Links to national curricula Form A

Progress Test in Science (PTS) has been designed to sample the main science knowledge and skills set out in the national curricula for England, Wales, Scotland and Northern Ireland. While the intentions are similar, the science curricula vary between regions, for example in the terminology used. This document provides additional information on the test questions and their links to regional science skill sets.

Reporting areas

Learning in science comprises scientific knowledge as well as the skills and understanding needed to apply knowledge in different contexts.

To capture the different aspects of learning, the questions in *PTS*8 have been mapped to three reporting areas:

Reporting area	Questions
Knowledge and Understanding • Recognising, recalling and showing understanding of scientific knowledge	1, 3, 5, 7, 8, 11, 12, 13, 15, 17, 19, 20, 24, 27, 30, 32, 34, 36, 39, 40
Application of Knowledge and Understanding • Application of scientific knowledge and understanding, including that related to issues, uses and implications • Understanding of the nature, processes and methods of science through different types of science enquiries to help answer scientific questions about the world	2, 4, 6, 9, 10, 14, 16, 18, 21, 22, 23, 25, 26, 28, 29, 31, 33, 35, 37, 38

Working scientifically
• Key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions
  ○ Observing over time, pattern seeking, identifying, classifying and grouping, controlled investigations, researching using secondary sources
  ○ Collecting, analysing and presenting data
	2, 12, 14, 18, 20, 21, 23, 28, 30, 31, 32, 33, 35, 36, 38

The reporting areas shown above are based on the National Curriculum in England Science programmes of study for KS1 and KS2. The curricula for Wales, Scotland and Northern Ireland have similar requirements, although there is wide variation in the way they are defined.

Knowledge and skills

The question by question analysis in *PTS* reports provides detailed information on how students perform in the scientific disciplines of biology, chemistry and physics. The following information links the test questions to the different regional curriculum content categories.

Some test questions may reflect content from previous years to ensure that knowledge has been embedded and progress is made across the range of scientific knowledge and skills. There are also some advanced questions to ensure that the more able pupils are challenged.

England

Aspects of the National Curriculum in England for KS1 and KS2 relevant to *PTS*8.

Biology

Plants, animals including humans
Recording, concluding, planning

- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal
- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how they vary from plant to plant
- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- Investigate the way in which water is transported within plants
- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- Identify that humans and some other animals have skeletons and muscles for support, protection and movement
- Asking relevant questions and using different types of scientific enquiries to answer them
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Questions
1, 2, 3, 5, 6, 17, 18, 19, 21, 22, 23, 35, 36, 37, 38, 39, 40

Chemistry

Rocks

Carrying out, measuring, recording

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock
- Recognise that soils are made from rocks and other organic matter
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- Setting up simple practical enquiries
- Recording findings using simple scientific language, drawing, labeled diagrams, keys, bar charts and tables"

Questions

4, 12, 13, 14, 15, 16, 20, 30, 31, 32, 33, 34

Physics

Forces and magnets, light

Concluding

- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- Describe magnets as having two poles
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance
- Predict whether two magnets will attract or repel each other, depending on which poles are facing
- Compare how things move on different surfaces
- Notice that light is reflected from surfaces
- Recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- Recognise that light is needed in order to see things, and that dark is the absence of light
- Recognise that shadows are formed when the light from a light source is blocked by an opaque object
- Find patterns in the way that the size of shadows change
- Identify differences, similarities or changes related to simple scientific ideas and processes

Questions

7, 8, 9, 10, 11, 24, 25, 26, 27, 28, 29

Wales

Aspects of the National Curriculum in Wales for KS2 relevant to *PTS*8.

How things work

Friction, light, magnets

Patterns in data

- How light travels and how this can be used
- Forces of different kinds, e.g. gravity magnetic and friction, including air resistance
- Make comparisons and identify and describe trends or patterns in data and information

Questions

7, 8, 9, 10, 11, 24, 25, 26, 27, 28, 29

Interdependence of organisms

Environmental factors, human health, human organs, life cycles, plant nutrition

Concluding, measuring, patterns in data, variables

- Identifying through fieldwork the plants and animals found in local environments, e.g. identification, nutrition, life cycles, place in environment
- The environmental factors that affect what grows and lives in different environments, e.g. sunlight, water availability, temperature
- The names, positions, functions and relative sizes of a human's main organs
- The need for a variety of foods and exercise for human good health
- Use some prior knowledge to explain links between cause and effect when concluding
- Make careful observations and accurate measurements, using digital and ICT equipment at times
- When carrying out a fair test, the key variables that need to be controlled, and how to change the independent variable whilst keeping other key variables the same
- Make comparisons and identify and describe trends or patterns in data and information

Questions

1, 2, 3, 5, 6, 17, 18, 19, 20, 21, 22, 23, 35, 36, 37, 38, 39, 40

The sustainable Earth

Features and properties of materials, how materials are formed, rocks

Making comparisons, recording, measuring

- How some materials are formed or produced
- A comparison of the features and properties of some natural and made materials
- Make comparisons and identify and describe trends or patterns in data and information
- Communicate clearly by speech, writing, drawings, diagrams, charts, tables, bar charts, line graphs, videos, and ICT packages, using relevant scientific vocabulary
- Make careful observations and accurate measurements, at times using digital and ICT equipment

Questions

4, 12, 13, 15, 16, 31, 33, 34

In addition 'carrying out a fair test, choosing equipment and using standard measures and S.I. units' are addressed in 14, 30 and 32.

Scotland

Aspects of Curriculum for Excellence: Sciences experiences and outcomes for First and Second levels relevant to *PTS*8.

Biological systems

Body systems and cells, inheritance

- By investigating the lifecycles of plants and animals, I can recognise the different stages of their development
- By researching, I can describe the position and function of the skeleton and major organs of the human body and discuss what I need to do to keep them healthy

Questions

5, 17, 19, 22

Forces, electricity and waves

Forces, vibrations and waves

Concluding

- By exploring reflections, the formation of shadows and the mixing of coloured lights, I can use my knowledge of the properties of light to show how it can be used in a creative way
- By exploring the forces exerted by magnets on other magnets and magnetic materials, I can contribute to the design of a game
- By investigating forces on toys and other objects, I can predict the effect on the shape or motion of objects

Questions

7, 9, 10, 11, 24, 25, 26, 27, 28, 29

Materials

Earth's materials

Measuring, observing

- Having explored the substances that make up Earth's surface, I can compare some of their characteristics and uses
- By investigating common conditions that increase the amount of substance that will dissolve or the speed of dissolving, I can relate my findings to the world around me
- Through exploring properties and sources of materials, I can choose appropriate materials to solve practical challenges

Questions

4, 12, 13, 15, 16, 31, 34

Planet Earth

Biodiversity and interdependence, space

Concluding, measuring, planning, recording

- I can help to design experiments to find out what plants need in order to grow and develop. I can observe and record my findings and using what I have learned I can grow healthy plants in school
- By safely observing and recording the sun and moon at various times, I can describe their patterns of movement and changes over time. I can relate these to the length of a day, a month and a year
- I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions
- I can explore examples of food chains and show an appreciation of how animals and plants depend on each other for food
- By investigating how water can change from one form to another, I can relate my findings to everyday experiences
- I have collaborated in the design of an investigation into the effects of fertilisers on the growth of plants. I can express an informed view of the risks and benefits of their use

Questions

1, 2, 3, 6, 8, 18, 20, 21, 23, 30, 35, 36, 37, 38, 39, 40

In addition 'processes of the planet, measuring and recording' are addressed in questions 14, 32 and 33.

Northern Ireland

Aspects of the National Curriculum in Northern Ireland for KS1 and KS2 relevant to *PTS*8.

Change over time

Change in the natural environment, change in the natural world, how people change, ways in which change occurs

Making decisions and solving problems, memory and understanding, using information

- How living things grow and change
- About how materials are changed to make new materials
- How we grow, move and use our senses
- That some things decay naturally while others do not
- Recognise when carrying out a test, whether or not it is fair
- Make observations, use the senses and appropriate instruments to describe objects and events using relevant scientific terminology, for example, flexible, opaque or decay
- Record and present observations, findings, ideas and solutions in a simple form and use appropriate methods, for example, using lists, simple tables, drawings, diagrams, ICT, photographs or video recordings
- Use a range of methods for collating, recording and representing information

Questions

5, 12, 13, 14, 15, 16, 17, 19, 30, 33, 35, 38

Interdependence

Interdependence of people, plants, animals and place

Developing a line of reasoning, making decisions and solving problems

- The basic needs of animals and plants for survival
- Explain methods and give simple reasons
- Make predictions and give reasons based on scientific knowledge and understanding

Questions

21, 22, 23

Movement and energy

Causes and effects of energy, causes and effects of forces and movement, sources of energy

- Developing a line of reasoning
- That light travels through some materials and not others
- How shadows are formed and can be changed
- That push and pull forces can make things start and stop moving
- That different surfaces affect how easily things move over them
- Some of the ways in which light and sound are used to keep us safe in road safety and our everyday lives
- Make predictions and give reasons based on scientific knowledge and understanding

Questions

7, 8, 9, 10, 11, 24, 25, 26, 27, 28, 29

Place

Adaptation to the environment,features of the world

Memory and understanding, using information

- What plants need in order to grow
- About materials in the natural and built environment
- Make observations using the senses to describe a range of characteristics about objects or events, such as, soft, hard, rough, smooth or in models, fast, slow, loud or quiet
- Use a range of methods for collating, recording and representing information

Questions

1, 2, 3, 4, 6, 18, 20, 31, 34, 36, 37, 39, 40

Feedback to parents and carers

A report on the individual pupil is available to support feedback to parents or carers. This *Individual report for parents* strips away much of the technical detail that is included in the *Group report for teachers*. A series of statements, tailored for parents, is included to explain what the results mean and how learning may be affected. Recommendations focus on how the parent or carer can work with the school to support the pupil at home.

In addition to the *Individual report for parents*, you may wish to provide supporting information, either orally or in writing, explaining the process and outcomes. The following list provides you with guidelines to assist with this communication.

- Stress the school's commitment to identifying and addressing the needs of each individual pupil in order to understand and maximise their potential.
- Explain that testing with *PTS*8 is part of the school's regular assessment regime and that all pupils in the year group(s) have been tested.
- As part of the test, pupils were tested on their science knowledge and skills.
- You may wish to summarise the specific outcomes and recommendations from the test for that individual pupil (which are also shown on the *Individual report for parents*).
- Parents or carers should be reassured that if they have any questions or concerns or would like any further advice on how best to support their child, then they should contact the school.

A sample letter is provided (Figure 1) to support your communications with parents/carers after testing with *PTS*8.

Figure 1: Sample parent/carer feedback letter

Dear Parent or Carer,

In school, we wish to assess all our pupils to see what their needs are and how we can best help them learn and achieve.

As part of this process, your child has completed the *Progress Test in Science* 8, which assesses key aspects of science knowledge and skills.

A copy of the Individual report for parents is included*. This shows your child's results and describes what these mean in terms of the ways in which he/she will learn best and how you can support him/her at home.

[If the report is not included a relevant short extract can be included instead.]

If you have any queries or concerns please contact us.

Yours faithfully,

[School/Establishment name]

*If possible, it is helpful to parents to discuss the report with them on a suitable occasion before sending it out.