



The Diaper Dilemma

Lesson Topic

Sustainability- Human Impacts - Waste Management

RIEL Biology Element

Sociopolitical Consciousness

Time Required

Three class periods

Standards Addressed

- SC.912.L.17.14: Assess the need for adequate waste management strategies
- SC.912.L.17.12: Discuss the political, social, and environmental consequences of sustainable use of land.
- HE.912.C.1.3. Evaluate how the environment and personal health are interrelated.

Science and Engineering Practice

- Planning & carrying out investigations.
- Analyzing and interpreting data

Lesson Summary

Students will learn about waste management and sustainability; they will act as scientists and engineers understanding how product development and new technologies can lead to less waste and environmental impacts. Students will achieve this objective by researching waste management practices by focusing on disposable diapers. Students will take what they have learned about disposable vs cloth diapers and come up with ideas to design and engineer a “better” diaper.

Educating students about human impacts and waste management through examining the issues surrounding disposable diapers. Activating students’ personal connection with disposable diapers to connect and expand the impacts involved with waste management and sustainability.

Students will analyze and interpret data from new waste management vocabulary acquisition, videos, and a hands-on lab examining disposable vs cloth diapers. Students will carry out an engineering investigation to design a “better” disposable diaper.

Materials

[Diaper Dilemma PowerPoint Slides](#)

Video Link: [Changing disposable diapers: No plastic. No landfill. No waste.](#)

Video Link: [The Great Pacific Garbage Patch](#)

Graphic Organizer – 1 per student

Cloth Diapers (thick cloth rags can substitute) - 1 per group.

Disposable Diapers – 1 per group

Gallon Jugs or Buckets of water -- 1 per group

Food coloring for water (optional)

Paper towels

Scissors – 1 or 2 per group

Plastic grocery bag – 1 per group

Permanent marker – 1 per group

Beakers or Measuring Cups – 1 per group

3 -5 Extra disposable diapers to use in engagement “hook”

3 -5 Different Candy Bars

Optional: [poopoopaper](#)

Before the Activity

For homework have, students ask their parents/guardians: (If the student is too embarrassed to ask about themselves have them ask about their siblings)

- How many diapers did they use & for how long?
- What is their worst diaper-changing story?
- Ask the class—How many have ever changed a diaper?

Lesson Activities

- 1. Day 1.** To open the lesson with an engagement hook squash 3-5 different candy bars in 3-5 different disposable diapers, and have students sniff to guess the type of candy bar. Optional prize to the students that guess them all correctly. Then, using the *Vocabulary* side of the graphic organizer have students fill in vocabulary using the PowerPoint. Show the 2 videos that are linked in the vocabulary section of PowerPoint.
- 2. Day 2.** Have students get out their graphic organizer from previous day. Students will be seated in lab groups of 2-4 and will complete pre-lab questions using PowerPoint slides.
 - a. Students will get The Diaper Dilemma list of lab supplies for their group and will follow instructions on the *Lab* side of the graphic organizer.
 - b. Objective: Students will use water to see how many cups each diaper will hold before leaking
 - c. Students will record this information on their lab sheets.
 - d. Students will then deconstruct their disposable diapers and cut and save samples of each of the different materials their disposable diapers are made of and put these samples in their labeled bags for use as reference on Day 3.
 - e. Students will throw out the remaining pieces of disposable diapers.
 - f. Optional - teachers can collect cloth diapers to dry overnight and be handed back out as a reference for Day.

Content Learning Objectives

- Evaluate or refine a technological solution that reduces the impacts of human activities on natural systems.
- Constructing Explanations and Designing Solutions
- Design or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Teacher Notes

Modification Option:

Vocabulary can be completed for homework instead of on day 1 in class.

Lesson Activities

- Day 3.** Begin class by discussing the results from Day 2 of the lab and discuss the the pros and cons of why parents choose disposable diapers over natural cloth diapers. Give back student sample bags of disposable diaper materials (and cloth diaper if desired). Using the *Product Engineering* page of the graphic organizer have students research, design, and diagram improved disposable diapers.



Name: _____

Date: _____

The Diaper Dilemma Graphic Organizer

Vocabulary

Word	Definition	Example

Pre-Lab Questions

1. How many diapers did you use?
2. What was the total cost of your diapers?
3. Where did your diapers go?
4. Do your old diapers still exist?

Background Information

1. Disposable diapers take at least _____ to decompose
2. Disposable diapers for a single baby will cost around _____ a month and _____
3. Babies will use about _____ during their _____ of life.
4. _____ of mothers in the U.S. solely use disposable diapers for their children
5. Over _____ % of disposable diapers end up in landfills
6. Cotton diapers can be re-used between ____ and ____ times
7. Cotton (or natural fiber diapers) take _____ to decompose

Calculate

What was the estimated cost of your diapers?

Predict

How many cups of water do you think each diaper will hold?

1. Diaper – Disposable
2. Diaper – Cloth

----- Stop here – Follow the instructions on the PowerPoint Slides -----

Answer

How many cups of water did each diaper hold?

1. Diaper – Disposable
2. Diaper – Cloth

Results

1. Which diaper holds the most liquid?
2. Why do you think most parents prefer disposable diapers?
3. How can you design and engineer a better diaper?
4. What materials could you use or invent for use in this diaper?

Product Engineering

1. What is the problem with existing disposable diapers?
2. What is one idea that can solve this problem?
3. What type of diaper are you going to design? (make sure you include a vocabulary word from your lab sheet)
4. List the materials in your existing disposable diaper:
5. List the new materials or features of your “better” disposable diaper:
6. What must your new diaper be able to do?
7. Draw and label a diagram of your new diaper:
8. Write a product description of your new diaper so you can sell it – and parents will buy it.