



Teaching Science Classically: 10 Essential Principles with John D. Mays

Lesson 4a: Integration
Part A: History,
Epistemology,
Language,
Mathematics

Outline:

Integration (HELM)

- **History**
 - The history of science is science. This is how we see how science evolves.
 - How the **cycle of scientific enterprise** works is demonstrated clearly in the history of science.
 - Copernican Revolution
- **Epistemology**
 - Epistemology is the study of how we know what we know.
 - Divine revelation and direct observation
 - Science is the process of using experiments, observations, and logical reasoning to develop mental models of the world. A theory is a model.
 - What is a fact? A fact is proposition that is based on a lot of evidence. It is correct so far as we know. It is provisional, it is possible that it will change.
- **Language**
 - God created the world by speaking.
 - Christ is the universal Logos of God.
 - Humans are the only species of language users.
 - Our teaching needs to involve language at every turn.
 - We need to require students to use language all the time.
 - Students need to construct knowledge from scratch.
 - We need to check spelling, punctuation, and grammar as well as accuracy of students.
 - Lab reports should be written from scratch.
- **Mathematics**
 - Students can do a lot more than what we typically ask of them.
 - They need to do the math in science, they need the exercise.
 - Doing math adds many dimensions to the students understanding of modelling nature.