

Teece Fellowship Proposal Summer 2004

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I. Description

Over the course of the summer I would like to develop professionally in three main areas, as a physics teacher, as a computer user and as a curriculum developer. In the first two areas I have extensive experience and wish to further my knowledge base while the only curriculum development I've done has been through the Bentley minisemesters.

As a physics teacher I wish to enroll in the Exploratorium's Teacher Institute program (<http://www.exploratorium.com/ti/>). This is a six week program that has physics teachers comparing teaching techniques, building demos and allows me as an alumnus to return to the Exploratorium shop and use their tools for building demos throughout the school year. From what I hear it is exciting, challenging and a lot of fun. This program is at no cost to Bentley and is worth 6 graduate credits.

As a computer user I would like to learn the program AutoCAD. AutoCAD is a computer aided drafting program that is used to design everything from toothbrushes to skyscrapers. This program is extremely powerful and extremely complex. My aim is to be able to use AutoCAD to design some things for the physics room, create some models that I can display on a projector in the classroom as well as satisfying some of my own intellectual curiosity.

Thirdly I am developing a new course for the science department entitled "Science Workshop." This class will be an elective offered through the science department which focuses on how things work. The text will be *The New Way Things Work* by David MacCaulay and class will consist of some lectures, labs, long term projects and students teaching a class at the lower school much as students did last year in my minisemester class. Over the summer I wish to develop an accompanying supplement to the MacCaulay book which further illustrates principles of physics as well as a lab manual. These labs will not be typical "do and measure" labs but rather understand and build labs.

II. Costs

Exploratorium's Teachers Institute - \$0 (application pending)

Transportation to Exploratorium – \$360

(\$0.30/mile x 33 miles/trip x 30 trips + \$2 toll/trip x30 trips)

Graduate credit fee – not available

AutoDesk Inventor/AutoCAD program - \$475 (academic version)

(For reference the full version is \$2,800)

AutoCAD courses – \$1590 (ideally 2 classes at SFSU at \$795 each)

Science Workshop Research

Buying old speakers, stereos, computers, motors, etc. ~ \$250

Buying materials and tools to create the lab toolbox ~ \$250

The above materials will go towards researching a cost effective lab toolbox and creating models of engines, combination locks and other machines.

Total – \$2,925

III. Summary

It is unclear at this point how inexpensively I will be able to put the Science Workshop course together. Obviously when creating course sets of materials we want to keep costs down and while I'm able to do some labs like building speakers for about \$2/person it is unclear at this point how cheaply I will be able to fill the semester with labs, as the key is figuring out which inexpensive objects are adequate substitutes (in the case of speakers it becomes Starbucks Frappuccino cups). What is particularly exciting about those three summer projects is that they complement each other well. The Exploratorium Teachers Institute will be an ideal environment to bounce ideas as well as gather them for the Science Workshop class while the computer modeling class will allow me to quickly construct, examine and improve prototypes before actually building things for the classroom.

If you need any additional information to make your decision, send me an email. I've attached a draft of the Science Workshop elective and am happy to answer any questions about the Exploratorium or AutoCAD.

Thank you for your consideration,

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