Anchor question: How does restoring the health of soil in my community help living things, the atmosphere, climate, and me?

Goal of Quest: To design and carry out a solution to a local problem that will restore the health of soil, which will help the plants, animals, atmosphere, climate and people.

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## Q-U-E-S-T

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<th>Introduction</th>
<th>Join the new generation of Planeteers as they identify the goal of the Quest and put out a call for action.</th>
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<tbody>
<tr>
<td>Q - QUESTION</td>
<td>All Quests start with questions, many questions. They help create the path forward.</td>
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<tr>
<td>U - UNCOVER</td>
<td>Begin uncovering answers to your questions about soil and organizing clues that will help your figure out how to help restore the health of soil around you.*</td>
</tr>
<tr>
<td>E - EXPLORE</td>
<td>Explore soil in your own community and what is affecting its health.*</td>
</tr>
<tr>
<td>S - SOLVE</td>
<td>Design and carry out a project that helps solve a problem affecting the health of soil around you.</td>
</tr>
<tr>
<td>T - TEACH</td>
<td>With new knowledge and understanding comes responsibility. How can you teach others about what you have learned and done, and inspire them to become Heroes for soil around them?</td>
</tr>
</tbody>
</table>

*Supplemental lesson resources for customizing your plans for teaching soil-related concepts are listed at the end of UNCOVER. Categories include soil, climate change and carbon, gardens.

### Length of QUEST

1 class = 45 minutes  
Length of Quest: Range of 2.5 weeks-4 months  
Effects on Quest length:

- Preconceptions. Student’s background knowledge and experience with soils.
- UNCOVER AND EXPLORE. The breadth and depth of instruction for concepts and issues. The number of active lessons, research, and assessments needed to maximize student understanding, engagement, and impact.
- SOLVE. The number and complexity of action projects chosen, and the length of time to carry out the project (designing, creating, data collection, evaluation and refinement).
- TEACH. The size and scope of the student-led teaching experience developed for peers or community members.
**QUEST Instructional Storyline**

### Introduction of the Soils Quest

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<tr>
<th>Driving Questions</th>
<th>What we do on the website</th>
<th>What we figure out</th>
<th>How we can actively investigate &amp; demonstrate understanding</th>
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</table>
| **Call to action** Will you be a hero for soil in your community? | Respond to call to action. | Going on this Quest will let us design a project to help restore the health of soil in our community. | Discuss questions:  
  - What’s a Hero? Compare different definitions and descriptions of “hero.” Then choose or write one that fits the role we see ourselves in.  
  - What do you think a Hero for Soil would do? |
| **Story** Why should we care about soil and want to help? | Read and discuss the Planeteer story setting up the quest. | Soil plays a critical role on the planet. By restoring the health of soil, we are helping plants, animals, people, and our global climate. |  
  - Describe the problem the Planeteers noticed, and possible reasons for the problem.  
  - Make a personal connection: Where in your community might you find a similar problem? Have you seen problems like this before? If so, tell us what you noticed? |
| **Quest** What can we expect to do on a Quest? | Review the QUEST road map of steps we will take to understand the problem and design a solution to restore the health of soil in our community. | The Q-U-E-S-T is a learning approach that guides the learning and actions so that students can be most effective at restoring the health of our local soil. | Teacher reference document: QUEST Learning Approach |

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## Q - QUESTION.
All Quests start with questions, many questions. They help create the path forward.

<table>
<thead>
<tr>
<th>Driving Questions</th>
<th>What we do (based on the website)</th>
<th>What we figure out</th>
<th>How we can actively investigate &amp; demonstrate understanding</th>
</tr>
</thead>
</table>
| **Up Close with Soil**  
What can I find out by investigating the soil around me? | Go outside, map the visible and invisible locations of soil, and find both bare and plant-covered soil. | • Soils cover the surface of the earth around us.  
• Some features of bare soil and plant-covered soil are different.  
• Soils are mixtures of substances.  
• Soil is home to a variety of living and nonliving things. | Investigate several locations of bare and plant-covered soil around you. If you cannot go outside, the soil could be collected from around the school or program area, or brought in from home by students. Be sure to label bags or containers identifying where the soil came from.  
• Have students draw soil maps of the landscape around them that include soil that is visible, soil that we know is under plants, and soil that is invisible underneath buildings, roads, or lakes. Ah-ha moment: Everything on earth sits on soil or rock!  
• Find a grassy area where students can lie on their bellies to examine soil close up. Show them how to move grass aside without pulling it out of the ground. Then they can examine what is happening where the plants grow out of the soil. Encourage students to describe the soil using all senses. Hand lenses are helpful.  
• Walk around the area looking for patches of bare soil. Students can use their senses to compare bare soil with the soil beneath the grass.  
• **Mud balls**: Challenge students to make a pea-sized mud ball by mixing a pinch of soil with water and try to roll it into a ball. Have them describe the ball shape and compare it with soil balls made by other students or from different locations. |
| Know, Need, Do | Brain dump your personal and collective knowledge and experiences, questions, and ideas for what you might be able to do to help restore soil health. | Before we start, we already have personal knowledge and past experiences, questions that we need to answer so that we can help, and ideas of what we might be able to do to help. | Create a KND chart about soil health, and how and why to restore it.  
**K:** KNOW. What do we KNOW from observations, experiences, and background knowledge?  
**N:** NEED to know. What do we NEED to know to be able to understand the problem and help design a solution? Write these in open-ended questions starting with “who, what, why, how, what if, when, which.”  
**D:** DO. What might we DO to help improve the health of our soil?  

Optional instructional strategy: First, students write individually, then share and edit in small groups, and finally share out with full class and build a class chart to post as a dynamic reference chart throughout the Quest. An additional step could be for students to categorize the questions into topics about soils. With your guidance, a final goal might be to align questions with the UNCOVER and EXPLORE topics. This step could happen at the beginning of those project steps. |

- **Soil layering:** Introduce another scientific technique to look at soil composition. Students fill a small clear container with 1/2 - 2/3 soil and add water to fill. After shaking a container with a lid, or stirring a container without a lid, they will let it sit undisturbed for 24 hours so the soil can settle. Students observe the separation of soil into layers based on particle size and density.  
- **Surveying living and nonliving parts of soil:** Have students examine a scoop of soil to observe living things and nonliving parts of the soil’s ecosystem.
Begin uncovering answers to your questions about soil and organizing clues that will help your figure out how to help restore the health of soil around you.

*Supplemental lesson resources for customizing your plans for teaching soil-related concepts are listed at the end of UNCOVER. Categories include soil, climate change and carbon, gardens.

<table>
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<tr>
<th>Driving Questions</th>
<th>What we do on the website</th>
<th>What we figure out</th>
<th>How we can actively investigate &amp; demonstrate understanding*</th>
</tr>
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</table>
| Healthy vs Unhealthy Soil | Watch and discuss the video:  
● Explain the role of soil in creating a healthy ecosystem and a habitat for organisms.  
● Describe the role of carbon and minerals in soil.  
● Compare the features of healthy and unhealthy soil.  

Reflect and write:  
● What role does soil play in supporting a diversity of living things?  
● Why is the diversity of organisms different in different soils? | Healthy soil  
● provides an environment that can support a diverse ecosystem of living organisms and nonliving parts.  
● supports the biodiversity of the environment above the ground when it has biodiversity below the ground (in the soil).  
● has abundant carbon and minerals | Go back outside and conduct more investigations from “Up Close with Soil” with soil from several locations (garden, dirt road, eroded area, natural land). Compare results. How could this information help you learn about the health of the different soils? (Note: These investigations can be a part of learning about types and properties of soil.)  
○ Mud balls: Compare the appearance of mud-balls made with different soils found in various locations. Make mud balls with healthy and unhealthy soil. What does this information tell you about the mixture of soil?  
○ Soil layering: Create layered soil containers for different soils, healthy and unhealthy. How is the layering different? The same?  
○ Surveying living and nonliving parts of soil: Examine a scoop of healthy and unhealthy soil to observe living things and nonliving parts of the soil’s ecosystem. How do they compare? |
<table>
<thead>
<tr>
<th>Plants, Animals, &amp; Soil</th>
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</tr>
</thead>
<tbody>
<tr>
<td>How does carbon get into soil?</td>
<td>Challenge students to sketch out and explain how plants and animals help carbon get into the soil. Go outside and visualize the movement of carbon through the plants, animals, soil and air outside your door. Reflect and write: Why might some soils support little or no life?</td>
</tr>
<tr>
<td>How does plant photosynthesis add carbon to soil?</td>
<td>Plant photosynthesis takes carbon from the atmosphere and turns it into sugar that can be stored in the roots and soil. Decaying animals also pass carbon into the soil.</td>
</tr>
</tbody>
</table>

**Videos**
- Watch "Trees Come 'From Out of the Air.'" from NPR. Stop the video after each new question for small groups to reflect and share personal preconceptions.
- Watch The Living Soil Beneath Our Feet from Cal Academy. Discuss the Guiding Questions.

**Lessons**
- Earth’s Systems- Where is carbon found on Earth? From Kiss the Ground Lesson 1
- Photosynthesis- What role do plants play in the carbon cycle? From Lesson 2 of Kiss the Ground’s Soil Story Curriculum

**Infographics:** Examine and summarize one or more soil infographics in small groups. Options:
- Soil Food Web, from NRCS of USDA.

- **Identify** natural and human influences that might affect the health of the soil and natural environment.
- **Make a claim** for the soil(s) being healthy or unhealthy and defend your claim with evidence. Record reflections in journal.

- Case studies, videos, and more: Soil Health Awareness: Unlock the secrets in the soil, from NRCS of USDA.

1-2 classes
● How are plants the link between the atmosphere and soil?
● How do animals help make the soil healthier?

● **Unlock the secrets in the soil.**
● **Soil and biodiversity, from FAO (Food & Agriculture Organization of the UN).**

**Draw a visual model** (diagram) that shows the carbon connection between plants, animals, and soil.

**Read and discuss article:** The Wood Wide Web from the Atlantic. Focus on carbon movement.
1-2 classes
### Soil & Atmosphere

**How does carbon move between the soil and the atmosphere?**

- Examine the above Quest-focused carbon cycle diagram with a partner. Talk through the movement of carbon from the atmosphere to soil and back to the atmosphere.
- How the cycle would be different for healthy soil and unhealthy soil?
- Create clear descriptions of carbon release and carbon sequestration.
- Go outside to talk about and visualize the movement of carbon between the soil and atmosphere outside your door.

- Carbon is a form of matter that cycles between soil (and water) and the atmosphere through living (and dead) things.
- Soil is a storehouse for carbon, and helps control the amount of carbon dioxide in the atmosphere.
- Carbon release and carbon sequestration are two sides of the carbon cycle, with healthy soil able to sequester more carbon.

- Examine the Quest-focused carbon cycle diagram with a partner, and talk through the movement of carbon from the atmosphere to soil and back to the atmosphere. Determine how the cycle would be different for healthy soil and unhealthy soil.
- Create a new visual model (e.g., diagram) or 2-column table that shows the difference between carbon release and carbon sequestration, and the connection to both atmosphere and soil.
- Compare this diagram with other diagrams of the carbon cycle. What similarities and differences do you see between them? What new information do other diagrams offer? Example: Carbon Cycle Diagram from UCAR.

**Lessons**

- Healthy Soil- What role do microbes play in the carbon cycle? Lesson 3 From Kiss the Ground’s Soil Story Curriculum
- The Incredible Carbon Journey from NOAA.

**Create** a map of carbon flows that includes soil ecology. Example: Map of Carbon Flows from Soil Carbon Coalition.

1-2 classes

### Soil & Climate

**What does the health of soil have to do with climate change?**

- Describe the movement and balance of carbon in carbon sequestration different from in carbon release.
- What else do you notice about carbon release and sequestration in this

- Warming of our Earth’s atmosphere changes as the amount of atmospheric carbon changes.
- Unhealthy soil releases more carbon into the atmosphere and sequesters less, thus increasing the

- Compare the two sides of the carbon release/sequestration diagram. Write or tell what the sides are showing and how they are related.
- Compare this diagram to the carbon cycle diagram on “Soil and Atmosphere.” How are they related?
- Explain how the health of soil affects climate change.
- Watch and discuss The Carbon Cycle TED Talk by Nathaniel Manning. How does his message
<table>
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<th>diagram and written description?</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Compare this diagram with the carbon cycle on Soil &amp; Atmosphere, and explain how they help tell the same story.</td>
</tr>
<tr>
<td>● Describe how water is affected by the healthy and bare soil.</td>
</tr>
<tr>
<td>effects of global warming of Earth’s climate.</td>
</tr>
<tr>
<td>● Healthy soil releases less carbon and sequesters more, reducing global warming effects.</td>
</tr>
<tr>
<td>● The greenhouse effect is the warming of our atmosphere to a temperature that sustains life on Earth. When the climate changes, survival of some life on Earth is threatened.</td>
</tr>
<tr>
<td>contribute to your understanding of the relationship between soil, plants, the atmosphere, and climate change?</td>
</tr>
<tr>
<td>● <a href="https://www.fao.org">Infographic: Examine and summarize. Soils help to combat and adapt to climate change</a>, from FAO (Food &amp; Agriculture Organization of the UN).</td>
</tr>
</tbody>
</table>

1-2 classes

### Summarize new understanding from UNCOVER

How can you visually summarize what you’ve uncovered? Work in triads, pairs or individually to create a digital or hardcopy visual presentation (paper chart, powerpoints, infographics, brochures, a Frayer Model) that summarize the big questions for UNCOVER:

- What makes soil healthy?
- How does carbon get into soil?
- How does carbon move between the soil and the atmosphere?
- What does the health of soil have to do with climate change?

1 class

### Supplemental Teacher Resources for UNCOVER and EXPLORE

Customize your Quest to expand on concepts being taught in class. Below are a few resources with lesson plans, and other teaching resources.

**Soil**

- [Soil Health Kit Guides and Videos](https://www.nrcs.usda.gov) from USDA Natural Resources Conservation Service.
- [Soil lesson plans](https://www.nrcs.usda.gov) from USDA Natural Resources Conservation Service.
- [Soil teaching resources](https://www.oursoil.org) from Dr. Dirt.
- **Starting with Soil** (iPad App) from Center for Ecoliteracy and Whole Kids Foundation.

**Climate change and carbon**
- [The Essential Principles of Climate Science](#) from NOAA.
- [Visualizing Carbon Pathways](#) from SERC Carleton.
- [Understanding Food and Climate Change: An Interactive Guide](#) from Center for Ecoliteracy.

**Gardens to restore soil health**
- [School Gardens Activity Book](#) from Whole Kids Foundation and American Heart Association.
- [School Gardens Educator Resources](#) from LifeLab.
### E - EXPLORE.
Explore soil in your own community and what is affecting its health and vitality.

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<tr>
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<th>What we do on the website</th>
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</table>
| **Harming the Soil**  
How is soil being harmed by people’s choices and actions?  
What’s the biggest cause of degrading soil health? | - Explain how each conventional agricultural practice harms soil.  
- Look for examples of conventional agricultural practices in your community or state. Recall personal experiences, talk with family members, review news articles and TV reports.  
- Complete part 1 of the Survey of Plant Care Products. | - Conventional agricultural practices are the biggest cause of soil degradation.  
- These practices release carbon from the soil and increase atmospheric carbon dioxide that warms the climate. | - **Create** a diagram, chart, table or other visual representation that compares different conventional agricultural practices and how they harm soil. Include symbols and an explanation for the movement of carbon.  
- **Research** examples of conventional agricultural practices in your community or state. Recall personal experiences, talk with family members, review news articles and TV reports.  
- **Conduct a survey.** Download the Plant Care Product Survey. Decide where and how students will complete their surveys, and what they could do with the information gathered. Complete and discuss the survey.  
- **Infographic:** Examine and summarize. [Our soils under threat, from FAO](https://www.fao.org/zh/sustainable-soils-2019) (Food & Agriculture Organization of the UN). |

1-2 classes
# Healing the Soil

Learning from our past, how can we work with the soil to restore its health for the future?

- Watch and discuss the main messages of each video.
- In pairs or triads discuss “Spot the Difference.” Summarize by creating a comparison chart or concept map.
- Explain how regenerative agricultural practices help restore soil health.
- Look for examples of conventional agricultural practices in your community or state. Recall personal experiences, talk with family members, review news articles and TV reports.
- Complete Part 2 of the Survey of Plant Care Products.

<table>
<thead>
<tr>
<th>Regenerative practices restore and preserve the health of soil and maximize carbon sequestration and water retention.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Watch</strong> the 1-3 videos and complete a formative assessment activity such as 3-2-1 (Write 3 things learned, 2 questions, 1 connection to personal experience).</td>
</tr>
<tr>
<td><strong>Create</strong> a complementary diagram, chart, table, or other visual representation comparing the regenerative agricultural practices by explaining how each practice helps soil.</td>
</tr>
<tr>
<td><strong>Lesson</strong>: Food and Farming- What role do farmers play in the carbon cycle? Lesson 4 from Kiss the Ground’s Soil Story Curriculum.</td>
</tr>
<tr>
<td><strong>Research</strong> examples of regenerative agricultural practices in your community or state. Recall personal experiences, talk with family members, review news articles and TV reports.</td>
</tr>
<tr>
<td><strong>Survey</strong>: Return to the location of your Survey of Plant Care Product and complete Part 2.</td>
</tr>
<tr>
<td><strong>Summarize</strong> the data and results of the survey as a class; discuss the significance of your findings and possible actions you could take.</td>
</tr>
</tbody>
</table>

# Soil Impact Survey

How is my community affecting the amount of carbon in our soil and air?

- Complete the survey on your community’s carbon impact.
- Calculate your carbon footprint.
- Analyze your findings by responding to the questions in the **My community uses both (most likely) conventional and regenerative agricultural practices.**
- A carbon footprint calculates the amount of carbon (carbon dioxide) released by a person in a given time.

- In small groups, **research** and answer the survey questions.
- **Calculate** student carbon footprint using an online calculator linked on this page or another (whichever you prefer). Discuss why this information is helpful, and what could be done with it.

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| “Questions to Consider” box. | **Develop interview questions** based on what students now know, and interview community or Hero Society experts.  
**Lesson:** Taking Action, What role do you play in the carbon cycle? Lesson 5 from Kiss the Ground’s *Soil Story Curriculum.*  
1-2 classes |
| Revisit KND:  
What do we **KNOW** about soil?  
What do we **NEED** to know to help restore soil health?  
What can we **DO** to help restore soil health? |  
Revisit your individual and class KND lists from the Quest QUESTION steps.  
Review your notes and the UNCOVER and EXPLORE pages to edit.  
We have  
- new understandings  
- answered some questions  
- new questions  
- clearer ideas of possible actions we could do that would restore the health of soil.  
Review the KNDs you wrote at the beginning of your Quest. Add and edit them to include your new understandings and experiences. Mark questions you have answered, and ones you still need or want to answer.  
**K:** **KNOW** - Are there any preconceptions you now know are inaccurate (misconceptions) based on your new understanding of soil and carbon? If so, correct them by adding new information.  
**N:** **NEED** to know - Mark any questions that you have answered. Highlight ones you still need and want to answer. Add new questions.  
**D:** **DO** - Highlight any actions that you think are relevant solutions to help soil. Cross out any ideas that are no longer relevant. Add new ideas.  
Partial class |
**S - SOLVE. Design and carry out a project that helps solve a problem affecting the health of soil around you.**

<table>
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<tr>
<th>Driving Questions</th>
<th>What we do on the website</th>
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</thead>
</table>
| **Survey the Site** Where in your community could you restore the health of soil? | - Visit one or more places to survey unhealthy soil and possible causes.  
- Draw site maps with possible project locations.  
- Consider projects you could do to restore the health of the soil.  
- Compare and select the site where you want to design a project.  
- Determine what permissions are needed. | - Site selection depends on our ability to visit the site and change something on the site.  
- Mapping a site is a way to document locations of healthy and unhealthy soil, human activities that could affect the soil, possible project locations. | Teacher mapping and investigation guides  
- [Map Skills for Elementary Students](#) from National Geographic. Adapt to upper grades.  
- [Investigating Evidence](#), from Cornell Bird Sleuth’s Outdoor Observations.  
- [Observe, Describe, Wonder - Building Inquiry into Instruction](#), from Journey North. |
| **Define the problem** How could we restore the health of soil on this site? | - Gather evidence that explains the reason for the unhealthy soil on your project site.  
- Describe what you want your project (solution) to accomplish.  
- Establish the project’s (solution) criteria and constraints. | - Defining a problem requires gathering evidence that describes the problem.  
- The project selected as a solution needs to address the defined problem, and will have clear requirements (criteria) and limitations (constraints). | - **Gather evidence** of unhealthy soil:  
  ○ Conduct an on-site survey and soil investigations  
  ○ Review agriculture practices described in EXPLORE  
  ○ Review or repeat the Soil Impact Survey  
  ○ Review or repeat the Plant Care Product Survey  
- **Write** a news/opinion article or create a visual graphic that addresses: “Why should we help restore the health of soil at this location?” Include the human-related cause(s) of problem, the effects of the problem on soil health, and why you have chosen this problem as the focus of your project. |

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<table>
<thead>
<tr>
<th>Project Ideas</th>
<th>How can you solve the problem and restore soil health?</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Research and compare different project ideas on the website, and from independent research, that can help solve the soil health problem that we want to address.</td>
<td></td>
</tr>
<tr>
<td>● Narrow the project options by considering the criteria and constraints.</td>
<td></td>
</tr>
<tr>
<td>● A problem can be solved in more than one way.</td>
<td></td>
</tr>
<tr>
<td>● Projects have different requirements - which materials are needed, how much time is needed, how much they cost. These requirements affect project options.</td>
<td></td>
</tr>
<tr>
<td>● Working in small groups, research one or more projects that could help solve the identified soil problem. Begin with the project ideas described on this page, and then expand research using other local, paper, or web sources.</td>
<td></td>
</tr>
<tr>
<td>● Decision-making instructional strategies</td>
<td></td>
</tr>
<tr>
<td>○ List and discuss the pros and cons (strengths and limitations) for a minimum of two solutions, or variations of one solution. Choose a solution based on your evaluation. Get teacher approval of idea. Consider evaluating on effectiveness for soil health, do-ability by students, stakeholder support.</td>
<td></td>
</tr>
<tr>
<td>○ Complete an Engineering Design Decision Matrix (from the Jason Project) to compare solution options. Share and discuss the matrices as a full group. Then, individually, use the information to defend your decision for which solution you think would be most effective at helping soil. Choose a solution based on your evaluation. Get teacher approval of idea.</td>
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<td>● Create and share a visual presentation that explains the cause(s) of the threat to soil health, and a science-based argument for why you think your solution will reduce the threat and help the health of your soil. A few presentation options:</td>
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<td>○ Create and share a paper or digital infographic, a multi-flow Thinking Map, or other visual representation</td>
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<td>○ An Ignite Talks</td>
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<td>○ A Pecha Kucha Talks</td>
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| ● Intentionally teach presentation skills: Show several short video clips of pitches that argue for listeners to take a specific action or buy a product. Which was more
| Design & Do<br>How do you design a SMARTER project plan? | • Download the Project Planner to use as a guide for designing a SMARTER soil health project.<br>• Apply for a financial grant (optional).<br>• Do the project by following your plan. | • A project will be more effective if it is designed with the SMARTER criteria.<br>• There is a process for implementing a community project that makes a positive impact on the health of soil. | • Design one or more site-based project proposals by using the Project Planner or another PBL (project-based learning) process appropriate for your students.<br>• Conduct peer reviews of the proposals to give and receive feedback on designs based on the criteria of SMARTER projects. Peers can review the Project Planner. (This is an opportunity to teach constructive feedback skills.)<br>• Select the site-based project design that the class decides will be most effective at solving the problem.<br>• Apply for a Heroes Grant if funding for project materials is desired. | 4 days-4 weeks, extending throughout the seasons of the year as desired |
**T - TEACH.**

With new knowledge and understanding comes responsibility. How can you teach others about what you have learned and done, and inspire them to become Heroes to soil around them?

<table>
<thead>
<tr>
<th>Driving Questions</th>
<th>What we do on the website</th>
<th>What we figure out</th>
<th>How we can actively investigate &amp; demonstrate understanding</th>
</tr>
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<tbody>
<tr>
<td>Reflect on Impact</td>
<td>• Reflect back on the Quest to consider how it has changed your understanding, skills and confidence related to soil, climate change, and designing solutions to problems.</td>
<td>• I made a positive impact on the world by helping solve a local environmental problem. And I can do it again! • There is a logical process for designing and implementing a solution to a local environmental or sustainable problem. • To design an effective project that solves a local problem, we need to understand relevant STEM concepts and practices.</td>
<td>• Respond to any of the group and personal reflection prompts on this page to explore the impact of the project on individuals. • Write a personal reflection about how participation in the Quest has affected your perspective and understanding about soil health and climate, and your confidence and ability to design solutions to real-world problems. • Additional reflection prompt options: ○ <a href="#">The 40 Reflection Questions</a> from Edutopia. ○ <a href="#">Work Critique</a> from Edutopia.</td>
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<tr>
<th>Share your Story</th>
<th>Plan an experience to share your Quest story and to teach others about why and how to restore soil health.</th>
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<tbody>
<tr>
<td>How can you expand your impact on soil and climate?</td>
<td><strong>WHO to teach:</strong> Other students, school staff, school district leadership, school families, community members, local government officials, relevant staff of interested agencies, businesses, or organizations</td>
</tr>
<tr>
<td>How can you inspire others to help restore the health of soil at their homes or in their community?</td>
<td><strong>WHAT to teach:</strong> Take them on your Quest, what you learned and did:</td>
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<td></td>
<td>- Why is the health of the soil important for so many other environmental systems?</td>
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<td></td>
<td>- Your scientific understanding of soil health</td>
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<td>- Global and local human impacts</td>
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<td>- Your solution design process, results, analysis and explanations</td>
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<td></td>
<td>- How and why the audience can help</td>
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<td></td>
<td><strong>HOW to teach:</strong> Choose the presentation format that is most effective and engaging for your audience and for sharing the message of your story:</td>
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<td></td>
<td>- Interactive activities, demonstrations, project site signage, paper brochure, school website link, video documentary, news article, photo journal, models, powerpoint /digital presentation, skit, song, written story, picture book</td>
</tr>
</tbody>
</table>
| | **WHERE to teach:** On-site and off-site of project, school, community location, indoor, outdoor, school assembly, all-school event inviting families and community, TV station or radio interviews, district website article or video,
<table>
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<tr>
<th>Report to Hero Headquarters</th>
<th>Complete the Quest survey to share the highlights of your Quest with Captain Planet’s Project Hero Headquarters.</th>
<th>Our Quest to improve soil health in our community has made a difference to the environment, our community, and ourselves. People care about what we did and want to hear our story.</th>
<th>Complete the form on the webpage and submit to Captain Planet’s Hero Headquarters. Highlights from Reflections about the Quest might be helpful.</th>
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</table>

**Extending your Quest. Become a Citizen Scientist!**

Choose a soil-related citizen science project to participate in that is relevant to where your location and interests. These projects are actual regional and national scientific investigations being conducted by scientists. They are requesting help from citizens to gather data that will help restore the health of soil and the organisms who live in this ecosystem.

**Soil-relevant citizen science projects:**
- What's In Your Backyard?
- MODIRT Citizen Science Soil Health Surveys
- Citizen Science: From Soil to Sky
- ShareOK: Citizen Science Soil Collection Program

Have feedback for how to improve the Healthy Soils Quest? Email us at projecthero@captainplanetfdn.org

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