



# KNOWING WHAT TO DO WHEN YOU DON'T KNOW WHAT TO DO:

## How to Do HW, Take Exams & Solve Other Real Problems in the Course of Scientific Study

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### WHAT IS THE QUESTION?

A shocking realization: 'I have no idea what the question is asking!' An insult to your injury: What you're looking at isn't even the question. A reason for hope: It's no accident. You are now in research. Finding and holding onto the question is a big part of the job. A technique: Begin by trying to picture what a *wrong* answer would look like.

### WHAT IS THE CHOICE?

An recurring nightmare – experienced in broad daylight: I have no idea what to do next. A crucial technique: Trade 'I have no idea' for 'I have no idea *whether...*' and thereby trade confusion for conflict. A deflection: The choice I face is a mess of multiplicity! hardly simple! Should I go *this way* or *that way ... or yet another way*? An Aristotlean antidote: False. You must either go this way or *not* this way. Take the way which might well take you you *farther*. Make the move which seems more likely to facilitate... *another* one.



### WHAT WOULD YOU ASK DURING A SINGLE SLOT OF (fictional) FACULTY OFFICE 'MINUTES'?

A taunting tautology: You don't know what you don't know. A further fact: You can't get very far without finding out; you need to locate the first point at which you dropped the thread. An easily overlooked means: Find the last point when you were still holding on. Imagine the one question you would ask your favorite professor – if she only had 60 seconds to give.

### DO YOU FEEL DESPERATELY AND INEXPLICABLY STUCK JUST TRYING TO SHOW THAT SOMETHING RELEVANT IS TRUE?

Well, then stop doing that! How about maybe consider: sending your train of thought in a different direction... one that is, for example, *not* backwards. Scientific analysis proceeds from that which is generally (perhaps even obviously) true toward that which is particularly relevant, rather than the other way 'round. That's one reason it occasionally seems credible – even to non-scientists!

Some Samples of STEM-Speak  
An Undergraduate Underglossary of UnderStandard Overstanding  
(Abridged, Approximate and Uncomplete):

- A. Less = More.
- B. Simple = NOT Easy.  
(The opposite of easy is hard,  
but the opposite of simple is complex.)
- C. Obvious = Worth your extremely critical  
& continued attention.
- D. Show all work  
(said to the writer) = Sort, split, stack, scrub and *subtract*  
all need for work (from the reader).
- E. Repetition  
of something that seems the same = A difference that makes a difference.
- F. The notes you take during lecture = Your uniquely customized copy  
of a leaked final exam.
- G. The notes you take while studying = Your granddaughter's inheritance & heirloom.

Buy an art journal or similarly lush volume of *unlined*  
yet quite possibly flamboyant sheets of acid-free  
and fill it like a rock star.

Expound, exclaim, draw, critique, reconstruct, translate, own and err.

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Do not erase;

Cross out – if you must –

But gently.