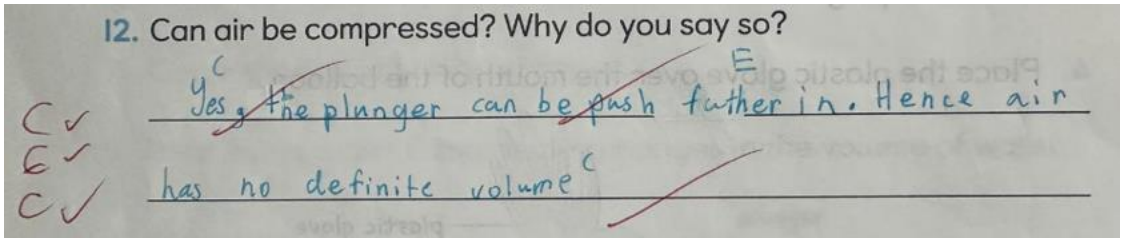
SBS for Standard Science

C-E-R stands for **Claim, Evidence, and Reasoning**, and it's a framework often used to structure responses to open-ended questions in science. It helps students construct well-organised and scientifically sound arguments.



What is the C-E-R Framework?

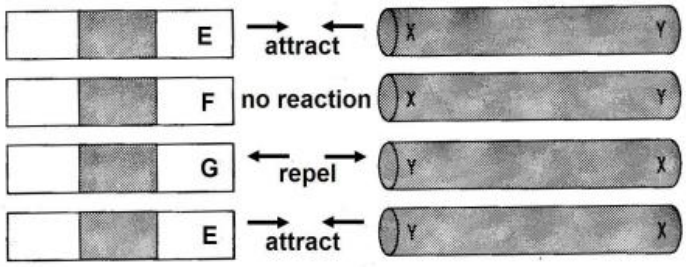
C – Claim	• answer to the question. • usually a choice has to be made in order to answer the question.
E – Evidence	• based on the information given in the question.
R – Reasoning	• concepts that are related to the information given in the question. • relate concepts to the situation or scenario given in the question.

This method is mostly applicable to the following types of questions:

- experimental questions
- questions that test on concepts using experiments in the first part of the question, followed by application of the concept in the earlier parts of the question to the next few parts of the question

Example 1

*Alex was given 3 metal bars, **E**, **F** and **G** and a cylindrical magnet marked **X** and **Y**. The cylindrical magnet was brought close to each metal bar as shown and the following outcomes were observed.*



Which metal bar is a magnet? Explain your answer?

Thinking Process

In the above question,

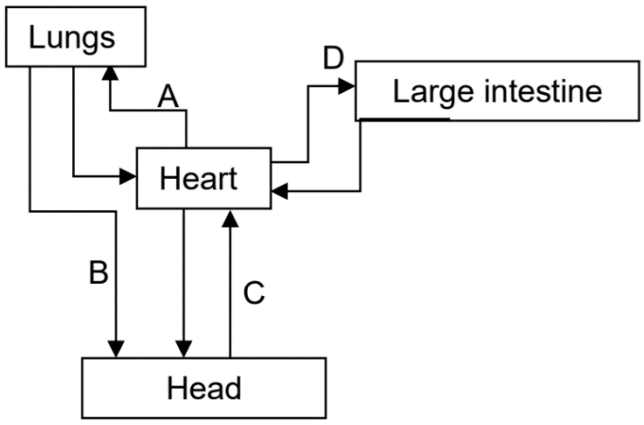
Claim (C)	Metal Bar G
Evidence (E)	Metal bar G **repels** magnet XY
Reason (R)	Only **magnets** repel each other

Suggested Ans:

Metal bar G (C). It **repels magnet XY (E)** and **only magnets repel each other (R).**

Example 2

Study the diagram below on our human body systems. The arrows represent the movement of blood in the body.



Which arrow, A, B, C or D, is drawn wrongly? Explain your answer.

Thinking Process

C	Arrow B is drawn wrongly.
E	For Arrow B, blood flows from lungs to head.
R	Blood flow(s) from lungs to heart to other parts of body.

Suggested Ans:

Arrow B is drawn wrongly (**C**). **For Arrow B, blood flows from lungs to head** (**E**). However, the **blood should flow from the lungs to the heart** and then to the **head/other parts of the body** (**R**).

The Claim-Evidence-Reasoning (CER) structure has provided many students with the springboard they need to grow in their answering techniques.

1. The structure guides students in forming clear claims and supporting them with relevant evidence. This helps them stay focused on the question and present their ideas in a logical, coherent manner. Students who might have otherwise provided disjointed answers now present their responses with greater clarity.

2. Requiring students to back their claims with evidence and explain the underlying concept, CER encourages critical thinking. Students learn to analyse the data and scientific concepts at a deeper level, which leads to a better understanding of the concepts.

3. Organising answers in a systematic way, students begin with a claim, follow with supporting evidence, and conclude with an explanation of how the concept ties it all together. This organisation helps students communicate their thoughts more effectively and ensures that they address all parts of the question stem.

4. Increased confidence with a structured approach, students seem more assured in their responses. They know what is expected and how to approach each question, reducing the anxiety often associated with open-ended questions in science.

CER has proven to be a valuable tool in helping students develop better-supported answers to open-ended science questions. By providing a clear framework, the structure enhances students' understanding, organisation and confidence, leading to the attainment of success criteria more readily and more effective communication of scientific reasoning.