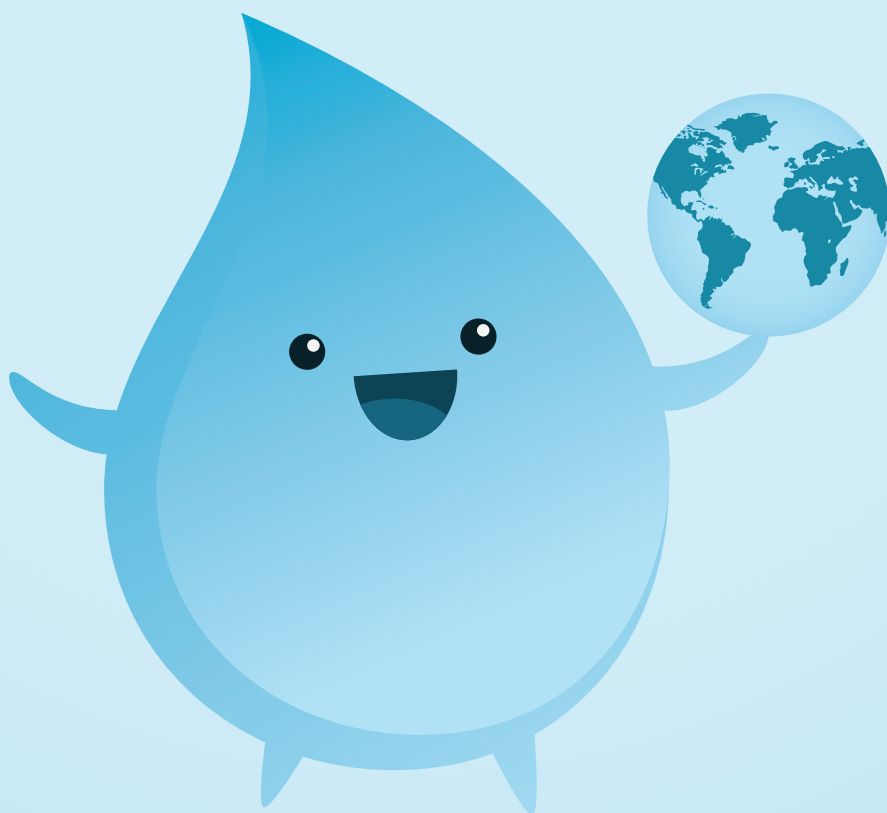


HOME ON THE BOW



From mountains to molecules - everything
you need to know about Cochrane's water

cochrane
HOW THE WEST IS NOW



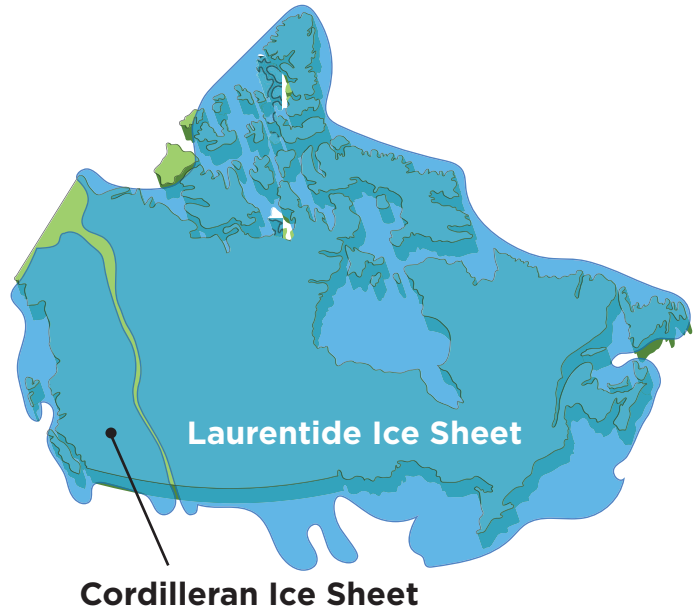
How Water Shaped Canada

Canada's land — our mountains, fields and lakes — was carved out by sheets of ice called glaciers. The whole country used to be covered by two huge glaciers: the *Laurentide Ice Sheet* and the *Cordilleran Ice Sheet*.

A glacier is a giant sheet of ice and snow that has been frozen for thousands of years.

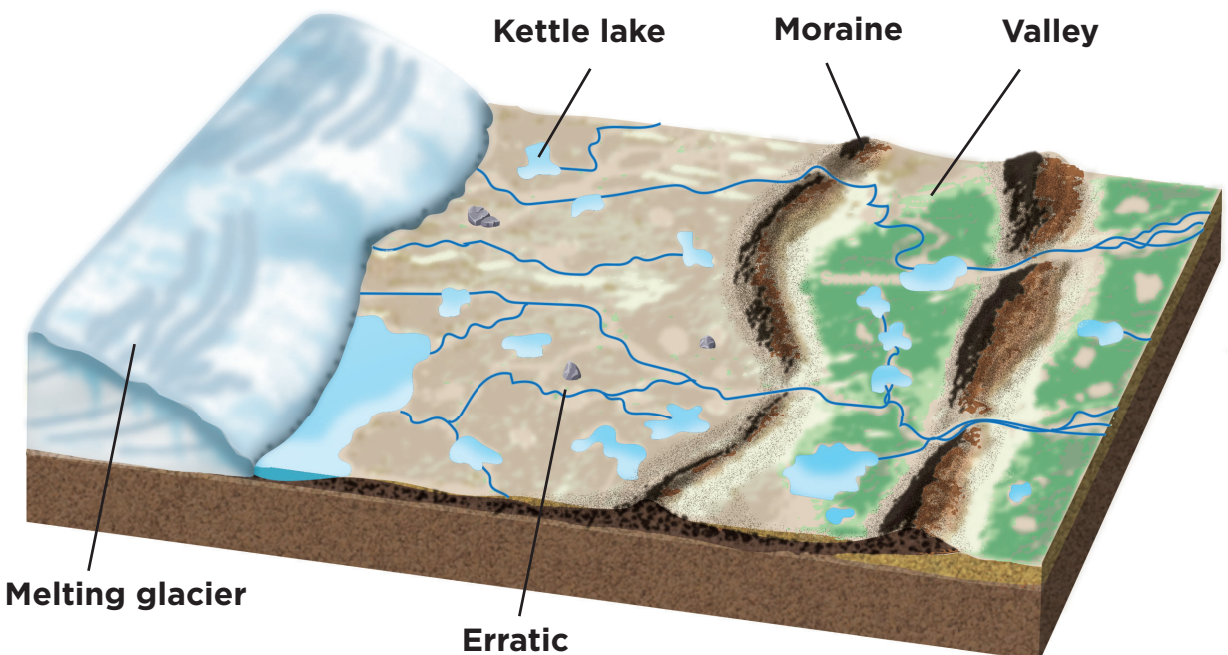
Gravity and other forces made the glaciers move very slowly over thousands of years.

Glaciers scraped the ground as they moved and made valleys and cliffs. Sometimes rocks ended up in a totally new location! Rocks moved by glaciers are called *erratics*. Okotoks, Alberta, about an hour away, has a famous one: the Big Rock erratic.



In some places, smaller rocks and dirt became tall, steep piles called *moraines*. *Kettle lakes* are almost perfectly round lakes that formed when blocks of ice broke off, were buried, then melted.

Glaciers shaped many other parts of Canada's landscape and are to thank for the beautiful country we enjoy today.



The History of Water in Cochrane

Indigenous groups lived here for thousands of years. The people who lived near Cochrane were known as the Plains First Nations. They include the Siksika, Kainai, Piikani, Stoney-Nakoda and Tsuut'ina.

The people used water every day. They travelled down the river in canoes, they fished in the rivers and lakes, and they made tea. To this day, the women are called “carriers of water.” They use water in ceremonies and songs to welcome new babies into the world.

People from England and France moved to the Cochrane area to start farms and ranches. The new settlers also used water to travel from place to place. And they used water for their animals and to grow crops for food.

Everyone who lives here should work together to help keep Cochrane's water clean and safe for the people who will live here in the future.

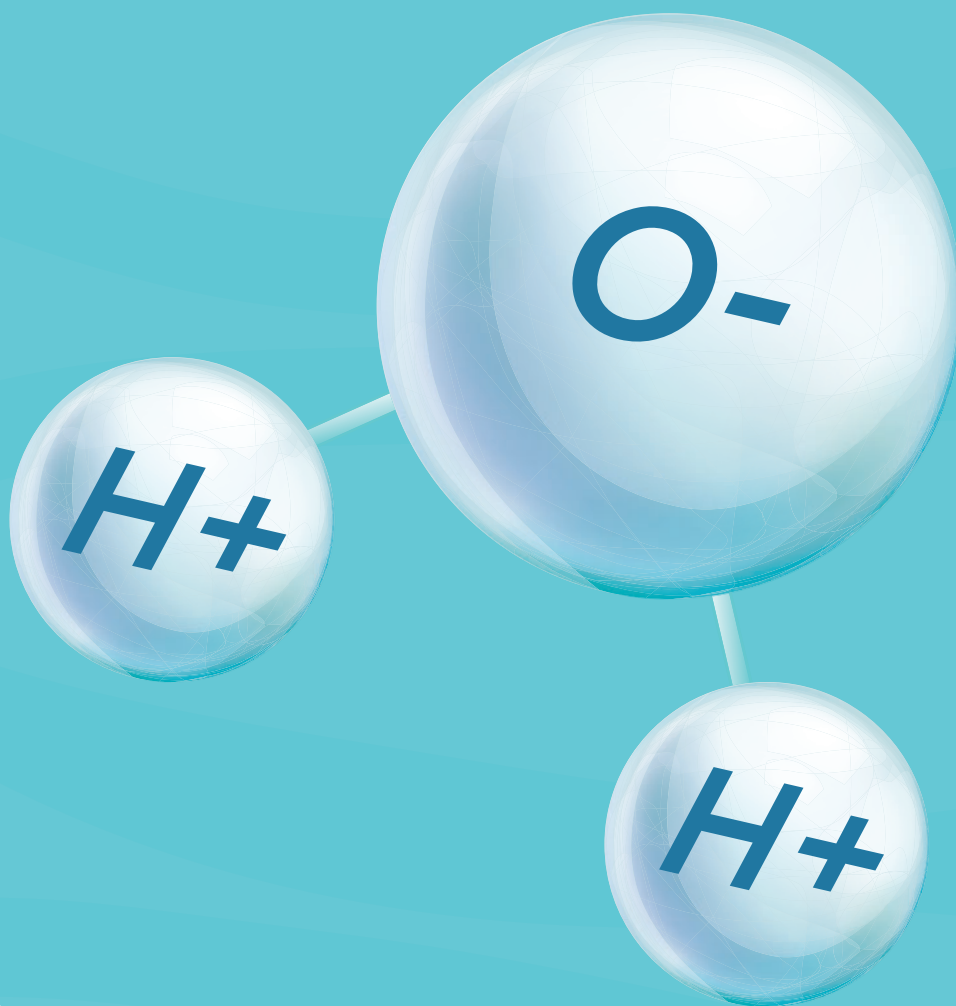


What is Water?

One drop of water has millions of smaller pieces called *molecules*. A molecule is made of even smaller pieces called atoms. Molecules of water have *atoms* of chemicals in them: two hydrogen (H) atoms and one oxygen (O) atom – that’s why water is also called “H₂O”!

Cochrane’s water is called “hard.” That’s because it has *calcium* (a mineral that’s also in your bones and teeth), which it picks up from the rocks in the mountains.

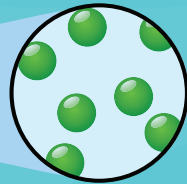
Water molecules stick together really well. They like to stay together so much, it’s one of the reasons beach balls and boats can float on a lake. You can see this in action at home!



Activity: Place a quarter on the counter. Use a water dropper and slowly drip one drop at a time onto the quarter. The water doesn’t spill off the quarter — it sticks together in a bubble shape!

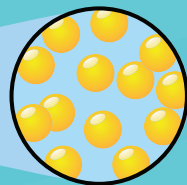
Phases of Water

Did you know water has different *phases*? That means it can appear in different forms.



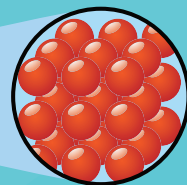
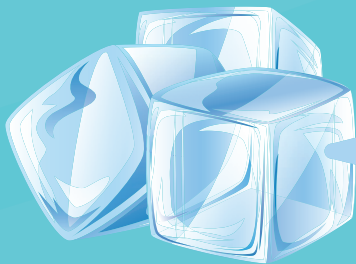
Gas

When water gets really hot (100° Celsius or hotter) it boils and makes steam. That steam, or vapour, is water in its gas form. The gas is the water molecules breaking apart and rising up into the air.



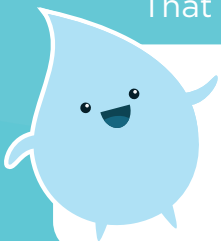
Liquid

When water is a liquid, it is wet. You can pour liquid water into a cup and drink it. We also use liquid water for cleaning, swimming and watering plants.



Solid

When water is very cold (0° Celsius or colder), it freezes solid and becomes ice. What is cool about ice (ha ha), is that when it freezes, it takes up more space than it does as a liquid. Ice is less dense than liquid water, which means the water molecules are further apart. That is why your ice cube floats at the top of your drink!



Activity: Fill a measuring cup with exactly 1 cup of water and then put it in your freezer. When it's frozen solid, take it out and see how much the water has expanded. Is it more than 1 cup? How much more?

Canada is Rich...in Water

There's a lot of water on earth. If you could collect all the water in the oceans, lakes, rivers and wetlands together, it would cover almost 75% of the earth! It sounds like a lot, but most of it is salty and can't be used unless the salt is removed.

We can't use all the fresh water right away either — a lot of it is frozen in glaciers and icebergs.

We're very lucky in Canada. We have lots of fresh water — almost one out of every five litres in the world! But we still need to be careful not to waste it or let it get polluted. We should all try to use less water so that people in the future can enjoy it too.



ONLY
3%
OF THE EARTH'S
WATER IS
FRESH WATER

75%
OF THE EARTH IS
COVERED IN WATER



OVER
68%
OF THE EARTH'S
FRESH WATER
IS TRAPPED IN
GLACIERS



Path of Cochrane's Water

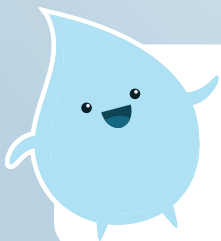
Cochrane gets its drinking water from the Bow River. The water in the Bow River starts out over two hours away from Cochrane, in the Bow Glacier. When the ice in the glacier melts, it flows into Bow Lake and then into the river.

As the glacier moves and scrapes along the rocks, it creates a fine-powdered rock called *silt*. This silt is what gives Bow Lake, and many other lakes in the mountains, their beautiful bright blue color. Silt particles are so small, they stay stuck to the water molecules instead of sinking to the bottom like rocks.

More water joins the Bow River when winter snow melts. And even more water is added when the Kananaskis River and Ghost River flow into the Bow River. Then it flows through Morley to Cochrane and on to Calgary and eventually east into Hudson Bay!

WHAT IS THE BOW RIVER BASIN?

A river basin or watershed is high at its edge and low in the centre where the river flows. The Bow River basin or watershed includes all the land that feeds water to the Bow River and its tributaries.



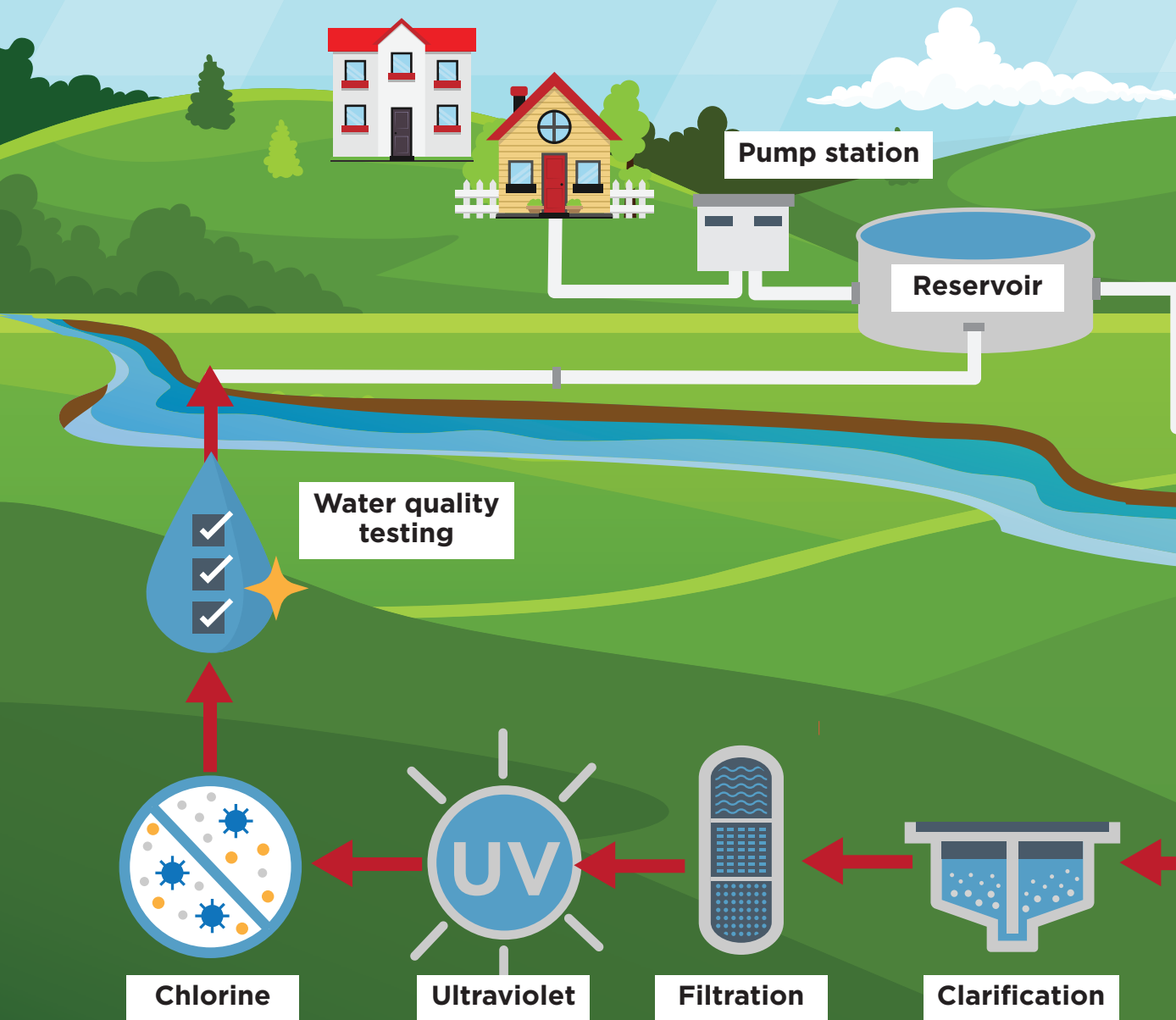
Activity: On a map, see if you can find the Bow Glacier and trace our water path to Cochrane, then across Canada all the way to the Hudson Bay!

Our Drinking Water Explained

Did you know the water we drink in Cochrane comes from a river?

The water gets from the river to the water treatment plant through a set of big pipes. The pipes have a mesh screen, like the ones in your windows at home, to keep rocks, bugs and fish out.

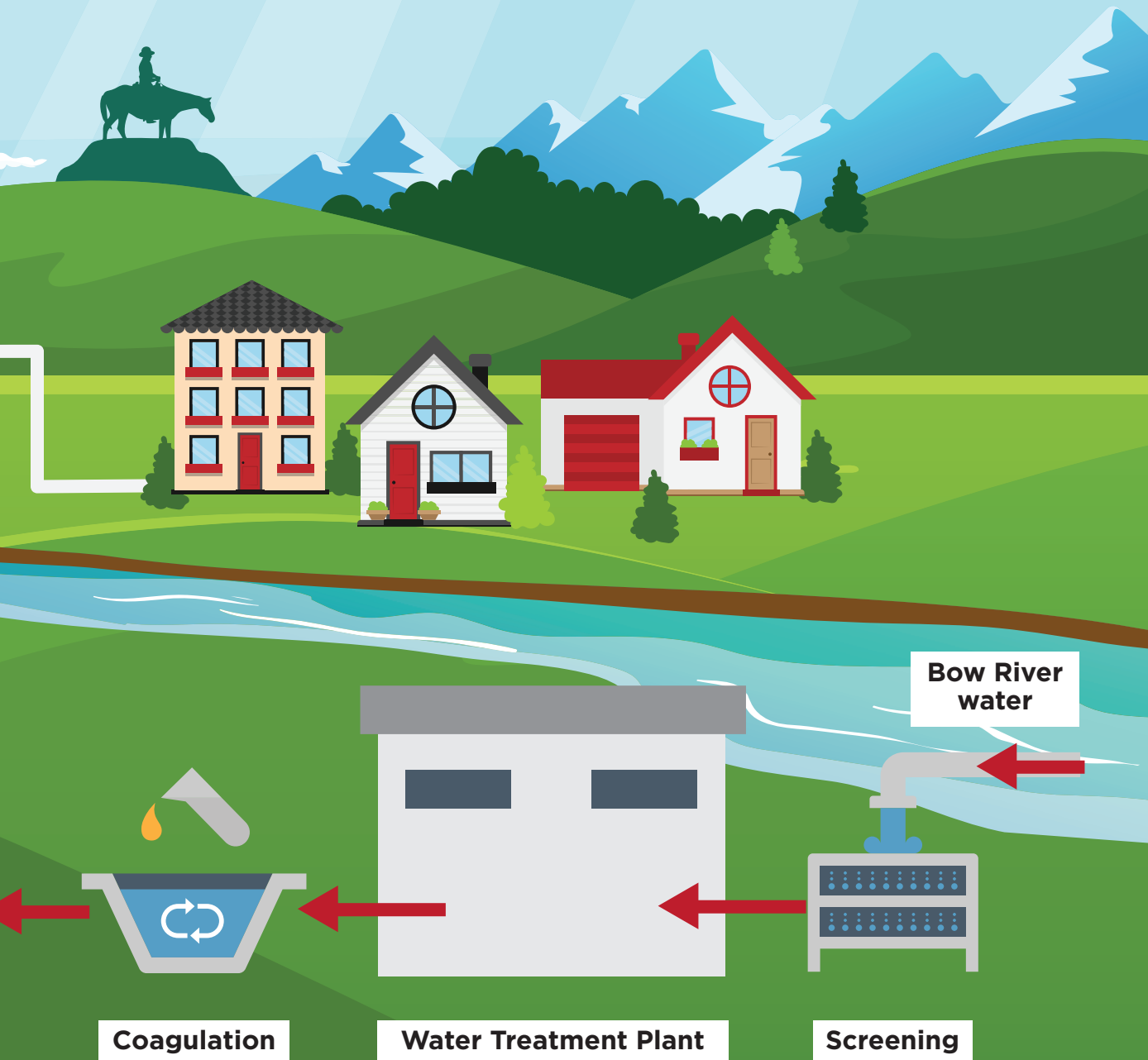
Once the water is in the plant, it goes through more filters that catch smaller and smaller pieces of dirt and other things. The water is stored in a big tank (like an underground swimming pool) while we get it ready to send to your house. We use a chemical that makes tiny pieces of dirt stick together and fall to the bottom. We use more filters and a special light called *ultraviolet* to get rid of germs that might make people sick.



Before the water leaves the treatment plant, we add one more thing. A chemical called *chlorine* is added to make the water clean and safe to drink. The water gets around town and to your house through another set of underground pipes.

Some parts of Cochrane are on hills. For these areas, we use huge underground tanks called reservoirs and giant pumps to make it easier to get the water to the houses in those neighbourhoods.

At the end, what comes out of your taps is some of the cleanest drinking water in all of Alberta!



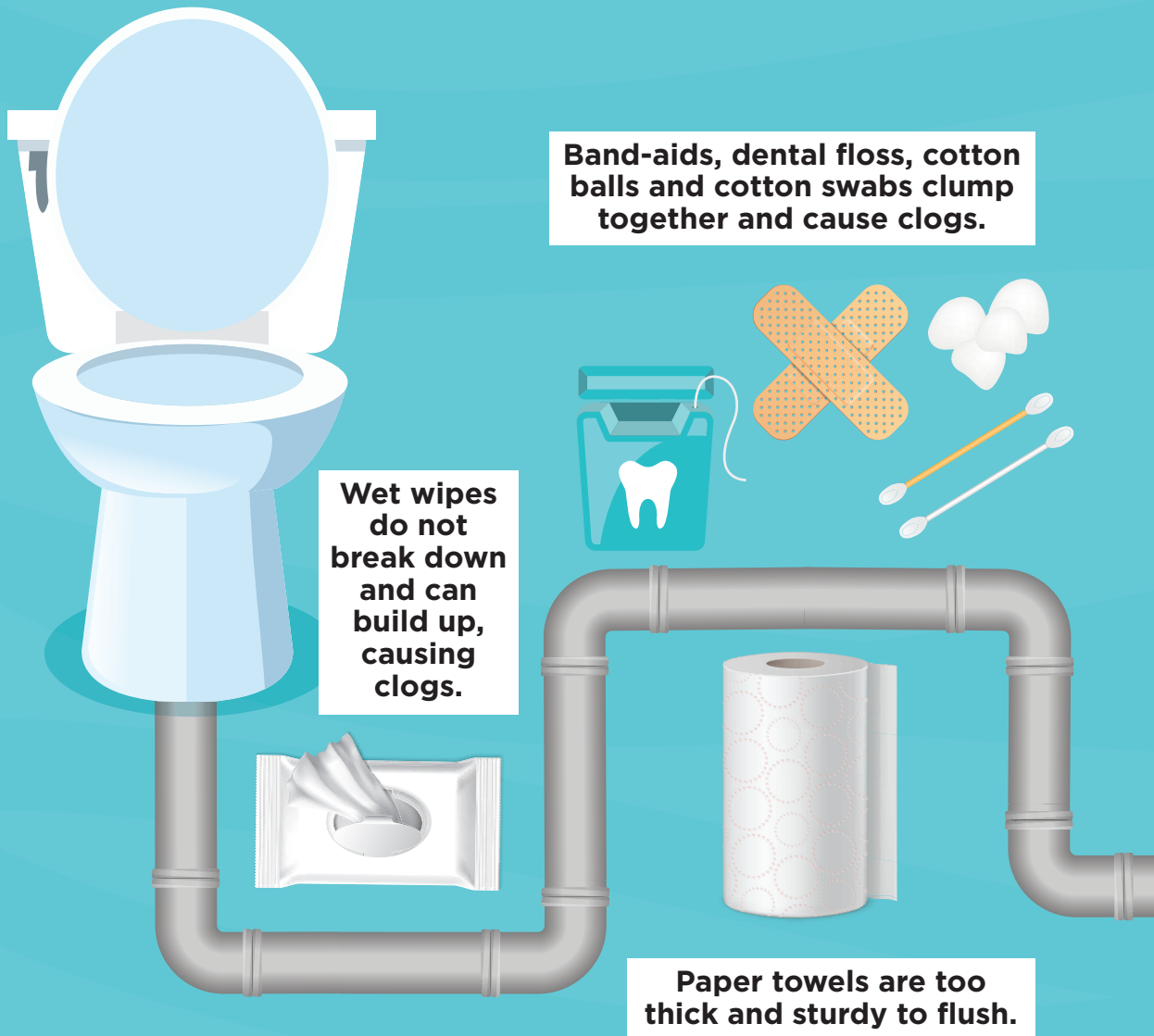
Where the Flush Goes

Have you ever wondered where the water goes after you flush?

Water from your house goes into pipes under the road and is called *wastewater*. It all goes back into the river, but not until it's been cleaned.

We collect all the wastewater in huge tanks in a building called the Wastewater Transfer Station. We add a little *bleach* to the water — a chemical you might use in your laundry — to kill germs so it's safe to take a long trip. Huge mixers keep the water and bleach in the tanks mixed just right.

The wastewater goes through a big pipe to the Wastewater Treatment Plant in Calgary. That's where it's filtered and cleaned before they let it go back into the Bow River as clean water.



Turbine Tangle

Plumbing pipes are picky (try saying that five times fast!). Pipes only want four things flushed down: Poop, Pee, Puke and toilet Paper – the four Ps. That's it. Nothing else is truly flushable.

Sometimes other things like paper towel, baby wipes and toys get into the pipes. They get stuck and can create huge problems at the wastewater pump station.

The wastewater pump station has special equipment called *turbines* to keep wastewater — the water that goes down the drain or gets flushed down the toilet — moving so it can be treated. When the wrong items go down the drain or get flushed, they can get tangled in the turbines. Then we have to send specially trained people inside to remove them so the machines can work properly again. Yuck!

What are the most common items that get flushed and tangled? Diapers and wipes are very common. Did you know that even if it says “flushable” on the package, wipes should never be flushed?

Little bits of food you rinse off your dinner plate can also get tangled. Food goes in the compost bin — even really small pieces — not down the drain.

Remember the four Ps and help keep the pipes clear!

**Chemicals
may not cause
blockages,
but they can
contaminate the
water system.**



REMEMBER THE

4
P
S

Only flush:

Poop
Pee
Puke
Toilet Paper



Activity: With your parent's help, take some food colouring and put a few drops in the tank of the toilet, watch it turn colour and wait 25 minutes and see if the water in the bowl changes colour, if the colour changes your toilet is leaking. If not, your toilet is using water smarter!

Water Cycle

As the water in oceans and lakes get warm, it *evaporates* and becomes a gas that rises up to make clouds.

As plants breathe, they release (or *transpire*) water from their leaves as gas — kind of like how people sweat. This water *vapour* also rises to the clouds.

The clouds get blown towards land by the wind.

Each cloud can only hold a certain amount of water vapour before it cools off. That makes the water in gas form turn back into a liquid. This is called *condensation*.

Once there is enough condensation, the water falls to the ground as rain, snow or hail (depending on how cold it is).

Once the water reaches the ground, it moves around.

The water can drip (or *percolate*) down through spaces in the soil. It keeps dripping until it reaches an area where all the soil spaces are filled with water – this is called *groundwater*.

Groundwater helps fill up rivers and streams, even during dry seasons.

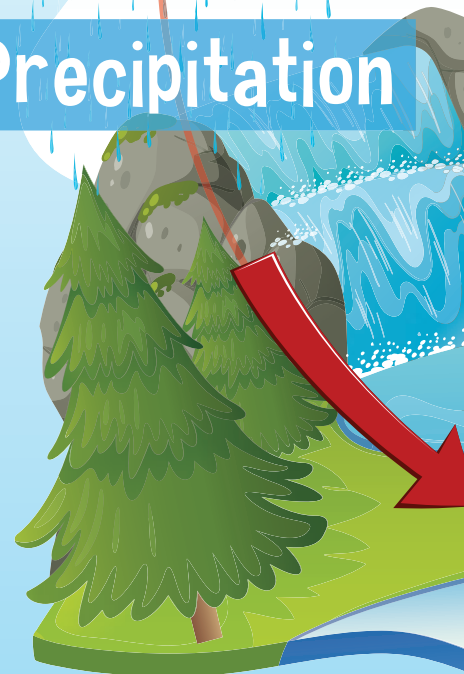
Water can also run on top of the ground into rivers and streams. This is called *surface runoff*.

Rivers and streams all lead to bigger bodies of water such as lakes and oceans. When the water there gets warm, it evaporates and the whole cycle starts again. All the water that reaches the ground ends up back in the ocean. The only difference is how long it takes to get there – days or years.

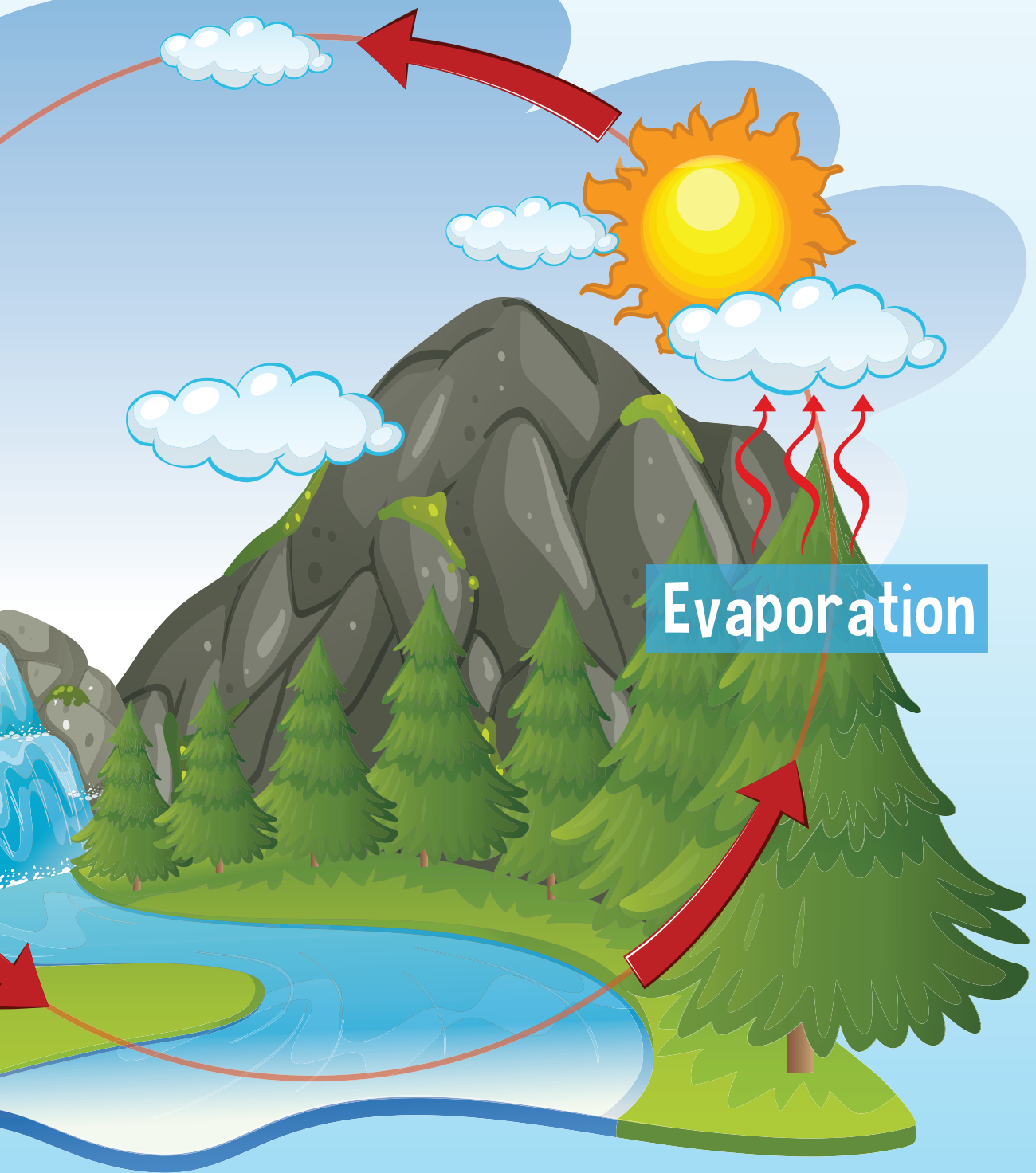
Condensation



Precipitation



Transportation



Evaporation

Water in our Ecosystem

Your yard probably has green grass and some colourful flowers. That's very different from how Cochrane looked before we all lived here.

Yards with lots of grass and flowers need water almost every day to look good. In nature, plants that need a lot of water usually grow where water naturally collects — like near rivers and lakes. And plants that need lots of sunshine grow in flat, open spaces to avoid the shade.

All plants (*flora*) and animals (*fauna*) need water and sunlight to survive, but they use them differently. Living things that share water, light, food and land make up what we call an *ecosystem*.

Creatures in each ecosystem live in a balanced way so they all get what they need. Trembling aspen trees pull water up through their roots to help the leaves grow.

Sweet grass grows in the moist soil on the shores of lakes and rivers. Deer drink water and eat moist tree leaves and sweet grass.

Beavers build their dams along the river where trees are close together and there are lots of logs.



Plants for our Ecosystem

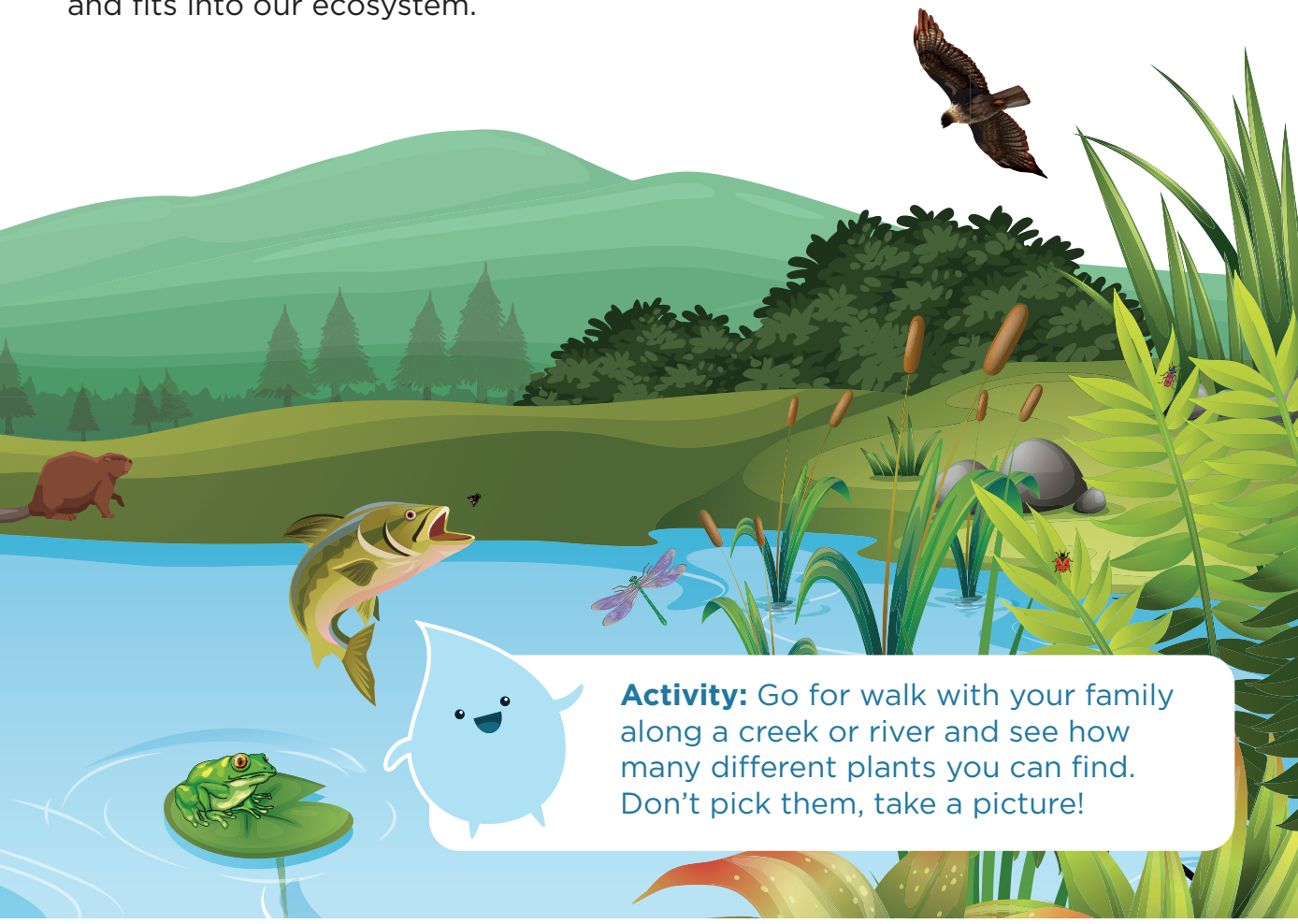
Green sphagnum moss grows under shady trees where it is protected from the hot sun. Sandbar willow and cattails love water and grow well along rivers. They are also a great place for insects such as dragonflies to lay their eggs and hide from birds.

Hawks like to sit on the tops of tall black spruce trees so they have a good view of their hunting area.

Ground squirrels and other small animals like to live near plants with the berries they eat, like Saskatoon and silver berry bushes. They also love to hide in tall grasses like poaceae and shrubs like the wild rose, Alberta's provincial flower.

Tall grasses and plants with flowers like asters and black-eyed Susans, attract pollinating insects like bees. Pollen is a great food source for insects, and when they move between plants, they help spread the pollen. This helps the flowers reproduce.

Plants that are used to the weather in Cochrane grow well here and don't need a lot of care. Plants that are used to conditions in other parts of Canada (or the world!) need extra care, extra water or food to grow well and look nice. Before you plant something, think about what already grows well here, and fits into our ecosystem.



Activity: Go for walk with your family along a creek or river and see how many different plants you can find. Don't pick them, take a picture!

Be Water Smart

Don't be a water waster! Your family can follow these six simple tips to use less water at home.

1

Only water your lawn early in the morning (5-10am) or late in the evening (7pm-1am). Use watering cans instead of hoses when possible.



2

Brush your teeth at least twice a day — if you are good at it, it should take two minutes each time. But don't let the tap run — that wastes water! Fill a glass of water for rinsing instead.



3

You can get your hair and body clean in the shower in less than five minutes. To relax in the water, have a bath instead!



4

Use less water for flushing the toilet. Remember how with this rhyme: if it's yellow let it mellow; if it's brown, flush it down.

5

Use your fork to scrape food scraps off your plate and into the compost bin instead of using water to rinse it in the sink.

6

If you wash dishes by hand, use two sinks: fill one with soapy water for washing, and the other one with clean water for rinsing. Then you won't have to leave the tap running.

