



Introducing the Water Gallery Performance Task		Lesson 4	Grade 8, Science and Technology
Critical Learning		Guiding Questions	
<ul style="list-style-type: none"> • Access to sufficient clean water for domestic and personal use is a fundamental human right and crucial to human health, food production, and economic development. • Many profit-motivated corporations see water as a commodity. • The sustainable management of water resources has become increasingly complicated. 		<ul style="list-style-type: none"> • Water is considered a renewable resource. Does this mean that we can use as much of it as we want? • Is water a basic human right for all or a commodity to be owned and sold? 	
Curriculum Expectations			
<p>Relating Science and Technology to Society and the Environment</p> <p>1. Assess the impact of human activities and technologies on the sustainability of water resources</p> <p>1.2 assess how various media sources address issues related to the impact of human activities on the long-term sustainability of local, national, or international water systems</p> <p>Developing Investigation and Communication Skills</p> <p>2. Investigate factors that affect local water quality</p> <p>2.4 use scientific inquiry/research skills to investigate local water issues</p>		<p>Learning Goals</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • analyse a media form using a RAFTS organizer (author, topic, purpose, audience, and form) • evaluate the effectiveness of a media source in presenting water issues and influencing an audience to become informed and take action • use a RAFTS organizer to plan a form that communicates water issues • use basic research skills 	
Instructional Components and Context			
<p>Readiness</p> <ul style="list-style-type: none"> • Sources of water • How we use water • Personal water consumption • In-home conservation methods • Accessibility of fresh water • Reliability of data • Appreciating various perspectives • Research skills 	<p>Terminology</p> <ul style="list-style-type: none"> • Role • Purpose • Audience • Form • Contrast • Couplet 	<p>Materials</p> <ul style="list-style-type: none"> • “Water is Life” flash presentation produced by World Vision with the support of the Government of Canada through Canadian International Development Agency. Lesson activities are adapted from “Water is Life”, an educational resource for grades 7-12 produced by World Vision with the support of the Government of Canada through Canadian International Development Agency. http://ourworldclass.tigweb.org/upload/waterilife.pdf • Chart paper and markers for each small group of 3-4 students • Water issues cards from www.worldvision.ca/resources 	

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Minds On (Elicit and Engage)		Pause and Ponder
<p>Whole Group → Identifying Issues of Concern</p> <p>Display question prompts, e.g., What surprises you? What reassures you? What worries you? Encourage students to substitute their own verbs, e.g., “frustrates,” “interests.”</p> <p>Tell students that they will view an animated presentation that poses a riddle.</p> <p>Show Water is Life without telling students the answer to the riddle, i.e., water. After viewing, engage students in a discussion. Show the video again, asking students to identify specific water-related issues that were raised in the presentation.</p> <p>Small Groups → Mind-Mapping Water Issues</p> <p>Groups mind map (as in Lesson 2) current water issues important to them. Maps might include issues from the video or prior knowledge. Post mind maps. Groups share one item from their mind map, e.g., something surprising or worrisome, or something that they see as a positive message or theme.</p> <p>Whole Group → Culminating Task</p> <p>Explain to students that they will demonstrate their learning about water and water issues at the end of the unit by creating a Water Gallery in which they will use oral, visual, and/or written representations to convey their understanding of current water issues. (Note: They will begin to investigate the issues in Lesson 6.)</p> <p>See Water Gallery Performance Task and Water Gallery Performance Task Rubric.</p>		<p>QuickTip View with a purpose: Having a purpose for viewing, listening, and reading is a strategy for increasing students’ ability to make sense of the text and recall information.</p> <p>QuickTip Mind mapping can be used as a brainstorming technique. Brainstorming is an intense problem-solving strategy used by creative teams that rapidly generates ideas without editing or evaluating them. Model effective brainstorming.</p> <p>QuickTip For Scientific Inquiry, refer to The Ontario Curriculum, Grades 1-8: Science and Technology (Revised, 2007), pages 15-16, for a skills continuum for research. Use this information to inform unit instruction, scaffolding, and groupings. See Think Literacy Subject-Specific Examples: Library Research, Grades 7-12 for strategies and handouts for evaluating information sources and for a Question Matrix, pp. 10-11.</p> <p>A for L Collect and provide feedback on research notes.</p>
Action! (Explore and Explain)		
<p>Whole Group → Making Meaning from an Animated Text</p> <p>Focus on the issue of how the media address water issues and how this particular source uses the flash medium to address them. Model how to use a RAFTS organizer for analyzing the flash animation. Discuss the effectiveness of the couplets, contrasts (irony, paradox), music, graphic images, lack of voice over, the accelerating pace, the concluding image (children playing in a water fountain with accompanying sounds of laughter), and the final slogan/injunction (think do act).</p> <p>Pairs → Selecting a Research Focus</p> <p>Describe the purpose (why), process (how), and product (what) of the Water Gallery performance task and lessons preparing students for success in the task. Each pair selects one couplet from Water is Life to be the focus of their research. Model how to narrow the focus from a couplet, how to pose questions to guide research, how to evaluate the research sources, and how to take notes.</p> <p>Pairs complete their research. Remind them that it is important to consider the perspectives of the sources from which they get their data, and to ensure a balanced view in their findings. Pairs share the sources that they are using and provide examples of how the sources are providing a balanced perspective of the issue.</p>		
Consolidation (Elaborate, Evaluate, Extend)		
<p>Whole Class → Establishing an Inquiry Framework</p> <p>Using a combined KWL and Graffiti strategy, students identify (1) what they learned from Lessons 1-4, (2) what they know (K column) and (3) what they wonder about (W column) for water. Post chart paper, inviting students to add to the graffiti wall during the unit.</p> <p>Solicit from students the couplet/water issue on which they’d like to focus for the performance task. Use this information to create Water Gallery Inquiry and Research Teams.</p> <p>Post examples of a range for graphic and prose forms. Using the Gallery Walk and dotmocracy strategies, students indicate which forms they wish to learn more about, practice, and select from for the performance task.</p>		<p>A for L Use information from the KWL and Graffiti strategies to inform instruction and plan guided practice.</p> <p>QuickTip Additional pieces of chart paper will be required.)</p> <p>QuickTip In a dotmocracy, students vote by placing stickers beside forms of communication they wish to learn more about.</p>

Minds On

Mind Map

Bennett and Rolheiser (2001) identify critical attributes of mind maps:

- a central image representing the subject
- main themes radiating like branches from that central image
- a key image or key word for each branch
- connections between the image and branches
- use of colour

Bennett, Barrie and Rolheiser, Carol (2001). *Beyond Monet: The Artful Science of Instructional Integration*. Ajax, ON: Bookation. p. 289.

Action

RAFT

RAFT (Role, Audience, Format, Topic) or **RAFTS** (Role, Audience, Format, Topic, Strong Verb) is a graphic organizer used for planning. Students use this tool to explore the role they will take on as creators, the audience they will address, the varied formats for their product, and the topic.

A RAFT establishes a context for writing by focusing on the dynamic connections between author, audience, topic, form, and purpose that are at the heart of communication. As with other graphic organizers, RAFT provides a framework to consider the various components (i.e., Role, Audience, Format, and Topic) as well as the relationships between them. RAFT can be used as a planning tool for media, written, and oral communication.

See **Student Success DI Package 2007, DI Cue Cards: Structures – RAFTs**.

See **Think Literacy Subject-Specific Examples, Language/English, Grades 7-9, Generating Ideas: Setting the Context**, pp. 32-37.

RAFTS

<p>Role Who wrote, produced, or sponsored the text?</p>	
<p>Audience For whom is the text created?</p>	
<p>Form What kind of text is it and what are its features?</p>	
<p>Topic What is the text about?</p>	
<p>Strong Verb What is the purpose of the text, e.g., to persuade? Explain?</p>	

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Scientific Inquiry

In scientific inquiry, students engage in activities that allow them to develop knowledge and understanding of scientific ideas in much the same way as scientists do. Like scientists, students must develop skills in the two major components of scientific investigation: experimentation and research.

Experimentation involves conducting “fair tests” to determine whether changing one factor in the experimental set up affects the results, and, if so, how.

Research includes both primary research, done through first-hand, direct observation of objects and processes, and secondary research, done by reviewing the work and the findings of others. See **The Ontario Curriculum, Grades 1-8: Science and Technology, 2007**, Ministry of Education of Ontario, pages 12-13.

Question Matrix

A question matrix is a chart of question words and verb forms that scaffolds skill development in posing questions. Question words signal different types of information being requested. Verb forms signal a variety of tenses and moods. For example, see the question matrix in **Think Literacy Subject-Specific Examples, Grades 7-12, Library Research**, pp. 10-11.

Consolidation

K-W-L (I Know-I Want to know-I Learned)

The Know-Want to Know-Learned strategy (Ogle, 1986) is linked to the before, during, and after framework. KWL is a generative strategy that structures thinking processes.

The “Know” column prompts students to activate and inventory prior knowledge. It can be completed individually or collaboratively.

The “Want to Know” column prompts students to generate inquiry questions that provide a purpose for reading. It provides an opportunity to anticipate learning, to focus on inquiry as a habit of mind, and to learn about and practise posing effective questions. Learning about questions can be scaffolded, e.g., by working with the categories of Bloom’s taxonomy or by providing question words, question prompts, or a question matrix. These scaffolds could be posted in the classroom as **anchor charts**.

The “Learned” column prompts students to summarize and consolidate their learning. K-W-L’s can be completed individually or collaboratively.

KWL variations include

- reconfiguring the usual 3-column organizer as a 3-part square, with “Know” across the top and “Want to Know” and “Learned” juxtaposed beneath
- adding columns, e.g., “Future” (“How I will apply this learning in the future”).

Link to prior learning by connecting the activity in today’s lesson to previous use of the K-W-L strategy. Doing so explicitly helps students recognize how the thinking structure in the strategy transfers to other situations, a critical aspect of becoming a self-directed and self-regulated learner.

The K-W-L strategy reflects key Literacy GAINS parameters, e.g., exposing and evoking students’ thinking in order to respond with appropriate levels of challenge and support. The strategy also supports an inclusive classroom environment and differentiated instruction by permitting a range of access, or entry, points for students along a continuum of difficulty, depending on the questions asked.

Online resources include the following:

Instructional reading strategy: KWL (Know, Want to Know, Learned). L517: Advanced Study of the Teaching of Secondary School Reading.

KWL. North Central Regional Educational Laboratory. Learning Point Associates.

Strategies for Reading Comprehension: K-W-L. ReadingQuest.org.

Graffiti

Graffiti is a collaborative learning strategy that structures generating ideas, critical reflection on those ideas, and summarizing skills.

Method:

1. Distribute a sheet of chart paper to each group. On each sheet is written a different question or prompt.
2. Each team, using a different coloured marker, collaboratively responds to the question or prompt.
3. At a signal, teams rotate to another sheet/prompt, taking their coloured marker with them. They record a collaborative response.
4. Repeat until teams return to their original sheet.
5. Teams critically consider all responses and then summarize key ideas.
6. Teams report out to the whole group.

See **Think Literacy Subject-Specific Examples**, Grades 10-12, English, p. 28.



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Grade 8, Science and Technology

Water Gallery Performance Task

Out of their research, students create two items for their Water Gallery. The purpose of the task is formative - to provide an overview of skills they will practise in the unit, to explore various modes of communication, and to obtain feedback on process and product. Students have an opportunity to revise their product for inclusion in the Water Gallery display. It is only at that point that this product is evaluated. Students use the rest of the unit to build knowledge and skills that will be demonstrated in the Gallery. Although the students will be evaluated individually, each student will have the support of a creative Water Gallery Public Relations Team. Teams and Couplet/Issues will be identified in Lesson 5.

See **Water Gallery Performance Rubric**.

Water Gallery Public Relations Team

To emphasize the collaborative nature of scientific research and inquiry and to build collaborative learning skills and a culture of learning, students work in teams for the remainder of the unit. The primary purpose of the teams is support, e.g., during brainstorming, writing process, inquiry activities. Teams are formed based on interest, i.e., couplet topics, but teachers may wish to ensure heterogeneous grouping as well as a range of strengths and learning preferences. These teams are not groups that are formed for guided practice on specific topics and skills, as those groupings should be flexible and based on needs of individuals.

Note: Assessment of learning (evaluation) is individual.

Gallery Walk

A Gallery Walk is a flexible strategy for having students respond to a range of texts. In a Gallery Walk, students explore multiple texts posted around the room. Texts can include: print, images, historical and contemporary texts, draft or completed texts, professional or student texts. Often, this activity is cooperative and structured by question prompts that require students to observe, discuss, and reflect. Because students move physically, it can appeal to kinaesthetic learners and provide variety in classroom activity. The activity can be used at various points in the lesson, e.g., as a community builder, a warm-up, source of debate, or consolidation activity. The debriefing focuses on key ideas and synthesizing observations, responses, and thinking.

Dotmocracy

Dotmocracy is a group decision-making strategy that facilitates agreement among a large number of people. Participants use pens, markers, stamps, or stickers to identify their individual vote on a sheet visible by everyone in the group. The result is a visual representation of the group's collective opinion.

See <http://dotmocracy.org/>



Water Gallery Performance Task

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In this unit of study, you will take the role of scientist.

You will:

- conduct scientific inquiry and research on a water-related topic
- communicate with a specific audience, using a graphic form
- communicate with a different specific audience, using a prose form

Steps

1. **Select your topic**, using the couplets from the **Water is Life** resource to identify your focus.
2. **Record information** and ideas related to your topic from each lesson on water. Record this information in your portfolio. This task is ongoing throughout the unit.
3. **Gather information** from two self-selected sources of information.
4. **Select your way of communicating** from a Choice Board. You will have studied and practised each of these forms.
 - Comic strip
 - Informal essay
 - Picture book
 - Slide presentation
 - Position statement
 - Science magazine article
 - Storyboard for a flash animation, picture book
 - News report
 - Mind map
 - Slide presentation
 - Podcast
 - Public Service Announcement (PSA)
 - Science report
 - Web page

5. **Use a RAFTS graphic organizer** to clarify your role, your audience, your goal, form of communication, and topic (content).

Possible communication goals are:

- increasing awareness
- increasing understanding
- engaging the audience in water issues, e.g., through entertainment
- persuading the audience to become responsible water consumers

Possible audiences are:

- students aged 5-8 years
- students in another science class
- local politician, e.g., member of parliament or city councilor
- school administrators
- parents
- general public in the local area
- teachers in the school
- a Canadian scientist, e.g., David Suzuki
- an organization, e.g., World Wildlife Fund

6. **Collaborate with your Inquiry and Research Team** members to ensure that each of you is successful. Team members will collaborate on inquiry and research during the unit and take responsibility for helping each team member be successful, for example, by providing support and feedback to each other, to get some feedback on your draft so that you can make necessary improvements.



Water Gallery Performance Task

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RAFTS

Question Prompts		Your Response
Role	What is your role? What part are you playing? What are the habits of mind, attitudes, knowledge, and skills that a person in this role needs to have?	
Audience	Who is the intended audience? What does the audience already know? What attitude does the audience have? What does the audience need to know?	
Form	What is the most appropriate way to communicate your information and ideas to a specific audience? What are the characteristics of the form? What are its features?	
Topic	What is the form of communication about? What are the most important concepts and facts? What can't be answered?	
Strong Verb	What change in audience knowledge, attitudes, and actions do you want? What verb best expresses what you hope to achieve? For example, increase awareness, persuade, engage.	

Water Gallery Performance Task

Rubric

	Level 1	Level 2	Level 3	Level 4
Knowledge and Understanding <ul style="list-style-type: none"> Demonstrate an understanding of the characteristics of the earth's water systems and the influence of water systems on a specific region 	Explains characteristics of the earth's water systems and the influence of water systems on a specific region with limited understanding	Explains characteristics of the earth's water systems and the influence of water systems on a specific region with some understanding	Explains characteristics of the earth's water systems and the influence of water systems on a specific region with considerable understanding	Explains characteristics of the earth's water systems and the influence of water systems on a specific region with a high degree of understanding
Thinking <ul style="list-style-type: none"> Use scientific inquiry/research skills with Assess the impact of human activities and technologies on the sustainability of water resources 	<p>Uses scientific inquiry/research skills with limited effectiveness</p> <p>Evaluates the impact of human activities and technologies on water resource sustainability with limited insight</p>	<p>Uses scientific inquiry/research skills with some effectiveness</p> <p>Evaluates the impact of human activities and technologies on water resource sustainability with some insight</p>	<p>Uses scientific inquiry/research skills with considerable effectiveness</p> <p>Evaluates the impact of human activities and technologies on water resource sustainability with considerable insight</p>	<p>Uses scientific inquiry/research skills with a high degree of effectiveness</p> <p>Evaluates the impact of human activities and technologies on water resource sustainability with a high degree of insight</p>
Communication <ul style="list-style-type: none"> Use a variety of forms (e.g. oral, written, graphic, multimedia) to communicate with different audiences for a variety of purposes Use appropriate science and technology vocabulary, including water table, aquifer, potable, and freshwater, in oral and written communication 	<p>Uses a graphic form to communicate with a specific audience for a particular purpose with limited effectiveness</p> <p>Uses a prose form to communicate with a specific audience for a particular purpose with limited effectiveness</p> <p>Uses appropriate science and technology vocabulary with limited accuracy and frequency</p>	<p>Uses a graphic form to communicate with a specific audience for a particular purpose with some effectiveness</p> <p>Uses a prose form to communicate with a specific audience for a particular purpose with some effectiveness</p> <p>Uses appropriate science and technology vocabulary with some accuracy and frequency</p>	<p>Uses a graphic form to communicate with a specific audience for a particular purpose with considerable effectiveness</p> <p>Uses a prose form to communicate with a specific audience for a particular purpose with considerable effectiveness</p> <p>Uses appropriate science and technology vocabulary with considerable accuracy and frequency</p>	<p>Uses a graphic form to communicate with a specific audience for a particular purpose with a high degree of effectiveness</p> <p>Uses a prose form to communicate with a specific audience for a particular purpose with a high degree of effectiveness</p> <p>Uses appropriate science and technology vocabulary with a high degree of accuracy and frequency</p>

Personal Water Audit

Type of Use	Amount of water per use	Number of uses per day	Calculation (# of uses per day x amount per use in L)	Total amount of water used per day
Toilet flush	15-19 L	Day 1	_____ x _____ =	
		Day 2		
		Day 3		
Shower (5 min.)	100 L	Day 1		
		Day 2		
		Day 3		
Tub bath	60 L	Day 1		
		Day 2		
		Day 3		
Hand washing (with tap running)	8 L	Day 1		
		Day 2		
		Day 3		
Teeth brushing (with tap running)	10 L	Day 1		
		Day 2		
		Day 3		
Outdoor watering	35 L/min	Day 1		
		Day 2		
		Day 3		
Automatic dishwashing	40 L	Day 1		
		Day 2		
		Day 3		
Dishwashing by hand	35 L	Day 1		
		Day 2		
		Day 3		
Washing machine	225 L	Day 1		
		Day 2		
		Day 3		
				Grand total