YEAR 8 MUSIC · POPULAR MUSIC

SONG STRUCTURE

ORANGE · PREPARE

Week 3 · PREP TASK

5 mins • Complete on this sheet • Bring it to your next lesson

QUICK RECAP — Sections of a pop song

VERSE	CHORUS	BRIDGE	INTRO/OUTRO
Tells the story	The hook / message	A contrasting bit	Start & end

TASK 1 — Match the sections

UNDERSTAND

Match it up. Draw a line from each section to its job.

VERSE	The catchy, repeated hook
CHORUS	Opens the song
BRIDGE	Tells the story (changes each time)
INTRO	A contrasting section near the end

TASK 2 — Map a song

WRITE

Map a song. Choose a pop song you know well and write its sections **in order** (e.g. Intro – Verse – Chorus...).

Song:

Structure:

REFLECTION

Why do most pop songs repeat the chorus so many times?

LISTEN | READ | UNDERSTAND | PRACTISE | PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

YEAR 8 MUSIC · POPULAR MUSIC

PLAYING THE CHORDS

RED · RECALL

Week 5 · POST TASK

5 mins • Complete on this sheet • Bring it to your next lesson

QUICK RECAP — How chords are built

3 NOTES	THE SHAPE	SKIP
Every chord has three	1st · 3rd · 5th	Skip the 2nd & 4th

TASK 1 — Playing the chords

RECALL

Chord questions. Answer using what you know about the chord shape.

1. In **C major**, the three notes you play are _____, _____ and _____.
2. Each chord has **three notes** — the 1st, the _____ and the _____.
3. Which two notes do we **skip** when building a chord? _____ and _____.

TASK 2 — Build your own

UNDERSTAND

Your turn. Pick another chord (G, A minor or F). Write its name, then the three notes you would play.

Chord: _____

The three notes: _____, _____, _____

REFLECTION

How does knowing the 1st-3rd-5th shape help you learn any chord quickly?

LISTEN | READ | UNDERSTAND | PRACTISE | PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

YEAR 8 MUSIC · POPULAR MUSIC

EDM & DANCE: WHAT CAN YOU HEAR?

ORANGE · PREPARE

Week 5 · PREP TASK

5 mins • Complete on this sheet • Bring it to your next lesson

QUICK RECAP — Listening to EDM & dance

EDM / DANCE	CHORDS	MELODY
Electronic dance music	Which instrument plays them?	Which instrument has the tune?

TASK 1 — Make a mind map

LISTEN

Press play! Listen to an EDM / dance track — e.g. Avicii's **"Wake Me Up"** or **"Hey Brother"**. Make a quick **mind map** of every instrument or sound you can hear.

TASK 2 — Chords vs melody

UNDERSTAND

Zoom in. Two key questions:

Which instrument is playing the **chords**? _____

Which instrument is playing the **melody**? _____

REFLECTION

In dance music, how do the chords and the melody work together?

LISTEN | READ | UNDERSTAND | PRACTISE | PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

YEAR 8 MUSIC TECHNOLOGY

LEARNING BOX 1

LEARNING BOX

Composing EDM Music

GOLDEN THREAD:

This half-term you compose music to a **brief** and get to know the features of a brand-new genre. You build on your skills in **creating and editing** music with technology, and turn your ideas into a finished track.

KEY IDEA:

Understand how **EDM** (Electronic Dance Music) is built using modern technology.

Using **loops, samples and chords**, you create your own **dance track** from scratch.

Loops · Samples · Chords · Melody

VISUAL REPRESENTATION:

A **multi-track** DAW project: each row is a layer (Drums, Bass, Piano, Synth). One track plays the **chords** (harmony), another plays the **melody** — stacked together to build a full EDM track.

IMPORTANT MISCONCEPTION:

EDM stands for **Electronic Dance Music** — but it isn't just one genre. It covers many genres that use music technology.

The key point is **how** these genres use the **elements of music** — tempo, rhythm, texture and more — to create their upbeat sound.

House · Techno · Drum & Bass · Trance

WHEN TO USE THIS:

EDM layers **many sounds and instruments** on top of each other to create a **thicker texture** (texture is one of our elements of music). Because it is made **with** music technology, you reach for these skills whenever you want to create **upbeat music on the computer**.

Layers = thicker texture · Made on the computer

THINKING STEPS:

1. Read the **brief** carefully — what mood, tempo and length should your dance track have?
2. Choose your **chords** (e.g. C–G–Am–F) and a simple **melody** idea to sit on top.
3. Plan your **layers**: which sounds for drums, bass, chords and melody?
4. Think about **structure** — intro, build-up, drop and breakdown, like a real dance track.

CREATIVE STEPS:

1. Open your DAW and start a new project at a dance tempo (around 120–128 BPM).
2. Lay down a **drum loop** for the beat, then add a **bass line** underneath.
3. Add a **chord** track and a **melody/lead** on top — layer them to build texture.
4. Use loops, samples and effects to create a **build-up** and **drop**, then listen back and refine.

SUMMARY:

Composing EDM brings together everything in music technology — **loops, samples, chords and layers** — to build an upbeat dance track to a brief. By stacking sounds you create **texture** and energy, and a clear structure turns your ideas into a finished piece.

LISTEN · READ · UNDERSTAND · PRACTISE · PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

YEAR 8 MUSIC TECHNOLOGY

LEARNING BOX 2

EXAMPLE & NON-EXAMPLE

Composing EDM Music · Music Technology

GOLDEN THREAD:

In Year 7 you composed music to a brief — creating an **animal piece in Soundation** inspired by Saint-Saëns' *Carnival of the Animals*. This year we build on that idea: composing to a brief again, but now in the **EDM** genre.

EXAMPLE ANSWER:

Below is what a **good EDM project** looks like in a DAW. It has several **layers** stacked together — drums, bass, a **chord** track and a **melody** — building a full, upbeat dance track that fits the brief.

A full EDM project — drums, bass, chords and a melody layered across the timeline.

WHAT IS GOOD ABOUT THIS?

- Several **layers** (drums, bass, chords, melody) build a thick, full texture.
- The **chords and melody** work together, and the melody comes in later to build the track.

NON-EXAMPLE ANSWER:

Below is a **weak EDM project**. There is only **one layer**, with **no chord track and no melody** — and it does **not** follow the brief for an upbeat, layered dance track.

A weak project — one short clip, no chords or melody, and lots of empty space.

WHAT IS WRONG WITH THIS?

- Only **one layer** — no bass, chords or melody, so the texture is thin and empty.
- It does **not meet the brief**: no build, no upbeat dance feel, and lots of empty space.

REMEMBER:

EDM means **Electronic Dance Music**. To compose it well you need the fundamentals: **layers** of sound for a thick texture, a **chord** track (harmony), a **melody** on top, a strong **beat**, and a clear **structure** (intro → build-up → drop).

LISTEN · READ · UNDERSTAND · PRACTISE · PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

YEAR 8 MUSIC · POP & EDM PRODUCTION

LISTENING TO OTHER GENRES

RED · RECALL

Week 1 · POST TASK

5 mins • Complete on this sheet • Bring it to your next lesson

QUICK RECAP — What makes EDM different?

SOUNDS	TEMPO	MOOD	PATTERNS
What can you hear?	BPM = beats per min	The feel	Repeated loops

TASK 1 — Listen & break it down

LISTEN

Press play! Listen to **Avicii — "Levels"** and/or **Avicii — "Wake Me Up"**. **Break down what you can hear** — tick each sound as it comes in, then jot down the order the layers arrive.

- ☐ A steady beat (drums)
- ☐ A bass line
- ☐ Chords / synths
- ☐ A melody or vocal
- ☐ A repeated loop
- ☐ A build-up & drop

Which track did you choose? _____

What comes in **first**, and what is added next?

Roughly how fast does it feel? _____ (slow · medium · fast)

TASK 2 — Recall: DAW, loop, sample

RECALL

Recall from Year 7 Tech. Write a definition for each:

Keyword	My definition
DAW	
LOOP	
SAMPLE	

REFLECTION

What makes EDM sound different from pop — the sounds, tempo or the beat?

LISTEN · READ · UNDERSTAND · PRACTISE · PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

YEAR 8 MUSIC · POP & EDM PRODUCTION

EDM SUB-GENRES

ORANGE · PREPARE

Week 1 · PREP TASK

5 mins • Complete on this sheet • Bring it to your next lesson

QUICK RECAP — Electronic music styles

EDM
Electronic Dance Music

SUB-GENRES
House, D&B, Synthpop

COMPARE
Tempo, sound & mood

TASK 1 — What does EDM mean?

RECALL

What does EDM stand for?

_____ _____ _____

TASK 2 — Compare 3 sub-genres

RESEARCH

Sub-genre detective. Listen to a short clip of each, then write 2–3 words on the tempo, sounds and mood.

Sub-genre	Tempo, sounds & mood
House	
Drum & Bass	
Synthpop	

REFLECTION

How can two EDM tracks feel so different from each other?

LISTEN | READ | UNDERSTAND | PRACTISE | PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

YEAR 8 MUSIC · POP & EDM PRODUCTION

PRODUCTION REFLECTION

GREEN · REFLECT

Week 3 · POST TASK

5 mins • Complete on this sheet • Bring it to your next lesson

QUICK RECAP — Evaluating your track

CREATED	TECHNIQUES	IMPROVE
What have you made?	What have you used?	What could you add?

TASK 1 — Sentence starters

REFLECT

Finish the sentences:

"My track so far includes..."

"One production technique I have used is... because..."

"This could be improved by..."

TASK 2 — Producer's checklist

UNDERSTAND

Producer's checklist. Tick what your track already has — then circle the one you'll add next.

☐ A drum beat ☐ A bass line ☐ Chords ☐ A melody ☐ An effect (reverb/echo)

REFLECTION

What production technique are you most proud of so far, and why?

LISTEN | READ | UNDERSTAND | PRACTISE | PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

YEAR 8 MUSIC · POP & EDM PRODUCTION

ANALYSING A TRACK'S STRUCTURE

ORANGE · PREPARE

Week 5 · PREP TASK

5 mins • Complete on this sheet • Bring it to your next lesson

QUICK RECAP — Patterns & features

STRUCTURE	BPM	EFFECTS	SOUNDS
Intro, drop, outro	How fast?	Reverb, echo, filters	Main instruments

TASK 1 — Map the structure

LISTEN

Map the structure. Listen to a well-known EDM/pop track and number these sections **in the order** you hear them.

☐ Intro ☐ Verse ☐ Chorus ☐ Drop ☐ Outro

Track: _____ · BPM (slow/fast): _____

TASK 2 — Spot the effects

UNDERSTAND

Producer's ear. Tick any effects you can hear, then name the main sounds/instruments used.

☐ Reverb ☐ Echo / delay ☐ Filter sweep

Main sounds:

REFLECTION

How does a producer use structure and effects to keep a track exciting?

LISTEN · READ · UNDERSTAND · PRACTISE · PERFORM

BUILDING MUSICAL KNOWLEDGE TODAY, BETTER PERFORMANCES TOMORROW!

UXBRIDGE
HIGH SCHOOL

YEAR 8

PE

POST AND PREP LEARNING MAP

Post tasks help you recap knowledge that you have learned in the past.

The blue boxes cover previous knowledge you learned in other terms.

The green boxes help you recap what you are learning this term.

Post tasks

Prep tasks teach you important knowledge, vocabulary and skills to prepare you for the lessons ahead.

Your prep tasks will always be in an orange box.

Prep tasks

YEAR 8 / PE

RULES AND REGULATIONS OF FOOTBALL

WHAT YOU WILL GET OUT OF IT

Learning the key rules for the sports you will be studying.

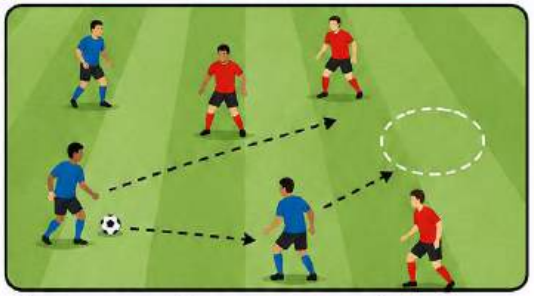
GOLDEN THREAD

In Primary school you would have taken part in a variety of sports but now we are focusing on knowing this rules correctly and implement them into our lessons.

KEY IDEA

Football Rules

The agreed rules that players must follow to play fairly, keep everyone safe and decide the outcome of the game.



Players are marking opponents and creating space to pass the ball.

IMPORTANT MISCONCEPTION

- Score more goals than the other team.
- 11 players per team
- 90 minutes (2 × 45 min)
- Ball in goal = 1 goal
- No hands (except goalkeeper in own box)
- No offside positions when receiving a pass
- Warning | Sent off
- Most goals wins!

THINKING STEPS

Questions students should ask themselves when identifying or analysing this concept.

- Movement on and off the ball
- Move into a space

REMEMBER

Knowing and applying the rules helps everyone play fairly, stay safe and enjoy the game.

FOOTBALL RULES & DECISION-MAKING

PLAY SMART. PLAY FAIR. PLAY FOOTBALL.

GOLDEN THREAD

Now you would have taken part in a variety of sports but now we are focusing on knowing this rules correctly and implement them into our lessons.

EXAMPLE

1 Stay onside

Stay behind the second-last defender before receiving a pass.

2 Use your body

Use feet, chest or head to control the ball (no handball).

3 Defend fairly

Tackle cleanly without pushing, tripping or holding.

WHAT IS GOOD ABOUT THIS?

- Follows the Laws of the Game
- Fair play and respect
- Keeps the game safe and enjoyable
- Helps your team keep possession

NON-EXAMPLE

1 Offside position

Receiving the ball while in an offside position.

2 Handball

Deliberately handling the ball (not the goalkeeper).

3 Foul play

Pushing, tripping or using excessive force unfairly.

WHAT IS WRONG WITH THIS?

- Gives an unfair advantage
- Breaks the Laws of the Game
- Can result in a free kick, penalty or yellow/red card

ALTERNATIVE VERSION (MOVEMENT & TEAM SHAPE)

KEY RULES TO REMEMBER

- No handballs (except goalkeepers in their area)
- No pushing, tripping or dangerous play
- Throw-ins: over the head, both feet on the ground, from behind the head
- Offside: you must be behind the second-last defender when the ball is played to you

FAIR PLAY = RESPECT + SAFETY + ENJOYMENT

CHECK YOUR DECISIONS

- Am I following the rules?
- Is my team supporting each other?
- Am I making the game safe and fair?
- Am I helping my team keep possession?

GOOD DECISIONS = BETTER PLAYERS!

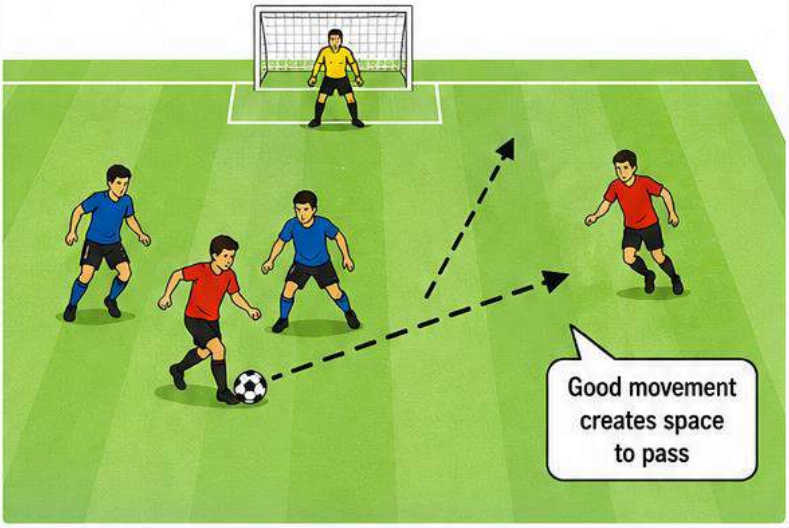
PREP ACTIVITY

CORRECT THE COACH

Recognising when football rules are followed and when they are broken in game situations.

INSTRUCTIONS

1. Read each statement about a football situation.
2. Decide if the statement is **CORRECT** or **INCORRECT**.
3. If it is **INCORRECT**, write which rule has been broken.
4. Be ready to explain your answer.



TASK

Read each statement below. Decide if it is **CORRECT** or **INCORRECT**.

If **INCORRECT**, write which rule has been broken.

	STATEMENTS	CORRECT	INCORRECT (Rule Broken)
1	A player uses their hands to stop the ball.		
2	A player passes the ball to a teammate who is behind the second-last defender.		
3	A player takes a throw-in by throwing the ball over their head with both hands from behind their head.		
4	A player pushes an opponent to gain possession of the ball.		
5	A goal is scored directly from a goalkeeper throwing the ball.		
6	A player controls the ball with their foot, dribbles forward and passes to a teammate.		
7	A player stays in an onside position until the ball is played.		

RULES TO REMEMBER

- No handballs (except goalkeeper in their area)
- No pushing or dangerous play
- Throw-ins must be over the head, both feet on the ground, from behind the head
- Offside: you must be behind the second-last defender when the ball is played to you
- Fair play and respect at all times

KEY

CORRECT – The statement follows the rules.

INCORRECT – The statement breaks a rule. Write which rule has been broken.

POST

FOOTBALL RULE BREAKS SELF ASSESSMENT

RAG RATING:

- **GREEN** — I understand and can apply consistently
- **AMBER** — I sometimes understand and can apply
- **RED** — I don't understand or find it difficult to apply

Read each rule break below and rate your understanding and ability to apply it in a game using the RAG rating.

RULE BREAK	MY RAG RATING
1. Using your hands to stop or control the ball (handball).	○ ○ ○
2. Standing in an offside position when the ball is played to you.	○ ○ ○
3. Taking a throw-in incorrectly (not using both hands or not throwing from behind the head).	○ ○ ○
4. Pushing an opponent to gain possession of the ball.	○ ○ ○
5. Dangerous play that puts another player at risk.	○ ○ ○
6. Failing to stay onside until the ball is played.	○ ○ ○

WHAT AM I DOING WELL?

List the football rules you feel confident about and why.

_____

_____

_____

_____

WHAT DO I WANT TO IMPROVE?

List the rules you find challenging and what you will do to get better.

_____

_____

_____

_____

MY TARGET:

My next step is to _____

I will achieve this by _____

_____

LEARNING BOX

THE IMPORTANCE OF WARM-UPS & COOL-DOWNS

GOLDEN THREAD

Warm-ups and cool-downs are essential parts of any physical activity. They prepare the body for exercise, support recovery afterwards, and help keep you safe, reduce injury risk, and improve performance.

1 WARM-UPS – PREPARE YOUR BODY

A warm-up is done before exercise to gradually prepare your body and mind for activity.

REASONS:

- Increase heart rate and blood flow.
- Raise body temperature.
- Loosen muscles and joints.
- Prepare the mind and improve focus.
- Reduce the risk of injury.

BENEFITS:

- Improves performance.
- Enhances flexibility and mobility.
- Helps you start exercise safely and effectively.
- Reduces muscle strains and pulls.

EXAMPLES:

Light jogging, dynamic stretches, arm circles, leg swings, high knees.

2 COOL-DOWNS – RECOVER & RESTORE

A cool-down is done after exercise to help your body return to normal.

REASONS:

- Gradually lower heart rate.
- Help breathing return to normal.
- Reduce muscle soreness.
- Prevent blood pooling.
- Support recovery.

BENEFITS:

- Improves recovery and reduces muscle stiffness.
- Helps remove waste products from muscles.
- Reduces risk of dizziness and injury.
- Leaves you feeling relaxed and refreshed.

EXAMPLES:

Light jogging or walking, static stretches, deep breathing, gentle mobility exercises.

COMMON MISCONCEPTION

"I don't need to warm-up" for short exercises. I'll be fine."

Even short or low-intensity activities can cause injury without a warm-up. Your muscles and joints still need preparation.

THINKING STEPS

1. Why do we need to warm-up before exercise?
2. What could happen if we skip a warm-up?
3. Why is it important to cool down after exercise?
4. How do warm-ups and cool-downs improve performance and safety?

WRITING STEPS

1. State what a warm-up and cool-down are.
2. Explain why warm-ups are important.
3. Explain why cool-downs are important.
4. Describe the benefits of both and give examples.

KEY LEARNING POINT

Warm-ups prepare your body and mind for exercise, and cool-downs help your body recover. Both are essential for performance, safety, and overall well-being.

POST: WARM-UP & COOL-DOWN DETECTIVE

INSTRUCTIONS

1. Read each statement about warm-ups and cool-downs.
2. Decide whether the statement is about a warm-up, a cool-down, or both.

   WARM-UP | COOL-DOWN | BOTH

3. Write your answer in the correct column.
4. Explain why you chose that answer.

THE THREE PHASES

1. WARM-UP (PREPARE)
Prepare your body and mind for exercise.
Examples: light jog, dynamic stretches, arm circles, high knees.

2. COOL-DOWN (RECOVER)
Help your body return to normal.
Examples: walking, static stretches, deep breathing.

3. BENEFITS (PERFORM & PROTECT)
Improve performance, support recovery, reduce injury risk, and promote overall health and well-being.

STATEMENTS

	WARM-UP (Prepare)	COOL-DOWN (Recover)	BOTH (Prepare & Recover)	WHY? (Explain your choice)
1 Increases heart rate and blood flow.	☐	☐	☐	
2 Helps muscles become more flexible.	☐	☐	☐	
3 Gradually lowers heart rate.	☐	☐	☐	
4 Helps prevent injuries.	☐	☐	☐	
5 Helps your body recover after exercise.	☐	☐	☐	
6 Improves overall performance.	☐	☐	☐	
7 Reduces muscle soreness.	☐	☐	☐	
8 Helps you focus and feel ready.	☐	☐	☐	
9 Helps remove waste products from muscles.	☐	☐	☐	
10 Leaves you feeling relaxed and refreshed.	☐	☐	☐	

TOP TIP!
Think about how each statement connects to preparing, recovering, or supporting performance and safety!

CHALLENGE QUESTION

Explain how doing both a warm-up and a cool-down can help you perform better and stay healthy.

Think about your body, mind, and long-term benefits.

_____

_____

THINKING QUESTIONS

1. Why is it important to prepare your body before exercise?
2. What could happen if you do not warm-up?
3. Why is it important to cool-down after exercise?
4. How do warm-ups and cool-downs reduce the risk of injury?
5. How do warm-ups and cool-downs help your body and mind in the long term?

SUCCESS CRITERIA

- ☐ I can identify statements as warm-up, cool-down, or both.
- ☐ I can explain my choices clearly.
- ☐ I can describe the benefits of warm-ups and cool-downs.
- ☐ I can apply my understanding to health, performance, and safety.

REMEMBER:
Warm-ups prepare your body and mind.
Cool-downs help your body recover and restore.
Both are essential for performance, safety, and well-being.

LEARNING BOX

TASK 2: FOOTBALL RULES RETRIEVAL CHALLENGE

GOLDEN THREAD

Understanding football rules helps keep the game fair, safe and enjoyable for everyone. Following the rules shows respect for teammates, opponents and the game.

1	**Explain** why players are not allowed to use their hands to stop or control the ball during play.	_____ _____ _____	
2	**Identify** the rule that is broken if a player is standing in an offside position when the ball is played to them.	_____ _____ _____	
3	**Describe** what makes a throw-in legal in football.	_____ _____ _____	
4	**Explain** why pushing an opponent to gain possession of the ball is not allowed.	_____ _____ _____	
5	**Identify** two football rules that help keep the game fair and safe.	1. _____ 2. _____	

COMMON MISCONCEPTION

"Rules slow the game down and are not important."

Rules are essential. They protect players, keep the game fair and help everyone enjoy football.

THINKING STEPS

1. Why are rules important in football?
2. How do rules help keep players safe?
3. What could happen if players do not follow the rules?
4. How do rules make the game fair for both teams?
5. Give examples of rules that promote respect and fairness.

WRITING STEPS

1. State why football rules are important.
2. Explain how rules keep the game fair.
3. Describe how rules help keep players safe.
4. Give examples of football rules.
5. Explain how following rules shows respect and improves the game.

KEY LEARNING POINT

Knowing and following football rules helps create a safe, fair and enjoyable game for everyone and allows all players to perform at their best.

YEAR 8 PE

NETBALL

RULES & REGULATIONS

PLAY SMART. PLAY FAIR. PLAY NETBALL.

GOLDEN THREAD

In Year 8, you are expected to apply the rules of netball in a range of game situations. This knowledge helps players make informed decisions, compete fairly and maintain a safe and positive environment.

EXAMPLE

FOOTWORK (PIVOT)

You must land on one foot and pivot to pass. You cannot lift or drag your landing foot.

PASSING

Pass the ball to a teammate using both hands. Obstruct the view of opponents.

DEFENDING

Use defensive footwork and positioning to challenge opponents without contact.

WHAT IS GOOD ABOUT THIS?

- Follows the Rules of Netball
- Promotes fair competition
- Keeps players safe
- Improves teamwork
- Encourages smart decisions
- Builds confidence

NON-EXAMPLE

FOOTWORK FAULT

Lifting or dragging the landing foot or taking more than one step.

CONTACT

Contact with an opponent is not allowed. Do not push, hold or obstruct.

OBSTRUCTING

Standing in the way or blocking an opponent's view or movement.

WHAT IS WRONG WITH THIS?

- Breaks the rules
- Creates an unfair advantage
- Can lead to free pass or penalty
- May lead to injury
- Increases the risk
- of losing possession

KEY RULES

- Each team has 7 players on court.
- Players must stay in their assigned positions (as shown) and cannot step into another position.
- You must pass the ball within 3 seconds.
- A player with the ball cannot hold it for more than 3 seconds.
- The ball must be passed from one player to another; you cannot run with it.

GS	Goal Shooter	WD	Wing Defence
GA	Goal Attack	GD	Goal Defence
WA	Wing Attack	GK	Goal Keeper
C	Centre		

ADVANCED RULE: OBSTRUCTION

A player obstructs an opponent if they:

- Stand in front, close enough to block movement or vision
- Move their arms, body or feet to block an opponent
- Remain stationary in the space an opponent needs to move into without attempting to play the ball

CONSEQUENCE:
Free Pass may be awarded to the other team.

FOULS & PENALTIES

Common fouls include: footwork faults, contact, obstruction, held ball and offside.
Penalty: The opposing team is awarded a Free Pass.
Repeated or serious infringements may result in a Warning or Suspension.

IMPORTANT MISCONCEPTION

"It's not contact if it's accidental."

This is incorrect.

Any contact that impacts an opponent or gives an unfair advantage is a foul, even if accidental. Players are responsible for their actions.

ALTERNATIVE VERSION

(DECISION-MAKING & GAME UNDERSTANDING)

- ✓ Read the game and space before receiving the ball
- ✓ Move into space to create passing options
- ✓ Communicate with teammates
- ✓ Apply rules when making decisions
- ✗ Stay calm and respect umpires
- ✗ Argue with umpires or officials instead of resetting quickly

KEY RULES TO REMEMBER

- Pass within 3 seconds
- No more than 3 seconds holding the ball
- Stay in your position
- Use correct footwork
- No contact
- Give your opponent space
- Respect teammates, opponents and umpires

CHECK YOUR DECISIONS

- ✓ Am I using correct footwork?
- ✓ Am I passing to the right player?
- ✓ Am I staying in my position?
- ✓ Am I avoiding contact?
- ✓ Am I following the rules and showing respect?

KEY LEARNING POINT

Understanding and applying netball rules helps you play fairly, make smart decisions and keep the game safe and enjoyable for everyone. Good players know the rules – great players use them to their advantage!

NETBALL RULES & DECISION-MAKING

PLAY SMART. PLAY FAIR. PLAY NETBALL.

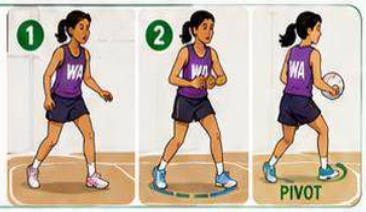
EXAMPLE

1 3 SECOND RULE

Holding the ball for no more than 3 seconds.

2 FOOTWORK

Landing on one foot then the other, or pivoting correctly while holding the ball.



3 NO OBSTRUCTION

Allowing opponents to move and receive the ball freely.

4 NO CONTACT

Not making unnecessary contact with an opponent.

WHAT IS GOOD ABOUT THIS?

- Fair play and follows the Rules of Netball
- Everyone has a chance to play and enjoy
- Increases skill, flow and teamwork
- Players make smart, controlled decisions

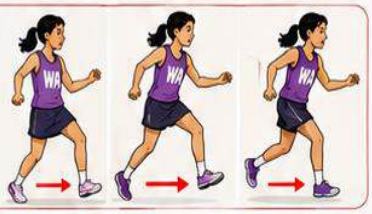
NON-EXAMPLE

1 3 SECOND RULE

Holding the ball for longer than 3 seconds.

2 FOOTWORK

Stepping, hopping or running with the ball.



3 OBSTRUCTION

Standing in the way, blocking movement or restricting opponents.

4 CONTACT

Pushing, holding, tripping or making unnecessary physical contact.

WHAT IS WRONG WITH THIS?

- Breaks the Rules of Netball
- Gives an unfair advantage
- Stops the flow of play
- Can cause injury and frustration

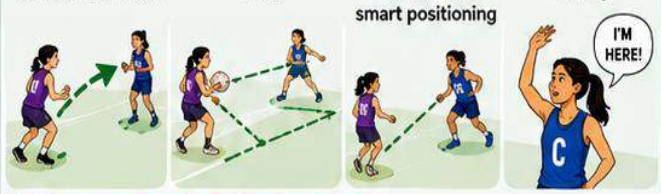
ALTERNATIVE VERSION (MOVEMENT & SPACING)

Move into space to receive the ball

Create passing lanes

Support your team with smart positioning

Communicate clearly



WHAT IS GOOD ABOUT THIS?

- Creates more opportunities to pass and score
- Helps maintain possession and build team play
- Improves spacing, awareness and communication
- Makes the game fun, fast and fair for everyone

Standing still and ball watching

Crowding the same space

Not supporting team-mates

Failing to communicate

WHAT IS WRONG WITH THIS?

- Fewer passing options and harder to score
- Creates congestion and confusion
- Breaks team structure and reduces success
- Leads to turnovers and missed opportunities

KNOW THE RULES. MAKE SMART DECISIONS. RESPECT THE GAME.

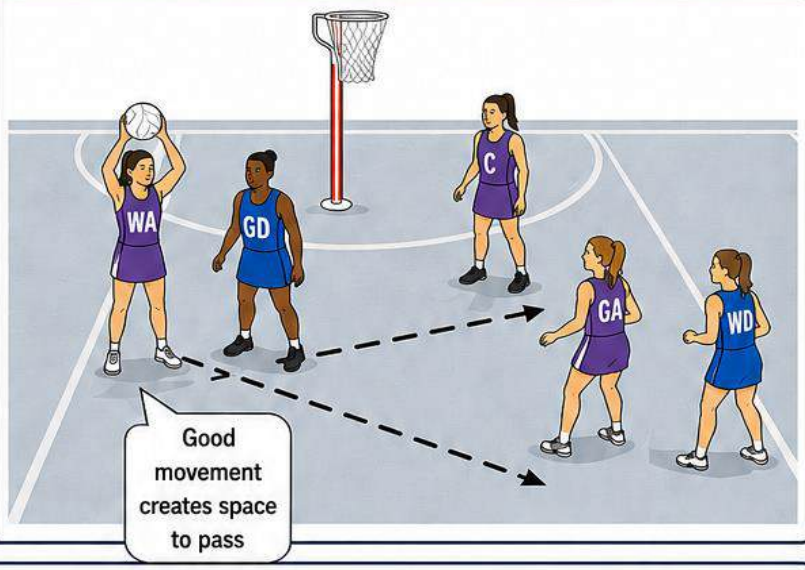
PREP ACTIVITY

CORRECT THE UMPIRE

Recognising when netball rules are followed and when they are broken in game situations.

INSTRUCTIONS

1. Read each statement about a netball situation.
2. Decide if the statement is **CORRECT** or **INCORRECT**.
3. If it is **INCORRECT**, write which rule has been broken.
4. Be ready to explain your answer.



TASK

Read each statement below. Decide if it is **CORRECT** or **INCORRECT**.

If **INCORRECT**, write which rule has been broken.

	STATEMENTS	CORRECT	INCORRECT (Rule Broken)
1	A player takes more than one step without passing or shooting the ball.		
2	A player holds the ball for more than 3 seconds.		
3	A player passes the ball to a teammate who is in a different third of the court.		
4	A player shoots for goal from outside the shooting circle.		
5	The Goal Attack (GA) passes the ball to the Goal Defence (GD).		
6	The Centre (C) receives the ball and turns to find a teammate to pass to.		
7	A player plays the ball out of court over the sideline.		

RULES TO REMEMBER

- Cannot run with the ball – must pass or shoot
- Must pass the ball within 3 seconds
- Only one foot may be in contact with the ground when holding the ball
- Each position has specific areas of the court they can play in
- Contact is not permitted
- Fair play and respect at all times

KEY

CORRECT – The statement follows the rules.

INCORRECT – The statement breaks a rule. Write which rule has been broken.

POST

NETBALL RULE BREAKS
SELF ASSESSMENT

RAG RATING:

GREEN — I understand and can apply consistently

AMBER — I sometimes understand and can apply

RED — I don't understand or find it difficult to apply

Read each rule break below and rate your understanding and ability to apply it in a game using the RAG rating.

RULE BREAK	MY RAG RATING
1. Stepping or moving with the ball (more than one foot) without passing or shooting.	○ ○ ○
2. Holding the ball for more than 3 seconds without passing or shooting.	○ ○ ○
3. Contact (obstruction or pushing) an opponent.	○ ○ ○
4. Intercepting a pass.	○ ○ ○
5. Footwork or stepping into the goal third.	○ ○ ○
6. Not taking the centre pass from where it was awarded.	○ ○ ○

WHAT AM I DOING WELL?

List the netball rules you feel confident about and why.

_____

_____

_____

_____

WHAT DO I WANT TO IMPROVE?

List the rules you find challenging and what you will do to get better.

_____

_____

_____

_____

MY TARGET: My next step is to _____

I will achieve this by _____

_____

LEARNING BOX

THE IMPORTANCE OF WARM-UPS & COOL-DOWNS

GOLDEN THREAD

Warm-ups and cool-downs are essential parts of any physical activity. They prepare the body for exercise, support recovery afterwards, and help keep you safe, reduce injury risk, and improve performance.

1 WARM-UPS – PREPARE YOUR BODY

A warm-up is done before exercise to gradually prepare your body and mind for activity.

REASONS:

- Increase heart rate and blood flow.
- Raise body temperature.
- Loosen muscles and joints.
- Prepare the mind and improve focus.
- Reduce the risk of injury.

BENEFITS:

- Improves performance.
- Enhances flexibility and mobility.
- Helps you start exercise safely and effectively.
- Reduces muscle strains and pulls.

EXAMPLES:

Light jogging, dynamic stretches, arm circles, leg swings, high knees.

2 COOL-DOWNS – RECOVER & RESTORE

A cool-down is done after exercise to help your body return to normal.

REASONS:

- Gradually lower heart rate.
- Help breathing return to normal.
- Reduce muscle soreness.
- Prevent blood pooling.
- Support recovery.

BENEFITS:

- Improves recovery and reduces muscle stiffness.
- Helps remove waste products from muscles.
- Reduces risk of dizziness and injury.
- Leaves you feeling relaxed and refreshed.

EXAMPLES:

Light jogging or walking, static stretches, deep breathing, gentle mobility exercises.

COMMON MISCONCEPTION

"I don't need to warm-up" for short exercises. I'll be fine."

Even short or low-intensity activities can cause injury without a warm-up. Your muscles and joints still need preparation.

THINKING STEPS

1. Why do we need to warm-up before exercise?
2. What could happen if we skip a warm-up?
3. Why is it important to cool down after exercise?
4. How do warm-ups and cool-downs improve performance and safety?

WRITING STEPS

1. State what a warm-up and cool-down are.
2. Explain why warm-ups are important.
3. Explain why cool-downs are important.
4. Describe the benefits of both and give examples.

KEY LEARNING POINT

Warm-ups prepare your body and mind for exercise, and cool-downs help your body recover. Both are essential for performance, safety, and overall well-being.

POST: WARM-UP & COOL-DOWN DETECTIVE

INSTRUCTIONS

1. Read each statement about warm-ups and cool-downs.
2. Decide whether the statement is about a warm-up, a cool-down, or both.

   WARM-UP **COOL-DOWN** **BOTH**

3. Write your answer in the correct column.
4. Explain why you chose that answer.

THE THREE PHASES

1. WARM-UP (PREPARE)

Prepare your body and mind for exercise.
Examples: light jog, dynamic stretches, arm circles, high knees.

2. COOL-DOWN (RECOVER)

Help your body return to normal.
Examples: walking, static stretches, deep breathing.

3. BENEFITS (PERFORM & PROTECT)

Improve performance, support recovery, reduce injury risk, and promote overall health and well-being.

STATEMENTS

	WARM-UP (Prepare)	COOL-DOWN (Recover)	BOTH (Prepare & Recover)	WHY? (Explain your choice)
1 Increases heart rate and blood flow.	☐	☐	☐	
2 Helps muscles become more flexible.	☐	☐	☐	
3 Gradually lowers heart rate.	☐	☐	☐	
4 Helps prevent injuries.	☐	☐	☐	
5 Helps your body recover after exercise.	☐	☐	☐	
6 Improves overall performance.	☐	☐	☐	
7 Reduces muscle soreness.	☐	☐	☐	
8 Helps you focus and feel ready.	☐	☐	☐	
9 Helps remove waste products from muscles.	☐	☐	☐	
10 Leaves you feeling relaxed and refreshed.	☐	☐	☐	

TOP TIP!

Think about how each statement connects to preparing, recovering, or supporting performance and safety!

CHALLENGE QUESTION

Explain how doing both a warm-up and a cool-down can help you perform better and stay healthy.

Think about your body, mind, and long-term benefits.

_____

_____

THINKING QUESTIONS

1. Why is it important to prepare your body before exercise?
2. What could happen if you do not warm-up?
3. Why is it important to cool-down after exercise?
4. How do warm-ups and cool-downs reduce the risk of injury?
5. How do warm-ups and cool-downs help your body and mind in the long term?

SUCCESS CRITERIA

- ☐ I can identify statements as warm-up, cool-down, or both.
- ☐ I can explain my choices clearly.
- ☐ I can describe the benefits of warm-ups and cool-downs.
- ☐ I can apply my understanding to health, performance, and safety.

REMEMBER: Warm-ups prepare your body and mind.
Cool-downs help your body recover and restore.
Both are essential for performance, safety, and well-being.

POST

NETBALL DECISION-MAKING TASK 2: RETRIEVAL CHALLENGE

Complete the challenges below using your knowledge of advanced netball rules.

1 DEFINE IT

Write a definition for:

Obstruction

_____

_____

Held Ball

_____

_____

2 SPOT THE DIFFERENCE

Complete the table.

TERM	WHAT DOES IT MEAN?
Obstruction	_____
Contact	_____
Interfering	_____
Offside	_____

3 TRUE OR FALSE?

Circle T or F

- T / F A player can only move with the ball for 3 seconds before they must pass.
- T / F A footwork fault occurs when a player lifts their landing foot.
- T / F A player must not contact an opponent who does not have the ball.
- T / F Held ball is called when two or more opponents gain possession at the same time.
- T / F The centre pass must be taken outside the centre third.

4 COMPLETE THE SENTENCE

Fill in the missing words.

1. A player is considered offside if they are in the _____ third when the ball is in the _____ third.
2. A player must pass the ball within _____ seconds of receiving it.
3. A player gains an advantage if they receive a pass _____ or _____ while in an obstructed position.

5 MATCH THE CONSEQUENCE

Draw a line to match.

INCIDENT	CONSEQUENCE
Obstruction	Free Pass
Footwork Fault	Penalty Pass
Contact	Change of Possession
Held Ball	Play Continues
Interfering in Play	Centre Pass

6 CORRECT THE COACH

The coach says:

> "You can stand anywhere as long as you're not holding the ball."

Why is this statement incorrect?

_____

_____

7 GAME SCENARIO CHALLENGE

The goal attack receives a pass in the goal third.
A defender moves in front to block the ball.
The goal attack changes direction to get around them.

What should the umpire decide?

☐ Goal ☐ Pass ☐ Obstruction ☐ Held Ball

Explain your answer:

_____

_____

8 CHALLENGE QUESTION

Explain the difference between:

Obstruction and Contact

_____

_____

_____

_____

REMEMBER THE KEY RULES

- Obstruction is preventing an opponent from playing the ball.
- You have 3 seconds to pass or shoot after receiving the ball.
- Footwork faults happen when you break the landing rule.
- No contact with an opponent who does not have the ball.
- Respect opponents, teammates and officials.

UXBRIDGE
HIGH SCHOOL

YEAR 8

HISTORY

POST AND PREP LEARNING MAP

Post tasks help you recap knowledge that you have learned in the past.

The blue boxes cover previous knowledge you learned in other terms.

The green boxes help you recap what you are learning this term.

Post tasks

Prep tasks teach you important knowledge, vocabulary and skills to prepare you for the lessons ahead.

Your prep tasks will always be in an orange box.

Prep tasks

LEARNING BOX Year 8 History –KO1 Elizabethan England

GOLDEN THREAD

Last term we learned about the reign of Henry VIII. This term we are going to use this foundation of knowledge to learn about his daughter Elizabeth's reign.

KEY IDEA

Elizabeth did not fit into Early Modern standards of monarchy. She was a Protestant, taking over from Catholic Mary. She was also a woman, in a world where women were perceived to be too weak to rule. Elizabeth also refused to marry or have children. She was aware that as soon as she did, her personal power would be reduced and her husband would be in charge. This angered her nobleman who saw this decision as problematic. The main expectation of a monarch was to secure the line of succession!

IMPORTANT MISCONCEPTIONS

Elizabeth grew up as a princess. This is incorrect. After Anne Boleyn, Elizabeth's mother, was executed, she was removed from the line of succession. Elizabeth grew up exiled from court until 1537 when Henry married his 6th wife, Catherine Parr.

THINKING STEPS

1. How were women perceived in the 16th century?
2. Were female leaders accepted by the nobility or wider society?
3. How do you think growing up away from court would have impacted how she was seen by the nobles?

Examples and Non Examples

STRONG EXAMPLE

Women were perceived by society as to belong in the 'private sphere', primarily operating in the home. Who they married, particularly noble women, was very important and could decide how successful their lives were. Elizabeth grew up away from court; this could mean she was not trusted by the noblemen who were essentially her decision makers.

WEAK EXAMPLE

Elizabeth was a women, they were seen as bad leaders.

No one wanted a Queen to be in charge of England.

They didn't know her.

WHY THIS IS GOOD

- ✓ Clear explanation
- ✓ Links between questions
- ✓ Historical understanding shown

WHY THIS IS WEAK

- ✗ Not written in full sentences with any explanations
- ✗ Doesn't actually explain the challenges Elizabeth faced
- ✗ No true historical understanding of Elizabeth's reign

THINKING STEPS

What do I know about Early Modern society?

What do I know about Elizabeth's parentage?

Why would she maybe not be trusted?

WRITING STEPS

Have I answered the question?

Have I written in full sentences?

Have I connected my answers into a clearly explained paragraph?

PREP TASK: Elizabeth's problems

INSTRUCTIONS:
Task 1: Using the reading from your learning box, complete the gap fill using the word bank. Then, rank Elizabeth's personal problems in order of the biggest challenge to the smallest.

Protestants
Catholicisism
Challenge
Mary's
Unpopular
Throne
Religion

TASK 1: Elizabeth's religious problems

During ..... reign, England had been Catholic. Mary executed over 280 ..... for not following her religion. When Elizabeth took the ....., she had to change the ..... back to .....

This was a difficult..... and in many ways made her .....

TASK 2: Elizabeth's personal problems

Problem: **Ranking**

- Elizabeth was the daughter of traitor, Anne Boleyn ☐
- She was a woman ☐
- She refused to have children or get married ☐

POST TASK: Who were Elizabeth's parents?

<u>INSTRUCTIONS</u>: Some of Elizabeth's problems came from her parents. Use the images to circle the names of her parents then complete the paragraph explaining what happened to her mother.

TASK 1: Who were Elizabeth's parents?

Circle the correct names

Henry VIII and Jane Seymour

Henry VII and Catherine of Aragon

Richard III and Anne Boleyn

Henry VIII and Anne Boleyn

Edward VI and Mary I

TASK 2: What happened to Elizabeth's mother?

Using your learning from last week, explain what happened to Elizabeth's mother.

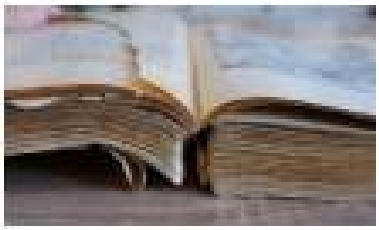
Elizabeth's mother was.....

This was because.....

For Elizabeth, this meant that.....

POST TASK: Historical interpretations

INSTRUCTIONS: **For task one, select the correct definition of a Historical interpretation. Once you have done that, read the historical interpretation in task two and state what the Historian is arguing and a quote that supports it.**



TASK 1:

Highlight the correct definition of a Historical Interpretation

1. A piece of evidence from the past
2. A Historian's opinion of a person or event in the past, created from the study of evidence and sources
3. A Historian's opinion of something in the past using websites and Wikipedia.

TASK 2:

Read the interpretation of Henry VIII. What is the Historian saying about Henry? What quote from the text suggests this?

"Henry VIII was raised as a traditional Renaissance prince, educated in religion, humanism, and chivalric ideals. However, after his severe jousting accident in 1536, his health and temperament appear to have deteriorated significantly." - **L Wolsey**

1. What is Wolsey saying about Henry?

2. Find a quote in the text that supports this:

SELF QUIZZING: Elizabeth's problems

INSTRUCTIONS:
Use your knowledge from the prep and post tasks to quiz yourself.

If you can, try not to looks back in the booklet when answering to see how much you have retained!

Once you have finished, flip back in the booklet to see if you were right!

PREP CHECK

Question	Answer	Check
What was England's religion under Mary I?		
Name one religious problem Elizabeth experienced?		
Name one political problem Elizabeth experienced?		

POST CHECK

Question	Answer	Check
What was the name of Elizabeth's mother?		
Why was Elizabeths heritage (her parents) a problem for her?		
What is the definition of a historical interpretation?		

LEARNING BOX Year 8 History –KO1 Elizabethan England

GOLDEN THREAD

This week we have been/ will be learning about the later challenges and threats of Elizabeth's reign, alongside how she responded to them. Elizabeth faced every challenge head on and defeated all that opposed her!

KEY IDEA

As Elizabeth continued to reign, she continued to experience challenges. Her cousin, Mary Queen of Scots was one of these. She was the Catholic queen of Scotland and a figurehead for Catholic rebellion. At the same time, the Spanish led by King Philip of Spain attempted to invade via an armada (force of ships). Elizabeth had to fight off internal and external threats while maintaining her authority.

THINKING STEPS

1. Why would the Catholics pose a more significant threat than the Puritans?

2. What would an external invasion mean for Elizabeth?

3. Why was it significant these things happened at the same time?

WRITING STEPS

Argument: Consider what the Historian is saying about the event

Detail: Where in the interpretation does it tell you this?

Evidence: What do you know about Elizabeth that supports this idea?

Examples and Non Examples

STRONG EXAMPLE

Elizabeth's Protestant religion made her a significant target for strong Catholic powers. The Catholics were more of a challenge than Protestants because they had important figureheads such as Philip of Spain and Mary Queen of Scots. If England was invaded, Elizabeth's reign and Protestantism would be over. The fact that these threats occurred at the same time is significant as they could pose a joint threat of invasion from both the North and the South, leaving no escape for Elizabeth.

WEAK EXAMPLE

Elizabeth was Protestant but other monarchs were Catholic. This meant they did not get along. If they happened at the same time, Elizabeth would not be able to win both battles.

WHY THIS IS GOOD

- ✓ Clear explanation of the question
- ✓ Links between individual questions
- ✓ Historical understanding shown

WHY THIS IS WEAK

- ✗ Surface level explanation of threats faced
- ✗ No true historical understanding of Elizabeth's reign displayed
- ✗ Limited depth of understanding shown.

THINKING STEPS

Who were other successful monarchs of the time?

What is England's relationship with Spain and Scotland at this time?

Why would a joint invasion prove to be a problem?

WRITING STEPS

Have I answered the question?

Have I written in full sentences?

Have I connected my answers into a clearly explained paragraph?

PREP TASK: Armada portraits

INSTRUCTIONS: Examine the famous Armada Portrait, painted in 1588. What can you see in the painting? Then, look for the symbolism and explain what they might represent or mean.

TASK 1: Finish the sentence

In the portrait I can see...

TASK 2:

From the three elements of symbolism here, what do you think they might represent?

1. Two paintings behind her

2. Hand on globe

3. Facing forward

POST TASK: Mary Queen of Scots

Mary Queen of Scots was the Scottish Queen at the same time as Elizabeth was the English Queen. She was married to the heir to the French throne and was a strict Catholic. Lots of Catholics in England wanted her to be their queen instead of Elizabeth.

TASK 1: Why would Mary pose a threat to Elizabeth? Name 3 reasons:

1.

2.

3.

TASK 2: Use the sentence starters t explain what the Babington Plot was and how it led to Mary's execution.

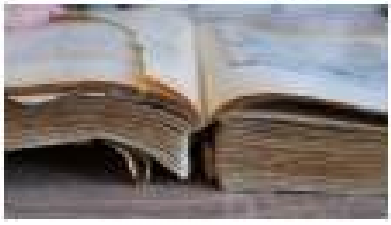
The Babington Plot was in 1586 when.....

Mary was found out to have been involved as.....

This led to her execution because.....

POST TASK: Historical Interpretations

INSTRUCTIONS: For task one, use your prior understanding from year 7 and 8 so far to explain the definition of an interpretation and where it comes from. Then, look at John Guy's interpretation and evaluate it using the 2 questions.



TASK 1:

Write a detailed explanation of what a historical interpretation is and how it is formed.

.....
.....
.....
.....
.....
.....
.....
.....

Read the interpretation of Elizabeth's decision to execute Mary QoS. What is the Historian saying about his decision ? What quote from the text suggests this?

'Elizabeth's hands were tied when it came to Mary. While she was her cousin, and killing a royal may set a dangerous precedent, Mary's connections to internal and external Catholic threats were too much for Elizabeth.'

- **J Guy**

- What is Guy saying about Elizabeth's decision?

2. Find a quote in the text that supports this:

SELF QUIZZING: Challenges to Elizabeth, 1586-1588

INSTRUCTIONS:

Use your knowledge from the prep and post tasks to quiz yourself.

If you can, try not to looks back in the booklet when answering to see how much you have retained!

Once you have finished, flip back in the booklet to see if you were right!

PREP CHECK

Question	Answer	Check
Why was Elizabeth sat facing forward in the Armada portrait?		
What is Elizabeth wearing in the Armada portrait?		
Why would Elizabeth have her hand resting on the globe?		

POST CHECK

Question	Answer	Check
Who was Mary Queen of Scots married to? Why was this a threat to E?		
What was the Babington Plot and what was Mary's involvement?		
How did Elizabeth feel about executing Mary? How do you know?		

LEARNING BOX Year 8 History –KO1 Elizabethan England

GOLDEN THREAD

This term's Enquiry Question 'Was Elizabeth's reign really a 'golden age' is coming to an end. We need to begin considering the lived experience of those living under Elizabeth to make our final judgements.

KEY IDEA

Was Elizabeth's reign truly a Golden Age as some Historians suggest or does that ignore the suffering experienced by many?
Can two things be true at once?

IMPORTANT MISCONCEPTIONS

A misconception some students might make is thinking that we only need to judge the monarch's reign by their actions.

It is also incredibly important that we consider the impact their actions had on the whole population of England.

THINKING STEPS

Who is impacted by Elizabeth's decisions?

Did Elizabeth defeat all challenges within her reign as some historians suggest?

Were the English people better off with Elizabeth on the throne than previous monarchs?

WRITING STEPS

Judgement: *Was Elizabeth's reign really a 'Golden Age'?*

Evidence: *Historical knowledge of Elizabeth's reign to support the judgement*

Explain: *How does this evidence prove it was/ was not a 'Golden Age'?*

Examples and Non Examples

STRONG EXAMPLE

Some Historians argue Elizabeth's reign was a 'golden age'. These Historians focus on the success in the reign, particularly the defeat of the Spanish Armada. However, some Historians focus on the experience of the people living at the time, arguing it was not a 'golden age' because of the poverty and religious suffering of the people. Different Historians look at different parts of the reign to come to their conclusions.

WEAK EXAMPLE

Some people in Elizabethan England struggled because their religion wasn't accepted.

This meant it was not a 'Golden Age' because some people lived their lives in poverty.

Elizabeth was a female ruler people didn't all like because they didn't think women could rule.

WHY THIS IS GOOD

- ✓ Strong, detailed explanation linking to the question
- ✓ Historical evidence from Elizabeth's reign shown
- ✓ All relevant and detailed knowledge

WHY THIS IS WEAK

- ✗
- ✗
- ✗

THINKING STEPS

WRITING STEPS

Have I answered the question?

Have I written in full sentences?

Have I connected my answers into a clearly explained paragraph?

PREP TASK: Golden Age interpretations

In some interpretations, Elizabeth's reign has been presented as a 'golden age' of England. Historians who say this may focus on how Elizabeth successfully defeated all direct challenges to her reign. However, some historians believe that Elizabethan England was a challenging time for many, due to poverty, war, a lack of education and religious tension.

TASK 1: What is a golden age?

Write 4 adjectives to describe what you believe would make a time period a 'Golden Age'

.....

.....

.....

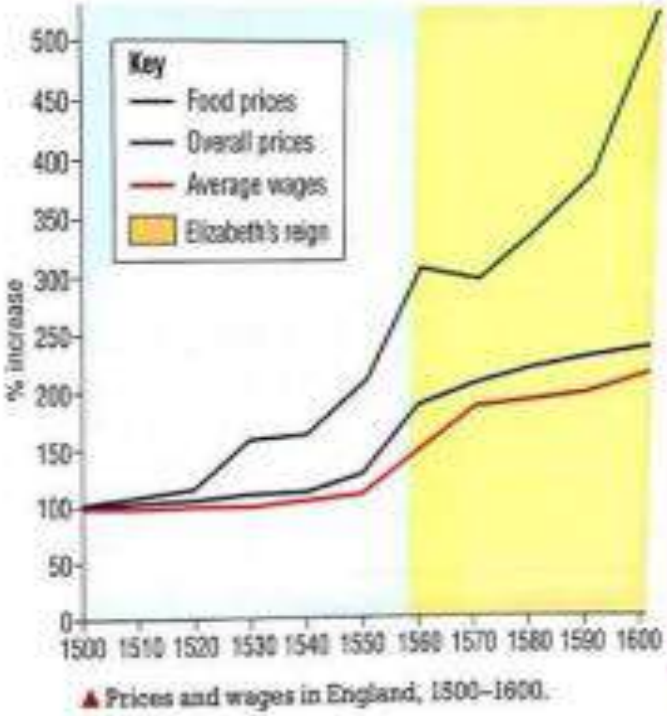
.....

TASK 2: For each argument (golden age vs not 'golden), write 2 pieces of evidence from your lessons on Elizabethan England.

Elizabeth's reign was a Golden Age for England	Elizabeth's reign was NOT a Golden Age for England

POST TASK: Elizabethan Poverty and Education

INSTRUCTIONS: Whilst Elizabeth and her courtiers lived in luxury, many ordinary people were struggling with poverty and a lack of education. They also suffered from religious division and potential punishment for homelessness or being Catholic.



▲ Prices and wages in England, 1500–1600.

TASK 1: Look at the graph.

1. What happened to food prices in Elizabeth's reign?
2. What happened to wages?
3. What would this mean for people?

TASK 2: Read the paragraph and answer the following questions:

1. Which children received the most education?
2. Which received no education?
3. What was the literacy rate in 1600 for men and women?

Elizabethan Education:

Most children did not receive a formal education. Poor girls were offered the least. Boys from wealthy families or were intelligent were offered formal schooling in grammar schools. Very wealthy girls were educated by governesses and taught to be good housewives for their rich husbands. By 1600, the literacy rate for men was 30%, but for women was only 10%.

POST TASK: Historical interpretations

INSTRUCTIONS: Different historians have come to different conclusions about Elizabeth's reign. Some argue it was a time of success and prosperity. Some argue that many ordinary people were not considered by Elizabeth and suffered in their lives.

TASK 1: Read the interpretation, then answer the following questions:

'Tolerance found a patron and religion its balance, seas were navigated and an empire embarked upon and a small nation defended itself against larger enemies and found a voice and a purpose. The greatest prince this country has produced was a prince in skirts.' - **M Portillo**

- Does the historian believe Elizabeth's reign was a 'golden age'?.

- What evidence do you have agreeing with them?

TASK 2: Read the interpretation, then answer the following questions:

'Whilst Elizbaeth's reign saw success, the violence, poverty and suffering experienced by the British population during the 1580s cannot be ignored. Elizabeth's harsh reforms to poor laws led many into beggary.' - **J Sharpe**

1. Does the historian believe Elizabeth's reign was a 'golden age'?.

2. What evidence do you have agreeing with them?

SELF QUIZZING: Elizabeth's 'Golden Age'

INSTRUCTIONS:

Use your knowledge from the prep and post tasks to quiz yourself.

If you can, try not to looks back in the booklet when answering to see how much you have retained!

Once you have finished, flip back in the booklet to see if you were right!

PREP CHECK

Question	Answer	Check
What is a historical interpretation?		
Why do historians come to different conclusions over the same person or event?		
Give one piece of evidence suggesting Elizabeth's reign was a 'Golden Age'		

POST CHECK

Question	Answer	Check
What was the literacy rate for women in 1600?		
What happened to food prices in Elizabethan England?		
What evidence of her reign signals it was not a golden age?		

UXBRIDGE
HIGH SCHOOL

YEAR 8

SCIENCE

POST AND PREP LEARNING MAP

Post tasks help you recap knowledge that you have learned in the past.

The blue boxes cover previous knowledge you learned in other terms.

The green boxes help you recap what you are learning this term.

Post tasks

Prep tasks teach you important knowledge, vocabulary and skills to prepare you for the lessons ahead.

Your prep tasks will always be in an orange box.

Prep tasks

CONTENTS — YEAR 8 BIOLOGY

Autumn Term 2026–27

HW	Dates	POST — Retrieval topic	PREP — Skills content
Autumn 1 · 21 Sep – 23 Oct 2026			
1	21 Sep 26 → 05 Oct 26	▧ GREEN B8: Gas Exchange and Breathing (8.3.1–8.3.2)	KO12: Identifying Trends
2	05 Oct 26 → 19 Oct 26	■ RED Y7 Retrieval: Body Systems and Cells	KO12: Identifying Anomalies
Autumn 1 → Autumn 2 (Half Term)			
3	19 Oct 26 → 09 Nov 26 ★ Half Term	▧ GREEN B8: Nutrients and Food Tests (8.4.1–8.4.2)	KO12: Drawing Conclusions
Autumn 2 · 03 Nov – 19 Dec 2026			
4	09 Nov 26 → 23 Nov 26	■ RED B8 Retrieval: Gas Exchange (~7 weeks ago)	KO13: Scientific Vocabulary
5	23 Nov 26 → 07 Dec 26	▧ GREEN B8: Digestive System and Enzymes (8.4.3–8.4.5)	KO13: Cause and Effect
Christmas Holiday Homework (due 14 Jan 27)			
6	07 Dec 26 → 14 Jan 27 ★★ Christmas — due 14 Jan	▧ GREEN B8 Assessment Consolidation	KO13: Evaluating Explanations

Each homework contains: Steps 6–8.5 (Prep) | Steps 9–11 (Post + Answer) | Step 12 (Challenge ★★★) | Step 14 (Feedforward) | Step 15 (Self-Quizzing)

YEAR 8 BIOLOGY · AUTUMN TERM

Autumn 1 · 21 Sep – 23 Oct 2026

HW 1

Set: **21 Sep 26** Due: **05 Oct 26**

GREEN POST

B8: Gas Exchange and Breathing (8.3.1–8.3.2)

PREP

KO12: Identifying Trends

PREP LEARNING BOX

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

GOLDEN THREAD:

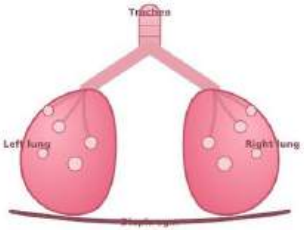
In Year 7 you collected data and drew graphs. Now in Year 8 we go further — identifying the pattern in results, describing it precisely, and writing a conclusion that directly answers the question. This skill runs through every investigation you will do this year and at GCSE.

KEY IDEA:

A trend is the overall pattern in data — it tells you how one variable changes as another changes.

- **Positive trend:** as X increases, Y increases.
- **Negative trend:** as X increases, Y decreases.
- **No trend:** Y stays roughly the same.
- A **conclusion** names the trend, quotes data values, and links to science.

THE HUMAN LUNGS



Millions of tiny alveoli line the branching airways inside each lung, giving a huge surface area for gas exchange.

IMPORTANT MISCONCEPTION:

Students often write "*the results show that as temperature goes up, the rate goes up.*" **This is incomplete** — it ignores the drop above 37°C. A strong conclusion must describe the *full* trend, refer to specific data values, and link to the science.

WHEN TO USE THIS:

Use this whenever you are asked to "describe the trend", "analyse the results", "draw a conclusion" or "what does the data show?" — in any science topic, including B1 Health & Lifestyle this week.

THINKING STEPS:

- What happens to the dependent variable as the independent variable increases?
- Does the trend stay the same throughout, or does it change direction?
- What specific values support the trend you have described?

WRITING STEPS:

- State the overall trend: "As ... increases/decreases, ... increases/decreases."
- Quote specific data values to support the trend (e.g. "from X to Y").
- Explain *why* the trend occurs using scientific knowledge.

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

GOLDEN THREAD:

We use the writing steps — state the trend, quote data values, explain using science — to answer data analysis questions. These same steps work in Biology, Chemistry and Physics.

Question: A student investigates how the mass of sugar in a drink affects the energy released when burned. Results: 5 g = 12 kJ; 10 g = 23 kJ; 15 g = 35 kJ; 20 g = 46 kJ. Describe the trend and write a conclusion. (3 marks)

EXAMPLE

As the mass of sugar increases from 5 g to 20 g, the energy released increases from 12 kJ to 46 kJ. This is a positive trend — for every additional 5 g of sugar, the energy increases by approximately 11–12 kJ. This supports the conclusion that sugar contains stored chemical energy, and the more sugar that burns, the more energy is transferred to the surroundings.

WHAT IS GOOD ABOUT THIS?

✓States the trend precisely using the correct sentence structure.

✓Quotes specific data values at the start and end of the range.

✓Links to scientific knowledge — chemical energy stored in sugar.

NON-EXAMPLE

The results show that more sugar gives more energy. The numbers went up each time.

WHAT IS WRONG WITH THIS?

✗No specific data values quoted — "numbers went up" is too vague.

✗No scientific explanation of *why* more sugar releases more energy.

✗Does not use the correct sentence structure: "as X increases, Y increases."

KEY TAKEAWAY:

Always name the independent and dependent variables, quote at least two data values, and explain *why* using science. Vague phrases like "it went up" will never gain full marks.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Complete all three questions from memory using the writing steps. Do not look back until you have finished, then check and correct in a different colour.

DATA:

A student investigates how the concentration of a salt solution affects the time taken for a potato strip to lose mass through osmosis. Their results are shown below.

Salt concentration (%)	0	0.5	1.0	1.5	2.0
Mass change (g)	+0.4	+0.1	0.0	−0.3	−0.6

YOUR ANSWERS:

1. Describe the trend shown in the results. Use the sentence structure from your Learning Box. ***(2 marks)***

2. Write a conclusion for this investigation. Include specific data values and a scientific explanation. ***(3 marks)***

3. At what concentration does the potato strip neither gain nor lose mass? What does this tell you about the concentration of the potato cells? ***(1 mark)***

NOTES PAGE

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

YEAR 8 BIOLOGY STEP 9 GREEN POST

POST LEARNING BOX

B8: Gas Exchange and Breathing — 8.3.1 & 8.3.2

GOLDEN THREAD:

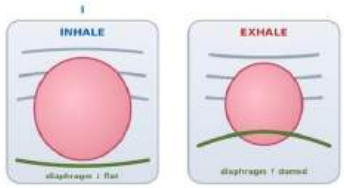
In Year 7 you learned that cells need oxygen for respiration and produce carbon dioxide. Now in B8 we look at how those gases get into and out of the body through the lungs — the process of gas exchange. This links your Year 7 cell biology directly to the respiratory system.

KEY IDEA:

Gas exchange in the alveoli:

- **Alveoli** — tiny air sacs in the lungs. Adaptations: one cell thick walls (short diffusion distance), large total surface area (millions of alveoli), moist lining (gases dissolve), rich blood supply (maintains concentration gradient).
- **Oxygen diffuses** from alveolar air (high [O_2]) → blood (low [O_2]) — down the concentration gradient.
- **Carbon dioxide diffuses** from blood (high [CO_2]) → alveolar air (low [CO_2]).
- Both gases move by **diffusion** — passive, no energy required.
- **Ventilation** (breathing) maintains the concentration gradient by refreshing alveolar air continuously.

BREATHING IN AND OUT



Ribs and diaphragm move to change chest volume, which changes pressure and drives air in or out.

IMPORTANT MISCONCEPTION:

Students often say oxygen is 'pumped' into the blood. **This is incorrect.** Oxygen moves by *diffusion* — passively down its concentration gradient. No energy is used. The breathing mechanism simply maintains the gradient by refreshing stale air with fresh air.

WHEN TO USE THIS:

Use this when explaining gas exchange in the lungs, describing alveolus adaptations, or describing the breathing mechanism.

THINKING STEPS:

- Is the question about gas exchange (diffusion, concentration gradient, alveolus) or the breathing mechanism (muscles, volume, pressure)?
- Which gas is diffusing which way? O_2 into blood; CO_2 out of blood.

WRITING STEPS:

- For gas exchange: name the gas, state direction, use 'diffuses down the concentration gradient'.
- For alveolus adaptations: name feature → explain its effect on diffusion rate.
- For breathing: diaphragm/intercostals → ribcage → volume → pressure → airflow.

YEAR 8 BIOLOGY STEP 10 Post Example / Non-Example

EXAMPLE & NON-EXAMPLE

B8: Gas Exchange and Breathing — 8.3.1 & 8.3.2 — modelling a full answer

Explain how the structure of the alveolus is adapted for efficient gas exchange. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

The alveolus has several structural adaptations that maximise the rate of gas exchange by diffusion. First, the walls are only one cell thick, which minimises the diffusion distance so oxygen and carbon dioxide can cross quickly. Second, there are millions of alveoli providing a very large total surface area, which increases the number of molecules that can diffuse simultaneously. Third, the moist lining allows gases to dissolve before diffusing across the membrane. Fourth, each alveolus is surrounded by a dense capillary network — a rich blood supply — which constantly carries oxygenated blood away and delivers deoxygenated blood, maintaining a steep concentration gradient for both gases. Together these features ensure that diffusion of oxygen into the blood and carbon dioxide out of the blood occurs as rapidly as possible.

WHY IS THIS GOOD?

- Names at least THREE structural adaptations (thin walls, large SA, moist lining, rich blood supply).
- Each adaptation linked to its specific effect on diffusion rate.
- Uses 'concentration gradient' and 'diffusion' correctly.

✗ NON-EXAMPLE (WEAK ANSWER)

The alveolus has a large surface area and thin walls so gases can get in and out quickly.

WHY IS THIS WEAK?

- Only two adaptations — four are expected for 6 marks.
- 'Gets in and out' is vague — must say 'diffuses down the concentration gradient'.
- No mention of moist lining or how the blood supply maintains the gradient.

KEY TAKEAWAY:

Alveolus adaptations: at least 4 features, each with a mechanism linked to diffusion efficiency. Always use 'concentration gradient' and 'diffusion' explicitly.

POST TASK

B8: Gas Exchange and Breathing — 8.3.1 & 8.3.2 — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

Explain how the structure of the alveolus is adapted for efficient gas exchange. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** Name TWO structural features of the alveolus and explain how each increases the rate of diffusion.
2. **(2 marks)** Name a THIRD feature and explain how the rich blood supply maintains the concentration gradient for BOTH O_2 and CO_2.
3. **(2 marks)** Name the moist lining as a FOURTH feature. Explain why gases must dissolve before diffusing, and use 'concentration gradient' in your answer.

CHALLENGE TASK

B8: Gas Exchange and Breathing — 8.3.1 & 8.3.2 — stretch your thinking further

★★★

A student says: '*Fish breathe water, not air — so they must use a completely different process to get oxygen into their blood.*'

Evaluate this statement. Compare gas exchange in fish gills with gas exchange in human alveoli. Use diffusion, concentration gradient, surface area and adaptation in your answer.

Hint: What structure in fish gills corresponds to the alveolus? Both use diffusion — how are concentration gradients maintained in each case? What adaptations are shared and what differs?

FEEDFORWARD BOX

Reflect. Improve. Develop.

PREP SECTION — KO12: Identifying Trends

If you wrote …	Improve it by …
Named the trend but not explained it	Add: 'this means that as X increases, Y increases/decreases at a consistent rate'.
Said 'the results support the prediction'	Explain WHY — state the specific values that show the link.
Vague conclusion ('results show a pattern')	Name the pattern precisely: 'positive/negative correlation' or 'as X doubles, Y also doubles'.

POST SECTION — B8: Gas Exchange and Breathing (8.3.1–8.3.2)

If you wrote …	Improve it by …
Said oxygen is 'pumped' into blood	Oxygen moves by diffusion — passive, down the concentration gradient. No pump involved.
Named only 1–2 adaptations	6-mark answers need at least 3–4 adaptations, each linked to a consequence for diffusion rate.
Forgot the moist lining	Gases must dissolve in moisture before diffusing — this is a distinct and markable adaptation.
Said 'CO_2 moves from alveoli into blood'	CO_2 moves FROM blood INTO alveolar air — it is produced by cells and builds up in blood.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Identifying Trends — Prep

WHAT DO I KNOW?

What is a trend in data?

What is the difference between a positive and a negative correlation?

HOW DO I USE IT?

What sentence structure should you use to describe a trend?

After stating the trend, what must you always add?

WHEN DO I USE IT?

What question keywords tell you to describe a trend?

When must you describe more than one trend?

MISTAKES TO AVOID

Why isn't 'the numbers went up' a strong trend statement?

What do students often forget to include alongside a trend statement?

B8: Gas Exchange (8.3.1–8.3.2) — Post

RECALL

Name four structural adaptations of the alveolus.

What is the direction of diffusion for O_2 and CO_2 across the alveolus?

EXPLAIN

Explain how thin walls and large surface area each increase the rate of diffusion.

How does the rich blood supply maintain the concentration gradient?

APPLY

Why does ventilation (breathing) need to occur continuously for gas exchange to continue?

What happens to the concentration gradient if air is not refreshed?

MISTAKES TO AVOID

Why is it wrong to say oxygen is 'pumped' from the alveolus into the blood?

Which direction does CO_2 diffuse — blood to alveoli or alveoli to blood?

YEAR 8 BIOLOGY · AUTUMN TERM

Autumn 1 · 21 Sep – 23 Oct 2026

HW 2

Set: **05 Oct 26** Due: **19 Oct 26**

RED POST

Y7 Retrieval: Body Systems and Cells

PREP

KO12: Identifying Anomali

PREP LEARNING BOX

KO12: Analysing & Evaluating — Identifying Anomalies in Data

GOLDEN THREAD:

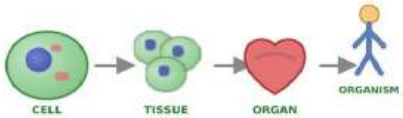
Last week you described trends in data. Now we go further — spotting results that don't fit the pattern (anomalies), explaining why they occur, and deciding whether to include them in your conclusion.

KEY IDEA:

An anomaly (also called an outlier) is a result that does not fit the overall trend in the data.

- Anomalies are often caused by human error, faulty equipment or a one-off variable.
- You should **identify** the anomaly, **suggest a cause**, and **exclude it** when calculating a mean or drawing a line of best fit.
- Never ignore an anomaly — always comment on it.

FROM CELL TO ORGANISM



IMPORTANT MISCONCEPTION:

Students often cross out an anomaly and say 'I ignored it because it was wrong.' **This is incorrect.** You must identify it, suggest a likely scientific or procedural cause, and then exclude it from your mean — not simply delete it.

WHEN TO USE THIS:

Use this whenever data is provided and you are asked to 'comment on the results', 'evaluate the data', or 'suggest why one result is different'. This applies across Biology, Chemistry and Physics.

THINKING STEPS:

- Does every result follow the same trend, or does one stand out?
- What could have caused this anomalous result? (human error? equipment fault? contamination?)
- Should this result be included in the mean or line of best fit?

WRITING STEPS:

- Identify the anomaly: 'The result at [X] does not fit the trend because…'
- Suggest a cause: 'This may have been caused by…'
- State your decision: 'This result was excluded from the mean / line of best fit.'

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Identifying Anomalies in Data

GOLDEN THREAD:

We use the writing steps — identify the anomaly, suggest a cause, state the decision — to answer data evaluation questions in any science topic.

Question: A student measures the volume of gas produced when different masses of marble chips react with hydrochloric acid. Results: 1g=12cm³; 2g=24cm³; 3g=35cm³; 4g=8cm³; 5g=60cm³. Identify the anomaly, suggest a cause, and explain what the student should do with it. (3 marks)

EXAMPLE

The result at 4 g of marble chips (8 cm³) does not fit the trend. As the mass of marble chips increases, the volume of gas produced generally increases, so 8 cm³ is far lower than expected. This anomaly may have been caused by a faulty gas syringe or a leak in the apparatus at that point in the experiment. This result should be excluded when drawing the line of best fit and when calculating any mean rate, as it would distort the conclusion.

WHAT IS GOOD ABOUT THIS?

✓Anomaly clearly identified with the specific data value stated.

✓Plausible scientific or procedural cause suggested.

✓Clear statement that it should be excluded and why.

NON-EXAMPLE

The 4 g result is wrong so I crossed it out. The rest of the results go up.

WHAT IS WRONG WITH THIS?

✗"Crossed it out" is not scientific — no cause or decision given.

✗No specific data value quoted to identify the anomaly precisely.

✗No suggestion of what caused the anomaly (equipment, error, etc.).

KEY TAKEAWAY:

Never just delete an anomaly. Identify it by value, explain a cause, and state whether you included or excluded it. Each of these earns a separate mark.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Answer all questions from memory. Do not look back until finished, then check and correct in a different colour.

DATA:

A student neutralises sodium hydroxide with sulfuric acid and records the temperature change at each addition of acid.

Volume of acid added (cm³)	0	5	10	15	20
Temperature (°C)	18	22	29	19	21

YOUR ANSWERS:

1. Describe the overall trend in the data. ***(2 marks)***

2. Identify the anomalous result. Suggest a cause and state what should be done with it. ***(3 marks)***

NOTES PAGE

KO12: Analysing & Evaluating — Identifying Anomalies in Data

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

YEAR 8 BIOLOGY STEP 9 RED POST

POST LEARNING BOX

Y7 Retrieval: Body Systems and Cells

GOLDEN THREAD:

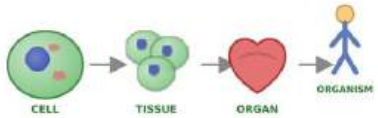
In Year 7 you studied cells (organelles and their functions), the major body systems and how they are organised. This Red Post retrieves that knowledge — the wider the gap since you last used it, the stronger the memory becomes when you recall it now.

KEY IDEA:

Y7 Core Knowledge — Cells and Body Systems:

- **Cell organelles:** nucleus (controls cell / contains DNA), cytoplasm (chemical reactions), cell membrane (controls entry/exit), mitochondria (releases energy by aerobic respiration), ribosomes (make proteins). Plant cells also: cell wall, chloroplasts, vacuole.
- **Specialised cells:** red blood cells (no nucleus, biconcave, carry O_2), sperm cells (tail, acrosome, mitochondria), nerve cells (long, carry electrical signals).
- **Organisation:** cells → tissues → organs → organ systems → organism.
- **Key systems:** circulatory (heart pumps blood through vessels), digestive (breaks down food), respiratory (gas exchange in lungs), skeletal (support and movement).

FROM CELL TO ORGANISM



IMPORTANT MISCONCEPTION:

Students often say the *nucleus* produces energy. **This is incorrect.** Energy is released by respiration in the *mitochondria*. The nucleus controls the cell by containing DNA. Nucleus = control centre; mitochondria = power station.

WHEN TO USE THIS:

Use this when naming organelles and their functions, describing levels of organisation, or explaining how specialised cells are adapted for their function.

THINKING STEPS:

- Which organelle is responsible? Don't confuse nucleus (control) and mitochondria (energy).
- Correct order: cell → tissue → organ → system → organism.
- Adaptation question: name structural feature → explain WHY it helps the cell do its job.

WRITING STEPS:

- Name the organelle and state its precise function.
- For adaptation questions: name the structural feature and explain HOW it helps.
- For organisation: use all five levels in the correct order.

YEAR 8 BIOLOGY STEP 10 Post Example / Non-Example

EXAMPLE & NON-EXAMPLE

Y7 Retrieval: Body Systems and Cells — modelling a full answer

Describe three ways in which a red blood cell is adapted for carrying oxygen around the body. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

Red blood cells are highly specialised for carrying oxygen. First, they have a biconcave (dished) shape, which increases their surface area relative to volume — more oxygen can diffuse in and out quickly. Second, they have no nucleus, which frees up space for haemoglobin, the oxygen-carrying protein, maximising oxygen-carrying capacity. Third, they contain large amounts of haemoglobin, an iron-containing protein that binds reversibly to oxygen in the lungs and releases it in the tissues where it is needed. Together these three adaptations make red blood cells highly efficient at collecting, transporting and delivering oxygen.

WHY IS THIS GOOD?

- Three distinct adaptations: biconcave shape, no nucleus, haemoglobin.
- Each adaptation linked to its function/benefit.
- Precise language: 'surface area', 'diffuse', 'haemoglobin', 'reversibly'.

✗ NON-EXAMPLE (WEAK ANSWER)

Red blood cells are flat and round so they can carry oxygen. They have no nucleus so they can carry more. They have haemoglobin.

WHY IS THIS WEAK?

- 'Flat and round' is vague — must say 'biconcave' and explain the surface area increase.
- 'Carry more' — must specify more haemoglobin and therefore more oxygen.
- Haemoglobin mentioned but not explained — must say it binds reversibly to oxygen.

KEY TAKEAWAY:

Adaptation answers need: structural feature + precise explanation of how it helps function. Always link structure to benefit.

POST TASK

Y7 Retrieval: Body Systems and Cells — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

Describe three ways in which a red blood cell is adapted for carrying oxygen around the body. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** Name the first adaptation — the shape. Use 'biconcave' and explain what it does to surface area and why this matters for oxygen diffusion.
2. **(2 marks)** Name the second adaptation — no nucleus. Explain what this removes and what it makes space for, and why this increases oxygen-carrying capacity.
3. **(2 marks)** Describe haemoglobin — what it is, what it does, and use 'reversibly'.

CHALLENGE TASK

Y7 Retrieval: Body Systems and Cells — stretch your thinking further

★ ★ ★

Compare the structure and function of a red blood cell, a nerve cell and a root hair cell. For each cell, name two structural adaptations and explain how each adaptation helps the cell carry out its specific function.

Hint: What does each cell need to do? Red blood cells carry O_2; nerve cells transmit signals; root hair cells absorb water and minerals. How does the structure match the function in each case?

FEEDFORWARD BOX

Reflect. Improve. Develop.

PREP SECTION — KO12: Identifying Anomalies

If you wrote …	Improve it by …
Said 'the result is wrong'	Don't dismiss it — suggest a possible cause: 'this result may be anomalous due to measurement error'.
Did not circle/identify the anomaly	On graph questions: circle the anomalous point and justify why it doesn't fit the trend.
Ignored anomaly in mean calculation	Exclude anomalies when calculating the mean and state clearly that you have done so.

POST SECTION — Y7 Retrieval: Body Systems and Cells

If you wrote …	Improve it by …
Mixed up nucleus and mitochondria	Nucleus = control centre (DNA); mitochondria = energy (aerobic respiration). These are different organelles.
Said 'flat' instead of 'biconcave'	'Biconcave' is the precise scientific term — it tells the examiner you know the exact shape and its effect on SA.
Named adaptation without explaining it	Always link structure to function: biconcave → increased SA → faster oxygen diffusion.
Got organisation order wrong	Order is FIXED: cell → tissue → organ → organ system → organism. Learn this chain.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Anomalies in Data — Prep

WHAT DO I KNOW?

What is an anomalous result?

How do you identify an anomaly on a graph?

HOW DO I USE IT?

Should you include an anomaly when calculating a mean? What should you do instead?

How do you show an anomaly on a line graph?

WHEN DO I USE IT?

In which part of a practical write-up do you discuss anomalies?

What does an anomaly suggest about the reliability of your results?

MISTAKES TO AVOID

What is wrong with saying 'this result is wrong'?

Why should you never just ignore an anomaly without commenting on it?

Y7: Body Systems and Cells — Post

RECALL

Name five organelles and their functions.

What is the correct order of the five levels of organisation?

EXPLAIN

How is the red blood cell adapted for carrying oxygen? Give three adaptations with explanations.

Why does a sperm cell have many mitochondria?

APPLY

Name an organ in the circulatory system. What tissue is it made of? What cells make up that tissue?

Which organelle carries out photosynthesis? In which types of cell is it found?

MISTAKES TO AVOID

Why is it wrong to say the nucleus releases energy?

What is wrong with saying a red blood cell is 'flat' rather than 'biconcave'?

YEAR 8 BIOLOGY · AUTUMN TERM

Autumn 1 → Autumn 2

HW 3

Set: **19 Oct 26** Due: **09 Nov 26**

Set over Half Term — due first lesson back

GREEN POST

B8: Nutrients and Food Tests (8.4.1–8.4.2)

PREP

KO12: Drawing Conclusions

PREP LEARNING BOX

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

GOLDEN THREAD:

You have identified trends and spotted anomalies. The final step is writing a full conclusion: describing the trend, quoting data, explaining the science, and linking back to your original prediction. This completes the scientific method.

KEY IDEA:

A **conclusion** answers the original question by summarising what the data shows.

- State whether the data **supports** or **does not support** the prediction.
- Quote at least two **specific data values** as evidence.
- Explain the trend using **scientific knowledge**.
- Comment on any **anomalies** and whether they affected the conclusion.

FOOD TEST RESULTS

IMPORTANT MISCONCEPTION:

Students often say 'my prediction was right' without quoting any data to justify it. **This is incorrect** — you must cite specific values from your results as evidence. Simply agreeing with a prediction without data is not a scientific conclusion.

WHEN TO USE THIS:

Use this in every investigation write-up and in any question asking you to 'write a conclusion', 'evaluate your prediction', or 'summarise what your results show'. Works in Biology, Chemistry and Physics.

THINKING STEPS:

- What did I predict? Do the results support it?
- What is the trend — and are there any anomalies to mention?
- What specific values can I quote as evidence?

WRITING STEPS:

- State whether your prediction was supported, with a reason.
- Describe the trend, quoting at least two data values.
- Explain the science behind the trend.

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

GOLDEN THREAD:

We use the writing steps — link to prediction, state the trend with data, explain the science — to write conclusions that gain full marks.

Question: A student predicted: "Increasing resistance in a circuit will decrease the current." Results: 10Ω=0.6A; 20Ω=0.3A; 30Ω=0.2A; 40Ω=0.15A. Write a conclusion referencing the prediction and the data. (4 marks)

EXAMPLE

My prediction was correct — as resistance increased, the current decreased. This is supported by the data: when the resistance was 10Ω the current was 0.6A, but when the resistance increased to 40Ω the current fell to 0.15A. This is because, according to Ohm's law, current is inversely proportional to resistance when voltage is constant — a higher resistance opposes the flow of charge more, reducing the current. There were no anomalies in this data set.

WHAT IS GOOD ABOUT THIS?

✓Directly states whether prediction was supported.

✓Quotes two specific data values as evidence.

✓Scientific explanation using Ohm's law and charge flow.

NON-EXAMPLE

My prediction was right. The current went down when I added more resistance. This is what I expected to happen.

WHAT IS WRONG WITH THIS?

✗No data values quoted — "went down" is too vague.

✗No scientific explanation — why does current decrease?

✗"This is what I expected" adds nothing; the prediction must be justified with evidence.

KEY TAKEAWAY:

A conclusion must do four things: reference the prediction, state the trend, quote data, and explain the science. Any one missing loses marks.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Complete both questions from memory. Do not look back until finished, then check and correct in a different colour.

DATA:

A student predicts: "*Increasing the number of cells in a circuit will increase the brightness of the bulb.*" They measure the potential difference (voltage) across the bulb for each number of cells.

Number of cells	1	2	3	4
Voltage across bulb (V)	1.5	3.0	4.5	6.0

YOUR ANSWERS:

1. Write a full conclusion for this investigation, referencing the prediction and quoting at least two data values. *(4 marks)*

2. Suggest a scientific explanation for the relationship between the number of cells and the voltage. *(2 marks)*

NOTES PAGE

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

YEAR 8 BIOLOGY STEP 9 GREEN POST

POST LEARNING BOX

B8: Nutrients and Food Tests — 8.4.1 & 8.4.2

GOLDEN THREAD:

You have studied how gas exchange supplies cells with oxygen. Now in B8 we look at the other essential requirement of cells — nutrients. Food provides the energy and raw materials cells need. This lesson covers what the key nutrients are and how to test for them in the laboratory.

KEY IDEA:

Essential nutrients and their roles:

- **Carbohydrates:** main energy source (glucose used in respiration; starch = stored form in plants).
- **Proteins:** growth and repair of tissues; enzymes are proteins.
- **Lipids (fats/oils):** energy store; insulation; cell membrane structure.
- **Vitamins and minerals:** small amounts needed — e.g. iron (haemoglobin), calcium (bones), vitamin C (immune system).
- **Fibre:** aids peristalsis (movement of food through gut).
- **Water:** solvent for reactions; temperature regulation; transport.

FOOD TEST RESULTS

IMPORTANT MISCONCEPTION:

Students often say Benedict's test turns red if *any* sugar is present. **This is incorrect.** Benedict's only detects *reducing sugars* (e.g. glucose, fructose). Sucrose (table sugar) is a non-reducing sugar and gives a *negative* result — the reagent stays blue.

WHEN TO USE THIS:

Use this when identifying which reagent tests for which nutrient, predicting food test results, explaining the role of nutrients, or planning a food testing investigation.

THINKING STEPS:

- Which nutrient is being tested? Match it to the correct reagent and positive result colour.
- Is this a reducing sugar or starch? Don't confuse Benedict's (glucose → brick red) and iodine (starch → blue-black).

WRITING STEPS:

- State the reagent name, the positive colour change, and the nutrient it detects — all three are needed.
- Always state both starting colour AND positive result colour (e.g. 'yellow-brown to blue-black').
- For Benedict's: specify 'reducing sugar', not just 'sugar'.

YEAR 8 BIOLOGY STEP 10 Post Example / Non-Example

EXAMPLE & NON-EXAMPLE

B8: Nutrients and Food Tests — 8.4.1 & 8.4.2 — modelling a full answer

A student tests a food sample with iodine solution and Benedict's reagent. Describe the expected results if the food contains starch but no glucose. Explain why Benedict's reagent must be heated. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

Adding iodine solution to the food sample containing starch would cause a colour change from yellow-brown to blue-black — a positive result for starch. For the Benedict's test, since the food contains no glucose (no reducing sugar), the Benedict's reagent would remain blue — a negative result. Benedict's reagent must be heated (to approximately 80°C in a water bath) because the chemical reaction between glucose and Benedict's reagent only occurs at high temperatures — the heat provides the activation energy needed for the reaction that produces the brick-red precipitate. Without heating, the reagent remains blue even if glucose were present, giving a false negative result.

WHY IS THIS GOOD?

- Iodine: yellow-brown → blue-black (positive for starch — BOTH colours stated).
- Benedict's: remains blue (negative — no reducing sugar present).
- Heating explained: provides activation energy for the reaction to occur.

✗ NON-EXAMPLE (WEAK ANSWER)

Iodine goes blue-black because there is starch. Benedict's stays blue because there is no sugar. Benedict's needs heat to work.

WHY IS THIS WEAK?

- Iodine correct but starting colour not stated — must say 'yellow-brown to blue-black'.
- 'No sugar' is vague — must say 'no reducing sugar / no glucose' specifically.
- 'Needs heat to work' — must explain WHY: provides activation energy for the reaction.

KEY TAKEAWAY:

Food tests: always state BOTH starting colour AND positive result colour. Benedict's detects reducing sugars only. Always explain WHY heating is needed (activation energy).

POST TASK

B8: Nutrients and Food Tests — 8.4.1 & 8.4.2 — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

A student tests a food sample with iodine solution and Benedict's reagent. Describe the expected results if the food contains starch but no glucose. Explain why Benedict's reagent must be heated. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** Describe the iodine test result for starch — state the starting colour AND the positive result colour.
2. **(2 marks)** Describe the Benedict's test result — state the starting colour and result when NO glucose is present. Use 'reducing sugar'.
3. **(2 marks)** Explain why the Benedict's test must be heated. What does the heat provide? What would happen without heating?

CHALLENGE TASK

B8: Nutrients and Food Tests — 8.4.1 & 8.4.2 — stretch your thinking further

★★★

A student has four unknown food solutions labelled A–D. She has access to iodine, Benedict's reagent, biuret reagent and the ethanol test.

Design a step-by-step procedure to identify which nutrients each food solution contains. State the positive result for each test and explain why you would run them in the order you choose.

Hint: How do you avoid contamination between tests? What is the safe way to heat Benedict's? Why might you test for starch and protein before lipid?

FEEDFORWARD BOX

Reflect. Improve. Develop.

PREP SECTION — KO12: Drawing Conclusions

If you wrote …	Improve it by …
Described data but drew no conclusion	A conclusion must state WHAT the data shows AND WHY — 'this shows that X causes Y because…'.
Ignored the prediction	Always state whether the data supports or contradicts the prediction and refer to specific evidence.
Wrote 'the experiment worked'	This is not a conclusion — state what relationship between variables the data shows.

POST SECTION — B8: Nutrients and Food Tests (8.4.1–8.4.2)

If you wrote …	Improve it by …
Confused iodine and Benedict's	Iodine = starch (blue-black). Benedict's = glucose/reducing sugar (brick red). Learn these as a pair.
Forgot the starting colour	Always state starting colour AND positive result — not just the final colour.
Said 'no sugar' instead of 'no reducing sugar'	Sucrose is a sugar but NOT detected by Benedict's — always say 'reducing sugar' or 'glucose'.
Said heating 'makes it work'	Explain WHY: heating provides the activation energy needed for the chemical reaction to occur.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Drawing Conclusions — Prep

WHAT DO I KNOW?

What is the difference between 'describing data' and 'drawing a conclusion'?

What must a full conclusion always reference?

HOW DO I USE IT?

What phrase can you use to link data to a conclusion?

How do you state whether results support or contradict a prediction?

WHEN DO I USE IT?

In which section of a write-up do you draw a conclusion?

When must you draw more than one conclusion?

MISTAKES TO AVOID

What is wrong with writing 'the experiment worked' as a conclusion?

What is wrong with 'the data shows a trend' without specifying the trend?

B8: Nutrients and Food Tests (8.4.1–8.4.2) — Post

RECALL

Name the four food tests and state the positive result colour for each.

What is the starting colour for iodine? For Benedict's?

EXPLAIN

Explain why Benedict's reagent must be heated. What does heating provide?

Why does sucrose give a negative result with Benedict's?

APPLY

A food tests positive for starch with iodine but negative with Benedict's. What does this tell you?

Design a test to show whether milk contains protein and lipid.

MISTAKES TO AVOID

Why is it wrong to say Benedict's tests for 'any sugar'?

What information is missing if you only say 'the iodine turned dark'?

CONTENTS — YEAR 8 CHEMISTRY

Autumn Term 2026-27

HW	Dates	POST — Retrieval topic	PREP — Skills content
Autumn 1 · 21 Sep – 23 Oct 2026			
1	21 Sep 26 → 05 Oct 26	GREEN C5: Elements, Atoms and Compounds (5.3.1–5.3.3)	KO12: Identifying Trends
2	05 Oct 26 → 19 Oct 26	RED Y7 Retrieval: Elements, Atoms and Compounds	KO12: Identifying Anomalies
Autumn 1 → Autumn 2 (Half Term)			
3	19 Oct 26 → 09 Nov 26 ★ Half Term	GREEN C5: Chemical Formulae and Polymers (5.3.4–5.3.5)	KO12: Drawing Conclusions
Autumn 2 · 03 Nov – 19 Dec 2026			
4	09 Nov 26 → 23 Nov 26	RED C5 Retrieval: Elements, Atoms and Compounds (~7 weeks)	KO13: Scientific Vocabulary
5	23 Nov 26 → 07 Dec 26	GREEN C5: Periodic Table and Groups 1, 7 and 0 (5.4.1–5.4.4)	KO13: Cause and Effect
Christmas Holiday Homework (due 14 Jan 27)			
6	07 Dec 26 → 14 Jan 27 ★★ Christmas — due 14 Jan	GREEN C5 Assessment Consolidation	KO13: Evaluating Explanations

Each homework contains: Steps 6–8.5 (Prep) | Steps 9–11 (Post + Answer) | Step 12 (Challenge ★★★) | Step 14 (Feedforward) | Step 15 (Self-Quizzing)

YEAR 8 CHEMISTRY · AUTUMN TERM

Autumn 1 · 21 Sep – 23 Oct 2026

HW 1

Set: **21 Sep 26** Due: **05 Oct 26**

GREEN POST

C5: Elements, Atoms and Compounds (5.3.1–5.3.3)

PREP

KO12: Identifying Trends

YEAR 8 SCIENCE STEP 6 — PREP · Scientific Skills

PREP LEARNING BOX

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

GOLDEN THREAD:

In Year 7 you collected data and drew graphs. Now in Year 8 we go further — identifying the pattern in results, describing it precisely, and writing a conclusion that directly answers the question. This skill runs through every investigation you will do this year and at GCSE.

KEY IDEA:

A trend is the overall pattern in data — it tells you how one variable changes as another changes.

- **Positive trend:** as X increases, Y increases.
- **Negative trend:** as X increases, Y decreases.
- **No trend:** Y stays roughly the same.
- A **conclusion** names the trend, quotes data values, and links to science.

ELEMENTS, COMPOUNDS & MIXTURES

IMPORTANT MISCONCEPTION:

Students often write *"the results show that as temperature goes up, the rate goes up."* **This is incomplete —** it ignores the drop above 37°C. A strong conclusion must describe the *full* trend, refer to specific data values, and link to the science.

WHEN TO USE THIS:

Use this whenever you are asked to "describe the trend", "analyse the results", "draw a conclusion" or "what does the data show?" — in any science topic, including B1 Health & Lifestyle this week.

THINKING STEPS:

- What happens to the dependent variable as the independent variable increases?
- Does the trend stay the same throughout, or does it change direction?
- What specific values support the trend you have described?

WRITING STEPS:

- State the overall trend: "As ... increases/decreases, ... increases/decreases."
- Quote specific data values to support the trend (e.g. "from X to Y").
- Explain *why* the trend occurs using scientific knowledge.

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

GOLDEN THREAD:

We use the writing steps — state the trend, quote data values, explain using science — to answer data analysis questions. These same steps work in Biology, Chemistry and Physics.

Question: A student investigates how the mass of sugar in a drink affects the energy released when burned. Results: 5 g = 12 kJ; 10 g = 23 kJ; 15 g = 35 kJ; 20 g = 46 kJ. Describe the trend and write a conclusion. (3 marks)

EXAMPLE

As the mass of sugar increases from 5 g to 20 g, the energy released increases from 12 kJ to 46 kJ. This is a positive trend — for every additional 5 g of sugar, the energy increases by approximately 11–12 kJ. This supports the conclusion that sugar contains stored chemical energy, and the more sugar that burns, the more energy is transferred to the surroundings.

WHAT IS GOOD ABOUT THIS?

✓States the trend precisely using the correct sentence structure.

✓Quotes specific data values at the start and end of the range.

✓Links to scientific knowledge — chemical energy stored in sugar.

NON-EXAMPLE

The results show that more sugar gives more energy. The numbers went up each time.

WHAT IS WRONG WITH THIS?

✗No specific data values quoted — "numbers went up" is too vague.

✗No scientific explanation of *why* more sugar releases more energy.

✗Does not use the correct sentence structure: "as X increases, Y increases."

KEY TAKEAWAY:

Always name the independent and dependent variables, quote at least two data values, and explain *why* using science. Vague phrases like "it went up" will never gain full marks.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Complete all three questions from memory using the writing steps. Do not look back until you have finished, then check and correct in a different colour.

DATA:

A student investigates how the concentration of a salt solution affects the time taken for a potato strip to lose mass through osmosis. Their results are shown below.

Salt concentration (%)	0	0.5	1.0	1.5	2.0
Mass change (g)	+0.4	+0.1	0.0	−0.3	−0.6

YOUR ANSWERS:

1. Describe the trend shown in the results. Use the sentence structure from your Learning Box. ***(2 marks)***

2. Write a conclusion for this investigation. Include specific data values and a scientific explanation. ***(3 marks)***

3. At what concentration does the potato strip neither gain nor lose mass? What does this tell you about the concentration of the potato cells? ***(1 mark)***

NOTES PAGE

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

YEAR 8 CHEMISTRY STEP 9 GREEN POST

POST LEARNING BOX

C5: Elements, Atoms and Compounds — 5.3.1, 5.3.2 & 5.3.3

GOLDEN THREAD:

In Year 7 you were introduced to elements and the periodic table. Now in C5 we build on this by studying the structure of atoms in detail and how atoms of different elements combine to form compounds — the chemical building blocks of everything around us.

KEY IDEA:

- **Element:** a pure substance made of only one type of atom. Cannot be broken down by chemical reactions. ~118 elements exist, each with a unique symbol.
- **Atom:** smallest particle of an element. Contains a nucleus (protons + neutrons) with electrons in shells around it. Atomic number = number of protons. Mass number = protons + neutrons.
- **Compound:** formed when two or more different elements are chemically combined. Has entirely different properties from the elements it contains. E.g. H_2O: hydrogen (flammable) + oxygen (supports combustion) → water (extinguishes fire).
- **Mixture:** two or more substances mixed but NOT chemically combined. Can be separated by physical methods. Components retain their own properties.

ELEMENTS, COMPOUNDS & MIXTURES

IMPORTANT MISCONCEPTION:

Students often confuse compounds and mixtures. **A compound is NOT the same as a mixture.** In a compound, elements are chemically bonded — the result has entirely different properties and can only be separated by chemical reaction. In a mixture, substances are simply combined physically — properties are retained and separation is physical.

WHEN TO USE THIS:

Use this when identifying elements, compounds and mixtures; explaining why a compound differs from its elements; or explaining chemical vs physical changes.

THINKING STEPS:

- Is this one type of atom (element), chemically bonded different atoms (compound), or physically mixed (mixture)?
- Can it be separated by physical methods? Yes → mixture. No → compound or element.

WRITING STEPS:

- State element/compound/mixture and give a reason using the definition.
- For compounds: explain that properties differ because elements are chemically combined.
- For mixtures: state that components retain their own properties and can be separated physically.

YEAR 8 CHEMISTRY STEP 10 Post Example / Non-Example

EXAMPLE & NON-EXAMPLE

C5: Elements, Atoms and Compounds — 5.3.1, 5.3.2 & 5.3.3 — modelling a full answer

Explain the difference between a compound and a mixture. Use iron and sulfur as an example. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

Iron and sulfur can exist as either a mixture or can react to form the compound iron sulfide. In the iron-sulfur mixture, the iron and sulfur are not chemically bonded — they are simply mixed together. Each component retains its own properties: iron is magnetic and grey; sulfur is yellow and non-magnetic. The mixture can be separated using a magnet to attract the iron particles away from the sulfur. Iron sulfide is a compound — the iron and sulfur atoms are chemically bonded through a chemical reaction. The resulting compound has entirely different properties from either iron or sulfur: it is not magnetic, it is dark grey/black, and it cannot be separated by physical methods such as a magnet. A chemical reaction would be needed to break it down back into iron and sulfur.

WHY IS THIS GOOD?

- Mixture: not bonded, each retains own properties (iron=magnetic, sulfur=yellow), separated physically (magnet).
- Compound: chemically bonded, new/different properties, not separable physically.
- Iron and sulfur example used correctly for both mixture and compound.

✗ NON-EXAMPLE (WEAK ANSWER)

A compound has elements joined together, a mixture has elements mixed. Iron sulfide is a compound because iron and sulfur are joined.

WHY IS THIS WEAK?

- 'Joined' is vague — must say 'chemically bonded'.
- No mention of properties: compound has DIFFERENT properties from its elements.
- Mixture not explained — must say components retain own properties and can be physically separated.

KEY TAKEAWAY:

Compound vs mixture: compounds have chemical bonds → different properties → only separated chemically. Mixtures have no bonds → retain individual properties → CAN be physically separated.

POST TASK

C5: Elements, Atoms and Compounds — 5.3.1, 5.3.2 & 5.3.3 — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

Explain the difference between a compound and a mixture. Use iron and sulfur as an example. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** Describe the iron-sulfur MIXTURE — how are the components combined, do they retain their properties, and how could you separate them?
2. **(2 marks)** Describe iron sulfide as a COMPOUND — state the type of bonding and whether the new compound has the same or different properties.
3. **(2 marks)** Explain one specific difference in properties between iron sulfide and the mixture. Why can the compound not be physically separated?

CHALLENGE TASK

C5: Elements, Atoms and Compounds — 5.3.1, 5.3.2 & 5.3.3 — stretch your thinking further

★★★

A student heats iron and sulfur together and gets a dark solid. They claim the iron and sulfur have simply mixed together.

Design an experiment to determine whether the product is a mixture or compound. Describe at least two tests, state the expected result for a mixture and for a compound, and explain what the results would tell you about bonding.

Hint: What properties differ between iron+sulfur mixture and iron sulfide compound? Try a magnet test or acid test. What result would confirm chemical bonding has occurred?

FEEDFORWARD BOX

Reflect. Improve. Develop.

PREP SECTION — KO12: Identifying Trends

If you wrote …	Improve it by …
Named the trend but not explained it	Add: 'this means as X increases, Y increases at a constant rate'.
Ignored the scale of change	State specific values: 'as temperature doubles from 20°C to 40°C, rate increases from 5 to 10 units — a two-fold increase'.
Conclusion too vague	State exactly what relationship the data shows and whether it supports the prediction.

POST SECTION — C5: Elements, Atoms and Compounds (5.3.1–5.3.3)

If you wrote …	Improve it by …
Confused molecule and compound	A molecule is any 2+ atoms bonded together (O_2 is a molecule of an element). A compound has 2+ DIFFERENT elements bonded.
Said mixtures have chemical bonds	Mixtures have NO chemical bonds between components — only compounds do.
Could not explain why compound properties differ	Properties differ because chemical bonding creates new arrangements of electrons — the substance is fundamentally new.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Identifying Trends — Prep

WHAT DO I KNOW?

What does a positive correlation mean? What does a negative correlation mean?

What is the difference between directly proportional and a positive correlation?

HOW DO I USE IT?

What specific values should you refer to when describing a trend?

How do you describe the rate of change in a data set?

WHEN DO I USE IT?

When should you describe a trend rather than calculate a gradient?

What graph features tell you the relationship between two variables?

MISTAKES TO AVOID

What is wrong with saying 'the results show a pattern' as a conclusion?

Why must you always refer to specific data values when describing a trend?

C5: Elements, Atoms and Compounds — Post

RECALL

Define: element, compound, mixture. Give one example of each.

What is the difference between a molecule and a compound?

EXPLAIN

Explain why iron sulfide has different properties from a mixture of iron and sulfur.

Why can a mixture be separated physically but a compound cannot?

APPLY

Is seawater an element, compound or mixture? Justify your answer.

Is CO_2 an element or a compound? How many atoms does one molecule contain?

MISTAKES TO AVOID

What is wrong with saying a mixture has 'chemical bonds' between its components?

What does 'chemically bonded' mean — how is this different from 'mixed together'?

YEAR 8 CHEMISTRY · AUTUMN TERM

Autumn 1 · 21 Sep – 23 Oct 2026

HW 2

Set: **05 Oct 26** Due: **19 Oct 26**

RED POST

Y7 Retrieval: Elements, Atoms and Compounds

PREP

KO12: Identifying Anomalies

YEAR 8 SCIENCE STEP 6 — PREP · Scientific Skills

PREP LEARNING BOX

KO12: Analysing & Evaluating — Identifying Anomalies in Data

GOLDEN THREAD:

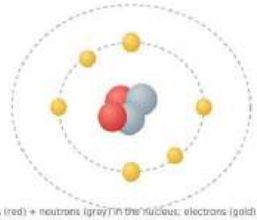
Last week you described trends in data. Now we go further — spotting results that don't fit the pattern (anomalies), explaining why they occur, and deciding whether to include them in your conclusion.

KEY IDEA:

An anomaly (also called an outlier) is a result that does not fit the overall trend in the data.

- Anomalies are often caused by human error, faulty equipment or a one-off variable.
- You should **identify** the anomaly, **suggest a cause**, and **exclude it** when calculating a mean or drawing a line of best fit.
- Never ignore an anomaly — always comment on it.

INSIDE AN ATOM



protons (red) + neutrons (grey) in the nucleus; electrons (gold) in shells

IMPORTANT MISCONCEPTION:

Students often cross out an anomaly and say 'I ignored it because it was wrong.' **This is incorrect.** You must identify it, suggest a likely scientific or procedural cause, and then exclude it from your mean — not simply delete it.

WHEN TO USE THIS:

Use this whenever data is provided and you are asked to 'comment on the results', 'evaluate the data', or 'suggest why one result is different'. This applies across Biology, Chemistry and Physics.

THINKING STEPS:

- Does every result follow the same trend, or does one stand out?
- What could have caused this anomalous result? (human error? equipment fault? contamination?)
- Should this result be included in the mean or line of best fit?

WRITING STEPS:

- Identify the anomaly: 'The result at [X] does not fit the trend because…'
- Suggest a cause: 'This may have been caused by…'
- State your decision: 'This result was excluded from the mean / line of best fit.'

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Identifying Anomalies in Data

GOLDEN THREAD:

We use the writing steps — identify the anomaly, suggest a cause, state the decision — to answer data evaluation questions in any science topic.

Question: A student measures the volume of gas produced when different masses of marble chips react with hydrochloric acid. Results: 1g=12cm³; 2g=24cm³; 3g=35cm³; 4g=8cm³; 5g=60cm³. Identify the anomaly, suggest a cause, and explain what the student should do with it. (3 marks)

EXAMPLE

The result at 4 g of marble chips (8 cm³) does not fit the trend. As the mass of marble chips increases, the volume of gas produced generally increases, so 8 cm³ is far lower than expected. This anomaly may have been caused by a faulty gas syringe or a leak in the apparatus at that point in the experiment. This result should be excluded when drawing the line of best fit and when calculating any mean rate, as it would distort the conclusion.

WHAT IS GOOD ABOUT THIS?

✓Anomaly clearly identified with the specific data value stated.

✓Plausible scientific or procedural cause suggested.

✓Clear statement that it should be excluded and why.

NON-EXAMPLE

The 4 g result is wrong so I crossed it out. The rest of the results go up.

WHAT IS WRONG WITH THIS?

✗"Crossed it out" is not scientific — no cause or decision given.

✗No specific data value quoted to identify the anomaly precisely.

✗No suggestion of what caused the anomaly (equipment, error, etc.).

KEY TAKEAWAY:

Never just delete an anomaly. Identify it by value, explain a cause, and state whether you included or excluded it. Each of these earns a separate mark.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Answer all questions from memory. Do not look back until finished, then check and correct in a different colour.

DATA:

A student neutralises sodium hydroxide with sulfuric acid and records the temperature change at each addition of acid.

Volume of acid added (cm³)	0	5	10	15	20
Temperature (°C)	18	22	29	19	21

YOUR ANSWERS:

1. Describe the overall trend in the data. ***(2 marks)***

2. Identify the anomalous result. Suggest a cause and state what should be done with it. ***(3 marks)***

NOTES PAGE

KO12: Analysing & Evaluating — Identifying Anomalies in Data

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

YEAR 8 CHEMISTRY STEP 9 ■ RED POST

POST LEARNING BOX

Y7 Retrieval: Elements, Atoms and Compounds

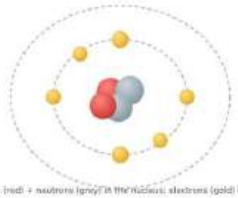
GOLDEN THREAD:

In Year 7 you were introduced to elements, atoms, compounds and the periodic table. This Red Post retrieves that knowledge — recalling it now, after a gap, converts short-term revision into lasting long-term memory.

KEY IDEA:

- **Elements:** pure substances made of one type of atom. Represented by symbols (H, O, Fe, Na). Arranged in periodic table by atomic number.
- **Periodic table:** groups (vertical columns) contain elements with similar chemical properties — same number of outer electrons. Periods (horizontal rows) show increasing atomic number and a new electron shell beginning.
- **Atoms:** nucleus (protons + neutrons) + electrons in shells. Proton = +1, mass 1. Neutron = 0, mass 1. Electron = −1, negligible mass. Neutral atom: protons = electrons.
- **Compounds:** two or more elements chemically bonded. Formula shows atom ratio (H_2O, CO_2, NaCl). Properties are entirely different from the component elements.
- **Chemical vs physical changes:** chemical = new substance formed; physical = no new substance, usually reversible.

INSIDE AN ATOM



protons (red) + neutrons (grey) in the nucleus; electrons (gold) in shells

IMPORTANT MISCONCEPTION:

Students often say protons are positive because they are bigger or stronger than electrons. **This is not a scientific explanation.** Protons carry +1 charge and electrons carry −1 charge as a fundamental property. An atom has equal numbers of protons and electrons, so it is electrically neutral overall.

WHEN TO USE THIS:

Use this when answering questions about atomic structure, the periodic table, chemical symbols, or the difference between chemical and physical changes.

THINKING STEPS:

- Atomic number = protons. Mass number = protons + neutrons. Neutrons = mass − atomic number.
- Is this element in a group (vertical, similar properties) or period (horizontal, increasing atomic number)?

WRITING STEPS:

- For atomic structure: state proton number (= atomic number), neutron number (= mass − atomic number), electron number (= protons for neutral atom).
- For periodic table: groups = similar properties; periods = increasing atomic number.

YEAR 8 CHEMISTRY STEP 10 Post Example / Non-Example

EXAMPLE & NON-EXAMPLE

Y7 Retrieval: Elements, Atoms and Compounds — modelling a full answer

Describe the structure of an atom. Explain why atoms are electrically neutral. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

An atom consists of a central nucleus surrounded by electrons in shells (energy levels). The nucleus contains protons, which have a relative charge of +1 and relative mass of 1, and neutrons, which have no charge and relative mass of 1. The nucleus is very small compared to the overall atom but contains almost all of its mass. Electrons orbit the nucleus in shells and have a relative charge of −1 and negligible mass (approximately 1/1840 of a proton). Atoms are electrically neutral because the number of protons (positive charges) in the nucleus equals the number of electrons (negative charges) orbiting it. These equal and opposite charges cancel out, giving an overall charge of zero.

WHY IS THIS GOOD?

- Nucleus: protons (+1, mass 1) and neutrons (0, mass 1).
- Electrons: −1 charge, negligible mass, in shells around nucleus.
- Neutrality: equal numbers of protons and electrons → charges cancel.

✗ NON-EXAMPLE (WEAK ANSWER)

An atom has a nucleus with protons and neutrons. Electrons are around the outside. Neutral because charges balance.

WHY IS THIS WEAK?

- 'Charges balance' is vague — must say equal numbers of protons (+1) and electrons (−1) cancel each other.
- Relative charges not stated (+1 proton, −1 electron, 0 neutron).
- Relative masses not stated — proton and neutron = 1; electron = negligible.

KEY TAKEAWAY:

Atomic structure: proton (+1, mass 1) + neutron (0, mass 1) in nucleus; electron (−1, negligible mass) in shells. Neutral because protons = electrons → charges cancel.

POST TASK

Y7 Retrieval: Elements, Atoms and Compounds — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

Describe the structure of an atom. Explain why atoms are electrically neutral. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** Describe the nucleus — name both particles, their relative charges, and their relative masses.
2. **(2 marks)** Describe the electrons — state their charge, mass, and where they are found relative to the nucleus.
3. **(2 marks)** Explain why atoms are electrically neutral. Use 'equal numbers of protons and electrons' in your answer.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Identifying Anomalies — Prep

WHAT DO I KNOW?

What is an anomalous result?

How do you identify an anomaly on a line graph or in a data table?

HOW DO I USE IT?

Should you include an anomaly when drawing a line of best fit?

What should you do with an anomaly when calculating a mean?

WHEN DO I USE IT?

In which part of a practical write-up do you discuss anomalies?

What does an anomaly tell you about the reliability of your experiment?

MISTAKES TO AVOID

What is wrong with saying 'I'll ignore that result because it's too high'?

Why should you suggest a reason for an anomaly rather than simply excluding it?

Y7: Elements, Atoms and Compounds — Post

RECALL

Name the three subatomic particles. State the charge and relative mass of each.

What is the correct formula: neutrons = mass number minus what?

EXPLAIN

Why are elements in the same group of the periodic table chemically similar?

What is the difference between atomic number and mass number?

APPLY

Carbon: atomic number 6, mass number 12. State protons, neutrons and electrons.

Potassium: atomic number 19, mass number 39. State protons, neutrons, electrons.

MISTAKES TO AVOID

What is the difference between a group and a period in the periodic table?

Why is it wrong to say 'the electron has mass 1'?

YEAR 8 CHEMISTRY · AUTUMN TERM

Autumn 1 → Autumn 2

HW 3

Set: **19 Oct 26** Due: **09 Nov 26**

⏸ Set over Half Term — due first lesson back

GREEN POST

C5: Chemical Formulae and Polymers (5.3.4–5.3.5)

PREP

KO12: Drawing Conclusions

PREP LEARNING BOX

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

GOLDEN THREAD:

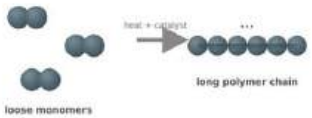
You have identified trends and spotted anomalies. The final step is writing a full conclusion: describing the trend, quoting data, explaining the science, and linking back to your original prediction. This completes the scientific method.

KEY IDEA:

A **conclusion** answers the original question by summarising what the data shows.

- State whether the data **supports** or **does not support** the prediction.
- Quote at least two **specific data values** as evidence.
- Explain the trend using **scientific knowledge**.
- Comment on any **anomalies** and whether they affected the conclusion.

MONOMERS JOINING INTO A POLYMER



IMPORTANT MISCONCEPTION:

Students often say 'my prediction was right' without quoting any data to justify it. **This is incorrect** — you must cite specific values from your results as evidence. Simply agreeing with a prediction without data is not a scientific conclusion.

WHEN TO USE THIS:

Use this in every investigation write-up and in any question asking you to 'write a conclusion', 'evaluate your prediction', or 'summarise what your results show'. Works in Biology, Chemistry and Physics.

THINKING STEPS:

- What did I predict? Do the results support it?
- What is the trend — and are there any anomalies to mention?
- What specific values can I quote as evidence?

WRITING STEPS:

- State whether your prediction was supported, with a reason.
- Describe the trend, quoting at least two data values.
- Explain the science behind the trend.

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

GOLDEN THREAD:

We use the writing steps — link to prediction, state the trend with data, explain the science — to write conclusions that gain full marks.

Question: A student predicted: "Increasing resistance in a circuit will decrease the current." Results: 10Ω=0.6A; 20Ω=0.3A; 30Ω=0.2A; 40Ω=0.15A. Write a conclusion referencing the prediction and the data. (4 marks)

EXAMPLE

My prediction was correct — as resistance increased, the current decreased. This is supported by the data: when the resistance was 10Ω the current was 0.6A, but when the resistance increased to 40Ω the current fell to 0.15A. This is because, according to Ohm's law, current is inversely proportional to resistance when voltage is constant — a higher resistance opposes the flow of charge more, reducing the current. There were no anomalies in this data set.

WHAT IS GOOD ABOUT THIS?

✓Directly states whether prediction was supported.

✓Quotes two specific data values as evidence.

✓Scientific explanation using Ohm's law and charge flow.

NON-EXAMPLE

My prediction was right. The current went down when I added more resistance. This is what I expected to happen.

WHAT IS WRONG WITH THIS?

✗No data values quoted — "went down" is too vague.

✗No scientific explanation — why does current decrease?

✗"This is what I expected" adds nothing; the prediction must be justified with evidence.

KEY TAKEAWAY:

A conclusion must do four things: reference the prediction, state the trend, quote data, and explain the science. Any one missing loses marks.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Complete both questions from memory. Do not look back until finished, then check and correct in a different colour.

DATA:

A student predicts: "*Increasing the number of cells in a circuit will increase the brightness of the bulb.*" They measure the potential difference (voltage) across the bulb for each number of cells.

Number of cells	1	2	3	4
Voltage across bulb (V)	1.5	3.0	4.5	6.0

YOUR ANSWERS:

1. Write a full conclusion for this investigation, referencing the prediction and quoting at least two data values. *(4 marks)*

2. Suggest a scientific explanation for the relationship between the number of cells and the voltage. *(2 marks)*

NOTES PAGE

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

YEAR 8 CHEMISTRY STEP 9 GREEN POST

POST LEARNING BOX

C5: Chemical Formulae and Polymers — 5.3.4 & 5.3.5

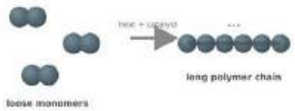
GOLDEN THREAD:

You know what elements, atoms and compounds are. Now in C5 we look at how to write chemical formulae — the shorthand for compound composition — and how small monomer molecules can join to form very long polymer chains through addition polymerisation.

KEY IDEA:

- **Chemical formulae:** show types and numbers of atoms in a compound. Subscript numbers show atoms per formula unit. E.g. H_2O = 2H + 1O; CO_2 = 1C + 2O; H_2SO_4 = 2H + 1S + 4O.
- **Polymers:** very large molecules made by joining many small monomer molecules through polymerisation.
- **Addition polymerisation:** monomers with C=C double bonds (e.g. ethene, $CH_2=CH_2$) join to form a long chain polymer. The double bond breaks open and allows monomers to link.
- **Monomer vs polymer:** monomer = small, reactive molecule (has double bond). Polymer = large, unreactive chain molecule (no double bond).
- **Uses of polymers:** poly(ethene) → plastic bags; poly(propene) → containers; nylon → clothing/ropes; PVC → water pipes.

MONOMERS JOINING INTO A POLYMER



IMPORTANT MISCONCEPTION:

Students often say the subscript number tells you how many molecules there are. **This is incorrect.** A subscript number (e.g. the 2 in H_2O) tells you how many atoms of that element are in ONE formula unit. A coefficient (large number in front, e.g. $2H_2O$) tells you how many formula units there are. So '$2H_2O$' means two molecules of water, each with 2 H and 1 O atom.

WHEN TO USE THIS:

Use this when reading or writing chemical formulae, counting atoms in a formula, or explaining the structure and uses of polymers.

THINKING STEPS:

- What does the subscript number tell you? Atoms per formula unit, NOT number of molecules.
- Is the question about monomers (small, reactive, C=C double bond) or polymers (large, unreactive, no double bond)?

WRITING STEPS:

- To count atoms: list each element and multiply by subscript. H_2SO_4 = 2H, 1S, 4O.
- For polymerisation: state that the C=C double bond breaks and monomers join to form a long chain. Name both monomer and polymer.

YEAR 8 CHEMISTRY STEP 10 Post Example / Non-Example

EXAMPLE & NON-EXAMPLE

C5: Chemical Formulae and Polymers — 5.3.4 & 5.3.5 — modelling a full answer

Describe how poly(ethene) is made from ethene monomers. Explain why poly(ethene) is useful as a packaging material. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

Poly(ethene) is made from many ethene ($CH_2=CH_2$) monomer molecules by addition polymerisation. Each ethene monomer has a carbon-carbon double bond (C=C). During polymerisation, the double bond breaks open and each monomer joins with the next, forming a long chain of repeating —CH_2—CH_2— units. Thousands of ethene monomers join together to form a single large polymer molecule. The resulting poly(ethene) has no double bonds and is chemically unreactive compared to ethene. Poly(ethene) is useful as packaging because it is flexible (can be made into thin films or bags), lightweight, waterproof (does not dissolve in water), tough (resistant to tearing), and inexpensive to manufacture. However, it is non-biodegradable and can persist in the environment for hundreds of years if not recycled.

WHY IS THIS GOOD?

- Polymerisation: double bond in ethene breaks, monomers join to form long chain.
- Product contrasted with monomer: no double bond, unreactive.
- At least two specific properties of poly(ethene) linked to its use as packaging.

✗ NON-EXAMPLE (WEAK ANSWER)

Poly(ethene) is made from ethene by polymerisation. It is useful because it is plastic and cheap.

WHY IS THIS WEAK?

- 'Plastic and cheap' insufficient — must name specific properties: flexible, waterproof, lightweight.
- No description of the mechanism — the double bond breaking.
- No contrast between monomer (reactive, double bond) and polymer (unreactive, no double bond).

KEY TAKEAWAY:

Polymerisation: C=C double bond breaks → monomers join → long unreactive chain. For uses: name at least two specific properties and link each to the use. Never say just 'plastic'.

POST TASK

C5: Chemical Formulae and Polymers — 5.3.4 & 5.3.5 — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

Describe how poly(ethene) is made from ethene monomers. Explain why poly(ethene) is useful as a packaging material. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** Name the monomer and polymer. Describe what happens to the C=C double bond during polymerisation.
2. **(2 marks)** Describe the structure of the polymer chain. Explain why it has different properties from ethene monomer.
3. **(2 marks)** State two specific properties of poly(ethene) and link each to why it suits packaging material.

CHALLENGE TASK

C5: Chemical Formulae and Polymers — 5.3.4 & 5.3.5 — stretch your thinking further

★★★

Plastic pollution is a major environmental problem. Poly(ethene) does not biodegrade for hundreds of years.

Evaluate the use of synthetic polymers in everyday life — state benefits, explain why non-biodegradability is a problem, evaluate solutions (recycling, bioplastics, reduced use), and consider the trade-offs involved.

Hint: What makes synthetic polymers useful (cheap, light, waterproof, durable)? Why is non-biodegradability a problem (ocean plastic, microplastics)? What are the solutions and their limitations?

FEEDFORWARD BOX

Reflect. Improve. Develop.

PREP SECTION — KO12: Drawing Conclusions

If you wrote …	Improve it by …
Described data but drew no conclusion	A conclusion must state WHAT the relationship is between variables, not just what changed.
Did not reference the prediction	Always state whether the conclusion supports or contradicts the original prediction.
Conclusion too general	Be specific: name the variables and state the exact relationship found.

POST SECTION — C5: Chemical Formulae and Polymers (5.3.4–5.3.5)

If you wrote …	Improve it by …
Read subscript as number of molecules	Subscript = atoms per formula unit. Coefficient (large number in front) = number of formula units.
Said polymers are reactive	Polymers have no double bonds and are generally unreactive — monomers are reactive because of the C=C.
Named monomer same as polymer	Monomer: ethene. Polymer: poly(ethene). The 'poly-' prefix and brackets mark the polymer.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Drawing Conclusions — Prep

WHAT DO I KNOW?

What must a full scientific conclusion include? List three required components.

What is the difference between describing data and drawing a conclusion?

HOW DO I USE IT?

How do you reference a prediction when drawing a conclusion?

What phrase links the data to the conclusion?

WHEN DO I USE IT?

In which section of a practical write-up do you draw a conclusion?

When must you draw more than one conclusion from a set of results?

MISTAKES TO AVOID

What is wrong with writing 'my results show a pattern' as a conclusion?

Why must you always quote specific data values in a conclusion?

C5: Chemical Formulae and Polymers — Post

RECALL

How many atoms of each element are in: H_2SO_4? CO_2? $C_6H_{12}O_6$?

What is the monomer of poly(ethene)? What is the monomer of poly(propene)?

EXPLAIN

Describe the polymerisation of ethene. What happens to the C=C double bond?

Why is poly(ethene) unreactive while ethene is reactive?

APPLY

Suggest two properties of nylon that make it suitable for rope. Explain each.

Why is poly(ethene) non-biodegradable, and what problem does this cause?

MISTAKES TO AVOID

What does the subscript 2 in H_2O tell you — atoms or molecules?

What is wrong with saying a polymer is just 'a big plastic'?

HALF TERM HOMEWORK

Set over half term — complete before your first lesson back.

CONTENTS — YEAR 8 PHYSICS

Autumn Term 2026–27

HW	Dates	POST — Retrieval topic	PREP — Skills content
Autumn 1 · 21 Sep – 23 Oct 2026			
1	21 Sep 26 → 05 Oct 26	GREEN P1: Friction, Drag and Squashing/Stretching (1.3.1–1.3.2)	KO12: Identifying Trends
2	05 Oct 26 → 19 Oct 26	RED Y7 Retrieval: Forces	KO12: Identifying Anomalies
Autumn 1 → Autumn 2 (Half Term)			
3	19 Oct 26 → 09 Nov 26 ★ Half Term	GREEN P1: Turning Forces and Pressure in Gases (1.3.3–1.4.1)	KO12: Drawing Conclusions
Autumn 2 · 03 Nov – 19 Dec 2026			
4	09 Nov 26 → 23 Nov 26	RED P1 Retrieval: Friction and Drag (~7 weeks ago)	KO13: Scientific Vocabulary
5	23 Nov 26 → 07 Dec 26	GREEN P1: Pressure in Liquids/Solids; P2: Magnetic Fields (1.4.2–2.3.1)	KO13: Cause and Effect
Christmas Holiday Homework (due 14 Jan 27)			
6	07 Dec 26 → 14 Jan 27 ★★ Christmas — due 14 Jan	GREEN P1 and P2 Assessment Consolidation	KO13: Evaluating Explanations

Each homework contains: Steps 6–8.5 (Prep) | Steps 9–11 (Post + Answer) | Step 12 (Challenge ★★★) | Step 14 (Feedforward) | Step 15 (Self-Quizzing)

YEAR 8 PHYSICS · AUTUMN TERM

Autumn 1 · 21 Sep – 23 Oct 2026

HW 1

Set: **21 Sep 26** Due: **05 Oct 26**

GREEN POST

P1: Friction, Drag and Squashing/Stretching (1.3.1–1.3.2)

PREP

KO12: Identifying Trends

PREP LEARNING BOX

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

GOLDEN THREAD:

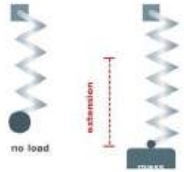
In Year 7 you collected data and drew graphs. Now in Year 8 we go further — identifying the pattern in results, describing it precisely, and writing a conclusion that directly answers the question. This skill runs through every investigation you will do this year and at GCSE.

KEY IDEA:

A trend is the overall pattern in data — it tells you how one variable changes as another changes.

- **Positive trend:** as X increases, Y increases.
- **Negative trend:** as X increases, Y decreases.
- **No trend:** Y stays roughly the same.
- A **conclusion** names the trend, quotes data values, and links to science.

A SPRING STRETCHING



IMPORTANT MISCONCEPTION:

Students often write "*the results show that as temperature goes up, the rate goes up.*" **This is incomplete** — it ignores the drop above 37°C. A strong conclusion must describe the *full* trend, refer to specific data values, and link to the science.

WHEN TO USE THIS:

Use this whenever you are asked to "describe the trend", "analyse the results", "draw a conclusion" or "what does the data show?" — in any science topic, including B1 Health & Lifestyle this week.

THINKING STEPS:

- What happens to the dependent variable as the independent variable increases?
- Does the trend stay the same throughout, or does it change direction?
- What specific values support the trend you have described?

WRITING STEPS:

- State the overall trend: "As ... increases/decreases, ... increases/decreases."
- Quote specific data values to support the trend (e.g. "from X to Y").
- Explain *why* the trend occurs using scientific knowledge.

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

GOLDEN THREAD:

We use the writing steps — state the trend, quote data values, explain using science — to answer data analysis questions. These same steps work in Biology, Chemistry and Physics.

Question: A student investigates how the mass of sugar in a drink affects the energy released when burned. Results: 5 g = 12 kJ; 10 g = 23 kJ; 15 g = 35 kJ; 20 g = 46 kJ. Describe the trend and write a conclusion. (3 marks)

✓ EXAMPLE

As the mass of sugar increases from 5 g to 20 g, the energy released increases from 12 kJ to 46 kJ. This is a positive trend — for every additional 5 g of sugar, the energy increases by approximately 11–12 kJ. This supports the conclusion that sugar contains stored chemical energy, and the more sugar that burns, the more energy is transferred to the surroundings.

WHAT IS GOOD ABOUT THIS?

✓States the trend precisely using the correct sentence structure.

✓Quotes specific data values at the start and end of the range.

✓Links to scientific knowledge — chemical energy stored in sugar.

× NON-EXAMPLE

The results show that more sugar gives more energy. The numbers went up each time.

WHAT IS WRONG WITH THIS?

✗No specific data values quoted — "numbers went up" is too vague.

✗No scientific explanation of *why* more sugar releases more energy.

✗Does not use the correct sentence structure: "as X increases, Y increases."

KEY TAKEAWAY:

Always name the independent and dependent variables, quote at least two data values, and explain *why* using science. Vague phrases like "it went up" will never gain full marks.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Complete all three questions from memory using the writing steps. Do not look back until you have finished, then check and correct in a different colour.

DATA:

A student investigates how the concentration of a salt solution affects the time taken for a potato strip to lose mass through osmosis. Their results are shown below.

Salt concentration (%)	0	0.5	1.0	1.5	2.0
Mass change (g)	+0.4	+0.1	0.0	−0.3	−0.6

YOUR ANSWERS:

1. Describe the trend shown in the results. Use the sentence structure from your Learning Box. ***(2 marks)***

2. Write a conclusion for this investigation. Include specific data values and a scientific explanation. ***(3 marks)***

3. At what concentration does the potato strip neither gain nor lose mass? What does this tell you about the concentration of the potato cells? ***(1 mark)***

NOTES PAGE

KO12: Analysing & Evaluating — Identifying Trends and Drawing Conclusions

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

YEAR 8 PHYSICS STEP 9 GREEN POST

POST LEARNING BOX

P1: Friction, Drag and Squashing/Stretching — 1.3.1 & 1.3.2

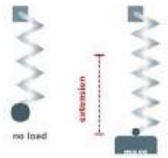
GOLDEN THREAD:

In Year 7 you studied forces — contact and non-contact forces, gravity and weight. Now in P1 Forces we explore specific types of contact force in more detail: friction, drag, and the forces involved when objects are squashed or stretched.

KEY IDEA:

- **Friction (1.3.1):** a contact force between two surfaces. Acts to oppose relative motion. Always acts parallel to the surface and opposite to direction of motion. Rough surfaces → more friction. Can be useful (braking, grip) or a problem (wear, heat).
- **Drag (1.3.1):** a friction force between a moving object and a fluid (liquid or gas). Also called air resistance (in air) or water resistance (in water). Drag increases with speed. Streamlined shapes reduce drag.
- **Elastic deformation (1.3.2):** object returns to original shape when force is removed (within elastic limit).
- **Inelastic/plastic deformation:** object does NOT return to original shape — elastic limit has been exceeded. Permanent change.
- **Hooke's Law:** within the elastic limit, extension ∝ force applied. F = ke, where k = spring constant (N/m), e = extension (m).

A SPRING STRETCHING



IMPORTANT MISCONCEPTION:

Students often say friction always acts downwards, like gravity. **This is incorrect.** Friction is a contact force that acts *parallel to the surface* and always *opposes the direction of motion*. If an object moves forward, friction acts backward. If an object slides sideways, friction acts the opposite way. The direction of friction depends on the direction of motion, not on gravity.

WHEN TO USE THIS:

Use this when asked to describe friction or drag forces, apply Hooke's Law, or distinguish elastic from inelastic deformation.

THINKING STEPS:

- Which direction does friction/drag act? OPPOSITE to direction of motion.
- Has the elastic limit been exceeded? If yes → inelastic/plastic deformation.
- Hooke's Law: F = ke. Rearrange for the unknown. Check elastic limit assumption.

WRITING STEPS:

- For friction/drag: state the direction (opposite to motion), the surface or fluid causing it, and whether useful or problematic in context.
- For Hooke's Law: state F = ke, rearrange, substitute with units, state the elastic limit assumption.
- For deformation: state whether elastic (returns to shape) or inelastic (permanent), and whether elastic limit has been exceeded.

YEAR 8 PHYSICS STEP 10 Post Example / Non-Example

EXAMPLE & NON-EXAMPLE

P1: Friction, Drag and Squashing/Stretching — 1.3.1 & 1.3.2 — modelling a full answer

A spring has a spring constant of 40 N/m. Calculate the extension when a force of 12 N is applied. State any assumption you make. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

Using Hooke's Law: F = ke, where F = force (N), k = spring constant (N/m), and e = extension (m). Rearranging to find extension: e = F/k. Substituting: e = 12 N ÷ 40 N/m = 0.3 m. The extension of the spring is 0.3 m (or 30 cm). The assumption I make is that the spring has not exceeded its elastic limit — that is, the extension is proportional to the force applied, and the spring will return to its original length when the force is removed. If the elastic limit were exceeded, Hooke's Law would no longer apply and the extension would be greater than predicted by F = ke, and the spring would undergo inelastic/plastic deformation.

WHY IS THIS GOOD?

- Hooke's Law stated: F = ke.
- Correct rearrangement and calculation: e = 12 ÷ 40 = 0.3 m, with units.
- Elastic limit assumption stated; consequence if exceeded explained.

✗ NON-EXAMPLE (WEAK ANSWER)

F = ke so e = 12 ÷ 40 = 0.3 m.

WHY IS THIS WEAK?

- Hooke's Law equation not stated — must write F = ke first.
- Elastic limit assumption absent — this is always required in Hooke's Law answers.
- No units stated for the final answer.

KEY TAKEAWAY:

Hooke's Law: state F = ke → rearrange → substitute with units → state answer → state elastic limit assumption and consequence if exceeded.

POST TASK

P1: Friction, Drag and Squashing/Stretching — 1.3.1 & 1.3.2 — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

A spring has a spring constant of 40 N/m. Calculate the extension when a force of 12 N is applied. State any assumption you make. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** State Hooke's Law as an equation (F = ke). Define each symbol and state its unit.
2. **(2 marks)** Rearrange the equation to find the extension. Substitute values and calculate. Include units throughout.
3. **(2 marks)** State the assumption you are making. Explain what would happen if the elastic limit were exceeded.

CHALLENGE TASK

P1: Friction, Drag and Squashing/Stretching — 1.3.1 & 1.3.2 — stretch your thinking further

★★★

A bungee cord manufacturer claims their cord obeys Hooke's Law up to an extension of 8 m. A student tests this by hanging different masses from the cord and measuring the extension.

Design an experiment to test this claim. State the IV, DV and three CVs. Describe how to identify the elastic limit from a force-extension graph. Evaluate one safety risk.

Hint: IV = force applied (masses × g). DV = extension of cord (ruler). CVs = same cord, same temperature, same starting position. On a graph: the elastic limit is where the straight line through the origin begins to curve. Safety: falling masses if cord breaks.

FEEDFORWARD BOX

Reflect. Improve. Develop.

PREP SECTION — KO12: Identifying Trends

If you wrote …	Improve it by …
Named the trend but not explained it	Add: 'this means that as force increases, extension increases at a constant rate'.
Said 'directly proportional' without justifying	Justify with the graph: 'the line is straight and passes through the origin'.
Vague conclusion ('results show a pattern')	Be precise: 'extension is directly proportional to force — consistent with Hooke's Law'.

POST SECTION — P1: Friction, Drag and Squashing/Stretching (1.3.1–1.3.2)

If you wrote …	Improve it by …
Said friction acts downwards	Friction acts PARALLEL to the surface and opposes motion — direction depends on motion, not gravity.
Said drag increases as speed decreases	Drag INCREASES as speed INCREASES — faster objects experience more air/water resistance.
Applied Hooke's Law without stating the elastic limit assumption	Hooke's Law only applies within the elastic limit. Always state this assumption.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Identifying Trends — Prep

WHAT DO I KNOW?

What does 'directly proportional' mean?

How is a directly proportional relationship shown on a graph?

HOW DO I USE IT?

What sentence structure should you use to describe a trend from a graph?

After stating the trend, what specific values must you reference?

WHEN DO I USE IT?

What graph keywords tell you to describe a trend?

When is 'positive correlation' not the same as 'directly proportional'?

MISTAKES TO AVOID

What is wrong with saying 'the line goes up'?

What two features must a graph show for you to claim direct proportionality?

P1: Friction, Drag and Squashing/Stretching — Post

RECALL

State Hooke's Law as an equation. Define k and e. What are their units?

What is the difference between elastic and inelastic deformation?

EXPLAIN

Explain the difference between friction and drag. In which direction does each act?

What happens to a spring if the elastic limit is exceeded?

APPLY

A spring constant is 25 N/m. A force of 5 N is applied. Calculate the extension.

A skydiver falls faster — what happens to drag? Why?

MISTAKES TO AVOID

In which direction does friction act on a forward-moving car?

Why is it wrong to say Hooke's Law always applies?

YEAR 8 PHYSICS · AUTUMN TERM

Autumn 1 · 21 Sep – 23 Oct 2026

HW 2

Set: **05 Oct 26** Due: **19 Oct 26**

RED POST

Y7 Retrieval: Forces

PREP

KO12: Identifying Anomalies

YEAR 8 SCIENCE STEP 6 — PREP · Scientific Skills

PREP LEARNING BOX

KO12: Analysing & Evaluating — Identifying Anomalies in Data

GOLDEN THREAD:

Last week you described trends in data. Now we go further — spotting results that don't fit the pattern (anomalies), explaining why they occur, and deciding whether to include them in your conclusion.

KEY IDEA:

An anomaly (also called an outlier) is a result that does not fit the overall trend in the data.

- Anomalies are often caused by human error, faulty equipment or a one-off variable.
- You should **identify** the anomaly, **suggest a cause,** and **exclude it** when calculating a mean or drawing a line of best fit.
- Never ignore an anomaly — always comment on it.

A JOURNEY, DRAWN AS DISTANCE-TIME

Speed = distance travelled ÷ time taken

IMPORTANT MISCONCEPTION:

Students often cross out an anomaly and say 'I ignored it because it was wrong.' **This is incorrect.** You must identify it, suggest a likely scientific or procedural cause, and then exclude it from your mean — not simply delete it.

WHEN TO USE THIS:

Use this whenever data is provided and you are asked to 'comment on the results', 'evaluate the data', or 'suggest why one result is different'. This applies across Biology, Chemistry and Physics.

THINKING STEPS:

- Does every result follow the same trend, or does one stand out?
- What could have caused this anomalous result? (human error? equipment fault? contamination?)
- Should this result be included in the mean or line of best fit?

WRITING STEPS:

- Identify the anomaly: 'The result at [X] does not fit the trend because...'
- Suggest a cause: 'This may have been caused by...'
- State your decision: 'This result was excluded from the mean / line of best fit.'

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Identifying Anomalies in Data

GOLDEN THREAD:

We use the writing steps — identify the anomaly, suggest a cause, state the decision — to answer data evaluation questions in any science topic.

Question: A student measures the volume of gas produced when different masses of marble chips react with hydrochloric acid. Results: 1g=12cm³; 2g=24cm³; 3g=35cm³; 4g=8cm³; 5g=60cm³. Identify the anomaly, suggest a cause, and explain what the student should do with it. (3 marks)

EXAMPLE

The result at 4 g of marble chips (8 cm³) does not fit the trend. As the mass of marble chips increases, the volume of gas produced generally increases, so 8 cm³ is far lower than expected. This anomaly may have been caused by a faulty gas syringe or a leak in the apparatus at that point in the experiment. This result should be excluded when drawing the line of best fit and when calculating any mean rate, as it would distort the conclusion.

WHAT IS GOOD ABOUT THIS?

- ✓Anomaly clearly identified with the specific data value stated.
- ✓Plausible scientific or procedural cause suggested.
- ✓Clear statement that it should be excluded and why.

NON-EXAMPLE

The 4 g result is wrong so I crossed it out. The rest of the results go up.

WHAT IS WRONG WITH THIS?

- ✗"Crossed it out" is not scientific — no cause or decision given.
- ✗No specific data value quoted to identify the anomaly precisely.
- ✗No suggestion of what caused the anomaly (equipment, error, etc.).

KEY TAKEAWAY:

Never just delete an anomaly. Identify it by value, explain a cause, and state whether you included or excluded it. Each of these earns a separate mark.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Answer all questions from memory. Do not look back until finished, then check and correct in a different colour.

DATA:

A student neutralises sodium hydroxide with sulfuric acid and records the temperature change at each addition of acid.

Volume of acid added (cm³)	0	5	10	15	20
Temperature (°C)	18	22	29	19	21

YOUR ANSWERS:

1. Describe the overall trend in the data. ***(2 marks)***

2. Identify the anomalous result. Suggest a cause and state what should be done with it. ***(3 marks)***

NOTES PAGE

KO12: Analysing & Evaluating — Identifying Anomalies in Data

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

YEAR 8 PHYSICS STEP 9 RED POST

POST LEARNING BOX

Y7 Retrieval: Forces

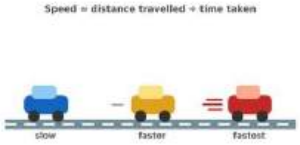
GOLDEN THREAD:

In Year 7 you were introduced to forces — contact vs non-contact, balanced and unbalanced forces, and the effects of forces on motion. This Red Post retrieves that knowledge — recalling it now, after a gap, is what builds long-term memory.

KEY IDEA:

- **Contact forces:** require surfaces to touch — friction, normal contact force, tension, air resistance, upthrust.
- **Non-contact forces:** act at a distance — gravity (gravitational force), magnetism, electrostatic force.
- **Weight:** W = mg. Weight = mass (kg) × gravitational field strength (N/kg). On Earth, g = 10 N/kg. Weight is a force (N); mass is an amount of matter (kg) — they are different quantities.
- **Balanced forces:** resultant force = 0 → object remains at rest OR continues at constant speed in a straight line (Newton's 1st Law).
- **Unbalanced forces:** resultant force ≠ 0 → object accelerates (changes speed or direction).
- **Speed:** speed = distance/time (m/s). Distance-time graphs: gradient = speed. Horizontal line = stationary. Steeper gradient = faster speed.

A JOURNEY, DRAWN AS DISTANCE-TIME



IMPORTANT MISCONCEPTION:

Students often confuse mass and weight. **Mass and weight are NOT the same.** Mass is the amount of matter in an object, measured in kilograms (kg) — it never changes. Weight is the gravitational force acting on an object, measured in newtons (N) — it varies with gravitational field strength. On the Moon (g = 1.6 N/kg), your mass stays the same but your weight is much less.

WHEN TO USE THIS:

Use this when asked about force types, calculating weight, interpreting distance-time graphs, or explaining balanced and unbalanced forces.

THINKING STEPS:

- Contact or non-contact? Contact forces require surfaces to touch; non-contact forces act at a distance.
- Weight or mass? W = mg (N). Mass = kg. They are different quantities.
- D-T graph: gradient = speed. Steeper = faster. Horizontal = stationary.

WRITING STEPS:

- For weight: state W = mg, substitute values with correct units, give answer in N.
- For forces: name the force type (contact/non-contact) and the specific force.
- For d-t graphs: calculate gradient = Δdistance ÷ Δtime. State units (m/s).

YEAR 8 PHYSICS STEP 10 Post Example / Non-Example

EXAMPLE & NON-EXAMPLE

Y7 Retrieval: Forces — modelling a full answer

A student has a mass of 50 kg. Calculate their weight on Earth (g = 10 N/kg) and on the Moon (g = 1.6 N/kg). Explain the difference between mass and weight. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

Weight on Earth: W = mg = 50 kg × 10 N/kg = 500 N. Weight on Moon: W = mg = 50 kg × 1.6 N/kg = 80 N. Mass is the amount of matter in an object, measured in kilograms (kg). Mass does not change with location — whether on Earth, the Moon, or in space, the student's mass remains 50 kg. Weight is the gravitational force acting on the object, measured in newtons (N). Weight depends on the gravitational field strength — on Earth, g = 10 N/kg, so the student weighs 500 N. On the Moon, the gravitational field strength is only 1.6 N/kg, so the student weighs only 80 N. The student's mass is the same in both places, but their weight is much less on the Moon because the Moon's gravitational field strength is weaker.

WHY IS THIS GOOD?

- Correct weight on Earth: 500 N; correct weight on Moon: 80 N. W = mg stated with units.
- Mass defined as amount of matter (kg), constant regardless of location.
- Weight defined as gravitational force (N), varies with gravitational field strength.

✗ NON-EXAMPLE (WEAK ANSWER)

Weight on Earth = 500 N. On Moon = 80 N. Mass doesn't change but weight does because the Moon has less gravity.

WHY IS THIS WEAK?

- W = mg not written — equation and substitution must be shown.
- 'Less gravity' is vague — must say 'lower gravitational field strength' and give g = 1.6 N/kg.
- No precise definitions of mass or weight — these are expected in a 6-mark answer.

KEY TAKEAWAY:

Weight (N) = mass (kg) × g (N/kg). Mass = constant; weight = varies with location. Always state W = mg, substitute with units, give answer in N.

POST TASK

Y7 Retrieval: Forces — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

A student has a mass of 50 kg. Calculate their weight on Earth (g = 10 N/kg) and on the Moon (g = 1.6 N/kg). Explain the difference between mass and weight. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** State W = mg. Substitute values and calculate weight on Earth. Show units throughout.
2. **(2 marks)** Substitute values and calculate weight on the Moon. State the value of g used.
3. **(2 marks)** Define mass and weight. Explain why weight changes between locations but mass does not.

CHALLENGE TASK

Y7 Retrieval: Forces — stretch your thinking further

★ ★ ★

An astronaut has a mass of 80 kg. On the International Space Station (ISS), orbiting at ~400 km altitude, astronauts appear to float.

Explain why astronauts appear weightless on the ISS, even though gravity still acts on them. Distinguish between weightlessness and zero gravity. Calculate the astronaut's weight at the ISS if g = 8.8 N/kg at that altitude.

Hint: Free fall: both ISS and astronauts fall towards Earth at the same rate while also moving sideways fast enough to miss it — this creates apparent weightlessness. True zero gravity doesn't exist near Earth. Calculate: W = 80 × 8.8 = 704 N.

FEEDFORWARD BOX

Reflect. Improve. Develop.

PREP SECTION — KO12: Identifying Anomalies

If you wrote …	Improve it by …
Said 'the result is wrong'	Suggest a reason: 'this may be due to measurement error or a change in conditions'.
Excluded anomaly without explanation	State: 'this result was excluded because it does not fit the overall trend and may be due to an error'.
Did not identify the anomaly on the graph	Circle the anomalous point clearly and justify why it falls outside the trend.

POST SECTION — Y7 Retrieval: Forces

If you wrote …	Improve it by …
Confused mass and weight	Mass = kg, constant. Weight = N, depends on gravitational field strength. Never write mass in N or weight in kg.
Said friction acts in the direction of motion	Friction always OPPOSES motion — it acts in the OPPOSITE direction.
Read d-t graph gradient incorrectly	Gradient of d-t graph = speed. Calculate: Δdistance ÷ Δtime. Don't just read a y-value.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Anomalies — Prep

WHAT DO I KNOW?

What is an anomalous result?

How do you identify an anomaly on a graph?

HOW DO I USE IT?

Should you include an anomaly when calculating a mean?

How do you handle an anomaly when drawing a line of best fit?

WHEN DO I USE IT?

In which section of a practical write-up do you discuss anomalies?

What does an anomaly tell you about the reliability of your results?

MISTAKES TO AVOID

What is wrong with saying 'I'll ignore that result because it's too high'?

Why must you suggest a reason for an anomaly rather than just excluding it?

Y7 Retrieval: Forces — Post

RECALL

Name three contact forces and two non-contact forces.

State the equation for weight. Give the unit of weight and the unit of mass.

EXPLAIN

Explain the difference between balanced and unbalanced forces. What happens to motion in each case?

Why does weight change on different planets but mass does not?

APPLY

A car travels 300 m in 20 s. Calculate its speed.

What does a horizontal section on a distance-time graph tell you about the object?

MISTAKES TO AVOID

What is the unit of weight? What is the unit of mass?

If a d-t graph is steeper on the left than the right — is the object speeding up or slowing down?

YEAR 8 PHYSICS · AUTUMN TERM

Autumn 1 → Autumn 2

HW 3

Set: **19 Oct 26** Due: **09 Nov 26**

⏸ Set over Half Term — due first lesson back

GREEN POST

P1: Turning Forces and Pressure in Gases (1.3.3–1.4.1)

PREP

KO12: Drawing Conclusions

YEAR 8 SCIENCE STEP 6 — PREP · Scientific Skills

PREP LEARNING BOX

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

GOLDEN THREAD:

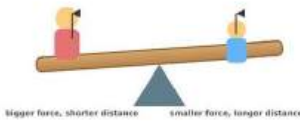
You have identified trends and spotted anomalies. The final step is writing a full conclusion: describing the trend, quoting data, explaining the science, and linking back to your original prediction. This completes the scientific method.

KEY IDEA:

A **conclusion** answers the original question by summarising what the data shows.

- State whether the data **supports** or **does not support** the prediction.
- Quote at least two **specific data values** as evidence.
- Explain the trend using **scientific knowledge**.
- Comment on any **anomalies** and whether they affected the conclusion.

A SEESAW BALANCING



IMPORTANT MISCONCEPTION:

Students often say 'my prediction was right' without quoting any data to justify it. **This is incorrect** — you must cite specific values from your results as evidence. Simply agreeing with a prediction without data is not a scientific conclusion.

WHEN TO USE THIS:

Use this in every investigation write-up and in any question asking you to 'write a conclusion', 'evaluate your prediction', or 'summarise what your results show'. Works in Biology, Chemistry and Physics.

THINKING STEPS:

- What did I predict? Do the results support it?
- What is the trend — and are there any anomalies to mention?
- What specific values can I quote as evidence?

WRITING STEPS:

- State whether your prediction was supported, with a reason.
- Describe the trend, quoting at least two data values.
- Explain the science behind the trend.

PREP: EXAMPLE / NON-EXAMPLE

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

GOLDEN THREAD:

We use the writing steps — link to prediction, state the trend with data, explain the science — to write conclusions that gain full marks.

Question: A student predicted: "Increasing resistance in a circuit will decrease the current." Results: 10Ω=0.6A; 20Ω=0.3A; 30Ω=0.2A; 40Ω=0.15A. Write a conclusion referencing the prediction and the data. (4 marks)

EXAMPLE

My prediction was correct — as resistance increased, the current decreased. This is supported by the data: when the resistance was 10Ω the current was 0.6A, but when the resistance increased to 40Ω the current fell to 0.15A. This is because, according to Ohm's law, current is inversely proportional to resistance when voltage is constant — a higher resistance opposes the flow of charge more, reducing the current. There were no anomalies in this data set.

WHAT IS GOOD ABOUT THIS?

✓Directly states whether prediction was supported.

✓Quotes two specific data values as evidence.

✓Scientific explanation using Ohm's law and charge flow.

NON-EXAMPLE

My prediction was right. The current went down when I added more resistance. This is what I expected to happen.

WHAT IS WRONG WITH THIS?

✗No data values quoted — "went down" is too vague.

✗No scientific explanation — why does current decrease?

✗"This is what I expected" adds nothing; the prediction must be justified with evidence.

KEY TAKEAWAY:

A conclusion must do four things: reference the prediction, state the trend, quote data, and explain the science. Any one missing loses marks.

PREP TASK

KO12: Analysing & Evaluating — Apply what you have learned

INSTRUCTIONS:

Cover your Learning Box and Example / Non-Example. Complete both questions from memory. Do not look back until finished, then check and correct in a different colour.

DATA:

A student predicts: "*Increasing the number of cells in a circuit will increase the brightness of the bulb.*" They measure the potential difference (voltage) across the bulb for each number of cells.

Number of cells	1	2	3	4
Voltage across bulb (V)	1.5	3.0	4.5	6.0

YOUR ANSWERS:

1. Write a full conclusion for this investigation, referencing the prediction and quoting at least two data values. *(4 marks)*

2. Suggest a scientific explanation for the relationship between the number of cells and the voltage. *(2 marks)*

NOTES PAGE

KO12: Analysing & Evaluating — Drawing Conclusions and Referencing Predictions

INSTRUCTIONS:

Use this page to make your own notes on the Learning Box and Example / Non-Example. Write down anything you want to remember before the lesson, or any questions you still have.

MY NOTES:

QUESTIONS I STILL HAVE:

POST LEARNING BOX

P1: Turning Forces and Pressure in Gases — 1.3.3 & 1.4.1

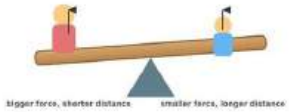
GOLDEN THREAD:

You know how friction and drag affect motion. Now in P1 we look at two more key force concepts: moments (turning forces) and gas pressure. These appear in many real-world applications from door handles to pneumatic tyres.

KEY IDEA:

- **Moment (turning force) (1.3.3):** M = F x d. Force (N) x perpendicular distance from pivot (m). Units: newton-metres (N m). Longer distance from pivot → larger moment for same force.
- **Principle of moments:** for a balanced lever: sum of clockwise moments = sum of anticlockwise moments.
- **Pressure (1.4.1):** P = F ÷ A. Force (N) ÷ area (m^2). Units: pascals (Pa) or N/m^2.
- **Gas pressure:** gas particles move randomly, collide with container walls → exert pressure. More collisions per second → higher pressure. Reducing volume (compressing gas) → more frequent collisions → higher pressure.
- **Inverse relationship:** at constant temperature, pressure x volume = constant. Halve the volume → double the pressure.

A SEESAW BALANCING



IMPORTANT MISCONCEPTION:

Students often say pressure increases when forces increase. **This is correct but incomplete.** Pressure depends on BOTH force AND area (P = F/A). Pressure also increases when the same force acts on a smaller area. A sharp knife cuts more easily than a blunt one not because it exerts more force, but because the same force acts over a much smaller area — giving much greater pressure.

WHEN TO USE THIS:

Use this when calculating moments or pressure, applying the principle of moments, or explaining how gas pressure changes with volume.

THINKING STEPS:

- Moment: identify the force (N) and the perpendicular distance from the pivot (m). M = F × d.
- Balanced lever: clockwise moments = anticlockwise moments. Use this to find an unknown force or distance.
- Gas pressure: particles hitting walls. More collisions per second → higher pressure.

WRITING STEPS:

- For moments: state M = F × d, identify the pivot, state which moments are clockwise and which are anticlockwise. Give units: N m.
- For balanced lever: write CW = ACW equation, then solve.
- For gas pressure: explain in terms of particle collisions with container walls.

EXAMPLE & NON-EXAMPLE

P1: Turning Forces and Pressure in Gases — 1.3.3 & 1.4.1 — modelling a full answer

A seesaw is balanced. A child of weight 400 N sits 2 m from the pivot. Another child sits 2.5 m from the pivot on the other side. Calculate the moment of the first child and use the principle of moments to find the weight of the second child. (6 marks)

✓ EXAMPLE (GOOD ANSWER)

Moment of first child = force × distance = 400 N × 2 m = 800 N m (anticlockwise). For the seesaw to be balanced, the clockwise moments must equal the anticlockwise moments — this is the principle of moments. Clockwise moment = weight of second child × 2.5 m. Setting clockwise = anticlockwise: weight of second child × 2.5 m = 800 N m. Therefore: weight of second child = 800 N m ÷ 2.5 m = 320 N. The second child weighs 320 N.

WHY IS THIS GOOD?

- Correct moment for first child: 400 × 2 = 800 N m, with units.
- Principle of moments explicitly stated: clockwise = anticlockwise.
- Correct weight of second child: 800 ÷ 2.5 = 320 N.

✗ NON-EXAMPLE (WEAK ANSWER)

Moment = 400 × 2 = 800 N m. Second child: 800 ÷ 2.5 = 320 N.

WHY IS THIS WEAK?

- Principle of moments not stated — must write 'clockwise moments = anticlockwise moments'.
- Units (N m) missing from the moment calculation.
- No working shown for the second calculation.

KEY TAKEAWAY:

Moments: M = F × d (units: N m). Principle of moments: clockwise = anticlockwise. State the principle explicitly, then set up the equation and solve for the unknown.

POST TASK

P1: Turning Forces and Pressure in Gases — 1.3.3 & 1.4.1 — use the scaffolded steps

RETRIEVAL PURPOSE:

Cover your Post Learning Box. Answer from memory. After completing, use **green pen** to mark and improve using the answer page.

A seesaw is balanced. A child of weight 400 N sits 2 m from the pivot. Another child sits 2.5 m from the pivot on the other side. Calculate the moment of the first child and use the principle of moments to find the weight of the second child. (6 marks)

SCAFFOLDED STEPS:

1. **(2 marks)** Calculate the moment of the first child. State M = F × d and include units (N m) in your answer.
2. **(2 marks)** State the principle of moments in words. Set up the equation for the balanced seesaw.
3. **(2 marks)** Solve for the weight of the second child. Show all working. Give the answer with correct units.

CHALLENGE TASK

P1: Turning Forces and Pressure in Gases — 1.3.3 & 1.4.1 — stretch your thinking further

★ ★ ★

A gas is stored in a cylinder with a moveable piston at 100 kPa and volume 4 litres. The piston is pushed in so the volume halves to 2 litres (at constant temperature).

Calculate the new pressure using the inverse relationship ($P_1V_1 = P_2V_2$). Explain in terms of particle collisions why the pressure increases. Explain why a bicycle tyre at higher pressure provides a firmer ride.

Hint: $P_1V_1 = P_2V_2$: $100 \times 4 = P_2 \times 2 \rightarrow P_2 = 200$ kPa. Particles: same number in half the volume → hit walls twice as often → double the pressure. Tyre: more collisions → walls pushed outward more firmly → tyre resists deformation.

FEEDFORWARD BOX

Reflect. Improve. Develop.

PREP SECTION — KO12: Drawing Conclusions

If you wrote …	Improve it by …
Described data but drew no conclusion	A conclusion must state WHAT the relationship is between variables, not just what happened.
Did not reference the prediction	Always state whether the data supports or contradicts the prediction.
Conclusion too general	Be specific: name the variables and state the exact relationship found.

POST SECTION — P1: Turning Forces and Pressure in Gases (1.3.3-1.4.1)

If you wrote …	Improve it by …
Used wrong unit for moment	Moment is measured in N m (newton-metres), not just N or m alone.
Said pressure = force	Pressure = force ÷ area. Both force AND area determine pressure.
Explained gas pressure without mentioning particles	Always explain gas pressure in terms of PARTICLE COLLISIONS with container walls.

SELF-QUIZZING BOX

Cover your Learning Box. Answer from memory. Check and correct.

COVER YOUR LEARNING BOX — answer every question from memory only

KO12: Drawing Conclusions — Prep

WHAT DO I KNOW?

What three components must a full scientific conclusion include?

What is the difference between describing data and drawing a conclusion?

HOW DO I USE IT?

What phrase links results to a conclusion?

How do you state whether results support or contradict the prediction?

WHEN DO I USE IT?

In which section of a practical write-up do you draw a conclusion?

When must you draw more than one conclusion from a set of results?

MISTAKES TO AVOID

What is wrong with 'the experiment worked' as a conclusion?

What information is missing if you say 'the results showed a trend' without specifying it?

P1: Turning Forces and Pressure in Gases — Post

RECALL

State the equation for a moment. State the equation for pressure. Give the unit for each.

State the principle of moments in one sentence.

EXPLAIN

Explain in terms of particle collisions why compressing a gas into half the volume doubles its pressure.

Why does a sharp knife cut more easily than a blunt one with the same force applied?

APPLY

A force of 60 N acts 0.5 m from a pivot. Calculate the moment.

A pressure of 200 Pa acts over an area of 0.4 m². Calculate the force.

MISTAKES TO AVOID

What is the unit of a moment? Why is it NOT the same as the unit of work?

What is wrong with explaining gas pressure without mentioning particle collisions?

HALF TERM HOMEWORK

Set over half term — complete before your first lesson back.

UXBRIDGE
HIGH SCHOOL

ENRICHMENT

Reflection

TAKE TIME TO REFLECT ON YOUR ENRICHMENT EXPERIENCES.
WHAT HAVE YOU LEARNED? HOW HAVE YOU GROWN?

WEEK ONE

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WEEK TWO

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WEEK THREE

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UXBRIDGE
HIGH SCHOOL

ENRICHMENT

Reflection

TAKE TIME TO REFLECT ON YOUR ENRICHMENT EXPERIENCES.
WHAT HAVE YOU LEARNED? HOW HAVE YOU GROWN?

WEEK FOUR

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WEEK FIVE

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WEEK SIX

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WEEK SEVEN

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