

## Week Three, Day One

### Lesson Plan: "Who's Responsible for This?"

Grade Level: Middle School

Time: 40-45 minutes

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#### Objective

The lesson provides students with the opportunity to explore and debate the responsibility different stakeholders have in managing waste. They will analyze the roles of consumers, manufacturers, and waste management companies in reducing waste and promoting sustainability.

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#### Potential Standard Alignment

##### Literacy:

- **Writing**
  - **W.6-8.1:** Write arguments to support claims with clear reasons and relevant evidence.
  - **W.6-8.4:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- **Speaking and Listening**
  - **SL.6-8.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade-level topics, texts, and issues, building on others' ideas and expressing their own clearly.
  - **SL.6-8.4:** Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

##### Social Studies:

- **SS.6.14:** Explain how the relationship between environmental characteristics and human activity creates challenges and opportunities for societies.
- **SS.7.15:** Evaluate how economic decisions affect the well-being of individuals, businesses, and society.
- **SS.7.17:** Critique the impact of technology and innovation on society.
- **SS.7.21:** Analyze the role of civic and political institutions in meeting the needs of individuals and societies.

##### Next Generation Science Standards (NGSS):

- **MS-ESS3-3:** Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.
  - **MS-ESS3-4:** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
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##### Materials:

- **Whiteboard or chart paper**
  - **Markers**
  - **Printed role cards (Consumer, Manufacturer, Waste Management, Government, Environmental Activist)**
  - **Sticky notes**
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## Lesson Activities

### 1. Introduction (5 min)

- Ask students to discuss with a partner: **"After our experiences over the past two weeks, what do you think: Who is responsible for reducing waste?"**
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### 2. Group Activity: Stakeholder Debate (30 min)

#### Step 1: Assign Roles (5 min)

- Divide students into four groups. Assign each group a role:
  1. **Consumers** – People who buy and use products.
  2. **Manufacturers** – Companies that produce and package goods.
  3. **Waste Management Companies** – Organizations that handle waste collection and disposal.
  4. **Government** – Policymakers who regulate waste and recycling.

#### Step 2: Discussion & Argument Building (15 min)

- Each group answers the following questions from their perspective:
  - **What responsibility does your group have in reducing waste?**
  - **What challenges do you face?**
  - **Who else should be responsible and why?**
- Students write key points on sticky notes.

#### Step 3: Debate (10 min)

- Each group presents their argument. After all groups have spoken, facilitate a discussion:
    - "Who should bear the greatest responsibility?"
    - "How can these groups work together?"
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### 3. Reflection & Exit Ticket (5 min)

- Ask students to individually respond to:  
**"What is one change you can make to help better manage waste in your daily life?"**
  - Collect responses to review later.
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#### Assessment & Extension:

- **Assessment:** Participation in the debate, quality of arguments, exit ticket responses.
  - **Extension:** Students research and propose a local initiative to reduce waste at school or in the community.
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## Role Cards: "Who's Responsible for Our Trash?"

### Role: Consumer

**Your Role:** You are an everyday person who buys and uses products. You throw away packaging, food scraps, old clothes, electronics, and more.

**Key Questions to Consider:**

- How much responsibility do you have for reducing waste?
- Should you make better purchasing decisions (like buying items with less packaging, recycling more)?
- Is it fair to expect you to change your habits if manufacturers keep producing wasteful products?

**Challenges You Face:**

- Sometimes, sustainable products cost more.
  - Disposable products make life easier in the moment.
  - Recycling rules can be confusing.
  - Many products are designed to be thrown away quickly.
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### Role: Manufacturer

**Your Role:** You design, produce, and package goods that people buy. Your choices impact how much waste is created (ex, plastic packaging, disposable products).

**Key Questions to Consider:**

- Should you be responsible for reducing waste, or is it the consumer's job?
- Can you make products that last longer or are easier to recycle?
- How does the cost of sustainable packaging impact your business?
- How do you balance the cost of packaging choices with the profit your company can make?

**Challenges You Face:**

- Sustainable materials can be expensive.
  - Many customers expect cheap and convenient products.
  - Switching to eco-friendly production methods takes time and money.
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### Role: Waste Disposal Company

**Your Role:** Your facilities manage garbage, recycling, and yard waste. You run landfills, recycling facilities, hazardous waste facilities, and compost facilities.

**Key Questions to Consider:**

- Should you do more to recycle and manage waste responsibly?
- Are consumers and manufacturers making your job harder by creating too much trash?
- How do costs affect waste disposal?

**Challenges You Face:**

- Not everything can be recycled.
  - Landfills are filling up quickly.
  - Sometimes services like recycling cost more money than they make.
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### Role: Government

**Your Role:** You create and enforce laws about waste, recycling, and environmental protection. You decide on bans (ex, plastic bags, straws) and incentives (ex, bottle return programs).

**Key Questions to Consider:**

- Should you pass stricter laws to limit waste?
- How do you balance environmental concerns with business interests?
- Should you fine people or companies that create too much waste?

**Challenges You Face:**

- Businesses may resist strict rules.
- People don't always follow recycling laws.
- Some waste problems (like plastic in the ocean) require global cooperation.

## Week Three, Days Two-Five

**Grade Level:** Middle School (6th-8th)

**Time:** 40-45 minutes per day

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### Objective

Students will apply their knowledge of waste generation and management by designing a town that minimizes waste production and maximizes sustainable waste management practices.

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### Overview of the 4 Days

**Day 1: Brainstorm & Town Planning**

**Day 2: Designing the Town (Layout & Infrastructure)**

**Day 3: Finalizing & Preparing Presentations**

**Day 4: Presentations & Reflection**

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### Potential Standard Alignment

#### Literacy:

- **Reading Informational Text**
  - **RI.6-8.7:** Integrate information presented in different media or formats (ex, visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
- **Writing**
  - **W.6-8.2:** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
  - **W.6-8.7:** Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.
  - **W.6-8.8:** Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism.
- **Speaking and Listening**
  - **SL.6-8.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade-level topics, texts, and issues, building on others' ideas and expressing their own clearly.
  - **SL.6-8.4:** Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

#### Social Studies:

- **SS.6-8.G.1:** Use geographic tools to analyze the locations and relationships of people, places, and environments.
- **SS.6-8.G.2:** Explain how culture influences the way people modify and adapt to their environments.
- **SS.6-8.E.5:** Analyze the role of innovation and entrepreneurship in a market economy.

#### Next Generation Science Standards (NGSS) for Middle School:

- **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 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.
  - **MS-ESS3-3:** Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.
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## Day 1: Brainstorm & Town Planning

### Objective

Students will identify key waste-reducing and management strategies and start planning their town's design.

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### Materials

- **Planning a Sustainable, Waste-Conscious Town worksheet [included]**
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### Lesson Activities

1. **Warm-Up Discussion (10 min)**
  - Ask: "If you were founding a brand-new town from scratch, how could you make sure it has fewer of the troubles you learned about over the course of this unit?"
  - Record responses on the board under two categories: **Reducing Waste** and **Managing Waste**.
2. **Group Formation & Role Assignment (5 min)**
  - Divide students into small groups (3-5 students per group).
  - Each group will design their own town and assign roles (ex, Town Planner, Environmental Engineer, Director of Waste Disposal, Community Coordinator, etc.).
3. **Planning Discussion & Town Concept (20 min)**
  - Groups brainstorm key features of their town on their planning worksheet.
  - Provide guiding questions:
    - How will waste be **reduced**? (ex, no plastic bags, bulk shopping, repair shops)
    - How will waste be **managed**? (ex, town composting, advanced recycling systems)
    - How will the town's design encourage sustainability? (ex, green spaces, shared resources)
4. **Exit Ticket (5 min)**
  - Each group writes a short summary of their town's waste philosophy to turn in.

## Day 2: Designing the Town (Layout & Infrastructure)

### Objective

Students will begin designing a visual representation of their town, mapping out sustainable features.

*\*\*Note: This lesson includes an opportunity for you to showcase materials of your choice to help students conceptualize how to visually represent their town. This opportunity is highlighted in yellow in the Lesson Activities section.*

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### Materials

- **Supplies to create town visuals, like**
    - Large paper or posterboard
    - Grid paper
    - Rulers
    - Drawing supplies
    - Digital design tools
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### Lesson Activities

1. **Review & Recap (5 min)**
  - Groups review their town plans from the previous day.
  - Ask: "What is one waste-related feature your town has that you're excited about?"
  - **Optional Demo: Share different ways to visually showcase a town (ex, Google maps, grid, bird's eye view, etc.)**
2. **Town Design Begins (35 min)**
  - Groups begin **creating a visual representation** of their town. They can use:
    - Poster board with drawings and labels
    - A digital tool (if available, such as Google Slides, Canva, or Minecraft)
  - They must include key areas:
    - Residential (homes, waste collection systems)
    - Commercial (stores, restaurants, businesses)
    - Public Spaces (parks, community gardens, waste drop-off sites)
    - Waste Management (recycling centers, compost facilities, landfills, incineration plants)
3. **Check-In & Feedback (5 min)**
  - Groups do a **gallery walk** to see each other's progress and share one constructive idea with another group.

## Day 3: Finalizing & Preparing Presentations

### Objective

Students will finalize their town design and prepare a presentation explaining their choices.

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### Materials

- **Supplies to create town visuals, like**
    - **Large paper or posterboard**
    - **Grid paper**
    - **Rulers**
    - **Drawing supplies**
    - **Digital design tools**
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### Lesson Activities

1. **Touch-Ups & Details (25 min, or as needed)**
  - Groups refine their town's layout and add labels explaining waste-related features.
  - Encourage creativity! They can create a town motto, slogans, or advertisements promoting sustainability.
2. **Presentation Preparation (20 min, or as needed)**
  - Groups prepare a **3-4 minute presentation** that includes:
    - An overview of their town's layout
    - How their town **reduces waste**
    - How their town **manages waste effectively**
    - What makes their town unique



## Day 4: Presentations & Reflection

### Objective

Students will present their town designs and reflect on their learning.

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### Materials

- Finished town designs
  - Post-test
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### Lesson Activities

1. **Presentations (30 min)**
    - Each group presents their town. Encourage classmates to ask questions after each presentation.
  2. **Discussion & Reflection (5 min)**
    - Whole-class discussion:
      - "What common features did we see in different towns?"
      - "What were the most creative ideas?"
  3. **Post Test**
    - Deliver the same assessment given as a pre-test at the start of the unit
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### Assessment & Extension:

- **Assessment:** Group participation, creativity in town design, clarity of presentation, post-test.