



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

Lesson 10: Tools

Outline:

Tools

- Thinking of matter in scientific terms
- Knowing unit systems and performing unit conversions.
- Describing physical laws in terms of mathematical relationships between variables
- Knowing why the Scientific Method has led to centuries of successful experimentation
 - They should know what it is for and why it has been so successful
- Understanding the difference between accuracy and precision
 - Precision refers to the degree of resolution you have.
 - Accuracy is about how much error there is in a measurement.
- Formulating a quantitative hypothesis.
- Documenting experiments with a lab journal
- Writing an effective lab report from scratch
- Using computer tools to design tables and graphs
 - By ninth grade they should be working on the computer.
- Manipulating and representing data; computing percent difference
- Identify factors contributing to percent difference
- Estimating uncertainty in measurements
- Using correct measurement techniques and correct equipment handling procedures
- Exploring uses of unfamiliar equipment
- Creating scientific graphs and using them to compare theoretical and experimental values and trends
- Identifying and handling outliers
- Formulating solution strategies when they are not immediately apparent.
- Applying mathematics to solving problems.
- Using mental math to form estimates
- Recognizing when solutions or data are unreasonable
- Appreciating the level of effort needed to gain proficiency in a new area of study