

**Task Background**

**Domain & Area:** Science - Earth and Space Science

**Target CCR Standard(s)** (including level of standard, if needed) and/or adult diploma competency for Science or Social Studies:

**MN Standard Adult High School Diploma Science Competency**

**Area 3: Earth and Space Science**

- Explain aspects of earth and space changes as they relate to human interaction with global environments.

**Task Description:** The purpose of this task is to provide a student an opportunity to demonstrate competency in fundamental concepts in earth and space science: human impacts on greenhouse gases and the carbon cycle. In this task, a student will

- create a diagram demonstrating the relationship between the carbon cycle, use of fossil fuels, and climate change
- evaluate their own carbon footprint/usage using an online calculator and explain their connection to generating greenhouse gases
- create a visual presentation to share their footprint and any changes they resolve to make to lower their footprint

**Information for the Teacher**

- All materials described below are found in a Google folder here:  
[https://drive.google.com/drive/folders/107xuoQuHRdNVj3mKdFTPw5xOPjm\\_P2Z-?usp=sharing](https://drive.google.com/drive/folders/107xuoQuHRdNVj3mKdFTPw5xOPjm_P2Z-?usp=sharing)
- Students should have already studied the natural greenhouse effect and how increasing levels of greenhouse gases affect the climate. Students should also have studied the carbon cycle and how use of fossil fuels since the industrial revolution has outpaced the earth's ability to reabsorb CO<sub>2</sub>, contributing to an increase in greenhouse gases.
- Besides a copy of the student-facing directions for this task (could be provided to students in print or electronic form), the student will need access to the internet to use a carbon footprint calculator and materials to create a presentation to share their carbon footprint and plans for reducing it.
- This task was designed to be completed mostly independently by a learner. For students needing more support, they are encouraged to ask for feedback on their work from a teacher and make revisions as needed. Students are also encouraged

to follow all activity instructions carefully and to study the rubric to understand how their final visual presentation of information will be evaluated.

- This task was developed so that the individual components could be used in different ways. Depending on the level of the presentation and accompanying written work (demonstration of Level E competency needed), this task could show evidence of CCRS ELA Speaking & Listening and/or Writing anchors. It is up to the teacher to determine if appropriate CCRS standards will be included and if a claimed CCRS ELA anchor is demonstrated at a level to show diploma competency. It is up to the teacher and student to determine when task evidence is ready to be submitted to the portfolio reviewers.
- There is a rubric provided for evaluating the visual presentation.

**Activities**

<p><b>Title:</b> Carbon Footprint Calculator</p>	<p><b>Materials:</b> This activity includes the <i>following link</i> for students to calculate their current CO<sub>2</sub> emissions and explore some options to reduce them and the handout “<i>Carbon Footprint Data Collection.</i>”</p> <ul style="list-style-type: none"> <li>• Carbon Footprint Calculator: <a href="https://www3.epa.gov/carbon-footprint-calculator">https://www3.epa.gov/carbon-footprint-calculator</a></li> </ul>
<p><b>Title:</b> Impacting the Carbon Cycle</p>	<p><b>Materials:</b> This activity requires students to create a diagram of the carbon cycle, personalized with ways they participate in the cycle, using information from the Carbon Footprint Calculator. They may do this electronically or on paper.</p>
<p><b>Title:</b> Summary</p>	<p><b>Materials:</b> This activity requires students to create a written summary of the connection between fossil fuels used to power homes and vehicles, the waste produced by humans, and increased greenhouse gases in the atmosphere. A clear explanation of how increased greenhouse gases accelerate climate change should be part of the summary.</p>
<p><b>Title:</b> Create a Visual Presentation</p>	<p><b>Materials:</b> The activity includes the “<i>Earth and Space Science Task Rubric</i>” handout, a tri-fold display board, and any</p>

	materials, including markers, paper, glue, etc., needed to create the presentation.
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