Station 1: Air Quality Demonstration

We are often unaware of how our everyday activities contribute to air pollution. The purpose of this demonstration is to make you aware of the air pollution you create every day. The cup of clean water in front of you represents unpolluted air. You'll add drops of food coloring to the cup to represent the different types of air pollutants caused by the everyday activities that I'll describe to you. We'll use the following colors to represent these pollutants:

Color Key
Blue—pollutants from consumer products and paints (VOCs)
Green—pollutants from lawn, garden, and construction machinery (CO, NO_2, PM10, SO_2, and VOCs)
Red—pollutants from cars and trucks (CO, NO_2, PM10, SO_2, and VOCs)
Yellow—pollutants from power plants and industrial processes (CO, NO_2, PM10, SO_2, and VOCs)

Particulate matter (PM10)—Particulate matter consists of airborne solids less than 10 micrometers in diameter. These tiny particles are easily inhaled into the lungs, where they can cause damage to lung tissue. Diesel fumes from busses and trucks are a source of airborne particulate matter.	Sulfur dioxide (SO2)—Sulfur dioxide is a toxic gas with a pungent odor. Electric power plants fueled by coal or oil are the primary source of sulfur dioxide pollution. Sulfur dioxide emissions can cause respiratory diseases and are a key factor in acid rain formation.	Nitrogen dioxide (NO2)—Nitrogen dioxide is a toxic, reddish brown gas by product of the combustion of fossil fuels (e.g., coal, diesel fuel, and gasoline). Nitrogen dioxide can irritate airways and increase susceptibility to respiratory diseases. It is also a factor in the formation of acid rain.

Carbon monoxide (CO)—Carbon monoxide is a colorless, odorless toxic gas. Motor vehicles are the primary source of carbon monoxide pollution. CO is highly toxic. At low concentrations it causes drowsiness and headache; it is lethal in high concentrations.	Volatile organic compounds (VOCs)—Volatile organic compounds are toxic gases made of carbon, hydrogen, oxygen, and other atoms that form gases easily. They are found in nature as well as in glue, paint, gasoline, tobacco smoke, and clothes that have been dry-cleaned. VOCs form ground level ozone, a main component of smog.

If you participated in the activity **during the past week**, add one drop of the appropriate color of food coloring to your cup of water. Some activities may not apply to you (for example, applying nail polish or mowing the lawn). That's why you each have your own cup, because each individual's contribution to air pollution is unique.

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6 & Final Cup

Analysis Questions:

1. Look inside your cups. If the air pollution around you were this apparent, would you want to breathe the air? Explain your thoughts.

2. What other sources of air pollution, beyond those mentioned in this demonstration, could you think of as being produced in a single day?

3. What could you do to reduce the number of pollutants released each day?

4. What are your thoughts/comments on the combined effect of each individual's pollution (container with everyone's pollution)?

Station 2: Helpful and Harmful Ozone

Watch the video and fill out the graphic organizer for helpful and harmful Ozone.

What it is?

What it is not

Harmful Ozone

Examples.

Facts from the video

1.

2.

3.

4.

What it is?

What it is not

Helpful Ozone

Examples

Facts from the video

1.

2.

3.

4.

Station 3: The Clean Air Act

Read the following article and answer the questions that follow.

1. Define industrialization. How has industrialization lead to an increase in air pollution?

2. What happened in 1948?

3. What did the Air Pollution Control Act of 1955 do for the country?

4. What did the acts of 1963 and 1967 call for?

5. How did the act in 1970 differ? What major changes did we see?

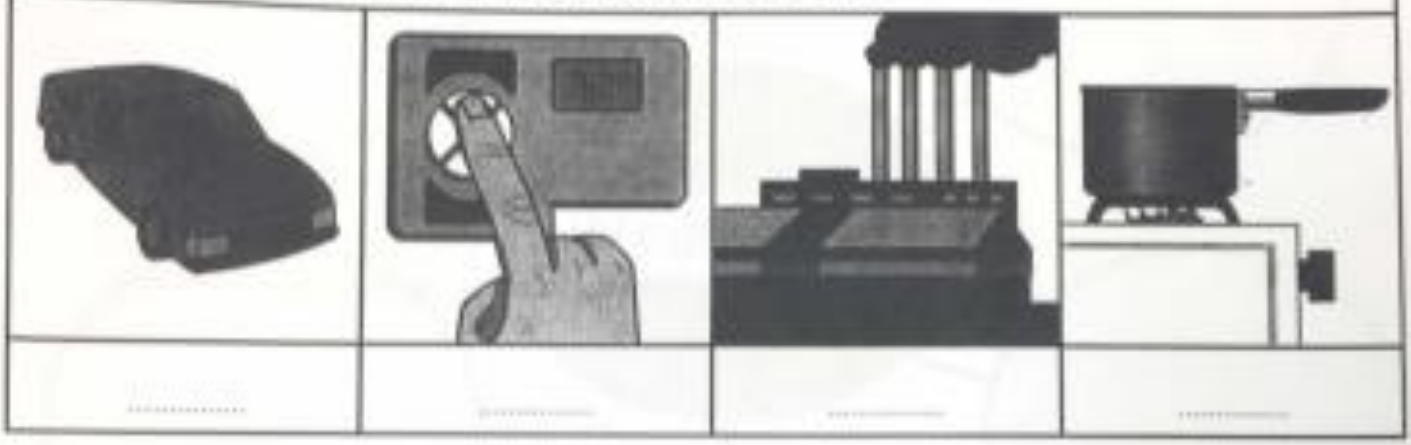
6. Has every country passed the laws like we have?

Station 4: Watch the brainpop video on **Fossil Fuels** and fill out the activity guide

FOSSIL FUELS

CATEGORIZE IT

Categorize the following according to whether they are usually fueled by oil (O), natural gas (G), or coal (C). Some may be fueled by more than one type.



LIST THE EXAMPLES

List some drawbacks to burning fossil fuels.

List some alternative energy sources that can help replace fossil fuels.

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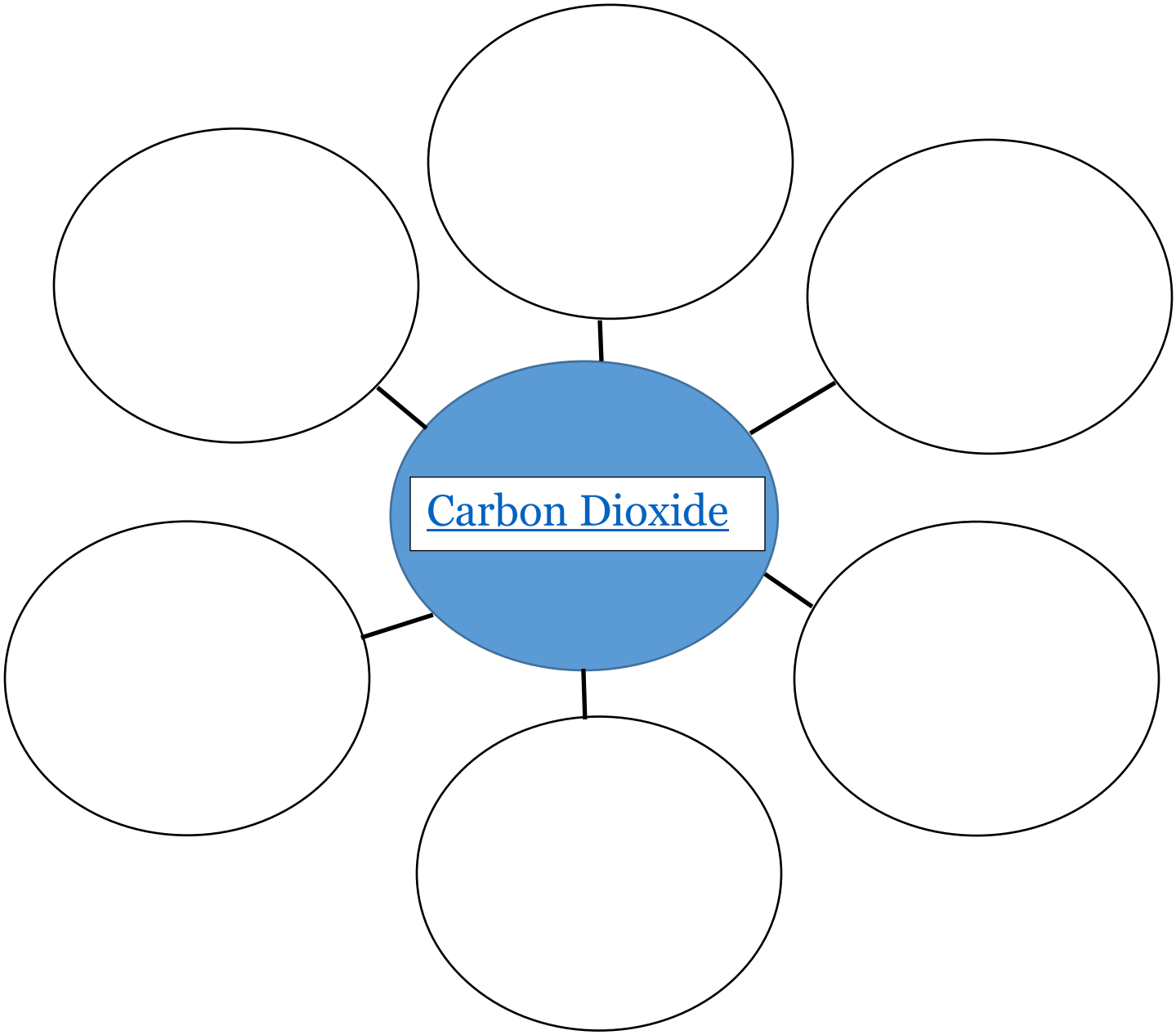
Station 5: Watch the following video and fill out the graphic organizer by writing 6 facts about CO_2 in the bubbles (Carbon Dioxide)



Station 6: Global Warming and Arctic Animals

1. What are examples of abiotic factors in the Arctic Ecosystem?

2. Why is the disappearance of one food source a major problem in the Arctic?

3. What is the largest threat to the Arctic animals? Why?

4. Why do scientists watch the Arctic as an indicator for climate change?