**Demanding Thinking**

**Why demand disciplinary thinking   
on our assessments:**

*Disciplinary expertise is not about simply knowing factual correct material. It is about knowing that material well enough to use it in situations that require analysis and judgement. When we ask student to merely recognize (not even know) in our assessments, we lower that standards for worthwhile understanding and make our field vulnerable to automation. If retrieving or recognizing without knowing is enough, computers are usually better at it than people.*

Good exam questions demand students do the key thinking of the course, and are usually strong enough to withstand an exam being moved to an open-book environment.

**What low thinking questions look like:**

Imagine a multiple choice question that asks: *Which of the following best describes a photoelectric effect*? There are 4 answers to the exam question, but in order to get the right response, a student has two basic options:

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| **Recognize without help** | **Recognizes with help** |
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It is possible students actually understand the term or process, but to get a correct response, they don’t need to.Disciplinary thinking is not required.

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| **Idea** | **Most of the complex thinking in this example is around identifying the best source online, rather than the disciplinary thinking. The solution is a higher-level question.** |

**High-level, open book questions demand disciplinary thinking:**

Imagine a question that asks: *Explain how photoelectric effect applies to night vision.*

To get a correct response, a student must:

Analysis and judgement are required. These are disciplinary thinking.

*Not sure how to make a test that stands up to an open-book environment and growing automation?*

**Demand thinking from your students:**

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| **Clipboard Checked** | **Ask a question that requires interpretation** |
| **Have more than one variable in your question** |
| **Clarify what answering the question would equip the learner to do within the discipline** |
| **Try to answer your question in google** |

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