



Lesson 4:

If you do nothing else.

After reducing and reusing, recycling items is the next step to reduce our impact on the earth.

OBJECTIVE: Students learn how recycling conserves natural resources and how to recycle plastic and paper.



Ask Students

Who can tell me what natural resource paper is made from?

What about plastic?

Which one of these is considered non-renewable and why?

Recycling is the way of nature. Trees use fallen leaves as nutrients, birds build nests from whatever is available and hermit crabs use discarded shells for protection. This provides the vital natural advantage of using energy as efficiently as possible.

Nature uses many cycles to conserve energy, and this can include how humans use resources. Instead of sending products to the landfill, which interrupts the natural process of recycling, we can keep materials in the cycle.

(Show the students the cycle of plastic, and the choices we have in this – it can be used as an overhead or handout)

While recycling still requires manufacturing, it uses fewer natural resources than the direct production of items from the raw materials. Since 90% of products are made of some sort of plastic, this cycle is definitely one we should pay attention to.

Some interesting facts that make this priority clear:

- Packaging accounts for 31% of all household waste and 50% of the volume.
- The average American uses 500 plastic shopping bags per year. The majority of this ends up in a landfill.
- Americans use 29 billion water bottles per year – which is 93 bottles per person! Only 1 in 6 plastic water bottles is recycled.
- Plastics are made from fossil fuels. In U.S., we use 17 million barrels of oil per year to produce our plastic water bottles.
- The U.S. uses more plastic water bottles than any other country.
- People consume 2x as much today as they did 50 years ago!



ACTIVITY 1 - Plastic Sorting Game

Students will work in pairs. They have printed cards of different plastic household items. They sort these into different “bins” of landfill or recycle.

Discussion:

In order to recycle products, they must be able to be broken down. Some products cannot be recycled because it is difficult to break them down into the components needed to make new products.

Materials:

- Printed cards of plastic items
- Small containers for them to place cards in
- Label one **RECYCLE** and the other **LANDFILL**
- Setting up one or two stations for students to do this activity while completing Activity 2 (*Recycling Paper*) is suggested

Activity:

Ideally, you can set this up as one or two stations for students to do while completing Activity 2 (*Recycling Paper*). Instruct the students to mix up the cards when they are done.

After everyone has completed the station, ask them what choices they could make to not interrupt the “Plastic Cycle” - this could be choosing to purchase and use these items that cannot be recycled sparingly or not at all.

Recycling everything they can at school and at home is another way to help make sure the cycle is not interrupted.

Discuss how plastics are recycled at school. What are they best at recycling? What could they do better at recycling?

Extension: Have the students pledge to recycle more plastic at school and make a poster for the classroom to remind everyone which plastics can be recycled. (*water and juice bottles, plastic utensils, etc*)



ACTIVITY 2 - Recycling Paper

Students will work in pairs and make paper pulp in order to understand how paper can be recycled.

Discussion:

Recycling paper not only saves trees, it also conserves resources such as energy and water, and reduces pollutants released during the manufacturing of paper from raw material. Discuss how students recycle paper in the classroom and at home.

(Show the included graphic on recycling paper to the students in order to emphasize the point of interrupting the cycle when it goes to the landfill rather than being recycled – connecting it to the plastics lesson)

Materials: *enough for groups of 5 students*

- Small bucket
- Plastic tub to lay out newspaper
- Cover for table or floor
- Newspaper (12 sheets per group)
- Pencils and/or small rolling pins to flatten wet paper
- Recycling Paper worksheet for each student
- *(as an alternative, you can use this as an overhead and have students write in notebooks)*

Activity:

Day 1: *Preparation to make paper pulp*

- Ask students to predict what will happen if they let pieces of newspaper soak in water overnight.
- Have them write their prediction down based on their experience with the materials.
- Show the students the graphic of recycling paper again and ask them what steps in the process are eliminated when paper is recycled.
- Divide students into groups of 4 or 5 and distribute materials.
- Fill buckets with warm water.
- Tear newspaper into approximately 2 in X 2 in squares and let it soak in warm water overnight.
- Write the group number on a piece of paper and tape to the bucket.



ACTIVITY 2 - Recycling Paper *(continued)*

Day 2: Making Paper Pulp

- Ask the group to collect supplies and record on their worksheet or in their notebook their observations of
- the paper after having soaked overnight. Was their prediction supported?
- Using their hands, have the students squeeze out the excess water from the newspaper.
- Spread the pulp on the tray lined with dry newspaper with pencils and rollers.
- Let this dry at least one day. Were they able to make paper again from the newspaper? Have them record this.
- Remind them that paper is made by reorganizing the cellulose fibers of wood.
- Ask students to provide examples of products they have seen made from recycled paper. Buying recycled products
- when possible is a great way to help make sure the paper cycle is not interrupted.
- Lastly, make a list of paper items students recycle at school and where they can recycle them. Remind students
- what CANNOT go into recycling (*staples, paper with glue, tape or plastic tabs*).

Extensions: Make paper in the classroom. Visit www.raft.net (*Resource Area for Teachers*) for a lesson and kits.

Have students research the history of paper beginning with the Egyptians and papyrus – create a timeline with pictures.



Words to Know

Recycle – to process used materials in order to use them in making new materials

Raw materials – the basic material from which a product is made

Items That Can Be Recycled



Items That Can Be Recycled



Items That Cannot Be Recycled



Paper Recycling Process

PAPERMAKING PROCESS AN INTRODUCTION

Today's high-quality papers require a highly technical and accurate manufacturing process. This diagram details the paper-making process and illustrates the use of wood and paper for recycling.

