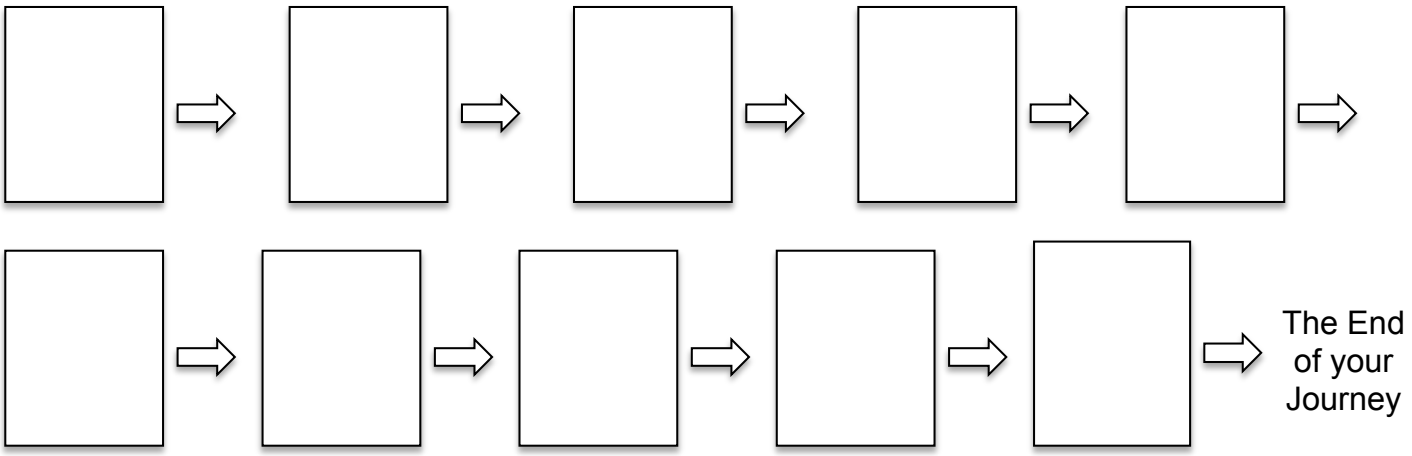
The Carbon Cycle Game

Activity

Carbon is the foundation of all life and the source of the majority of energy consumed by human civilization. Most of Earth's carbon is stored in rocks. The rest is in the ocean, atmosphere, plants, soil, and fossil fuels. Carbon flows between each reservoir in an exchange called the carbon cycle. Any change in the cycle that shifts carbon out of one reservoir puts more carbon in the other reservoirs, such as the atmosphere, which results in global warming.

Procedure:

1. You are going to be carbon atoms moving through the carbon cycle 10 different times.
2. Notice the areas of the room that are labeled with the places carbon can be found: Atmosphere, Plants, Animals, Soil, Ocean Surface, Deep Ocean, and Fossil Fuels. These stations contain the directions for movement from that station.
3. Make at 3-column data table in your lab notebook with the following titles: Name of Station, What Happened, Next Destination.
4. You will be assigned to a station randomly. Identify the different places carbon could go from that given station. Discuss the processes that allow for the transfer of carbon between stations. Make a line at each station to take turns and complete a roll of the die. Follow the directions for movement from (or retention at) each station. You will move (roll) 10 different times. Remember you are representing atoms of carbon moving through the carbon cycle.
5. Record the 10 results that you completed as a carbon atom in a three-column data table labeled: Name of Station, What Happened, Next Destination.
6. Once you've completed your journey through the carbon cycle (rolled 10 times), use the sample storyboard outline below to model (through drawing) your journey in your lab notebook.



6. Write a **scientific explanation** describing the mechanisms by which your carbon atom was moved through Earth's systems.

The Carbon Cycle Game

Activity, continued

Rubric for writing a scientific explanation

Points Awarded	2	1	0
Claim	Not applicable.	Answers the question and is accurate based on data.	No claim or does not answer the question.
Evidence	Cites data and patterns within the data. Uses labels accurately.	Cites data from the data source, but not within the context of the prompt.	No evidence, or cites changes but does not use data from data source.
Reasoning	Cites the scientifically accurate reason using correct vocabulary and connects this to the claim. Shows accurate understanding of the concept.	Cites a reason, but it is inaccurate or does not support the claim. Reasoning does not use scientific terminology or uses it inaccurately.	No reasoning, or restates the claim but offers no reasoning.
Rebuttal	Rebuttal provides reasons for different data or outliers in the data. Can also provide relevance to the real world or other uses for the findings.	Rebuttal is not connected to the data or is not accurate.	Does not offer a rebuttal.