

Riverton City Council Activity: Proposal to Sell City Land for Development of a “Green” Mall

TEACHER GUIDE – Version 5.2.11

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1. Activity Introduction

The Activity Scenario

Students will work in groups of five, and take on the role of Riverton City Council members who need to decide about an issue confronting their city. Riverton Park is a parcel of land adjacent to the Green River, which runs through the city. Riverton Park is a natural area with woods, open meadows and trails. People in Riverton use the park for activities such as walking, jogging, bird watching, and picnicking. Currently, Riverton faces steep budget problems, and in particular, the city schools need technology updates in order to be brought up to 21st century standards.

Riverton City Council is considering selling Riverton Park to a developer to raise money to install new computer technology labs in the city’s K-12 schools. The developer who wants to buy the land is proposing to build an eco-friendly mall on the land.

Overview of Activity

In this activity, students take on the role of Riverton City Council members who have to vote whether to keep Riverton Park as a city park (which costs the city money every year for upkeep), or to sell the land to the mall developer (which will raise money that can be used to install new computer technology in the schools). Each group of students will be provided with information about the proposal to sell the park and build a mall. The information will come from different sources including the mall developer, city scientists, Riverton Chamber of Commerce, Riverton Downtown Business Association, Friends of Riverton Park, and the superintendent of the school district.

The students will be asked to review the information and answer some questions to help them think through their decision. The questions will ask them to:

1. Explain the science underlying the scenario
2. Interpret data and evidence
3. Evaluate the evidence and arguments from the different sources and stakeholders
4. Predict likely outcomes of courses of action, and decide what to believe about outcomes predicted by different stakeholders
5. Indicate what additional information (e.g., studies) would be needed to make a better decision and monitor the consequences of the decision.
6. Vote on what to do
7. Provide reasoning and justification for their decision

After the students complete their group work, the whole class will reconvene for a discussion about how science can be used to inform decision-making.

Purpose of the Activity

A basic challenge for science education in a democratic country is preparing citizens to make informed environmental decisions. We define environmental science literacy as the capacity to understand and participate in evidence-based discussions about environmental systems and to make informed decisions about actions and policies. Environmental science literate citizens use science to inform their decision in both private (e.g., consumer, worker) and public (e.g., voter) roles. Some of the practices that are particularly important for using science as a tool of citizenship include:

- Explaining and predicting what is happening in an environmental system or issue using evidence and science understanding.
- Evaluating arguments and evidence (including multiple arguments and pieces of evidence that may conflict with each other).
- Dealing with uncertainty in arguments.
- Making, justifying and explaining a decision about a course of action.
- Identifying and prioritizing relevant information to use in making a decision about a socio-ecological issue.

This activity provides students with an opportunity to practice engaging in the citizenship practices described above. At the end of this teacher guide, we provide suggestions for leading a debrief session to discuss with students how people can use understanding of science to inform their decisions. As we are very interested in exploring how students engage in these practices, we will talk with you about data collection opportunities related to the activity. These will include collecting students' written data. If possible, we would also be interested in videotaping in your classroom during the activity, and in interviewing several students after they engage in the activity.

2. Activity Learning Objectives Aligned with National Science Education Standards

Content Standard A: As a result of activities, all students should develop

- Understandings about scientific inquiry

Content Standard F: As a result of activities, all students should develop understanding of

- Environmental quality
- Natural and human-induced hazards
- Science and technology in local, national and global challenges

Content Standard G: As a result of activities, all students should develop understanding of

- Science as a human endeavor
- Nature of scientific knowledge

3. Activity Timeline

<i>Day</i>	<i>Time</i>	<i>Description</i>
1	50 min	Introduce the activity to students and hand out the student packets. Students read and answer some initial individual questions on their own. If time permits, have the students form their groups and begin to address the group questions.
2	50 min	Students work in groups addressing the group questions and working toward a group decision with reasoning and justification.
3	25 min 25 min	Students finish their group work. Class debrief discussion of how science can be used to inform decisions

4. Activity Materials

- The teacher will need:
 - “Using Science in Decision-Making” PowerPoint Presentation
- Each student will need:
 - City Council Packet*
- Each group will need:
 - Group Packet*

Materials marked with a “*” include components that we’d like the teachers to collect from students and submit as data to help us understand how students engage in this activity.

6. Day-By-Day Lesson Procedures

Day One: Introduction to Activity and Individual Preparation Time

Overview

On day one, students are introduced to the Riverton City Council scenario. The teacher will hand out the student packet. Students will then be provided time for reading through the City Council Packet and answering the individual questions in the packet. The teacher should collect students' individual responses, make photocopies, and return originals to the students the next day. If time allows, the students also form their groups and begin their group work on the activity.

Advance Preparation

Before the lesson begins, the teacher should set up groups, assigning students to groups of about five using any preferred grouping strategy. All of the groups will have the same task. Make one copy of the City Council Packet for each student. Make one copy of the Group Packet for each group.

Procedure

1. Introduce the students to the activity by reading/sharing the following information.

For the next three days, you will be taking on the role of city council members in a city called Riverton. Each of your groups represents a city council that will need to make a decision about an issue your city faces. You will be provided with information about the issue and about procedures that the city council must follow in making decisions. Group members will need to discuss the issue together, write down responses to some questions about the issue, and vote on the issue.

So here is the issue you need to deal with... currently, the City of Riverton faces steep budget problems, and in particular, the city schools need technology updates to be brought up to 21st century standards. One proposal that has been put forward is to sell a city park to raise money to install needed technology updates in schools.

In making decisions about selling land, the council must adhere to an established city ordinance (rule) that city land is to be sold in such a way as to maintain the overall environmental quality of the city. Therefore, before voting to sell city land, the council must follow a three step decision process of 1) gathering the best evidence available about the possible benefits and impacts from multiple perspectives, 2) evaluating the evidence and determining if it is adequate or inadequate for making a decision about selling the parcel of land, and 3) making a decision (either a tentative decision if more information is requested or a final decision if sufficient information has been gathered).

A few months ago, a business person named Sharon Brown submitted a proposal to the city council. Ms. Brown and her company, Eco-Mall Ventures, are proposing to purchase the land in Riverton Park and to build an environmentally-friendly mall where the park is located. Ms. Brown submitted a report to you outlining the plans for building the mall and including a scientific evaluation of predicted environmental impacts of building the mall.

After Eco-Mall Ventures submitted their report, you (the city council) announced the plan to the community and asked for comments and feedback. Various people and groups have since submitted reports and comments on the proposed sale of the park land to build the mall.

Step 1 (gathering evidence and arguments) was recently completed and at this time, reports and comments from seven groups have been submitted to city council. These include:

- Sharon Brown and Eco-Mall Ventures
- Riverton City scientists (a biologist and a water scientist)
- The Riverton Chamber of Commerce
- The Riverton Downtown Business Association
- A community group called Friends of Riverton Park
- The Superintendent of Riverton Schools
- Riverton Climate Action Coalition

It will be your job to carry out Steps 2 and 3 as described above. You will need to review the information provided and then to work together as a city council to first determine the quality and adequacy of the evidence, and then make a decision about whether or not Riverton should sell Riverton Park land to Eco-Mall Ventures. Today you will be given time to read through the City Council Packet on your own and to answer some questions to help you think through the information. If we have time today, you can also start working with your city council group.

2. Provide time for students to read the City Council Packet on their own and to answer the individual questions. When students are done answering their individual questions, collect their responses. You can photocopy their responses and set them aside, then return the original copies to the students so that they have their responses in front of them while working on the activity with their group.

3. If time allows, students can be placed into their city council groups and begin to work on the group portion of the activity. Each group will need a Group Packet.

Day Two: City Council Group Work

Overview

On day two, students work in their city council groups reviewing and discussing the information and answering questions that ask them to evaluate information and evidence from different stakeholders.

Advance Preparation

Make sure each student has their City Council Packet and that each group has their Group Packet.

Procedure

Students join their groups and work through the issue using the Group Packet as a guide. Students should choose one person who will record their responses in the Group Packet. Let the students know that they will have today plus part of tomorrow to discuss the material, vote on a decision, and provide their group rationale for their decision.

As students work, the teacher can move from group to group observing how the students are engaging with and responding to the information. Make sure the students are working together in a respectful and equitable manner, but try not to give them directions about how to evaluate the information, or about what decision they should make. As the teacher listens to the different groups work, s/he may want to jot down some notes about how the students are using the various pieces of information that have been provided to them. For example, do the students consider all of the reports and comments that have been provided? Do they seem to trust some information more than other information? Do they privilege different types of information (e.g., scientific arguments or arguments based on values such as generating more jobs or preserving the natural environment)?

Day Three: Finish Group Work and Hold Discussion about Science and Decision-Making

Overview

For the first half of the class period, students finish working in their groups - reviewing and discussing the information and answering questions. Each student should turn in their individual question responses and each group should turn in their Group Packet. For the second half of the class period, the teacher leads a debrief discussion about how people can use understanding of science to inform their decisions.

Advance Preparation

Project the Using Science In-Decision Making PowerPoint using computer technology or overheads as available.

Procedure

1. During the first half of the class period, the groups can finish working through the Group Packets and recording their responses. Monitor the groups' progress to make sure that students are both thoughtful in their work on the Group Packet responses, and will be able to finish their work in half the class period.
2. Halfway through the class period, groups should complete their group work and turn in both their individual question responses and their Group Packets.
3. At this point, the teacher may want to ask each group to briefly share their decision and the reason for their decision with the class.
4. Save at least twenty minutes for the "Using Science in Decision-Making" debrief discussion. The PowerPoint presentation that accompanies this activity is designed to help the teacher and students reflect on the activity and on how informed citizens can use science to help make better decisions. Go through the PowerPoint presentation with the class allowing the students to discuss the questions provided on each slide one question at a time. If only a few students are participating, encourage other students to share their ideas as well. You might ask students to discuss questions with their group members for a minute or two, and then ask each group to share out their ideas. If the class is very vocal and many people participate, a more open discussion format may be appropriate. Encourage students to respond to each others' ideas, and not just to the teacher.

7. Optional Variations on Activity

We offer two suggestions for optional variations to the Riverton City Council Activity.

Variation 1. If a teacher has limited time to complete this activity, and if students do well with independent homework assignments, the teacher might consider shifting the majority of the first day's activities to a homework assignment. In this variation, the teacher still provides an introduction to the activity, but rather than having the students read the City Council Packet and complete the individual questions in class, students read and answer the individual questions as homework. One advantage to this variation is that it allows students to complete the reading and initial questions at their own pace. If the teacher chooses this variation, s/he should check to make sure that each student has answered the individual questions at the beginning of day two. The teacher can make a copy of the students' work, and then students should be given back the originals of their individual questions so that they can refer to them as they work with their group, and turn them in on the last day of the activity.

Variation 2. If the teacher would like to extend this activity and emphasize students' classroom discourse and presentation skills, s/he might consider adding in a group presentation component to the activity. Group presentations would take place after the students complete their group work, and before the final debrief discussion about science and decision-making.

If the teacher chooses to have students make presentations, s/he can use the Presentation Guidelines handout (included with student materials) to help students develop their presentations. The teacher can also decide what sort of visual aids s/he would like students to create for their presentations (e.g., posters or PowerPoint presentations). Provide the materials for students to develop their presentations as appropriate.

On the day of the presentations, have the groups pick numbers out of a hat to decide on the order of presentations. Each group should take about five to ten minutes (the teacher can decide on an appropriate amount of time) to present their decision and the reasoning underlying their decision. Groups should use the Presentation Guidelines to help them decide what information they should include in their presentations. After each group presents, the teacher should ask the class if anyone has any questions or comments for the group. If time for presentations is limited, the teacher may choose a subset of the questions from the Presentation Guidelines for the groups to address.

8. Student Materials

Student Materials for this activity include the following handouts:

1. City Council Packet
 - a. Introduction
 - b. Riverton Crossing Shopping Center Proposal
 - c. Riverton Scientists Report
 - d. Superintendent of Riverton Schools Comment
 - e. Riverton Chamber of Commerce Comment
 - f. Riverton Downtown Business Association Comment
 - g. Friends of Riverton Park Comment
 - h. Riverton Climate Action Coalition Comment
 - i. Individual Student Questions
2. Group Packet
3. Presentation Guidelines Handout (for optional activity variation)