From *Education in Chemistry*
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ROYAL SOCIETY OF CHEMISTRY

Answering exam questions

Detect, recall, solve

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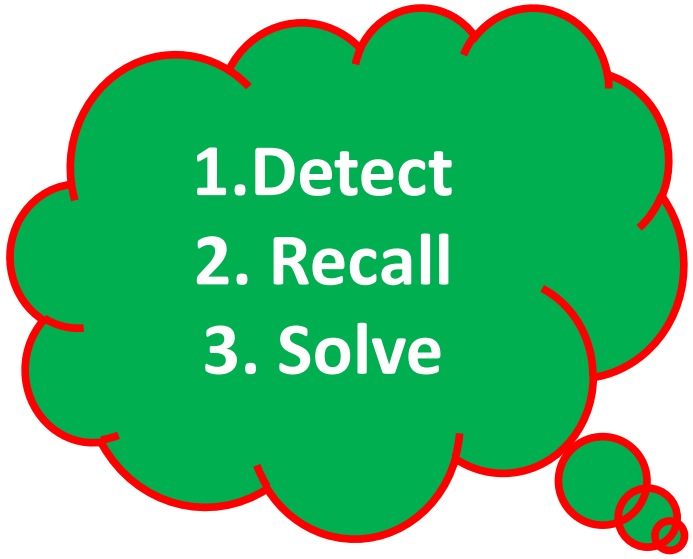
Detect, recall, solve



- **Detect** the **command words** and **information** in the question (highlight them)
- **Recall** the **relevant information** you know
- **Solve** by linking the **information in the question** with **your knowledge** (use logical bullet points)

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Q1 Try it yourself

1.Detect
2. Recall
3. Solve

Do not write outside the box

The Earth's early atmosphere was different to Earth's atmosphere today.

Scientists think that the Earth's early atmosphere was like the atmosphere found on Venus today.

Table 2 shows the amounts of carbon dioxide and oxygen in the atmospheres of Venus and Earth today.

Table 2

Gas	Percentage (%) in Venus' atmosphere today	Percentage (%) in Earth's atmosphere today
Carbon dioxide	96.50	0.04
Oxygen	0.00	20.95

0 3 . 4 The percentages of carbon dioxide and oxygen have changed from Earth's early atmosphere to Earth's atmosphere today.

Explain the processes that led to these changes.

[6 marks]

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Detect the **command words**, and **information** in the question (highlight)

Recall: The carbon cycle. What processes change the amount of CO_2 in the atmosphere?

Solve: Link the information and your knowledge. Use 'because' to link cause and effect.
Eg. This difference exists *because* this process occurred.

(logical, bullet points)

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Do not write outside the box

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Explain the processes that led to these changes.

[6 marks]

Detect and highlight the command words.

Detect the differences between Venus' and Earth's atmosphere.

Recall the processes in the carbon cycle

Solve: Link the changes in the amount of CO_2 and O_2 to the processes in the carbon cycle.

Mark scheme

Question	Answers	Mark	AO / Spec. Ref.
03.4	**Level 3:** Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO2
	Level 2: Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.	3–4	AO1
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	AO1
	No relevant content	0	
	Indicative content **changes** • carbon dioxide has decreased • oxygen has increased **processes** • volcanic activity released water vapour • the water vapour condensed to form oceans • carbon dioxide dissolved in oceans • carbonates produce sediments • carbon locked up in sedimentary rocks • algae and plants evolved / appeared • algae / plants absorbed carbon dioxide • by photosynthesis • which also released oxygen • carbon locked up in fossil fuels		4.9.1.2 4.9.1.3 4.9.1.4

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Q2 Try it yourself

1.Detect
2. Recall
3. Solve

0 1 . 3 Describe a method to make pure, dry crystals of magnesium sulfate from a metal oxide and a dilute acid.

[6 marks]

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Detect the **command words**, and **information** in the question (highlight)

Recall: The equipment needed, the processes and the safety required.

Solve: Write the steps in a logical sequence. You may use bullet points or a numbered list.

You may use diagrams if you wish.

(logical, bullet points)

0 1 . 3 Describe a method to make pure, dry crystals of magnesium sulfate from a metal oxide and a dilute acid.

[6 marks]

Detect and highlight the command words.

Which metal oxide and dilute acid will you need to use?

List the equipment you will need.

What processes need to happen to form dry salt crystals?

Give instructions in a logical order, you may use bullet points

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Mark scheme

Question	Answers	Mark	AO / Spec. Ref.
01.3	**Level 3:** The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced.	5–6	AO1 4.4.2.3
	Level 2: The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.	3–4	
	Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1–2	
	No relevant content	0	
	Indicative content • use magnesium oxide and sulfuric acid • add sulfuric acid to a beaker • warm sulfuric acid • add magnesium oxide • stir • continue adding until magnesium oxide is in excess • filter • using a filter paper and funnel • to remove excess magnesium oxide • heat solution in an evaporating basin • to crystallisation point • leave to crystallise • pat dry with filter paper credit may be given for diagrams		

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