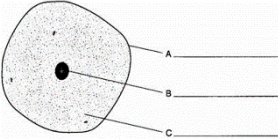
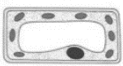


# Year 8 Science Knowledge quizzes

## Tips:

- Learn one quiz at a time. Cover the right hand side and go through each question, checking the answers as you go.
- Get a friend or family member to quiz you – in random order
- When you are feeling confident, cover the right side and write the answers to all the ones you can, then check.

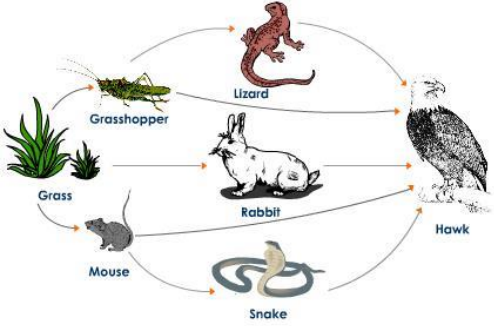
## Cells, tissues, organs, organ systems

Question	Answer
What is a "unicellular organism"?	One that is only one single cell
Give an example of a unicellular organism	Bacteria or yeast
What is the function of the mitochondria?	Respiration – to release energy
What is the function of the ribosomes?	Make proteins
Which part of the cell controls what enters and leaves the cell?	Cell membrane
What is the function of the nucleus?	Controls the whole cell and contains the DNA
Why do plant cells have cell walls?	Strength and support
Which 3 structures are found in most plant cells but not in animal cells?	Vacuole, chloroplasts, cell wall
What are the 3 labels for the diagram shown: 	A – cell membrane B – nucleus C - cytoplasm
What do groups of similar cells form?	tissue
Name the process by which substances enter and leave cells because of a difference in concentration	diffusion
Why do muscle cells contain lots of mitochondria?	To release lots of energy to allow muscles to contract
Why do palisade cells contain lots of chloroplasts?	To absorb as much energy as possible for photosynthesis
Which organ system contains the stomach and large and small intestine?	Digestive system
What is the job of the respiratory system?	To get oxygen into the body for respiration and to get rid of carbon dioxide
Name the air sacs at the end of the bronchioles inside the lungs	alveoli
How does the good blood supply around the air sacs speed up diffusion?	Constantly removes substances to maintain a concentration difference
What is the job of the digestive system?	Digest food into small enough particles that they can be absorbed into the blood
How do folded membranes on structures inside the body speed up diffusion?	It gives a large surface area
Why should you always start with the lowest magnification on a microscope?	For a wide field of view to allow you to find why you are looking for
How do you bring cells into view when looking down the microscope?	Turn the focussing wheel
How can you tell that the cell below is a plant cell? 	It has a cell wall and a large vacuole

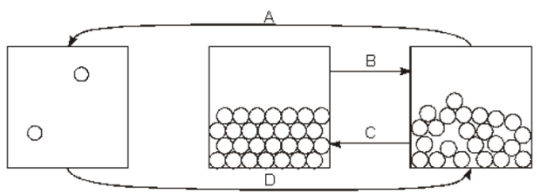


## Reproduction

Question	Answer
What is sexual reproduction?	Where 2 parents, 1 male and 1 female, each provides half of the genetic information for their offspring
How is a sperm cell adapted for its function?	<ol style="list-style-type: none"> <li>1. It has lots of mitochondria to release energy so the sperm can swim to the egg</li> <li>2. Tail to help it swim</li> <li>3. Nucleus contains half a set of (23) chromosomes</li> <li>4. Streamlined head helps it burrow through the egg membrane</li> </ol>
What is the job of the testes?	Produce sperm
What are the male and female sex cells called in animals?	Male – sperm    female - eggs
Where are eggs produced in a female?	Ovaries
Why are the oviducts lined with cilia?	To help waft the fertilised egg towards the uterus
Name the process in which a sperm cell and egg cell join together.	Fertilisation
Where does fertilisation normally take place inside a female?	In the oviduct
Describe the job of the i)placenta ii) umbilical cord	Placenta: provides oxygen and nutrients and removes waste Umbilical cord: joins the foetus to the placenta and transfers substances between the 2.
What is the purpose of amniotic fluid during pregnancy?	Protects foetus from bumps and temperature changes.
What happens in the uterus during birth?	Uterus muscles <u>contract</u> to push the baby through the cervix and out of the vagina.
What causes menstruation (a period)	When an egg is not fertilised, the thickened uterus lining (and egg) are lost as blood – this is a period
Why does the uterus lining thicken as part of the menstrual cycle?	To prepare for implantation of a fertilised egg
Name the male and female sex cells for plants	Male: Pollen    Female: egg
How do insects pollinate plants?	When they move from flower to flower they transfer pollen that hooks onto their bodies to the stigma of other plants.
Why is seed dispersal important?	Move seeds away from parent plants, and each other, so they don't need to compete with each other for nutrients, water, light etc and have a better chance of survival
How many chromosomes do human sex cells contain?	23
Which 2 factors cause variation in a species?	Inherited genes, environmental
Give an example of discrete variation	Eye colour, hair colour, hitchhikers thumb, tongue rolling ability etc

## Ecology

Question	Answer
What is always at the start of a food chain?	Green plant / producer
What are the organisms that feed only on plants called?	Herbivores
What are the organisms that feed on animals called?	Carnivores
<p>For the food web below:</p>  <p>a) Identify the producer b) Name the 3 herbivores c) Name one predator d) What do the arrows represent?</p>	<p>a) grass b) grasshopper, mouse, rabbit c) lizard, hawk or snake d) transfer of energy or 'eaten by' (NOT 'eats')</p>
Which 2 types of organisms cause decay?	detritivores and microbes
What conditions are best for decay?	Warm, damp and plenty of oxygen
State 4 things that animals might compete for.	Water, food, living space, mates, oxygen
State 4 things that plants might compete for:	Water, nutrients, light, carbon dioxide
What does the term "extinct" mean?	When there are no more individuals of a species left on Earth
State the factors that could lead to a species becoming extinct.	Physical changes in the environment; new predators; new competitors; new disease
What is bioaccumulation?	The build up of toxins in the body of animals further up the food chain
Name the 5 main chordate groups	Mammals, fish, birds, reptiles, amphibians
What term is given to the differences between members of the same species?	Variation
What are the two reasons for variation within a species?	Genes and environment
How do you calculate the mean of these samples: 5, 1, 0, 12, 6, 18	Add them all up, press = and then divide by 6. You do not leave out 'anomalies' in this case

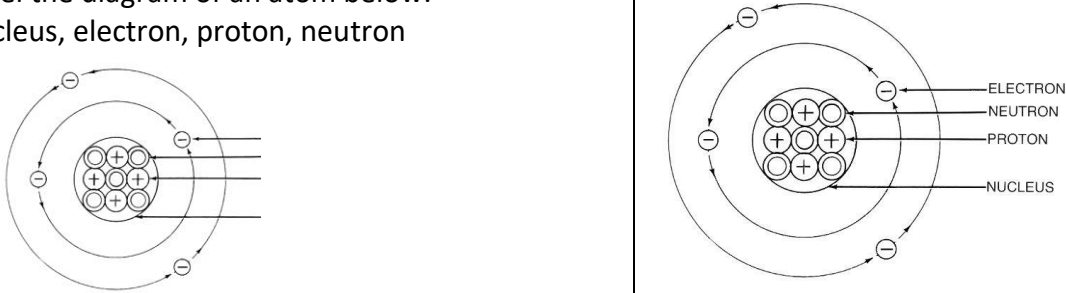
## Particles

Question	Answer
What are the 3 states of matter?	solid, liquid, gas
Which state of matter has particles that are always touching, arranged in rows and can vibrate but not change position?	solid
Which state of matter has particles that can move around but are always touching and are not arranged in neat rows?	liquid
Why can liquids and gases flow?	Because the particles in liquids and gases are free to move around
Which states of matter have a fixed volume?	solids and liquids
Why can solids and liquids not be compressed (squashed)?	Because there is no space between the particles
Why can gases be compressed?	Because there is space between the particles
Which states of matter will take the shape of the container they are placed in?	gases and liquids
What do we call the change of state when a liquid turns into a solid?	freezing
What is a solvent?	A liquid into which something will dissolve
What is formed when a solid dissolves into a solvent?	A solution
What happens to solubility when the temperature is increased?	Solubility increases
How can an insoluble solid be separated from a liquid?	Filtration
Which technique can be used to separate two liquids	distillation
What is chromatography used to separate?	A mixture of dissolved substances
Why is the line drawn in pencil in chromatography?	Because pencil is insoluble and won't run
What is a saturated solution?	A solution into which no more solid will dissolve
Name the changes of state shown below 	A – boiling B – melting C – freezing D - condensation
Name the equipment: 	Filter funnel
Name the equipment: 	Evaporating dish
What do we call the variable that is deliberately changed in an investigation?	Independent variable
What do we call the variable that is measured and recorded in an investigation?	Dependent variable
What do we call the variables that need to be kept the same in order to make sure our investigation is valid?	Control variables

## Chemical reactions

Question	Answer
What are the signs of a chemical reaction?	Temp change, colour change, fizzing/gas release
What do we mean by conservation of mass?	No mass is lost or gained during a chemical reaction mass of reactants = mass of products
What is an oxidation reaction?	When something reacts and joins with oxygen
If I react 24g magnesium with 16g oxygen, what is the mass of magnesium oxide that should be produced?	$24g + 16g = 40g$
What do the following pHs with universal indicator, tell us about a substance? A) pH 1-3; B) pH 4-6; C) pH 7; D) pH 8-10; E) pH 11-14.	A) Strong acid; B) Weak acid; C) Neutral; D) Weak alkali; E) Strong alkali
What is the general word equation to summarise a reaction between an acid and a metal?	Acid + metal $\rightarrow$ salt + hydrogen
What is the test for hydrogen gas?	Hold a lit splint near the gas and listen for it burning with a squeaky pop
What information can indicators give us?	Whether something is an acid, base or neutral
What colour does universal indicator turn in a neutral solution?	green
Complete the following word equations:  sodium + oxygen $\rightarrow$ ..... iron + oxygen $\rightarrow$ ..... fuel + oxygen $\rightarrow$ ..... + .....	 $\rightarrow$ Sodium oxide $\rightarrow$ Iron oxide $\rightarrow$ Carbon dioxide + water
What is a neutralisation reaction?	Reaction between an acid and an alkali to produce a neutral substance (pH 7)
Acid + alkali $\rightarrow$	acid + alkali $\rightarrow$ salt + water
The second part of a salt name comes from the acid that has been used to make it. What second name do the following acids give a salt? a. Sulfuric acid b. Nitric acid c. Hydrochloric acid	a. Sulfuric acid sulfate b. Nitric acid nitrate c. Hydrochloric acid chloride
What colour would universal indicator turn in a strong acid?	Red
What would be seen if a reaction produces a gas?	Bubbles

## Elements, compounds and periodic table

Question	Answer
What is an element?	Substance made up of one type of atom
What is a compound?	2 or more types of atom, chemically joined
What are the vertical columns in the periodic table called?	groups
What is used to order the elements in the modern periodic table?	Atomic number
What are the three particles that make up the atom called?	Proton, neutron and electron
Which two particles are found in the nucleus?	Proton and neutrons
Which particle is tiny, has a negative charge and is found orbiting the nucleus in shells?	electron
Label the diagram of an atom below: Nucleus, electron, proton, neutron	
What do all elements in the same group have in common in terms of electrons	Same number of electrons in outer shell
What are the two types of element?	Metals and non-metals
Name the compound formed when copper reacts with chlorine.	Copper chloride
Name the three elements joined together in copper carbonate	Copper, carbon and oxygen
How many different elements are there in $\text{KNO}_3$ ?	3 elements: K, N and O
What happens to reactivity going down group 1?	Reactivity increases
What are the signs of a chemical reaction?	Temp change, colour change, fizzing/gas release
What do we mean by conservation of mass?	No mass is lost or gained during a chemical reaction mass of reactants = mass of products
Name the gas given off when group 1 react with water	hydrogen
What is the name for group 7?	Halogens
What is the trend in reactivity in group 7?	The elements get less reactive as you come down group 7

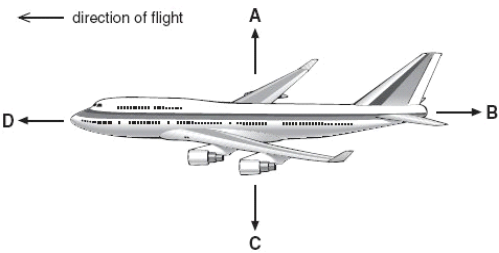
## Earth and atmosphere

What are the three layers of the Earth called?	Core, mantle, crust
What is the region of rising hot liquid in the mantle called?	Convection currents
Which type of rock is formed from liquid magma inside a volcano?	Intrusive igneous
Which rocks are formed when from lava cooling quickly outside a volcano?	Extrusive igneous
Which rocks are formed from layers of sediment?	Sedimentary
Which two conditions are needed to turn sedimentary rocks into metamorphic rocks?	Heat and pressure
What is a fossil?	Traces and remains of a living from millions of years ago
Why are fossils not found in igneous or metamorphic rocks?	They get destroyed by the heat/pressure
Which two gases make up most of the greenhouse layer?	Carbon dioxide and methane
What is the name of the process carried out by plants that removes carbon dioxide from the atmosphere?	Photosynthesis
What is the name of the process that all living things carry out to release energy from food?	Respiration
Which gases were present in the Earth's early atmosphere?	Carbon dioxide, ammonia, methane, water vapour
Give two reasons carbon dioxide levels fell in the Earth's early history	Dissolved in the oceans, photosynthesis by plants, locked up in rocks or fossil fuels
Give two reasons carbon dioxide levels in the atmosphere have been increasing over the last 100 years.	Combustion of fossil fuels, deforestation

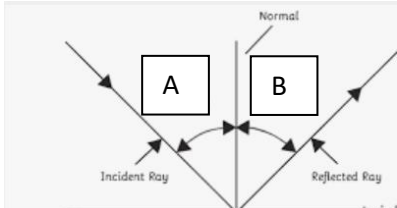
## Energy

Question	Answer
What is the unit for energy?	Joules
What are the 8 energy stores?	Kinetic, gravitational potential, thermal, elastic potential, nuclear, electrostatic, magnetic, chemical
Which store is filled when an object is raised off the ground?	Gravitational potential
Which store fills when energy is 'wasted'?	Thermal store (of the environment)
What is a fuel?	A substance with a store of energy in a chemical store that can be released
Why does the Bunsen burner flame release more energy when the hole in the Bunsen is open?	More oxygen is available for combustion
Which method of heat transfer occurs in solids when particles collide with each other?	Conduction
Why do regions of hot liquids and gases rise?	They are less dense
Which colour absorbs and emits the most Infrared radiation?	Black
Why are hot food takeaway containers silver or white?	Because this reflects infrared back to the food and is a poor emitter of infrared / keeps the food hot
What is the equation to calculate power?	$\text{Power} = \text{energy} \div \text{time}$
Which unit is used for power?	Watt
What is 1 watt equal to in terms of joules?	1 watt = 1 joule per second
What is a fossil fuel?	A fuel created from the remains of dead sea creatures or plants millions of years ago
What does the term 'renewable' mean?	Will not run out
Give an example of renewable energy resource	Solar, wind, hydroelectric, wave, tidal, biomass
Give an advantage of renewable resources such as solar and wind other than not running out	They don't release carbon dioxide
Give an advantage of renewable resources such as solar and wind	Not very reliable – eg solar doesn't work when it isn't sunny/when it's dark, wind doesn't work on still days
How do insulators help us save money?	They reduce energy transfers
Name the method of heat transfer that takes place in fluids when regions of hot gas/liquid rise	convection
What is efficiency in terms of energy transfers?	The fraction of energy that is transferred usefully Calculated by $\frac{\text{energy usefully transferred}}{\text{Total energy transferred}}$

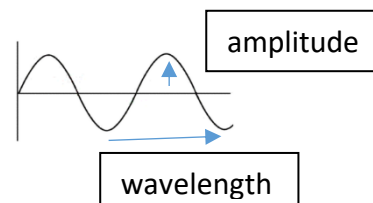
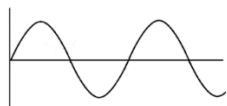
## Forces

Question	Answer
What do we say about forces acting in opposite directions are the same size?	They are balanced
If forces are unbalanced, what might happen to an object?	Accelerate or decelerate
What is the difference between mass and weight?	Mass is how much matter an object is made of (depends on number and mass of particles), weight is the force of gravity pulling on every Kg of mass
What is the equation for calculating weight?	$W = m g$
Calculate the weight of a 60kg astronaut on the Mars, where the gravitational field strength is 3.7N/kg.	$W = 60\text{kg} \times 3.7\text{N/kg} = 222\text{N}$
Why would you weigh more on Jupiter than Earth?	Jupiter has a larger gravitational field strength than earth as it is bigger.
Which force acts on objects moving through air?	Air resistance
Which force tries to stop objects moving along the surface of water?	Water resistance
Which force opposes weight to make an object float in a liquid?	upthrust
Which force acts on objects moving along a solid surface?	friction
What is the equation for pressure?	$P = F / A$
Calculate the pressure of a shoe with an area of 0.03m <sup>2</sup> and a force of 1800N.	$P = 1800\text{N} / 0.03\text{m}^2 = 60,000 \text{ N/m}^2$
Which is higher pressure, 1N/cm <sup>2</sup> or 1N/m <sup>2</sup> ? Explain your answer	1 N/cm <sup>2</sup> – the same force is spread over a smaller area
Why do skis not sink into the snow, but shoes do?	The force is spread out over a larger area, so reduces the pressure
What is the equation for speed?	Speed = distance ÷ time
A bike travels 200 metres in 10 seconds. Calculate the speed.	Speed = 200m ÷ 10 s = 20m/s
If you were travelling in a car that was travelling at 20 mph along the carriages of a train which was travelling in the same direction at 50 mph, what would be their relative speed?	Same direction so subtract. 50mph – 20mph = 30mph
Name the forces acting on the plane: 	A – lift B – air resistance C – weight D - thrust

## Light

Question	Answer
What type of wave is a light wave?	transverse
What do waves transfer?	energy
What 4 things can happen to waves when they meet a surface?	They can be transmitted, absorbed, reflected or refracted
What is the name of the ray that shines on a surface?	Incident ray
What is the name for the angles A and B shown in the diagram:  	A – angle of incidence B – angle of reflection
What is the law of reflection?	the angle of incidence = angle of reflection
How many colours are there in white light?	7
Why do leaves look green?	they reflect the green part of the spectrum
What colour would leaves look if the white light was passed through a red filter first?	black
Why do objects look white?	They reflect all 7 colours of the spectrum
When does refraction happen?	when light/waves pass from one material into another and the density is different – eg air to water
What is the line that is 90 degrees to a surface known as?	Normal
Which two parts of the eye refract light to make sure it focuses?	Cornea and lens
Which part of the eye is where images are formed?	Retina
Why is gravity called a 'non-contact' force?	Because the force is exerted on objects even if they are not touching the Earth
Give an example of another non-contact force	Magnetism
What produces a wave?	Vibrations
What type of wave is a sound wave?	Longitudinal wave
Describe two differences between a light wave and a sound wave	<ul style="list-style-type: none"> <li>- Light waves are transverse waves but sound waves are longitudinal</li> <li>- Light waves are caused by vibrations that are perpendicular to the direction of travel and sound waves are caused by parallel vibrations.</li> <li>- Light waves travel much faster than sound waves</li> <li>- Light waves can travel through a vacuum but sound waves need a medium to travel through</li> <li>- Sound travels fastest through solids but light travels slowest through solids</li> </ul>
Through which medium does sound travel fastest?	solid

Label the diagram using the following words:  
amplitude, wavelength



### Electricity and magnetism

Question	Answer
What is current?	The rate of flow of charge
Which piece of equipment is used to measure current?	Ammeter
How is an ammeter connected into a circuit?	In series
What is the unit for current?	Amps (A)
What is a series circuit?	One in which there is only a single loop or path from the cell
What is the pattern for current in a series circuit?	Current is the same at all points in a series circuit
What is a parallel circuit?	One with more than one loop or path
What happens to current in a parallel circuit?	Current splits down each strand
Which piece of equipment measures voltage?	Voltmeter
How is a voltmeter connected?	Volts (V)
What is the unit for resistance?	Ohms ( $\Omega$ )
How does adding extra bulbs affect resistance?	Extra bulbs increases the resistance
When resistance is increased, what happens to current?	It decreases
Which force causes a build up of static electricity?	Friction
What is removed to cause static?	Electrons
What type of materials are the ones in which static electricity builds up?	Insulators
When electrons are removed from a material, what charge is the material left with?	Positive