

**Objective**

The student will be able to apply knowledge of renewable energy to solve a problem.

**Curriculum Focus**

Problem solving, Science

**Materials**

Frozen beans

Reference books on renewable energy

Videotapes (e.g., ENERGY ACTION TECHNOLOGY)

Posters

*Shasta River Camp City Council Specifications Sheet*

*Shasta River Camp Resources and Environment Summary Sheet*

# Summer Camp 2050

## INTRODUCTION

During this extended activity, students apply their knowledge of energy systems to the design of a summer camp in the year 2050.

## PROCEDURE

1. Before commencing this lesson, the teacher should read through the two handouts and photocopy them for class use.
2. Issue handouts to students. Work through the handouts with students and make sure they have a clear understanding of the requirements for their projects.
3. It is suggested that students work in small groups to complete this project. Allow students to gather resource materials and to decide upon their methods of presentation.
4. The students should discuss which type of energy system they would like to supply. Teachers should encourage different groups to consider different options so that a good range of alternatives are investigated.

Suggestions could include:

- Solar cells
- Wind generators
- Small-scale hydro generators
- Diesel generators
- Tidal energy system
- Use of biomass

Combinations of the above systems also should be encouraged.

5. Further class time (and homework time, if appropriate) should be made available to students to complete their projects.
6. Set aside sufficient class time so that all groups can make a five- to 10-minute presentation.

The presentation should take place within the context of a mock City Council meeting. While a group is making its presentation, the rest of the class acts as the City Council. They should be encouraged to question the presenters and to look for advantages and disadvantages of the submissions presented.

7. When presentations have been completed, get the group to further discuss and then summarize the advantages and disadvantages of each proposal.

If you feel that it is appropriate, a vote could be taken.

The information presented during this activity may, due to limitations of time and background knowledge, be somewhat superficial. It is unlikely that any one proposal will be clearly superior to the others, especially with regards to the energy systems chosen. Point out to students that the wise selection of an energy production system can be made only if adequate scientific, technological, social, economic, and environmental information is available to support the proposals. This makes the preparation of such a proposal a very large and complex task. Students who are motivated, though, can apply their research and critical-thinking skills to develop serious proposals.

This is a simulation activity, but if you can find a “real-life” example, so much the better.

## ***STUDENT ACTIVITY SHEET***

### **SUMMER CAMP 2050**

#### **INTRODUCTION**

The year is 2050. Your school has decided to set up a summer camp on the Shasta River, which is at a remote location in a temperate climate. The camp site has no electricity connected. The City Council has decided to allow students to design the camp.

#### **MATERIALS**

You will require the following materials to complete this project:

- Shasta River Camp *City Council Specifications Sheet*
- Shasta River Camp *Resources and Environment Summary Sheet*

#### **REFERENCES**

You will need background information regarding renewable energy sources and technologies. This could include:

- Your notes from previous activities on this topic
- Reference books on renewable energy
- **ENERGY ACTION TECHNOLOGY** video
- Posters
- Related Internet sites

#### **PROCEDURE**

1. Refer to the Shasta River Camp *City Council Specification Sheet*. Read it carefully.
2. Read through the Shasta River Camp *Resources and Environment Summary Sheet*.
3. Gather resource materials and decide upon your method(s) of presentation.
4. Decide which type of energy system(s) you would like to use to supply the energy needs of the camp.
5. Prepare your report following the guidelines outlined on the specifications sheet.
6. Practice your presentation.
7. Present your report to the “City Council” (the rest of your class).

## SHASTA RIVER CAMP

### *City Council Specification Sheet*

Students are invited to assist the City Council in the design of a Summer Camp at Shasta River. The camp will be used by groups of 30 students and two to three teachers each week of the summer year. On weekends and during school vacations, the camp will be made available to parents, teachers, and their families. Buildings should include six five-berth cabins for students and a cabin for teachers. You also may like to consider the design of other buildings that may be constructed if funds are available.

### THE REPORT

Students should present a detailed report to the City Council outlining the following:

1. Activities to be undertaken by students at the camp. (Remember it is the year 2050. Use your imagination.)
2. Suggested location for cabins and any other buildings.
3. Design of cabins.
4. Appliances (for cooking, washing, lighting, refrigeration, etc.)
5. Description of electrical power system(s) to be used for cabins.
6. Description of hot water system to be used in cabins.
7. Description of any other energy resources and systems to be used in cabins.
8. Environmental impact statement relating to items 1–7 above.
9. Social impact statement outlining the effect of the campsite on existing human activity in the area.
10. Estimated costs of the energy system(s).

### PRESENTATION OF REPORT

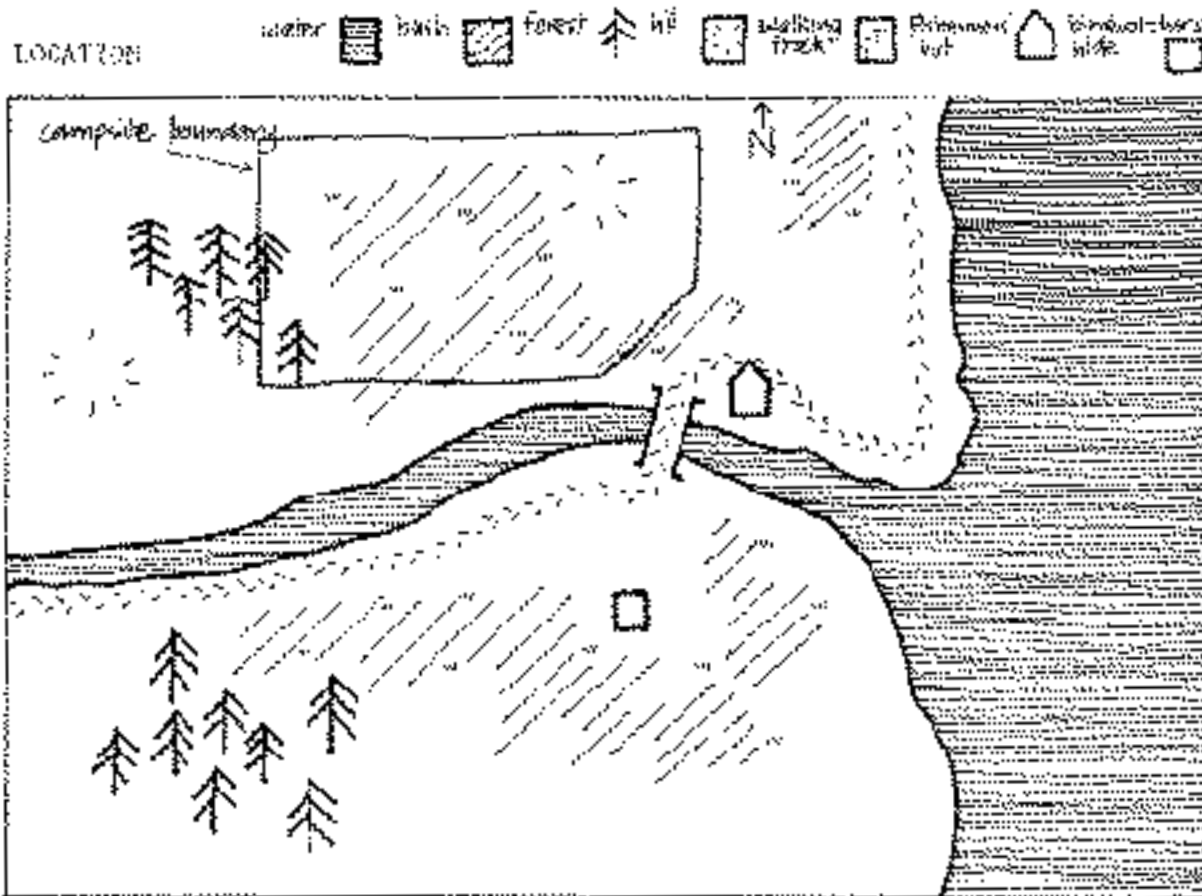
You will be required to make a five- to 10-minute presentation to the City Council. You should decide upon your own method of presenting the report.

You may like to use one or more of the following presentation ideas:

- Written report (which you read to the class)
- Wall chart or poster
- Overhead transparencies
- Microsoft PowerPoint or other presentation software
- Videos
- Models
- Presentation software program

## SHASTA RIVER CAMP

### *Resources and Environment Summary Sheet*



## WILDLIFE

The campsite is situated in an area of natural forest that contains an extensive range of native plants. Bird life is prolific.

Animals include reptiles such as snakes. Deer and foxes are some of the mammals that inhabit the area. Fish species living in the river are trout and salmon.

## CURRENT ACTIVITIES IN THE AREA

A hiking track passes near the campsite (see map). Hikers use the track quite regularly and sometimes camp overnight near the river.

A bird-watching club has set up a hide to observe birds just south of the bridge. This is used on most weekends.

A fishermen's shack is situated on the north side of the river about 1/2 kilometer east of the campsite. A few fishermen regularly use a small boat to catch fish in the river.

CLIMATE

	<b>Jan.</b>	<b>Feb.</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
Average Wind Speed (m/s)	4.5	4.4	3.8	3.6	3.6	4.5
Average Temperature	22.7	22.6	20.8	18.1	14.6	12.8
Rainfall (MM)	50	50	60	60	55	50
	<b>July</b>	<b>Aug.</b>	<b>Sept.</b>	<b>Oct.</b>	<b>Nov.</b>	<b>Dec.</b>
Average Wind Speed (m/s)	4.5	4.4	4.5	4.8	5.1	5.1
Average Temperature	11.9	12.9	14.6	16.9	18.6	20.7
Rainfall (mm)	50	50	60	70	55	50

Prevailing wind direction: North Easterly

Annual solar resource: Good

River characteristics: flow rate = 4 liters/sec  
available fall = 3 meters

Tidal range: 1.4 – 2.7 meters