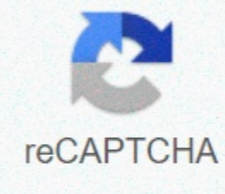




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Claim evidence reasoning middle school science

Modeling C-E-R for my students is an important first step, requiring direct instruction. I'll start by asking a pretty basic question, does air have mass? I have chosen this topic because I want to make C-E-R easy to understand and practice. Air has mass is a relatively easy concept to support with evidence and reasoning. Remember: The ultimate goal is to get my students to explain how the egg got into the plunger, but I first have to show them how to make sense of their data before they can deal with the rather daunting task. I project this onto the board when I talk about it with the class, modeling my thought process as I continue: Question: Does air mass? Claim: Air is matter and therefore has mass and takes up space. Proof: In the second link that we used in class on day 2, we found that the mass of basketball increased from 571 g to 576 g after air was pumped into it. Besides, when the air was pumped into basketball, it got bigger. We also observed that the air container started with a mass of 135 g and then, after air was released from the container, it had a mass of 132 g. Interject sentence in evidence part - State: Do you notice that I do not explain anything in this section. I am simply recording the facts of the research that we did yesterday. Like a lawyer, researchers must first gather their evidence before they can understand what it means or explain how it supports their ideas. We will explain what our evidence means in the next section. Proceed to read the reasoning section to class. Reasoning: The data show that air has mass, one of the properties of matter. If the air did not have mass then the mass of the basketball and air container would not have changed when the air was added or removed. Also, since basketball got bigger when the air was pumped into it, we know that the air takes up space, as well. If the air didn't take up space then basketball would have remained the same shape. This supports our claim that air has mass and volume. Practice 7-Engaging in arguments from evidence. Clarifying the importance of using evidence to support our explanations in science – State: If I just say here is my evidence but don't explain how it supports my claim, then no one in the scientific community will evaluate my claims. I have to explain how the evidence supports my claim. This is similar to a lawyer trying to convict a criminal. Just as a lawyer needs to gather evidence and express to the judge how it connects to their claim(s) that the defendant committed the crime, the researchers must do the same. If we as scientists only present a lot of evidence but don't explain/reason how things relate to our claims, then we don't take full advantage of explaining our findings! Using CER for the remainder of our scientific careers will help establish causal and support our claims. In this class we will always clearly explain our understanding using C-E-R. I give students this sheet as a reference for future C-E-R activities performed this year. They staple the sheet into their science notebooks. © 1996-2014, Amazon.com, Inc. or its subsidiary Guest Post Written by Sockmonkey Science Science will naturally be most elementary students. After all, observing phenomena and problem solving is how their young minds develop. I notice, however, that although my students can address big issues and come up with creative solutions, they find it difficult to formulate their conclusions scientifically. They can't tell me why or how. Justifying their work logically is a big part of what they should learn in my class, but it always seems to be the area we lack most. For a long time, I tried to follow the scientific method to help students explain their thought process. However, the steps are not always clear and also seem to vary from publisher to publisher, creating confusion for students (and teachers) as they progress to higher grades. Recently, I stumbled across the claim, evidence, reasoning (CER) model, and I feel like this simple graphic organizer based strategy is something that will really help my students write scientifically and prepare them for more rigorous lab reports in high school. What is CER? CER is a writing strategy that helps students analyze information and experiences in an organized, concise way. The process for elementary students usually begins with a question or quick from the teacher concerning a scientific concept they are familiar with. The students then use the CER method to answer the question (or make a claim) that provides both evidence and reasoning. Seems simple, doesn't it? That's because it is! Well, it should be, anyway. Students generally have no problem making a claim, or even snuggling together any evidence to support it, but when it comes to providing the reasoning that links the claim and evidence students tend to freeze up. CER Poster The good news is with proper introduction, scaffolding and practice, CER should dramatically improve your students' scientific reasoning and writing skills. The big news is that you can turn almost anything into a CER moment. In fact, many teachers propose to introduce the concept of something that is not science-related. One of the best examples I've seen of this comes from Trevor Register, which shows an Audi TV commercial, My Dad is a foreigner to introduce using CER. The commercial shows a young girl listing the evidence of why she thinks her father is an alien, and students have to decide for themselves if he really is an alien. The commercial is quite straight forward, and the content leads to a certain creative discussion from students. OK, OK... It is is but how do you use this with actual scientific concepts you teach? Here's an example. Juan brought his lunch to school in a brown paper bag. When he's done, there's nothing left in the bag. His friend Mia disagrees, however. She thinks the bag contains air. Who's right? So, this option leaves two ways to use CER. The first option is to simply give students a data table that shows the physical characteristics of the bag (such as mass and volume) when it is full of lunch as opposed to when it is only full of air. The second option, which I prefer, would allow students to conduct the survey and collect data. Invite students to measure the mass of the bag when it is full of lunch, when it is open and empty, and when it is inflated with air and closed. Then allow them to make a claim based on their own data, and provide evidence and reasoning to substantiate their claim! If you're not sure how to start incorporating CER into your classroom, Model Teaching has a great article, checklist and graphic organizer available to download for free here. I've also started creating some CER calls to address real science issues! Check it out! If you like this post, you might like these: Teaching Science with Art. Animal Adaptations for Children about the Author: Mary is the mother of two amazing little boys. When she's not changing diapers, she's mom blogging, teaching elementary science and creating science resources to share with other teachers. She's going to finish her M. Ed. later this year, and hope to become a school counselor in the near future! You can find her at Sockmonkey Science, TpT, Facebook, Instagram, and Pinterest, and even subscribe to her blog via email for some cool surprise freebies! If you like it, then pin it! Thanks for reading! Christine Weis is a passionate elementary teacher, classroom management coach, blogger, TpT writer, mother of two busy boys and founder of For The Love of Teachers, a website/blog/shop that provides tips and resources for everything elementary from writing to classroom management. Claim-Evidence-Reasoning (CER) Claim-Evidence-Reasoning: A Written Strategy to Help Students Make Connections With Science Concepts and Labs Have You Ever Had Students Respond, I Don't Know. It just did, when asked to analyze and interpret their classroom lab results? We all want our students to think like a scientist, but often they fail to connect the dots between the lab results and the science concepts. Claim-Evidence-Reasoning or CER is a written strategy that can develop a student's analytical thinking and argumentative writing skills to turn that I don't know to aha, so that's why we got these results in the lab. What exactly is CER, and how does it work? CER all with a question asked by the teacher. This question is based on a phenomenon or lab lab The student's explanation or answer, as you may have guessed, will consist of three parts: a statement, the evidence and the student's reasoning. Claim A claim is a statement that answers the question. There will usually only be one sentence in length. The claim does not contain any explanation, reasoning or evidence so it should not contain any transitional words as because. Evidence The evidence is the information used to support the claim. It can be either quantitative or qualitative depending on the issue and/or lab. The evidence can even be a computer table that the student creates. Students should only use data within their evidence that directly supports the claim. Reasoning The reasoning explains why and how the evidence supports the claim. It should include an explanation of the underlying concept of science which produced the evidence or data. INTRODUCTION TO CER IN YOUR CLASSROOM When I present how to write a CER answer in my classroom, I start with a non-scientific example. In order for students to succeed in writing a CER response, they must be able to make connections between their claim and evidence. If you start with something students are familiar with, they're more likely to fully understand what to write in each section. A non-science example I've used before is a Doritos commercial with the suggested question, what happened to the cat? This commercial is fun for students to watch, and students can easily justify their claims within their reasoning using evidence seen within the commercial. When students first write their claim-proof-reasoning answers, it's helpful to provide a template for students to organize their thoughts. You can use the CER Graphic Organizer resource with your students to help them organize their thoughts during the early phases of CER writing. Another useful technique when introducing CER to your students is collaboration. I first show the video to the class and the students work in pairs to write a statement that answers the question, what happened to the cat? Student claim example: the dog killed the cat. Student Evidence Example: There is a missing cat poster. The dog is seen burying pet tags. The dog hands the man a bag of Doritos that says you didn't see nuthin. Last, I define the reasoning section, and students write their reasoning for why and how the evidence supports the claim. We then have a class discussion over the commercial and their written CER while crafting a whole group of CER answers to answer the question, what happened to the cat? STUDENT REASONING EXAMPLE: There was a missing poster posted by the cat meaning the cat was missing. The cat was missing because the dog killed the cat and hides the murder. The dog is seen digging in dirt and covering up pet tags to hide the body of the cat. When someone is murdered, is usually hidden to hide the murder. If there are witnesses to the crime, they are often bribed to keep quiet about the crime. The man saw the dog bury the cat so he bribed the man with Doritos to keep him quiet about witnessseeing the dog dispose of the cat's body. This approach to introducing CER into your classroom provides the framework students will need to start writing CER responses in the lab setting. Argumentative reasoning is a skill that takes practice. This means that students will not write a perfect CER answer their first attempt. They will need guidance and support from you, the teacher, when they write CER responses over labs implemented in class. It is useful for the teacher to model a sample CER response with the students at the beginning. However, students should first try to write their own CER response from the lab before modeling. When discussing with the class your sample CER response make sure that you emphasize the concepts of a successful claim, evidence, and reasoning response. Use the included CER checklist to help you with this discussion. Students should use the cer graphic organizer resource as they continue to develop their writing skills and analyze their lab results. But with continued use of CER their writing should be more refined and polished. Instead of the teacher modeling a sample response, students can now peer review responses and give feedback to each other. At this point in your class, you have taught your students what it really is like to think and write like a scientist! This blog is intended to provide an overview for using the Claim-Evidence-Reasoning framework within your class. Use the resources provided for more information, implementation, and specific cer ideas in your classroom. VIEW OUR FULL RESOURCE LIBRARY A checklist for each section within a CER response is included here. It contains a detailed list of what should be included in claims, evidence, and reasoning lessons for your students. The instructor can use this checklist to model CER responses in class. The checklist ensures that students' responses have all the necessary components to write CER responses. This is a graphical organizer for students to use to help organize their thoughts when writing CER answers. It will help students see the connection between the claim, evidence and reasoning. Use the cerchecklist resource to evaluate your student's growth in writing CER response during lab activities. After the CER has been modeled at least 3 times within your classroom, a student's CER response should be written with at least 70% of CER checklist entries met. NSTA - How do you know that? Helping students write about claims and evidence – KL, and DM Martin. Claims, Evidence and Reasoning. Science and Children, vol. 48, No. 8, 52–56. A collection of resources for CER: Join Our Guest Blogger Program ModelTeaching2020-01-05T16:13:22-06:00 ModelTeaching2020-01-05T16:13:22-06:00

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