



<b>Title:</b> How Big is Your Carbon Footprint?	
<b>Author:</b> Kathy Rusert Acorn High School Mena	
<b>Course:</b> Physical Science Environmental Science	<b>Duration:</b> 2 class periods
<b>Grade:</b> 9-12	
<b>Objective:</b> Students will learn how much they contribute to the CO <sub>2</sub> level in our atmosphere and explore ways to decrease the total.	
<b>Summary of Lesson:</b> Students will use technology and enter data to determine their carbon footprint.	
<b>Arkansas Standards</b>	
<b>CODE</b>	<b>STANDARD</b>
<b>Physical Science</b>	
P.5.PS.2	Calculate changes in <i>thermal energy</i> using: $q = mc_p\Delta T$ Where $q$ = heat energy, $m$ = mass, $c_p$ = specific heat, $\Delta T$ = change in temperature
<b>Environmental Science</b>	
SP.3.ES.3	Explain common problems related to water quality: <ul style="list-style-type: none"> <li>• conservation</li> <li>• usage</li> <li>• supply</li> <li>• treatment</li> <li>• pollutants (point and non-point sources)</li> </ul>
SP.3.ES.4	Explain problems related to air quality: <ul style="list-style-type: none"> <li>• automobiles</li> <li>• industry</li> <li>• natural emissions</li> </ul>
SP.3.ES.9-11	<ul style="list-style-type: none"> <li>• Evaluate personal and societal benefits when examining health, population, resource, and environmental issues</li> <li>• Predict the long-term societal impact of specific health, population, resource, and environmental issues</li> </ul>



	<ul style="list-style-type: none"> <li>Investigate the effect of public policy decisions on health, population, resource, and environmental issues</li> </ul>
PD.1.ES.19	<p>Describe the cycling of materials and energy:</p> <ul style="list-style-type: none"> <li>nitrogen</li> <li>oxygen</li> <li>carbon</li> <li>phosphorous</li> <li>hydrological</li> <li>sulfur</li> </ul>
NS.4.ES.2	<p>Use appropriate equipment and technology as tools for solving problems (e.g., microscopes, centrifuges, flexible arm cameras, computer software and hardware)</p>
<p><b>Teacher Excellence Support System (TESS):</b> 3b: Using questioning/prompts and discussion, 3d: Using assessment in instruction</p>	
<p><b>Instructional Strategies and Practices:</b> Models, Problem-Based Instruction, Technology, Visualization and Guided Imagery, Writing</p>	
<p><b>Bloom's Level:</b> Highest Level Only Analyzing</p>	
<p><b>Materials and Resources:</b> –</p> <ul style="list-style-type: none"> <li>Computer with internet access</li> </ul>	
<p><b>Formative Assessment:</b> Exit Slip</p>	
<p><b>Notes to Teacher:</b> The Nature Conservancy's interactive website helps to measure an individual's carbon footprint. The carbon footprint for a person is the total amount of carbon emitted based on daily actions and the choices they make. A carbon footprint is measured based on factors such as fossil fuel usage, food consumption, goods and services bought, home energy usage, and levels of waste (not recycled).</p>	



## Student Activity

### Procedure:

1. Go to the website <http://www.nature.org/greenliving/carboncalculator/index.htm> and follow the prompts that will calculate an individual's carbon footprint.
2. Record the result: \_\_\_\_\_ tons of CO<sub>2</sub> produced per year. To convert it to pounds, multiply the amount by 2000.
3. Discuss why CO<sub>2</sub> levels are important to the environment.
4. Students will work in groups to identify ways to decrease their carbon footprint. **Select a reporter to share the findings.** The groups may be self-selected or the teacher may assign groups.
5. The reporter from each group will present the findings to the class
6. Hand out the exit slip as students leave class. These will be collected and discussed the following day.

### Student Handouts: See web site for a printable copy:

<https://arkansasenergyrocks.com/educators/lesson-plans-9-12>

### Student Handout How Big Is Your Carbon Footprint? Exit Slip

The amount of CO<sub>2</sub> I produce per year is \_\_\_\_\_ pounds.  
Which variable do you think contributed the most to this total? Why?