Science Core Knowledge

Year 7

This booklet contains the core knowledge that we believe is the foundation of understanding for each of the topics taught in year 7.

Pupils are require to learn a selection of these questions each week for homework. Their teacher will then carry out regular quizzes to check pupil progress.

The first 10 questions in end of topic tests will always come directly from this booklet so that pupils who have applied themselves to revision will always be rewarded by predicable questions.

We suggest that pupils work with each other or with adults at home to memorise a few at a time in much the same way you may have prepared for spelling tests in the past.

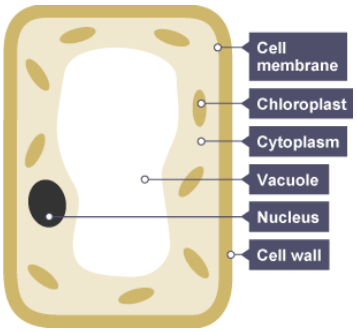
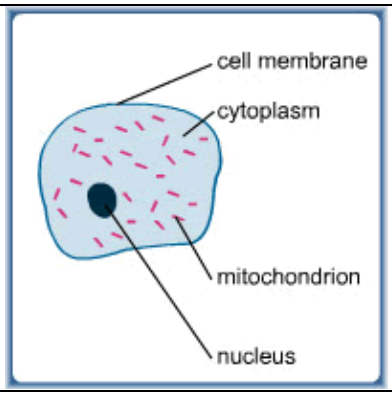
To help prepare for the end of topic tests we have created a website that contains digital copies of these questions, the presentations that teachers use in their lessons, links to other websites, details of test dates and other things you may find useful.

bit.ly/aylshamscience

(You will need to type this in to the the address bar exactly as is because the site is hidden from Google.)

We also sell CGP KS3 revision guides from room 10 at lunch or break time at a significantly reduced price.

7.1 Living Cells

Number	Question	Answer
1	What is an organ? Give an example of an organ in humans.	A structure in a living thing that does one or more important jobs. Any sensible named organ.
2	What is a cell?	The smallest structural unit of living things.
3	Draw and label a typical plant cell.	
4	Draw and label a typical animal cell.	
5	What is the function of the nucleus?	Contains the genetic material, the 'instructions' for running the cell.
6	What is the function of the cytoplasm?	Where the cell's chemical reactions happen.
7	What is the function of the cell membrane?	To control what goes in and out of the cell.
8	What is the function of the cell wall in plants?	To protect the cell and give it shape and rigidity.
9	What is the function of the vacuole in plants?	It is filled with a fluid that contains sugar for the cell and gives the cell shape and rigidity
10	What is the function of the chloroplasts in plants?	To convert light energy into chemical energy by making food.
11	What is a flower for?	It contains the plant's sexual organs and makes sex cells
12	Briefly describe fertilisation in plants.	Pollen grain from anther lands on stigma. The nucleus from the pollen grain and ovule fuse and this then becomes the seed.
13	How does pollen from one plant reach the stigma of another?	Blown by wind or carried by insect/bee/butterfly/moth/hummingbird/bat etc.
14	Name the main mechanisms of seed dispersal.	Wind, water, explosive, animal (hooks/burrs), animal (buried/stored), animal (eaten and excreted).

15	State some changes that occur during puberty in boys.	Testes start producing sperm and become larger, voice deepens, shoulders become broader, hair grows in pubic area, chest, armpits and face, sweat more, acne, mood swings, etc.
16	State some changes that occur during puberty in girls.	Ovaries begin releasing eggs/ova, periods start, breasts develop, hips widen, hair grows in pubic area and armpits, sweat more, acne, mood swings etc.
17	What causes the physical changes that take place at puberty?	Hormones
18	Why do these physical changes at puberty occur?	To prepare the body for reproduction/sex
19	Name the sex cells in humans.	Sperm and egg.
20	How is a sperm cell adapted to its function?	Tail to swim to egg, enzymes in head to break down jelly coat of egg, half the normal number of chromosomes, many mitochondria to release energy for long swim
21	How is an egg cell adapted to its function?	Jelly coat to protect and harden after sperm entry to prevent other sperm from getting in, large store of food to provide energy for cell division/growth after fertilisation.
22	Describe what happens at fertilisation in humans.	Sperm reaches egg, head enters the egg cell, nuclei of sperm and egg fuse.
23	Describe the function of the ovaries.	Organs in a woman where an egg is released from.
24	Describe the function of the uterus (womb).	Muscular organ in a woman where the foetus/baby develops until it is ready to be born.
25	Describe the function of the testes.	To produce sperm.
26	How often does a woman have a period (on average)?	Once per month/every 28 days
27	What is a period?	Shedding of the lining of the uterus that happens if an egg is not fertilised.
28	How often does a woman release an egg?	Once a month/every 28 days.
29	How long does pregnancy last in humans? 9 months, or 40 weeks.	9 months, or 40 weeks.
30	How do food water and oxygen reach the growing baby?	Through the placenta.
31	Briefly describe birth.	Waters break (amniotic sac breaks), contractions (of uterus) start. Contractions push the baby out through the vagina.
32	Name the three main groups of drugs and describe their effects.	Stimulants: speed up nervous impulses, depressants: slow down nervous impulses, painkillers: block nervous impulses from pain receptors and prevent them from reaching the brain.

33	Give some reasons why drugs should not be abused.	Can be addictive, so hard to give up. Can damage organs like brain and liver. Can develop tolerance, so have to take more to get same effect as before.
34	Explain why smoking cigarettes is bad for you.	Causes lung, throat, mouth and laryngeal cancer, more likely to get other cancers too, causes emphysema, more likely to get chest infections like bronchitis and pneumonia.
35	Explain why drinking too much alcohol is bad for you.	Lowers inhibitions, causing reckless behaviour. Causes cirrhosis of the liver and liver cancer. Alcohol is an addictive drug.

7.2 Environment and Classification

Number	Question	Answer
1	What is the name of an animal that catches and eats other animals?	Predator/carnivore
2	State three adaptations of prey animals (eg Hare)	Run fast Small so can hide Camouflage Live in huge numbers Eyes on the side of their head Live underground
3	Define the Key term -Adaptation	Organisms have certain characteristics that allow them to survive in particular places.
4	Name four seasons in a temperate climate.	Spring, summer, autumn and winter
5	What are the two types of variation?	Inherited Variation and Environmental Variation
6	Define the key term species	Living things of the same type belong to the same species. For example, humans are one species and dogs are another species.
7	What type of question is asked in a classification key?	A question with a 'yes' or 'no' answer
8	What to Herbivores eat?	Plant material only
9	In a food chain what comes first?	A producer
10	What is a food web?	A diagram that shows with arrows the flow of food and energy from one organism to another. This shows feeding relationships in one habitat
11	What percentage of energy is passed on from one trophic level to another?	10%
12	Where do producers get their energy?	The Sun (students should know that plants photosynthesise using light energy from the sun)
13	What is the first consumer in a food chain/web called?	The primary consumer
14	Define the Key term Population	The number of individuals of one species in one area at one time

15	What is a Community	A collection of animals and plants that share a habitat
16	What is a pyramid of numbers?	A **quantitative** way of representing food chains. The relative number of organisms in each trophic level
17	What is a pyramid of biomass?	A pyramid that represents the **amount of organic matter** in each trophic level.
18	Define the key term Extinction	The dying out of a species so it no longer exists
19	What is an insecticide?	A chemical used by farmers to kill insects
20	What type of material can build up/accumulate in food chains?	Toxic material eg DDT or Mercury

7.3 Chemical and Physical Changes

Number	Question	Answer
1	What is the opposite of condensing?	evaporating
2	which metal would show no signs of corrosion even after hundreds of years?	Gold
3	What word means "the liquid that a solid dissolves in"	Solvent
4	Which has a fixed melting point, a compound or a mixture?	A compound
5	Which is easily reversed, a chemical or a physical change?	A physical change
6	What is the opposite of melting?	Freezing
7	Do alkalis have a pH higher or lower than 7?	Higher
8	What is the pH of salt water?	7
9	What word describes the reaction between an acid and an alkali?	Neutralisation
10	What colour does universal indicator turn in a strong alkali?	Purple
11	What gas is formed when a metal reacts with an acid?	Hydrogen
12	What is the pH of a strong acid?	1 or 2
13	If acid is added to sodium hydrogen carbonate the mixture fizzes. What does the fizzing indicate?	That the reaction is producing a gas.
14	In chemistry, what does the word "product" mean?	A product is a new substance made in a chemical reaction.
15	What two products are made when an acid and an alkali react?	A salt and water.
16	What does the word " insoluble" mean?	A substance is insoluble if it will not dissolve.
17	In chemistry, what does the word " corrosive" mean?	A corrosive substance can burn living tissue e.g. Skin
18	What can chromatography be used for?	Chromatography can be used to separate and identify miscible liquids according to the weight of the particles in the substance e.g. Mixtures of inks.

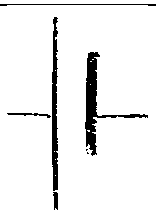
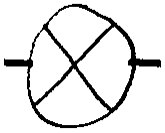
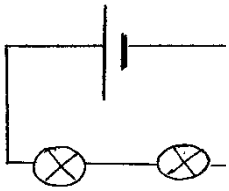
19	Give an example of two imiscible liquids.	Oil and water.
20	What is distillation used for?	Distillation is used to separate miscible liquids according to their boiling points e.g. Alcohol and water

7.4 Particles

Number	Question	Answer
1	What is an atom?	The smallest part of an element, atoms are the building blocks of molecules
2	What is a chemical change?	A change that results in a new chemical, chemical changes are not easy to reverse.
3	Give three examples of a chemical change.	Combustion or burning, corrosion and neutralisation.
4	What is a compound?	A chemical substance that is made from two more different types of atom or elements.
5	What is concentration?	It is a measure of the amount of particles in a given volume.
6	What is condensation?	The process when a gas cools down and turns into a liquid, (it is the opposite of evaporation).
7	What is diffusion?	The movement of one substance through another substance.
8	What is dissolving?	Dissolving happens when a solid mixes with a liquid to become a solution.
9	What is an element?	An element is a substance that is made up of only one type of atom.
10	What is evaporation?	Evaporation is the process that turns a liquid into a gas, (it is the opposite of condensation).
11	What is freezing?	Freezing is the process that turns a liquid into a solid, it is the opposite of melting?
12	How are the particles arranged in a gas?	They are very far apart, moving very fast, they have lots of energy and are arranged randomly.
13	What is kinetic energy?	The energy of movement.
14	How are the particles arranged in a liquid?	They are close together and touching, they can move past one another and are arranged in an irregular fashion.
15	What is melting?	Melting is the process that turns a solid into a liquid, (it is the opposite of freezing).
16	What is a molecule?	A molecule is a group of atoms that have been chemically joined together.
17	What is a particle?	A very small part of a substance, it is sometimes used instead of the word molecule.
18	What is a physical change?	A change that affects the way a substance looks but that doesn't affect the way it reacts.
19	Give three examples of a physical change.	Melting, freezing, evaporation (or you could have sublimation , condensing).

20	How are the particles arranged in a solid?	They are close together and touching, they cannot move past one another and are arranged in a regular orderly fashion.

7.5 Electricity and Magnetism

Number	Question	Answer
1	Draw the symbol for a battery, cell or power pack	
2	Draw the symbol for a bulb	
3	Will these bulbs light up? Explain your answer. 	No. There is not a complete circuit
4	What is electric current?	The movement of electrons
5	Where can you find electrons?	In everything
6	Why don't I get electric shocks of everything?	There is only an electric current when the electrons are moving
7	Why do we use copper in wires?	It is a good conductor of electricity
8	What is an insulator?	A material that does not conduct electrical current
9	What can we use to measure voltage?	A voltmeter
10	What is an ammeter for?	Measuring current (in amps)
11	What is voltage (potential difference)?	The amount of energy each electron has
12	What is current?	The number of electrons passing in a certain amount of time
13	What is a fuse	A piece of wire that melts when too much current flows through
14	What is static electricity?	A separation of charge. When there are too many electrons in one place and not enough in another
15	Two opposite charges…	Attract one another
16	Same charges…	Repel one another
17	To cause a static charge we must rub together two…	insulators
18	The three most common magnetic metals are…	Iron, nickel and cobalt
19	The lines in magnetic fields go from…	North to south
20	How does a compass work?	It is a magnet that aligns to the Earth's magnetic field

21	How can we make an electromagnet?	Wrap wire around an iron core and then pass current through the wire
22	Give three ways you could increase the strength of an electromagnet	Use an iron core Use more current Use more coils
23	What happens when we move a wire in a magnetic field?	We cause an electric current
24	How can we increase the current produced by a generator?	Move the coil and magnetic quicker Use a stronger magnet Use more coils of wire
25	Give three forms of renewable electricity generation	Wind Hydroelectric Tidal
26	What are the disadvantages of burning coal, oil or gas?	Carbon dioxide is produced which causes global warming

7.6 Energy and Energy Transfer

Number	**Question**	**Answer**
1	Name 9 forms of energy	Light, sound, thermal (heat), chemical, elastic, electrical, gravitational potential energy, kinetic and nuclear
2	What is energy transferred into a device called?	Input energy
3	What is energy transferred out of a device called?	Output energy
4	Complete this sentence: The amount of input energy is _____ as output energy	The amount of input energy is <u>always the same</u> as output energy
5	What are the energy changes in a candle?	Input: chemical & Output: heat and light
6	What are the energy changes in a TV?	Input: Electrical & Output: light, sound, thermal
7	What is the law of energy conservation?	Energy cannot be created or destroyed, it is transferred from one form into another
8	Which forms of energy are often produced as wasted energy?	Sound and thermal
9	Describe how to reduce waste energies	Use lubricants such as oil or ball bearings
10	Describe an efficient machine	It does not waste much energy
11	State the equation for calculating efficiency	Efficiency = <u>useful output energy</u> x 100 Total input
12	Another name for heat energy is	Thermal energy
13	What are the units for measuring heat energy?	joules
14	What is the difference between heat and temperature?	Heat is a form of energy, temperature is a measurement of how hot or cold something is.
15	The amount of heat energy in an object depends on three things, state these 3 things	Its mass, its temperature and the material it is made from
16	Name 3 different methods of heat transfer	Conduction, convection and radiation
17	Suggest a material that is a good conductor of thermal energy?	Any named metal

18	Explain why metals make a good conductor of thermal energy	Metals contain free electrons which can pass on thermal energy as they move inside the metal
19	Describe what happens when one end of a piece of metal is heated	The particles vibrate more and the vibrations are passed from particle to particle.
20	Explain why solids are better conductors than liquids or gases	The particles are closer together in solids and so can pass on vibrations and thermal energy quicker.
21	In which 2 states can heat travel through by convection?	Liquids and gases
22	Why do materials expand when they are heated?	The particles move around more and take up more space.
23	Explain why convection occurs when a fluid (liquid or gas) is heated	As particles gain more thermal energy, they vibrate more and take up more space. This causes the heated fluid to become less dense. Less dense fluids will rise.
24	Which method of heat transfer can travel through a vacuum, such as space?	Infrared radiation
25	What is radiation?	Radiation is an electromagnetic wave called infra-red radiation.
26	Which surfaces make the best reflectors of thermal energy?	Silver or white, shiny surfaces