

8 POINTS**LESSON PLAN:**

RECYCLING WITH A TWIST

(Image: Library of Congress, 2017838445.)

INTRODUCTION

Take a close look at the recycling symbol. What do you think it means? Why do you think it has that shape? The word “recycle” has the word “cycle” in it. A cycle is any series of events that repeat themselves, like a bicycle wheel goes round and round. The main aim of recycling is to go round and round, or in other words, to find ways to reuse things again and again in a never-ending cycle. There is a great way to understand the idea of a never-ending cycle. It’s called a Mobius strip. August Mobius was a nineteenth-century mathematician who discovered the concept of a non-orientable two-dimensional surface with only one side when embedded in three-dimensional Euclidean space. What does that mean?! Basically, a Mobius strip is a three-dimensional object with only one side. It goes on and on and on.

MATERIALS

- + Mobius strip example and template
- + Art supplies

OBJECTIVES

With this hands-on activity, students should draw connections between the visual representation of recycling and the larger meaning and history of conservation. See if students can find ways that symbols represent a call to action.

TIME REQUIREMENT

1 class period

KEY THEMES

**SCRAPPING****MATH**

COMMON CORE STANDARDS

CCSS.ELA-LITERACY.RH.6-8.7

Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

CCSS.ELA-LITERACY.RST.6-8.4

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

CCSS.ELA-LITERACY.RST.6-8.9

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

ASSESSMENT

While evaluating the student-made Mobius strips, determine how well the students understand the connections between symbols and a central message. Through verbal discussion, determine how well does the class see the meaning of recycling represented in the visual representation of the Mobius strip cycle. Students should demonstrate an understanding of the symbol's meaning and how well it connects to broader knowledge of recycling and conservation efforts.

PROCEDURES

1. Explain to students the background information above about Mobius strips.
2. Guide your students in making the strip by using the instructions below. You may want to use the attached template to make a finished example before your demonstration.
3. Cut a strip of paper one inch by eight and a half inches. Decorate with a recycling motif.
4. Bend the strip into a ring so that the ends meet.
5. Twist one end upside down.
6. Tape the two ends together and you have a Mobius strip—a three-dimensional object with only one side. Don't believe it? See below.
7. Take a pencil and hold the point down on your Mobius strip. Hold the pencil in place while you pull your Mobius strip toward you, drawing a line down its center. Keep going until your pencil line ends where it began. You never lifted your pencil, yet you covered both "sides" of your strip! A never-ending cycle!

NAME:

DATE:

RECYCLING WITH A TWIST WORKSHEET

Directions: Print two-sided, flip short side.

Twist the "A" away from you and connect it to the "D."



