Use WebQuests to Teach Science

By Marianne C. Phillips and Teresa M. Phillips

Bernie Dodge (1995), considered the father of WebQuests, defined a WebQuest as an inquiry-based activity that uses the Internet as its main source for information. The content requires students to use higher order thinking skills and research skills. By engaging in a science WebQuest, students are learning the content as well as engaging in the processes involved in doing science. This inquiry method of teaching and learning is student-centered.

How Are WebQuests Created?

First, access the Next Generation Science Standards (NGSS Lead States, 2013) and decide what you want students to learn. Think about students’ interests, prior knowledge, and reading level. Begin by creating your lesson plan, which will include a teacher page.

The teacher page needs the following:
1. Introduction stating the purpose of your WebQuest
2. Description of the learners: grade level, prior knowledge needed, and suggested accommodations to meet the needs of diverse learners (for example, list Gardner’s (2006) eight multiple intelligences with suggestions for accommodations)
3. National, state, and local standards addressed
4. Student learning objectives for the science content and processes
5. Science background information for the teacher with a link to more detailed information on the Internet
6. Recommendations for how the WebQuest is to be organized and managed:
   a. Will students work in cooperative groups or individually?
   b. How much time should be allotted for completion?
   c. What directions are needed for the teacher to facilitate the students’ journey?
   d. Back-up plan: How can the WebQuest be done if computers are not available?
7. Materials and resources needed to complete the WebQuest
8. Methods for evaluating the students’ work
9. Concluding statements about the importance of the WebQuest to meet student objectives

Find a link to the actual WebQuest Life in Space: The New Settlement at http://questgarden.com/102/06/0/100424125220

Online extras at kdp.org/publications/nta
Once you have completed the teacher page, you are ready to develop the student pages. This part consists of five sections originally proposed by Dodge (1995):

1. **Introduction**: Creatively engage students in the quest. Provide a scenario or mystery that presents a real problem or question for students to solve.
2. **Task**: Present a short summary of the tasks students will complete on their journey to solve the problem or answer the question.
3. **Process**: Include the activities students will complete. Each activity should include the description, directions, and links to the Internet. Links to authentic sources should be provided as they are mentioned for easy navigation.
4. **Evaluation**: Provide a summative evaluation activity. Below this activity create a rubric to assess accomplishment of all WebQuest activities.
5. **Conclusion**: Bring a close to the WebQuest journey. Look back to your objective(s) and congratulate students on a job well done.

### Why Do You Want to Use WebQuests?

To begin an inquiry, it is important for the teacher to engage students in asking questions—not just questions that can be answered with a “yes” or a “no,” but divergent and evaluative questions that get students to think of alternative answers and make judgments. When these questions are asked, students are engaged in using their higher level thinking skills of analysis, synthesis, and evaluation. In the WebQuest *Life in Space: The New Settlement* (Phillips, 2013), students are asked to “figure out the needs of living things and determine if life can survive outside planet Earth.” Students start by connecting to an article from *The New York Times* advertising the opportunity to purchase real estate in space. During this investigation, students access and study authentic data from the National Aeronautics and Space Association (NASA) about the environment on several different planets and learn what is necessary for survival. At the end of the quest, students are asked to develop their own plans for a future settlement and create a pamphlet to advertise their location. During the inquiry, students use a variety of science process skills: making observations, posing questions, collecting and examining data, planning investigations, constructing explanations, and designing solutions (NGSS Lead States, 2013).

Student populations are becoming very diverse in socioeconomic status, culture, ethnicity, and language background. Well-designed WebQuests are a great way to meet the needs of all students. To accommodate different learning profiles the WebQuest can be designed to offer choices of activities, with different ones designed for linguistic, musical, logical mathematical, spatial, bodily kinesthetic, naturalistic, interpersonal, and intrapersonal learners (Gardner, 2006).

WebQuests are great platforms for engaging students in inquiry. They present students with a motivational task while providing them with varying approaches for completing it. WebQuests encourage collaboration in cooperative groups, increase self-esteem, develop critical thinking skills, and provide relevant learning experiences using authentic tasks involving Internet resources.

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