YEAR 8 SCIENCE

Exam & revision guide | December 2026

EXAM WEEK	ONE 60-MINUTE SCIENCE EXAM
Beginning Monday 7 December 2026	**20 min Biology • 20 min Chemistry • 20 min Physics**

What should I revise?

7.08	Life Cycles
8.01	Heating and Cooling
8.02	Earth and Atmosphere
8.03	Forces and Motion
8.04	Plants and Their Processes (Lessons 1–8)

Important: Any topic from Year 7 could also be assessed.

How to revise effectively

1 Knowledge Organisers: blank page retrieval

Find your Year 8 Knowledge Organiser on the school website. Choose one small section at a time.

READ · 2 minutes	Read one small section carefully. Focus on key words and their definitions, important facts, explanations and diagrams.
COVER & RETRIEVE · 4 minutes	Close the organiser. On a blank page, write everything you can remember without looking. Include definitions, explanations and labelled diagrams.
CHECK & CORRECT · 2–3 minutes	Reopen the organiser. Compare with your work, then use a different-coloured pen to correct mistakes and add missing information.

2 Core Knowledge Questions

Use the question banks later in this guide to test yourself. Cover the answers, say or write your own answer, then check. Keep practising questions you get wrong.

Question sets provided: 8.01 Heating and Cooling; 8.02 Earth and Atmosphere; 8.03 Forces and Motion; 8.04 Plants and Their Processes.

7.08 Life Cycles: a core knowledge question set is not included in this guide. This topic is still examinable, so use the Knowledge Organiser to revise it.

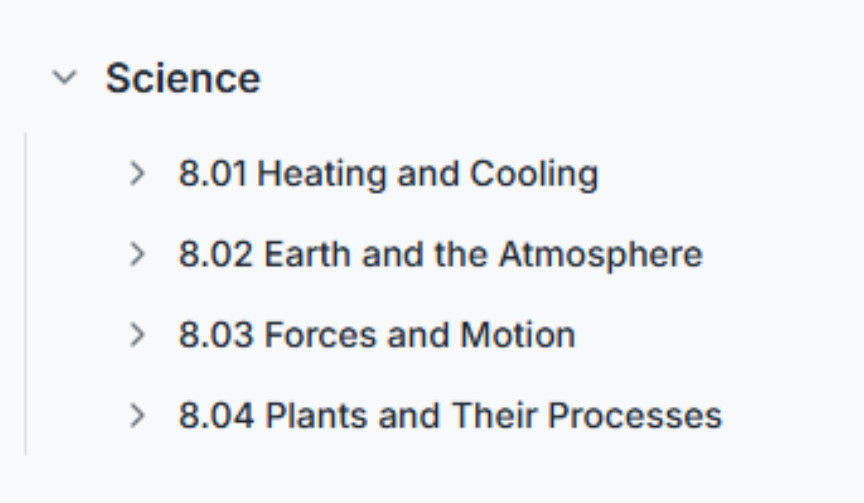
3 Use Noticed to revisit difficult lessons

Visit app.noticedtechnology.com, open Resources → Science, expand a topic and select the lesson you found difficult. Choose Interactive worksheet to revisit it.

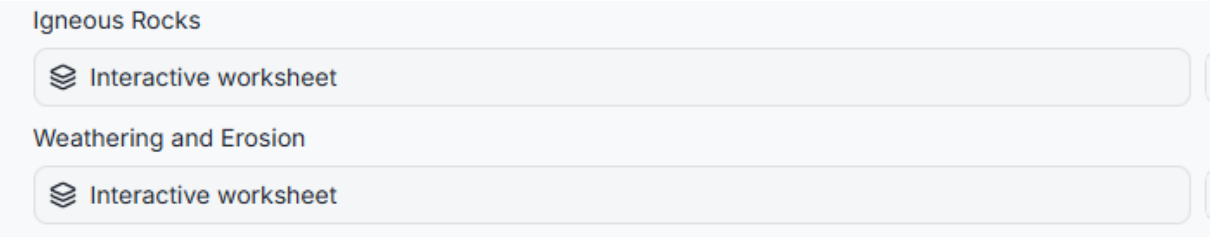
Noticed: finding your revision worksheets

Follow the example screenshots below to access lesson-by-lesson worksheets. These are especially useful for topics you found challenging.

1. In Resources → Science, expand the topic you want to revise.



2. Choose Interactive worksheet to recap the lesson (example: Igneous Rocks).



Revision tip: Revise little and often across Biology, Chemistry and Physics. Spend extra time on topics where you make mistakes.

Remember: Reading notes alone is not enough. Test yourself, check your answers and revisit difficult questions.

Core Knowledge Question Bank

Cover the answer column and test your recall. All questions and answers below are taken from the original Year 8 guide.

8.01 Heating and Cooling

Question	Answer
What is matter?	Anything that has mass and occupies space.
What does temperature measure?	The average energy of particles due to their motion.
How do particles in hotter matter differ from those in colder matter?	They have more energy and move/vibrate more.
How is temperature measured in a laboratory?	Using a thermometer.
What happens to the thermal store when particles move faster?	It increases.
In which direction does energy transfer between objects in contact?	From hotter to colder.
What is meant by cooling?	A net transfer of energy away from an object.
What determines the final temperature when two liquids are mixed?	Their masses, materials and starting temperatures.
How does friction increase temperature?	It transfers energy to thermal stores.
What type of radiation is emitted by warm objects?	Infra-red radiation.
What is thermal equilibrium?	When objects reach the same temperature.
What must happen for an object to maintain a steady temperature?	Energy entering equals energy leaving.
What is a systematic error?	An error that affects results in the same way each time.
What is a random error?	An unpredictable variation in measurements.
Why do scientists take repeat measurements?	To reduce the impact of random errors.
Why should scales be viewed at eye level?	To reduce parallax error.
What does a heating graph show?	Temperature change over time.
What does a sloping line on a heating graph represent?	A temperature change within one state.
What is meant by rate?	The speed of change.
Name one factor that affects how quickly temperature changes.	Mass, material or temperature difference.
Name one hazard when heating liquids.	Fire or hot equipment.
Why are control measures used in practical work?	To reduce risk.
What should a scientific conclusion be based on?	The evidence collected.
Why should scientists avoid over-generalising conclusions?	Conclusions made would not reflect data gathered.
What is thermal conduction?	Energy transfer through vibrations of particles moving from hot to cold regions.
How do particles transfer energy during conduction?	By vibrating and passing energy to neighbouring particles.
Why does metal feel colder than plastic at room temperature?	It conducts energy away from the body faster.
Which group of materials are usually good thermal conductors?	Metals.
What is a thermal insulator?	A material that reduces energy transfer.
Give one example of a good thermal insulator.	Wood, plastic or trapped air.
What does the prefix kilo- mean?	×1000.
How many millimetres are there in one metre?	1000 mm.
Which has more thermal energy: a hot object or a cold object of the same mass and material?	The hot object.
Why does a higher mass object contain more thermal energy?	It contains more particles.

Question	Answer
Do different materials store equal thermal energy at the same temperature and mass?	No.
Some materials require more energy for the same temperature rise. What does this mean?	They have a greater capacity to store energy.
Where should the independent variable usually go in a results table?	The first column.
Where should the dependent variable usually go?	The far-right column.
Why should scientists evaluate their methods?	To judge validity and reliability.
What is peer review?	Scientists checking each other's work.
What is internal energy?	The total energy due to particle motion and position OR sum of the energy in its thermal store and energy due to its state.
Why can temperature stay constant during a change of state?	Energy separates particles instead of increasing their motion.
Which state has the greatest energy due to particle separation?	Gas.
What do horizontal sections on heating curves represent?	Changes of state.
What usually happens to matter when heated?	It expands.
What happens when matter cools?	It contracts.
What is density?	Mass ÷ volume.
Why are hotter fluids often less dense?	Their particles are spread further apart.
What causes pressure in a gas?	Collisions of particles with surfaces.
What is convection?	The movement of a hotter fluid to a colder region.
Why does warm fluid rise?	It is less dense.
What is a convection current?	Fluid movement caused by temperature/density differences.
In which states of matter does convection occur?	Liquids and gases.
What type of light is involved in thermal radiation?	Infra-red
Do all objects emit infra-red radiation?	Yes.
Which surfaces are best at absorbing infra-red radiation?	Dark, matt surfaces.
How does increasing surface area affect radiation?	It increases the rate of energy transfer.
Name one method of reducing heat loss from a building.	Loft insulation, cavity wall insulation, double glazing or a draught excluder.
What happens to energy transfer when the temperature difference increases?	The rate of transfer increases.
Why do energy-efficient buildings use less fuel?	Less energy is transferred to the surroundings.
How does a high flow rate affect convection?	It increases the rate of convection.

8.02 Earth and Atmosphere

Question	Answer
Why do scientists use models of Earth’s structure?	Because humans have only drilled about 12 km into the Earth, so models help represent Earth’s internal structure that cannot be directly observed.
What is peer review?	Experts check other experts work
Why is peer review important?	It helps check research quality, identify errors and improve trustworthiness.
What are crude oil and natural gas formed from?	The remains of plankton that lived in oceans millions of years ago.
What happens to plankton after they die?	Their remains sink to the ocean floor and mix with sediment.

Question	Answer
How are crude oil and natural gas formed?	Plankton buried within sediment are exposed to high pressure and temperature over millions of years, changing them into crude oil and natural gas.
How are crude oil and natural gas extracted?	Wells are drilled through impermeable rock and pumping equipment brings them to the surface.
Name two products made from crude oil.	Petrol and diesel.
What are common uses of natural gas?	Home heating, cooking, electricity generation and chemical manufacturing.
Name the four layers of the Earth.	Crust, mantle, outer core, inner core.
Who proposed continental drift?	Alfred Wegener.
What drives the movement of tectonic plates?	Convection currents in the mantle.
How do igneous rocks form?	When molten rock cools and crystallises.
Why do extrusive igneous rocks have small crystals?	They cool quickly on the surface.
Describe the stages of sedimentary rock formation.	Weathering, transportation, deposition, compaction, cementation.
What is freeze-thaw weathering?	Water in cracks freezes, expands and breaks the rock.
Why are fossils not found in metamorphic or igneous rocks?	Heat and pressure destroy them.
Name three fossil fuels.	Coal, crude oil and natural gas.
What is today's approximate percentage of oxygen in the atmosphere?	About 21%.
What caused oxygen levels to rise in the early atmosphere?	Photosynthesis by algae and plants.
What is the enhanced greenhouse effect?	Extra warming caused by human activity increasing greenhouse gases.
Name three greenhouse gases.	Carbon dioxide, methane and water vapour.
Which two gases mainly cause acid rain?	Sulfur dioxide (SO_2) and nitrogen oxides (NO_x).
Give two effects of acid rain.	Damages buildings/statues; harms trees, soil and aquatic life.

8.03 Forces and Motion

Question	Answer
How can the motion of an object be described?	By the distance travelled or the speed.
How does a faster object compare in the same time interval?	It travels a greater distance and has a higher average speed.
How can a faster object be identified over a given distance?	It travels the distance in a shorter time interval.
What is speed a measure of?	Distance travelled in a given time.
What is meant by rate?	The speed at which something is changing or happening, often per second.
What two quantities are needed to determine speed?	Distance travelled and time taken.
What formula is used to calculate speed?	Speed = distance travelled ÷ time taken.
What is the SI unit of speed?	Metres per second (m/s).
What does steady or constant speed mean?	An unchanging speed.
What is the scientific term for unchanging speed?	Uniform speed.
What is average speed?	The speed for the whole journey, taking into account faster and slower sections.
What is instantaneous speed?	The speed at a specific moment in time.
What can a distance-time graph show?	Distance travelled in a given time.
What else can a distance-time graph show?	Time taken to travel a given distance.
What can be calculated from a distance-time graph?	Average speed for a journey.
What does a horizontal line represent on a distance-time graph?	No change in distance over time.

Question	Answer
What does a straight diagonal line represent?	Movement at a steady speed.
What does a curve represent?	A changing speed.
What does a curve on a distance-time graph indicate?	Changing speed.
What is acceleration?	The rate of change of speed.
When is an object accelerating?	When its speed changes over time.
What causes acceleration?	A non-zero resultant force.
What effect does a resultant force in the direction of motion have?	The object speeds up.
What effect does a zero resultant force have?	Zero acceleration.
Which forces are frictional forces?	Friction, air resistance and water resistance.
What are air resistance and water resistance examples of?	Drag forces.
In which direction does drag act?	Opposite to the direction of motion.
How can drag be reduced?	By lowering speed, reducing area, streamlining shape, or reducing fluid density/viscosity.
What happens to energy during motion through a fluid?	Energy is transferred to thermal stores of the object and fluid.
Why do faster objects experience more drag?	They interact with more particles each second.
What happens if the driving force falls to zero?	The object eventually slows down and stops.
When does a zero resultant force occur?	When forces are balanced.
What happens to motion when forces are balanced?	Motion remains constant.
Why is a driving force needed?	To overcome drag and frictional forces.
What is the relationship between drag, resultant force and speed?	Changes in drag alter resultant force and therefore change speed.
What is meant by falling?	One object moving towards another due to gravity.
What force acts constantly on a falling object near Earth?	Gravity force.
What effect does gravity have on a falling object?	It causes acceleration towards Earth.
What force acts on objects falling through air?	Drag force.
How does a parachute reduce speed?	It increases surface area and therefore drag.
What effect does increased drag from a parachute have?	It creates a resultant force opposite to motion and slows the object down.

8.04 Plants and Their Processes

Question	Answer
What are the four main organs of a plant?	Leaf, stem, roots and flower.
What is the function of the leaf?	Absorbs light for photosynthesis.
What is the function of the stem?	Connects organs and transports substances such as water.
What is the function of the roots?	Anchor the plant and absorb water and minerals.
What is the function of the flower?	It is the reproductive organ.
What is mesophyll tissue?	Leaf tissue where photosynthesis occurs.
What does phloem transport?	Dissolved sugars produced in photosynthesis.
What does xylem transport?	Water and dissolved minerals from roots to the rest of the plant.
What is the function of epidermal tissue?	Forms a protective layer on leaf surfaces.
What is photosynthesis?	A series of chemical reactions using carbon dioxide and water to make glucose and oxygen using light energy.
Where does photosynthesis occur?	In chloroplasts.
What pigment is found in chloroplasts?	Chlorophyll.

Question	Answer
What is the role of chlorophyll?	Absorbs light energy for photosynthesis.
How does water reach the leaf?	It is absorbed by roots and transported in the xylem.
How does carbon dioxide enter a leaf?	From the surrounding air.
What are the reactants of photosynthesis?	Carbon dioxide and water.
What are the products of photosynthesis?	Glucose and oxygen.
Why is photosynthesis endothermic?	It requires energy transfer from the surroundings.
Why are leaves green?	They contain many chloroplasts with chlorophyll.
Why do leaves have a broad shape?	To provide a large surface area for light absorption.
Why are leaves thin?	To provide a short diffusion distance and allow light to penetrate.
What is the function of stomata?	Allow gases to diffuse into and out of the leaf.
What is the function of the spongy mesophyll?	Supports gas exchange with air spaces.
What is the function of the palisade mesophyll?	Main site of photosynthesis.
What is the role of the waxy cuticle?	Reduces water loss.
What is a tissue?	A group of similar cells working together for a specific function.
What is an organ?	A structure made of different tissues working together.
Where are stomata mainly found?	On the underside of leaves.
What are guard cells?	Specialised cells that control stomatal opening and closing.
Why do guard cells open stomata during the day?	To allow carbon dioxide in for photosynthesis.
How do guard cells help reduce water loss?	By closing stomata.
What are root hair cells adapted for?	Absorbing water and minerals.
How does a root hair cell increase absorption?	It has a long extension giving a large surface area.
Why do root hair cells contain many mitochondria?	To provide energy for mineral absorption.
Why do root hair cells not contain chloroplasts?	There is no light underground.
What is osmosis?	Movement of water from high to low water concentration across a selectively permeable membrane.
How are minerals absorbed into root hair cells?	By active transport.