



## Teacher Program Packet

Tillamook State Forest  
**Forest Carbon & Climate**  
7<sup>th</sup> — 8<sup>th</sup> grade

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# Preparation Resources

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This packet is designed to be a single resource for planning for your Tillamook Forest Center field trip in the Tillamook State Forest. Below are website links for planning resources along with pre-site and post-site activities. Conducting the pre-site and post-site activities will provide a well-rounded and successful field trip. In addition, it will ensure students are prepared and concepts are reinforced. If you have any questions or suggestions, please do not hesitate to contact us.

All the best,

*Denise Berkshire*

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## Links to Resources

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Welcome & Overview Letter (What to Expect)

<http://www.tillamookforestcenter.com/resources/Welcome%20Letter%202020.pdf>

Preparation Checklist & Reminders

<http://www.tillamookforestcenter.com/resources/FT%20Checklist%202020.pdf>

Directions & Maps

<http://www.tillamookforestcenter.com/resources/Directions%20and%20Maps%202020.pdf>

Parent Letter

<http://www.tillamookforestcenter.com/resources/Parent%20Letter%202017.pdf>

Chaperone Expectations

<http://www.tillamookforestcenter.com/resources/Chaperone%20Expectations%202020.pdf>

Carbon and Climate Field Trip Agenda

<http://www.tillamookforestcenter.com/resources/CC4R%20Agenda%20Web.pdf>

# Forest Carbon & Climate

## Program Information & Overview

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### Overview

Students will learn about the carbon cycle and wildfire impacts during a simulation activity. They also use math to calculate rainfall, language arts while watching the Legacy of Fire, and discover the forest's role as a carbon sink in the global carbon cycle and the temperate rainforest climate while exploring the exhibit hall.

### Theme(s)

Forests are working their trunks off by storing carbon and helping reduce impacts of climate change.

### Learning Goals

Upon completion of all pre-site, on-site and post-site activities, students will be able to:

- Define, in simple terms, the carbon cycle and that forests are a carbon sink (collector).
- Be able to describe carbon flow in living and non-living parts of an ecosystem (forest)
- Understand that forest products store carbon.
- Measure the amount of carbon that is stored in a living tree.
- Explain that carbon storage is a part of photosynthesis.

## Pre-site Activities

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Please complete all of the pre-site activities. This will ensure students are adequately prepared for the field trip.

### Activity #1 - How Does Photosynthesis Work?

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Review the concept of photosynthesis by:

- Watching OFRI's **Photosynthesis** video:  
[https://learnforests.org/sites/default/files/FB\\_Photosynthesis\\_h264.mp4](https://learnforests.org/sites/default/files/FB_Photosynthesis_h264.mp4)
- Using the **How Does Photosynthesis Work?** fact sheet from the Oregon Forest Resources Institute:  
[http://learnforests.org/resource\\_article/forest-fact-sheet-photosynthesis](http://learnforests.org/resource_article/forest-fact-sheet-photosynthesis)

### Activity #2 - Forest Fact Break

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Introduce students to the concept of carbon capture by showing the **Forest Fact Break – Carbon Capture** video from the Oregon Forest Resources Institute [https://learnforests.org/resource\\_article/forests-fact-break-carbon%20capture](https://learnforests.org/resource_article/forests-fact-break-carbon%20capture)

### Activity #3 - OFRI's *Where's All the Carbon?*

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In this activity, after studying the [Where's All the Carbon?](#) poster, students create a model of the carbon cycle depicting where carbon is stored and how it moves through the cycle. This lesson was created by the Oregon Forest Resources Institute.

#### Preparation:

- Visit [learnforests.org](http://learnforests.org) to order a copy of the *Where's all the Carbon?* Poster and the accompanying *Where's All the Carbon?* Instruction Guide *Where's All the Carbon?* poster
- Make copies of the "Carbon Reservoirs and Fluxes" student page (located on the next page)

#### Activity Procedure:

- 1 Share the poster with students, asking them what they think it represents. As necessary, explain that the poster depicts the carbon cycle. Point out how it shows different carbon reservoirs where carbon is stored, and that the arrows represent carbon fluxes or processes that move carbon from one reservoir to another.
- 2 Have students work in pairs to identify the carbon reservoirs and fluxes presented on the poster, using the "Carbon Reservoirs and Fluxes" student page as a guide.
- 3 Challenge students to create a model of the carbon cycle using the information they have gleaned. It may be an illustration, flow chart, graphic organizer, three-dimensional model or other visual representation of the carbon cycle (but should not copy the poster). You might specify what components their model should include, such as:
  - At least four carbon reservoirs
  - At least four carbon fluxes
  - At least three ways carbon is added to the atmosphere through natural means
  - At least three ways carbon is added to the atmosphere by human activities
- 4 Invite students to present their models to the class.

## Carbon Reservoirs and Fluxes

Almost everything around us contains carbon, including plants, animals, soil, oceans and even the air we breathe. The amount of carbon in, on and around Earth is always the same. But carbon is constantly cycling from one place to another.

The carbon cycle is the movement of carbon between Earth's organisms, bodies of water, soil, rock and fossil fuel deposits, and the atmosphere. The cycle involves different **carbon reservoirs** that store carbon over time and **carbon fluxes**, the processes that move carbon from one reservoir to another.

1. Using the *Where's All the Carbon?* poster, identify different carbon reservoirs and carbon fluxes in Earth's carbon cycle, and describe how carbon moves from place to place.

Carbon reservoir	How does carbon get there?	Carbon flux	How does carbon move?

2. A carbon sink is a reservoir that takes up more carbon than it gives off, and a carbon source is one that gives off more carbon than it takes up. Which of the reservoirs you've listed above are carbon sinks? Which are carbon sources?

## Activity #4 - What is a Carbon Footprint?

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Introduce students to the concept of a carbon footprint. Here are a few resources to help explain the concept to your students.

Videos:

- *Simpleshow explains the Carbon Footprint*: [https://www.youtube.com/watch?v=8q7\\_aV8eLUE](https://www.youtube.com/watch?v=8q7_aV8eLUE)
- *What are Carbon Footprints?* by Fuse School: <https://www.youtube.com/watch?v=Dwkh46MZulc>

## Post-site Activity

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Please complete the post-site activity. This will ensure students are adequately prepared for the field trip.

### Activity #1 – Calculate Your Carbon Footprint?

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Students will collect information about their energy usage to help them calculate their personal carbon footprints. You can also calculate your classroom's carbon footprint and even compare your class' carbon footprint to those of other classes around the world.

Use one of the online carbon footprint calculators below:

- International Student Carbon Footprint Challenge: <https://depts.washington.edu/i2sea/iscfc/index.php>
- EPA Household Carbon Footprint Calendar: <https://www3.epa.gov/carbon-footprint-calculator/>