

ScienceNews

Activity Guide for Students: Reimagining Plastic Recycling

Directions:

In this activity, you will discuss new methods for recycling plastic, work in groups to research local options for plastics recycling and identify the types of plastics used in your home or school. Then, you will identify a way to improve the plastic recycling in your area and write a letter addressed to local officials.

The setup

To prepare for the activity, read the online *Science News* article "[Chemists are reimagining recycling to keep plastics out of landfills](#)" and answer the following class discussion questions as homework. A version of the article, "Recycling reimagined," appears in the January 30, 2021 issue of *Science News*.

Class discussion

Discuss answers to the following questions as a class.

1. What types of plastics are currently regularly recycled?
2. What percentage of the world's plastics is made of the types of plastic that are routinely recycled?
3. What issues limit the usability of recycled plastics? Identify at least three issues facing plastic recycling mentioned in the article.
4. Identify and briefly describe five potential solutions the article mentions for recycling plastics in the future. Identify the types of plastics for which each solution has been successfully tested.

Group research

In a group, use the internet or other resources to identify plastic collection and processing facilities available in your town, county, state or region. With your teacher's permission, you may make phone calls to ask clarifying questions of the recycling facility operators or government officials in charge of local recycling programs. Then, answer the following questions.

1. What plastics are collected for recycling in your local area?
2. What happens to plastic items that cannot be recycled by your local recycling facilities?

3. Is processing and recycling of plastic materials performed at your local facility, or are the plastic materials collected and shipped to a new location for processing? If the latter, where are the materials shipped?

4. Create a flow chart or process diagram that illustrates the path of at least three different types (numbers) of plastic items after they enter the recycling bin at your local facility.

5. Which of the proposed recycling solutions described in the *Science News* article, if any, are being implemented in any recycling facilities near you?

Collect plastic use data

For homework, perform a brief inventory of the plastic containers in your home.

1. Most plastic containers are stamped with the triangle symbol and number identifying the type of plastic of which they are made. Using the chart labeled “False advertising” from the *Science News* article and the reference sheet titled “Classifying plastics” provided by your teacher, tally how many disposable plastic items in your house fit into each category. Begin with containers in the kitchen and bathroom, and include at least 10–15 items in your inventory. Then, write a sentence or two that describes which type(s) of plastic are most common in your home.

| Type of plastic | Number of items | Percentage of total plastic inventoried |
|-----------------|-----------------|---|
| No. 1 PET | | |
| No. 2 HDPE | | |
| No. 3 PVC | | |
| No. 4 LDPE | | |
| No. 5 PP | | |
| No. 6 PS or EPS | | |
| No. 7 Other | | |

Analyze the data

Submit the data you gathered to your teacher. Your teacher will compile the class data into a table, which they will provide to you. Use the class data table and your personal data table to answer the following questions.

1. Are most of the plastics you encounter in your daily life of the types (or numbers) that are regularly recycled? Explain your answer.

2. Which one of the proposed solutions described in the *Science News* article would lead to the largest increase in the amount of plastic waste that your class could recycle?

Advocate for change

Use your answers to the following questions to help you craft a formal letter asking local officials to implement the proposed recycling technology that you identified in the previous section.

1. Which new plastic recycling technology are you advocating?

2. How does that technology work to recycle plastic waste?

3. How could this technology reduce the plastic waste produced by your community and increase recycling of plastics? Make sure to provide evidence.

4. What actions would your local officials need to take to implement these new recycling techniques? Consider what changes will have to be made to the recycling or waste-management infrastructure and whether the collection process needs to change. Other issues to consider are the cost of implementation and how the public will be educated about the changes.

5. Use your answers to write a formal letter addressed to your local officials asking them to implement your proposed recycling method. Submit the letter to your teacher.

