

# LAKE AT STAKE



## KEY CONCEPTS

- WATER IS IMPORTANT TO ALL PEOPLE.
- RESPONSIBILITY FOR WATER IS EVERYONE'S CONCERN.
- ACTIONS WE TAKE IN OUR EVERYDAY LIVES INFLUENCE THE SUSTAINABILITY OF THE GREATER VICTORIA WATER SUPPLY.

## METHOD

Students will use collaborative group work, research, role play, drama and/or debate methods to present a variety of points of view about a water supply lake and its surrounding land uses.

### ACTIVITY INFORMATION BOX:

**TIME REQUIRED:** 120 minutes plus student research time

**GRADE LEVEL:** Grades 8-12

**KEY WORDS:** *water supply, decision-making, watershed, land use*

**MATERIALS:**

- Lake at Stake case study
- Internet and other information resources
- Student Worksheets

**SETTING:** indoors

**SKILLS:** gathering information, persuasive argument, analysis

**SUBJECTS:** Science 8-10  
Biology 11-12

### LEARNING OUTCOMES:

**IT IS EXPECTED THAT THE STUDENT WILL:**

- Develop an argument representing a point of view about water and land use;
- Use persuasive language to present a point of view;
- Practice decision making.



## BACKGROUND

Why worry about a lake and what could be at stake? All things depend on water – life as we know it on Southern Vancouver Island would not exist without fresh water. For most of us, the water we use every day comes from a lake (reservoir) in a nearby watershed. Water has many uses – plants and animals require it to live, and humans use it for recreation, water supply, business and industry – to name a few. In addition to fulfilling physical needs of humans and non-humans, water also has aesthetic, spiritual, and community values. Whether we're splashing in our local pond or listening to loons call across a quiet lake, water sets the scene for some of our most enjoyable moments.

Though we can't live without water, we often forget to protect it. Sometimes, we use water without thought about conserving it or we damage sensitive aquatic habitat and impact water quality by developing nearby land. In order to safeguard our water supplies for future generations, we need to take care of where the water comes from and how we use it today.

Issues surrounding management of watersheds and water supply are complex and involve many differing perspectives. We are all stakeholders to one degree or another when it comes to our water. More than likely, different people may view water differently. For example, people who are concerned about maintaining biodiversity in a watershed may have different concerns about water supply and watershed management than a land developer who wants to put in a shopping centre or a farmer who is raising a crop. In Greater Victoria, the T'Sou-ke Nation has a special interest in the Sooke River, the management of its watershed, the maintenance of its fish populations, and the maintenance of the ecosystem of the river's watershed. These interests have led to an agreement with the CRD and the development of a Water Management Plan for the Sooke Watershed in which the T'Sou-ke Nation and the CRD have both had input. In this case, and in most water supply and watershed management plans, the approach focuses on best practices that foster healthy ecosystems so that these resources can be sustained and passed on to future generations.

Water quality and quantity, sustainability of watershed ecosystems, biodiversity, and land management are all important in water supply and watershed management. Today, in many cases, water use is characterized by an increased competition for a finite water as population and development pressures increase.

## PROCEDURE

1. Read aloud or have students read the case study about Green Lake.
2. Discuss with students:
  - What are the important issues in this case study?
  - Who are the key players (stakeholders)?
3. Tell students that they will represent the people interested in Green Lake and its watershed. Each student will be asked to determine what they think is the best use of the water and watershed land of Green Lake in the town of Smallville.
4. Divide the class into groups that will represent the stakeholders at Green Lake. (You should have at least 3 students in each stakeholder group). Some ideas for stakeholder groups:
  - Recreation users (boaters, hikers)
  - Developers (homebuilders, commercial)
  - First Nations
  - Industry (mining, logging)
  - Environmental groups
  - Plants and animals that live in Green Lake/Green Lake Watershed
  - Water Department (public water supply)
  - Agriculture (organic farmers, greenhouses)
  - Water Bottling Plant (commercial water exporter)
  - Other ideas as generated by the class.



5. Using the information given in the case study as preliminary background, have each stakeholder group research and then develop their argument as to why they should have the use of Green lake and its watershed.
6. With teacher guidance, students should access various web sites to find information about their type of land/water use, consult with experts electronically, and create the documents and visuals needed for their presentation. Using the student worksheet, they should research and develop statements, from their stakeholder perspective, on:
  - Description of proposed land use and/or water use;
  - Description of environmental impact - especially on the impact of proposed use on sensitive habitat or endangered or threatened species;
  - Why is the proposed use of the lake the best for all concerned, the majority, or for one particular group?
7. Students should prepare a set of speaking notes for their group describing their point of view and goals based on their research. Additional presentation media (posters, graphics, etc.) will help substantiate their position.
8. Set a date for the "Smallville Town Meeting" where students will present their findings. The town meeting can be presented in one of two ways:
  - Each stakeholder group will dramatize their presentation by role-playing their key findings, giving a 5 minute oral presentation using their prepared cards with accompanying poster (or other graphics and media) to make their points. Classes can be split into three simultaneous groups – making sure that there is at least one representative from each stakeholder group – to facilitate more speakers and discussion.

### **OR,**

- Have a class debate. As students present their points of view, the teacher employs Socratic style questions to guide the debate. Teachers should: keep the discussion focused and intellectually responsible; ask questions about assumptions that may be made; stimulate the discussion with probing questions; and periodically summarize what has and what has not been resolved. It is important to draw as many students as possible into this discussion. Students should prepare background information for the debate with the appropriate student worksheet (grade 8-9 or grade 10-12).
9. While listening to presentations, the remaining students make a summary of each presentation. At the conclusion of all of the presentations each student will analyze all of their summary sheets, indicate his/her choice for the land use or land uses of choice, and write a paragraph substantiating the decision.
  10. The teacher can then tally all votes and inform Smallville of the fate of Green Lake and its watershed.

### **EVALUATION**

Have students:

- Describe what they have learned about conflicting land uses in watersheds.
- Make a mind map of water supply, watershed, and land use issues.

### **EXTENSIONS**

1. Water supply and watershed management often involves finding a balance of resource uses. Ask students to brainstorm ways in which multiple users may be accommodated. Are there uses that mean no other use of the lake can be accommodated? Discuss. Using a consensus style decision making process, have students come up with a plan that they all agree upon.
2. Apply the case study approach to a real life situation. Have student research and debate about the situation in Lake Chad in Africa, the Colorado River basin in the United States, the Columbia River – which has its headwaters in British Columbia – or the Three Gorges Dam on the Yangtze River in China.



## COMMUNITY CONNECTIONS

Invite a land use planner from the CRD to visit the classroom and have him/her discuss local land use issues.

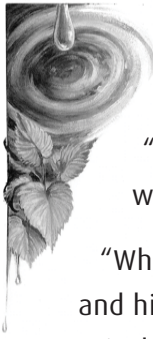
## ADDITIONAL RESOURCES

*Water: The fate of our most precious resource.* (2<sup>nd</sup> edition). By Marq. D. Villiers, 2003. Houghton Mifflin Publishing

*Reading the Peninsula.* By Sara Dowse, (ed). 2003 Community Arts Council of the Saanich Peninsula.

## REFERENCES

*Water for Tomorrow: A Guide to Watershed Stewardship in the Howe Sound Basin.* (1996). by DG Blair-Whitehead and W. Husby. Bowen Island, BC. Habitat Conservation Trust Fund



## CASE STUDY: GREEN LAKE AT STAKE

“What I do in my own backyard is my business, so butt out!” yelled Harry Johnson as Sam Sheppard walked away. Shaking his head, Sam jumped into his '01 Ford pickup and drove off in a cloud of dust.

“Why me? Why now?” he asked himself as he drove. The past year had been a difficult one for Sam. Sam and his teenaged son, Travis, had moved to Smallville to try to start anew after Travis’s mom died. Sam and Travis decided to try something new together and they were both volunteering at the local nature reserve and fish hatchery at Green Lake. Sam spent a fair amount of time trying to get the hatchery up and running while Travis volunteered a couple of days per week after school.

Earlier in the year Sam had spoken to their neighbour, Maggie O’Donnell, about the construction of her new horse barn. Sam had pointed out that land for the barn had been cleared nearby the lake and that the backhoe used in construction was dumping mixtures of earth, gravel, and manure along the shoreline. With the land clearing, when it rained, sediment from the pile flowed into the lake, increasing the turbidity of the water. Increased turbidity, or muddy water, can kill fish and other creatures and make it difficult to treat water for human consumption. Since Green Lake supplied water for both Smallville and the fish hatchery, Sam was concerned. Sam had explained to Maggie that he was trying to bring back the Kokanee salmon that were so plentiful here 25 years ago. Maggie had listened impatiently and told him to go talk to George whose factory was probably causing more damage to the lake than her horses. “And besides,” she added, “I’ve lived in Smallville my whole life and I’ve always planned to put in this barn and now that I have the money to do so – nothing will get in my way.”

Now Harry Johnson was building cement walls to prevent erosion along the banks of his Fairy Creek property. Harry owned a large piece of property in the watershed of Green Lake. Going through his property was Fairy Creek, the largest stream that flows into the lake. Harry had decided that he wanted to subdivide his property and build houses to meet the growing demand for residences in Smallville but first, he needed to “make sure” the stream bank stayed where it was so that as many houses as possible could be built along the stream’s banks.

When Sam got home that night, he and Travis talked about what was happening around the nature reserve and hatchery. They really enjoyed their volunteer work at the reserve, but as relative newcomers they were concerned about all the different points of view of the reserve’s neighbours and how this might lead to damage of the sensitive habitat of the reserve. “I think that we’re going to have to look beyond our own backyards to keep the nature reserve and hatchery going” Sam said. “Yeah, Dad; how are you going to make *that* happen?” Travis replied. “Hmmm, good question,” Sam answered, “maybe if I can get more people involved....”

Sam and Travis had lived in Smallville for the past year. After years of working full-time as an engineer in Vancouver, Sam decided to work part time as an engineer and do some volunteer work while he and Travis settled into their new routine. Travis attended the local high school. They both decided to work at the nature reserve and hatchery because they wanted to make a difference about preserving the environment.

But it was getting complicated with all the neighbours and what they wanted to do with their land surrounding the lake. And this afternoon’s argument with Harry was the last straw! They had to do something – they decided that Sam should call a meeting for anyone interested Green Lake and its surrounding watershed.



Situated on the southern tip of a large island off the Pacific Coast, Smallville is a small community of about 8,000 people. It has a Mediterranean-type climate with wet, rainy winters and dry summers. Green Lake is a small, relatively pristine, lake surrounded by forested lands and farms. The nature reserve is at one end of the lake, while the water intake for the community water supply is at the other end. In the forests you will find trees such as western red cedar, Douglas-fir, and western hemlock. Animals that call it home include the black bear, Columbia black-tailed deer, Pileated woodpecker, and Roosevelt elk. The watershed of the lake is both private property and Crown Land – land owned by the province. There are no glaciers or heavy snow pack on the gentle hills surrounding Smallville and Green Lake; most of the annual precipitation comes as rain during the winter. The summers are often very dry.

The night of the meeting Sam was so nervous he couldn't eat dinner. Travis made him even more nervous by telling him all about a class where they talked about "social responsibility" and how he had better run a good meeting. "But really, Dad, you're doing the right thing by holding the meeting and you'll be fine" he added.

By the time Sam was ready to call the meeting to order, twenty-five people had taken their seats in the community hall. After introducing himself, Sam asked every one to say a few words about themselves and why they were at the meeting.

Jenny Thompson represented the Smallville Field Naturalists and indicated some concern for Marbled Murrelet nesting habitat deep in the forests. Marbled Murrelets nest only in old growth fir and their habitat could be destroyed if the watershed were developed. She said she was very worried about the possible effects of some proposed housing developments in the watershed.

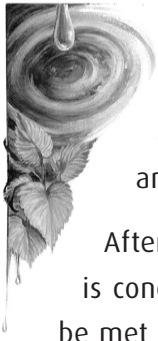
Norma Turner represented the Smallville water district, reminding every one that Green Lake was the water source for all the houses, schools, and businesses of Smallville. She said that it is very important to keep the lake water clean so that they don't have to add more costly treatments to the water to keep it safe to drink. She was supportive of keeping as much of the watershed protected as possible. Norma also agreed with Jenny that she was concerned about any new developments which would require an expansion of the water system. This, she said, would be a huge problem especially in the summer months when our water supply is limited.

This is getting more complicated, Sam thought.

Sam tensed when Harry introduced himself as a developer. "I've lived in Smallville my whole life and I only have its best interests at heart. Don't you want more jobs that I could provide to local carpenters and other businesses?" he added. "And now, some people" – he looked over at Sam – "don't want me to build some simple concrete barriers?" and then went on to say that he had been building houses in the community for the past fifteen years and always did a good job.

Bill Lewis got up and said he represented the First Nations people of the Green Lake watershed. He told the group that his people have fished in Fairy Creek for many hundreds of years and that these fish and those downstream of Green Lake sustain his people. He reminded that Green Lake itself has been a part of his people's culture for its clean water and that his people have a sweat lodge site nearby for spiritual practices. He told how water was very important in his people's creation stories. He also reminded the group about the water agreement his band has with the water district to ensure enough water is left in the creek downstream of Green Lake to maintain fish habitat – fish, he added again, that his people depend on.

Sheila Matthews introduced herself as an avid boater on Green Lake. She and her family have been boating there



every summer and they just love the lake. She described how she and her teenaged daughters used the lake for canoeing, swimming, and just hanging out. She didn't want to see a lot of houses built along the shoreline; "just some tasteful cottages – and maybe more docks", she added. She didn't see any problem with recreational use of a public water supply lake.

After everyone had introduced themselves, Norma Turner stood up again. "It seems that everybody here is concerned about Green Lake and its watershed" she said, "but we're not sure how our own needs can be met at the same time as those of our neighbours and the Smallville community." Most people nodded in agreement.

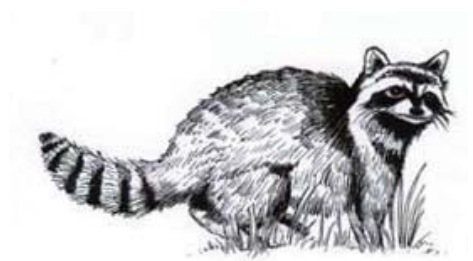
"I suggest that we talk about how we might proceed from here. What does everyone think?" Norma asked.

Sam was the first to stand up. "I think it's a great idea but we need to be careful about respecting other people's point of view. Let's make a list of all of our ideas and concerns and come up how to proceed from there later."

By the end of the meeting, everyone had a chance to voice their opinion and listen to one another. They decided that although there were many potential conflicts, everyone had an interest in Green Lake and its watershed. Most people had signed up for another follow-up meeting and agreed to invite anyone else that may be interested to attend.

Sam stood up and thanked everyone for coming. Just as he was sitting down, Harry jumped up. "This is all very fine," he said "but I'm going to have to put in those erosion barriers before the winter rains. I don't think we've done much to sort this issue out." The room was quiet as Harry hurried out into the night.

*This case study was adapted from "Apples or Salmon" from Water for Tomorrow – a guide to watershed stewardship.*



NAME:

BLOCK:



## LAKE AT STAKE DEBATE: *Grade 10-12 Assignment Instructions*

### AIM:

Your task is to work collaboratively with your group to develop a proposal on your stakeholders' use of Green Lake and its watershed. Using the Green Lake Case Study, the internet and other resources, gather background information for your proposal:

- What is the proposed land use and or water use?
- What is the environmental impact of your land use or water use?
- How will you manage any potential conflicts with other users?

### INSTRUCTIONS:

Develop a written report outlining your group's proposal. The report should include the following:

- Introduction – List the aims or goals of your proposal (What is the proposed land use and/or water use) and a description of your stakeholder group.
- Methodology – describe the background research that was used in approaching your proposal. Also, in this section, discuss the data sources you used and any assumptions/limitations that might be in the data sources.
- Research Findings and Analysis – present your background findings in the areas of environmental impact, management of potential conflicts, and any other issues that the background research provides.
- Conclusion – what do you propose to do with Green Lake and its watershed? Why? What are the strengths/weaknesses of your approach? Why should the citizens of Smallville vote to support your proposal?
- References – properly cite any academic articles or material from the Internet and data sources in this section. Proper citation format for this report will be based on the APA Style Manual.
- Be prepared to describe and defend your proposal in a class debate.

### EVALUATION

- Stakeholder Proposal
  - 75% of the project grade, based on originality and completeness (see above).
- Presentation
  - 25% of the project grade.
  - Your group will be required to present your findings and state a clear argument for your proposal for Green Lake and Smallville. You will have 5 minutes for the presentation and may use this time in any way you like.





NAME:

BLOCK:

## LAKE AT STAKE DEBATE: *Grade 8-9 Assignment Instructions*

### AIM:

To work collaboratively with your group to research, prepare, explain and defend a position on Green Lake and the use of its waters. Using the Green Lake Case Study, the Internet and other resources, gather background information for your position. Answer the following questions:

- What is the proposed land use and/or water use?
- What is the environmental impact of your land use or water use?
- Why is your proposal the best for all concerned, or the majority of residents, or your group?

### INSTRUCTIONS:

Make notes on the information you have gathered to refer to during the debate. The notes must be complete. You will be required to provide your teacher with a written summary of your group's position.

Your notes and summary should include the following:

- Introduction – what is the issue and a brief description of your group's position;
- Methods – describe the research sources you used (bonus for describing any assumptions they or you make);
- Research Findings – present your findings in terms of impact on the environment, potential conflicts, and any other issues;
- Conclusion – what do you propose and why it is the best use of Green Lake and its watershed;
- References – list websites and other sources you used.

Be prepared to describe and defend your proposal in a class debate.

### EVALUATION:

- Debate presentation, proposal, and behaviour
  - 75% of the project grade, based on originality and completeness (see above).
- Written summary from notes
  - 25% of the project grade.



NAME:

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## LAKE AT STAKE DEBATE: *Presentation Summaries*

**INSTRUCTIONS:** use this worksheet to write a summary of each presentation.

RECREATION USERS

DEVELOPERS

FIRST NATIONS

INDUSTRY

ENVIRONMENTAL GROUPS

PLANTS AND ANIMALS THAT LIVE IN GREEN LAKE

WATER DEPARTMENT

AGRICULTURE

WATER BOTTLING PLANT



NAME:

BLOCK:

# LAKE AT STAKE DEBATE:

1. LIST YOUR PREFERRED CHOICE(S) OF LAND USE AT GREEN LAKE AND IT'S WATERSHED

Blank area for listing preferred land use choices.

2. WRITE A PARAGRAPH DEFENDING YOUR POSITION

Blank area for writing a paragraph defending your position.