

Paper Clip Carbon Cycle Model #1

1. **Game Board.**
 - a. Different-colored circles on the game board represent different carbon reservoirs (e.g. ocean). Arrows represent flows moving carbon between the reservoirs.
 - b. Carbon atoms that belong to each reservoir are represented by different-colored paper clips. All of the paper clips represent identical carbon atoms—the different colors help keep track of which reservoir each carbon atom started in. Each reservoir starts with 10 paperclips.
2. **Carbon Cycle Cards.** These cards include descriptions of **reservoirs** (blue edged cards), **flows between reservoirs** (green-edged cards), and **human actions** affecting the carbon cycle (black-edged cards).
3. **Instructions to run the model (play the game), starting with the ocean reservoir.**
 - a. First person rolls the die. The number that comes up on the die will tell you where to move ONE carbon atom (paper clip) from the ocean reservoir. For example, if the first person rolls a five, she will move a single paper clip to the atmosphere reservoir.
 - b. Before moving a carbon atom, the small group works together to find the flow card representative of that flow (e.g. photosynthesis), and then the person whose turn it is shares with the small group how that process moves the carbon from one reservoir to another.
 - c. Take turns rolling the die and moving one paper clip from the ocean reservoir, finding the appropriate flow card and describing the process. Once everyone has a turn in the ocean reservoir, move clockwise to the next reservoir. Continue until you have completed all five reservoirs.
4. **Discuss prompts after running this first model:**
 - a. Which reservoirs increase? Which decrease?
 - b. Which reservoir(s) gained the most atoms from different reservoirs?
 - c. What happens to the total number of carbon atoms on Earth?

Paper Clip Carbon Cycle Model #2

1. **Running second model, *Paper Clip Carbon Cycle Model #2*.** Since the start of the Industrial Revolution, fossil fuel use has increased significantly. This game board represents the present-day carbon cycle and includes a “combustion” flow from the fossil fuel reservoir.
 - a. Set up the game board as before (10 paper clips in each reservoir of appropriate colors). Follow the directions from step 3 above.
 - b. Discuss prompts after running the second model:
 - i. What difference(s) in results did you notice between the 1st and 2nd model?
 - ii. What are the strengths and limitations of this model?