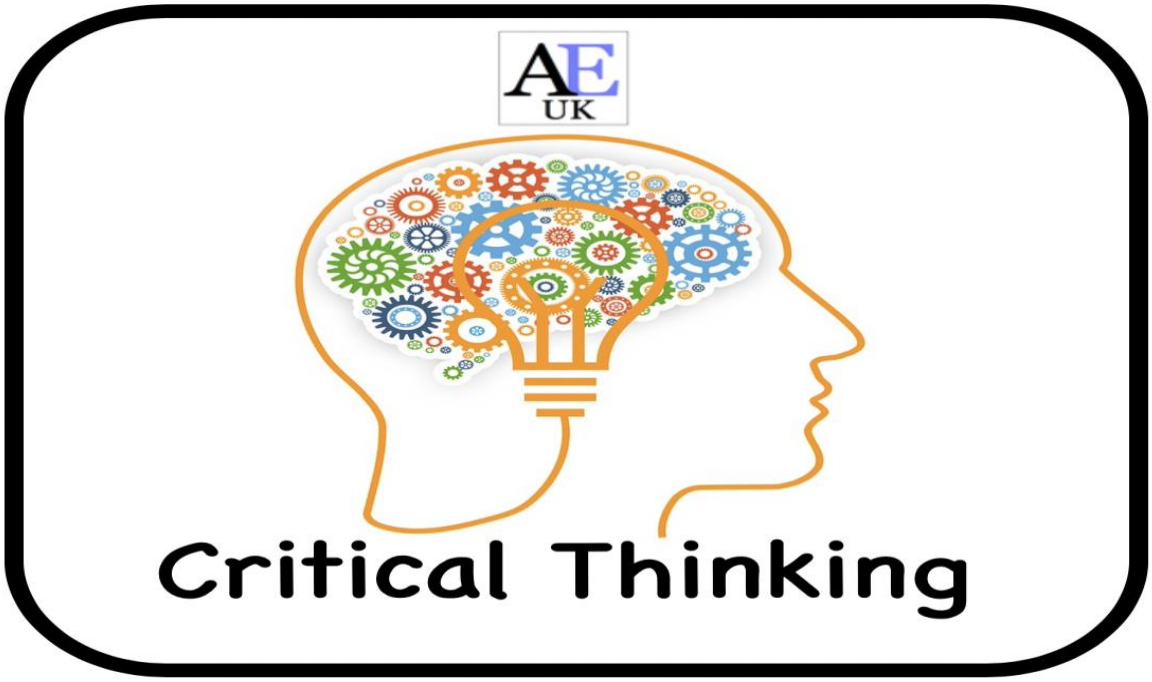
Academic English UK

Critical Thinking



Reading Text Analysis 6

Hadron Collider

EXAMPLE

Critical Thinking: Reading Text Analysis 6

EXAMPLE

Lesson Plan

Aim: to provide quality practice in developing analytical critical reading skills.

1. Preparation

- Reading text 'Hadron Collider' for each student. Page 3
- Answer sheet (one sheet between two). Page 4-5

2. Introduction

- Ask students to discuss: 'What is critical reading?'
- Try to elicit key terms and ideas: *questioning / critique / analysis / evaluation / validity / evidence / bias / opinion / stance / credibility / reliability / synthesis.*

- *EXTRA IDEAS! Go here: Critical thinking Dictogloss / Critical thinking videos / Bloom's Higher-level thinking skills* *https://www.academic-englishuk.com/critical-thinking*

3. Set up

- Hand out the reading text 'Hadron Collider'.
- Explain that you want the students to apply the critical thinking skills of analysing and evaluating to the text.
- Give examples of the two terms:
  Analysis is to draw connections among ideas: to examine / to question / to compare.
  Evaluation is to justify a stand or decision: to judge / to identify support and credibility / to appraise / to critique.

4. The lesson

- As a whole group, do the first paragraph together. Explain there are three possible problems.
- Give the students 5-10 minutes to read the paragraph and try to identify areas in the paragraph can be questioned or critiqued.
- Students can conduct internet research to check information.
- Feedback individually or as a group using the answer sheet for guidance.
- Students work individually: Allow the students 20-30 minutes to read and highlight possible areas of question, critique or appraisal. Explain there are ten possible problems to find.

5. Feedback

- Feedback in pairs - students share their ideas and justify their answers.
- Feedback as a whole class. Teacher highlights key answers and elicits other possible critiques.

Disclaimer: There are a variety of different answers to this activity.

Hadron Collider EXAMPLE

C. Wilson & H. Kennedy (2024)

Based at the European Organization for Nuclear Research in Geneva, Switzerland, the Large Hadron Collider, or known as LHC for short, is according to CERN (2024) 'the world's largest and most powerful particle accelerator'. The colossal apparatus is built from a ring of electromagnets made from superconducting electric cables, and measuring almost thirty kilometres, to produce coils of a variety of sizes and types which create a magnetic field that forces two high-energy particle beams travelling [redacted] opposite [redacted] collide (CERN, 2024). The LHC first began collecting scientific data regarding what the 'Standard Model', [redacted] explained [redacted] which make up the universe, has yet to predict, in what is known as a run between 2009 and 2013. Since then, [redacted] (May and Dobrijevic, 2022).

Although the LHC has been successful in the breakthrough [redacted] of the [redacted] in 2012, in which it was [redacted] (May and Dobrijevic, 2022), there is much more scope to investigate several other areas in particle physics. CERN (2024) claims [redacted] limited, [redacted] exists more matter than antimatter, what evidence can be found to explain supersymmetry, or what can be [redacted]. For this reason, according to Hossenfelder (2020), CERN is planning to construct a 100-kilometre tunnel [redacted] or the FCC, which [redacted] energy of the LHC by six times to 100 tera-[redacted]

There has, however, been [redacted] to the building of the FCC. One of the main concerns is expense. Hossenfelder (2020) argues that as [redacted] current [redacted] FCC could rise to $1billion year-on-year, largely due to the huge infrastructure required, such as digging tunnels [redacted] the physicists and [redacted] say that despite the size of the FCC, it may still not be large enough to test for dark matter or energy, or using a collider might not [redacted] theories. Instead, [redacted] build large-scale tunnels and colliders could be [redacted] distance-decreasing wake field acceleration technology, or via [redacted] at room temperature which [redacted], but at a lower cost. Therefore, as costs are rising but perhaps relevance is declining when it comes to [redacted] be put into [redacted] which has more of an impact on society, such as climate change.

References

[redacted] [online]. Available at: https://home.cern/resources/faqs/xxxxxxxxx/ [Accessed 14.08.2024].

CERN, (2024). [redacted] Available at: https://home.cern/science/accelerators/xxxxxxx [Accessed 15.08.2024].

Hossenfelder, S., (2020). *The World Doesn't Need a New Gigantic* [redacted] [online]. Available at: [redacted] [Accessed 15.08.2024].

May, A., and Dobrijevic, D., (2022). [redacted] online]. Available at: https://www.space.com/large-hadron-cxxxxxxxxxxx/ [Accessed 14.08.2024].

Possible critical evaluation ANSWERS

Based at the European Organization for Nuclear Research in Geneva, Switzerland, the Large Hadron Collider [1], or known as LHC for short, is according to CERN (2024) 'the world's largest and most powerful particle accelerator' [2]. The colossal apparatus is built from a ring of electromagnets made from superconducting electric cables, and measuring almost thirty kilometres, to produce coils of a variety of sizes and types which create a magnetic field that forces two high-energy particle beams travelling at almost the speed of light yet in opposite directions to collide [3] (CERN, 2024). The LHC first began collecting scientific data regarding what the 'Standard Model', that is to say, the theory...

1) Why is it called the Hadron collider?
2) Are there any other particle accelerators in the world? Yes, there 30,000 across the world (EPA, 2024).
3) What is the purpose of forcing particles to collide?
4) Why can these runs only last a few years? What reason is there for having breaks?

ALL ANSWERS ARE INCLUDED IN PAID VERSION...