 Head, neck, arms, elbows, legs, knees

Resources
 OIPS Student Book 1, Module 1 Ourselves, p.8
 Year 1 Term 2 Week 2 Lesson 1 worksheet

Your arm connects to your body at your shoulder.

Introductory activity

- Where is my knee? Where is my ankle? Ask children to talk about where their knee is. Can they point to this?
- Explain to children that humans are very complicated. They have lots of different parts that all work together.
- Tell children that they will learn some of the names of the parts of the body.

Main activity

- Where are all the parts of the body?
- Read aloud the lesson vocabulary. These words were introduced in the first lesson. Do the children remember any of the key words?
- Children work in groups for this activity. Select the groups carefully, as naming the parts of the body can be a sensitive issue. Using a drawing may be less problematic than sticking labels directly on children.
- Give each group a worksheet associated with this lesson.
- Children join the dots to form a human body.
- Children discuss why it is important to be sensitive before touching someone else.
- Children problem solve names of the parts of the body.
- When they are in a group, they discuss the parts of the body.
- Display the drawing class agree with the names of the parts of the body.
- Discuss any differences between the 'arm' and 'head' cards.
- You could leave some children to draw a human body.

Additional tasks

- Learn the song 'Name the parts of the body' in each lesson.
- Talk about the part that you might not know.

Learning review

- Children can name the parts of the body.

Differentiation

- Look for any common parts of the body.
- Work with small groups to discuss this lesson. You could use the drawing to help.

Extension task

- Children draw a variety of human bodies.

YEAR 1, Term 2, Unit 1: Animals including humans

YEAR 7, Term 1, Unit 2: The particle model
Week 7, Lesson 2: Changes of state: Boiling
Learning outcome: 7.4a
Additional outcome: 7.2a

Context

- What happens to water particles as water is heated?
- In this lesson, students will discuss answers to this question.
- Students have been introduced to solids, liquids and gases in Year 4. They explored how materials can change state and investigated the effect of heat on the changes of state. In Year 5, students used the ideas of solids, liquids and gases to explore separation techniques. Students have studied the particle model and used this to describe the properties of materials. They have also evaluated the usefulness of the particle model. Students have investigated the changes of state in materials. They have drawn the particles for the changes of state in water.
- Students will evaluate the risks in an investigation to themselves and take responsibility for others
- Students will collect data from investigations and use secondary data to make predictions.
- This lesson should take an hour. The additional tasks can be used to extend this time, if required.

Introductory activity

- Have a beaker of water boiling.
- Ask students what they can hear. Ask them to discuss and describe what they see. Ask them why they see bubbles. Ask them where this energy is transferred from.
- Explain that if enough energy is transferred to the particles in a liquid, the liquid will boil. Different substances need different amounts of energy to boil. You could use the diagram on page 66 of Activate Book 1 to help to explain where the bubbles of gas come from.

Main activity

- Students will collect data to be used to plot a heating curve. Alternatively, use the worksheet associated with this lesson, which provides this data.
- Ask a student to demonstrate how to set up the equipment from last lesson. Discuss how to use the equipment safely.
- Students will heat a beaker of water. They take the temperature of the water at the start of the investigation. Then they record the temperature every minute for 10 minutes.
- Encourage students to describe any patterns in the data that they can see from the results.
- Students should use the data to plot a graph. Tell them that this is called a temperature-time graph. Ask them to describe the shape of the graph. Can they see any patterns in the relationship between the variables? Plotting graphs is a scientific skill. It is used to show patterns and relationships in data quickly and efficiently. Ask students where they have seen graphs used to display data outside the classroom. They should recognize that they are used on TV and in magazines because they display information well. This should justify why they need to learn to use graphs.
- Discuss the graph. Ask why there are points on the graph where the temperature remains constant. Explain that this is the latent phase.
- Ask: What was the temperature when the water began to bubble? What temperature did the readings remain at? This is the boiling point of water.

Additional tasks

- Organize students to work as a team. Give them the following problem to solve: You are given a liquid but you do not know what it is. On the bottle, it says the liquid has a boiling point of 78 °C. Describe how you can find out what the liquid is.

Learning review

- Different substances boil at different temperatures.
- Data can be used to make predictions about unknown substances.

Differentiation

- Organize students into groups so that they can support each other. Work with a small group of students. Take time to discuss boiling points and what this means.

Extension tasks

- Give the boiling temperatures of ethanol and propanol. Ask students to plan an investigation to prove this.

Heating water

Setting the scene

What happens to water particles as water is heated? If the temperature of water is monitored as it is heated, a graph can then be plotted. This can help us to understand what is happening.

Aims

In this activity you will:

- discuss what happens to water particles as water is heated and boiled.

You will be **working scientifically** to:

- present data using graphs
- interpret data to identify patterns and draw conclusions.

Task

Beth recorded the temperature every minute as she heated water. Plot a graph of Beth's results. You should give your graph the title 'Heating water'.

Time (min)	Temperature (°C)
0	23
1	38
2	51
3	65
4	82
5	96
6	100
7	100
8	108
9	114

Questions

- Describe the shape of the graph you have plotted.

YEAR 7, Term 1, Unit 3: Measures

Step-by-step guidance navigates through the delivery of the lesson, with differentiation suggestions provided.

Every lesson highlights the learning outcomes it covers, linking back to the curriculum-at-a-glance document.

Includes links to recommended resources and worksheets where relevant.

Opportunities to link to the Global Skills Projects and Wellbeing curricula are highlighted.

Worksheets accompany lesson plans where appropriate to aid teaching.

Resources

We recommend that schools use **Oxford International Primary Science Second Edition** at Primary level, and **Activate KS3 Science** at Lower Secondary to support the implementation of the Oxford International Curriculum for Science.

Together, these series provide a complete and integrated nine-year (Years 1–9) Science course. Engaging students in topics through asking questions that make them think, and activities that encourage them to explore and practise, these resources provide ideal preparation for further scientific study.

The recommended student books can be used alongside the Oxford International Curriculum for Science schemes of work and lesson plans.

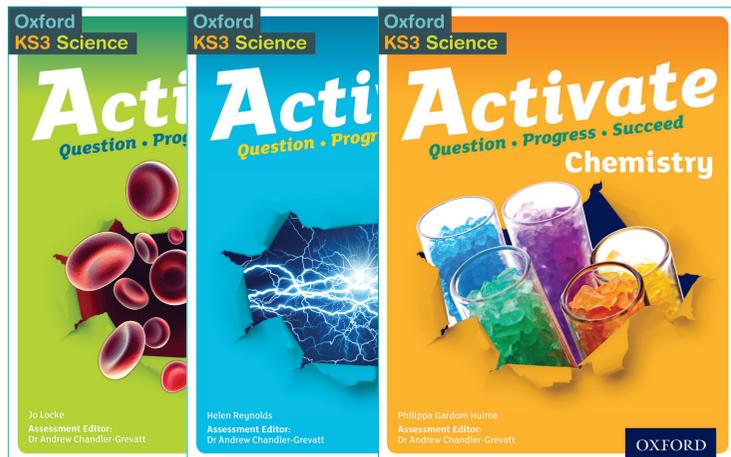
Primary



Oxford International Primary Science

www.oxfordprimary.com/international-science

Lower Secondary



Activate KS3 Science

www.oxfordsecondary.com/activate

Find out more at
oxfordinternationalcurriculum.com

