Recycling Coalition of WV, Inc.

Recycling Lesson Plans

with Cash Prizes for Science Classrooms

The Recycling Coalition of West Virginia (RCWV) is a non-profit environmental organization whose mission is to promote the effective and sustainable reduction, reuse, and recycling of materials otherwise destined for disposal. As an educational outreach, the coalition has developed lessons for West Virginia teachers so they and their students may recognize materials which may be recycled; realize decomposition eventually restores some materials back to the soil; develop an understanding of the solid waste management practices related to recycling, incineration, sanitary landfills, and hazardous waste disposal; and consider the role engineers play in solid waste management. The lessons align to the West Virginia College- and Career- Readiness Standards (WVCCRS) for science and may be adapted per grade level and cross-curricular instruction.

The RCWV has prepared four lessons in this document:

- ***Don't Waste the Moment,*** page 2 - Research the amount of waste generated in the school cafeteria.
- ***One Man's Trash is Another Man's Treasure,*** page 3- Research the cost of waste disposal and possible savings when recycling and composting.
- ***Waste Not, Want Not,*** page 4 - Investigate and make decisions about composting.
- ***Reclaiming and Replacing,*** page 5 - Investigate what happens when landfills reach maximum capacity and then propose solutions.

Additional age-appropriate student activities can be found on the programs page of our website at wvrecycles.org. The youngest students in the Youth Contest identify recyclable, compostable, and trash items on a coloring sheet, then cut and paste the items next to the appropriate compost, recycle, or trash bin. The older pupils create a painting or drawing, write poetry, compose or record a song, produce a recycling themed video, write an essay, or build a sculpture. Teachers may assign a particular medium based on their area of emphasis, i.e. language arts teachers may require students to write an essay or science teachers may ask students to develop a simulation illustrating the environmental benefits of recycling. All winners will be recognized for their skilled accomplishments.

Recycling Lesson Plan- Don't Waste the Moment

Driving question- How much of the waste which is thrown away in the school cafeteria may be composted or recycled?

Lesson - Divide students into groups so that each group may be given a different assignment for collecting data about the waste generated in the school cafeteria; some students may collect data in different locations, during different breakfast and lunch periods, or on different days during the week. Students will survey and record items placed in the trash and record the number of students eating during that time. Their data collecting may include categories such as Styrofoam plates, plastic forks, food scraps, paper products, and packaging materials. After collecting data, information must be categorized as compostable, recyclable, or trash.

Information from each group may be compiled in charts. If students have experience working with spreadsheets, they may consider using Microsoft Office Excel or Google forms; tutorials are available online. Graphs may be created to illustrate data from the cafeteria waste research.

After analyzing their data, students will be asked to identify how much waste was generated; they may express it as the mass or the volume of the waste. They should provide details about what was thrown away and state what could have been recycled or composted. Students should be able to answer questions about how they determined what could be composted and what the triangles on plastic materials represent.

Following their research, student teams should propose a solution to reduce the amount of solid waste in the garbage and present it to the class. They should consider the best way to manage sorting the waste materials from the school cafeteria.

Informational Text - As part of their presentations, students should be prepared with an, "If you want to learn more…" recommended reading for their peers, which includes appropriate citation for consulted resources, including a website, book, magazine or newspaper article, author or interviewee, and summary.

Recycling Lesson Plan- One Man's Trash is Another Man's Treasure

Driving question- What does waste disposal cost anyway?

Lesson - Following the research from the *Don't Waste the Moment* lesson, student teams can research the cost of waste disposal and continue with interviewing the cafeteria workers, janitors, teachers, and the principal. Their questions may extend to other members of the school system and community so they may get answers to questions such as:

- How often is trash removed from cafeteria?
- How often is trash removed from school?
- What does the trash service cost for the school per month?
- What is the transportation or disposal charges for trash?
- How might we reduce our impact on the amount of waste generated?
- Could we reduce the cost of waste removal and save money for other purposes?

Information from each group may be compiled in charts. If students have experience working with spreadsheets, they may consider using Microsoft Office Excel or Google forms; tutorials are available online. Graphs may be created to illustrate results of waste disposed.

Following their research, student teams should present their findings about the cost of waste removal for the school. They should propose a solution to reduce the amount of solid waste in the garbage. If their proposals show a saving of school funds, the students may also propose what could be done with the money.

Informational Text - As part of their presentations, students should be prepared with an, "If you want to learn more…" recommended reading for their peers, which includes appropriate citation for consulted resources, including a website, book, magazine or newspaper article, author or interviewee, and summary.

Recycling Lesson Plan- Waste Not, Want Not

Driving question- How does a compost pile reduce waste?

Lesson- Students may use the internet, visit libraries and greenhouses, and interview farmers, neighbors, or family members with gardening experiences to gain information about composting. As part of this lesson, students will:

- Compost materials to observe and record what happens in the process.
- Experiment to determine what types of materials biodegrade.
- Research on why compost needs air and water.
- Investigate how to control compost odors.
- Consider why they should bother with composting.
- Plan what might be done with the compost from their experiments.

Following the research, student teams should consider how composting might be done at home or on a larger scale for a school or community and what might be done with the compost from large scale composting operations. They should prepare to present a composting plan recommendation to the principal, school board, or city council. Teachers may contact these individuals and arrange for them to attend the students' presentations.

Informational Text- As part of their presentations, students should be prepared with an, "If you want to learn more…" recommended reading for their peers, which includes appropriate citation for consulted resources, including a website, book, magazine or newspaper article, author or interviewee, and summary.

Recycling Lesson Plan- Reclaiming and Replacing

Driving question– What happens to garbage when it leaves the school or my house?

Lesson- Students will collect household trash for analysis and build model or simulated landfills to understand the processes and impacts of solid waste management. They should consider the following questions:

- What is going into landfills?
- What kind of barriers are there at modern landfills to prevent chemical leaching?
- What happens when a landfill reaches maximum capacity?
- Are the laws the same in all states?

Student teams are to consider what might be done when a local landfill reaches maximum capacity and propose how the land may be reclaimed for future use. Teams will also design a landfill to take the place of the current landfill. They must determine where to put it and explain the reason for choosing that location. How will they prevent chemicals leaching into the environment? They may use models, drawings, or multi-media presentations to share their ideas with the class and explain the reasons for the choices they make in both design plans.

Informational Text- As part of their presentations, students should be prepared with an, "If you want to learn more…" recommended reading for their peers, which includes the book or article and the name of the newspaper or magazine, author, a quick summary, and the ISBN.

Recycling Lesson Plan- Recycling Investigations

The Recycling Investigations Lesson document is a more text driven lesson and is available on our website. The lesson aligns with West Virginia College- and Career- Readiness Standards (WVCCRS) for science, addresses content literacy, includes text-dependent questions, provides graphical representations of data, prompts students with investigations, and may be adapted per grade level and cross-curricular instruction.

Students may work in small groups and be assigned different parts of the document. Each group will read informational text, answer the text dependent questions, and pursue the investigation for the section(s) they are assigned. Follow-up may be a jigsaw activity as each group teaches the others what they learned. It may be informal class discourse as each group takes its turn leading the discussion or multi-media presentations which include content specific language.

Additional Lessons Browse K-12 STEM Curriculum - TeachEngineering

Recycling Competitions

Recycling Coalition of West Virginia ReFashion Show and Youth Contests

RecycleMania is a friendly competition and benchmarking tool for college and university recycling programs to promote waste reduction activities to their campus communities at Home - Campus Race To Zero Waste

The initiation of Recycling - Keep America Beautiful for K-12 schools has received an enthusiastic response from over 1,200 schools. These schools have taken advantage of the platform and resources to promote recycling awareness, education and performance.

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Additional Information

For more than thirty years, the U.S. Environmental Protection Agency (EPA) has been collecting data on the generation and disposal of waste in the United States. Waste reduction and recycling programs across the country are measured and used to determine the amount of waste generated. In 2017, Americans generated about 268 million tons of trash and recycled and composted over 27 million tons of material, which is equivalent to a recycling and composting rate of 35.2 percent. On average of the 4.51 pounds of solid waste generated by every person each day, we recycle 1.13 pounds and compost 0.45 pounds or about 1.58 pounds of that waste.

Recycling is the process of turning used waste and materials into new products. This prevents potentially useful materials from being wasted, as well as reduces energy use.

The energy required to convert raw materials such as minerals, oil, and trees into metals, plastics, and paper is far greater than the amount of energy required to collect and recycle our paper, bottles, and cans into new products.

A wide variety of different materials can be recycled, including paper, plastic, glass, metal, textiles and electronic equipment. Historical evidence shows that humans have been recycling various materials for thousands of years.

Recycling Resources

West Virginia Solid Waste Management Board or Solid Waste Authority Contact Information-- Solid Waste Management Board .

Find recyclers at Earth911 - More Ideas, Less Waste or Recycling Centers Near Me - Find Closest recycle center near you.

The Recycling Economic Information Report aims to increase understanding of the economic implications of material reuse and recycling. https://www.epa.gov/sites/production/files/2017-05/

TerraCycle - Recycling systems for previously non-recyclable or hard-to-recycle waste. TerraCycle

Reduce, Reuse, Recycle | US EPA Learn how reducing, reusing, and recycling can help you, your community, and the environment by saving money, energy, and natural resources.

Characterization fact sheet and data tables provide the most recent available data on annual US waste generation, recycling, and disposal, as well as the benefits of recycling Facts and Figures about Materials, Waste and Recycling | US EPA.

American Forest & Paper Association report on paper recovery, 2019. www.paperrecycles.org/statistics/paper-paperboard-recovery

American Chemistry Council 2019 report on post-consumer plastic bottle recycling . https://plastics.americanchemistry.com/Reports-and-Publications/2018-National-Post-Consumer-Plastics-Bottle-Recycling-Report.pdf

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