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EDU 272
Artifact #5

Create a set of learning activities appropriate for the grade and subject level you intend to teach. Identify ONE concept and Arizona State Standard that you will focus on. Create learning activities that address EACH of Gardner's intelligences. Include preparation, materials, and procedures for each of the activities.

This document, along with InterestWorksheet.doc and InterestSpreadsheet.xls, comprise a set of learning activities appropriate for high school students in a technology education course or a math course with a technology component. The specific standard addressed is Technology Standard 3 (3T, Technology Productivity Tools), Proficiency (P, grades 9-12), 2 (Use a variety of technology tools for data collection and analysis to support a decision), PO 2 (Create and use a spreadsheet to analyze variables): 3T-P2 PO 2. The loan rate suggestion is targeted in particular, but additional exercises are included to demonstrate how the same equations and spreadsheet can be applied to music and nature so that those intelligences can be addressed. To take advantage of interpersonal intelligence, the activity should be performed in small groups.

It is assumed and is therefore a prerequisite that students understand the basic mathematics of interest rates, balance=principle*(1+rate)^{term}, and can work handily (kinesthetically) with Excel. Preparation includes ensuring that computers are available in the right location at the right time, installing Excel and configuring its security settings to allow running of macros, placing a copy of the Excel spreadsheet in a central location so that it can be copied to student directories, and having a procedure in place for dividing students into groups. Note that the musical portion of the spreadsheet works only on a PC. The worksheet gives data for two different credit cards, but if the students or teacher can bring in actual junk mail credit card offers, the exercise will be more (inter- or intra-) personal.

Materials required are electronic copies of the Excel spreadsheet for each group and printouts of the Word worksheet for individuals. The worksheet can be printed two sided. Each student should have a copy even if only one answer is turned in for the group. This ensures that all the equations (logical-mathematical) and words (linguistic) are available to all.

Groups of eight are too large for a single computer, but since the activity involves all eight intelligences, students will need to exercise more than one each. The procedure begins with dividing students into groups of approximately three members. The single keyboard and mouse should probably go to the kinesthetic expert, who will be best served by the opportunity. Students are allowed to choose their own informal roles including calculator, scribe, coordinator, and reflector. The groups then set out to experiment with the spreadsheet and complete the worksheet. After worksheets have been completed, the class should discuss any issues that have arisen, especially answers to the open ended, reflective questions 1f and 2g. How each kind of intelligence is addressed and the role each best applies to is described briefly now.

Logical-mathematical: The mathematician in the role of "calculator" is likely to understand the formulas explained on the worksheet and used in the spreadsheet. The mathematician should help ensure that others do as well, demonstrating if necessary by calculating a row by hand.

Linguistic: The linguist can read the worksheet questions out loud and as "scribe" record answers for the group, possibly reformulating them for clarity. Close contact with the words will

help the linguist understand the material. If students come across any unknown vocabulary words, the linguist may be able to define them.

Musical: The worksheet includes a musical interlude with questions best interpreted and explained by a musician. This scaffolding may help the musician make sense of the equations and in any case encourage personal interest.

Spatial: Key spreadsheet columns are graphed and updated on the fly as variables are changed. A student with high spatial intelligence should be able to follow how the graph is transformed as term and variables change.

Bodily-kinesthetic: The scroll bars are included not just for convenience, but to take advantage of kinesthetic intelligence. The student can directly manipulate the variables and get a feel for how they influence the loan. This person is probably the best candidate for typist. The formulas will be better learned this way than by hearing or seeing them.

Interpersonal: The student with the best interpersonal intelligence may want to coordinate everyone else. This can include collecting potentially differing opinions on worksheet answers, finding a consensus, and forwarding it to the scribe.

Intrapersonal: The worksheet includes thoughtful questions (1f and 2g in particular) which encourage introspection by a "reflector."

Naturalist: A biological application is included with the worksheet along with questions about the well being of organisms and how they relate to each other.