

Recycling & Conservation

Grade 3

RECYCLING/CONSERVATIONOVERVIEW: In this unit students will be learning about natural resources and how these resources provide us with things we need to live. Students will have an opportunity to develop ideas on how to conserve natural resources by reducing, reusing, recycling, and replacing.

SCIENCE CONTENT STANDARD 3.4

<p>CONCEPTUAL THEME:</p> <p><i>Science and Technology in Society - How do science and technology affect the quality of our lives?</i></p> <p>CONTENT STANDARD:</p> <p>3.4 – Earth materials provide resources for all living things, but these resources are limited and should be conserved.</p>	<p>GRADE-LEVEL CONCEPT: ♦ Decisions made by individuals can impact the global supply of many resources.</p> <p>GRADE-LEVEL EXPECTATIONS:</p> <ol style="list-style-type: none"> 1. Earth materials that occur in nature include rocks, minerals, soils, water and the gases of the atmosphere. Earth materials are natural resources that provide us with things we need to live, including food, clothing, water, air, shelter, land and energy. 2. Some natural resources are useful to people in their raw form (for example, fresh water, soil or air); other natural resources must be modified to meet human needs (for example, petroleum must be extracted from rocks and refined into gasoline, heating oil or plastics; wood from trees must be processed to make paper). 3. The supply of many natural resources such as fossil fuels, metals, fresh water and fertile soil is limited; once they are used up or contaminated they are difficult or impossible to replace. 4. Human actions can affect the survival of plants and animals. The products of the fuels people burn affect the quality of the air. Waste and chemicals from factories, farms, lawns and streets affect the quality of the water and soil. 5. Humans can extend the use of some natural resources by <u>reducing</u> the amounts they use (for example, driving less to reduce the amount of gasoline used; turning off faucets when not in use). 6. Humans can extend the use of some natural resources by <u>recycling</u>, or collecting used materials and processing them into new materials (for example, collecting waste paper or plastic bottles and making them into new products). 7. Humans can extend the use of some natural resources by <u>reusing</u> products instead of buying new ones (for example, washing 	<p>CMT EXPECTED PERFORMANCES</p> <p>B7 Describe how earth materials can be conserved by reducing the quantities used, and by reusing and recycling materials rather than discarding them.</p>
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	<p>containers that food is packaged in and using them again to store different foods or objects).</p> <p>8. Humans can extend the use of some natural resources by <u>replacing</u> what they use (for example, planting new trees to replace those that are cut for lumber or paper; purifying dirty water from storm drains and discharging clean water back into a river).</p> <p>KEY SCIENCE VOCABULARY: natural resources, recycle</p>	
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CONCEPTS: Need to know about...

- Many of our natural resources are limited and once they are used up they will be impossible to replace
- People can extend the use of natural resources by reusing, reducing, and recycling
- Natural resources are used in our everyday lives, whether in its raw form or after it is processed
- Conservation is the key to saving our natural resources

SKILLS: Be able to do...

- Observing, describing, graphing, and recording properties of paper
- Predicting and comparing properties of paper
- Communicate observations through writing
- Identify different sources and kinds of pollution
- Develop ways to conserve our natural resources

MISCONCEPTIONS:

- We can never run out of natural resources.
If we do not do our part to help conserve our natural resources these resources can become impossible to replace.

BIG IDEA:

There are many earth materials in nature which are “natural resources” . From these natural resources we are able to make things we need in order to live. However, there is a limited supply of natural resources. It is our responsibility to keep our natural resources from becoming depleted. Therefore, we need to conserve these resources. We can do this by reusing, reducing, and recycling.

Cumulative questions:

What are natural resources and what can we do to conserve them?

ESSENTIAL QUESTIONS TO GUIDE INSTRUCTION AND ASSESSMENT:

- What are natural resources?
- How can we reduce the amount of natural resources we use?
- How can we reuse products to extend the use of natural resources?
- What can we recycle in order to conserve our natural resources?
- How can we replace some of our natural resources?

MATH SKILLS TAUGHT/USED:

- Graphing
- Measuring

TOPICS OR CONTEXT:

LESSON 1: Pre-Assessment

- Students identify what they know about Recycling and Conservation

Embedded Task

LESSON 2:

Day 1: Observation of paper types and completion of chart

- Students will explore some of the properties of different kinds of paper
- Students record observations in an organized table
- Students make predictions on absorbency

LESSON 3:

Day 2: Experiment #1 – Data Collection

- Students compare different types of paper to find out which one holds the most water

LESSON 4:

Day 3: Experiment #1 – Data Analysis, Graphing, and Discussion

- Students make a bar graph comparing how many squares of each paper type were needed to absorb 25 mL of water
- Students explain in writing how they came up with results

LESSON 5:

Day 4: Experiment #2 – Planning – Which Paper Towel Brand is Best?

- Students discuss ways to define the “best” paper product

- Students observe and compare the properties of different brands of paper towels
- Students predict which towel brand will be the most absorbent
- Students plan an experiment to compare different brands of paper towels to find out which brand is the most absorbent
- Students write out steps they will use in the experiment

LESSON 6

Day 5: Experiment #2 – Data Collection

- Students perform experiment using written steps (from Day 4)
- Students record data on an organized table

LESSON 7

Day 6: Experiment #2 – Data Analysis and Discussion

- Students analyze and report data
- Students explain their conclusion in writing using data to support their conclusion
- Students make a bar graph to record their data

LESSON 8: Embedded Task

Day 7: Communicate Your Learning

- Students write a letter to family member explaining their experiment and the outcome along with recommendation

LESSON 9: Hooray for Trees!

- Students will describe the ways in which trees benefit people
- Students will make pictures or models depicting how trees may be used to improve the human-made environment

LESSON 10: We Need Trees

- Students will discuss and analyze a fictional story relating to the proper and improper use of natural resources.
- Students examine the importance of conserving natural resources.

LESSON 11: Stop the Pollution!

- Students will identify different kinds of pollution
- Students will identify sources of pollution
- Students will discuss and explain why it is important to keep the environment free of pollution

LESSON 12: Reduce, Reuse, Recycle

- Students will make necklaces using recycling paper material.
- Students will understand the importance of the 3Rs—reducing, reusing, and recycling.

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LESSON 13: Culminating Activity: Field Trip to the Garbage Museum Celebration of our natural resources! Plant A Tree

Lesson 14: Post-Assessment

Name _____ Date _____

Recycling & Conservation
Pre-Assessment

1. When we talk about conserving energy or conserving water, what does the word “conserve” mean? _____

2. What are some ways that you recycle? _____

3. What is pollution? _____

4. Give an example of one type of pollution. _____

1. Do you think we could run out of trees in the world and there would be none left? Why or why not? _____

2. Why do you think it is important to save our natural resources? _____

~Day 1
Embedded Task
Observation of Paper Types

Name _____ Date _____

Directions:

1. Take a close look at the different types of paper you have. Record in the Observation Chart the properties you have found under each type. (When recording the properties you observe, think about how the paper feels, if you can see through it, what you see, etc.)

OBSERVATION CHART

Properties of Paper

PAPER TYPE	Properties Observed Without Magnifier	Properties Observed With Magnifier
Paper Towel		
Tissue		

Napkin		

~Day 1
Embedded Task

THINK about the properties you observed. Which properties might be related to how well the paper can hold water? This property is called “absorbency”.

PREDICT which paper type might hold the MOST water, and which one might hold the LEAST water:

Most: _____ Least: _____

I think this because I noticed that _____

~Day 2
Embedded Task
Experiment #1

Name _____ Date _____

EXPERIMENT #1: WHICH TYPE OF PAPER HOLDS THE MOST WATER?

In this activity, you are going to compare different types of paper to find out which one holds the most water. You will pour some water onto a plate and then count how many squares of each paper type it takes to soak up all the water.

Directions:

1. Label three plastic cups: “towel”, “tissue”, and “napkin”. You will use the cups for storing the wet paper squares.
2. Measure 25 milliliters (mL) of water into the graduated cylinder. Decide which paper you want to test first.
3. Pour 25 mL of water onto the plastic plate.
4. Lay one paper square over the water spill, and leave it there until you can tell that it is not absorbing any more water.
5. Pick up the wet paper square with the forceps, and hold it over the plate until it stops dripping. Put the wet paper square in the labeled cup.

6. Keep using squares until there is no more water left in the plate.
7. Count how many paper squares you use to soak up all the spilled water. Record the number of squares you use for each paper type in a data table.
8. Repeat Steps 3 to 7 with the other paper types.

~Day 2
Embedded Task

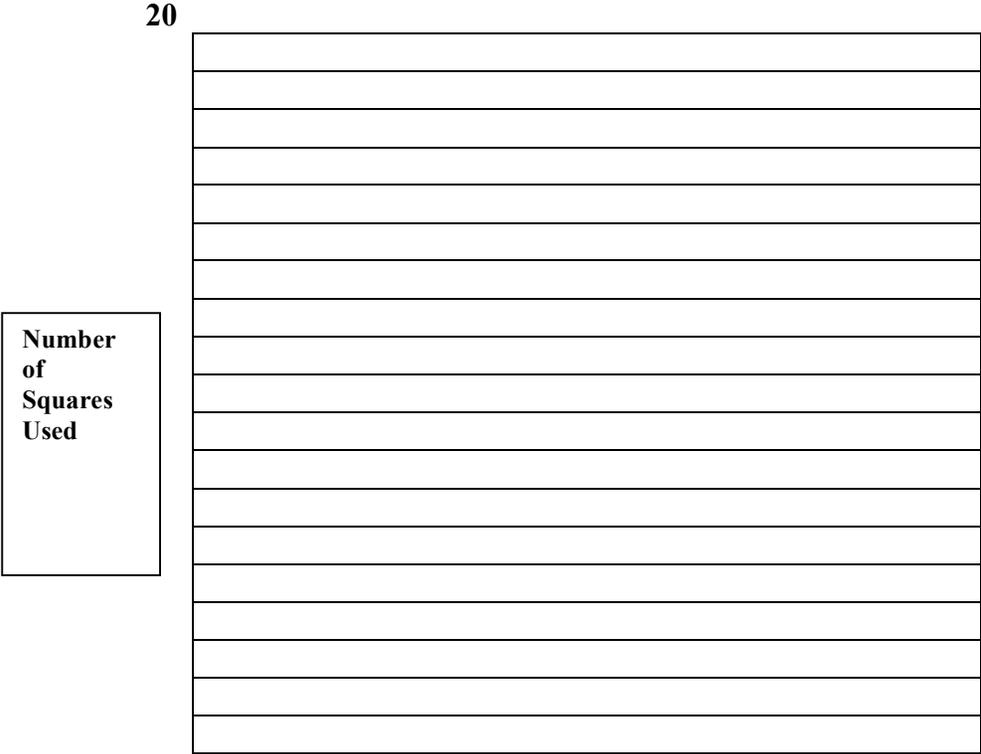
Name _____

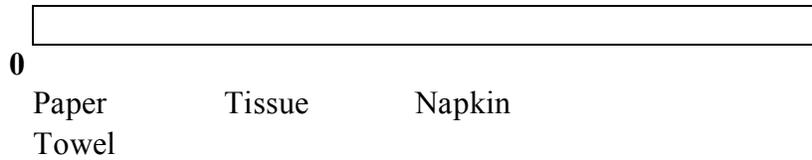
TYPE OF PAPER	AMOUNT OF WATER SPILLED	NUMBER OF SQUARES USED
Paper Towel	25mL	
Tissue	25 mL	
Napkin	25 mL	

Graph Your Data:

Make a bar graph to compare how many squares of each paper type were needed to absorb 25 mL of water.

Water Absorbency of Different Paper Types





~Day 3
Embedded Task

EXPLAIN

Think about your Data:

1. Which paper type used the fewest squares to soak up all the water? _____

Which paper type used the most squares to soak up all the water? _____

2. Which paper type is the most absorbent? _____

Which paper type is the least absorbent? _____

Explain your conclusion: _____

3. What properties did the absorbent paper have that the less absorbent paper did not have?

4. SHARE your data and discuss your conclusions with the whole class.

~Day 4
Embedded Task

Directions:

2. Write the brand names of the paper towels you are observing in each of the columns.
3. Take a close look at the different brands of paper towels you have. Record in the Observation Chart the properties you have found under each brand name.

OBSERVATION CHART

Properties of Different Brands of Paper Towels

Brand Name:	Brand Name:	Brand Name:

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Predicting: Which towel brand will be the most absorbent? Why do you think so?

~Day 4
Embedded Task

Describe the experiment you will be doing to compare different brands of paper towels to find out which brand is the most absorbent.

Steps needed to complete the experiment:

1.

2.

3.

4. _____

5. _____

6. _____

~Day 5
Embedded Task

Experiment #2

OBSERVATION CHART

BRAND NAME PAPER TOWEL	Properties Observed Without Magnifier	Properties Observed With Magnifier
Brand Name:		
Brand Name:		
Brand Name:		

“Analyzing Data”

Review the data from Experiment #2. Answer the following questions:

1. Which brand of paper towel used the fewest squares to soak up all the water?

Which brand of paper towel used the most squares to soak up all the water?

2. Which brand of paper towel is the most absorbent? _____

Which brand of paper towel is the least absorbent? _____

Explain your conclusion: (How do you know which one is the most absorbent or least absorbent?)

Brand Name: Brand Name: Brand Name:

~Lesson 7

Embedded Task

“Communicate Your Learning”

Directions: You now have some important information to share with the person in your family who shops for groceries. Write a letter to this person and tell:

- What questions about paper products you explored;
- What you did to find answers to your questions
- What you found out about different types and brands of paper products. Tell about some of the data you recorded in your experiments;
- What type of paper you recommend they use in the kitchen, and which brand you recommend to buy.

LESSON 8

~Day 7
Embedded Task

Dear _____,

~Lesson 9

LESSON 9: Hooray for Trees!

- Students will describe the ways in which trees benefit people
- Students will make pictures or models depicting how trees may be used to improve the man-made environment

Materials:

- The Giving Tree
- Drawing paper
- Crayons/Markers
- Chart paper

Preparation: Write the following list on the board:

Playground, City street, Neighborhood, Park, Zoo, Picnic area,
Farm

Procedure:

1. Have each person choose and draw one of the areas on the list. Explain that students can draw the area any way they like, except they must leave trees out of the picture.
2. When students have finished their drawings, have them draw the same scene again, but this time use as many trees as they wish.

3. Display the drawings for everyone to see. Ask students which environment they would rather spend their time in. Does having trees in this environment effect your decision?
4. Discuss the benefits of trees in public places. You can read The Giving Tree at this time as well.
5. On chart paper make a web of benefits that trees provide (examples include shade, protection from wind, habitat for wildlife, reduce noise pollution, etc.)

Closure:

Review with students the importance of having trees in our environment. Have 2-3 students refer to their pictures and explain why trees are important to that environment.

American Forest Foundation, Project Learning Tree: Environmental Education PreK-8 Activity Guide. 2004.

~Lesson 10

LESSON 10: We Need Trees!

Objectives:

- Students will discuss and analyze a fictional story relating to the proper and improper use of natural resources.
- Students examine the importance of conserving natural resources.

Materials:

- The Lorax by Dr Seuss
- Comprehension cards

Procedure:

1. Start this lesson by having students look around the classroom and see how many things are made from wood. Call on students to tell the class what items are made of wood. Students will notice that there are lot of things just in the classroom that are made from wood. Ask students “Where does wood come from?” They should respond “trees”.

2. Explain to students that trees provide oxygen, beauty, and a habitat for plants and animals. Ask students what they think would happen if there were no trees? Responses should vary.

3. Read **The Lorax** aloud.

4. Ask students what they think is the main idea of the story.

5. Lead students into a discussion. Hand out cards to 5 students. Have student ask the question that is on the card to other students. Allow 2-3 students to respond to each question.

~Lesson 10

.Comprehension Cards

*Laminate or glue onto index card for stability.

Why do you think the Once-ler did what he did?	What were environmental conditions like before the company started making Thneeds?
What patterns of change in the environment did we observe?	What were environmental condition like after the company started making Thneeds?

What was the author's message concerning what one person can do to save or destroy the environment?	

~Lesson 11

LESSON 11: Stop the Pollution!

- Students will identify different kinds of pollution
- Students will identify sources of pollution
- Students will discuss and explain why it is important to keep the environment free of pollution

Materials:

- Chart paper
- Posterboard or Construction paper
- Crayons/markers
- Photos of water, air, and land pollution

Procedure:

1. Display pictures of water, air, and land pollution on the board for the class to see. Ask students what is wrong in each of the pictures. As the students answer write their responses under the pictures on the board.
2. Explain to the students what pollution is: anything that harms our environment. Explain also that people cannot survive if they do not have clean air, water, and land.

3. Tell the students it is everyone's responsibility to make sure that we have a clean environment free of pollution.
4. Have the students brainstorm ways that they can help prevent pollution (i.e., pick up garbage off the ground, don't throw trash in rivers).
5. Using chart paper write student's responses to preventing pollution. (You can title it "Solutions to Pollution" or whatever you'd like).
6. Hand out poster board or construction paper. Have the students make a poster informing others about pollution and what they can do to prevent pollution.
7. Have students share what they learned about pollution and have them share their poster with the class.
8. Display the posters around the school.

~Lesson 12

LESSON 12: Reduce, Reuse, Recycle

Objective: Students will make necklaces using recycling paper material.
Students will understand the importance of the 3Rs—reducing, reusing, and recycling.

Materials:

- toothpicks or pencils
- liquid glue
- scissors
- yarn or string
- colorful magazines, catalogs, brochures

Procedure:

1. Ask students what they know about the 3Rs—reduce, reuse, recycle. Explain to them why it is so important to recycle and reuse items you might otherwise throw away. Ask students what they have recycled or reused. Ask them what they can do with old magazines.
2. Tell students today we will be doing our part by recycling paper. We will be making necklaces out of paper materials, such as magazines and catalogs.
3. Pass out magazines, catalogs, and/or brochures to the students.

4. Have students cut colorful images into tall, skinny triangle shapes. The triangles should be about 3/4 inch at the bottom and 4-5 inches tall. (Be sure to model this for them.)
5. Wrap each triangle strip around a toothpick or pencil. Start with the wide end (the base of the triangle). Wrap the paper around and around until it is totally and tightly wrapped. (The narrow tip of the triangle will be visible on the top of the bead. Put a little glue under the last half-inch or so of the triangle, then press firmly. Let dry.
6. Repeat step 5 and make additional beads. Students will need to make about 20 to 30 beads.
7. When the beads are dry, pull the toothpick out of the beads. You will end up with a hole in the center of each bead.
8. Students string yarn or string through the holes to connect the beads and create a necklace.

Closure: Review with the students the importance of reducing, reusing, and recycling. Ask students if they have come up with any other ways that can reuse the magazines and catalogs while working on this project.

~Lesson 13

CULMINATING ACTIVITY

- **Field Trip to The Garbage Museum**
- **“Plant A Tree” Project**

To celebrate students’ learning about recycling, conservation, and the scientific process, plan a field trip to the Garbage Museum. Students will be able to see firsthand how many things are reduced, reused, and recycled.

You can also arrange a tree-planting activity. Students can plan the event ahead of time and send out fliers to other classes publicizing their tree-planting event.

1. Check with a local nursery and see if they would be willing to donate trees or the children may want to raise money to buy the trees.
2. Make sure you have the following materials before you get started:
 - Sapling or seedling
 - Shovels
 - Gardening gloves
3. Have students plant trees and take care of them. Hand out the “Plant A Tree Directions”.

*If you are teaching this unit in the spring you might want to do the Plant A Tree Activity on Earth Day.

American Forest Foundation, Project Learning Tree: Environmental Education PreK-8 Activity Guide. 2004.

“Plant A Tree” Directions

1. When deciding where to plant your tree be sure to give your plant plenty of room (the roots will grow and widen). Plant it well away from building or power lines.
2. During the planting try not to handle the tree’s roots.
3. Dig a hole that is twice as wide and as deep as the root ball. In the hole build a small mound that is 2 inches high and place the plant on the mound.
4. Fill the hole with the dirt; use your foot to press the dirt down firmly.
5. Wet the dirt and plant, all the while pressing the dirt with your foot to be sure the plant is stable.

Care for your tree (after planting):

3. The most important years for a tree are the first years of its life.
4. Be sure to water the tree often. You want to keep the plant and soil around you tree moist.
5. Sit back and enjoy!

~Lesson 14

Name _____ Date _____

Recycling & Conservation
Post-Assessment

3. When we talk about conserving energy or conserving water, what does the word
“conserve” mean? _____

4. What are some ways that you recycle? _____

3. What is pollution? _____

4. Give an example of one type of pollution. _____

6. Do you think we could run out of trees in the world and there would be none left?

Why or why not? _____

7. Why do you think it is important to save our natural resources? _____

Student Name _____ Date _____

Recycling and Conservation Unit Assessment Sheet

Goal/Big Ideas for Unit	Shows understanding	Needs support	Does not Grasp concept
Understands pollution and how it can effect our environment			
Understands the concept of conducting a “fair test”			
Identifies ways to recycle			

Understands the importance of conserving our natural resources

Extension Activities:

- *Students build a Trash City out of recycled materials. You can group students and have each group make different parts of a city. For example, one group can make a neighborhood, another group can make downtown with stores, etc.*
- *As a writing activity, have students write how they would solve a pollution problem. Title them “Our Solution to Pollution.” These can be put into a book or hung up for others to see.*
- *Have students name three ways that they can reuse various items instead of throwing them away (i.e., cardboard box, glass jar, plastic bag, newspaper).*
- *As a research project have students research how much trash everyone produces each day, each year. They can also research what makes up the biggest amount of our trash.*

- *Students can arrange a book swap. Instead of throwing away their books they can swap with other classmates. Better yet, get the entire school involved!*
- *Students can act out what can happen to animals or people that are exposed to pollution.*
- *Either alone or in small groups, students write and illustrate a sequel to The Lorax. The sequel might explain how the Truffula tree made a come-back through replanting and proper care.*

Teacher Resource Books:

American Forest Foundation, Project Learning Tree: Environmental Education PreK-8 Activity Guide. 2004.

Non-fiction Trade Books:

- How We Use Paper, Oxlade, Chris. Raintree, Chicago, IL 2005.
- Paper, Oxlade, Chris. Heinemann Library, Chicago, IL. 2005.

- You Can Recycle, Walsh, Patricia. Pearson Scott Foresman Leveled Readers.

Fiction Books:

A Pig's Tale by Olivia Newton-John

The Day the Trash Came Out to Play by David M. Beadle

Just A Dream by Chris Van Allsburg

The Lorax by Dr. Seuss

HOOT by Carl Hiaasen

Judy Moody Saves the World by Megan McDonald

Johnny Appleseed, Steven Kellog, New York, William Morrow and Co., 1988.

Kenju's Forest, Yukno Morimoto, Australia, Collins Publishers, 1989.

Song of the Trees, Mildred D. Taylor, Bantam-Skylark.

Websites:

- <http://www.tappi.org/> - "Paper University"
- <http://www.straightdope.com/mailbag/mpapermaking.html> - Science Advisory Board
- <http://www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/aperandglass.html>
- <http://teacherlink.ed.usu.edu>
- www.earth911.org
- www.education-world.com
- <http://kids.nationalgeographic.com>
- www.unitedstreaming.com

Videos/DVDs:

“Earth Aid: Recycling”

“Earth Aid: Water Conservation”

“Pollution Solutions”

“Recycle Rex”