

Investigating Science

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Abstract of Workshop

It is strange that so many science students do not know what science is. They can often regurgitate “science is a process of observing, formulating a hypothesis, etc.” but they are unable to compare and contrast the concepts of a scientific fact, theory or law. The students’ paradigm nearly always falls apart when they are asked to square their ideas of facts, theories and laws with the statement “not yet proven false.” I recently began questioning professional scientists about these concepts and was alarmed to discover that they too did not have a firm grasp of these ideas or worse. In this workshop participants will determine what is in a box without opening the box. They will do this by designing experiments and testing their hypothesis against controls. Once participants have come to a conclusion for themselves, they then test each other’s ideas and either reject them or fail to reject them. At the end of the lab, students make a statement about what is in the box. Because the students never learn what is in the box for certain, they are stuck with the statement “Based on all of our experiments, we think the object is X.” For the rest of their college days I can ask them “yes, but what was in the box?” when we are having a discussion about scientific facts. Not only do they remember what was in the box, but also they understand the statement “not yet proven false.”