Unit 3: Scientific Explanations, and the History of the Earth

Earth and Space Science

Last week many of you started Unit 3 by going to the Earth Science website and downloading (from the Unit 3 page) an assignment built around two videos. If you haven’t started that assignment yet, please download it now.

For that assignment you are asked to use specific note taking strategies to obtain information about our next topics of study: the formation and history of the Earth, and the scientific skill of Constructing Explanations. You are asked to watch the videos several times each, the first time through without taking notes, and then again using note-taking strategies that we used for reading in our last unit. Finally, you are asked to write a short summary (3-5 sentences) of each video. Once you finish each of your video summaries, log into our classroom on Socrative (LANIKSOCRATIVE) and respond to the prompts that have been posted about the videos.

After completing the assignment on Socrative, please follow [this link](https://youtu.be/5KKsLuRPsvU) to video about the process of developing scientific explanations. Watch the video twice, the first time without taking notes, and then again for information. Answer these questions as you watch the video the 2nd time.

What does CER stand for?

What is a scientific “claim”?

What is scientific reasoning?

What are the C, E, and R for the example in the video that examines whether or not air is matter.

**Constructing Explanations in Science (Claim, Evidence, Reasoning)**

|  |  |  |
| --- | --- | --- |
| **Claim or...** | **Evidence or...** | **Reasoning or...** |
| Answer  Idea  Conclusion  Thesis | Observations  Data  Facts  Information | Justification  (Claim + Evidence; Logic behind your answer that incorporates scientific principles and evidence; final conclusion) |

* The claim (that typically answers the question: “What do I think?”)
* The evidence (that typically answers the question: “How do I know this is the case?”).
* The reasons (that typically answer the question: “Why do I think this?”)

**Constructing Explanations**- The goal of science is the construction of theories that can provide explanatory accounts of features of the world. A theory becomes accepted when it has been shown to be superior to other explanations in the breadth of phenomena it accounts for and in its explanatory coherence and parsimony. Scientific explanations are explicit applications of theory to a specific situation or phenomenon, perhaps with the intermediary of a theory-based model for the system under study. The goal for students is to construct logically coherent explanations of phenomena that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence.

Explain what the phrase “explanatory coherence and parsimony” means in the statement above.

Find the links on the website to the two articles on meteor impacts and the dinosaurs. Open each link, and carefully read each article several times, first for gist, and then for information/understanding. After you have finished reading, use the table below to create a Claims-Evidence-Reasoning summary outline for each article.

**Skill Standard: Apply Scientific reasoning to link evidence to claims to assess the extent to which the reasoning and data support the explanation.**

| CLAIM | EVIDENCE | REASONING |
| --- | --- | --- |
| Statement about the results of an investigation.What claim is being made? | Provide scientific data to support your claim. You should only use appropriate dada and include enough to prove your claim | Connect your claim to your evidence. Tell why your data counts as evidence using scientific principles |
|  | What is your evidence for the claim?  Do you have enough evidence to support the claim?  Is there other evidence that would support the claim?  Is there evidence that would suggest another claim would be more appropriate?  what do you think of the quality of the evidence of the claim? |  |
|  | **Sentence Stems** |  |
|  | According to the text…  The author teaches us…  In the book, it says…  According to the scientists….  For instance, in the text… | This shows that because….  This is important because…  This proves that because…  From the evidence, it can be inferred that…  From the evidence we know that… |
|  |  |  |

The table below is a guide for you when making claims, gathering evidence and providing scientific reasoning.

Article 1: *Scientists Say Dinosaur-Killing Asteroid Made Earth's Surface Act Like Liquid*

**Claim**: What scientific claim is the author making?

**Evidence**: List all of the Evidence used to support the claim:

**Reasoning**: Explain how each piece of evidence supports the claim.

Article 2: *Right after an Asteroid Killed the Dinosaurs…*

**Claim**: What scientific claim is the author making?

**Evidence**: List all of the Evidence used to support the claim:

**Reasoning**: Explain how each piece of evidence supports the claim.