

AAQ Applied Science induction activities

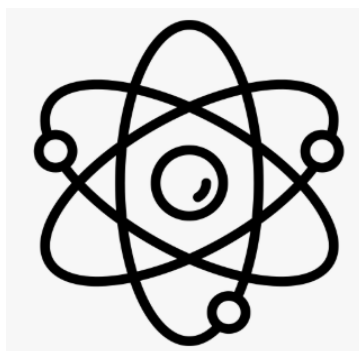
Congratulations for being accepted onto the AAQ Applied Science course!

The induction activities are as follows:

- Labelling biological cell diagrams
 - Balancing chemical equations
 - Forming compounds from ions
 - Drawing and labelling waves
- Making revision materials using Quizlet

Please **complete all activities** before your first lesson.

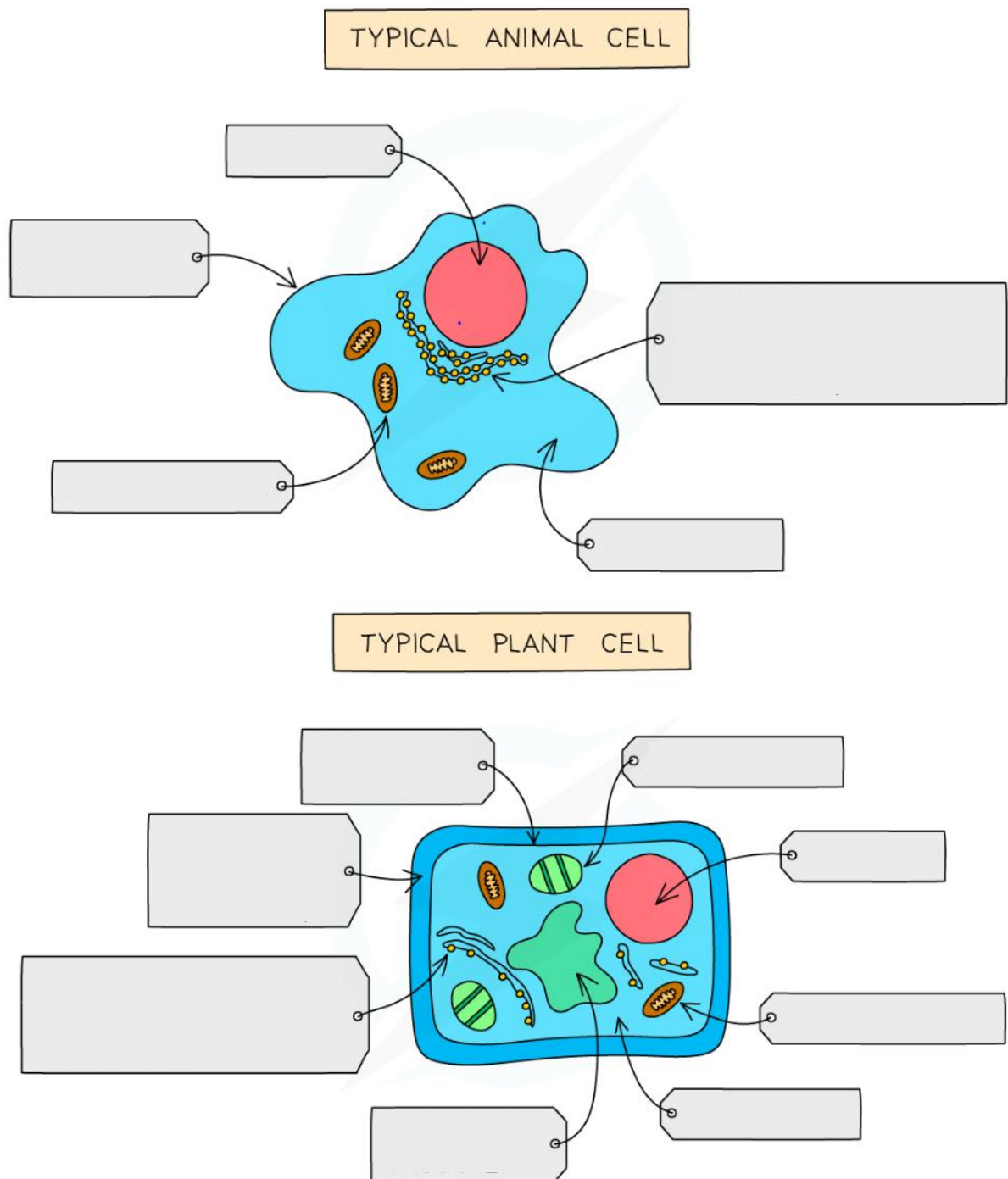
See you soon!

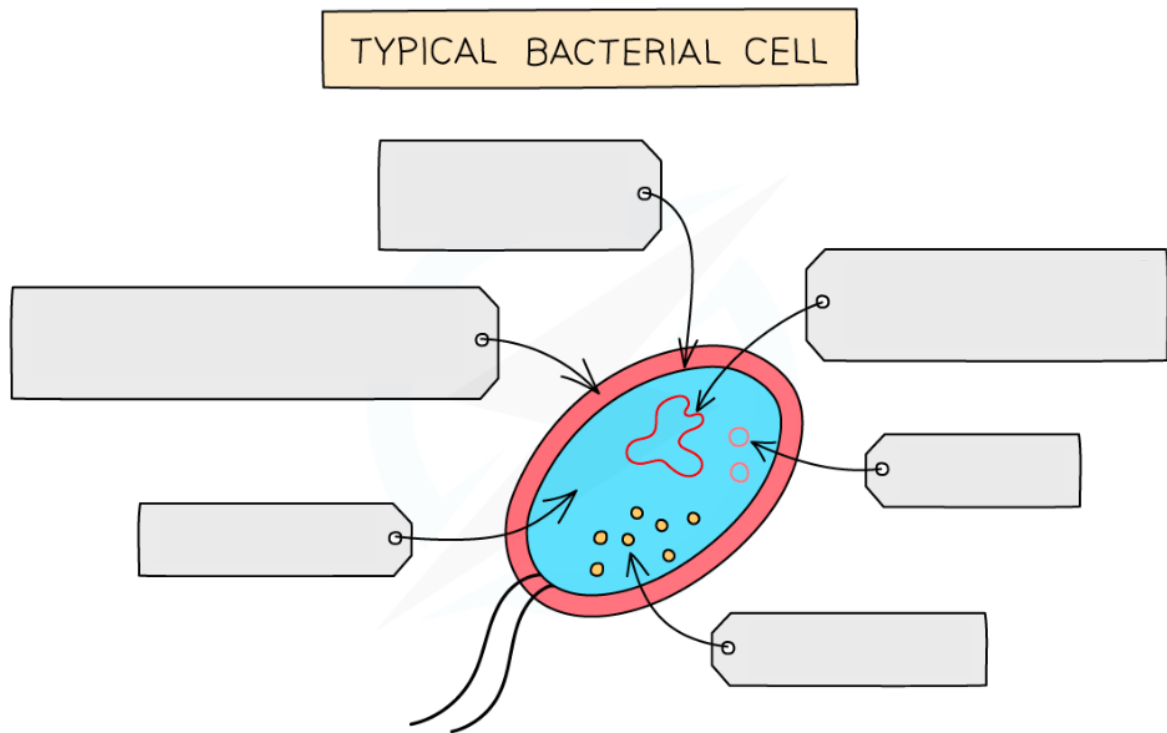


AAQ Unit 1: Principles and Applications of Biology

The tasks on the following pages will test your basic biology knowledge. You **must** complete these tasks before you attend your first science lesson.

Complete the following cell diagrams by adding labels.





AAQ UNIT 2: PRINCIPLES AND APPLICATIONS OF CHEMISTRY

The tasks on the following pages will test your basic chemistry knowledge. You **must** complete these tasks before you attend your first science lesson.

The **first task** on page 6 involves balancing equations.

The **second task** involves reading the information on common ions and formulae on page 7, then completing the grid on page 8. A few examples have been done for you.

I would recommend following the QR code below to watch a helpful video before you start.



Balance these equations. Remember the rules:

- You can only change coefficients (big numbers in front of the formulae), **not** the little numbers within the formulae.
- You can use half-numbers when you have **diatomic molecules** (e.g. $\frac{1}{2}\text{O}_2$)
- Focus on one element at a time.



Challenge



Common ions and formulae

The essentials (you MUST learn these):

Sodium metal	Na	Fluorine (molecule)	F₂
Sodium ion	Na⁺	Fluoride ion	F⁻
Magnesium metal	Mg	Chlorine (molecule)	Cl₂
Magnesium ion	Mg²⁺	Chloride ion	Cl⁻
Hydrogen ion	H⁺	Hydroxide ion	OH⁻
Hydride ion	H⁻	Sulfate ion	SO₄²⁻
Aluminium metal	Al	Carbonate ion	CO₃²⁻
Aluminium ion	Al³⁺	Phosphate ion	PO₄³⁻
Iron (II) ion	Fe²⁺	Chlorate (I) ion	ClO⁻
Zinc (II) ion	Zn²⁺	Nitrate ion	NO₃⁻
Silver ion	Ag⁺	Hydrochloric acid	HCl
Carbon solid	C	Sulfuric acid	H₂SO₄
Helium gas	He	Phosphoric acid	H₃PO₄
Hydrogen gas	H₂	Nitric acid	HNO₃
Nitrogen gas	N₂	Sodium hydroxide	NaOH
Nitride ion	N³⁻	Potassium hydroxide	KOH
Oxide ion	O²⁻	Barium hydroxide	Ba(OH)₂
Sulfide ion	S²⁻	Calcium carbonate	CaCO₃

Assembling ionic formulae

- Positive and negative ions can be combined to create ionic formulae.
- When assembling these, you should make sure that the overall charge is neutral and so you may need more of one ion than the other.

E.g. 1) Na⁺ and Cl⁻ can combine to make NaCl

E.g. 2) Mg²⁺ and 2 x F⁻ can combine to make MgF₂

E.g. 3) Al³⁺ and 3 x NO₃⁻ can combine to make Al(NO₃)₃

- You may be asked to assemble an ionic formula using ions you are not familiar with!

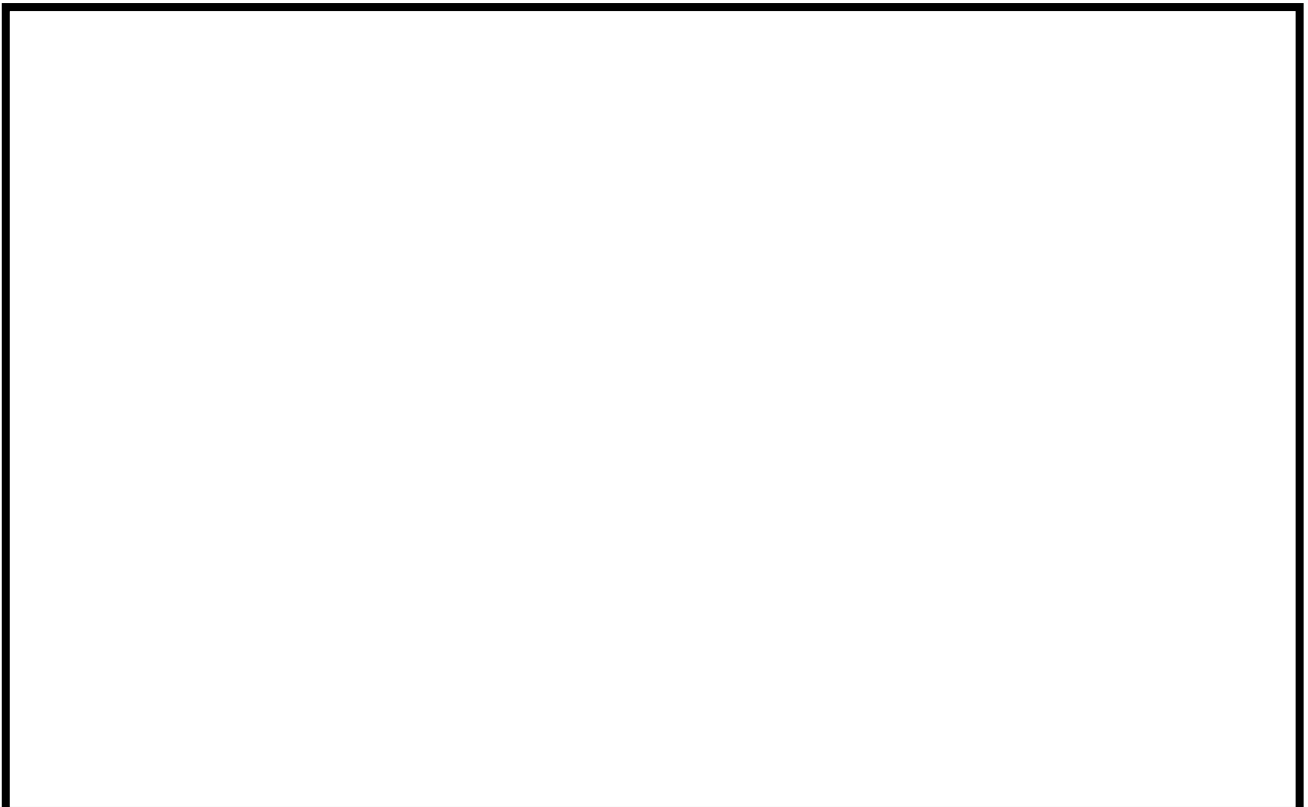
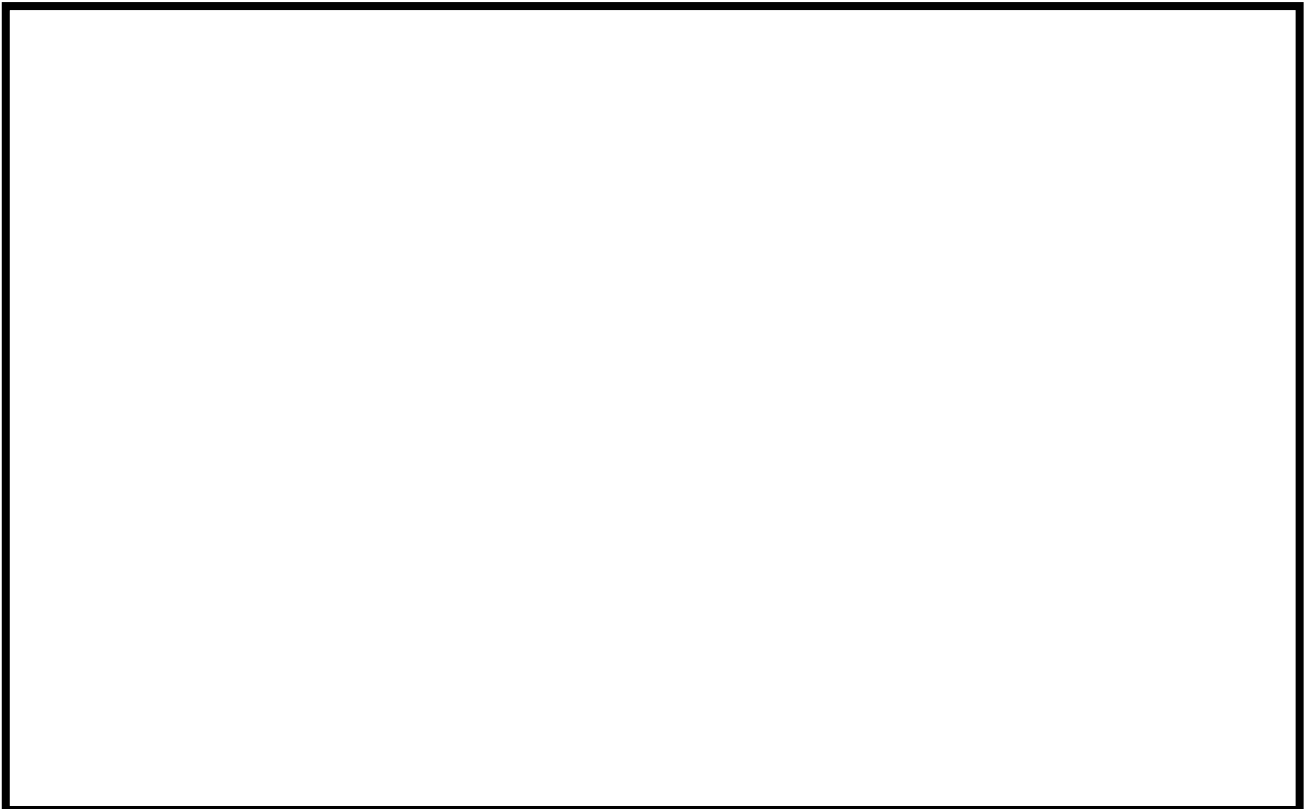
	Cl^-	Br^-	O^{2-}	CO_3^{2-}	SO_4^{2-}	PO_4^{3-}	OH^-	NO_3^-	ClO^-	S^{2-}	N^{3-}
Na^+	NaCl										
K^+											
Li^+											
Ba^{2+}											
Ca^{2+}											
Mg^{2+}											
Al^{3+}											
H^+											
Ag^+			Ag_2O								
Fe^{2+}											
NH_4^+											

AAQ UNIT 3: PRINCIPLES AND APPLICATIONS OF PHYSICS

The tasks on the following pages will test your basic physics knowledge. You **must** complete these tasks before you attend your first science lesson.

On the next page, use the **first box** to draw and label a **transverse wave**. Use the **second box** to draw and label a **longitudinal wave**. Answer the questions in the **third box**.

Follow the **QR codes** for helpful videos.



1. Explain the difference between a transverse wave and a longitudinal wave.

2. State two examples of transverse waves and two examples of longitudinal waves.

And finally...

Follow the QR code below to sign up to Quizlet.

This website allows you to make helpful revision materials, e.g. flash cards.

Try making five flashcards for each of biology, chemistry and physics before your first lesson.

See you soon!

