

Use Less Stuff



OBJECTIVES:

Students will:

1. define “reduce” and describe at least three ways to decrease the use of paper items.
2. form a hypothesis and collect data using a survey to support or refute their hypothesis.



STANDARDS: Science



SKILLS: Analysis, classification, description, problem solving



SETTING: Homework assignment and Classroom



TIME: 60 minutes over two days



VOCABULARY:
Reduce

Introduction

Overview:

In this lesson, students will bring in paper waste items from home. They will work in groups to brainstorm ways to reduce the amount of paper they use by describing alternative materials that can be used in place of paper products.

Teacher Background:

In 2000, paper accounted for 23 percent of waste by weight generated in Alameda County that ends up in the landfill. When paper is thrown away, many resources required to produce the paper including wood, pulp, water and energy are lost. Trees are one of the many natural resources harvested to make paper. In the United States, we produce one-quarter of the world’s paper and consume almost 30 percent of forestry products including paper. Americans alone used an average of 718 pounds of paper products in the year 2000.¹

The process for making paper utilizes other resources besides trees. The manufacturing process requires oil, electricity, coal and water. Many chemicals such as chlorine are often used in the bleaching process. Recycling paper reduces the use of these



resources and reduces pollution; however, recycled paper fibers break down over time, so eventually new trees must be harvested and added to the paper production process.

Materials:

Students:

- “Use Less Stuff Homework” sheet (one per student)
- “Paper Savers Class Survey” worksheet (one per student)

Teacher:

- “Use Less Stuff Homework” sheet overhead
- “Paper Savers Class Survey” worksheet overhead
- Poster paper (one sheet per group of five students)
- Rubric overhead
- Rubrics (one per student)

Preparation:

Assign students to complete the homework activity the day before the lesson. Be prepared to divide the class into groups of five.

¹ American Forest and Paper Association’s article “Forest Health” at www.afandpa.org/Content/NavigationMenu/Forestry/Forestry_Facts_and_Figures/forest_health.pdf



ACTIVITY

Discussion

1. Tell the students they will be learning about the top of the 4Rs hierarchy: Reduce. Ask whether they can define “reduce” (to decrease the amount of waste generated). Put the definition on the board.
2. Tell the students that paper makes up 23 percent of what we find in the landfill. Ask the students what they know about paper and how it is made. What is it made from? What other resources are required to make paper? Ask students to share their answers with the class.
3. Tell the students they will be learning about ways to reduce the amount of paper they use at home and school.

Procedure

For Homework:

1. Put up the overhead of the “Use Less Stuff Homework” sheet.
2. Tell students that for homework, they will identify five different paper items that are discarded in the family garbage. Ask students to give some examples (paper plates, paper cups, newspaper, sheets of paper in a letter, paper towels). They will fill out only the first column “Name of paper item” on their homework sheet.
3. Post the overhead of the rubric and review with the class the expectations for this lesson.
4. Pass out the “Use Less Stuff Homework” sheet to each student.

In-Class:

1. Put students in groups of four to share their lists of items and try to identify ways to use less paper or replace the use of the paper items with another more durable item. (For example, ceramic plates can replace paper plates and can be washed for reuse. Paper towels can be replaced by cloth towels that are washed for reuse. Newspapers can be replaced by obtaining the news on TV or on a computer. Paper that has writing on one side can be saved for reuse on the backside. When using a computer, print only the section that is needed; do not print the entire document.)
2. Now that the students have analyzed their paper use at home, they will examine how paper is used in the classroom by conducting a survey to determine whether paper use is reduced or conserved in the classroom.
3. Ask students to think about how paper is used in the classroom. Do they think their class makes an effort to reduce the amount of paper used? Explain that they will

form a hypothesis which, is a testable scientific guess, about whether students use less paper or conserve paper in their classroom based on their own knowledge and observations of how classmates use paper.

4. Ask each student to write a hypothesis on scratch paper describing whether they think their class uses paper wisely. For example, “I think my class conserves paper because I often see students using both sides of a piece of paper before recycling it” or “I think paper is wasted in the classroom.”
5. Ask the students to share ideas about how they will find the answer to their hypothesis.
6. Explain that each student will investigate the paper-using habits of a classmate in order to answer their hypotheses. They will conduct a survey to gather data, which will support or refute their hypotheses.
7. Organize students into pairs and pass out a “Paper Savers Class Survey” to each student. Have the students interview each other and complete the survey.
8. Collect the surveys and record the class results on the “Paper Savers Class Survey” overhead.

Wrap-Up

1. Once you have recorded all the class data on the overhead, organize the students into groups of five and give each group a copy of one survey question and the class results.
2. Have each group create a graph that shows their survey results on a large piece of paper. Then have each group present their graph and explain the results to the class.
3. Once all the groups have presented their results, have the students come back together as a class and decide whether the poster results support or refute their hypothesis. Ask students to describe why they came to this conclusion.
4. Ask students to come up with solutions for how they can reduce paper use in the classroom or share ways they are currently using less paper.
5. Record their ideas on a poster that can be placed on a wall in the classroom.

Final Assessment Idea

Ask students to explain why reduce is placed at the top of the 4Rs hierarchy and share at least one way they will reduce the amount of paper they use at home or school.



RESOURCES

Extensions:

Assign students to research types of paper that they can recycle in their community using the *Alameda County Recycling Guide*.

Teacher Materials:

California State Content Standards

The standards below represent broad academic concepts. This lesson provides connections to these academic concepts through hands-on activities and exploration. This lesson is not designed for a student to master the concepts presented in the standards. Additional lessons in the classroom that build on this lesson or the standard(s) ensure that students will have the opportunity to master these concepts.

SCIENCE	CONTENT STANDARDS
Grade 4	Investigation and Experimentation 6.a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.
Grade 5	Investigation and Experimentation 6.h. Students will draw conclusions based on scientific evidence and indicate whether further information is needed to support a specific conclusion.





Use Less Stuff Rubric

A rubric is a scoring tool that defines the criteria by which a student's work will be evaluated. This rubric is provided to assist you in setting expectations for students and assessing their performance and engagement during the lesson based on specific tasks. Ideally, a rubric is developed with the cooperation of the students. Two blank rows have been provided for you and your class to develop and add your own assessment criteria.

CATEGORY	4	3	2	1
Homework	Student identifies five different paper items.	Student identifies four different paper items.	Student identifies three different paper items.	Student identifies two different paper items.
Group Work	Students provide five different ideas for reducing the paper items.	Students provide four different ideas for reducing the paper items.	Students provide three different ideas for reducing the paper items.	Students provide two different ideas for reducing the paper items.
Generate Hypothesis	Student clearly states a hypothesis.	Student attempts to write a hypothesis.	Student has difficulty writing a hypothesis.	Student does not write a hypothesis.





Teacher

Paper Savers Class Survey

Directions: Record the class data below.

1. I recycle paper after I am done using it.

How many students answered:

almost always _____ **total**

sometimes _____ **total**

never _____ **total**

2. When I take my lunch to school, I use a lunch box that I can reuse instead of using a paper bag.

How many students answered:

almost always _____ **total**

sometimes _____ **total**

never _____ **total**

3. I use both sides of a piece of paper before recycling it.

How many students answered:

almost always _____ **total**

sometimes _____ **total**

never _____ **total**

4. I print lots of stuff from the Internet that I later throw away.

How many students answered:

almost always _____ **total**

sometimes _____ **total**

never _____ **total**

5. I often grab more paper towels than I end up using after washing my hands in the restroom.

How many students answered:

almost always _____ **total**

sometimes _____ **total**

never _____ **total**





Paper Savers Class Survey

Directions: Read the statements below to your partner and circle their answers.

1. I recycle paper after I am done using it.

almost always _____ sometimes _____ never _____

2. When I take my lunch to school, I use a lunch box that I can reuse instead of using a paper bag.
How many students answered:

almost always _____ sometimes _____ never _____

3. I use both sides of a piece of paper before recycling it.

almost always _____ sometimes _____ never _____

4. I print lots of stuff from the Internet that I later throw away.

almost always _____ sometimes _____ never _____

5. I often grab more paper towels than I end up using after washing my hands in the restroom.

almost always _____ sometimes _____ never _____

Name: _____ Date: _____





Student

Use Less Stuff Homework

Directions:

Homework: Identify up to five paper items that are thrown away at home.

Describe how each paper item is used.

Group Work: Identify ways to use less paper or replace the paper item with something more durable.

Name of paper item	Use of paper item	How could you reduce the use of this paper item?
1		
2		
3		
4		
5		

Name: _____

Date: _____



DEFINITIONS

Vocabulary:

Reduce: to use less “stuff” and produce less waste.

