

TEMPLATE FOR CMap PROJECT

Project Title: Native Utah Plants

Created by: Anna Davis

Class: Box Elder 2008

Project Description	<p>In my class, we learn to identify and categorize native Utah plants. In addition, we learn to classify plants according to biomes and see how they relate together. In this project, the students would mark waypoints to identify plants, and then use GPS technology to create a nature trail map. Other students and members of the community could then use this tool to help them learn new plants. In addition, by mapping out where plants are in relation to each other, they could begin to see how plant communities are relational.</p>
Community Issue or Problem Selected -How project evolved?	<p>The NPS, NFS, and BLM are constantly looking for interpretive and educational tools to help the public not only enjoy recreation, but also learn as well. In addition to helping my students learn, the nature maps they create could also be distributed by the NFS to help educate the public.</p>
Community Partner(s)	<p>NPS, NFS, or BLM (depending on where the nature trail is.)</p>
Project Objectives	<ol style="list-style-type: none"> 1. Identify at least 10 native Utah plants. 2. Identify at least three Utah biomes. 3. Realize how plants work as a community? What factors lead them to live where they do? 4. Create a nature trail map. 5. Learn how to mark waypoints and how to use a GPS to find other waypoints. 6. Learn how to use Arcsoft software to create a map. 7. Create a brochure including the map, pictures of the plants, and a written description of the plants. It would also identify the biome these plants live in and their relationships with each other. 8. Other students can learn even more plants by following their fellow students' maps.
Utah Core Standards/Objectives	<p>Geography (Social Studies) Standard 1, Objective 1: Use maps and other geographic tools to acquire information from a spatial perspective.</p>

- a. Explain the differences between major types of map projections.
- b. Examine characteristics of maps and globes such as latitude, longitude, great circle routes, cardinal directions, compass rose, legend, scale, relief, grid system, and time zones.
- c. Explain selected map concepts, including rotation, revolution, axis, seasons, solstice, equinox, and the earth/sun relationship of weather patterns.
- d. Collect and interpret geographic data using maps, charts, population pyramids, cartograms, remote sensing, and Geographic Information Systems (GIS).

Standard 2, Objective 1: Interpret place by its human and physical characteristics.

- a. Examine human characteristics, including language, religion, population, political and economic systems, and quality of life.
- b. Investigate physical characteristics such as landforms, climates, water cycle, vegetation, and animal life.
- c. Recognize that places change over time.

Standard 5, Objective 2: Assess the importance of natural and human resources.

- a. Describe the roles of natural and human resources in daily life.
- b. Identify worldwide distribution and use of human and natural resources.
- c. Compare and contrast the use of renewable and nonrenewable resources.
- d. Evaluate the role of energy resources as they are consumed, conserved, and recycled.

Standard 6, Objective 2: Apply geographic concepts to interpret the present and plan for the future.

- c. Participate in community activities respecting the environment and personal property.

Language Arts

2. Demonstrate Appreciation for the Role of Language Arts

- a. Use language arts skills and strategies to think critically, communicate with others, and understand our culture and common heritage.
- b. Develop thinking and language acquisition together

through interactive learning.

c. Recognize that in studying language arts they will learn the strategies necessary for acquiring academic knowledge, achieving common academic standards, and learning independently.

6. Use the Skills, Strategies, and Processes of Writing

- a. Understand that writing is a process of skills, strategies, and practices for creating, revising, and editing a variety of texts.
- b. Develop reflective abilities and meta-awareness about writing.
- c. Use writing to discover and explore ideas.
- d. Develop collaborative writing skills to prepare for workplace writing.
- e. Understand that writing is a tool for thinking: solving problems, exploring issues, constructing questions, addressing inquiry.

Biology

Standard 1, Objective 2: Explain relationships between matter cycles and organisms.

- a. Explain how water is a limiting factor in various ecosystems.

Standard 5, Objective 2: Explain relationships between matter cycles and organisms.

- a. Use diagrams to trace the movement of matter through a cycle (i.e., carbon, oxygen, nitrogen, water) in a variety of biological communities and ecosystems.
- b. Explain how water is a limiting factor in various ecosystems.

Objective 3: Classify organisms into a hierarchy of groups based on similarities that reflect their evolutionary relationships.

- a. Classify organisms using a classification tool such as a key or field guide.
- b. Generalize criteria used for classification of organisms (e.g., dichotomy, structure, broad to specific).
- c. Explain how evolutionary relationships are related to classification systems.
- d. Justify the ongoing changes to classification schemes used in biology.

Photography

Standard 1, Objective A: Create photography using principles and elements of art.

	<p>Standard 4</p> <p>Objective B: Involve the creation of photography with other educational subjects.</p>
<p>Essential Question(s) -Spatial Issue</p>	<ol style="list-style-type: none"> 1. What are some native plants that live in Utah? 2. What plants live in different biomes and why? 3. What relationship do plants have with each other within a plant community? 4. How can I use GPS units to find things? 5. How can I use GIS software to create a map?
<p>Assessments (rubrics, scoring guides)</p>	<ol style="list-style-type: none"> 1. Informal assessments: are the kids on task and understanding what to do? 2. Students are able to correctly identify plants by using a GPS that marks waypoints (worksheet.) 3. GIS map of their nature trails using ArcMap. 4. Finished brochure showing a map, pictures of the plants, and a written description of the plants using Apple Pages.
<p>Project Products</p>	<p>Map of nature trail using ArcMap. Finished brochure.</p>
<p>Project Timeline (include a step by step Procedures)</p> <p>Social Studies (geography)</p> <p>Science</p> <p>Recreation</p> <p>Science</p> <p>Art (photography)</p> <p>English (note-taking)</p>	<ol style="list-style-type: none"> 1. Before class, Sid and I would identify our own nature trail. We would find 10 native species that we want them to identify and mark them as waypoints on the GPS. We would download them using DNR Garmin and put them on ArcMap to print out a map for each team of kids. 2. (One field trip- 3 class periods) Then we would give each team of students (2 in a team) the map and a GPS unit and teach them how to use the GPS to find a waypoint. Each waypoint would be a different native Utah plant that they would have to identify. They would have to fill out a worksheet where they have to draw leaves, make observations, etc. to help them remember the native plants. This would get them familiar with the GPS and model for them what we will then want them to do. 3. (One field trip- 3 class periods) We would go to a hiking area and, in their teams, they would have to use their field guides to identify ten other native plants (they can't use the ten that we did first.) At each plant, they would mark each as a waypoint. They would also need to take a digital picture of the plant. They also

<p>Social Studies (geography/ map skills)</p> <p>Art (graphic design)</p> <p>English (writing)</p> <p>Science</p> <p>Recreation</p> <p>Social Studies (community relations)</p>	<p>need to write down any other observations they have about the plants.</p> <ol style="list-style-type: none"> 4. (2 periods) Back in class, give the students an introduction to ArcMap by showing how Sid and I plotted our waypoints. Step by step with the class, help them to use DNR Garmin to download their waypoints and then transfer the data into ArcMap. Have the students number and label each of the plants and use lines to mark the trail. They would also need to include the coordinates so that others could enter it into their own GPS unit. They would also have to include a title, compass rose, scale and legend on the map. Save the map as a .pdf. 5. (2 periods) Using Apple Pages, import the map as an image. Include a picture of each plant. On the back of the brochure, include a brief paragraph of some interesting and useful information about each plant. At the bottom, write a paragraph about the biome that these plants live in and their relationship with each other. Save and print the brochures. 6. (3 periods- one field trip) Follow up activity: Go on another field trip and give different groups another group's brochure. See if the students can correctly identify and learn about the other native plants. 7. Give the brochures to the National Forest Service to see if they would be interested in using or adapting the brochures for the public.
<p>Resources Needed</p>	<p>Access to transportation and a natural area for the field trips. Field guides. GPS units (preferably one for every 2 students) DNR Garmin and ArcMap software and computers Printer</p>
<p>Skills Required</p>	<p>GPS technology skills GIS and ArcMap technical skills How to read a field guide to identify plants Observation and note-taking Photography Writing Graphic Design Organization</p>
<p>Project Team Member Roles</p>	<p>Teacher(s): Anna Davis and Sid Hatch. We would have to set up an model first so that they can become familiar with GPS and have a vision of the end product. We would teach how to use the GPS units and the mapping software, as well as Apple Pages to put</p>

	<p>together the brochure. We would answer any questions about what to do and keep students on task. Facilitate to be a resource for questions and problem-solving.</p> <p>Students: Unified Studies class of Orem High School. Do the work!</p> <p>Partner(s): National Forest Service, if interested.</p>
Celebration/Presentation	After the brochures are finished, go up again to the same location and give the brochures to a different group and have them learn the information put together.
Project Evaluation	As Leslie explained this field, this would be for me to fill in after the project was completed. I would then evaluate things that went well and that I could change to make better for next time.
Project Bibliography	Native plant field guides
Plans for Future CMAP Activities	If this project goes well, doesn't take TOO much time, and is well-received by the students, I would love to do more. We could do water-sampling of the Provo River vs. Utah Lake. We could maybe do something to map out about the Japanese beetle in Orem. We could do something with recycling (we started paper recycling at Orem High last year.) Lots of options.

Optional:

- Lesson Plans
- Student Artifacts
- Publicity