LESSON: Litter In Our Community

Grade Level: K-12

Essential Questions:

1. What is litter?
2. Why do people litter?
3. What happens to litter in the environment?
4. How does litter affect our visual environment?
5. How do we teach others not to litter?

Objectives:

1. Scenic America Principles of Scenic Conservation #6: Teach young people to value the visual environment and to create and respect places of beauty.
2. Students carry out a litter audit of their school/community
3. Students understand the negative effects of litter on the environment
4. Students design an educational campaign about litter and the importance of the visual environment

Background:

According to a 2009 Keep America Beautiful Litter survey “Over 51 billion pieces of litter appear on U.S. roadways each year. Most of it, 46.6 billion pieces (91%), is less than four inches [long]. That’s 6,729 items per mile of roadway.” Littering remains a pervasive problem in our cities and towns whether it’s on major highways or neighborhood streets. Litter not only costs taxpayers money in clean-up time and energy; Keep America Beautiful citing $11.5 billion annually, but it also has a detrimental effect on our local and global environment.

Litter can end up in our waterways and not only cause contamination of water systems, but also harm to animal life. Land animals, birds and sea life can mistake litter for food or become entangled depending on the type of litter.
The top ten types of litter and their frequency as cited by the litter survey are:
(https://www.kab.org/sites/default/files/LitterinAmerica_FactSheet_LitteringBehavior.pdf)

<table>
<thead>
<tr>
<th>Type</th>
<th>Proper</th>
<th>Improper</th>
<th>% Littered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarette Butt</td>
<td>146</td>
<td>194</td>
<td>57%</td>
</tr>
<tr>
<td>Combo/Mixed Trash</td>
<td>325</td>
<td>12</td>
<td>4%</td>
</tr>
<tr>
<td>Paper</td>
<td>251</td>
<td>20</td>
<td>7%</td>
</tr>
<tr>
<td>Beverage Cup</td>
<td>180</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Napkin/Tissue</td>
<td>110</td>
<td>9</td>
<td>8%</td>
</tr>
<tr>
<td>Beverage Bottle: Plastic</td>
<td>100</td>
<td>5</td>
<td>5%</td>
</tr>
<tr>
<td>Food Remnants</td>
<td>65</td>
<td>16</td>
<td>20%</td>
</tr>
<tr>
<td>Food Wrapper</td>
<td>85</td>
<td>14</td>
<td>14%</td>
</tr>
<tr>
<td>Beverage Can</td>
<td>59</td>
<td>8</td>
<td>12%</td>
</tr>
<tr>
<td>Food Container</td>
<td>57</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Plastic Bag</td>
<td>38</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Beverage Bottle: Glass</td>
<td>11</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Unknown</td>
<td>116</td>
<td>10</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>77</td>
<td>46</td>
<td>37%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,620</strong></td>
<td><strong>342</strong></td>
<td><strong>17%</strong></td>
</tr>
</tbody>
</table>

About 85% of littering is the result of individual behavior and continued education and campaigns are needed to educate individuals on why they should not litter. Town-wide campaigns to increase the number and type of receptacles available can decrease the amount of litter. Town-wide clean ups can help raise awareness to the issue.

Litterati is an app designed to capture real-live data on litter in communities and uses that data to work with organizations and businesses on more sustainable solutions. Litterati is powered by everyday people going about their everyday lives. https://www.litterati.org/#home

Using the Litterati map, students can look to see if there is data in their community. Zooming in will allow individual entries to appear as they were entered into the system. See below for an example of what you could see.
Teacher Preparation:

1. Gather images of litter in your community into a slideshow to use in the introduction activity or gather age appropriate images off the internet.
2. Include the essential questions in the last slide.
3. Procedures are sorted by grade level, but modify according to your classroom resources and students.
4. Videos to choose from:
   a. https://youtu.be/4pbXLw6NDBM (Grades K-5)
   b. Litterati Founder, Jeff Kirschner, speaks to he came up with his litter tracking app and how it is used to benefit communities across the globe: https://youtu.be/es4w3WUcrN0 (Grades 6-12)

Procedure:

Grades K-5

1. Choose one or two images from your slideshow to present to your students.
2. Ask the students to call out items that don’t belong. Make a list for all to see.
3. Ask students to brainstorm how those items got there.
a. People
b. Water
c. Other animals
4. Introduce the term “litter” if students have not already started using the term. Litter is trash that is left lying in an open or public space.
5. Ask students to explain how these images make them feel. Happy? Sad? Angry?
6. Have students watch this short video on why we should not litter
   https://youtu.be/4pbXlw6NDBM
7. Talk to students about the dangers of litter to our sense of place (how it makes us feel about where we live), visual environment (how it looks in our environment) and the dangers to waterways and animals (can contaminate water and hurt animals).
8. Tell students they will be doing a survey of the litter around their school.
9. Use the Litterati map (https://map.litterati.org/globalmap/) to see if there is any data captured in your school’s neighborhood.
10. Students will then go on a walk to find and pick up litter around their school. Students should be provided with gloves to gather litter safely.
11. Students should use the data sheets provided to track the type and amount of litter.
12. Returning to the classroom, students should analyze their data.
   a. How much litter did they find?
   b. What was the most common type of litter found?
   c. How do they think that litter made its way to their school? (Wind, water, individual)
13. Students should design a poster/flyer educating their school and community about littering and show residents ways they can reduce litter in their community. Students can choose to use the litter they found around their school on their posters.

Extensions:
   a. Students can petition their town hall to hold a town-wide clean up for their community
   b. Teacher can create an account on Litterati and capture digital images and data as the students capture data on their data sheets.

Grades 6-12

1. Introductory activity
   a. Present the slideshow of litter images with your students. Ask that they just sit back and observe each image carefully.
   b. After the slideshow, ask the students to respond to the essential questions on their own
   c. Lead a class discussion based on student answers to the essential questions.
   d. Be sure to talk to students about the dangers of litter to our sense of place (how it makes us feel about where we live), visual environment (how it looks in our environment) and the dangers to waterways and animals (can contaminate water and hurt animals).
2. Tell students they will be doing a survey of the litter around their school and designing an educational campaign around litter.
4. Use the Litterati map (https://map.litterati.org/globalmap/) to see if there is any data captured in your school’s neighborhood.

5. Using the data table provided, students will then pick up litter around their school. For older students, consider widening the perimeter. Students should be provided with gloves and bags to gather litter safely.

6. Returning to the classroom, students should analyze their data.
   a. How much litter did they find?
   b. What was the most common type of litter found?
   c. How do they think that litter made its way to their school? (Wind, water, individual)
   d. How many trash and recycling receptacles were available outside the school and where?

7. Choosing their medium of choice, students should design a campaign educating their school and community about littering and show residents ways they can reduce litter in their community.
   a. Campaign Options: Video, slideshow, poster, flyer/brochure, Public Service Announcements, play

Extensions:
   a. Students can petition their town hall to hold a town-wide clean up for their community
   b. Students can visit their local elementary school to educate the students on littering
   c. Teacher can create an account on Litterati and capture digital images and data as the students capture data on their data sheets.

National Standards:

- Social Studies: Culture; People, Places, & Environments; Power, Authority, & Governance; Civic Ideals & Practices; Science, Technology, & Society
(Grades K-2) Make a tally mark for each piece of litter around your school.

<table>
<thead>
<tr>
<th>Cigarettes</th>
<th>Plastic cups</th>
<th>Food Wrappers</th>
<th>Glass bottles</th>
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</thead>
<tbody>
<tr>
<td>Straws</td>
<td>Plastic Bags</td>
<td>Food Containers</td>
<td>Aluminum Cans</td>
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</tbody>
</table>

Draw other items you found:

Most of our items were found:
- In the parking lot
- On the playground
- In the grass
<table>
<thead>
<tr>
<th>Type of Litter: Plastic bag, cup, food wrapper, cigarette, can, etc.</th>
<th>Where we found the litter: Parking lot, playground, grass</th>
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</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
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<tr>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
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<tr>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
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<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
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<tr>
<td><img src="image9.png" alt="Image" /></td>
<td><img src="image10.png" alt="Image" /></td>
</tr>
<tr>
<td>Type of Litter: Plastic bag, cup, food wrapper, cigarette, can, etc.</td>
<td>Quantity</td>
</tr>
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<td></td>
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</tr>
<tr>
<td>Trash Or Recycling Receptacles</td>
<td>Quantity</td>
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Scenic America’s Principles of Scenic Conservation

Principle #1 - Retain the distinctive character of our communities and countryside by rebuilding older cities, towns and suburbs as beautiful places in which to live and work; and conserve agricultural land and open space.

- Set aside open space for greenways, parks, trails and river corridors;
- Protect farms and ranches from subdivision through agricultural zoning, conservation land trusts, agricultural land banking, and tax abatement; and
- Create incentives for growth to help rebuild older cities and towns, and to create compact, transit-oriented, pedestrian-friendly mixed-use communities.

Principle #2 – Foster new development that respects the special character of places as defined by their distinctive geographical features, cultures, climate and natural systems.

- Encourage communities to identify and map the visual qualities they most value, and then adopt strategies to conserve them.
- Incorporate aesthetics into performance measures for planning, siting and construction of all new development.
- Establish comprehensive community tree policies that preserve existing trees, control tree cutting and tree damage during construction, and add new trees to replace those lost over the years to development.

Principle #3 – Encourage a balance of regulatory and market approaches to protect scenic resources including rewarding land stewardship by property owners, local governments and corporations; and providing disincentives for practices that destroy scenic values.

- Provide tax incentives and property tax relief for scenic conservation and good land stewardship; and
- Make visual polluters pay by fining those who break the law; taxing those who use the visual environment for commercial advertising based on the true value of their asset; and levying fees for uncompensated use of the roadways to cover the cost of services and access to the public right-of-way.

Principle #4 - Design a national transportation system that respects aesthetic values as well as economic and energy efficiency, social equity, and environmental qualities.

- Encourage excellence in road design and in bridge construction and reconstruction; and allow flexibility in design standards to respect scenic, historic, natural and community values; and
- Landscape our highways and community gateways to incorporate native vegetation and to reflect themes of local history and culture.

Principle #5 - Prevent mass marketing and outdoor advertising from intruding on the landscape or community appearance.
- Produce dramatic and immediate results in the scenic character of our landscape by banning the construction of new billboards and strictly regulating existing billboards; using any constitutional means to remove existing billboards within a reasonable period of time; and halting all cutting of trees and vegetation on public land to improve the visibility of billboards;
- Set height and size standards for on-premise signs;
- Promote well-designed logo and tourist-oriented directional signage systems, along with other information technologies to help travelers find the services they need;
- Regulate other forms of outdoor advertising including the exterior of public buses, floating or flying messages, posters on bus shelters, street furniture, and store windows, corporate sponsorship of public service events so as to minimize intrusiveness on our enjoyment of the built and natural environments; and
- Minimize the visibility of cellular communication, utility and energy generation technologies.

**Principle #6 - Teach young people to value the visual environment and to create and respect places of beauty.**
- Incorporate scenic conservation into all elementary and secondary environmental and geography education curricula.
- Incorporate the values of scenic conservation into graduate courses in economics, planning, design, and public policy.
- Integrate scenic conservation projects into scouting and school service learning programs.

**Principle #7 – Actively engage business, industry, civic and professional organizations in the movement for a more scenic America.**
- Promote the link between business and tourism development and conservation of natural, cultural, recreational, heritage and scenic resources; and
- Enlist retired professionals whose skills and political clout can benefit scenic conservation.

**Next Generation Science Standards**

**Engineering Design**

K-2ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

3-5-ES1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ES1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ES1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

HS-ETS1-1. Analyze a major global challenge to specify qualitative or quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.