PUTTING WASTE IN ITS PLACE

Objective: Provide students with hands-on learning about recycling while establishing, expanding and/or maintaining a community wide recycling program.

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Grade Level	7th
Materials	Various types of litter, recycling bins, protective gloves, litter bags, trash grabbers, access to internet

Outcomes and Connections:

Alabama Course of Study Standards

Science	(Ecosystems-8) Construct an explanation to predict patterns of interactions in different ecosystems in terms of the relationships between and among organisms (e.g., competition, predation, mutualism, commensalism, parasitism). (Ecosystems-9) Engage in argument to defend the effectiveness of a design solution that maintains biodiversity and ecosystem services (e.g., using scientific, economic, and social considerations regarding purifying water, recycling nutrients, preventing soil erosion). (MS-ESS3-3) Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment
Social Studies	(Geography -3) Compare geographic patterns in the environment that result from processes within the atmosphere, biosphere, lithosphere, and hydrosphere of Earth's physical systems. (Geography-9) Explain how human actions modify the physical environment within and between places, including how human-induced changes affect the environment. (Geography-11) Explain the cultural concept of natural resources and changes in spatial distribution, quantity, and quality through time and by location. (Geography-12) Explain ways geographic features and environmental issues have influenced historical events. (Civics 12) Describe how the U.S. can be improved by individual and group participation in civic and community activities.

Learning Outcomes

- Compare and contrast different recycling streams.
- Study and evaluate recycling programs in own and neighboring communities.
- Present data to a general audience.
- Design and implement a recycling plan.
- Compare and contrast different recycling streams.
- Compare and contrast how recycling (or lack of recycling) affects different communities and ecosystems.

Environmental Justice Concepts

1. Recycling and reducing waste can help reduce air and soil pollution (by minimizing landfill waste and reducing the use of oil refineries) which can benefit low-income, marginalized communities that are often the site for landfills and oil refineries. There are 3 landfills and 6 refineries near Africatown (two that are upstream of Chickasaw Creek) as well as a paper mill, metal refineries, asphalt mixing plant, and the Mobile Energy Plant. The greenhouse gas emissions of all these industries can be lessened through appropriate recycling practices that would then directly benefit residents of Africatown by decreasing soil, water and air pollution created by these plants.
2. While researching recycling programs across various local communities, students will discuss potential disparities, resource needs and challenges between communities (i.e. neighboring Baldwin County has a robust recycling program whereas the city of Mobile does not). Students can also explore how litter impacts soil quality and what local events or practices may increase or decrease litter (such as Mardi Gras and Alabama Coastal Cleanup).

Climate Change Concepts

1. Students will research and discuss how recycling can reduce greenhouse gases, lessen the depletion of natural resources (such as trees which help reduce greenhouse gases as well) and minimize litter debris.
2. Students can also explore the difference between mixed stream and separate stream recycling practices and the different impacts on greenhouse gases/climate change reduction between the two.

Local Connection

Students will research local recycling programs and resources while analyzing the need in their own neighborhoods to design and implement a recycling plan. Additionally, 6th grade field trips to Baldwin County and Mobile City Recycling centers can help provide background knowledge for students. In-house field trips from representatives of both, as well as those from ACF and Mobile Baykeeper could also occur to provide background knowledge. Partnership with Alabama Coastal Cleanup in mid-September at Three-Mile Creek can provide students an opportunity to participate in a community event (Contact - Aubrey Bianco, Natural resources Planner with Alabama Dept. of Conservation. Aubrey.Bianco@dcnr.alabama.gov)

Lesson Outline:

<table>
<tr><th colspan="3">Lesson 1</th></tr>
<tr><td>Pre-assignment</td><td colspan="2">Students should read the article and respond to a journal prompt the night before to help assess and lead a discussion on what students already know about recycling.

Article: Recycling and Conservation: Why Recycle? From Readworks (human voice read along). This article can be integrated directly into google classroom, creating an account is free for teachers. There are also optional question sets you can assign (recommend the express for this assignment to assess comprehension and completion)

Journal Prompt: After reading the article “Why Recycle?”, answer the following questions in your journal:
1. What do you already know about recycling?
2. Do you recycle at home?
3. What would happen if we didn’t recycle?
4. What would happen if everyone in the world recycled?</td></tr>
<tr><td></td><td>Science</td><td>Social Studies</td></tr>
<tr><td>In-Class</td><td>Students walk into the classroom to find litter all over. Have a journal prompt on the board as they come in “How does this make you feel?” and ask students to journal quietly for the first 5 minutes of class.

Discussion: Ask students to share their thoughts from the pre-assignment and in class journal prompts to help lead a discussion on what students already know about recycling and how walking into a room filled with litter made them feel.

Instruction/activity: Instruct students on the different litter streams and discuss why it is important to not mix streams or put non-recyclable items in recycling. Have students then walk around the room and place litter in the appropriate containers.

Discussion: If time permits, discuss how the room cleanup was easy because of clear access to clearly marked bins in the room. Ask students “What is recycling like in your neighborhood?” to start a</td><td>Instruction/activity: Human activity significantly impacts the physical environment due to litter. One local example is the litter caused by Mardi Gras. While Mardi Gras is a defining characteristic of Mobile and an important event that draws in tourism and revenue that can help make the city better, it leaves tons of litter behind which can harm wildlife, clog water ways, and is costly to clean up for the city. However, there are ways communities and groups of people have tried to encourage responsible recycling during and after Mardi Gras.

Break students into small groups and have them research the environmental impact of Mardi Gras litter and beads; and some strategies various groups have developed to overcome this challenge. Alternatively, instructors can pre-select articles and assign a different one to each group
In their journals, they can answer two questions they find from their independent research or assigned article:
1. Why did this group/individual decide to do something about Mardi Gras litter?
2. What was their solution?
3. Do you think this was an effective</td></tr>
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	discussion. *This could be assigned as homework or as a lead in for the Social Studies section of Lesson 1.*	solution? Why or why not? Example resources: Clean up Krewe https://www.gogulfstates.com/2023/02/getting-a-bead-on-plastics-mardi-gras-recycling-makes-waves-out-of-waste/ https://gulfcoastmedia.com/stories/what-to-do-with-old-mardi-gras-beads-foley-mardi-gras-krewe-will-recycle-repurpose-them,155184 *Discussion*: Have students share with the rest of the class their answers to the questions above.
Lesson 2		
	Science	**Social Studies**
In-Class	Recycling impacts different ecosystems in different ways. In the social studies section of lesson 1, students learned about the impact of Mardi Gras on street litter in Mobile. Mardi Gras beads are often not biodegradable and can leach toxic chemicals into soil, water and fish who eat the beads. *Activity:* Students listen and follow along with article Plastic Mardi Gras Beads Are Cheap, Fun To Throw — And Toxic For The Environment. While students are listening to the story, they can use a guided notes template to help them break down the story. *Discussion*: Instructors can review the article and ask students to share their notes while addressing any questions students may have about the information. *Extension*: Holly Groh and her husband are trying to encourage people to celebrate Mardi Gras in greener, more sustainable ways. Students can journal or discuss environmentally friendly alternatives to throwing beads and other plastics from floats.	*Instruction:* Instructors may choose to model the activity below by walking students through an analysis of the Mobile City's webpage. *Activity:* Students research various recycling programs in different communities. Instructors can direct students to municipal webpages and assign different cities to small groups of students. Students can design a brief presentation summarizing the different programs to present to the class. A template google slide that students fill in may help serve as a guide. *Extension:* If time permits, have students research potential community organizations or companies that manage private recycling programs for the community they are researching.

Lesson 3		
	Science	**Social Studies**
In-Class	During the social studies section of Lesson 2, students may have discovered that different communities utilize different processes for separating recycling. There are three basic categories: • single stream (trash and recycling separated but all recycling together) • source separation (all recycling separated into individual streams) • no separation from trash. All have different economic and participation advantages, but they also have different environmental impacts. The dirtier the stream, the less recyclables that can be reclaimed. Often materials that cannot be reclaimed from mixed stream recycling still end up in landfills or incinerated, increasing greenhouse gas emissions and local air pollution. The instructor may invite a community partner from Baldwin County Waste Management or Mobile County Waste to instruct students on the different types of programs. Alternatively, the instructor can ask students to watch the following videos: What Happens to our 2.2 billion tons of trash? To encourage engagement, students can use this guided notes page:	*Activity:* Students present their findings from Lesson 2 to the class. *Discussion:* Have students compare and contrast different types of recycling programs and community access. Guiding questions below can be used to help foster discussion: 1. Which program seems the most accessible for residents? Why? 2. Which program seems the least accessible? Why? 3. Are there still challenges that no program addresses? If so what are they? 4. How might you address those challenges?
Lesson 4		
	Science	**Social Studies**
Pre-assignment	Students watch the videos "11-tear-old starts recycling company to fight climate change" and "How Plastics Affects Climate Change" are then asked to reflect and discuss in their journal how they think recycling can help reduce greenhouse gas emissions.	
In-Class	Students will explore how litter and recycling impacts different ecosystems and impacts climate change. The instructor can assign small groups to focus on ecosystems specific to their local	This might be a good opportunity to invite a classroom speaker from recycling programs to talk to students about how they can start/manage a recycling program at MCTS. If a program already exists, older students can be

	communities (swamp, beach, river, plains, etc). *This might be a good opportunity for ACF or Mobile Baykeeper to do an in-class field trip with students*.	invited to the classroom to discuss the existing program and train younger students how to continue implementation of the existing program. If there is a new or existing problem, this might be a good opportunity for older students to invite younger students to research and brainstorm solutions.
Lesson 5		
	Science	**Social Studies**
Community Outreach	Alabama Coastal Cleanup at 3-mile creek. This event occurs in mid-September on a Saturday. Can follow social media at https://www.facebook.com/AlabamaCoastalCleanup. Casey Colloway organizes this now (Resilience Officer of Mobile)	

Additional Resources:

- "What really happens to the plastic you throw away" TED-ed: https://ed.ted.com/lessons/what-really-happens-to-the-plastic-you-throw-away-emma-bryce
- "What to recycle" Video by ACF/Osprey Initiative for Alabama Coastal Cleanup program to describe and show what materials can and can not be recycled to help eliminate contamination that increases the cost of recycling.
- Clean Swell App: Coastal focused app that allows students to catalogue the trash they collect and provides an avenue for data assessment that is shared with the scientific community: Clean Swell® makes it easy for anyone to make an impact for our ocean. When you head out to clean up in your neighborhood, beach, or park use Clean Swell to be a part of long-lasting solutions. With this app you can easily record each item of trash you collect, which helps scientists and advocates around the world tackle ocean trash at a global scale.

  Can gamify as students can:

  - See the total weight of the trash you collect, track the location of your cleanup (only if you have enabled GPS or Location on your device) and see your total distance cleaned.
  - See your overall cleanup progress and badges you've earned on your personal profile page
- Alabama Coastal Cleanup Fact Sheet Shares facts and history about the program
- Close to home: Environmental Justice in Alabama A historically Black town in rural Alabama fights for change after toxic waste, dumped by out-of-state developers, impacts their health.
- WKRG Story: City of Mobile studying recycling expansion, possible partnership with other nearby cities

Assessment Alignment:

Q8: I understand how studying science can help people fix problems.
Q9: I like thinking about big ideas.
Q10: I think about what I learn in school when I am trying to solve problems outside of school.
Q11: I have heard the climate is changing.
Q12: I do some volunteer work. *
Q13: I would like to do some volunteer work.
Q17: I would like to work with people to help clean up the environment.
Q18: I know about problems that are happening in my community.
Q19: I would like to talk to people about how these problems can be solved.
Q20: I feel like I can make a difference in the world.
**If students participate in a community event such as Alabama Coastal Cleanup*

Potential 6th Grade Field Trips:

On-site field trips to recycling centers in local communities or in-house classroom visits from recycling representatives. Students can also participate in a coastal clean up event in mid September: Contact - Aubrey Bianco, Natural resources Planner with Alabama Dept. of Conservation. Aubrey.Bianco@dcnr.alabama.gov)

Potential 8th grade Capstone Projects:

- Create and manage a recycling program at MCTS. Start small by having the first year of students create a committee structure, organize training sessions for younger students, assemble/place/maintain recycling streams around the school campus, and coordinate with organizations outside the school to pick up recycling on a timely basis. As the program stabilizes, future groups of students can expand to local sites around school campus such as the community center and local churches. Regular committee meetings with faculty/staff oversite should occur to discuss potential challenges, celebrate successes, and maintain communication between committee, community partners and school staff.
- Pitch a business plan where students collect and clean mardi gras beads for use in arts and crafts that could then be sold or auctioned at an event. Profits could be used to support recycling program or donated to local community organizations.