



## The Great Diaper Dilemma

*The environmental impact of disposable diapers is often hotly debated. Students will conduct research via the World Wide Web as well as an experiment to reach their own conclusions regarding diapers and the environment. This lesson should lead to more environmental awareness and discussion.*

### **HYPOTHESIS:**

How many ways do disposable diapers seriously impact the environment?

### **Primary Learning Outcome:**

Students will learn what disposable diapers are made of, how they are manufactured, and the environmental concerns surrounding their use.

- *How many disposable diapers does one child require?*
- *What percentage of landfills is taken up by disposable diapers?*
- *How does a disposable diaper work?*
- *What environmental concerns are there surrounding the manufacture of disposable diapers?*
- *How long does it take for one diaper to decompose?*

### **Assessed GPS:**

#### **SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.**

- Exhibit the above traits in their own scientific activities.
- Recognize that different explanations often can be given for the same evidence.
- Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

#### **SCSh3. Students will identify and investigate problems scientifically.**

- Suggest reasonable hypotheses for identified problems.
- Collect, organize and record appropriate data.
- Graphically compare and analyze data points and/or summary statistics.

#### **SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.**

- Develop and use systematic procedures for recording and organizing information.
- Use technology to produce tables and graphs.

#### **SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.**

- Trace the source on any large disparity between estimated and calculated answers to problems.
- Consider possible effects of measurement errors on calculations.
- Recognize the relationship between accuracy and precision.
- Express appropriate numbers of significant figures for calculated data, using scientific

notation where appropriate.

e. Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.

**SCSh6. Students will communicate scientific investigations and information clearly.**

- a. Write clear, coherent laboratory reports related to scientific investigations.
- b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.
- c. Use data as evidence to support scientific arguments and claims in written or oral presentations.
- d. Participate in group discussions of scientific investigation and current scientific issues.

**SCSh8. Students will understand important features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

- a. Scientific investigators control the conditions of their experiments in order to produce valuable data.
- b. Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.
- c. Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.

**SCSh9. Students will enhance reading in all curriculum areas by:**

- Read technical texts related to various subject areas.
  - Respond to a variety of texts in multiple modes of discourse.
  - Relate messages and themes from one subject area to messages and themes in another area.
  - Recognize the features of disciplinary texts.
- c. Building vocabulary knowledge
    - Demonstrate an understanding of contextual vocabulary in various subjects.
    - Use content vocabulary in writing and speaking.
    - Explore understanding of new words found in subject area texts.
  - d. Establishing context
    - Determine strategies for finding content and contextual meaning for unknown words

**Total Duration:**

**1.5 hours background** (use this time to introduce the lesson and to allow students internet access)

**1 hour lab time** (diaper dissection and discussion of research findings, set up decomposition experiment)

**Several days** (to observe how long it takes for diapers to decompose)

**Materials and Equipment:**

- Several clean disposable diapers
- Plastic cups of water

**Technology Connection:**

- Computers with internet access

**Procedures:****Step One**

Students should be divided into small groups and given research assignments. One group should be responsible for finding the components of a disposable diaper, one group should find out information regarding how biodegradable they are (how many are used per baby per year, how long they exist in landfills, how many tons are generated per year, etc.), one group should research the manufacture of disposable diapers (are there environmental concerns here?), one group should research cloth diapers (what they are made of, issues concerning farming of cotton), and one group should research the environmental impact of cloth diapers (how much water is used to wash them, is chlorine bleach an issue).

**Step Two**

Pour the cup of water into the diaper. Take the diaper apart and note the components. How do the components change with the addition of water? Take several wet, intact diapers outside and leave them, noting the day and time. Observe over time and note changes.

**Estimated Time:**

**.5 hour**

**Assessment:**

Students should participate in a discussion about the issues surrounding diapers and the environment. The instructor should guide the discussion using the issues posed in the aforementioned “Step One”. Students could be instructed to write a position paper regarding their views about disposable diapers, using information from their research whenever possible.

**Extension:**

A classroom debate could be staged, with one half of the class for the use of disposables and one half against. Each group would be asked a question by the instructor (see ‘Step One’) and would be given a minute or so to formulate a response. Answers should be based upon specific research (John Smith states in 1989 that...) and points awarded to the team that answers first.

*Students could also be required to build a better diaper, taking into consideration aspects such as convenience, cost of manufacture, and the environmental issues discussed previously.*