

~ SuperSleuths ~

Pico's Problem: To build or not to build (a dam)

Welcome, SuperSleuths, to the mission base. We are so glad that you have come to help us with our new mission. You will soon be finding out your role in the mission, but no matter what your specific role will be, you will all be working toward the same goal. SuperSleuths, our job today is to help the small town of Pico solve their latest dilemma. Here is the big question we want to answer:

Should the town of Pico build a dam across the Mega River or not?

Before we begin our investigation, you need to know more about the town of Pico. It is important to keep this information handy while you search for information and answer your questions.

- Pico is located along a large river called the Mega River.
- The land along one side of the river is mostly used for farmland, both upstream and downstream from where the dam would be.
- Downtown Pico and most of the town's neighborhoods are on the other side of the Mega River.
- Downtown Pico is downstream from where the dam would be built.
- The neighborhoods are both upstream and downstream from where the dam would be.
- Pico's farms, neighborhoods, and downtown are surrounded with a lot of forestland (on both sides of the Mega River).
- The citizens of Pico have different opinions about the dam being built. Some people really want it to be built, and other people do not want a dam at all. Most people don't know much about dams, and they have a lot of questions.

This is where you come in. SuperSleuths, you will be finding important information about dams so that the citizens of Pico can make a good decision about whether or not they should build the dam. After we complete our research, we will send some SuperSleuth representatives to Pico's town meeting so that they can give the citizens of Pico advice about building the dam.

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Pico's Problem Continued

Before we start looking for information, we are going to split up into committees (groups) of three people. Most committees will not be looking for the same information and will not be answering the same questions, but each group will select one member to be a navigator, one member to be a scribe, and one member to be a representative.

- The **navigator** will be in charge of the computer. He or she will use the mouse and move through websites to find needed information, with the help of the other committee members.
- The **scribe** will be in charge of the mission task sheet. He or she will write notes about the information that is found and will make sure that other committee members know what questions they need to answer.
- The **representative** will attend the Pico town meeting to answer questions and give information that his or her committee found. The representative should pay close attention to the information his or her committee finds because he or she will have to tell others about what the committee learns.

When you are assigned to your committees and are working with your committee members, remember these important tips:

- Cooperate with your committee members. Listen to each other, do your share of the work, and remember that you are working as a team!
- Work quickly but carefully on this project. Our time to gather information is limited, but our mission is very important. Try to answer the questions on your task sheet as best as you can, but do not take too much time. The future of Pico may depend on us!
- If you run into any problems that you and your committee members cannot handle, raise a red flag in the air. Either the Mission Director or Mission Supervisor will come to help.

Now SuperSleuths, it is time to form your committees. The Mission Director will be coming to give you your badges. You will work in a committee with other sleuths whose badges have a color and symbol that match yours. After you get your badge, take a pencil with you and line up to go to the computer lab.

SuperSleuths: Pico's Problem WebQuest Lesson Plan

Overview

Grade: 4th (Darden Elementary)

Time: 1 hour 15 minutes

Source: TM, <http://simscience.org/cracks/>, <http://www.wordcentral.com>

Standards: *Science 4.2.6:* Support statements with facts found in electronic media.

4.3.5: Describe how water shapes and reshapes land surfaces.

Technology #13: Appropriately operate technological devices and systems.

Student Objectives: Students will gather information about dams from websites, will communicate their findings one another, and will make inferences based on their findings.

Materials

- Pico's Problem introduction (p. 1,2) (one per student and teacher)
- SuperSleuth badges, marked with symbols for each committee (1 per student)
- SuperSleuth Director/ Supervisor badges for teachers
- List of committees (Committees will each have three students and should be heterogeneous groups. If the number of students present is not divisible by three, make a group or two of four. Some students in these groups will share roles.)
- One red flag per committee
- One task sheet per committee
- Extra pieces of paper for committee working on Task Sheet 8
- Pico citizen roles and lines
- Self-evaluation sheets (1 per student)

Proposed Instructional Sequence

1. Introduce the activity by telling students they are going to switch from being ordinary students to being SuperSleuths. Tell them that you will go from being the regular teacher to the Mission Director. Pass out introduction sheets to students. Read aloud the SuperSleuth Pico's Problem introduction (pages 1&2) as students follow along.
2. Call students' names according to the committees they will be in, and give them each a SuperSleuth badge. Give each committee a red flag and a task sheet. Give the group assigned to Task 8 a few extra pieces of paper, so that they can do their experiment. Have students line up (taking pencils with them) after they receive their supplies. (If students forget who is in their group, they can match the symbol on their badge to other students' badges.)
3. Take students to the computer lab.
4. Direct committee members to sit together, and tell them that each committee will only be using one computer. Instruct committees to begin their tasks by reading and following the task sheets.
5. Walk around the room and make sure committee members in each group have chosen roles and put their names on the sheets next to the roles. Also

check to make sure students understand their tasks and can access the right websites and areas of the websites they need to find their information. Watch for red flags; they mean that students want your help.

6. Give a five-minute warning about six minutes before the computer lab period ends. (Tell students they have five minutes to finish finding their information.) After five minutes, tell students (SuperSleuths) to shut down their browsers, push in their chairs, grab their pencils and task sheets, and line up.
7. Take students back to the classroom. Have them return to their desks to “get ready for the next part of the mission”.
8. Students are now going to switch roles, except for the representatives. The town meeting portion of the activity is going to begin next. Tell students, **“SuperSleuths, it is now time for our representatives to go to Pico to give its citizens the information we found. Representatives, before the meeting begins, take your committee’s task sheet (to use as notes) to the back table. Review the information you have and quietly discuss what you found with the representatives from other committees. You want to be as prepared as possible to share information about dams with the citizens of Pico.”** Make sure the representatives go to the back table with their task sheets.
9. To the rest of the students say, **“The rest of you are now going to switch roles. You are going to go from being SuperSleuths to being citizens of Pico who are attending the town meeting. I have slips of paper with the parts you will play (such as farmers, business persons, and parents) along with questions for you to ask at the meeting. You will draw out a slip of paper and will play the role and ask the question that the piece of paper has on it.”** Go around the room and have students draw parts. Before beginning the meeting, ask if students have any questions about their parts (i.e. if they can read their lines).
10. Set up the room for the town meeting. Set up special chairs for the mayor and the SuperSleuth representatives near the front of the room.
11. Call the SuperSleuth representatives join the meeting. Have them sit at the front of the room. Tell the mayor to start the meeting, and let the meeting go on! (See the Pico Town Meeting Sheet for an overview of events and questions.)
12. Once the meeting has adjourned, pass out the self-evaluation sheets. Tell the students, **“We’re now jumping back to the SuperSleuth Mission Base, where the representatives have just returned.... Alright SuperSleuths! Another mission accomplished. I hope the Pico citizens are happy with the results of their meeting. I know you helped them make a more informed decision about building the dam. Now it is time to think about how *you* did throughout this mission. Did you do a super job, giving it your all, working hard, following directions, and cooperating with your committee? Did you do a decent job, working hard some of the time, following most directions, and cooperating with your committee most of the time? Did you do a**

not-so-super job on this mission, getting distracted, not following directions or finding the information you needed, and not working well with your committee? Or did your work fall somewhere in between? Now is your chance to decide and think about how you might do better next time. Mark on the self-evaluation sheets in front of you how you think you did, and then list some reasons why you gave yourself that score and tell some things you can do to do an even better job on future missions.”

13. Collect the evaluation sheets and the committee task sheets.

Provisions for Varying Abilities

Students will be working in groups, and the teacher will try to group students according to ability, so that students with high abilities can help students with lower abilities.

Formative Evaluation

The teacher will observe students’ participation in the activity and will review each group’s task sheet and each student’s self-evaluation. The teacher could create a checklist of wanted behaviors, if a more objective grade was needed.

Reflection

This was a fun lesson to teach, and the students said afterwards that they enjoyed the activity. The lesson engaged students in critical thinking skills and introduced them to dams, as I had hoped, but I did not have enough time to bring together all the concepts about dams and water flow, as I had hoped. The time I had to teach the lesson was cut short because of unexpected events that had occurred earlier, so I did not have the full amount of time I had planned. Consequently, many students did not finish their task sheets nor gather all the information I had hoped they would. Because students did not have all the information, they could not make as many inferences about the effects of building a dam, and the meeting was less informative than I had hoped. However, the students did use information they had found to talk about dams at the meeting, and they came to a few insightful conclusions.

I did not want to interrupt the students while they held their Pico town meeting, but at the end of the meeting before they voted, I decided to clear up some misunderstandings. The students had varying ideas about where flooding would occur if the dam were built, most of which were not correct. If I were to teach the lesson again, I would include questions or prompts to encourage students, who had researched flooding caused by dams, to explain the concept to other students. Also, while in the computer lab, I would make sure that the group(s) assigned to the flooding concept fully understood it.

Another change I would make if I were to teach this lesson again would be to point out that committees are answering different questions and that groups need to write the answers to the questions on their task sheets. Apparently, some groups were unaware that they were supposed to record the information they found.

Pico Citizen Lines

Mayor

You are in charge of the town meeting. When the meeting is ready to begin, welcome everyone to the Pico town meeting about building the dam. Introduce the SuperSleuths. Ask if anyone has any questions about the dams. Once people stop asking questions, ask if there are any more questions anyone wants to ask before voting about building the dam. If there are questions, let people ask them. If not, say, “All in favor of building the dam, say ‘I’”. Then say, “All in favor of not building the dam, say ‘I’”. Decide if building the dam or not building the dam got more votes. (If the vote is close, you can ask the SuperSleuths for help or can have a revote where people have to raise their hands, so you can count.)

Farmer who lives upstream from where the dam would be

Say, “I live on a farm upstream from where the dam would be. What will happen to my farm? Will my land be flooded?”

Farmer who lives downstream from where the dam would be

Say, “I have a farm that is downstream from where the dam would be built. Will there be any changes for me? Will my crops still get enough water?”

Parent who lives upstream from where the dam would be

Say, “My family and I live upriver from where the dam would be built. What is going to happen to us? Will we have to move?”

Parent who lives downstream from where the dam will be

Say, “My children and I live downstream from where the river will be. Is our property going to flood? Will we have to move?”

Person who likes to fish

Say, “My favorite thing to do is fish. I always fish in the river for fun. What would happen if we built a dam? Would there still be a river to fish in?”

Person who likes to swim

Say, “I hear that when a dam is built, a lake forms. Is that true? I would really like a place to go swimming. My mom always tells me the river is too dangerous to swim in but that she would let me swim in a lake.”

Environmentalist

Say, “I work at the Pico nature center, and I am worried about what building a dam would do to the wildlife around our town. We have lots of plants and animals that live in the woods and in the river. What kinds of things do you think would happen to the forests and the animals?”

Businessperson

Say, "I run a grocery store downtown Pico. Do you think building a dam would hurt or help my business? Is there anything else that I should plan on selling in my store, if we build the dam?"

Worried person

Say, "I have heard stories about dams cracking and breaking and flooding whole towns. I really, really don't want that to happen to our town. Should I be so worried about a dam breaking? Is there anything we can do to stop our dam from cracking, if we build one?"

Name _____

SuperSleuth Self-Evaluation Sheet

Did you do a super job on this project, giving it your all, working hard, following directions, and cooperating with your committee? Did you do a decent job, working hard some of the time, following most directions, and cooperating with your committee most of the time? Did you do a not-so-super job on this mission, getting distracted, not following directions or finding the information you needed, and not working well with your committee? Or did your work fall somewhere in between? Now is your chance to decide and think about how you might do better next time.

1. Make an X on the line to mark how you think you did.

Not-so-super

Decent

Super

2. List some reasons why you put the X in that spot.

3. Tell some things you can do to do an even better job on future missions.