

Due Date:	Friday, 10 th September 2021
Student Number:	
Name:	

Y10 T1 W2 B1 - Cell Structures

Visit the BBC Bitesize link: [Cell measurement - Cell structures - OCR Gateway - GCSE Combined Science Revision - OCR Gateway - BBC Bitesize](#)

Question	Answer
What is a light microscope used for?	To magnify the size of a specimen so it can be observed.
What is the equation to calculate total magnification?	Total magnification = Eyepiece lens x objective lens
What is the equation to calculate magnification?	Magnification = size of the image /real size of the object
What stain is used to see animal cells?	Methylene blue is used to stain animal cells.
What stain is used to see plant cells?	Iodine is used to stain plant cells.
What is an advantage of an electron microscope?	Electron microscopes have a higher resolution and magnification than light microscopes.
What is the disadvantage of an electron microscope?	A disadvantage of an electron microscope is that the specimen must be dead and images are in black and white.
What is the role of the mitochondria?	The mitochondria are the site of aerobic respiration.
What is the role of the ribosome?	The ribosomes are the site of protein synthesis.
What is the role of the chloroplasts?	The chloroplasts contain chlorophyll and is the site of photosynthesis.

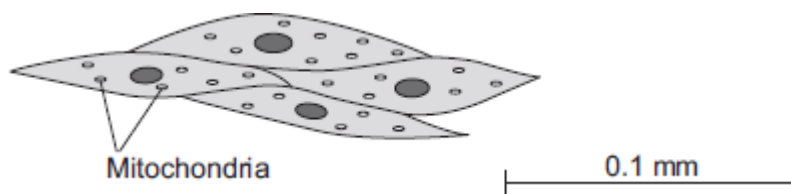
Look, Cover, Write, Check

Question	Answer
What is the equation to calculate magnification?	
What is the role of the chloroplasts?	
What is an advantage of an electron microscope?	
What is a light microscope used for?	
What is the role of the mitochondria?	
What stain is used to see animal cells?	
What is the equation to calculate total magnification?	
What is the role of the ribosome?	
What is the disadvantage of an electron microscope?	
What stain is used to see plant cells?	

Look, Cover, Write, Check

Question	Answer
	To magnify the size of a specimen so it can be observed.
	Total magnification = Eyepiece lens x objective lens
What is the equation to calculate magnification?	
	Methylene blue is used to stain animal cells.
What stain is used to see plant cells?	
	Electron microscopes have a higher resolution than a light microscope.
What is the disadvantage of an electron microscope?	
What is the role of the mitochondria?	
What is the role of the ribosome?	
	The chloroplasts contain chlorophyll and is the site of photosynthesis.

Exam Question: The image below shows some muscle cells from the wall of the stomach, as seen through a light microscope.



(a) The muscle cells in **Figure above** contain many mitochondria. What is the function of mitochondria?

(2)

(b) The muscle cells also contain many ribosomes. The ribosomes cannot be seen in the figure above.

(i) What is the function of a ribosome?

(1)

(ii) Suggest why the ribosomes **cannot** be seen through a light microscope.

(1)

Due Date:	Friday, 17 th September 2021
Student Number:	
Name:	

Y10 T1 W3 B1 - Photosynthesis

Visit the BBC Bitesize link: www.bbc.co.uk/bitesize/guides/zq8s2nb/revision/1

Question	Answer
What is the word equation for photosynthesis?	Carbon dioxide + Water → Glucose + Oxygen
Where does photosynthesis take place?	Photosynthesis takes place in the chloroplasts .
How many stages is photosynthesis?	There are 2 stages in photosynthesis.
Why is photosynthesis an endothermic reaction?	Photosynthesis is endothermic because energy is absorbed (taken in) from the surroundings in the form of light.
How does photosynthesis affect the concentration of carbon dioxide in the atmosphere?	Photosynthesis decreases the concentration of carbon dioxide in the atmosphere.
How does deforestation affect the concentration of carbon dioxide in the atmosphere?	Deforestation (the removal of trees) increases the concentration of carbon dioxide . This is because there is now less photosynthesis taking place, so less carbon dioxide is removed from the air.
Why do plants carry out photosynthesis?	Plants carry out photosynthesis to produce food (in the form of glucose) for themselves.
What happens to the glucose made during photosynthesis?	<ul style="list-style-type: none"> • Can be respired to released energy • Can be stored as starch (for later use) • Used to make proteins e.g. cellulose
Why do root hair cells not contain chloroplasts?	Root hair cells do not photosynthesise so do not need chloroplasts. This is because they receive no/very little light underground.

Look, Cover, Write, Check

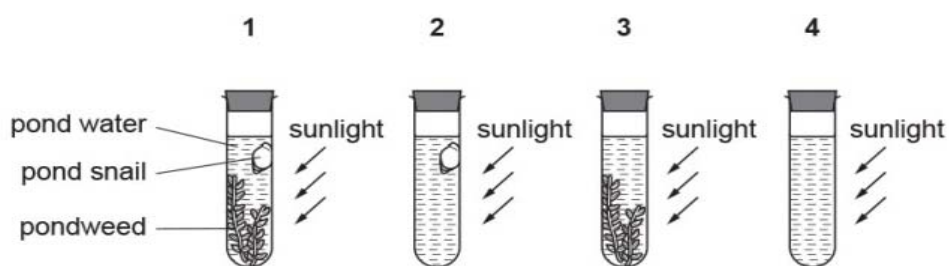
Question	Answer
How does deforestation affect the concentration of carbon dioxide in the atmosphere?	
Why do root hair cells not contain chloroplasts?	
How many stages is photosynthesis?	
Why is photosynthesis an endothermic reaction?	
How does photosynthesis affect the concentration of carbon dioxide in the atmosphere?	
What happens to the glucose made during photosynthesis?	
Why do plants carry out photosynthesis?	
What is the word equation for photosynthesis?	
Where does photosynthesis take place?	

Look, Cover, Write, Check

Question	Answer
What is the word equation for photosynthesis?	
How many stages is photosynthesis?	
	... to produce food (in the form of glucose) for themselves.
How does deforestation affect the concentration of carbon dioxide in the atmosphere?	
How does photosynthesis affect the concentration of carbon dioxide in the atmosphere?	
	... because energy is absorbed (taken in) from the surroundings in the form of light.
	<ul style="list-style-type: none"> • Can be respired to released energy • Can be stored as starch (for later use) • Used to make proteins e.g. cellulose
Where does photosynthesis take place?	
	... because root hair cells do not photosynthesise.

Exam Question:

1. Pond snails and pondweed are living in water in sealed test tubes.



Carbon dioxide dissolves in water and forms an acid.

In which test tube would the water become most acidic?

- A 1
- B 2
- C 3
- D 4

Your answer

[1]

Due Date:	Friday, 24 th September 2021
Student Number:	
Name:	

Y1- T1 W4 C1 - Atomic Structure and Isotopes

Visit the BBC bitesize link: www.bbc.co.uk/bitesize/guides/z2qq4qt/revision/1

Question	Answer
What is the mass of a proton?	1
What is the mass of a neutron?	1
Define 'atomic number'	The number of protons in the nucleus of an atom.
Define 'relative atomic mass'	The number of protons and neutrons in the nucleus of an atom.
How do you calculate the number of protons in an atom?	Number of protons = atomic number
How do you calculate the number of neutrons in an atom?	Number of neutrons = (relative atomic mass – atomic number)
Define an isotope.	Atoms of the same element with the same number of protons but a different number of neutrons.
Why do isotopes of an element have the same atomic number?	Isotopes have the same atomic number because they have the same number of protons.
Why do isotopes of an element have different relative atomic mass numbers?	Isotopes have a different relative atomic mass because they have a different number of neutrons.
Why is ${}^6\text{C}_{13}$ an isotope of ${}^6\text{C}_{12}$?	They have the same number of protons (6) but different number of neutrons (13 and 12).
Why is ${}^6\text{C}_{12}$ <u>not</u> an isotope of ${}^7\text{C}_{12}$?	They have a different number of protons which means that they are different elements. An atom with an atomic number of 7 is in fact nitrogen, not carbon.

Look, Cover, Write, Check

Question	Answer
What is the mass of a proton?	
What is the mass of a neutron?	
Define 'atomic number'	
Define 'relative atomic mass'	
How do you calculate the number of protons in an atom?	
How do you calculate the number of neutrons in an atom?	
Define an isotope.	
Why do isotopes of an element have the same atomic number?	
Why do isotopes of an element have different relative atomic mass numbers?	
Why is ${}^6\text{C}_{13}$ an isotope of ${}^6\text{C}_{12}$?	
Why is ${}^6\text{C}_{12}$ <u>not</u> an isotope of ${}^7\text{C}_{12}$?	

Look, Cover, Write, Check

Question	Answer
	1
Define an isotope.	
	The number of protons in the nucleus of an atom.
Why do isotopes of an element have different relative atomic mass numbers?	
How do you calculate the number of protons in an atom?	
	Relative atomic mass – atomic number
	1
Why do isotopes of an element have the same atomic number?	
	The number of protons and neutrons in the nucleus of an atom.
Why is ${}^6\text{C}_{13}$ an isotope of ${}^6\text{C}_{12}$?	
Why is ${}^6\text{C}_{12}$ <u>not</u> an isotope of ${}^7\text{C}_{12}$?	

Exam Question:

1. An atom has both an **atomic number** and a **mass number**. What do these **two** terms mean?

[2]

2. An atom of chlorine can be represented as



Different **isotopes** of chlorine exist.

Nick thinks the following are three isotopes of chlorine.

Only one is correct. Which one?



[1]

Due Date:	Friday, 1st October 2021
Student Number:	
Name:	

Y10 T1 W5 C1 - Atoms vs Ions

Visit the BBC bitesize link: www.bbc.co.uk/bitesize/guides/zpjp82/revision/1

Question	Answer
What is the charge of a proton?	+1 (positive 1)
What is the charge of an electron?	-1 (negative 1)
Why do atoms have an overall neutral charge?	They have an equal number of protons and electrons .
Define an ion.	An atom with an overall charge due to the loss of gain of electrons.
How does an atom form a positive ion?	Positive ions are formed when the atom loses electrons .
Why does losing electrons cause an ion to become positive?	An atom that has lost electrons, now has more protons than electrons , giving it an overall positive charge.
How does an atom form a negative ion?	Negative ions are formed when the atom gains electrons .
Why does gaining electrons cause an ion to become positive?	An atom that has gained electrons, now has more electrons than protons , giving it an overall negative charge.
What type of elements form positive ions?	Elements in group 1, 2 and 3 (most of which are metals).
What type of elements form negative ions?	Elements in group 5,6,7 (most of which are non-metals).
Why does group 0 not form ions?	Group 0 are inert (unreactive) because they have a full outer shell. They do not gain or lose electrons .

Look, Cover, Write, Check

Question	Answer
Why do atoms have an overall neutral charge?	
What is the charge of an electron?	
What is the charge of a proton?	
Define an ion.	
Why does group 0 not form ions?	
What type of elements form positive ions?	
How does an atom form a negative ion?	
Why does gaining electrons cause an ion to become positive?	
Why does losing electrons cause an ion to become positive?	
What type of elements form negative ions?	
How does an atom form a positive ion?	

Look, Cover, Write, Check

Question	Answer
	+1 (positive 1)
	-1 (negative 1)
Why do atoms have an overall neutral charge?	
	An atom with an overall charge due to the loss of gain of electrons.
How does an atom form a positive ion?	
Why does losing electrons cause an ion to become positive?	
	When the atom gains electrons .
Why does gaining electrons cause an ion to become positive?	
	Elements in group 1, 2 and 3 (most of which are metals).
	Elements in group 5,6,7 (most of which are non-metals).
	Group 0 are inert (unreactive) because they have a full outer shell. They do not gain or lose electrons.

Exam Question:

1. Atoms can form ions. Which statement is **correct**?
- A All metal ions are negatively charged.
 - B Ions are always smaller than the atom they are made from.
 - C Negative ions are formed when an atom gains electrons.
 - D Positive ions are formed when an atom gains electrons.

Your answer

[1]

2. The table shows some common ions.

Negative ions		Positive ions	
Nitrate	NO_3^-	Aluminium	Al^{3+}
Oxide	O^{2-}	Magnesium	Mg^{2+}

Write the formula for **aluminium oxide**.

[1]

3. The element **sodium** forms an **ion** with a charge of **1+**.

Work out the number of electrons in an **ion** of this element.

Electrons: _____

[1]

Due Date:	Friday, 8th October 2021
Student Number:	
Name:	

Y10 T1 W6 P1 - Density

Visit the BBC bitesize link: www.bbc.co.uk/bitesize/guides/zswpgdm/revision/2

Question	Answer
Define 'density'	The amount of mass in a certain volume.
What is the equation for density? Include units.	Density (kg/m ³) = mass (kg) / volume (m ³)
What apparatus is used to measure mass?	Mass balance
How do you convert from g to kg?	Divide by 1000.
How do you convert from kg to g?	Multiply by 1000.
Mass and weight are not the same. How is mass different to weight?	Mass is the amount of matter in an object, measured in g or kg. Weight is the force of gravity acting on a mass, measured in N.
Define 'volume'	The amount of space an object occupies.
How do you measure the volume of a regular object?	Length x width x height
What piece of equipment do you use to measure the volume of an irregular object?	Eureka can
Which state of matter has the highest density? Explain your answer	Solid because the particles are closely-packed together so there are lots of particles in a certain volume.
Which state of matter has the lowest density? Explain your answer.	Gas because the particles are spread out so there are few particles in a certain volume.

Look, Cover, Write, Check

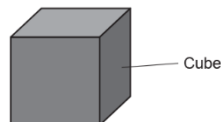
Question	Answer
How do you convert from kg to g?	
What is the equation for density? Include units.	
What piece of equipment do you use to measure the volume of an irregular object?	
How do you convert from g to kg?	
Define 'density'	
Mass and weight are not the same. How is mass different to weight?	
Define 'volume'	
Which state of matter has the lowest density? Explain your answer.	
What apparatus is used to measure mass?	
Which state of matter is the highest density? Explain your answer.	
How do you measure the volume of a regular object e.g. a cube.	

Look, Cover, Write, Check

Question	Answer
	Divide by 1000.
What is the equation for density? Include units.	
What piece of equipment do you use to measure the volume of an irregular object?	
Mass and weight are not the same. How is mass different to weight?	
Define 'density'	
	Multiply by 1000.
How do you measure the volume of a regular object e.g. a cube.	
	Gas because the particles are not touching (spread out) so there are few particles in a certain volume.
What apparatus is used to measure mass?	
Which state of matter has the highest density? Explain your answer.	
	The amount of space an object occupies.

Exam Question

A student is given a **solid** metal cube.



- i. Explain how the student can use a ruler to calculate the volume of the metal cube.

_____ [2]

- ii. The metal cube has a volume of 125 cm^3 and a mass of 850 g.

Calculate the density of the metal cube. Use the equation: density = mass \div volume

Density = _____ g/cm^3

Due Date:	Friday, 15 th October 2021
Student Number:	
Name:	

Y10 T1 W7 P1 – Specific Latent Heat

Visit the BBC Bitesize link: <https://www.bbc.co.uk/bitesize/guides/zgtwrwx/revision/4>

Question	Answer
What are the 6 changes of state?	The 6 changes of state are evaporating, condensing, melting, freezing, subliming, and depositing.
Describe what happens to temperature when a change of state occurs.	Temperature remains constant during a state change.
Explain why there is no change in temperature when ice melts.	The energy goes into breaking intermolecular forces between the particles, rather than increasing the kinetic energy of the particles.
What are the two types of specific latent heat?	Specific latent heat of vapourisation Specific latent heat of fusion
How do you calculate the energy needed to change the state of a substance?	Energy = mass x specific latent heat
What are the units of specific latent heat?	J/kg
What is the definition of specific latent heat?	The energy needed to change the state of 1kg of substance
What are the weak forces between molecules called?	Intermolecular forces.
What happens to molecules when you increase their temperature?	They gain kinetic energy.

Look, Cover, Write, Check

Question	Answer
Explain why there is no change in temperature when ice melts.	
What is the definition of specific latent heat?	
What are the weak forces between molecules called?	
Describe what happens to temperature when a change of state occurs.	
Describe what happens to temperature when a change of state occurs.	
What happens to molecules when you increase their temperature?	
What are the 6 changes of state?	
What are the units of specific latent heat?	
What are the two types of specific latent heat?	

Look, Cover, Write, Check

Question	Answer
	They vibrate more.
How do you calculate the energy needed to change the state of a substance?	
	J/kg
What are the 6 changes of state?	
	Energy goes into breaking intermolecular forces between the particles, rather than increasing the kinetic energy of the particles.
	Intermolecular forces.
Describe what happens to temperature when a change of state occurs.	
	Specific latent heat of vapourisation Specific latent heat of fusion
What is the definition of specific latent heat?	

Q1.

- (a) A company is developing a system which can heat up and melt ice on roads in the winter. This system is called 'energy storage'.

During the summer, the black surface of the road will heat up in the sunshine.

This energy will be stored in a large amount of soil deep under the road surface. Pipes will run through the soil. In winter, cold water entering the pipes will be warmed and brought to the surface to melt ice.

The system could work well because the road surface is black.

Suggest why.

(1)

- (b) (i) What is meant by specific latent heat of fusion?

(2)