Y7 Science

Key Stage 2

KEY TOPICS

- States of matter
- Properties of materials
- Describe changes of state
- Describe the rock cycle
- Simple fossil formation
- Describe and group different types of materials
- Describe how substances can be mixed together
- Describe the formation of new materials
- Some changes can be reversed but other can't

YEAR 7

Introduction to science

- Identifying hazard and risks
- Working safely
- Selecting and using apparatus
- Following a method

The particle model

- What is diffusion?
- What affects diffusion?
- How can we investigate diffusion?

- What is a solution?
- What are solutes?
- What are solvents?
- What is dissolving?

cells

What are the parts of cells?
What are the different types of cells ?
Using microscopes

Forces

What are forces? What is stretching and squashing?
Can you name examples of forces?
What is a resultant force?
What are resultant forces When it equals non-zero?
What are contact and non-contact forces?

Atoms, elements, compounds

- What are atoms?
- How can they be arranged?
- What are elements?
- What are compounds?
- What does a chemical formula tell you?

- What are elements, compounds and mixtures?
- Can you give specific chemical examples of each?
- Can you draw diagrams of examples of: atoms, elements, mixtures and compounds?

- What do the mass and atomic numbers tell us?
- How many electrons can go in each shell?
- How do you write the electronic configuration?

Ecosystem

- How do animals interact together in food chains?

- What is the structure/hierarchy of animals in ecosystems?

Energy

- What is energy?
- Why should we use the term transfer for energy?
- What are different stores of energy?

Acids & alkalis

- What is a neutralisation reaction?
- How can you investigate neutralisation reactions?

- What are acids and alkalis?
- What is pH?
- How can you use indicators to determine what pH a solution is?

Reproductive system

Comparing animal and plant reproduction.

Separating mixtures

- What is chromatography?
- How does chromatography work?
- What is filtration?
- How does filtration work?
- What is distillation?
- How does distillation work?

Magnets

-What are electromagnets?
-What can electromagnets be used to do?
What can be changed to make electromagnets stronger?

skeletal system

- How do your muscles and bones support and allow you to move.

Gas exchange

- What are the parts of the respiratory system?
- How do we breathe?

YEAR 8

Year 8

- The periodic table
- Electricity
- Sound
- Energy changes in reactions
- Light
- Analysis
- Digestive system
- Photosynthesis
- The earth
- Space

Y8 Science

Year 7

- The particle model
- Cells
- Forces
- Atoms elements and compounds ecosystems
- Energy
- Acids and alkalis
- Reproduction
- Skeletal system
- Magnets
- Separating mixtures
- Gas exchange

YEAR 8

Groups on the periodic table

- What are the elements in Group 7?
- What are the elements in Group 0?

Electricity

- What are the groups and periods ?
- What are the elements in Group 1?
- How does the arrangement of atoms match with the atomic structure of the elements.

Variation

- What is current and potential difference?
- What is electric charge?
- What are series and parallel circuits?
- What is resistance and what affects it?

Chemical reactions

- What is DNA?
- Where do we get it from?
- Links to reproduction and variation from Year 7

Waves light

- What is reflection and refraction?
- What can affect reflection and refraction?
- What is the angle of reflection?
- Investigate reflection and refraction

Waves sound

- What is light?
- What is the speed of light?
- What can happen to light waves?
- How does the surface affect what happens to a light wave?
- How does light make difference colours?

Energy changes in reactions

- What is sound?
- What is sound made of?
- What is amplitude, frequency and pitch?
- How do they relate to the shape of the sound wave?
- What is the speed of sound?
- How does audio equipment convert to sound?

Respiration

- What are waves?
- Can you give examples of waves?
- What are transverse and longitudinal waves?
- What is the speed of waves in a vacuum?

Analysing mixtures

- What are pure substances?
- What are mixtures?
- Choosing the right separation technique
- Distillation
- Filtration
- Evaoporation
- chromatography
- Testing for gases

Digestive system

- What is digestion?
- Why is it important
- Learn the parts of the digestive system and their functions.
- What are enzymes?
- Why are they important?

Photosynthesis

- What is photosynthesis?
- Why is it important to food chains?

Earth and rocks

- What is the structure of the earth?
- What is the rock cycle?
- Links to Year 7 weight, mass and gravity

Space

- What is an orbit?
- What is the orbit of the Earth?
- How does this affect day length and seasons?

YEAR 9

Year 9

- Cells continued
- Atomic structure
- Energy
- Health and disease
- Chemical analysis
- Energy resources
- Communities
- Periodic table
- Waves
- Reaction of metals
- Evolution and classification

Year 8

- Groups and periodic table
- Electricity
- Variation
- Chemical reactions
- Respiration
- Waves
- Energy changes
- Analysis
- Digestion
- Photosynthesis
- Earth & space

YEAR 9

Cells

- Required practical: microscopes and mounting a slide
- How can magnification be calculated?
- What kind of substances do cells need to get and get rid of?
- What is mitosis?
- When does it happen?
- What are the main stages in mitosis?
- Why is it important?
- What are stem cells?
- What is differentiation?

Atomic structure

- What are the models of the atoms?
- How have they changed over the years?
- What is the plum pudding model?
- Forming ions
- Atomic structure and the periodic table
- How was the plum pudding model disproved using the gold foil experiment?

Energy

- What are the stores of energy?
- What are the transfers of energy?
- What is specific heat capacity?
- Can you calculate specific heat capacity?
- Required Practical: Specific Heat Capacity
- What is insulation?
- Why is insulation important?
- What does insulation reduce?
- What is dissipation?
- Required Practical: Insulation
- What is elastic energy?
- Can you calculate the energy in the elastic potential energy store of an object?
- Can you rearrange equations to find the spring constant or the extension of a stretched object?

Health and disease

- What are non-communicable diseases?
- What features do they all have in common?
- What is cancer?
- What are the features, risk factors, symptoms, diagnosis and treatment of the disease?
- What are vaccines?
- How do they work?
- Why are they important?
- What are the stages of drug development?
- How is bias avoided?
- What are painkillers and antibiotics?
- Required practical: investigating antiseptics
- What is CHD?
- How does it link back to the heart?
- What are the main symptoms, diagnosis and possible treatments?
- What are the main pathogen to humans?

Communities

- How can animals and plants be sampled in environments?
- Required practical: factors affects population of a species
- What abiotic and biotic factors affect ecosystems?
- What is the order and hierarchy in ecosystems?
- How do organisms influence each ither in habitats?
- What can affect the energy transfer in food chains?
- Required practical: what affects the rate of decay

Energy resources

- What are the different types of energy generation?
- What is renewable energy?
- What is sustainable energy?
- How can you work out how much electricity costs?
- What are the units of cost and working cost out?

Chemical analysis

- What is a formulation
- What is chromatography?
- How does it work?
- What are Rf values?
- How do you calculate Rf?
- Links to Year 7 chromatography and mixtures
- Required practical: Chromatography
- What is classification?
- What are the three domains?

Periodic table

- How was the periodic table developed?
- What did different scientists originally suggest?
- What was good about Mendeleev's version? How is it ordered?

Waves

- What is a transverse wave?
- What is a longitudinal wave?
- Describe the differences between the types of wave.
- Give examples of each type of wave.
- Required Practical: Waves properties.
- Required Practical: Reflection
- What is amplitude?
- What is frequency?
- What is the wavelength?
- What is the period of a wave?

Reactions of acids

- What happens in a neutralisation reaction?
- What is the pH scale?
- Strong and weak acids
- Required practical: Preparation of a pure, dry sample of a soluble salt

Evolution and classification

- What is evolution?
- How does it happen?
- What evidence is there for evolution?
- What affects extinction?

YEAR 10

Year 10

- KS4 – Biology
- KS4 – Chemistry
- KS4 - Physics