

# CLIMATE ACTION!



## Part 5: Individual Climate Action

**SUSTAINABLE  
DEVELOPMENT GOALS**

developed by



**Smithsonian**  
*Science Education Center*

in collaboration with

**iap** **SCIENCE  
HEALTH  
POLICY**  
the interacademy partnership

### Copyright Notice

© 2024 Smithsonian Institution  
All rights reserved. First Edition 2024.

### Copyright Notice

No part of this module, or derivative works of this module, may be used or reproduced for any purpose except fair use without permission in writing from the Smithsonian Science Education Center.

Smithsonian Science Education Center greatly appreciates the efforts of all the individuals listed below in the development of *Climate Action! How can we mitigate human impacts on the atmosphere?* Part 5. Each contributed his or her expertise to ensure this project is of the highest quality. For a full list of acknowledgments please refer to the acknowledgments section at the beginning of this guide.

Smithsonian Science Education Center Module Development Staff

Executive Director - Dr. Carol O'Donnell

Division Director for Curriculum, Digital Media, and  
Communications - Dr. Brian Mandell

Science Curriculum Developer - Andre Radloff

Technical Reviewer  
Nothando Gwazani

The contributions of the Smithsonian Science Education Center staff, Project Advisors, Research Mentors, and Technical Reviewers are found in the acknowledgments section.

### Image Credits

Cover - AleksandarGeorgiev/E+/Getty Images Plus; kemirada/iStock/Getty Images Plus  
Figure 5.1 - Smithsonian Science Education Center



## PART 5: INDIVIDUAL CLIMATE ACTION

Planner	152
Meet Your Research Mentor	153
<b>Task 1: What individual action strategies will we use?</b>	154
<b>Discover:</b> What are different individual mitigation strategies?	154
<b>Understand:</b> What motivates people to take action?	159
<b>Act:</b> How can you choose a mitigation strategy to use?	161
<b>Task 2: How can we measure mitigation progress?</b>	164
<b>Discover:</b> How will you measure progress on your individual mitigation strategy?	164
<b>Understand:</b> What are you doing now?	166
<b>Act:</b> How will you commit to act in the future?	168
Glossary	171

### ***Find out More!***

For additional resources and activities, please visit the *Climate Action!* StoryMap at <https://bit.ly/CLIMATEACTION2030>.



## Planner

Activity	Description	Materials and Technology	Additional Materials	Approximate Timing	Page Number
<b>Task 1: What individual action strategies will we use?</b>					
<b>Discover</b>	Outline all the different individual actions you can take.	<ul style="list-style-type: none"> <li>• Paper</li> <li>• Pen or pencil</li> </ul>		30 minutes	154
<b>Understand</b>	Explore what motivates people to take action.	<ul style="list-style-type: none"> <li>• Paper</li> <li>• Pen or pencil</li> </ul>	<u>Mitigation Strategies</u>  <u>Futures Mood Board</u>	40 minutes	159
<b>Act</b>	Identify which individual mitigation strategy you will use.	<ul style="list-style-type: none"> <li>• Paper</li> <li>• Pen or pencil</li> </ul>	<u>Identity Map</u>  <u>Mitigation Strategies</u>	30 minutes	161
<b>Task 2: How can we measure mitigation progress?</b>					
<b>Discover</b>	Determine how you will measure progress on your mitigation strategy.	<ul style="list-style-type: none"> <li>• Pen or pencil</li> <li>• Paper</li> <li>• Recording device (optional)</li> </ul>	<u>Mitigation Strategy Venn Diagram</u>	30 minutes	164
<b>Understand</b>	Research your current actions to establish a baseline.	<ul style="list-style-type: none"> <li>• Pen or pencil</li> <li>• Paper</li> <li>• Access to print or online resources (optional)</li> </ul>	<u>Additions from Lifestyle Calculator</u>	60 minutes	166
<b>Act</b>	Outline your commitment to act in the future.	<ul style="list-style-type: none"> <li>• Pen or pencil</li> <li>• Paper</li> </ul>	<u>Research Organizer</u>	30 minutes	168



### ***Meet Your Research Mentor, You!***

Throughout this guide you have met many different people who are taking action from many different places in the world. Now it is your turn to be the research mentor. Take out the *Identity Map* you created in Part 1. Take a moment and write a statement about where you are from. Consider including the following.

- Describe where you live.
- What are some beliefs that represent where you are from?
- Can you provide a snapshot of places, traditions, events, family, pets, food, sports, sayings, smells, tastes, familiar sights of where you are from?



## Task 1: What individual action strategies will we use?

In the face of the urgent global challenge of climate change, individuals—yes, even you—can play a crucial role in making a positive impact. **Mitigation strategies**, or actions taken to reduce or prevent the emission of greenhouse gases, are essential for addressing this global situation. This may seem like a big task, but making small changes to our daily lives can have an impact in the fight against climate change. From conserving energy at home to adopting ecofriendly habits, small efforts add up to create a more sustainable future. In this part, you will explore and identify some individual mitigation strategies that could be used by you and others in your community.

In this task you will first **discover** different individual mitigation strategies. You will then **understand** more about how you feel and what motivates you to take action. Finally, you will **act** by identifying which mitigation strategies might best fit you.



### **Discover:** *What are different individual mitigation strategies?*

Did you know that each one of us has the power to make a big difference in the fight against human impacts on the atmosphere? It's not just about adults or governments fixing things—it's about all of us working together. Big issues like climate change are like a puzzle. The more people who work on it, the faster we can solve the puzzle. This means we have a better chance of reducing human impacts. Taking individual actions might seem small, but when we add up these mitigation strategies, they can help prove that change is possible.

1. Take out a piece of paper and divide it into two columns. Title the columns "Additions" and "Mitigation Strategies."



2. Based on what you have learned so far, as an individual, make a list in the *Additions* column of human actions that add greenhouse gases into the atmosphere. For example, driving a car that uses gasoline adds greenhouse gases. Use any lists or information you gathered for the categories you learned about in Parts 3 and 4.
  - a. Transportation
  - b. Electric power
  - c. Agriculture
  - d. Residential and commercial buildings
  - e. Industry
3. Turn to a partner and compare lists. Is there anything your partner has listed that you forgot to list? If so, add that to your list now.
4. As a team, have one person read aloud or have each person read silently *Greenhouse Gas Additions*. Add anything you learned about that is not currently on your list.

### *Greenhouse Gas Additions*

This is a list of common human actions that add greenhouse gases to the atmosphere.

#### **Transportation**

- a. Driving personal vehicles: using gasoline or diesel-powered cars
- b. Air travel: flying on planes and helicopters
- c. Inefficient transportation habits: not using public transportation, not carpooling, using older and less fuel-efficient vehicles
- d. Excessive commuting: long daily commutes

#### **Electric Power**

- a. Energy-intensive appliances: using energy-intensive appliances (such as electric heaters and air conditioners)
- b. High electricity consumption: leaving lights and electronic devices on when not needed
- c. Non-renewable energy: relying on electricity from fossil fuel-based power grids



## Agriculture

- a. Meat consumption: high consumption of meat, particularly from greenhouse gas-producing livestock
- b. Food waste: wasting food results in greenhouse gas emissions from landfills
- c. Unsustainable agricultural practices: supporting or practicing agriculture that relies heavily on fossil fuels, such as producing or using mineral or synthetic fertilizers

## Residential and Commercial

- a. Inefficient heating and cooling: poor insulation and inefficient heating or cooling systems
- b. Excessive water use: wasteful water consumption, leading to increased energy use for water heating and treatment

## Industry

- a. Consumer goods production: purchasing goods produced using energy-intensive processes, such as some new clothing and electronics
- b. Unsustainable manufacturing: supporting industries with high carbon footprints, such as cement and steel production

5. Examine your list. Next to each action in the *Additions* column, in the *Mitigation Strategies* column write a mitigation strategy that could prevent those greenhouse gases from entering the atmosphere. For example, if your action was driving a car, a mitigation strategy might be to try to walk, ride a bicycle, or use an electric car.
6. Turn to your partner and share your mitigation strategies. Does your partner have any strategies you didn't list? If so, add those now.
7. As a team, have one person read aloud or have each person read silently *Mitigation Strategies to Reduce Additions*. Add anything you learn about that is not currently on your list.





## Mitigation Strategies to Reduce Additions

This is a list of some actions that might help reduce the amount of greenhouse gases entering the atmosphere because of human actions.

### **Transportation**

- a. Using public transportation: opting for buses, trains, subways, and other forms of public transit
- b. Carpooling: sharing rides with others to reduce the number of individual vehicles on the road
- c. Walking and biking: choosing these active transportation modes for short distances
- d. Electric or hybrid vehicles: switching to electric or hybrid cars for reduced emissions
- e. Telecommuting: working from home to decrease the need for daily commuting

### **Electric Power**

- a. Energy-efficient appliances: using energy-efficient appliances and light bulbs
- b. Renewable energy sources: supporting or using electricity from **renewable sources** such as solar and wind power
- c. Reduced energy consumption: turning off lights and electronics when not in use
- d. Smart thermostats: installing programmable thermostats for efficient heating and cooling

### **Agriculture**

- a. Plant-based diet: eating more meals that are solely plant-based
- b. Local and seasonal produce: choosing locally sourced and seasonal foods to reduce transportation-related emissions
- c. Composting: **composting** organic waste to minimize greenhouse gas emissions from landfills
- d. Community gardens: plants absorb carbon dioxide, and locally grown produce reduces transportation-related emissions



## Residential and Commercial

- a. Reduced water use: conserving water to decrease the energy required for water heating and treatment
- b. Waste reduction: recycling and reducing single-use products to minimize waste
- c. **Green building practices:** implementing environmentally friendly building materials and designs
- d. **Conservation** and restoration of green or natural spaces: planting native plants and maintaining them into the future

## Industry

- a. Supporting sustainable products: choosing products from companies that prioritize sustainability
- b. Reduced consumption: thinking carefully before buying something new
- c. Energy-efficient manufacturing: encouraging or supporting industries that adopt energy-efficient and sustainable manufacturing processes

1. Examine your *Mitigation Strategies*. Each strategy should be a way of reducing greenhouse gas additions. A few might also remove or take away greenhouse gases that are already in the atmosphere. For example, plants can trap carbon and so can some technologies, such as types of building materials. Write a plus sign (+) next to each mitigation strategy that you think might also remove greenhouse gases.
2. Complete the activity in the research mentor box by listing your ideas.

### ***As a research mentor, what would you say?***

Go through your *Mitigation Strategies* list. Are there things you are already doing as a research mentor to reduce greenhouse gas additions? If so, make a list to show the actions you are already taking.

Keep this list in a safe place to use throughout this part.





## **Understand:** *What motivates people to take action?*

Different things can motivate people to take action or not take action to reduce greenhouse gases in the atmosphere. Understanding what motivates you and others is a helpful place to start when thinking about individual actions you and others in your community might take.

1. Take out the *Mitigation Strategies* list you created in the Discover activity.
2. Examine the list. Think quietly to yourself, is it currently possible for you to do any of these strategies? If so, why are you doing the things you are already doing?
3. Turn to a partner and discuss what it is that motivates each of you to take action.  
**Motivation** is the reason you do or are interested in something.
4. Take out your *Futures Mood Board* from Part 1, task 1, Act. Hopes or concerns about the future often motivate people to act.
5. Think about additions and removals of greenhouse gases from the atmosphere. Are you more motivated to focus on reducing additions or on trying to remove greenhouse gases that already exist in the atmosphere?
6. Examine your *Futures Mood Board* and think about what you have learned about climate change. Can you identify a few hopes or concerns that might motivate you to act?
7. Young people can be important action-takers. Read the *At the Smithsonian* about concerns that motivate them. As you read, consider:
  - a. What elements of climate are these young people seeing or experiencing in their communities?
  - b. What mitigation strategies do they suggest doing?
  - c. How do the things they identified in their communities compare with your community?





## *At the Smithsonian*

The Network for Emergent Socio-Scientific Thinking (NESST) is an inclusive, collaborative, action-oriented community project for a sustainable future at the Smithsonian Science Education Center. Part of this project is the NESST Youth Ambassador Program. Youth Ambassadors are a team of high school students ages 14 to 18 from different parts of the world. They work together for a year as Youth Ambassadors. Their job is to give advice, help out, work together, and take individual actions in their communities to help create a better, more sustainable future. Another goal of the Youth Ambassador Program is to help the NESST Advisory Committee by sharing what young people think and feel.

The Youth Ambassadors also focus on important global goals by learning from others around the world and taking individual action in their own communities. Meet a few of them here and find out what motivates each of them to take individual action. You will learn more about the collaborative NESST project in Part 6.

### **NESST Youth Ambassador Statements**

**Alexander:** Hello, my name is Alexander, and my community is located in the municipality of Ecatepec de Morelos, in Mexico. The context in which we find ourselves is marked by a high level of water stress, poverty, and lack of recreational space. Based on this, I have proposed involving my entire high school through the implementation of hydroponic crops at different scales to promote environmental education, the production of healthy food resources, and the use of available resources in our environment.

**Jerry:** Hello, my name is Jerry and I am from Los Angeles, California. Historically, many low-income communities and communities of color have felt the disparate impact of environmental issues. And in the future, this disparate impact will only increase. We need the global climate leaders to properly address these issues,



increase green space, and fight against polluting companies. Only then can we make progress. If we want to succeed, we must do so together.

**Ela:** Hi, I am Ela and I live in Ankara, the capital city of Turkey. I have seen that climate change has been a problem for our community for years. And I can sadly say that as time goes by and the population increases, the ongoing problems of our community will eventually get worse. These problems can be listed as lack of clean water resources, the agricultural areas getting smaller, and the increase of fossil fuel being used. These are some of the problems in our community, and these will only get worse if we don't start taking action now. So I believe that if we all come together to solve these problems and share our ideas and resources, there is nothing that can stop us!

Learn more about becoming part of the NESST Youth Ambassador Program by visiting the *Climate Action!* StoryMap.

8. Compare these statements. What were the different things that motivated Alexander, Ela, and Jerry?
9. Complete the research mentor box with your ideas.

### ***As a research mentor, what would you say?***

Write down a sentence or two that explains what motivates you to act to limit human impacts on the atmosphere. Maybe it is concerns about what will happen if you don't. Maybe it is a hope for a better future. Maybe it is something else. Whatever it is, write it down and keep it safe. You will need it in the next activity.



### ***Act:* How can you choose a mitigation strategy to use?**

Finding a mitigation strategy that works for you is essential for creating lasting change. You are more likely to continue with mitigation strategies that align with your goals, strengths, and the things that bring you joy.



1. Take out a piece of paper and write “Mitigation Strategy” in the center. Draw a box around the words.
2. Add four overlapping circles, as shown in Figure 5.1. Label them “Motivation,” “Joy,” “Strengths,” and “Influence.” This is your *Mitigation Strategy Venn Diagram*. A **Venn diagram** uses circles to represent relationships between collections of different things.

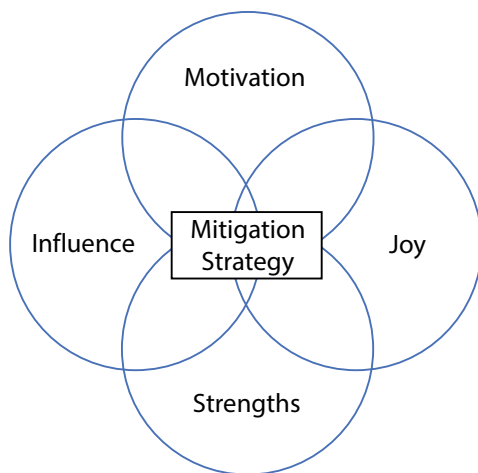


Figure 5.1: Example of a *Mitigation Strategy Venn Diagram*.

3. In the *Motivation* circle, add your motivation statement from step 9 of the Understand activity.
4. Think about what brings you joy.
  - a. Think about the things that make you happy.
  - b. What things in your life energize you? Examine your *Identity Map*.
  - c. Draw or write things that make you happy or energize you in the *Joy* circle of your Venn diagram.
5. Identify things you are good at.
  - a. Think about your skills, interests, and areas of expertise.
  - b. What strengths can you bring to a task?
  - c. How can you support the team?
  - d. Who and what do you have access to that others may not?
  - e. Write down or draw these things in the *Strengths* circle of your Venn diagram.



 **Emotional Safety Tip**

Everyone has strengths and weaknesses. Thinking about your unique strengths is important, even if it feels uncomfortable. It is important to respect your own strengths and to respect what others identify as their strengths.

6. Think about what you personally can change. Certainly, there are parts of your own behavior that you probably can change. You might be able to change things at home or at school as well. Write or draw your ideas about things that you can change in your *Influence* circle.
7. Take out your *Mitigation Strategies* list. Compare it to your *Influence* circle in your *Mitigation Strategy Venn Diagram*. Place a plus sign (+) next to any strategies you could personally put into action.
8. Examine the strategies with a plus (+) next to them and compare them to your *Strengths*. Are there any strategies you think play to your strengths? If so, put a second plus (+) next to those strategies. Some strategies now have two plus (+) signs next to them.
9. Examine the strategies with two plus signs and compare them to the things you added to *Joy*. Are there any of these strategies that would bring you joy? Place a third plus (+) sign next to them. Make sure to leave at least one strategy.
10. Finally, compare the remaining strategies with your *Motivation*. Pick the strategy that you are most motivated to carry out.
11. Write the mitigation strategy you pick in the *Mitigation Strategy* box.



## Task 2: How can we measure mitigation progress?

In this task you will first **discover** how to measure your action on your mitigation strategy. You will then **understand** how you will collect data to research this strategy over time. Finally, you will **act** by planning to sustain and share your research into the future.



### **Discover:** *How will you measure progress on your individual mitigation strategy?*

To know how well you are doing, you first need to decide what success might be. There are different ways to think about success. For example, if you were trying to walk more often, success might be measured in the number of additional walking trips you took or the distance you walked. Once you decide what you want to measure, then you can determine your goal.

1. Examine the mitigation strategy listed on your Mitigation Strategy Venn Diagram. Think to yourself about different ways to collect data or measure how you would implement this strategy. Under your Mitigation Strategy Venn Diagram write down any ideas you have for collecting data about implementing this strategy.
2. Read Data Types and write down any additional ways of measuring progress on your mitigation strategy.

### Data Types

This list shows different types of data you might use. For each type, consider what would you need to measure. For some, it might just be a number, such as counting the number of trips. For others it might be distance, size, or weight.

#### **Transportation Data**

- a. Personal vehicle use
  - Miles driven per day, week, or month
  - **Fuel efficiency** of vehicles used
  - Types of fuel used (gasoline, diesel, electric)
  - Maintenance practices that affect fuel efficiency





**b. Public transportation**

- Frequency of public transportation use
- Type of public transportation used (bus, train, subway)
- Distance covered using public transportation

**c. Air travel**

- Number of flights per year
- Distance traveled by air

**Energy Data****a. Home energy use**

- Monthly electricity and gas consumption
- Types of appliances used and their energy efficiency
- Heating and cooling practices
- Internet use and storing digital files in the cloud, which uses energy to store and access the information online

**b. Renewable energy sources**

- Use of renewable energy sources (solar panels, wind turbines)
- Percentage of electricity generated from renewable sources
- Participation in community or shared renewable energy projects

**Residential and Commercial Data****a. Waste generation**

- Amount of household waste produced
- Recycling practices
- Composting practices
- Efforts to reduce the use of single-use plastics and packaging

**b. Water use**

- Monthly water consumption
- Water conservation practices (low-flow fixtures, efficient irrigation)
- Awareness of virtual water use (water used by the goods and services you buy or use)



## Agriculture Data

- a. Diet and food choices
  - Frequency of meat consumption
  - Percentage of plant-based meals
  - Amount of locally sourced or organic food consumed
  - Amount of food waste created
- b. Gardening practices
  - Home gardening practices and sustainability efforts (size of garden, amount of food produced)
  - Use of environmentally friendly fertilizers and pesticides
  - Support for local and sustainable agriculture

## Industry Data

- a. Consumer behavior
  - Percentage of items purchased from environmentally friendly companies
  - Reduction in number of products, such as clothing, purchased or consumed

3. Examine your list of potential types of data you could gather.
4. Complete your research mentor box with your ideas.

### *As a research mentor, what would you say?*

Keeping in mind your mitigation strategy and your own situation as a research mentor, decide which data type or types you will collect to help you measure progress on your mitigation strategy.



### **Understand:** *What are you doing now?*

Before you decide on the actions you want to take in the future, it's important to understand what you already do. In this activity, you will gather data to research your current actions. This will help you make decisions about the individual action goal you want to set.



1. Complete your research using the instructions in *Individual Mitigation Research*.

### *Individual Mitigation Research*

#### **Create Your Research Organizer**

- a. Take out a piece of paper and label it “Research Organizer.” Draw five columns and label them “Type,” “Method,” “Period,” “Data,” and “Emissions.”
- b. In the *Type* column write the data type or types you decided on in the Understand activity.
- c. In the *Method* column list details about how you will collect this data. For example, will you use any tools, such as measuring devices. How often will you collect it? Consider tools like mobile apps, a journal, or a tracking spreadsheet to record your data.
- d. In the *Period* column define how long you will collect the data. For example, how many days, weeks, or months.
- e. Leave the other columns blank for now.

#### **Collect Data**

- a. Collect data about the current situation using your method, for the period you decided. This data will be your **baseline**. It will help you to understand what is happening before you start using your mitigation strategy.
- b. After you collect all your data, record it in the *Data* column.

#### **Add Your Emissions**

- a. If you can, use tools such as the *Additions from Lifestyle Calculator* in Part 4 or other calculators you can find in the *Climate Action!* StoryMap (<https://bit.ly/CLIMATEACTION2030>) to calculate the greenhouse gas emissions created by your current actions.
- b. Write any information you find in the *Emissions* column.

2. Reflect on your research. Is there anything about your type, method, or period you want to change before you implement your mitigation strategy? If so, mark those changes on your *Research Organizer*.



3. Examine your *Research Organizer*. How do you feel about your baseline?
4. Complete the research mentor box with your ideas.

### ***As a research mentor, what would you say?***

Draw a line under everything listed in your *Research Organizer* columns. You will use the area under this line to set your research goals. Consider:

- a. What would you like your data to be like in the future? Write that information at the bottom of the *Data* column.
- b. What would you like your emissions to be like? Write that information at the bottom of the *Emissions* column.



### ***Act: How will you commit to act in the future?***

In this task you identified a personal mitigation strategy. Then you found a way to measure it and researched your current baseline. Now you will commit to the individual action you will take to implement your strategy.

1. Examine your *Research Organizer* and remind yourself of the goals you wrote at the bottom of the *Data* and *Emissions* columns.
2. Turn your *Research Organizer* paper over and write “Action Commitment” on the back.
3. Create an action commitment and write it down. Be sure to make your commitment:
  - a. **Specific:** List exactly what you are going to do. For example, “I am going to take the bus instead of ride in the car four times a week.”
  - b. **Measurable:** Remember your goal for the data you will collect. What are you going to measure? For example, “I will reduce our household waste by 1 kilogram.”
  - c. **Achievable:** Is your commitment realistic? If you are unsure, it is better to choose a smaller goal and achieve it than choose a goal that is too big. Each time we meet a goal, it makes it easier to work toward the next goal.



- d. **Relevant:** Remember your motivation and include it in your commitment. For example, "I will eat 15 plant-based meals a week because I am concerned about the greenhouse gases created by livestock."
  - e. **Time-bound:** When will you start working on your commitment? How long do you commit to continuing?
4. Share your commitment with a partner, a family member, or your whole team. Sharing your commitment with others can help motivate people to continue to implement their commitment. If you're able, set a time to check back in with these people to discuss how your commitment is progressing.
  5. If it would help motivate you, create a poster or something else to help remind you of your commitment.
  6. Continue to collect your data, and at the end of your time period, examine your commitment again. Did you meet your commitment?
  7. Complete the research mentor box with your ideas.

***As a research mentor, what would you say?***

Celebrate! Each time you take action, even if it is less than you had hoped for, you should celebrate. Taking action is difficult and you did it!

Think about how doing research to take action felt to you. How would you describe this feeling to someone who has never done this before? As a research mentor, think about what you would say to them.

8. **Acknowledge:** Take a moment and recognize that you took more actions in this guide. Understanding the diversity of individual mitigation strategies is an important action. You are part of a human system. Humans are complex social animals. To effectively act on human impacts to the atmosphere, such as climate change, you must understand and respect the system.



# Congratulations!

## You have finished Part 5.

### *Find out More!*

For additional resources and activities, please visit the *Climate Action!* StoryMap at <https://bit.ly/CLIMATEACTION2030>.



## Glossary

This glossary can help you understand words you may not know. You can add drawings, your own definitions, or anything else that will help. Add other words to the glossary if you would like.

**Baseline:** The current situation

**Composting:** Setting aside and deliberately encouraging the decomposition of natural materials

**Conservation:** Protecting, preserving, and restoring biodiversity

**Fuel efficiency:** A measure of how much fuel a vehicle converts into energy to travel a certain distance

**Green building practices:** Using environmentally responsible and resource-efficient processes and structures throughout a building's lifecycle

**Motivation:** The reason for doing something

**Mitigation strategies:** Actions taken to reduce or prevent the emission of greenhouse gases

**Renewable sources:** Electricity produced from materials that are easily replenished or ongoing natural systems

**Venn diagram:** A diagram that uses circles to represent relationships between collections of different things

