Coordinated Sciences (0654) Mistake Corrections

Structure of flower for insect pollination:
- it has petals
- insect must crawl past stigma to reach nectar
- stigma and anther inside the flower/stigma not feathery
- so wind cannot blow away pollen

Named fruit seed dispersal:
Bixa produces fruits that contain hooks. They attach to the furs or feathers of animals. The seeds are carried over long distances and are eventually rubbed off by host animal.

Separation of nitrogen from other gases:
different boiling point
gases boil off as their boiling points are reached

Haber Process:
N2 and H2 are being recycled for equilibrium/reversible reaction/cycling/conversion of reactants incomplete

Suggest, in terms of forces between electrically charged particles, why energy is needed to break the covalent bond in a nitrogen molecule.
- Strong force of attraction between electrons and nucleus because opposite charges attract
- energy required to break the strong oppositely attracted particles

Suggest why nitrogen molecules are unreactive. [3]
- Because the nitrogen atoms are covalently bonded with 3 pairs of electrons producing a large negative charge
- large amount of energy is required to break bond
- because of high force of attraction

Explain, in terms of forces acting on the car, why there is a maximum speed (terminal velocity) that a car can reach.
- Because the air resistance increases as car speeds up
- eventually the two opposing forces become equal so that car can no longer accelerate

Suggest how bats detect a water surface
- sound waves scattered in many directions from a rough surface
- bats receive fewer echoes from a smooth surface

Explain how natural selection could have caused the behavior (moth flying in rapid zig-zags) to evolve. [4]
- moths with the genes are more likely to survive
- because they are less likely to be killed by bats
- so moths with the genes are more likely to reproduce
- and pass their genes to their offspring
- overtime, most moths will have the genes/behavior

Explain what happens to the nerve impulses in the sensory neuron, in order to produce the escape behavior of the tiger moth.
- impulse travel along sensory neuron
- to the central nervous system
- travel along motor neuron
- to muscles/effectors

Explain, in terms of relative number of protons and electrons, why calcium ions have an electrical charge of 2+, but sodium ions have a charge of 1+.
- metal atoms form ions by losing outer shell electrons
- calcium ions have 2 more protons than there are electrons
- sodium ions have 1 more proton then there are electrons

Explain what is meant by an a.c. frequency of 50 Hz. [2]
- alternating current; which changes 50 times per second

Explain the process of evaporation in terms of particles.
- particles separate/escape
- more energetic particles escape from surface
- able to overcome attractive forces of other particles

Explain how heat energy is able to pass through the metal parts of the heater.
- conduction
- particles nearer heater gain energy and vibrate more
- vibration/heat/energy passed from particle to particle along the metal
- reference to energy passing via mobile electrons

Describe the role of capillaries in the villus.
- absorb amino acids
- absorb glucose which dissolve in blood (plasma)

Suggest the function of the microvilli on the epithelial cells.
- increase surface area; increase rate of absorption

Describe what happens to the glucose <u>when it reaches the liver</u> if the concentration of glucose in the blood is too high.
- glucose taken up by liver cells
- changed to glycogen
- glycogen is stored

Explain the meaning of the term *ionizing radiation*.
- turns atoms into ions/charged particles, /atoms become charged
- removal of electrons from atoms

Describe the pathway along which water from the soil travels to cells in the plaint's leaves. [3]
- through root hair cells
- across cortex of root
- into xylem
- additional detail about xylem in root/stem/leaf
- to mesophyll cells in leaves

Explain why plants need nitrate ions.
- to make amino acids
- to make proteins
- for growth/to build cells/to make enzymes

Explain why too much fertilizer in the soil can stop movement of water into the plant's roots.
- no osmosis into roots
- because high concentration of dissolved ions reduces water potential
- water potential outside lower than water potential inside

Explain how fish die because of Eutrophication.
- fertilizer causes growth of algae/plants
- which, block sunlight for other plants/die/decompose/decay
- material, feed on/decompose, dead plants/increase in bacterial growth
- bacteria use oxygen for respiration
- fish die from lack of oxygen

Choose one difference in the physical properties of diamond and graphite and explain this difference in terms of structure. [4]
- diamond very hard and graphite softer/flaky
- diamond has C atoms all interconnected in three dimensional array/one huge macromolecule
- all bonds in diamond are very strong
- graphite arranged in layers of hexagonally bonded C atoms
- only weak forces between layers (allows layers to slide)

Explain why air pollution caused by car engines would be greatly reduced if hydrogen could be used as the fuel instead of gasoline.
- gasoline burns to produce carbon dioxide which is linked to climate change
- gasoline burns to produce pollutants such as carbon monoxide
- hydrogen waste product is non-polluting water

Explain why the electrical output from this power station has to be a.c.
- Transformers only work with a.c.
- to enable transformers to change voltage

Use the idea of particles to explain why the increased temperature in types will result in an increase in tyre pressure. [3]
- as temp increases, kinetic energy of particles increases
- increased force/energy of collisions
- increased frequency of collisions
- collisions with walls/surface of tyre
- force of collisions exert a pressure

Define the term *translocation.*
- movement of sucrose/sugars/amino acids in phloem

Describe the mechanism by which water flows through the xylem.
- transpiration/evaporation from leaves
- causing a tension in the xylem
- creates water potential gradient
- water molecules are cohesive

Describe the difference between evaporation and boiling.
- evaporation occurs at any temp/boiling only occurs at the boiling point of a liquid
- evaporation - only most energetic particles can escape from surface/boiling - all particles have enough energy to escape

During a sprint, the blood flow to the muscles increases. Suggest and explain the effect of this increased blood flow on

i) the rate of lactic acid production
- lactic production is slower/decreases
- because blood supplies more oxygen/less need for anaerobic respiration

ii) the rate at which lactic acid is removed from the muscle cell
- lactic acid removed faster
- because more oxygen to convert it to CO2/more lactic acid is oxidized

Describe the role of bile in the digestion of fats.
- emulsifies fat
- increases surface area so faster digestion

State functions of liver cell apart from bile production
- stores glycogen
- controls blood glucose levels
- breaks down poisons/alcohol
- destroys hormones
- produce urea/deamination
- remove old red blood cells

Explain why less energy is needed to extract copper from copper oxide than is needed to extract iron from iron oxide.
- copper forms weaker bonds with oxygen than iron does (CuO vs. Fe_2O_3)
- copper is lower than iron in the reactivity series

Explain how silicon dioxide is removed from the molten iron in the blast furnace.
- limestone/calcium carbonate decomposes to produce calcium oxide
- which reacts with silicon dioxide
- to form molten slag/calcium silicate
- which floats on/forms a separate layer on molten iron

Explain what is meant by coronary heart disease.
- blockage/narrowing of coronary arteries
- due to cholesterol/fat deposits/plaques
- lack of oxygen supplied to heart muscle

Explain how both of these effects can increase the chances of infections in the lungs.
cilia damage:
- cilia cannot remove the mucus bacteria/pathogens

extra mucus production:
- bacteria/pathogens are trapped/contained in mucus
- bacteria/pathogens stay in the lungs/breed in the mucus

Explain why lights in a house are connected in parallel and not in series.
- so that they can be individually turned on and off
- so that they all get the **full mains voltage**
- so that if one fails the rest still operate

State the approximate percentage of carbon dioxide in the air: 0.04%

Describe and explain how the student could use dilute hydrochloric acid and usual laboratory apparatus to obtain a sample of copper from this mixture.
- add excess acid to the mixed metals until bubbling stops
- magnesium reacts with acid/dissolves
- copper does not dissolve
- filter off the copper

type of electromagnetic wave that is strongly absorbed by the water in cells: microwaves

Describe how you could identify alpha, beta and gamma radiations by their deflections in an electric field. [5]
- gamma not deflected
- because gamma has no charge

- alpha deflected one way and beta the opposite
- because alpha and beta have opposite charges
- opposite charges attract

State two ways in which these workers could be protected from the radiation.
- wear protective clothing
- work behind protective screen

Function of sperm ducts: carries sperm
Function of prostate gland: produces fluid for sperm to swim in/secretes seminal fluid
Function of urethra: carries sperm/semen and urine

Describe three ways in which human male gametes differ from human female gametes.
- smaller
- produced in larger quantities
- more mobile
- have a tail/pointy head/streamlined

Outline how HIV affects the immune system of a person with HIV/AIDS.
- virus destroys/damages/attacks white blood cells
- reference to T cells
- reduces ability to destroy viruses/fight infection

Explain what is meant by compressions and rarefactions.
- compression region of high pressure/lots of air particles
- rarefaction regions of low pressure/fewer air particles

type of process or reaction	process or reaction
reaction that produces ethane from ethene and hydrogen	addition
reaction that causes protein molecules to break up into amino acids	hydrolysis
reaction that produces unsaturated compounds	catalytic cracking
process that simplifies a complex mixture	fractional distillation

Poor absorber and poor emitter of infrared: white

Outline the function of DNA.
- stores genetic information
- on making proteins
- reference to hereditary material

Explain why the exit gas stream contains all three of these gases. (haber process)
- reaction to make gases is reversible
- so reactants can never be fully used up/some product changes back to reactants/some gases pass through without reacting

Using your knowledge of osmosis, suggest why liver cells store glycogen and not glucose.
- If glucose, cells would take up water by osmosis but glycogen is insoluble
- may burst

Explain fully why body cells need glucose. [3]

- for energy
- respiration; glucose oxidized/glucose combined with oxygen
- for movement/other named use of energy

Describe the process of evaporation in terms of particles. [3]
- heat transferred into water particles from surroundings
- water changes from liquid to gas
- reference to attraction between particles in the liquid
- fastest moving/more energetic particles escape
- because they can do more work against attractive forces/can break bonds between them
- escape at surface/reference to process happening at temperature below BP
- average energy of rest of particles reduced/heat removed from liquid

Suggest how the dispersal of seeds away from the tree in golden lion tamarin faces could benefit the young plants that grow from the seeds.
- feces provide nutrients for young plants/seedlings
- less competition for seedlings away from parent trees
- example of factor competed for e.g. light, water, soil nutrients
- help of colonize new areas

Define an ecosystem.
- interaction between organisms and their environment in a given area

Describe how a circuit breaker protects a worker using an electric drill.
- circuit breaker cuts electricity to a device when current overflows

Explain why energy losses in overhead electricity transmission cables are lower when the voltage is high.
- current is low when voltage is high
- less energy loss

Explain how the rotating coil causes the lamp to light. Include in your explanation a description of what the slip rings and brushes do.
- coil/wire is cutting magnetic field lines
- voltage is induced
- brushes/slip rings form electrical connection
- stop connecting wires from getting twisted

Describe how anaerobic respiration in yeast is used in bread-making.
- yeast uses sugar from flour
- which produces carbon dioxide
- making the dough rise
- carbon dioxide trapped in the dough

State one way in which a worker's exposure to radiation can be monitored.
- photographic badge/dosimeter

terrestrial television communications: radiowaves
mobile phone communications: microwaves

Describe how the sound of the thunder is transmitted to the observer through the air.
- as a series of compressions and rarefactions
- as longitudinal waves
- by transfer of vibrations of particles

The impacts of coronary artery being blocked on the heart issue

- death of heart tissue/cells cannot respire
- because of lack of oxygen

Explain what is meant by *negative feedback* in homeostasis.
- action by body to maintain constant internal environment
- sensor/receptor detects a change from normal and brings about a response that returns factor towards normal
- changes detected by receptor are reversed and as a response, body returns it back to set level

Suggest what changes in the body to reduce the blood supply to the fingers:
vasoconstriction

Explain why the piece of iron is attracted to the bar magnet by referring to the magnetic properties of iron.
- iron can be magnetized
- north pole of bar magnet attracts induced south pole of iron piece

Explain why relays are used as switches in circuits that use large currents for operating machinery.
- relay uses a low current to switch on a high current
- safety qualified by context e.g. prevent electrocution

Describe how a relay switches electrical machinery on and off.
- magnetized coil
- attracts armature
- armature closes main circuit

Suggest one way in which the mongoose would use energy released from respiration.
- muscle contraction
- protein synthesis
- cell division
- growth
- passage of nerve impulses
- maintenance of body temperature

Suggest and explain how the values of energy transfer would be different for a mammal in a colder climate:
- more used in respiration/less used for new tissue
- respiration produces heat to keep warm

an animal that eats mainly grass:
- more energy lost in feces/less absorbed
- because more fibre in diet

Suggest why the half life of 6 hours makes the isotope suitable for its use as a radioactive tracer in the human body.
- lasts long enough to travel to target organ
- will only **irradiate** body for a short period/does not linger in the environment for too long

Suggest why an isotope that releases gamma radiation is suitable for its use as a radioactive tracer in the human body.
- more penetrating - easier to monitor/not stopped by skin
- less ionizing - causes less damage to body cells
- gamma ray energy/wavelength easy to detect using x-ray detectors
- gamma can leave body easily

Explain what is meant by the term *wavelength*.

- distance between identical points on two consecutive waves

State two ways in which the chromosomes in an egg cell would be different from those in skin cells.
- haploid/not paired/half as many
- no Y chromosome/only X chromosome

Explain why the presence of sulfur dioxide in the atmosphere causes the water in some lakes to become acidic. [3]
- dissolves/mixes/reacts with rain water/water in the air
- rain water becomes acidic/now contains dilute sulfuric acid
- acid rain falls into lake
- water evaporates but sulfuric acid does not

Suggest two reasons why pasteurization is important.
- remove other microorganisms
- other microorganisms might produce toxins/be harmful
- the microorganisms would compete with the yoghurt bacteria

Explain what happened to cell C (shrink) to cause its shape to change.
- water moved out of the cell
- by osmosis
- through partially permeable cell membrane
- down a water potential gradient
- reference to reduction in volume of cytoplasm/cell

Predict the color the student would see if the test-tube contained (adding chlorine solution) potassium iodide. brown/black

Describe how loudspeaker causes the sound to travel through the air. Use the idea of compressions and rarefactions in your answer.
- loud speakers cone vibrates/vibrations are passed on by
- particles/molecules
- makes region of high pressure (compressions) and regions of lower pressure (rarefactions)

Explain why sound travels at a different speed through water than through air.
- particles are closer together in liquid
- particles collide and transmit energy/sound more quickly in liquid

The food web shows that bees depend on plants. Some species of flowering plants also depend on bees and other insects. Explain how bees help flowering plant species to survive.
- reference to sexual reproduction
- pollination
- bees carry pollen from anther/to stigma/from one plant to another
- pollen contains male gametes
- reference to fertilization (following pollination)
- seeds formed

Suggest reasons for the pattern (as radiation level increases, number of spiders per m2 decreases), you should use your knowledge of the effects of ionizing radiation on living organisms, and the information in the food web.
- organisms do not survive in high levels of radiation
- reference to, mutation/why damaged DNA may kill organism
- reference to reason for variability in number at any one radiation level
- spiders are carnivores/spiders feed on other organisms

- idea that other organisms killed, so fewer spiders can get food

The coil on an a.c. generator is now made to spin in the opposite direction to the one shown in Fig. 6.1. What difference, if any, would be shown on the voltmeter reading?
- same alternating voltage

Explain why transformers are needed between the power transmission cables from the power station and the cables supplying homes.
- to change voltage/increase current
- so devices work at suitable voltage/avoid damage to devices

Explain how the ciliary muscle, suspensory ligament and lens will cause changes to allow the eye to focus on a nearby object.
- ciliary muscle contracts
- reduces diameter of its ring
- suspensory ligament slackens
- allows lens to become more rounded
- reduces focal length of lens
- refracts light rays more strongly

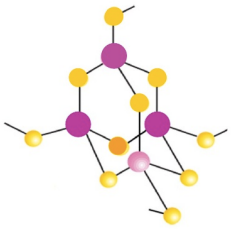
In which part of the eye are the receptor cells that sense the bright light?
- retina

Describe and explain how water in rivers and lakes could become polluted if sulfur compounds are not removed from fossil fuels before they are used.
- fuels combusted burnt/oxidized
- sulfur dioxide produced
- reacts/dissolves to form acid rain
- acidic water gathers in rivers and lakes/acid does not evaporate from lakes

Explain how bile helps lipase to breakdown fats more rapidly.
- reference to emulsification
- breaks fat into small droplets
- helps fat to disperse in water
- increases surface area/idea of allowing lipase to make contact with fats

State roles of fat in the human body.
- helps to keep body temperature constant
- insulator/reduces heat loss from skin
- energy store
- protection around soft organs
- make cell membranes
- make myelin sheath around neurons

Silicon (IV) oxide - structure

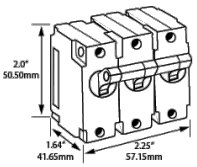


Each silicon atom is bonded to **four oxygen atoms** in a **tetrahedral** structure and **each oxygen atom** is bonded to **two silicon atoms.**

50

Compare briefly the structures of silicon oxide and water.
- silicon(IV) oxide has giant structure
- huge 3-D arrangement, tetrahedral structure
- large numbers of bonds/Si:O ratio 1:2
- water is made of small molecules/is simple molecular
- only weak attractions between molecules

Explain how a circuit breaker can stop someone who is using a faulty electrical device from receiving electric shock.
- A spring-loaded push switch(reset) is held in the closed position by a spring-loaded soft iron bolt.
- An electromagnet is arranged so that it can pull the bolt away from the switch.



- If the current increases beyond a set limit, the electromagnet pulls the bolt towards itself, which releases the push switch into the open position.
- stops the current/flow of electricity in the circuit

Short pulses of sound are sent out from the boat. The echo from the shoal of fish is detected by a receiver on the boat 0.2 seconds later. Sound waves travel through water at a speed of 1600m/s. Calculate the distance of the shoal of fish below the boat.
- d = 1600 • 0.2 / 2 = 320m

Outline two advantages of renewable energy.
- less fossil fuels used up/fossil fuels are conserved
- no emissions causing acid rain
- no CO2 emissions/greenhouse gases
- reduced greenhouse effect/global warming

Explain why the uncombined elements sodium and chlorine are not found in Earth's crust.
- too reactive/elements unstable/they would react/compounds much more stable

Explain why calcium does not need to be digested in the human alimentary canal.
- can be absorbed as it is/it consists of particles small enough to be absorbed

Explain why the milk is kept at a temperature of 40˚C after the bacteria have been added to the milk.
- to speed up the process
- reference to enzymes
- idea that enzymes working faster at this temperature

Suggest why the yoghurt is kept in a refrigerator at a temperature of 3˚C.
- slows/stops enzymes working/to keep it fresh

Explain what happens to the current in the fire alarm circuit when the temperature increases.
- resistance of thermistor goes down
- current goes up
- reference to V=IR; supply voltage is constant

Describe how acid rain is caused.
- combustion/burning of fossil fuels
- sulfur dioxide produced
- sulfur dioxide reacts with/dissolves in/mixes with water in atmosphere

Describe and explain how transformers are used in the large scale transmission of electricity.
- transformers increase voltage at power station
- to reduce current in cables
- to reduce energy losses
- transformers decrease voltage at point of use
- correct voltage for safe use in domestic appliances

Describe how goblet cell and cilia helps to stop harmful substances getting into the lungs.
- goblet cell produces mucus
- mucus traps bacteria/pathogens/dust/particles
- cilia sweep mucus, upwards/away from lungs/to throat

State and explain one use of graphite.
- as electrode e.g. in dry cell or electrolysis because graphite is an electrical conductor

- as a lubricant since layers of carbon atoms can easily slide/move past each other

This is a diploid cell. State the number of chromosomes that there will be in each of the daughter cells if this cell divides by
mitosis: 4
meiosis: 2

A student heated some water in a microwave oven for five minutes. Fig 4.2 shows how the temperature of the water changed. The temperature of the water stops increasing after two minutes. Explain what happened to the water molecules during the five minutes.
- energy is input throughout 5 minutes/at constant rate
- up to 100˚C/for first 2 minutes increase in the kinetic energy of the particles in liquid
- water boils at 100˚C/after 2 minutes
- energy used to separate water molecules/break forces/bonds between molecules
- correct reference to latent heat

Describe two differences in the properties of a typical ionic compound and a typical covalent compound.
- ionic always solid at room temperature/covalent can be liquids and gases
- ionic higher melting point or boiling point
- ionic often soluble in water/covalent tend to be insoluble in water
- ionic can form electrolytes/covalent cannot be electrolytes

All dilute solutions of acids contain hydrogen ions, H+. Explain the difference between the results for experiment 1 and 2 in terms of electrons, ions, atoms and electric current.
- when current less, the rate of gas production is less
- at cathode, hydrogen ions gain electrons/hydrogen is discharged
- current is rate of flow of electrons
- so if electrons arriving at cathode per second is halved then H+ discharging per second is halved/rate of discharge is proportional to current

Describe how red blood cell transports oxygen.
- hemoglobin combines with oxygen
- picks up oxygen in lungs/alveoli **and** drops it in tissues

Explain how the structure of the blood capillary helps oxygen to be provided easily to the body tissues.
- very narrow
- so red blood cell always close to the wall/the body tissues
- so red blood cell takes longer to pass (for better diffusion)

OR
- thin/one cell thick **walls**
- so oxygen can diffuse through quickly

Describe the function of white blood cells.
- protection against disease/destroys invading microorganisms/bacteria
- phagocytosis: phagocytes **engulf** pathogens to destroy/feed on/get information from them

Explain why energy cannot be transferred from the Sun to the Earth by conduction.
- conduction requires particles/a medium
- **only radiation can pass through a vacuum**

Explain why shaking the torch produces an electric current. [4]
- magnet moves through coil
- magnetic field generated around coil
- magnetic field changes, field lines are cut by coils

- this **induces** voltage

Explain the meaning of *fertilization*.
- **joining of nuclei of male and female gametes**

Function of sepal: protects flower when in bud

Describe briefly how the polymer chains in proteins may be broken down into small molecules.
- heat; aqueous acid/alkali

OR
- enzymes/biological catalysts; at optimum temperature or pH

Describe one way in which energy is lost from the food chain.
- respiration; energy lost as heat
- not all organisms eaten/not all parts or organisms eaten/dies before eaten; this energy goes into decomposer food chain
- not all food digested; so some not absorbed into organism's body/some lost in feces

Outline how the cells in the man's body obtain useful energy from the food that has been digested and absorbed into them.
- respiration
- glucose, oxidized/broken down/energy released from glucose

Use the idea of evolution to explain how antibiotic-resistant bacteria increased.
- mutation produces resistant variety
- some bacteria more resistant than others
- antibiotics in frequent use
- resistant bacteria more likely to survive/natural selection
- and reproduce to pass on this resistance

Suggest a reason why resistance to antibiotics increased faster in country A than B.
- more/incorrect antibiotic use in country A

A current passes through a wire placed between the poles of a magnet. When the switch is closed, the wire moves upwards. Describe and explain what happens when

i) the three cells are replaced by six similar cells,
- larger current so wire moves upwards higher/quicker/with more force

ii) the three cells are reversed in the circuit.
- currents reversed so wire moves downwards/direction reverses/forces act downwards

Name one gaseous element other than nitrogen or oxygen that is found in unpolluted air.
- any noble gas e.g. helium

Why is the volume of 1 mole of oxygen gas the same as volume of 1 mole of nitrogen gas (24dm3)?
- 1 mole of any gas at room temperature and pressure has a volume of 24dm3

Why is a car accelerating?
- there is a resultant/net force/sum of forces is not zero

State the meaning of half-life.
- time taken for half the atoms/nuclei to decay OR time for radioactivity to fall to half

Explain why the human circulatory system is described as a double circulation.
- blood flows twice through the heart for each complete circuit

- through lungs then through body tissues
- idea of separate oxygenated and deoxygenated blood

The pulse can be used as a way of measuring the heart rate. Explain why the beating of the heart causes a pulse at the wrist.
- surge of blood/pressure into the vessel causes the vessel wall to stretch and recoil with each beat

Describe, in terms of particles, how thermal energy is transferred through the base of the saucepan by conduction and heats up all of the water by convection.
- increased particle movement/vibration/kinetic energy
- energy transferred by collision, vibration/energy, passed from particle to particle
- water particles move further apart
- less dense water rises

Name two useful substances, other than oxygen, that pass from the mother's blood to the fetus's blood.
- water
- one from - amino acid/glucose/fatty acid/glycerol/named relevant element/named vitamin
- antibodies

Suggest with a reason whether bronze should be described as a mixture or as a compound.
- *mixture*
- proportions of tin and copper can vary/no fixed chemical formula

OR
- *compound*
- atoms of different elements are bonded
- some properties of bronze are different from either tin or copper

Suggest how the student could obtain experimental evidence that some of the copper in electrode T had dissolved.
- weigh the electrode before and after the process
- decrease in mass provides the required evidence

OR
- use micrometer to find/measure electrode thickness before and after the process
- decrease in thickness provides the required evidence

Describe how the leaves obtain carbon dioxide.
- from the air
- by diffusion
- through stomata

Define the term *digestion*.
- breakdown of large molecules
- so that they can be absorbed/become soluble

Explain briefly how calcium carbonate and potassium compounds could improve the quality of soil.

calcium carbonate:
- reduce acidity/increase pH/neutralize acids
- calcium carbonate reacts with soil/release nutrients from soil

potassium compounds:
- increase plant nutrient levels/fertilizes
- potassium compounds are essential for healthy plant growth/increase yield

Name the substance that neutralizes ammonia to produce ammonium nitrate. -nitric acid

Explain how the muscles can help to return a low body temperature to normal.
- contract/shiver
- release heat

Suggest why bottle milk is not better as a source of large amount of nutrients.
- may not be absorbed as efficiently
- many be more than the baby needs
- some nutrients destroyed during preparation

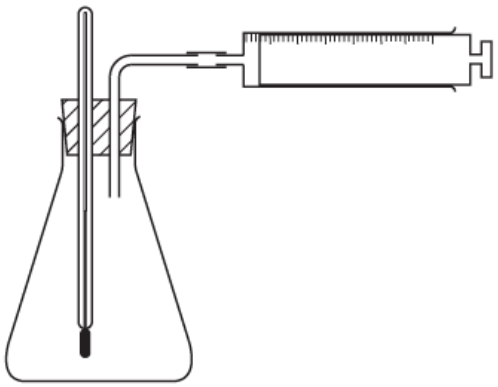
MCQ

Which statement about blood components is correct?
- platelets make antibodies
- platelets transport oxygen
- white blood cells can carry out phagocytosis
- white blood cells transport carbon dioxide

When focusing on a close object at night what is the state of suspensory ligament and ciliary muscle?
- Ciliary muscle contracts, suspensory ligament slack

Which feature of sexual reproduction helps a species to evolve?
- fewer offspring are produced than in asexual reproduction
- offspring always inherit advantageous characteristics
- offspring are the result of the fusion of genetically different gametes
- offspring produced will always be in a suitable environment

18 The apparatus below is used to investigate the speed of a chemical reaction.



For which reaction is the apparatus suitable?

A gas E + gas F → liquid G only

B solid H + solution I → solution J only

C solid K + solution L → solution M + gas N

D solution P + solution Q → solid R + solution Q

Answer: **C**
gas can be given off through the syringe, allowing it to expand
solution will stay in flask, thermometer used to measure temperature change of solution

19 Which equation shows a redox reaction?

A $AgNO_3(aq) + NaCl(aq) \rightarrow AgCl(s) + NaNO_3(aq)$

B $BaCl_2(aq) + H_2SO_4(aq) \rightarrow BaSO_4(s) + 2HCl(aq)$

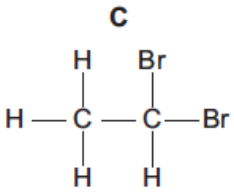
C $2Na(s) + Cl_2(g) \rightarrow 2NaCl(s)$

D $NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O$

C: leave answers in spectator ions

Which compound cannot be formed by reacting ethene with one other substance?

C

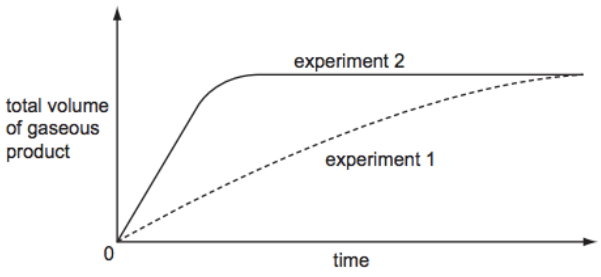


Which structures make up the nervous system?
- brain, nerves, spinal cord
- effectors, impulses, spinal cord
- impulses, muscles, nerves
- effectors, receptors, stimuli

20 Substance X does not react with dilute acid. Substance Y reacts with dilute acid, forming a gas.

The graph shows the results of two experiments.

experiment 1 Y + dilute acid
experiment 2 X + Y + dilute acid



What do these results show?

	X is a catalyst	X is quickly used up
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

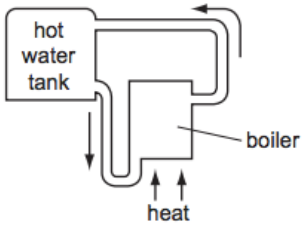
key
✓ = true
✗ = false

Answer: **B**

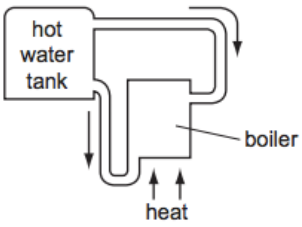
33 The diagrams show part of a water-heating system which is working by convection.

Which diagram shows the flow of water in the system?

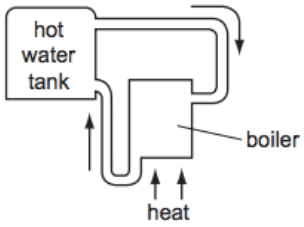
A



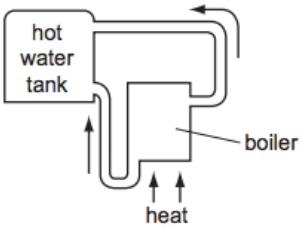
B



C



D



Answer: **A**