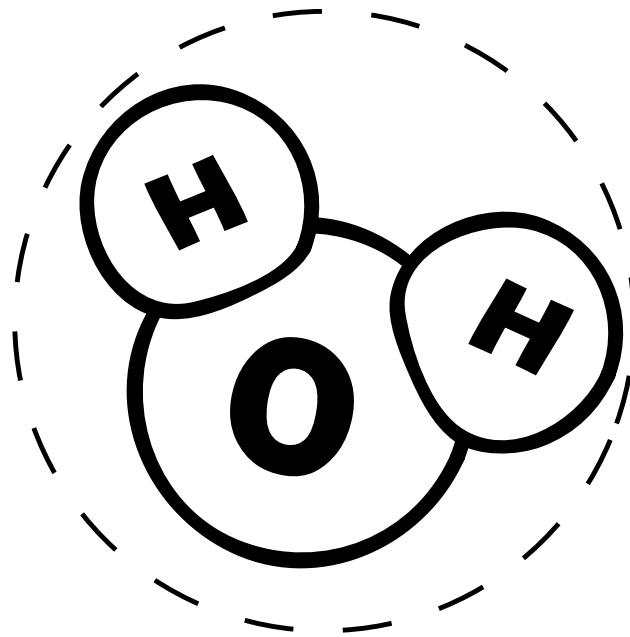




Our Most Valuable Resource

What is the most important natural resource in the world? You might think of diamonds, platinum or gold, or perhaps valuable fuels such as oil and natural gas. However, there is only one resource we truly could not live without: fresh water. People have even started to call it “blue gold”.



H₂O - Water molecule

Water is a simple molecule of two hydrogen atoms and one oxygen atom (H₂O). In its pure form, it has no colour, no smell, and no taste, but it has other properties that make it unique. Animals need water to turn food into energy, a process called metabolism. Plants need the hydrogen atoms in water to form glucose during **photosynthesis**, which supplies the plant with energy and releases oxygen into the atmosphere. As far as we know, no life can exist without liquid water.

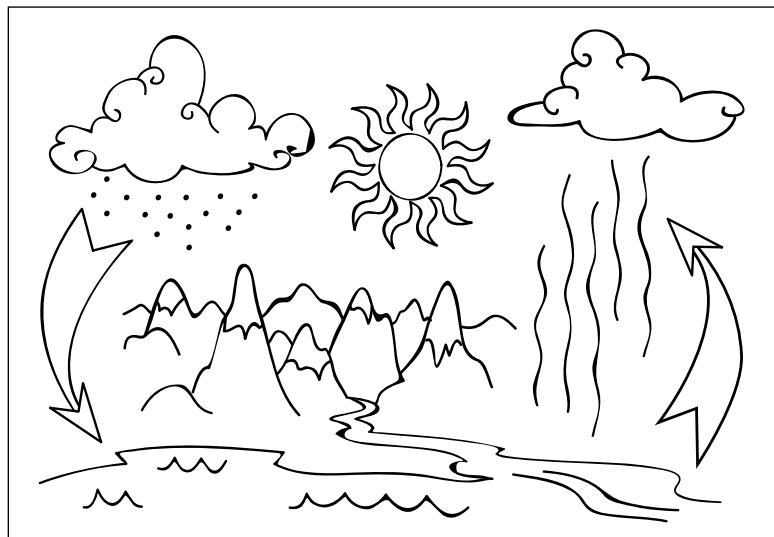
We depend on water for reasons other than biology, too. We use it to transport goods by ship, to manufacture the products we use every day, and to generate electricity.

Unlike precious metals or fossil fuels, water is all around us. Water is the only **compound** that is found in nature as a liquid, a solid and a gas.

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If you stand on the shore of a lake in early spring, you can see all three states at the same time – solid ice floating on liquid water under clouds of water vapour. All over the globe, water is constantly changing its state by evaporating (liquid to gas), condensing (gas to liquid), melting (solid to liquid) and freezing (liquid to solid). This is called the water cycle.



Water cycle

Seas and Oceans: What's the Difference?

More than 70 percent of the Earth's surface is covered by salt water. Almost all of this water is interconnected, making up an enormous system that many people call the "world ocean". This can be divided into five major parts: the Pacific, Atlantic, Indian, Arctic and Southern Oceans. The Earth's continents form the rough boundaries of the oceans: the Atlantic, for example, stretches from the east coast of North and South America to the west coast of Europe and Africa.

A sea is a large body of salt water that is connected with an ocean. In most cases, a sea is bordered by land on several sides, but is not closed off completely. For example, the Sea of Japan, between the islands of Japan and mainland Asia, is part of the Pacific Ocean. The Mediterranean Sea, surrounded by southern Europe and North Africa, is considered part of the Atlantic Ocean.





The term *sea* can be confusing, because it is used in other ways, too. The Caspian Sea between Russia and Iran is actually the world's largest lake – it is entirely enclosed by land, although its water is somewhat salty. Some large, sea-like bodies of water are called gulfs or bays, and it is difficult or impossible to define these terms consistently. And just to make things more complicated, a ship sailing in the ocean is said to be “at sea”!

If you've ever tasted water from the ocean, you know that not all liquid water is the same. No body of water contains pure H₂O – they all include dissolved minerals called salts. In lakes and rivers, however, the amount of dissolved salts is usually very low. This is the fresh water we drink and use to **irrigate** our crops. Seas and oceans, however, contain much higher **concentrations** of salts, the most common of which is sodium chloride, the same salt you put on your french fries.

The average **salinity** in the ocean is about 3.5 percent, which means that one kilogram of seawater contains 35 grams of salt. Salinity can vary greatly in different bodies of water, however. In the Baltic Sea, in northern Europe, it is usually well under 1 percent while the Dead Sea in the Middle East has a salt content as high as 30 percent. The higher the salinity of seawater, the more dense it is – in other words, one cubic metre of water from a lake has a lower mass than the same volume of water from the ocean. The Dead Sea is so dense that people can float on its surface without even trying!

About 97.5 percent of the Earth's water is salty, which makes it unsuitable for agriculture, and for humans and most animals to consume. (It is possible to remove the salt from seawater to make it drinkable, but this process, called desalination, is very expensive.) Of the remaining 2.5 percent of the world's water that is fresh, all but a tiny fraction is frozen in ice caps and glaciers, or is located deep underground. Lakes, rivers, clouds and soil moisture make up just 0.01 percent of the planet's H₂O. That's why fresh water is our most precious resource.

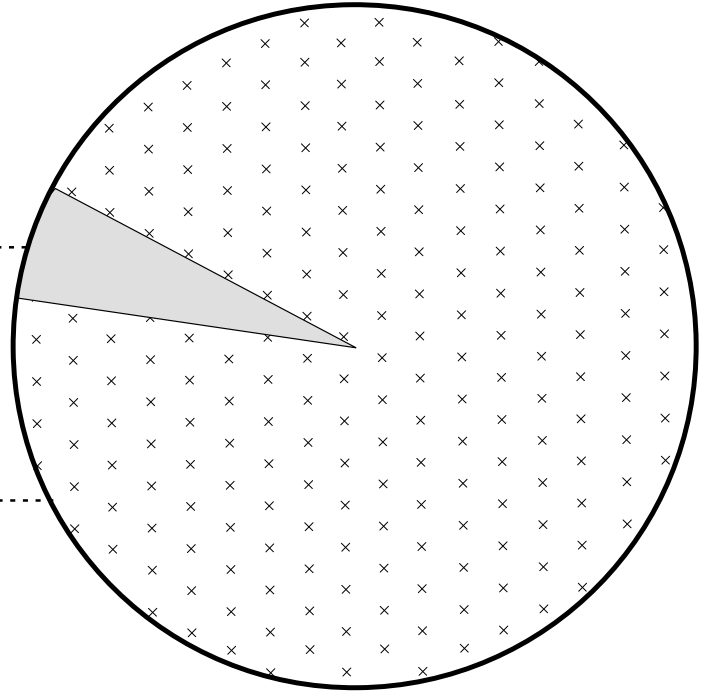
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The Earth's Water

Fresh Water: 2.5 percent

Salty Water: 97.5 percent



Fresh water may not seem like a luxury in some parts of Canada. The five Great Lakes alone – four of which border Ontario – contain about 20 percent of the world's fresh surface water. In other countries, fresh water is much harder to come by, and even when it is available, it is often unsafe to drink. Thousands of people, most of them children, die every day from diseases caused by **contaminated** water. These diseases were common in North America, too, until cities and towns began adding chlorine to the water supply to kill the germs that cause them.

Because fresh water is so abundant in our country, we often don't think twice about using too much. In fact, Canadians are the second biggest consumers of water in the world. The average Canadian uses about 340 litres a day for household activities – about three times as much as people in France and Germany. Most people agree that this is unnecessary and wasteful.

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Much of this water is later returned to its source, but not all of it. The vast majority of the water used to irrigate crops – not to mention golf courses and neighbourhood lawns – soaks into the soil and is no longer accessible. Cities and towns have treatment plants that remove most of the contaminants from wastewater, but pollution is still a major concern in densely populated parts of Canada. The Fraser River in British Columbia, Ontario's Great Lakes, and the St. Lawrence River in Quebec are all highly polluted because of human activities such as aluminum smelting and paper milling.

All Canadians can help to safeguard our fresh water by using less, and by taking steps to reduce pollution. Installing new, water-saving toilets, showerheads and washing machines can help cut down our use at home. Planting drought-resistant plants in our gardens reduces the need to turn on the sprinkler every week. Disposing of motor oil, paints and other chemicals properly – rather than dumping them down the drain – will help keep our lakes and rivers clean.

Our water is important not only to us, but to every species in Canada. Species that live in fresh water, salt water and terrestrial (land) habitats all depend on clean water. We can no longer afford to take our most valuable resource for granted if Canada is to avoid a water crisis in the future.

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Glossary

photosynthesis: the process plants use to convert sunlight, water and carbon dioxide into glucose and oxygen

compound: a chemical substance that contains two or more elements (for example, the elements hydrogen and oxygen make up the compound water)

irrigate: apply water to crops to help them grow

concentration: the amount of a substance in a given volume

salinity: saltiness

contaminated: containing harmful substances; polluted