Contents

TEACHER GUIDE

STUDENT HANDOUTS

READING COMPREHENSION

NAME: _____

Before You Read

How Warm Will Earth Get?

1. Complete each sentence with a word from the list. Use a dictionary to help you.

average	**evaporate**	**atmosphere**	**decade**
reflects	**clouds**	**concentration**	**system**

a) Water vapor in the atmosphere condenses into tiny droplets that form _____.

b) A period of ten years is called a _____.

c) A surface that _____ light bends the light back.

d) The _____ is the thin layer of gas that surrounds Earth.

e) _____ is the amount of a substance per volume.

f) A _____ is a set of natural objects or forces that interact together.

g) The value that represents the middle of a set of values is the _____.

h) To _____ is to change from a liquid to a gas.

2. Look up the meaning of the word **emissions**. Rewrite the meaning in your own words.

_____

_____

_____

Reading Passage

NAME: _____

Alternative Fuels

Vehicles like cars, buses, trucks, and airplanes, are major sources of greenhouse gas emissions. Yet in modern society, people and goods need to travel from place to place. One solution is the development of **alternative fuels**. Most of the fuels used to power vehicles, such as gasoline, are **fossil fuels**. These are made from the remains of plants that lived millions of years ago. They release a lot of carbon dioxide and other greenhouse gases when they are burned.

Heavy traffic

What are fossil fuels?

_____

_____

Fossil fuels

Alternative fuels are other sources of energy. They do not release as much greenhouse gases and other pollution. Most alternative fuels are also **renewable**. This means that they are replaced by nature faster than they are used up. Fossil fuels are in limited supply. This is because they take millions of years to form. Renewable sources of energy can be used long into the future. Some alternative fuels can be used directly in vehicles. Other alternative sources of energy can be used in power plants.

After You Read

NAME: _____

Transportation

1. Circle the word **TRUE** if the statement is TRUE **or** Circle the word **FALSE** if it is FALSE.

a) Transportation is one of the biggest sources of greenhouse gases.
TRUE **FALSE**

b) Hybrid cars use energy from the sun to drive.
TRUE **FALSE**

c) A car with greater fuel efficiency will travel farther on a gallon of gas than a car with lower fuel efficiency.
TRUE **FALSE**

d) Hybrid vehicles have low fuel efficiency.
TRUE **FALSE**

e) Buying products made or grown closer to home can help lower greenhouse gas emissions.
TRUE **FALSE**

f) Using public transportation can lead to higher greenhouse gas emissions.
TRUE **FALSE**

2. List five modes of transportation that could help lower greenhouse gas emissions.

_____

_____

_____

_____

_____

NAME: _____

After You Read

Urban Planning

3. Answer each question with a complete sentence.

a) Describe the job of an urban planner.

_____

_____

_____

_____

b) Explain how building more live-work spaces can help lower greenhouse gas emissions.

_____

_____

_____

_____

Research

4. Help plan the future of your city or town.

Work in groups. Visit your town planning department office or website. Find maps showing where people live and where they work. These are residential, commercial and industrial zones. Also, look for maps showing major roads and public transportation routes.

Study all of these maps. Make inferences about how most people move around town between home, work and shopping. How can you better connect the areas where people live and work with public transportation? Make some recommendations.

Hands-On Activity #1

Design Your Alternative Fuel Dream Car

If you could have any car, what would it be? Would you like a rugged, off-road truck? Maybe a sports car? In this activity, you will find a way to make your dream car "green."

First, research different vehicles that are already made. Look at magazines or the Internet. Find photos of vehicles that appeal to you. Don't forget to look at "concept" cars. These are futuristic vehicles designed by car makers.

Next, list the elements that you would like in your dream vehicle. Think about the following questions:

- What do you want the vehicle to look like?
- Where do you want to drive your vehicle?
- How many passengers do you want your vehicle to carry?
- What do you want the inside of the vehicle to be like?
- What special features do you want in your vehicle?

Now, research ways to make all of the parts of your vehicle "green." Think about the following questions:

- How will your vehicle be powered? Is there a way to power your vehicle with little or no greenhouse gas emissions?
- What materials do you need to build your vehicle? What choices can you make for materials that would result in less pollution, waste and greenhouse gas emissions? Don't forget that you need materials for the vehicle's frame, tires, seats, dashboard, carpet, and any other special parts it may have.
- What design features could you incorporate to lessen your vehicle's need for power? For example, a heavier vehicle takes more power to move. What other features of your vehicle could help lessen its need for power?

Finally, design your vehicle. Use drawings and labels to explain your design features. Create a poster to display your design. Invite your classmates to look at your poster and ask questions. For an extension, you may also want to build a model of your vehicle.

HANDS-ON ACTIVITY

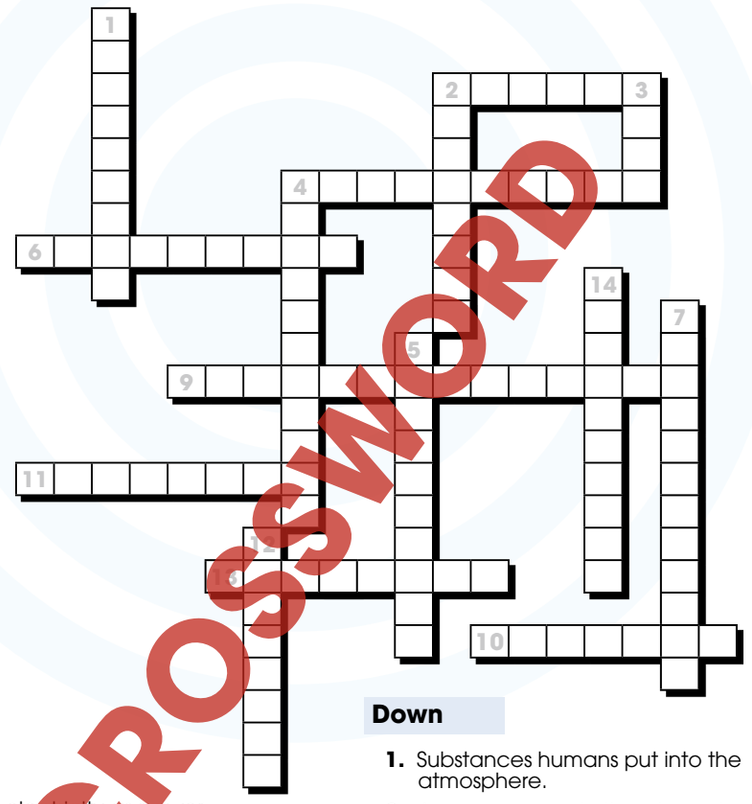
After You Read

NAME: _____

Crossword Puzzle!

WORD LIST

biofuel
dams
efficiency
emissions
fuel cell
hybrid
hydrogen
manufactured
planning
pollutants
renewable
solar cells
solar energy
transportation
turbines



CROSSWORD

Across

2. A car that uses electricity as power.
4. Objects that change energy from sunlight into electricity (two words).
6. Most alternative fuels are also _____.
9. The movement of people or goods from one place to another.
10. An alternative fuel made of vegetable oil or plant parts.
11. Urban _____.
13. Wind _____ change energy from wind into electricity.

Down

1. Substances humans put into the atmosphere.
2. A common gas in the atmosphere used for energy in fuel cells.
3. Structures that block the flow of rivers.
4. Energy from the Sun (two words).
5. A substance or condition that contaminates air, water or soil.
7. Products that are made by people are _____.
12. Technology that uses hydrogen as a source of energy to power vechicles.
14. Fuel _____ describes how far a car can go on a certain amount of fuel.

After You Read

NAME: _____

Comprehension Quiz

30

8

Part A

Circle the word **TRUE** if the statement is TRUE **or** Circle the word **FALSE** if it is FALSE.

1. Most greenhouse gas emissions come from burning fossil fuels.
   TRUE **FALSE**
2. If people stop emitting greenhouse gases today, Earth's average temperature will start to go down right away.
   TRUE **FALSE**
3. Alternative fuels release more greenhouse gases than fossil fuels.
   TRUE **FALSE**
4. Renewable sources of energy are replaced by nature faster than they are used up.
   TRUE **FALSE**
5. Hydroelectric generators change energy from sunlight into electricity.
   TRUE **FALSE**
6. A product made with recycled materials most likely used less energy to make than the same product made with raw materials.
   TRUE **FALSE**
7. Products that are manufactured are made by people using raw materials.
   TRUE **FALSE**
8. Buying fruits and vegetables grown near where you live is one way to help lower greenhouse gas emissions.
   TRUE **FALSE**

ASSESSMENT

Part B

5

List five transportation choices that result in less greenhouse gas emissions than driving individual vehicles.

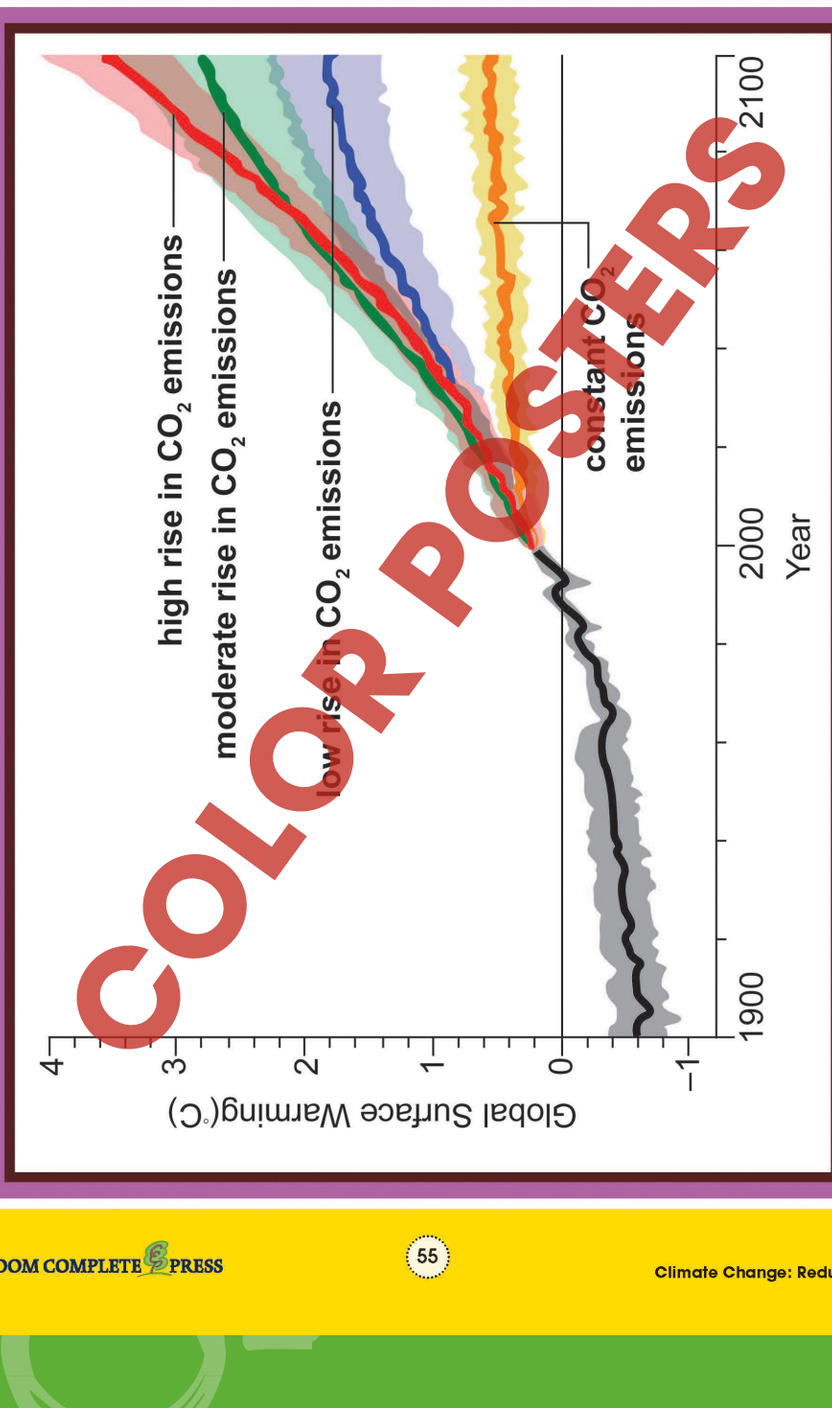
_____

_____

_____

SUBTOTAL: /13

Projections for Climate Change



COLOR POSTER

Before You Read

NAME: _____

Green Buildings

1. Have you ever heard the word "green"? It would be used to talk about products or services that are environmentally friendly. What do you think a "green building" is?

_____

_____

_____

_____

_____

2. Complete each sentence with a word from the list. Use a dictionary to help you.

toxic	**reducing**	**recycle**
fibers	**alternative**	**reservoir**

a) _____ sources of energy do not emit as many greenhouse gases than burning fossil fuels.

b) _____ substances can harm people's health.

c) People can help lessen the effects of climate change by _____ greenhouse gas emissions.

d) One way to _____ is to make something new out of something old.

e) A source of drinking water is called a _____.

f) _____ are thread-like substances used to weave textiles, carpets, and fabrics.

EASY MARKING ANSWER KEY

1.

Answers will vary.

2.

a) Alternative

b) Toxic

c) reducing

d) recycle

e) reservoir

f) Fibers

Buildings designed to lower greenhouse gas emissions, use less toxins, and reduce waste.

1.

a) TRUE

b) FALSE

c) TRUE

d) FALSE

e) TRUE

2.

Answers will vary.

3.

a) Green buildings have less greenhouse gas emissions, use less toxins, and reduce waste.

b) Direct sun in the winter and shade in the summer.

1.

a) solar energy

b) construction

c) carbon dioxide

d) public transportation

e) eliminate

2.

Answers will vary.

EZ

A sustainable city with little to no greenhouse gas emissions.

Low-carbon cement, 90% recycled aluminum.

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STOP

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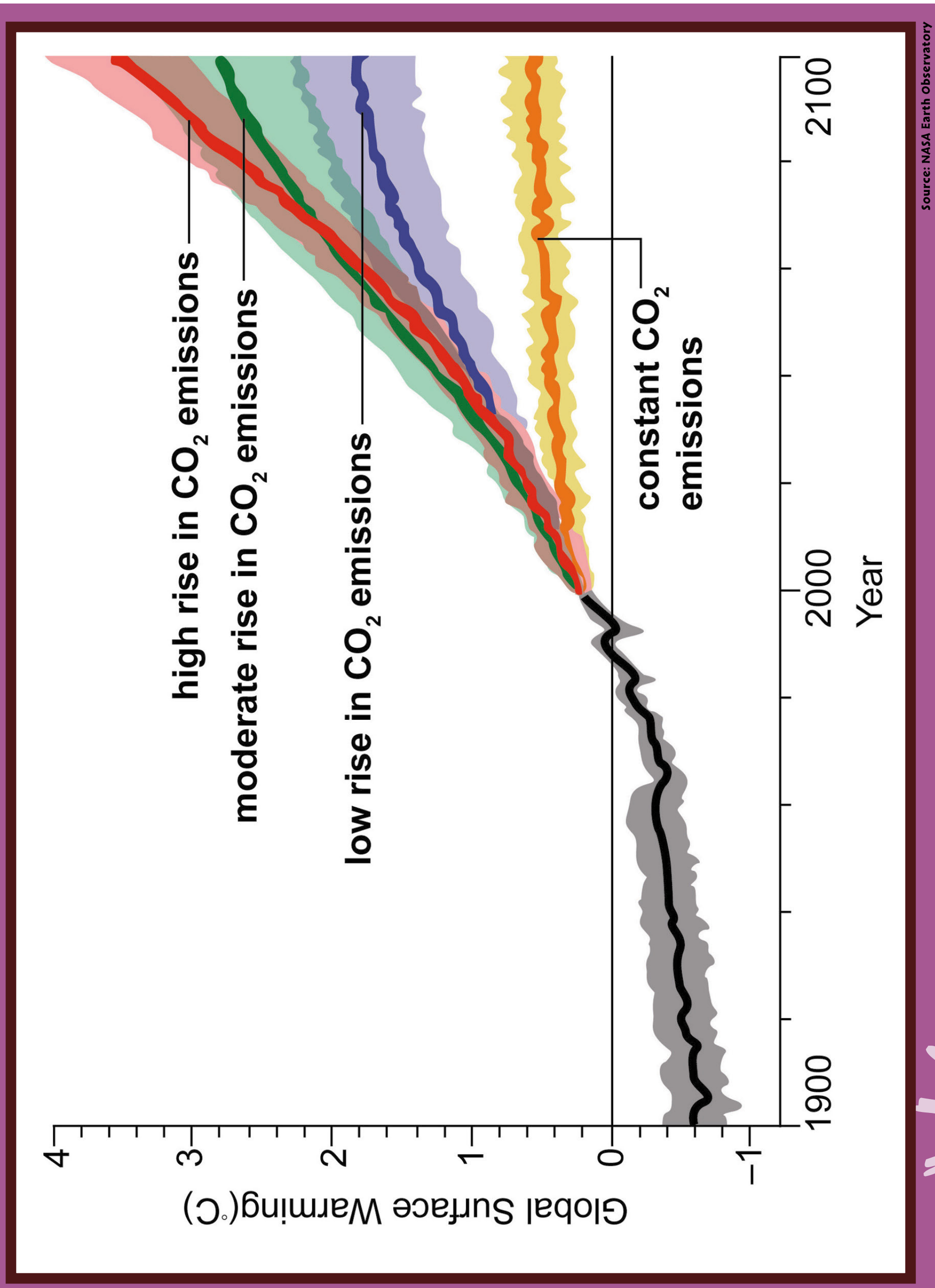
Projections for Climate Change



Source: NASA Earth Observatory