Can We Reformulate The Scientific Method?
In “Inquiry-based Learning,” why aren’t we asking more questions?
Is there a simplified, question-based formulation of “knowledge acquisition”?

What can I observe? What do I observe?

What is observable directly without “help”?
What is observable with “help”?

Is what I observe changed by the “help”?
Am I using the “help” in such a way that it is “helpful”?

What is observable indirectly (by inference or deduction)?
Are my observations:

accurately recorded?

honestly reported?

What can I learn from these observations?

What can I conclude based on observations?
What can I say that is consistent with my observations?
What can I conclude based on inferences from my observations?

How sure am I that I am right?

If I repeated or changed my method of observation, would it change what I:

observe?

infer?

conclude?

Is what I have observed consistent with what others have observed?
Is what I have inferred consistent with what others have inferred?
Is what I have concluded consistent with what others have concluded?

Why should I care?
How Ought We to Evaluate the Model and Modeling Process?

Is the model extensible?

- What approximations were made to formulate the problem?
- What approximations were made to implement the formulation?
- How would one proceed to remove these approximations?
- What would be the expected effect of these improvements?
- Can the model be used as a sub-model for a larger system?

upper left: what we want
lower left: the usual high school/undergraduate experience
upper right: idealized research
lower right: the real world