Introduction to the Problem

3

Instructional Purpose

- To introduce students to the initial problem statement
- To begin using problem-based learning

Curriculum Alignment

- ● Goal 1 — Concept
- ● Goal 2 — Content
- ● Goal 3 — Process/ Experimental Design
- ○ Goal 4 — Process/ Reasoning

Vocabulary

Stakeholder An individual with an interest in or involvement with an issue and its potential outcomes

Materials/Resources

- Initial Problem Statement (Handout 3.1)
- Need to Know Board (Handout 3.2)
- Additional Problem Statement Information (Handout 3.3)
- Group Activity Chart (Handout 3.4)
- Problem Log Questions (Handout 3.5)
- Need to Know Board on chalkboard or chart paper
- Problem Logs

Lesson Length

90 minutes

Activities

1. Ask students to write everything they know about systems in their **Problem Logs** without using resources. Review the concept generalizations and vocabulary as a class. Have students share their homework.
2. Distribute copies of the **Initial Problem Statement** (Handout 3.1) and read it

together as a class. Explain to students that they will be taking the role of the newly hired assistant, and they need to begin learning about archaeology in order to determine what steps should be taken to protect the site. Have students staple or glue the **Initial Problem Statement** into their **Problem Logs.**

3. Ask students what things an archaeologist considers as he or she works. Inform students that they will be working on their problem in the classroom; ask them how they will get the job done in such a setting. (*Note:* If they don't suggest it, prompt them to talk about the possibility of creating a simulation dig.)
4. Encourage students to think about what they have learned about systems and incorporate the vocabulary and generalizations into their problem-solving strategies. Have students brainstorm possible courses of action for the archaeological/construction situation.
5. Introduce the **Need to Know Board** (Handout 3.2) and explain that it is a tool to help organize important information about the problem as well as to record questions and resources. (In the first column, students list the information that they can glean from the **Initial Problem Statement;** they should list only information that is given in the problem statement. In the second column, students should list the types of additional information needed for working through the problem. In the third column, students should list ways they can find the needed information and also potential sources of the information.) Complete the chart as a class and record information on the chalkboard or chart paper. Ask students to clarify the importance of their ideas by asking for more information. Also encourage them to begin formulating their ideas about what the problem is.
6. Have students identify key words and phrases as they organize elements of the problem. Record new or key words and phrases on the chalkboard or chart paper. Students should devote a section of their **Problem Logs** to recording new or key words.
7. Have students prioritize the **Need to Know Board** from most to least critical in small groups. Debate reasons for prioritizing choices as a whole class and number accordingly on class **Need to Know Board.**
8. Ask students to identify resources that will help them answer or further investigate the issue. Allow small groups to choose which part of the issue they would like to investigate. Small groups should self-assign information to bring to the next class meeting.
9. Introduce the **Additional Problem Statement Information** (Handout 3.3). Ask students to speculate the things an archaeologist does to protect the site. **Ask:**
   - Now what's going on? What do you know about the situation?
   - What are the things that "archaeologists" know about?
   - What kinds of problems do archaeologists encounter when working on a dig site?

- How can you find out the necessary information in order to get started on your assignment and protect the site?
- What information do you need to know first and why do you need to know it?

10. Divide students into collaborative groups (four or five to a group). (These groups will work together for the duration of the unit.) Students should work in these groups to brainstorm what they need to know in order to investigate the problem. Have students use the **Group Activity Chart** (Handout 3.4) to guide their discussion.
11. **Ask:**
    - In order to complete this task, what would you need to know?
    - What do you already know that could help you?
    - How could you find out how to protect an archaeological site?
    - How can you find out how your area usually handles archaeology finds?
    - What else is important for you to consider?
12. Have students respond to **Problem Log Questions** (Handout 3.5) in their **Problem Logs.**

Notes

1. The **Initial Problem Statement** sets the stage for students to start asking questions about archaeology and systems. However, the **Additional Problem Statement Information** provides a sense of urgency as well as introducing the students to some of the problems that archaeologists face in the field. The students must determine the steps that they will take to protect the archaeological site and excavate the site while construction has been halted. The Exhibit Display and Town Meeting will integrate all that the students have learned in the prior lessons. (Review Lessons 18 and 21 prior to teaching this lesson.)
2. Many activities in this unit require students to work in groups. Determine whether you will maintain the same groups throughout the unit or vary them depending on the tasks.
3. The students' **Need to Know Boards** should be stapled or glued into their **Problem Logs.** They may be copied onto chart paper and posted around the room to be used as working documents throughout the unit.

Homework

Students are responsible for bringing information to class as agreed upon in Activity 8. Information should be written down but does not have to be in paragraph form. Students should bring the sources of their information to class.

Extending Student Learning

Have students complete a **Systems Diagram** for one of the systems mentioned in the problem statement.

Assessment

- Completed **Need to Know Board**
- Active and appropriate participation in group and class discussions
- **Problem Log Questions:** Students should utilize information from the class discussion to frame their answers.

Technology Integration

Online research can be conducted about archaeological current events and the problems that are encountered in the field.

Handout 3.1

Name Date

Initial Problem Statement

You are a newly hired assistant at a small museum that has just opened in your hometown. It is your second day on the job when you learn that the museum's archaeologist has resigned. Later that day, the museum receives a call from a local construction site. While digging to lay a foundation for a new school, a backhoe operator uncovered numerous artifacts. The construction company has stopped work while workers wait to hear what should be done next.

Handout 3.2

Name Date

Need to Know Board

What we know . . .	What we need to know . . .	How we can find out . . .

Handout 3.3

Name Date

Additional Problem Statement Information

As you are heading toward the construction/archaeological site, you hear a weather report that a thunderstorm with heavy wind and rain is headed toward the town. Based on the phone call with the construction company, you know that numerous artifacts have been exposed. You are unsure what the protocol is for protecting the site and the artifacts that have been exposed. What should you do?