



## **Energy Consumption and Conservation**

### **Engineering Portfolio**

This portfolio belongs to:

## Concept Map

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Show what you already know about energy. Brainstorm words or ideas related to energy and list them under the Energy heading below. Keep adding new words and ideas that relate to previously listed words.

Here are some questions you can think about to help you get started.

- Where do we get energy?
- What do we use it for?
- How does our use of energy affect the environment?

## Energy

## Energy and Climate Change

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What does our use of energy have to do with climate change? Take notes as you watch the video.

## Your Carbon Footprint

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What is a carbon footprint? Write a definition below.

How much carbon dioxide is released by doing these everyday activities? Write your answers below.

<b>Everyday Activities</b>	<b>Amount of CO<sub>2</sub> Released</b>
Watching television for two hours	
Blow drying your hair for 20 minutes	
Leaving a light bulb on for 6 hours	
Leaving an air conditioner on for 24 hours	

How do the everyday activities listed above contribute to the amount of carbon dioxide in the atmosphere?

Are you surprised by the amount of carbon dioxide released by these activities? Describe your reaction to the information you have learned.

## Calculate Your Carbon Footprint

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What is your family's carbon footprint, according to the online calculator? Fill in the first part of this chart (You will return to this chart to fill in the second part later in the lesson.):

<b>Type of Energy Usage</b>	<b>Tons of CO<sub>2</sub> released per year (first calculation)</b>	<b>Tons of CO<sub>2</sub> released per year (second calculation)</b>
Home Energy		
Transportation		
Food and Diet		
Recycling and Waste		
TOTAL		

## Reducing Your Carbon Footprint

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Use this graphic organizer to take notes as you explore the recommended websites. List ways that you can reduce your carbon footprint in each category.

<b>Category</b>	<b>Ways to Reduce Your Carbon Footprint</b>
Home	
Food	
Transportation	
Waste	

## **Personal Conservation Commitment**

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Now it is time to create your personal energy conservation commitment. This is a plan of action in which you will commit to reducing your consumption of energy.

Describe at least two actions you can take to reduce energy consumption and lessen carbon dioxide emissions for each of the four areas of daily life.

**Home:**

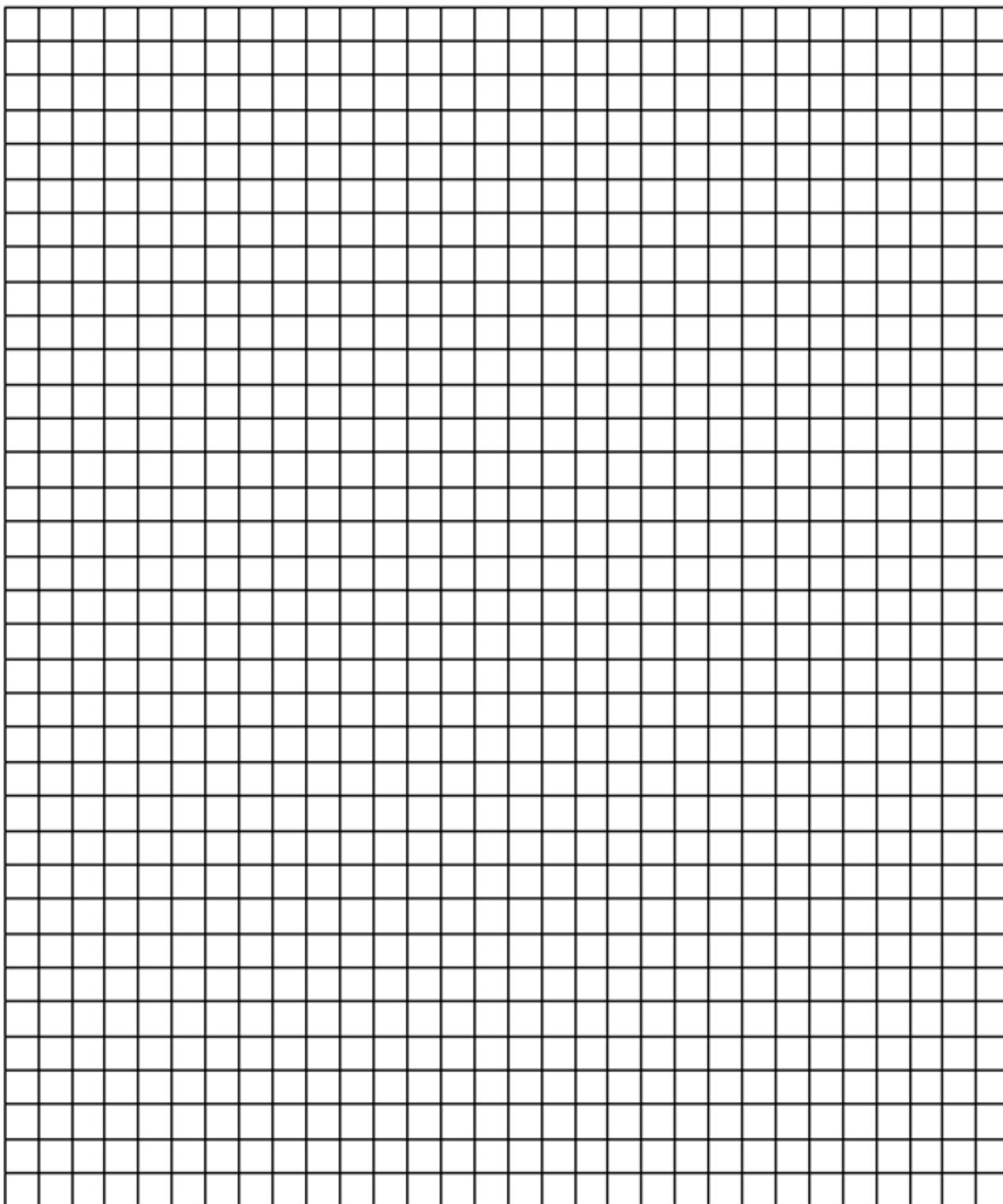
**Food:**

**Waste:**

**Transportation:**

# Grid Paper

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## Your Challenge: Create a Public Service Announcement

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Are you ready to create a public service announcement? Use the engineering design process outlined below as your team works on this project.

**1. Define the Problem:** What is your challenge? Write it below.

**2/3. Brainstorm, generate ideas and research:** Work with your STEM team to answer the following questions:

- What overall message do you want to get across with your PSA?
- Which specific actions will your PSA encourage?
- How will the graphics work to enhance the message of your PSA?

**4. Identify Criteria and Constraints:** Write criteria and constraints below.

- What are the requirements of your PSA?
- What limitations may be involved with creating or communicating your PSA?

**5. Explore Possibilities:** (Return to the website to continue working on your PSA.)

Check out some examples of existing PSAs. As you explore, think about:

- Who do you think is the intended audience for each PSA?
- What do you think works about these PSAs?
- What does not work?
- How do you want your PSA to be like or unlike the examples?

Record your notes below:

**Explore Possibilities Continued**

Take notes as you explore different possibilities for your PSA.

**Audience:**

**Text:**

**Images:**

**Placement of Text and Images:**

## Explore Possibilities Continued

Now sketch some ideas below or explore some ideas online.

**6./7. Select an Approach and Develop a Design Proposal:** Which of the possibilities you have explored seems like the best solution? Write down your proposal below. Think about:

- Who is your intended audience?
- What is the main message of your PSA?
- What three facts will your PSA contain?
- What two suggestions for changing behavior will your PSA contain?
- How will you explain how these behavior changes can help reduce greenhouse gas emissions?
- What images and text will you choose to enhance your message?

**8. Make a Prototype:** Print and attach a copy of your prototype.

## 9. Test and Evaluate

Use this survey to review each PSA. Rate the PSA on a scale of 1-5, with 5 being the highest ranking and 1 being the lowest ranking. Check the appropriate box.

Team Name:

<b>Question</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Is the message of this PSA clear and appropriate?					
Does the PSA contain three facts about energy consumption and its impact on the environment?					
Does the PSA contain two suggestions for behavior changes that people can make?					
Does the PSA explain how the suggested behavior changes will help reduce greenhouse gas emissions?					
Does the PSA display attractive graphics and layout?					
Does the PSA show creativity?					

Additional Comments:

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Additional Comments:

**10. Refine Your Design:**

How will you refine your design in response to comments from your classmates? Write your ideas below.

**11. Communicate Results:**

Write a short essay summarizing your experience in creating your PSA.

- Explain why it is important for the public to learn more about energy and its impact on the environment.
- Include details about how your team developed your message, why you chose the images and text you did, and what kind of feedback you received from peers.

Write your response below.