

Diagnose the problem and connect it to a misconception

Sooner or later, you will run into a practice problem that stumps you. This is actually a good thing! It allows you to refine your understanding of the material, so you'll be better prepared for the exam. At this point, it's helpful to diagnose *why* you don't understand this problem – what about your thought process isn't working?

Here are steps to follow for diagnosing a misconception:

1. Return to notes and review course material on the topic. Try sketching the overall concept or explaining it to someone else without looking at your notes. Is your sketch or explanation accurate?
2. Review your steps to the question. Look at each step individually: Was this step correct? Why did I do this part? (Think back to your sketch or explanation of the overall concept when trying to answer “why?”).
3. When you have found the step where you first made an error, identify exactly why you made the error. Did you not read the question carefully? Did you use incorrect data? Did you misunderstand the purpose of the question? Did you misunderstand the concept?
4. Try to think of other approaches, or find a similar practice problem and see if you can mirror the steps. Ask, “Why is this step correct? How will I modify my Concept Summary, analogy, etc. of the concept in light of this new information?”

Inspired by Chapter 4: Misconceptions as Barriers to Understanding Science from Science Teaching Reconsidered, A Handbook (1997).

Try timing yourself for each problem. If you exceed your time limit (20 minutes or so?) for a particular question, do your best to determine what about the problem is troubling you and then bring it to your instructor as soon as possible to talk about it and learn a new approach.

Put a star next to this type of problem and be sure to practice this type again before any tests. This is exactly why practice problems are so helpful!