REGIONAL DISTRICT OF NANAIMO

K-3 TEACHER'S GUIDE

# Freshwater Connections

WATER WHERE WE LIVE

DIGITAL TOOLKIT

**BC Curriculum**

This toolkit addresses big ideas, content and curricula competencies in the following subjects:

Science, Socials, Applied Skills and Technologies, English Language Arts, Career Education,

Physical and Health Education, Arts Education.

This toolkit also addresses BC Curriculum core competencies.

# Part 1 Importance of WATER

SLIDES 1-18
75 MINUTES

## MATERIALS NEEDED

- ☐ Video: **www.youtube.com/watch?v=yGwgnpYUZvw**
- ☐ Small paper cups (i.e., mini paper cups or paper condiment containers), two per student
- ☐ "**Water Scientist**" handout, print one copy per student
- ☐ Felt pens and/or pencils
- ☐ Two 1-litre bottles; fill with tap water, label "sample A" and "sample B" and add 1 tsp. salt to sample B and shake
- ☐ "**Ocean and Freshwater**" signs, print one copy

## TEACHER NOTES

### Introduction

a. At slide 3 start by sharing the land acknowledgment and introduce that people live, learn and play near water.

b. On slide 4 show the picture of a community living by a river and explain that early communities lived near rivers, as water is essential to life. There are six images showing someone washing in the river, drinking water, watering crops, boating down the river, fishing for food, and cooking. Ask students, in pairs, to identify the six images and share how people are using water in these images. As a class discuss that access to water is important and share further ideas on how we need water like washing clothes, brushing our teeth and washing our hands.

### Understanding Freshwater

c. On slide 5 show the video called Earth's Water Song at **www.youtube.com/watch?v=yGwgnpYUZvw.** This is about ocean saltwater and freshwater. Have students join with singing and dancing along. Share local examples of ocean saltwater, and freshwater rivers.

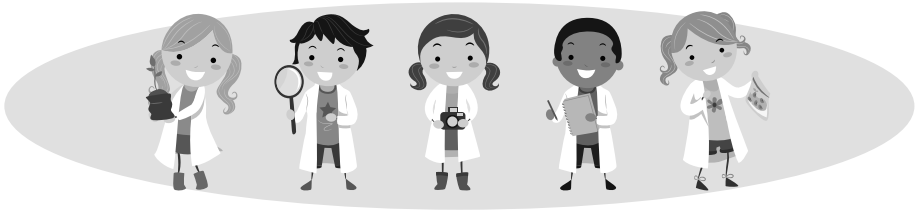
### Water Scientists

d. Explain to students that they will be water scientists and test two water samples A and B, by looking, smelling and tasting the water samples. Students can record their answers on the handout using one of the words provided, using their own descriptive word, or an illustration.

e. Provide each student with 2 paper cups labeling them A and B, and a copy of the "**Water Scientist**" handout.

f. Pour water from each sample into the cups A and B on each desk. Have students wait till everyone is ready then working all together at slide 7, look at sample A and B, and record the answer. Continue with slides 8 and 9 as students smell and taste the water. At slide 10, ask students to guess what they think are in A (tap water) and B (salty water). Note in this activity the salty water is not ocean water, instead just tap water with salt added.

g. Ask students if the saltwater was good to drink. Make the connection that ocean water is salty and not drinkable, and we need freshwater to drink. Our bodies need freshwater to stay hydrated and healthy. We can process small amounts of salt in the kidneys, but ocean water contains too much salt, so we become thirstier and dehydrated. For curious students who ask why the water in the ocean is salty, check out this video **www.youtube.com/watch?v=_FIh5_CQ2R0**.

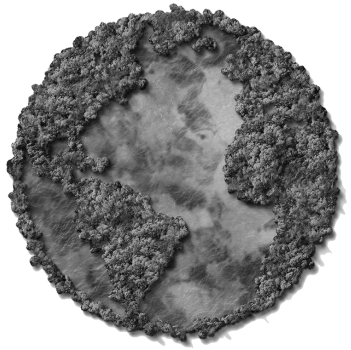


### How Much Freshwater?

h. At slide 11, introduce that much of our earth is covered in oceans which is salty water. Ask how much freshwater is on Earth?

i. Explore this by asking students to fill up their water bottles to the top. Tell them that this represents all of the water on the earth.

j. Instruct students to take one small sip of water and explain that this tiny sip of water represents all of the freshwater on the earth. It is a very small amount, and we need to take care of this freshwater, as it's the water we drink, use for cleaning, bathing, cooking and all our indoor and outdoor household needs. Plants and animals rely on clean and safe freshwater too.



### Ocean or Freshwater Game

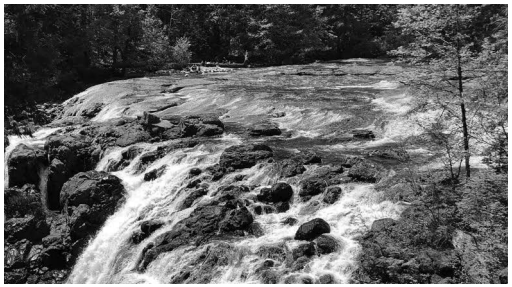
k. At slide 12 play a game about oceans and freshwater. Print the "**Ocean and Freshwater**" signs and tape them, one of each side of the room (classroom, gym or outdoors). Slides 13- 18 show local pictures of ocean water and freshwater, one by one. If students think it is an image of the ocean they run to that side of the room, if they think it is freshwater they run to that side of the room. Note: this could be adapted for smaller spaces by having students put their hands on their heads if the image is freshwater and do jazz hands if ocean.

   i) Slide 13 - Ocean
   ii) Slide 14 - Freshwater river
   iii) Slide 15 - Freshwater well
   iv) Slide 16 - Ocean

## TEACHER NOTES

v) Slide 17 - Freshwater reservoir

vi) Slide 18 - Ocean



l. Pour water from each sample into the cups A and B on each desk. Have students wait until everyone is ready then working all together at slide 7, look at sample A and B, and record the answer. Continue with slides 8 and 9 as students smell and taste the water. At slide 10, ask students to guess what they think are in A (tap water) and B (salty water). Note in this activity the salty water is not ocean water, instead just tap water with salt added.

## LEARNING OBJECTIVES

- ☐ To learn that water is vital to life, and how communities would live near water for drinking, cooking, cleaning, growing food, and fishing.
- ☐ To experience drinking salty and freshwater, learning we need freshwater to drink and there is a limited supply of freshwater on Earth.
- ☐ To play a movement game and discover local places with ocean and freshwater.

## EXTENSIONS

- ☐ Ask students to reflect on their ways they love water and draw a picture that illustrates their favourite way to use water.
- ☐ Bring the School Water Stewards program to your classroom! Nanaimo & Area Land Trust (NALT) gets students out of the classroom and into their boots, muddybuddies and rainpants to explore their local watershed! Our goal is to teach students the many ways they can be a water steward. We are looking to expand to new classrooms in School Districts 68 and 69. Connect with us at stewardship@nalt.bc.ca.

# Part 2 Movement of WATER

SLIDES 19-35
75 MINUTES

## MATERIALS NEEDED

- ☐ "**Sun and Cloud**" signs, print 2 suns and 2 clouds
- ☐ "**Water Cycle**" image
- ☐ "**Water on the Move**" worksheet

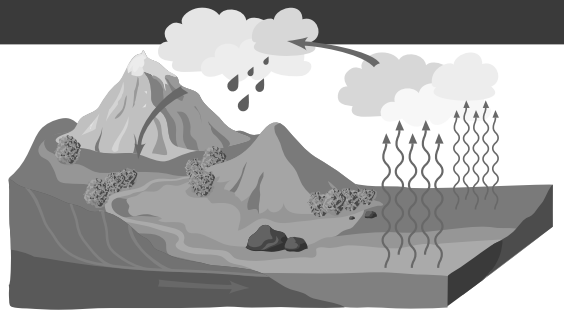


- ☐ "**Water on the Move**" experiment supplies:
  - 6 clear cups for each group (zero-waste option: use 250 ml mason jars, clear glasses, or jars) – note, choose cups/containers that are shallow
  - Red, blue and yellow food colouring
  - Roll of paper towel
  - Markers
  - Water

## TEACHER NOTES

### Introduction

a. Start by sharing that water moves around the earth in a cycle coming down as rain, collecting on the ground, lakes and rivers, and rising with the heat of the sun to gather in clouds and rain again.



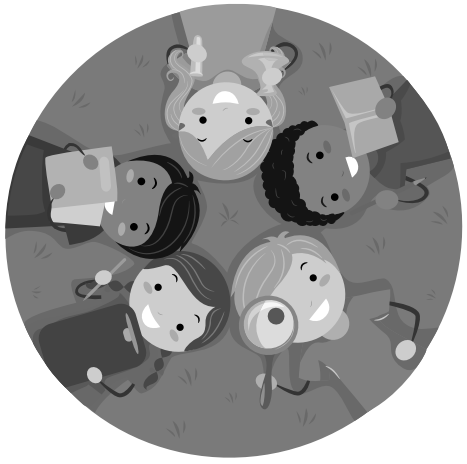
### Water Cycle Tag Game



b. With the printed "**Sun and Cloud**" signs, take students outside or to a gym to play a water cycle game. Choose 2 students to be suns and 2 students to be clouds, giving them each a sun and cloud sign. The rest of the students are water droplets.

c. The water droplets run around avoiding the sun. If a sun tags a water droplet, they stand on one spot and "heat up" by wiggling and dancing in place. The clouds run around looking for wiggling water droplets and tag them allowing the wiggling water droplets to rain back to the ground and start running around again.

d. After playing the game for a few rounds, show students the "**Water Cycle**" image print out. Using the image share how water moves around the earth as part of the water cycle. One day a water droplet might be in the ground, ocean, river or lake and the next day it might snow down on a mountain. Introduce the scientific words evaporation, condensation and precipitation to describe the cycle.



### Water Hide and Seek

e. Share that they are now going to explore where we find water outside. Ask students where they think we might find water. This will be very different on a rainy day compared to a dry day. If it is rainy, where might we find puddles? If it is dry, where could we look for water? Remind them that on a dry day, there is still water, but it might be harder to find. Discuss some ideas where we can find it, like under rocks, or in the soil.

f. Head outside to a playground or field on a rainy or dry day. Explain that we will be playing a hide and seek game, where the water is 'hiding', and we have to find it.

g. In small groups send students to various places to find water, like under rocks, under trees, on hard surfaces, under playground equipment, in the grass and in the soil. When they find a place that has water, tell them to study it and consider why is there water here? What is different from another spot with no water? How did the water get here?

h. When the students come back as a group, ask them where did they find water? Was it easy or difficult? Probe to find out whether they looked for water in unexpected places like digging for it or looking under trees.

i. You can encourage critical thinking by asking them more challenging questions like what will happen tomorrow if the weather is the opposite of today? How is it different on pavement compared to grass or playgrounds? Students will discover that water is everywhere, even when we can't see it.

### Water on the Move

j. Discuss with students how water moves with a few probing questions:
   i) How does water move on the ground?
   ii) When does water move down? (downhill, waterfalls, showers)
   iii) When does water move up? (trees, plants, evaporation)

k. To explore how water moves conduct an experiment. This can be done as a teacher demonstration, or small student groups.

l. Pull up the slideshow at slides 19-30 and follow the step-by-step instructions to set up the experiment:
   i) Label your cups 1-6 with markers (erasable markers are fine)
   ii) Fill your cups 1, 3, 5 with water and leave cups 2, 4, 6 empty
   iii) Place the cups in a circle in order 1-6
   iv) Put 10 drops of food colouring in cups with water (try to have exact amount in each cup) – red in cup 1, yellow in cup 3, blue in cup 5
   v) Fold each paper towel lengthwise and place one end in the water and one end in the empty cup next to it – repeat until there is a paper towel between each cup (you may need to cut or tear the folded paper towel shorter so there is not excess paper towel in each cup)

## TEACHER NOTES

m. At slide 31 and while waiting for things to start happening, give each student a "**Water on the Move**" worksheet to draw a picture of their prediction of what will happen.

n. At slide 32, keep checking the experiment and have students draw what actually happened on the worksheet. Slide 33 shows what happened with our experiment.

o. At slide 34, discuss what happened with the water- it crept up the paper towel and into the next cup. Why it happened - the water moved through capillary action sucking the water through small gaps in the paper towel. This is what happens for plants and trees allowing water to move up from the roots to the leaves, a process called transpiration.

p. At slide 35, finish by sharing that water moves around our earth in many ways including running downhill, through roots up into plants, and by the sun heating up the water where it gathers in clouds and rains down.

## LEARNING OBJECTIVES

- ☐ To learn about the water cycle, and how water moves around our earth.
- ☐ To play a movement game and learn how the sun heats up the water, forms clouds and rains.
- ☐ To explore outside to discover that water is everywhere.
- ☐ To do an experiment to learn ways water moves.

## EXTENSIONS

- ☐ Play an eye spy game to find further examples of what contains water. For example, go for a neighbourhood walk and call out examples like "I spy with my little eye something that has water. It is tall, green and just over there!"
- ☐ Pose the question, is there water in the air in our classroom? How can we tell? Bring in a dehumidifier and explain that if there is water in the air, we can capture it using this. Turn on the dehumidifier and predict how much water it can capture in one hour.

# Part 3 Water Sources in **OUR REGION**

SLIDES 36-39
60 MINUTES

## MATERIALS NEEDED

- ☐ "**Watershed Discovery Pictures**" handout, print 1 copy per student. Teacher or students to cut out pictures.
- ☐ Video XXX RDN
- ☐ "**Community Watershed Maps**" handouts, choose the map for your region, print 1 copy per student group (plan for small groups of 2-3 students).

## TEACHER NOTES

### Introduction

a. At slide 37, start by giving each student a copy of the "**Watershed Discovery Pictures**" handout and ask them to colour and cut out the images. Explain that a watershed is an area of land that catches rain and snow and where water flows downward into a river, stream, lake, or aquifer. All land is part of a watershed and we all live in a watershed.

b. Have students lay out the pictures on their desks and explain that all these can be found in our watersheds. Next, at slide 38, share that they will watch a video of our watersheds and instruct them to hold up one of their images if they see something similar in the video. For example, if they see a river in the video, they can hold up their image of the river.

c. Discuss the video. Did they get to hold up all their pictures? Have students act out being some of the things in the watershed like a tree blowing in the wind, a bear prowling through the forest, a salmon swimming in a river.

d. In pairs, ask students to sort the pictures into things that contain water and things that don't contain water. Then going picture by picture share how all of them contain water and that water is vital to life. For example, the salmon lives in water, the tree needs water to live, and the mountain soaks up water in the soil.

## Drinking Water Regional Map


e. Prior to starting the class go to the RDN interactive map **www.rdn.bc.ca/watersheds** to learn which watershed region your school is located.

f. Then go to the "**Community Watershed Maps**" handouts, to find a simplified map for your region. Print and provide each group of students with a copy of the simplified map.

g. Explain that this map shows the local water sources that provide drinking water for us. This map shows us information about our community viewing it simply as if a bird was flying over, looking down. Share that we live in a watershed, meaning everywhere around us water is gathering, running downhill, collecting in lakes and streams and in the ground. On the map we can discover where we are getting our drinking water here.

h. In groups, ask students to find various items on the map like your school, a river or stream, a lake, an aquifer, a well, and a park.

i. Come together as a class and review where your drinking water comes from and learn the names (including the traditional names) of some of the bodies of water.

j. To learn about the Salish languages spoken traditionally in the region, go to the RDN map: **www.rdn.bc.ca/watersheds**, click on your region and click the "First Nations Significance" tab, see the populated orange flag points on the map with names/audio clips. Share the audio with the class to learn about the traditional Salish languages.

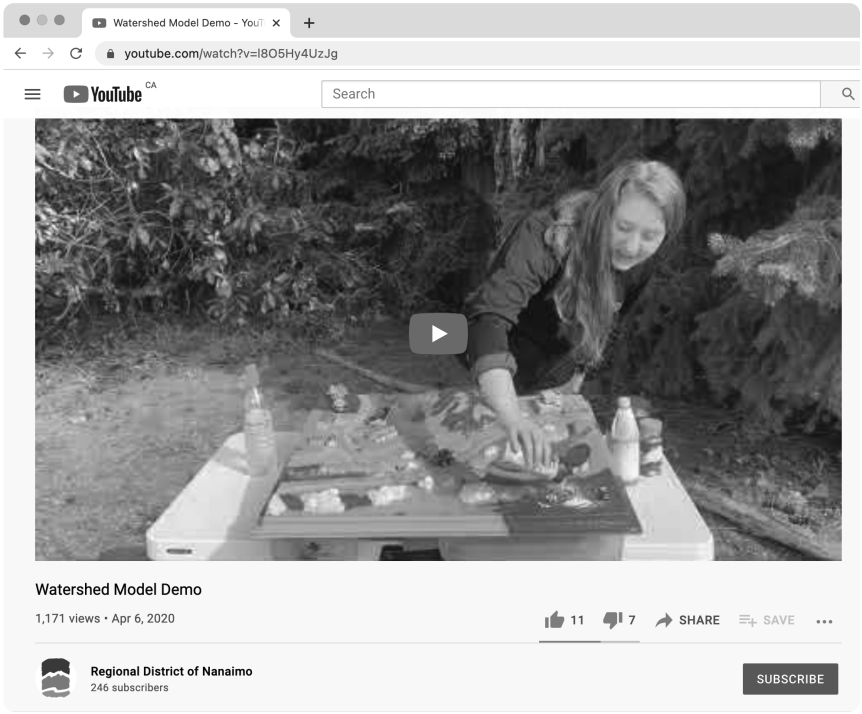
## LEARNING OBJECTIVES

- ☐ To learn that water is essential to all living things.
- ☐ To sort and identify things that contain water discovering that all living things contain water.
- ☐ To learn how to read a simple map and discover where our regional drinking water comes from.

## EXTENSIONS

- ☐ Plan a class field trip to a local stream or wetland and ask students questions like the following: What is a watershed? Where do the raindrops go when they fall from the sky? What can you see living in the watershed here?

- ☐ Check out the RDN Educational Materials Lending library to borrow the watershed model for your classroom: **www.rdn.bc.ca/educational-materials-lending-library** and view this video to learn how to use the model in your classroom: (**www.youtube.com/watch?v=l8O5Hy4UzJg**)



# Part 4 How Water CONNECTS US

SLIDES 40-41
45 MINUTES

## MATERIALS NEEDED

- ☐ Paper cup, 1 per group, and plan for 4 students per group.
- ☐ String, about 4 metres per group cut into 4 equal lengths.
- ☐ Jug of water
- ☐ Chalk
- ☐ "Kwulasulwut" by Ellen White, a copy can be borrowed from RDN, SD68, and SD69 lending libraries
- ☐ "**The Raven and the Raccoon Activity**" handout, page 2, one copy per student
- ☐ Felt pens and/or pencils

## TEACHER NOTES

### Introduction

a. Prepare the game pieces prior to starting this activity. This activity can be done in groups of 4, either one group at a time or multiple groups at once. Poke 4 small holes near the top of each paper cup, around the rim. Tie a large knot at the end of each string and thread the string through each hole in the cup, with the knots on the inside of the cup. See photo on the right.

b. Start with a class discussion about how we need each other, and that everything in our natural world is important and connected. For example, water feeds the trees, which provide fresh air, that we need, and animals need for life. Explain that we will be playing a game to demonstrate how everything is connected and we need each other.

**Are We Connected?**

c. Head outside to do this activity, since water will get spilled. Find a hard surface area like a basketball court, or playground.

d. Organize students into groups of 4, and for each group, using chalk, mark two spots on the ground. The spots should be separated by at least 1 m; the farther the separation, the greater the challenge.

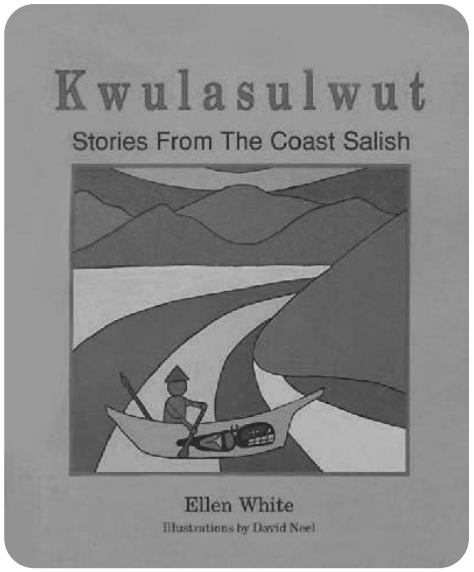
e. For each group, place the cup on the ground on one of the spots, with each string going out in a different direction. Pour a small amount of water into the cup to start. For each group assign the 4 students a colour, using a marker or dot on their wrists. Tell students they each represent something in our natural world like the forest, bear, eagle, person, salmon, lake or river.

f. Each student picks up one of the strings and working together. The group tries to move the cup from the first spot to the second spot, by gently pulling on the string, without spilling any water. This requires teamwork since the cup is being held up by all 4 strings.

g. Once the team is successful, remove one of the students, so only 3 are working together to move the cup. Take turns having a student sit out, asking them to observe what is happening with less people helping.

h. As a class discuss what happened. When we worked together it was easier to move the cup. Were we all important? Yes! Was anyone more important? No! We are all connected, and we need each other, and we need to take care of each other. This includes taking care of the water as everything in nature shares this resource, including the forest, animals, plants and us.

**First Peoples Perspective**




i. Discuss the First Peoples knowledge of ecosystems and water. If any part of the interconnected system is abused or neglected, the whole system will feel the impact. Based on these concepts, knowledge of the land as well as the plants, animals and even objects that reside on the land, should be the backbone of managing our freshwater sources in the region. A healthy watershed ecosystem means healthy water for everyone and everything. Ask students to consider why Indigenous cultures have such a deep knowledge of ecosystems, land and water? One reason is because their people have been on this land since time immemorial, co-evolving with this place, learning through direct experience and interaction and observation and connection through stories and learnings passed on through generations.

j. Read the "The Raven and the Raccoon" from the book "Kwulasulwut" by the late Ellen White from Snuneymuxw. By reading this story, students will learn about how Raven and Raccoon interacted with two freshwater sources, staɬuẃ (river) and ǩaǩca' (little lake, pond). Share that the First Peoples Principles of Learning show that learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain circumstances. When we read a Coast Salish story, it is very important to say how you came to know the story. Stories used to only be shared orally (by telling the story out loud), but now we have written and oral stories.

k. Distribute one copy of page 2 of the "**Raven and the Raccoon Activity**" to each student. In the story, there are two types of freshwater so students will explore the role of each freshwater source.

## LEARNING OBJECTIVES

- ☐ To experience working together as a team, learning to rely on one another.
- ☐ To learn that we are all connected, and equally important to each other and the health of our water.
- ☐ To learn a little about First Peoples' perspective on our ecosystems and water.

## EXTENSIONS

- ☐ Using the National Geographic "Funny Fill In" story, create a funny story about water as a class.
  Check out **https://kids.nationalgeographic.com/games/funny-fill-in/article/funny-fill-in-water-world**

# Part 5 Water for a SUSTAINABLE FUTURE

SLIDES 42-44
75 MINUTES

## MATERIALS NEEDED

- ☐ "**Sharing the Water**" activity supplies
  - 1 cup per student
  - 1 small spoon or dropper/pipette per student
  - Plasticine, about 1 tbsp for each student
  - Beads, craft supplies to decorate fish (optional)
  - Container (yoghurt container or jug) for each table or desk group
  - Water
  - Large towel for each desk/table group
- ☐ "**Sharing the Message**" craft supplies
  - Small rock, 1 per student (from outside or craft store)
  - Craft supplies to decorate rock like leaves, twigs, googly eyes, pipe cleaners, markers, ribbon, and glue
  - Felt, small piece per student, ~ 10 cm square
  - "**Water Saving Messages**", print 1 copy, cut out and provide each student with a message.


### Sharing the Water

a. Start by setting up the classroom with tables or desk groups of 3- 4 students. Lay a towel across each table/desk group as water may get spilled during this activity.

b. At slide 43, remind students that water is a precious resource, and we all need water to survive, including us, the forest, bears, and fish. So, we need to conserve water, meaning to save water, not waste it and only use what we need. Ask students to share ways we use water like drinking, bathing, brushing teeth, washing hands, watering vegetables, washing clothes. Explain to students that it's important to save water so we leave enough for others.

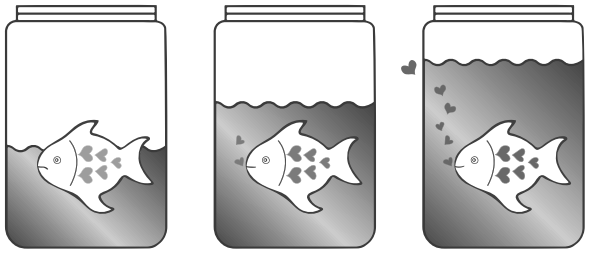
c. Provide each student about 1 tablespoon of plasticine and ask them to shape their plasticine into a fish shape. This could be very simple, or they can take the time to decorate by adding markings or beads for eyes.

d. Give each student a cup and spoon. Ask them to fill the cup half full of water and put their fish at the bottom of the cup.

e. Put the container (yoghurt container or jug) in the middle of each desk/table group and fill it about halfway with water.

f. Once everyone's cup is ready, tell students that you will read out different situations, some saving water, and some wasting water. If the situation saves water, they will add water, meaning there is more for their fish, and if the situation wastes water, they will remove water, meaning there is less for their fish.

g. Students will spoon water from their fish cup to the container if removing water and spoon it from the container into their fish cup if adding water. We recommend practicing how to get water in and out of the cup with the spoon. Students will need to hold onto their fish cup when spooning the water, to prevent spilling.

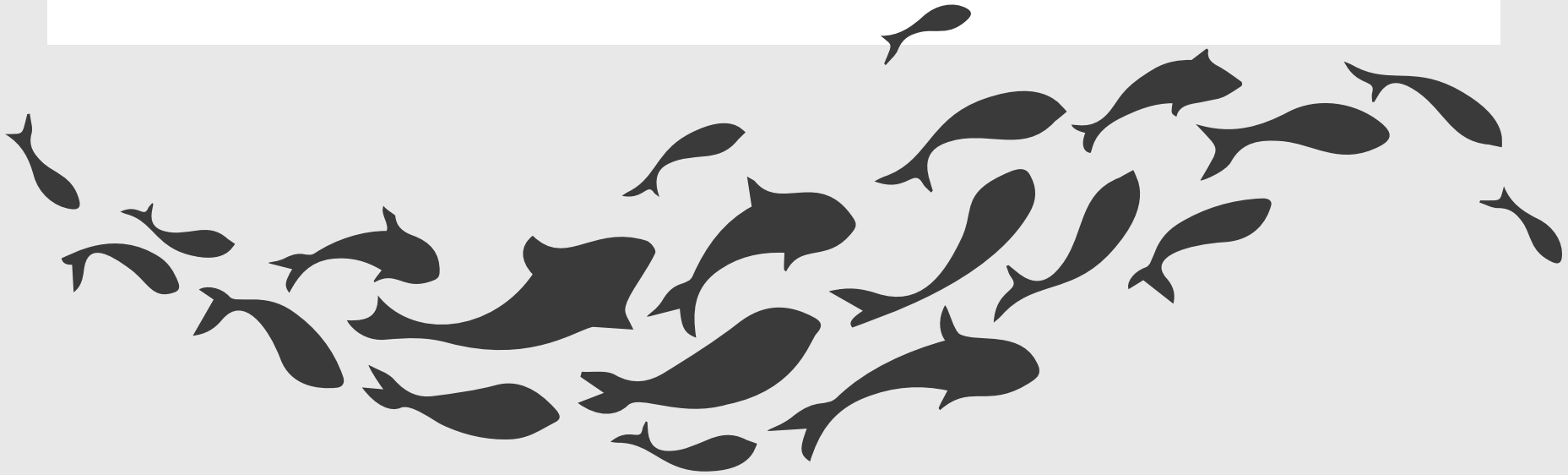


h. After reading out each situation, ask students to add or remove water discussing if we saved water or wasted it. Explain why. Check in with students periodically to ask questions like: what is happening to the water levels in the cups? Is there still enough water for your fish?

## TEACHER NOTES

i. Read out the following situations asking students if this action saves or wastes water:
   i) We turn OFF the tap when we're brushing your teeth. ADD 1 spoonful.
   ii) We have water left from dinner and throw it down the drain. REMOVE 1 spoonful.
   iii) We tidy up our room and pick up clean clothes lying the floor and put them in the laundry hamper! REMOVE 1 spoonful.
   iv) We water our veggies in the evening, so the plants get the water, (and the sun doesn't dry up the water). ADD 1 spoonful.
   v) We have water left from dinner and give it to our house plants. ADD 1 spoonful.
   vi) We fix a dripping tap. ADD 1 spoonful.
   vii) We water our lawns all summer in the middle of the day. REMOVE 2 spoonfuls.
   viii) We forget to turn off the tap after washing our hands. REMOVE 1 spoonful.
   ix) We take short showers (less than 5 minutes). ADD 1 spoonful.
   x) We don't water our grass in the summer, and let it go brown. ADD 2 spoonfuls.

j. After playing the game, discuss how human water use is connected to fish and other wildlife. Review ways we can save water in our lives so there is water for all to share including our fish!



## TEACHER NOTES

### Sharing the Message

k. Students will each be making a pet rock to remind us to save water. The pets can be placed outside, at home or school, or displayed in the school to share the messaging with others.

l. Provide each student with a rock, craft supplies, small piece of felt about 10 cm square, glue and a water saving message.

m. At slide 44, show examples of the pet rocks we created.

## LEARNING OBJECTIVES

- ☐ To learn that water is a shared resource so we should only use what we need.
- ☐ To play a game to explore ways to conserve water, and the impacts of wasting it.
- ☐ To make a pet rock and share the message to conserve water.

## EXTENSIONS

- ☐ If you have a buddy class, the pet rock activity is a great one to do. The older buddies can help the younger buddies create the pet rock and the younger buddies can share messages of water conservation to the older buddies.
- ☐ Another buddy activity could be to create paper fish with water saving messages on them that students can display around the school.

# Part 6 Water WRAP-UP

SLIDES 45-46
20 MINUTES

## MATERIALS NEEDED

- ☐ "**Water Bingo**" student template, print 1 per student
- ☐ Bingo chips or something to cover answers
- ☐ "**Bingo Questions**" teacher handout

## TEACHER NOTES

### Wrap-up Review

a. Review with the class what we have learned about water:

i) How early communities lived by water to have access for drinking, washing, cooking, fishing and growing food. We need freshwater to survive, and that freshwater is a very small percentage of the water available to us on earth.

ii) How the water cycle moves water around the earth with rain, sun, and clouds, that water can be found everywhere and that it's always on the move, going down a hill, up a tree and evaporating with heat from the sun.

iii) How water is vital to every living thing and discovered where our drinking water here is sourced: wells, rivers and lakes.

iv) How in our natural world everything is important and connected, and that we need to work together, and care for everything including water.

v) How we need to conserve and protect the water, and make sure we are only using what we need, so everything in the natural world has enough.

## TEACHER NOTES

### Water Bingo

b. Provide each student with bingo sheet, and chips. There are 6 versions so students do not all have the same bingo card. Ask students to match the words to the image and fill in the word.

c. Pull up the "**Bingo Questions**" teacher handout. Read out the questions, as a class decide on the answer, and students can cover the image/word. Play the game until a winning student get 4 words in a row or column, or 4 corners.


## LEARNING OBJECTIVES

- ☐ To review what we learned about water.
- ☐ To practice simple word recognition and writing.
- ☐ To participate in a fun game.

## EXTENSIONS

- ☐ At slide 47, play a wrap up video on saving water. Students can sing along to the song.

REGIONAL DISTRICT OF NANAIMO