What is the Greenhouse Effect?

Engage

Talk to your partners and try to answer these questions. Be ready to share your thoughts with the class.

1. Think about the last time you were sitting in a car on a warm sunny day. Did you have the windows open or closed?

_____

2. Why did you have the windows open?

_____

3. What would it have been like if you had the windows closed?

_____

4. Why do you think it would be warmer in the car with the windows closed?

_____

5. Look at the first scene of the video "Gary on the Street: How hot can the inside of a car get?" at https://www.youtube.com/watch?v=WMSVy9N_Zwo

6. How hot is it outside the car? _____

7. Predict how hot it is inside the car. _____

8. Watch the video and write down the highest temperature you see.

_____

9. Why should you never leave babies or pets in a car with the windows up?

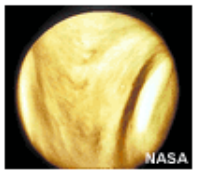
_____

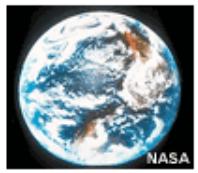
Explore

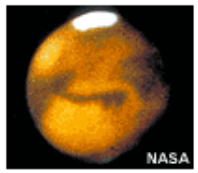
Materials: 5 colors of jellybeans, beans or pony beads, 3 re-sealable plastic bags per group labeled Venus, Earth, and Mars.

What To Do:

1. Look at the table below.







	Venus	Earth	Mars
Carbon Dioxide (CO_2)	96.5%	0.03%	95%
Nitrogen (N_2)	3.5%	78%	2.7%
Oxygen (O_2)	Trace	21%	0.13%
Argon (Ar)	0.007%	0.9%	1.6%
Methane (CH_4)	0	0.002%	0

2. Start with 100 and determine the number of each item needed to represent the atmosphere for each planet.
   Example – the Venus bag will need 96.5 yellow beans
3. Place the correct number of items in the bag for each planet.
4. Use the following code for each gas:

Nitrogen - red
Oxygen- green
Argon - purple
Carbon dioxide - yellow
Methane – white

Questions:

1. Name two ways that the atmospheres of Venus and Mars are similar to each other. _____
2. Name one way that both differ from Earth's.

_____

3. Which of the elements in the table is needed by humans to be able to breathe? _____

Explain

GREENHOUSE

GREENHOUSE GASSES

GREENHOUSE EFFECT

Elaborate **Teacher Demonstration**

Materials: 2 clear jars, 2 thermometers that will fit inside the jars or a thermometer gun, lid for one jar or plastic wrap, sunny window or heat lamp

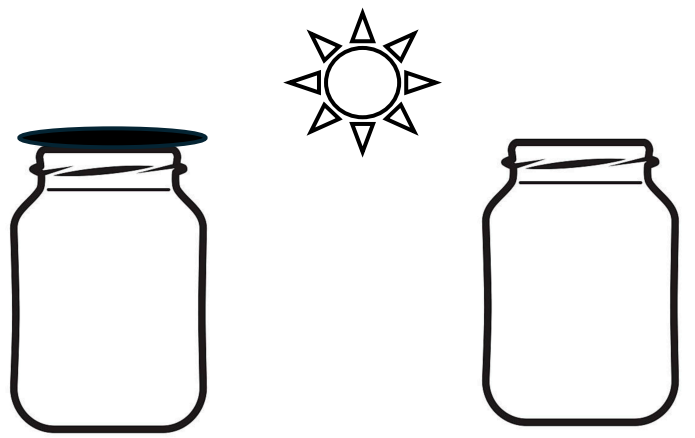
What To Do:

1. Your teacher will set up two clear jars.
2. You will need to measure the temperature inside each jar before the experiment starts and record in the table below.

Jar	Before Temperature inside	After Temperature inside
1		
2		

3. Place the lid or plastic wrap on Jar 1. Make sure it is sealed tightly.
4. Leave Jar 2 open.
5. Place both jars in a sunny window or under a heat lamp.
6. Watch the video on the next page and fill in the blanks.
7. After 15 minutes read the temperatures in the jars. **Don't open the lid until you have read the temperature!** Record in the table above.
8. Draw and label what is happening to the jars in the space below. Use the following words:

Sunshine, heat, lid, thermometer, trapped, released



1. Watch the video from NASA, "What Is the Greenhouse Effect?" at https://www.youtube.com/watch?v=SN5-DnOHQmE
2. Use the Word Bank to fill in the blanks.

WORD BANK			
measuring	greenhouse	balance	atmosphere
air	heat	living	just
trapping			
warming	cools	gases	examples

1. Earth is a comfortable place for _____ things.
2. It is _____the right temperature for plants and animals to thrive.
3. A _____ is a building with glass walls and a glass roof.
4. The clear glass allows sunlight to shine into the greenhouse, while also _____ the Sun's heat inside.
5. Earth is surrounded by a jacket of gases called the _____.
6. In the daytime, the Sun shines through the atmosphere _____ the Earth's surface.
7. After the Sun goes down, the Earth's surface _____.
8. This releases heat back into the _____.
9. Some of that heat is trapped by the _____ in the atmosphere.
10. The _____trapping gasses are called greenhouse gases.
11. Carbon dioxide, water vapor, and methane are all _____ of greenhouse gases.
12. Earth needs a _____ of greenhouse gases to maintain the right temperature for living things.
13. NASA satellites are constantly _____ the gasses in our atmosphere from space.

Evaluate

Name _____ period _____

EXIT TICKET

What Is the Greenhouse Effect?

1. What do greenhouse gases do?
   - A. Make greenhouses to grow plants
   - B. Trap heat from the sun in the atmosphere
   - C. Cause it to be too cold
   - D. Cause it to be too hot

2. What is a greenhouse?
   - A. A house that only has a few windows.
   - B. A house that is painted green.
   - C. A building with glass walls and a glass roof.
   - D. A building with lots of windows.

3. What is the greenhouse effect?
   - A. When satellites absorb heat from the Sun.
   - B. When green paint is spilled on the road.
   - C. When green algae grow on ponds.
   - D. When something traps heat and prevents its escape.

4. What happens to the temperature inside a greenhouse?
   - A. It gets colder.
   - B. It gets hotter.
   - C. It doesn't change.
   - D. It goes down and then goes up.

5. Why does Earth need a balance of greenhouse gases?
   - A. To produce more fossil fuels.
   - B. To keep it cold enough for snow to fall.
   - C. To maintain the right temperature for living things.
   - D. To make sure the Sun shines during the summer.