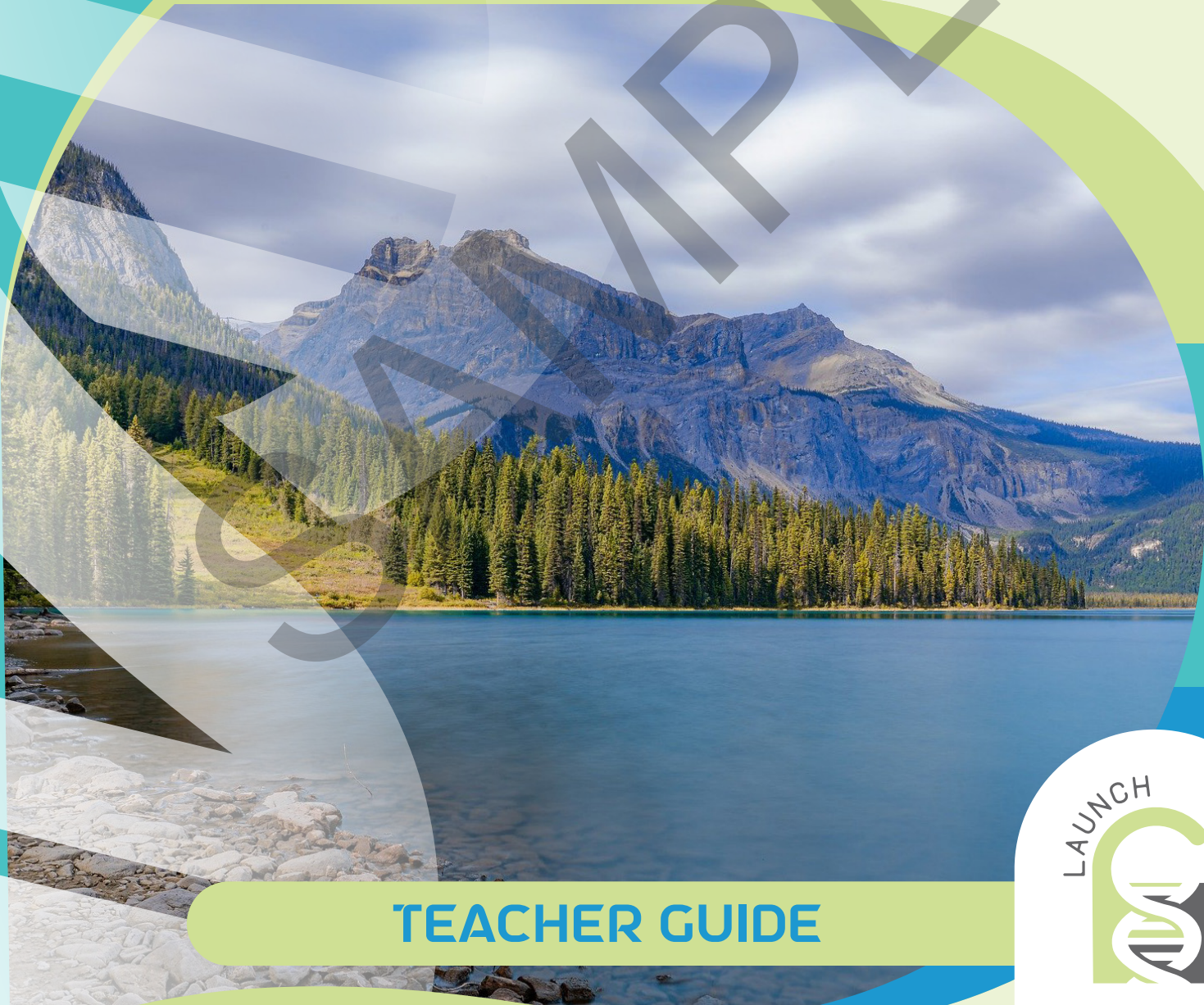


GOING IN CIRCLES



TEACHER GUIDE



PLANNING

Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time.

| ACTIVITY INFORMATION | SECTION (S) | TIME REQUIRED | DAY/ LESSON |
|---|---|---------------|-------------|
| ACTIVITY 1: CARBON'S TRAVELS Begin to discover Carbon's journey through Earth. Time required: 1 h | <input type="checkbox"/> Fun Facts <input type="checkbox"/> Traveling Carbon | 60 minutes | Day 1 |
| ACTIVITY 2: WHAT NATURE TELLS US Connect how carbon and the carbon cycle impact our planet. Time required: 3 h | <input type="checkbox"/> Spheres, Circles, and Cycles, Oh My! | 60 minutes | Day 2 |
| | <input type="checkbox"/> Carbon and Climate | 45 minutes | Day 3 |
| | <input type="checkbox"/> Talking Trees | 45 minutes | Day 4 |
| | <input type="checkbox"/> Show What You Know | 30 minutes | Day 5 |
| ACTIVITY 4: BIOCHEMICAL CYCLES Experiment with runoff and plant growth using a nitrogen-phosphorus fertilizer. Time required: 5 h | <input type="checkbox"/> Reach for the Stars (Set Up) | 30 minutes | Day 6 |
| ACTIVITY 3: WEATHER, WATER, AND CLIMATE Uncover the connection between carbon and the water cycle. Time required: 2 h | <input type="checkbox"/> Respiration | | Day 7 |

Full schedule available with purchase

1

activity

CARBON'S TRAVELS

The element carbon is everywhere you look, but it does not always look the same. Carbon is in the air, the oceans, underground, and inside living things. Help your student discover how carbon and other elements end up in the various parts of Earth.

FUN FACTS

CONTENT

- Your student will be given five trivia sentences and asked to decide which are true and which are false.
- Each trivia sentence relates to one of the five Earth cycles they will learn about in later activities of this kit.
- All of the trivia statements are true, but your student is not expected to know this yet. Instead, these statements are intended to get your student thinking about what they already know about Earth's cycles.

TRAVELING CARBON

PREPARATION AND SUPERVISION

SAFETY:

WARNING! CHOKING HAZARD - Small parts.
Not for children under 3 years.



- This model takes your student through the carbon cycle as if they are a single carbon atom. It gives students a personal connection to the material that they may not get if only reading through the carbon cycle and how the Industrial Revolution has impacted it.
- When going through each round, students will roll for each carbon atom (seed) one at a time. Then, after each seed has moved to a new reservoir, students will do the second roll. They will continue this for 10 rolls for Round 1.
- Some of the cards change during Round 2 to indicate changes that occurred in the carbon cycle following the Industrial revolution.
- The vocabulary terms flux and reservoir are defined for your student in this section.

MULTIPLE AGES AND ABILITIES:

This model can be used by 1 or more students. If working with multiple students, each can be their own carbon atom. Also, if you are working with more than three students, the model works best if students start on different reservoirs, so that as many reservoirs are represented to start as possible.

REFLECT

? Question 1: For each carbon atom, make a pie chart indicating the amount of time spent in each reservoir during each round.

Answer: Answers will vary.

How to Help:

- Make sure your student's response matches what they found in the model.
- Students should find that in Round 2, carbon is released into and stays in the atmosphere longer than in Round 1. They should also find that carbon stays in fossil fuels and soil less.

MULTIPLE AGES AND ABILITIES:

There are two additional pieces of information that can be included in this section to increase the complexity of this kit for your student.

The water cycle is connected to the atmosphere and hydrosphere, which you students learn in this section. It is also connected to a third “sphere” known as the cryosphere. The cryosphere references all the ice on Earth and is separate from the hydrosphere because of how water is accessed as a solid, liquid, or gas.

The water cycle is closely related to the oxygen cycle, which is the process of oxygen’s movement through Earth’s system. In Activity 6, there is an extension called “The Circle Continues” which asks your student to research the oxygen cycle and recognize how it is connected to the other cycles in this kit, as well as is impacted by carbon.

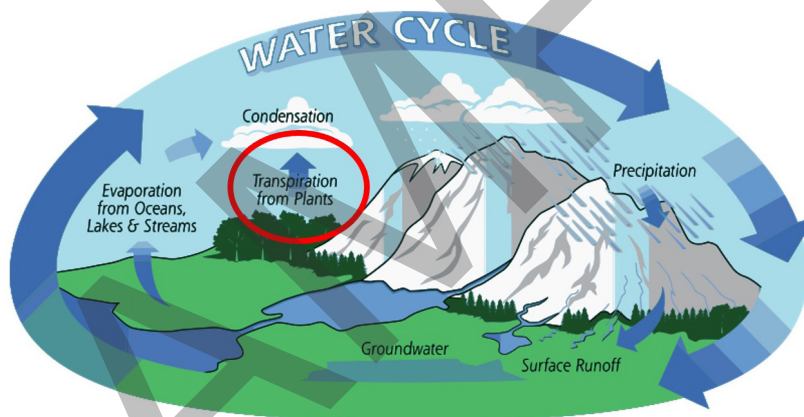


THINK ABOUT IT!

? Question 1

In the diagram of the water cycle, identify where carbon makes a direct impact.

Answer:



? Question 2: How is carbon related to the water cycle? Use Question 1 to form your response.

Answer: Increased atmospheric carbon results in increased transpiration. Therefore, we are seeing increased precipitation and changes to the water levels in reservoirs around the world.

WEATHER, WATER, AND CLIMATE

Runoff impacts how the water cycle connects to the earth. Encourage your student to think about how materials or compounds within runoff impact the earth.

4

activity

LEARNING GOALS:

- ✓ I can make a model showing how Earth’s materials are cycled, including how energy drives the cycle.
- ✓ I can make a quantitative model showing how carbon cycles among the hydrosphere, atmosphere, geosphere, and biosphere.



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| | |
|---------------|------------|
| Kit | SU-GOCIRC |
| Instructions | IN-GOCIRCT |
| Revision Date | 12/2021 |