Designing a Science Tool Kit

In this inquiry you will develop a science kit, called a "science tool kit." It should contain a lesson plan and all the equipment needed for a class of twenty-five students.

Materials

- A container such as a shoebox
- Hands-on equipment gathered for the tool kit

Procedures

1. Select a middle school or high school science concept or topic and use it as the focus for your science tool kit design. The ideas for your tool kit should be contained in a lesson plan, which also should be part of the kit. If you design a data table, charts, or graphs, or specialized laboratory procedures, be sure to include them in the kit.
2. Develop a lesson plan for your tool kit that contains the following elements:
   a. title of the science tool kit
   b. Goals
   c. Materials
   d. Procedures: You may want to use the constructivist sequence that was introduced in Chapters 6 and 7. The four phases include invitation, exploration, explanation, and take action.
3. Field-test your science tool kit with a group of students or, if that is not possible, present it to your peers.

Minds-On Strategies

1. How can this approach to curriculum design be useful as you begin your teaching career?
2. Examine one or more "commercial" kits (see Table 10.7) and think about the kinds of activities you could develop with the materials contained in the kits.

Table 10.7 Science Tool Kits

Elements of the Science Tool Kit	Astronomy Tool Kit: Comet in a Box, by Anne Gunn	Biology Tool Kit: Create a Life Form, by Lissa Blankenship
Goal	This lesson gives students an understanding of comets and an idea of what landforms are created when objects collide with a planet's surface.	To gain an understanding of adaptation. To analyze a planet and create a life form that could live on that planet. Evaluate how well a life form would live in certain conditions.
Materials	Aluminum tray	Lots of Styrofoam packing peanuts
	Styrofoam balls	Cottonballs
	Flour	Toothpicks
	Beads	Craft (Popsicle) sticks
	Cocoa	Pipe cleaners
	Dice	Styrofoam egg trays, cut out each egg cup
	Marbles	Craft eyes

Table 10.7 (*cont'd*)

Elements of the Science Tool Kit	Astronomy Tool Kit: Comet in a Box, by Anne Gunn	Biology Tool Kit: Create a Life Form, by Lissa Blankenship
	Recording chart	Construction paper, cut in 3-inch squares
		Bottles of glue and glue sticks
		Markers
		Crayons
		Planet cards from NASA (may need copies)
		Note cards with planet assignments written on them
		Plastic bags
		Assembly: Place six to eight Styrofoam peanuts, two cottonballs, six toothpicks, three craft sticks, one pipe cleaner, one egg cup, two craft eyes, and four squares of different colors of construction paper in a plastic bag and repeat for each pair of students you have. Write the name of one planet on each note card (except earth) and the details of the pair's assignment (create life form, write a "natural history", and describe planet's environment), three sets of eight planets (or however many you need). Place the note card in each bag.
Synopsis of Lesson	The students will then create their own "surface of Jupiter" by layering the cocoa and flour in their aluminum trays (in groups of three or four). They will experiment by dropping the different weighted and sized objects onto the surface and recording their observations in their chart.	Students have the class period to create the life form, write the "natural history" of this life form, and describe their planet's environment. The "natural history" should include what it eats, where on the planet it resides, and describe the habitat and how the life form's body allows it to live on the planet. In addition, the students should describe the planet's environment, including the surface, atmosphere, magnetic field, surface pressure, geologic formations, temperature differences, seasonal changes, and weather patterns. The students will present their life form, "natural history," and their planet's environment to the class.

Source: Anne Gunn and Lissa Blankenship, graduates of the TEEMS Program, Georgia State University.