

Carbon Cycle Pursuit Game

Summary:

By rolling a dice and answering question cards, teams compete with each other in a game that simulates the movement of a carbon atom through reservoirs of the carbon cycle. The first team to make it all the way around the carbon cycle wins.

Objective:

- Students will model the movement of carbon throughout the carbon cycle.
- Students will evaluate the relative timing of movement through various reservoirs of the carbon cycle.

Materials:

- 7 reservoir signs (attached)
- 1 Dice
- 7 x 10 question/answer cards (attached)

Lesson Preparation:

- Print the reservoir signs (lamine if possible).
- Equally space them around the classroom (blue-tac to the wall if possible).
- Print the double-sided question/answer cards and cut to size (don't mix reservoirs).
- Place the question/answer cards below their respective reservoir signs.
- Get a dice ready.
- *Optional* - write on the board the following processes of the carbon cycle: *combustion, respiration, photosynthesis, diffusion, decomposition and circulation*.
- (students arrive to class)
- Divide class into teams of 1 or 2 people in each team.
- Nominate a person to be the official '*question/answer card reader*'. Preferably someone who is trustworthy and is not going to give away answers to their friends.

Background:

The carbon cycle is the focus of much scientific research. Global warming and climate change can be attributed to the increased amount of heat-trapping gases, such as carbon dioxide. In this game you will develop an understanding of how carbon moves through the environment and hopefully gain an appreciation of the complexity when developing solutions to address problems associated with climate change. In addition, since anthropogenic (human) influences impact how much carbon is reintroduced to the active carbon cycle, you will recognize that human actions negatively affect the environment.

Instructions and Rules:

1. Teams of 3 *each* represent a carbon atom moving around the carbon cycle.
2. Around the room are 7 carbon cycle *reservoirs*: A fossil fuel, atmosphere, vegetation, soil, surface ocean, marine biota and deep ocean reservoir.
3. Each reservoir has a sign with a picture of that reservoir.
4. Each sign also has the numbers on the dice (1-6).
5. Each number on the dice refers to a designated reservoir.
6. Each reservoir also has a pile of question cards. They must stay at each reservoir.
7. Your teacher nominates someone to be the official '*question/answer card reader*' (someone who isn't already in a team).
8. Your teacher randomly and evenly assigns teams to each reservoir.
9. Stand at your assigned reservoir.
10. The team with a member possessing a birthdate closest to the day's date goes first (it doesn't matter if the birth date has past or is upcoming). The order of play goes clockwise from the starting team's starting position (remember who's turn is before yours as you will be moving around).
11. The person who was assigned as the official '*question/answer card reader*' selects a question card from the first team's reservoir pile of cards and reads the question out loud.
12. The team has 1min to decide on an answer. Only the card reader can read the question and award a correct answer (the answer is on the card).
13. If the answer is incorrect (or they run out of time), their turn is over and the question card is placed at the bottom of the stack.
14. If the answer is correct, they roll the dice.
15. Once the dice has been rolled, look on the reservoir sign to determine what the number on the dice means (which reservoir it refers to).
16. If the dice lands on the name of another reservoir, that team may advance to that reservoir **ONLY IF** they can name the process that transports them there. Processes to choose from include: *combustion, respiration, photosynthesis, diffusion, decomposition and circulation*.
17. If the dice lands on the same reservoir in which they're standing, they stay at that reservoir and their turn ends.
18. Other teams now repeat the same process in the order of play organised at the start of the game.
19. After a team correctly answers a question card in the same reservoir 3 times, but fail to advance to a new reservoir, or if all questions in the reservoir have been exhausted, they may move to another reservoir shown on their dice.
20. To win, a team must be the first to successfully cycle through all 7 reservoirs on the game board.