Fill in the Table

Physical Quantity	**Instrument**
Volume	Graduated cylinder
Time	Stopwatch
Temperature	Thermometer
Resistance	Ohmmeter
Potential difference	Voltmeter

(a)

Description	***Name of celestial object***
Consists of burning gas	Star
Orbits a planet	Moon
Orbits a star	Planet

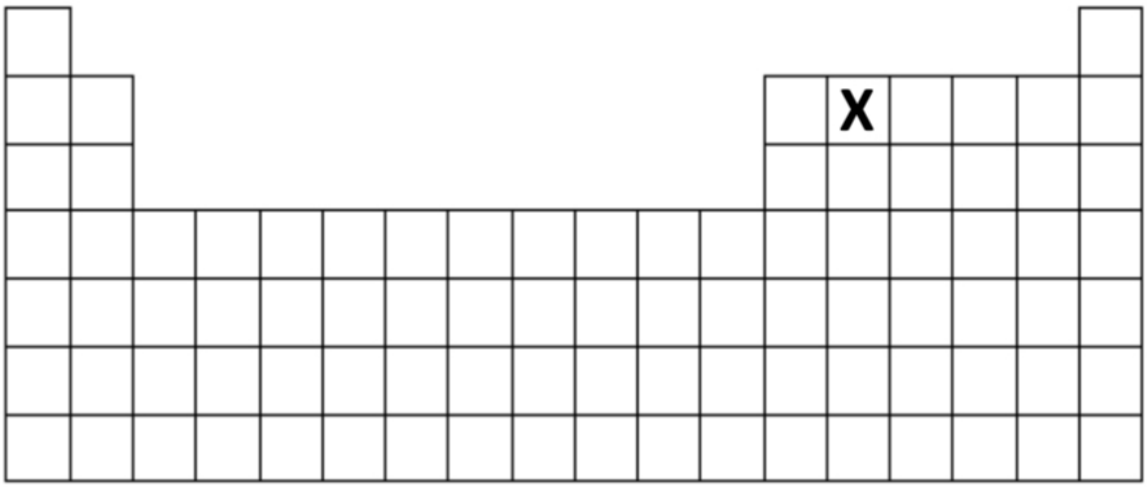
(b) Star

(c)

(a) Proton or neutron or nucleon

(b) Negative

(c)



(d)

(Carbon and Element X can both be used in the answer)
Any of…

- Element X (Carbon) has a valency of 4
- Element X has a combining power of 4
- Carbon has 4 valence electrons
- Carbon has 4 electrons in its outer shell
- Carbon needs 4 electrons
- The correct electron figuration for carbon is [2,4]

(a)

Statement	True	False
Evolution involves genetic mutations	✓	
Natural selection is based on competition	✓	
Natural selection involves survival of the weakest		✓

(b) Their thick fur allows them to conserve body temperature
Their sharp teeth allow them to easily eat meat
(Any other respectable answer accepted)

(c) The thorns of a rose bush prevent it from being eaten by grazing predators
The bright colour of a rose indicates that it may be poisonous to predators
The bright colour of a rose attracts pollinators
(Any other respectable answer accepted)

(a) Oxygen / O_2 / O

(b) Density

(c) 0.3 or 3/10

(d) Add more water (solvent) and increase the temperature

(a) Image 4

(b) Image 1

(c) 1 month

(d) Because it reflects light

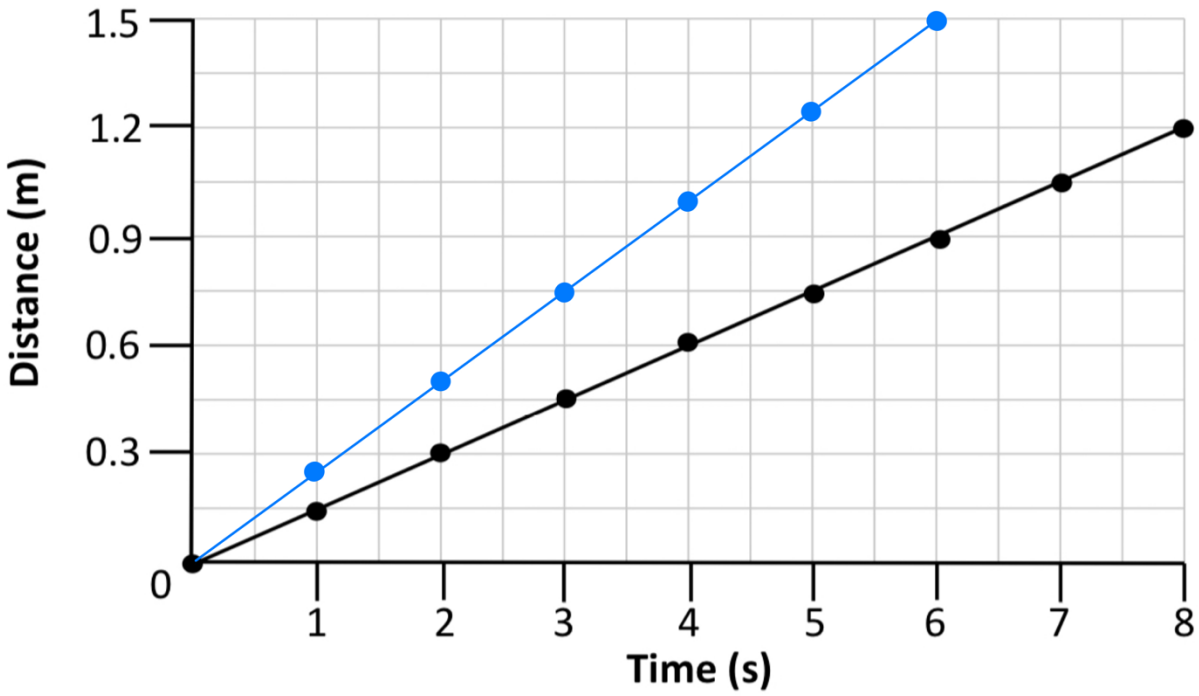
(e) The moon has a smaller mass than the Earth

(a) 0.15 m/s or 0.15 ms^{-1}

(b) Experiment to determine if a sloped track results in a higher average speed for a trolley than a horizontal track (or any other similar hypothesis)

(c) Use the same trolley / use a trolley of the same mass / use the same surface of a track / use the same track length / start the trolley in the same position / use the same starting force exerted on the trolley / keep the same friction or air resistance
(Any control)

(d) (Blue results)



(a) The Big Bang Theory

Evidence:
Any two of…
Expansion of the universe or galaxies
Cosmic / background radiation
Ratio / presence of hydrogen and helium gas clouds in distant galaxies

(b)
Benefit: Generates scientific knowledge, Sourcing raw materials, combatting climate change, etc. (any acceptable answer)
Hazard: High levels of radiation, Being in a hostile environment, Machinery faults etc. (any acceptable answer)

(a) Acid T

(b) Any valid safety precaution e.g.
Wear a lab coat
Wear goggles
Tie long hair back
Wear gloves

(c) 13

(d) 7

(e) Any laboratory base…
Sodium Hydroxide (NaOH)
Potassium Hydroxide (KOH)
Calcium Hydroxide [$Ca(OH)_2$]

(a)

Statement	True	False
The blood vessel in C is deoxygenated		✓
The organs found at location A are part of the respiratory system	✓	
Carbon dioxide leaves the blood at location B		✓
Vessel D is a vein	✓	

(b) Because the blood is under higher / greater pressure

(a) Position C

(b) A – Because it is tilted towards the sun

(c) Positions B and D

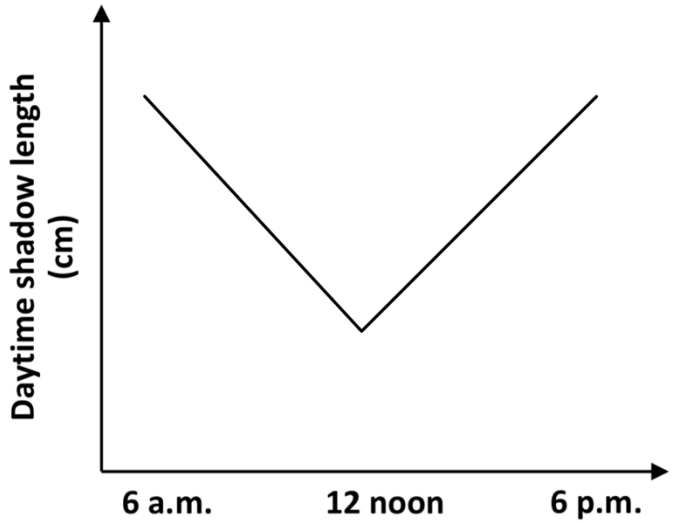
(d) The tilted Earth moves around the Sun

(e) A metre stick, a ruler, measuring tape or a trundle wheel

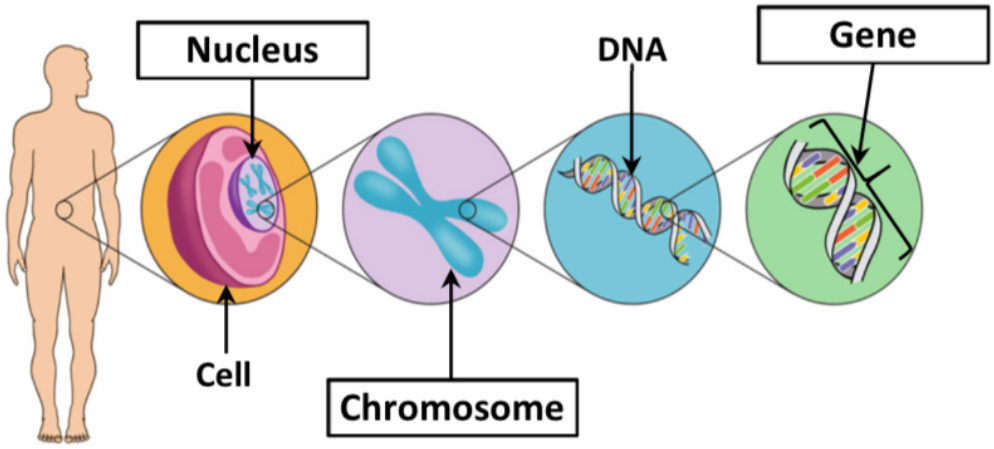
(f) Variables that should be kept constant include…
The length or height of the pole
The depth of insertion of the pole into the ground
The angle of insertion of the pole
The time of day
The aspect
The slope of the surface

(g) A – (Any valid reason) e.g. the student won't stay completely still

(h)



(a)

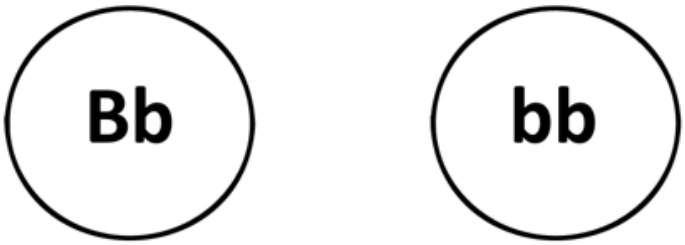


(b) A microscope

(c) 23 chromosomes in a sperm cell

(d) 46 chromosomes in a zygote

(e)(i)



(e)(ii) 50%

(e)(iii) 100%

(a) Melting point – The temperature at which a solid turns to a liquid

(b) Melting point is a physical change. No new substance is formed and it is a reversible change.

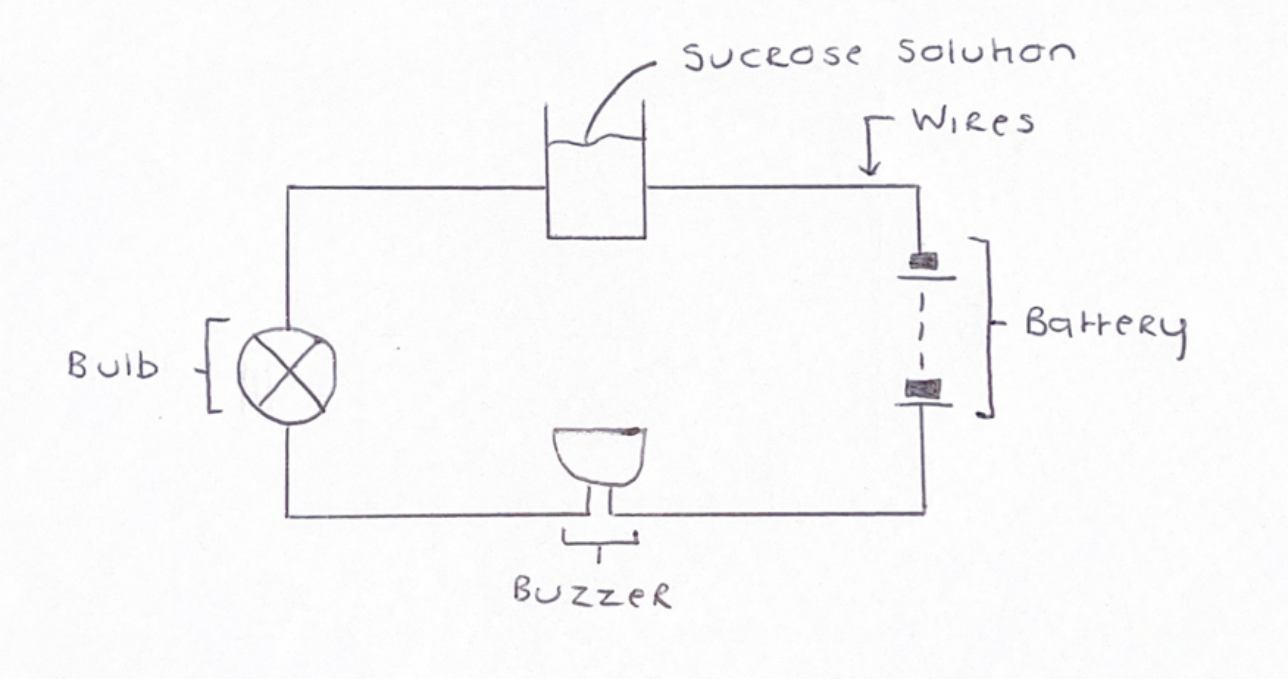
(c) Aluminium is less dense / zinc is more dense

(d) Aluminium is a better conductor of heat than zinc is

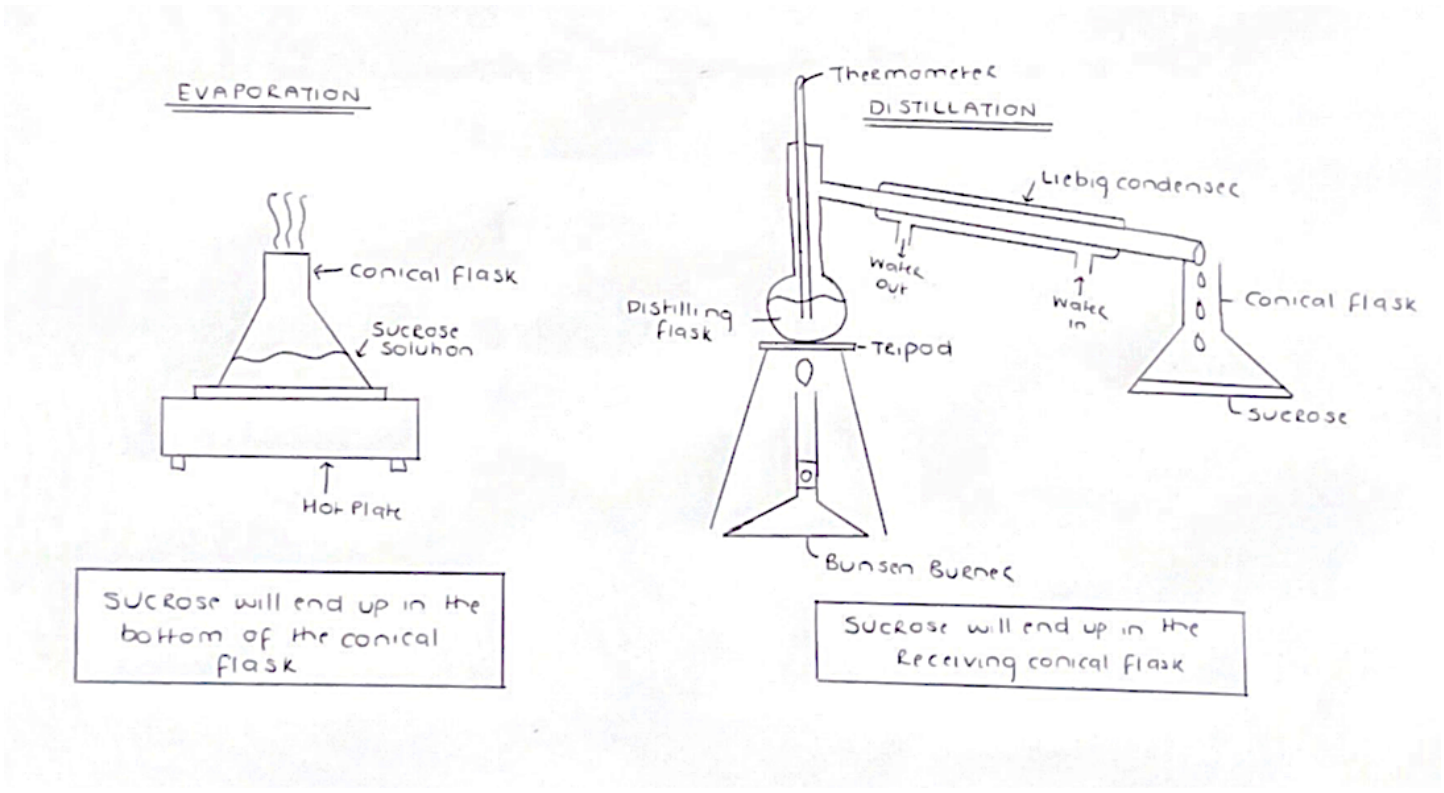
(e) Sugar has a lower melting point / Metals have a higher melting point

(f) Non-metals are…
Poor electrical conductors / good electrical insulators
Poor conductors of heat / good insulators of heat
Have low melting points
Have low boiling points
Non-lustrous / does not reflect light
Soft
Brittle
Liquid or gas at room temperature
(Any two of the lines above)

(g)



(h) The sucrose could have been separated from the water by either evaporation or distillation



(a) To make Europe climate neutral (or any other aim from the text)

(b) Any natural phenomenon such as drought, floods, forest fires or new pests

(c) (i) Methane, Carbon Dioxide or Nitrous Oxide

(c) (ii) Anything that matches the gas named, such as reduce consumption of cow products to reduce methane emissions

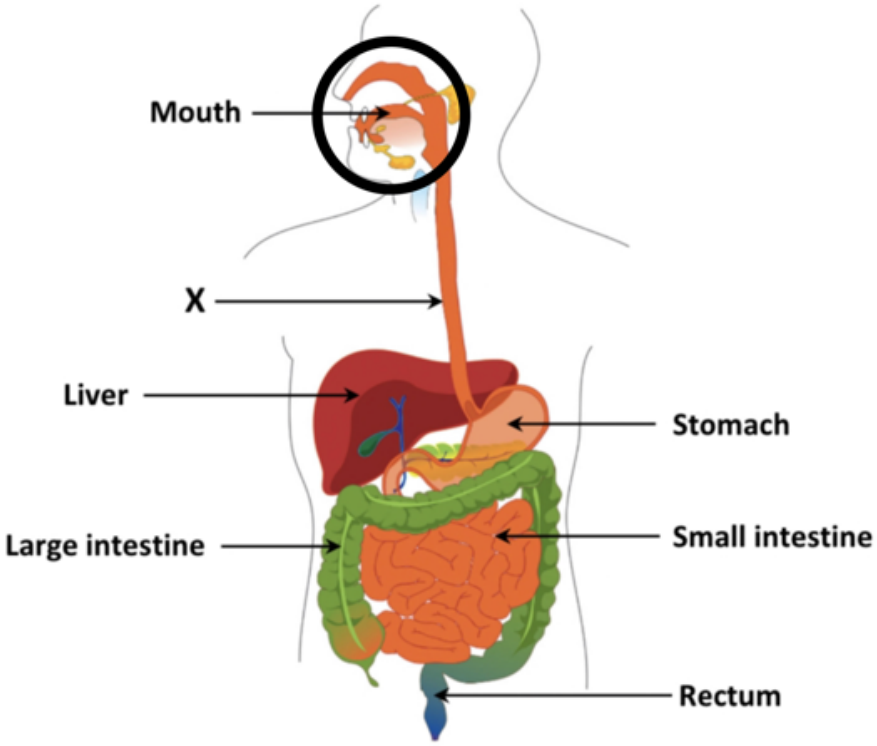
(d) Buy food on an as needed basis, make sure that food is eaten before it's best before date, try to abide by regular portion sizes etc.

(e) Both of the foods are compared based on 80g / same mass

(f) B would be healthier as it has less sugar, less fat, less cholesterol, less sodium and more protein (any two examples)

(g) (80 divided by 12) x 100 = 15%

(h) (i)



(h) (ii) The oesophagus

(h) (iii)

Function	***Part of the digestive system***
Absorbs water from fully-digested matter	**The Large Intestine**
Secretes hydrophobic acid to kill bacteria in food	**The Stomach**
Absorbs fully-digested food into the bloodstream	**The Small Intestine**

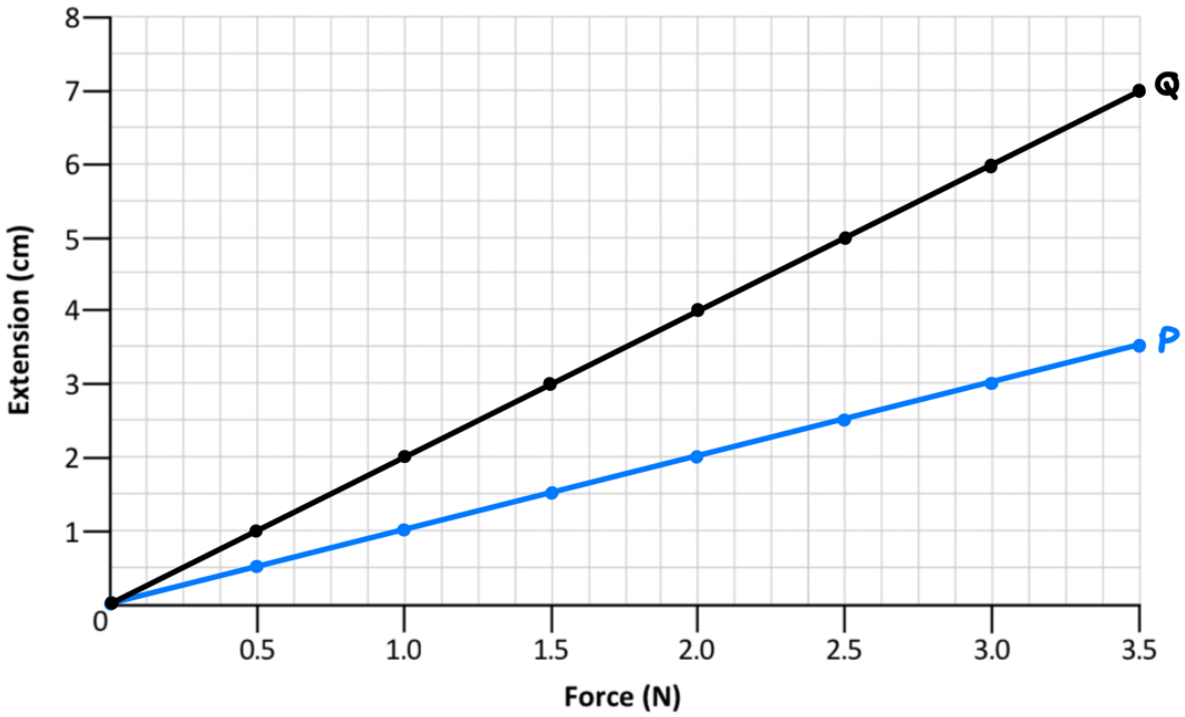
(a)(i) Positions 1 and 3

(a)(ii) Position 1

(b) Gravity

(c) Friction and Respiration

(d)



(e) The degree of extension of the spring is directly proportional to the force applied
Increasing force = increasing extension (positive correlation)

(f) 13.5

(g) Mass is the amount / quantity of matter
Weight is the force acting on an object due to gravity

(h) P because more force is needed to stretch spring P to 3cm