**Subject area/course**: Environmental Science

**Grade level/band**: 10–12

**Task source**: Summit Public Schools

**Personal Impact Project**

**TEACHER'S GUIDE**

1. **Task overview**:

In this task, students will answer the essential question: How can humans best balance our own interests and needs with the health of the environment? Students will understand how humans impact the sustainability of the Earth, how humans can effect change through individual actions, and learn how to quantitatively examine and predict the impact of large or small-scale change. Students will write a paper, grounded in research, analyzing the impact of their actions on the environment. They will then design and give a multimedia presentation to the class on how their actions affect the environment and how they might mitigate their effects.

1. **Aligned standards:**

**1. Common Core State Standards**

CCSS.ELA-Literacy.RST.9-10.1: Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

CCSS.ELA-Literacy.RST.9-10.2: Determine the central idea or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

CCSS.ELA-Literacy.RST.9-10.9: Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

[CCSS.ELA-Literacy.WHST.9-10.1a](http://www.corestandards.org/ELA-Literacy/WHST/9-10/1/a/): Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.

[CCSS.ELA-Literacy.WHST.9-10.4](http://www.corestandards.org/ELA-Literacy/WHST/9-10/4/): Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

[CCSS.ELA-Literacy.WHST.9-10.5](http://www.corestandards.org/ELA-Literacy/WHST/9-10/5/): Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

1. **Critical abilities**

Research: Conduct sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow or broaden the inquiry when appropriate, and demonstrate understanding of the subject under investigation. Gather relevant information from multiple authoritative print and digital sources, use advanced searches effectively, and assess the strengths and limitations of each source in terms of the specific task, purpose, and audience.

Analysis of Information: Integrate and synthesize multiple sources of information (e.g., texts, experiments, simulations) presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to address a question, make informed decisions, understand a process, phenomenon, or concept, and solve problems while evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

Communication in Many Forms: Use oral and written communication skills to learn, evaluate, and express ideas for a range of tasks, purposes, and audiences. Develop and strengthen writing as needed by planning, revising, editing, and rewriting while considering the audience.

Use of Technology: Present information, findings, and supporting evidence, making strategic use of digital media and visual displays to enhance understanding. Use technology, including the Internet, to research, produce, publish, and update individual or shared products in response to ongoing feedback, including new arguments or information.

Modeling, Design, and Problem Solving: Use quantitative reasoning to solve problems arising in everyday life, society, and the workplace, e.g., to plan a school event or analyze a problem in the community, to solve a design problem or to examine relationships among quantities of interest. Plan solution pathways, monitoring and evaluating progress and changing course if necessary, and find relevant external resources, such as experimental and modeling tools, to solve problems. Interpret and evaluate results in the context of the situation and improve the model or design as needed.

1. **Next Generation Science Standards**

HS-LS3-1. Ask questions that arise from examining models or a theory to clarify relationships.

HS-LS3-2. Make and defend a claim based on evidence about the natural world that reflects scientific knowledge, and student-generated evidence.

HS-LS2-6. Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

HS-ESS2-7. Construct an oral and written argument or counter- arguments based on data and evidence.

HS-ESS3-3. The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3)

Secondary to HS-ESS3-2, Secondary to HS-ESS3-4. When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts.

1. **Time/schedule requirements:**

This is a multi-step project that will require periodic in-class instructional days over approximately a 6-week period. See the accompanying Project Pacing handout as a guide for implementation. Students should be supplied with a modified version of the Personal Impact Student Calendar handout to allow them to manage their own projects and workload.

1. **Materials/resources:**

Teacher Materials:

* Personal Impact Project Pacing handout
* Personal Impact Project Rubric

Student Materials:

* (*Optional)* Personal Impact Student Calendar (modified to fit your class schedule and implementation)
* Provide each student with a copy of the following accompanying handouts:

1. Ecological Footprint Calculator handout
2. Making Calculations – A Guide to Starting Your Calculations handout
3. Task Card: Research
4. Task Card: Research, Background, and Procedures
5. Research Graphic Organizer
6. Peer Feedback Checklist
7. Slide Show Checklist
8. Presentation Feedback Form
9. **Prior knowledge:**

None listed.

1. **Connection to curriculum:**

None listed.

1. **Teacher instructions:**

The accompanying task materials will help support students complete the project. Use the Personal Impact Pacing handout as a guide for implementation.

* **Entry Event – Tragedy of the Commons** – This economic theory by Garrett Hardin introduces students to the fact that we all have an impact on the environment. If no one takes responsibility for our impact on the Earth, there may be nothing left for future generations.
* **Part 1: Ecological Footprint Calculator** – Students will complete each of the categories listed on the worksheet for a typical day in their home. They will add the points in each category to obtain a subtotal, and transfer each subtotal to the summary chart and then use the grand total to calculate their ecological footprint. Students will analyze how they currently impact the environment and brainstorm actions they can take to reduce their personal impact.
* **Part 2: Making Calculations** – This handout will help students begin the analysis of their Personal Impact project. This document is only considered a starting point and students should be encouraged to thinking outside this list. Advanced projects will move beyond these basic calculations to consider energy savings, carbon dioxide emissions, or other secondary effects of changing the behavior.
  + Students will record their regular habits for the past week and then record changed habits at the end of the following week.
* **Part 3: Research –** Students will conduct a literature review research and interpret the data they collected. Students will use the two Task Card handouts as a guide.
* **Part 4: Writing** – Students will write a paper, grounded in research, in which they analyze the impact of their actions on the environment. Students should use the Graphic Organizer handout to help them get started.
* **Part 5: Peer Editing** ­– Students will use the Peer Feedback Checklist to participate in peer editing of draft papers. Students will complete the checklist and provide supportive comments and constructive suggestions for improvement.
* **Part 6: Final Draft** – Students complete a final draft of their personal impact papers and begin to develop their presentation. Remind students about the Presentation Checklist handout.
* **Part 7: Presentation** – Each student will present a PowerPoint to the class on how their actions affect the environment and ways to mitigate the effects. When listening to other presentations, students will complete the Presentation Feedback handouts for their peers.

1. **Student support:**

Students are provided with graphic organizers to help them organize information while researching their project. They are also provided with task cards to help direct the type of information they gather and writing their impact statement. Students should be encouraged to use the recommended sources when gathering information for their project and should be clearly informed with regards to what are considered acceptable sources. A slide show check list is also provided to assist students with organizing their presentations. Students are given the opportunity to both review the papers and presentations of their peers and to and receive peer reviews themselves.

1. **Extensions or variations:**

In addition to the resources listed above, consider providing students with the opportunity to brainstorm in pairs or small groups. Students could also be given a PowerPoint template to assist them in generating their presentations. It would be helpful for students to have peer reviewed practice sessions in advance of their graded presentations so that they could be allowed time to make recommended corrections.

1. **Scoring:**

Student work can be scored using the Personal Impact Project rubric.