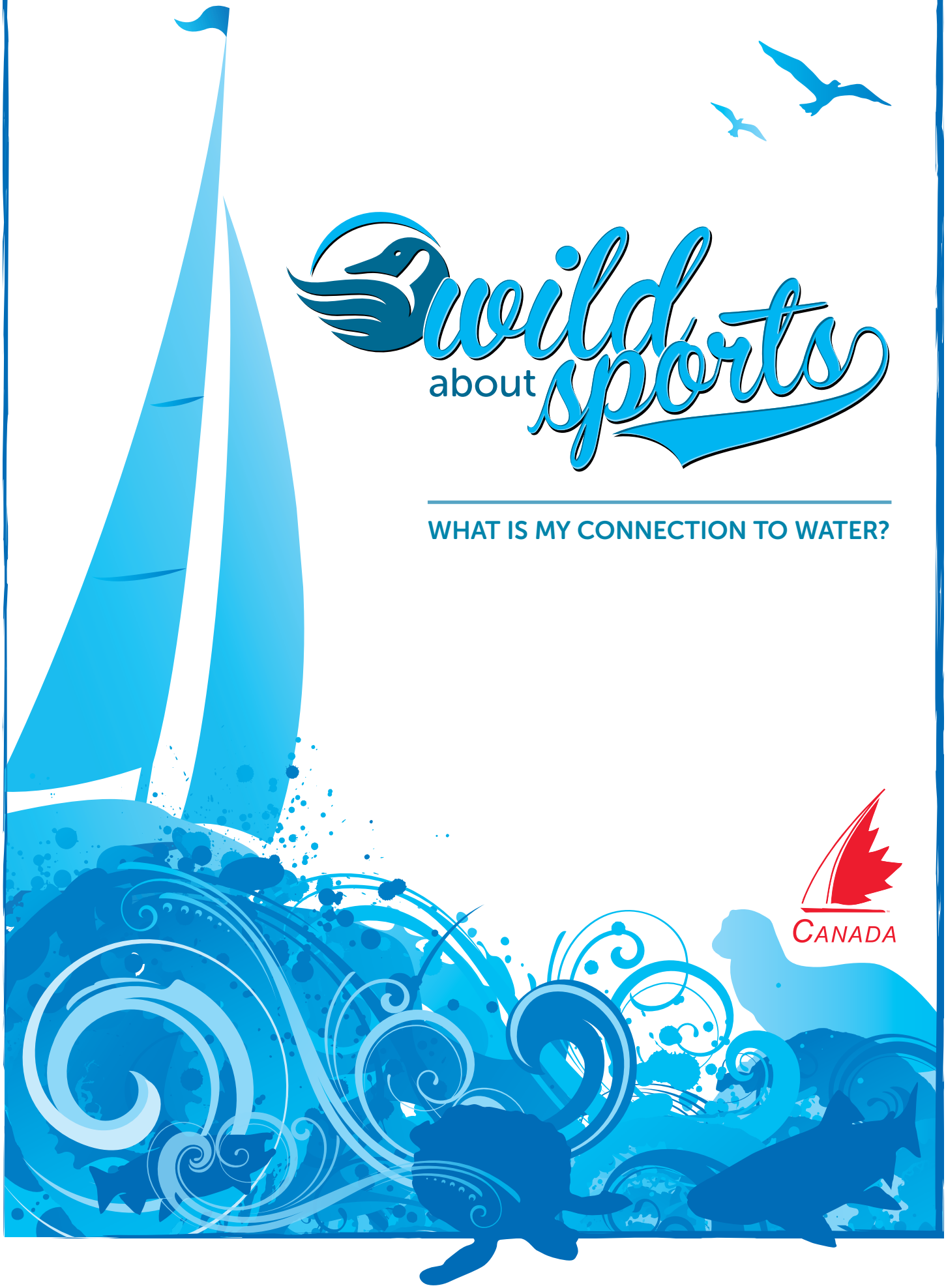

wild about sports

WHAT IS MY CONNECTION TO WATER?

CANADA

INTRODUCTION

This resource manual is designed as supplementary material for instructors who are teaching children about best practices in water sports as well as broader concepts of conservation, particularly as they pertain to the health of the Earth's water supply.

ORGANIZATION OF THE MATERIALS

These materials were selected and designed for instructors of children ages five and up. They are split into five sections of instruction. Each section has three to four activities to choose from, with the exception of section five, where we suggest a celebration of the good work done over the previous four sections.

Instructors are free to pick and choose any part of an activity to suit their existing plans. The materials are organized in a thematic and developmental order, which can help students to acquire knowledge and skills as they learn about natural resources, particularly in aquatic environments.

SECTION ONE: AWARENESS AND APPRECIATION

Activities in this section will naturally integrate with the instructor's first safety and orientation briefing. These activities encourage spatial awareness and discovery of our natural world.

SECTION TWO: HOW DO HABITATS WORK?

Activities in this section provide a foundation for the understanding that people and wildlife have similar needs.

SECTION THREE: WHAT'S MY CONNECTION TO WATER?

Activities in this section help students recognize and evaluate their direct and indirect connections to the environment.

SECTION FOUR: POSITIVE HUMAN ACTION

Activities in this section help students recognize, evaluate and make responsible choices in their own lives, reflecting the knowledge and skills they may have acquired in earlier activities.

SECTION FIVE: GRADUATION CELEBRATION!

It's time to celebrate a week of learning! Students will be encouraged to present their new knowledge and attitudes with the community through visual art, writing and dramatic presentations.

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INTRODUCTION

AGE EXTENSIONS AND ACTIVITY ICONS

1. Each activity and extension is geared to different ages:

ACTIVITY
AGE GROUP ALL

ACTIVITY
AGE GROUP 5 years and up

ACTIVITY
AGE GROUP 7 years and up

2. Eye-catching icons indicate four possible elements: quiet work, outside work, charting and on the water!

QUIET WORK OUTSIDE WORK CHARTING ON THE WATER

COMMITMENT TO EDUCATION

The Canadian Wildlife Federation is committed to providing educationally sound materials for instructional use and to maintaining neutrality on controversial issues, treating such issues fairly and honestly without advocating any one point of view. It recognizes that people need information from a variety of sources to make informed decisions.

ONGOING COMMITMENT TO IMPROVEMENT

We hope you will find these materials useful. Contact us with any suggestions about how to improve this program or to request additional information and assistance.

THIS MANUAL

WILD About Sports: What is My Connection to Water is part of the Canadian Wildlife Federation's Education program.

WILD EDUCATION

Become a WILD Education instructor! WILD Education is a professional development program that will train you to become a certified instructor of this manual, as well as other programs such as Project WILD and Below Zero. Our interdisciplinary activity guides feature interactive indoor and outdoor activities for youth that focus on wildlife and the environment.

For online resources to supplement this manual visit:
CWFWildAboutSports.org

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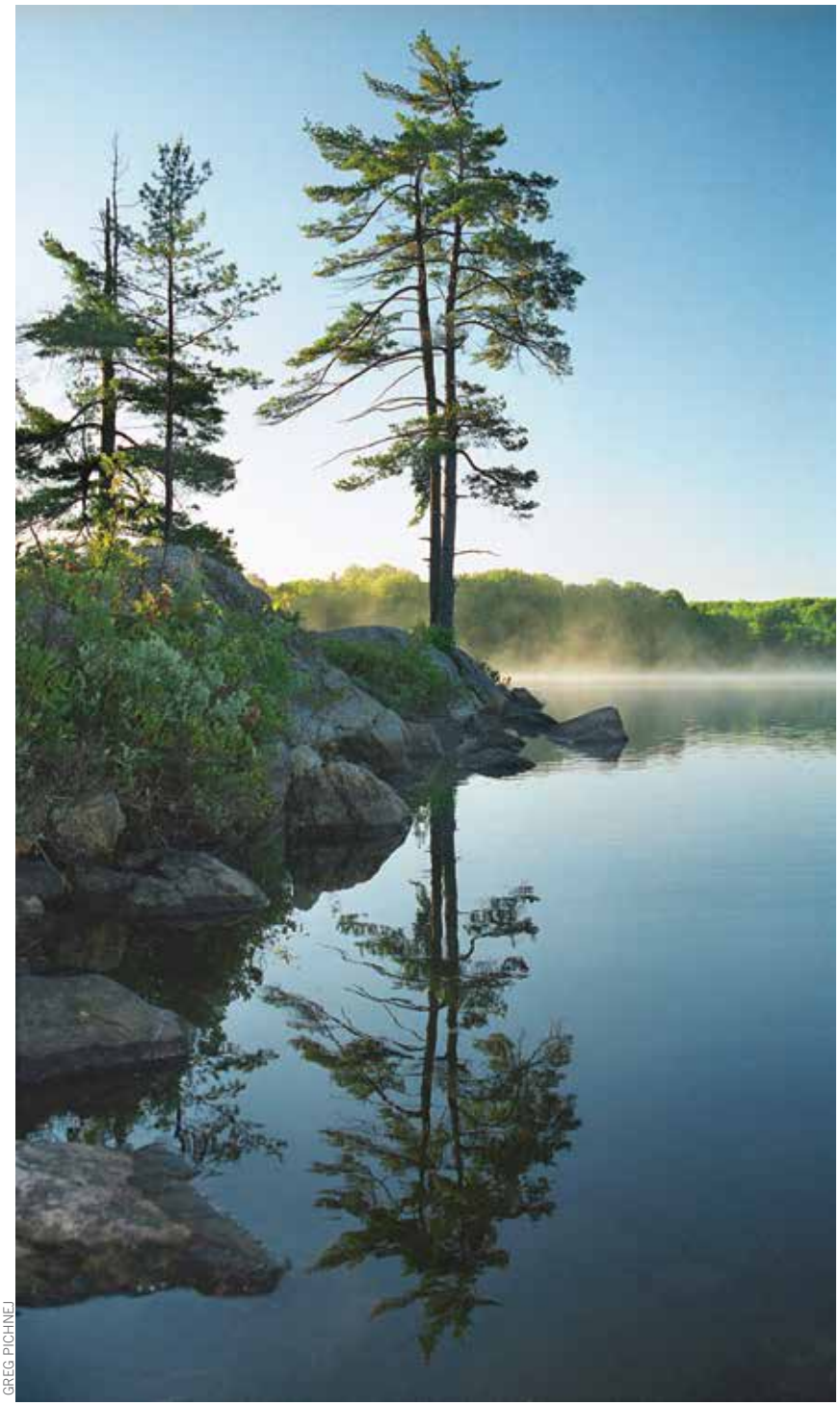
SECTION ONE:

AWARENESS AND APPRECIATION



GREG PICHNEJ

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1.1 SAFETY BRIEF

Students take a walking tour of the club area to become familiar with their local environment. Now is the time to introduce safety rules and identify any areas that are off limits.

KEY IDEAS

1. Safety rules are necessary to keep students safe from harm.
2. The environment surrounds us. It is everything we see, hear, smell and feel, including the water, air and space in which we – and all wildlife – live and thrive.

Skills: analysis, charting; critical thinking, discipline, discussion, interpretation, listening
Duration: 15 minutes
Setting: outdoors
Materials: a simple poster-sized diagram of the club area (see our example on page 13); masking tape; black and red markers

IN ADVANCE

1. Plan a route for a short walking tour around your club. Include areas you can point to from a safe distance that are off limits (on and off the water).
2. Bring your diagram of the club along on the walking tour. It should be large enough so your group can see it easily. **TIP: Draw it using a black marker to increase visibility.**

ACTIVITY

AGE GROUP ALL

1. Before the walk, explain your club's safety rules and the reasons for them.
2. During the walk:
   - Point out (from a safe distance) which areas on and off the water are off limits.
   - Point out landmarks such as docks or buildings to familiarize students with their surroundings. Refer to these surroundings as their environment.
   - Ask students to identify what else they can see in their environment (e.g. water, plants or animals).
   - Ask if there is anything they can feel or hear in their environment (e.g. wind, or waves on the shore).
3. After the walk, display your diagram and ask students to point out which spots are off limits.
   - Have them draw a large "X" on those spots using a red marker.
   - Post the diagram in an area where students can see it.

DISCUSSION:

1. Safety rules protect students from harm; can they protect the environment as well? In what ways?
2. Which areas are "off limits"?
3. Why are they off limits?
4. What are the other rules?
5. Where should we always wear a lifejacket?
6. Why must everything we take onto the boat come off the boat as well?
7. Can you name three different things in the environment?

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1.2 WHAT IS WILDLIFE?

Students look for evidence of wildlife.

KEY IDEAS

1. When many different plants and wild creatures live in or around the water it is usually a sign that their local water area is pretty healthy. Wildlife is any plant or animal that has not been domesticated.
   - » Beavers, seaweed, bulrushes, willows, otters, fish, crabs, birds and even mosquitoes and other insects are all examples of wildlife.
2. Wildlife shares space with water users.
   - » Did you know that while you are on the water you are sharing a place – the water – that many creatures and plants call their home? They need that home to be healthy!

Skills: analysis, classification, critical thinking, discussion, evaluation, examination, identification, inference, listing, personal and social values, speculation, writing
Duration: 10 minutes
Setting: outdoors
Materials: none

ACTIVITY

AGE GROUP ALL

1. Walk to the water's edge with your students and look for signs of wildlife, such as:
   - » Birds calling from the trees or flying in the sky; crabs or other creatures on the shore; tracks; scat; feathers; plants; seaweed.
2. Tell students that wildlife lives in the same space that they use when they are on the water.
   - » Talk about what they see.
   - » Ask them to name two things that live in the water (e.g., fish or seaweed).
3. Introduce the idea that when many varieties of wild plants and animals can be seen, it's usually a sign that their environment is healthy because they have lots of space to live, eat and survive.
   - » Ask them if they think their local environment is in good shape or not, based on what they are seeing.
4. Throughout the week, keep a lookout for signs of wildlife, especially on and under the water. As a group, keep track of your sightings.
   - » Are there any protected or endangered species in your local area? If you spot a species of special interest, consider reporting it. Flip to page 65 for more information on how to do this.
   - » If you can, build a project wall where wildlife sightings can be recorded throughout the year. Make observations as species and the environment change from season to season.

DISCUSSION

1. How do we know that we are sharing space with other living things while on the water?
2. How can we tell if our water spot is a healthy environment for ourselves and other living things?

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ACTIVITY

AGE GROUP 7 years and up

1. Discuss the differences between mammals, birds and fish.
   - » Name some freshwater species, some saltwater species and some species that live in both salt and fresh water.

ACTIVITY

AGE GROUP 9 years and up

1. Discuss the differences between mammals, birds, fish, reptiles and amphibians and invertebrates.
   - » **Mammals** are warm-blooded vertebrates (animals that have a backbone) that can be identified as having hair or fur; they almost always bear live young to which they feed milk that they secrete from mammary glands.
   - » **Birds** are warm-blooded vertebrates that can be identified as having feathers, wings and a beak.
   - » **Fish** are cold-blooded vertebrates that have gills throughout their lives and whose limbs are modified into fins.
   - » **Reptiles** and amphibians are cold-blooded animals, which means that instead of producing heat from inside their bodies, like people, they must get it from outside sources. To control their body temperature they must move to a cooler or warmer spot (for example, resting on a sunny rock).
   - » I**nvertebrates** are any animal form that does not have a backbone. An example of an aquatic invertebrate is a mollusc.

2. Discuss the following.
   - » Name species that live in both saltwater and freshwater.
   - » Look at the food chain on page 30.
   - » Where do humans sit on the food chain?
   - » What happens if plastic and other toxic waste gets into the food chain?
   - » Who will end up eating the most plastic and toxins?

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1.3 WATER DISCOVERY

Through observation, students discover simple properties of water movement and classify the body of water at their club as being a river, lake or ocean. *NOTE: The instructor should reiterate safety messages, such as the importance of wearing lifejackets.*

KEY IDEAS

1. Water is typically in motion.
   - In a river, it flows downhill.
   - In a lake, it typically slows down and stays in one location for a long time.
   - In oceans, it is in constant motion and is affected by tides.
2. Water from the land eventually drains into the ocean.
3. Water is a dense and resistant substance that is difficult to move through.

Skills: analysis, critical thinking, discipline, discussion, evaluation, inference, measuring, observation
Duration: 15 minutes
Setting: outdoors
Materials: none if you are located along a river or a lake; two wooden stakes if you are located along an ocean coast.

ACTIVITY

AGE GROUP ALL

1. Safety rule: Be sure lifejackets are nice and snug. Bring students to the water's edge.
2. Define the body of water with your students. Is it fresh, salty or a mix?
   - Is it part of a river and lake system? Which one?
   - Where does the water in it come from?
   - Is it part of an ocean system? Which one?
   - Is there a river flowing into it nearby?
3. Does the water move?
   - Up and down? (tide)
   - Left to right? (current)
4. Is there a high tide or low tide line? If your club is located along an ocean coast, this is a great opportunity to show the effects of tides over the course of the day.
   - Mark the high-tide line with a wooden stake.
   - Put another stake at the edge of the water.


ROSS FARROW


ISTOCK

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- » Compare the water levels later in the day.

5. In a safe spot, have students run their hands through the water from side to side as quickly as possible so they can feel the resistance of the water.
   - » Why is a boat long and pointy? (So that it pushes less water.)
   - » Why is a light boat faster than a heavy boat? (It pushes less water.)
6. Ask students if they can see any plants or evidence of creatures by the water (e.g., tracks on the ground). Remind them that they are sharing the area with different plants and wild creatures that live in and around the water body.

DISCUSSION

1. Why is wind important for water sports?
2. How does the wind affect the water?
3. Why are lifejackets important for safety?
4. What other kinds of life forms share your water area?
5. Look at the watershed map on page 41 and locate your community on it. Where is your watershed?

ACTIVITY

AGE GROUP 7 years and up

Waves

1. Waves are caused by:
   - » Wind blowing across the water (the more wind the bigger the waves).
   - » Currents, especially in shallow water.
2. Ask students if they can think of other causes of waves. Consider tidal bores, earthquakes, tsunamis, glaciers breaking up, boats, et cetera.
3. Now, ask students to consider how waves affect us and wildlife? For example, what effects might erosion have on a habitat? How might plants and animals survive wave action?

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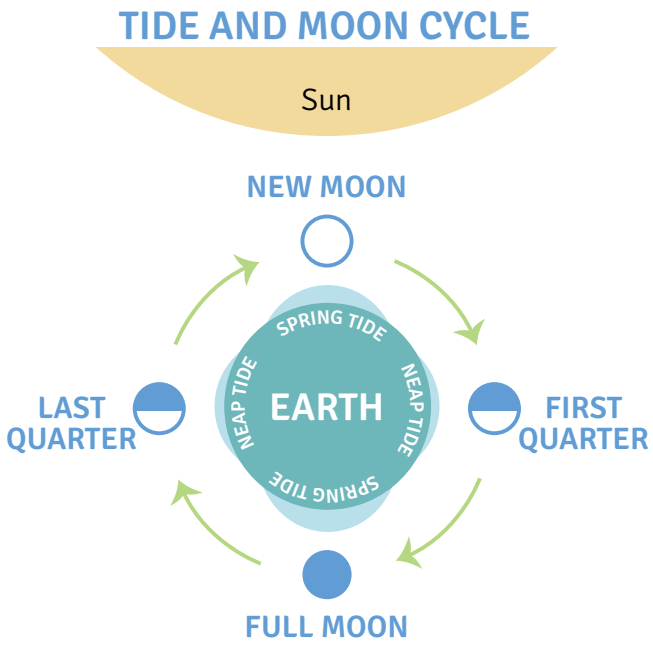
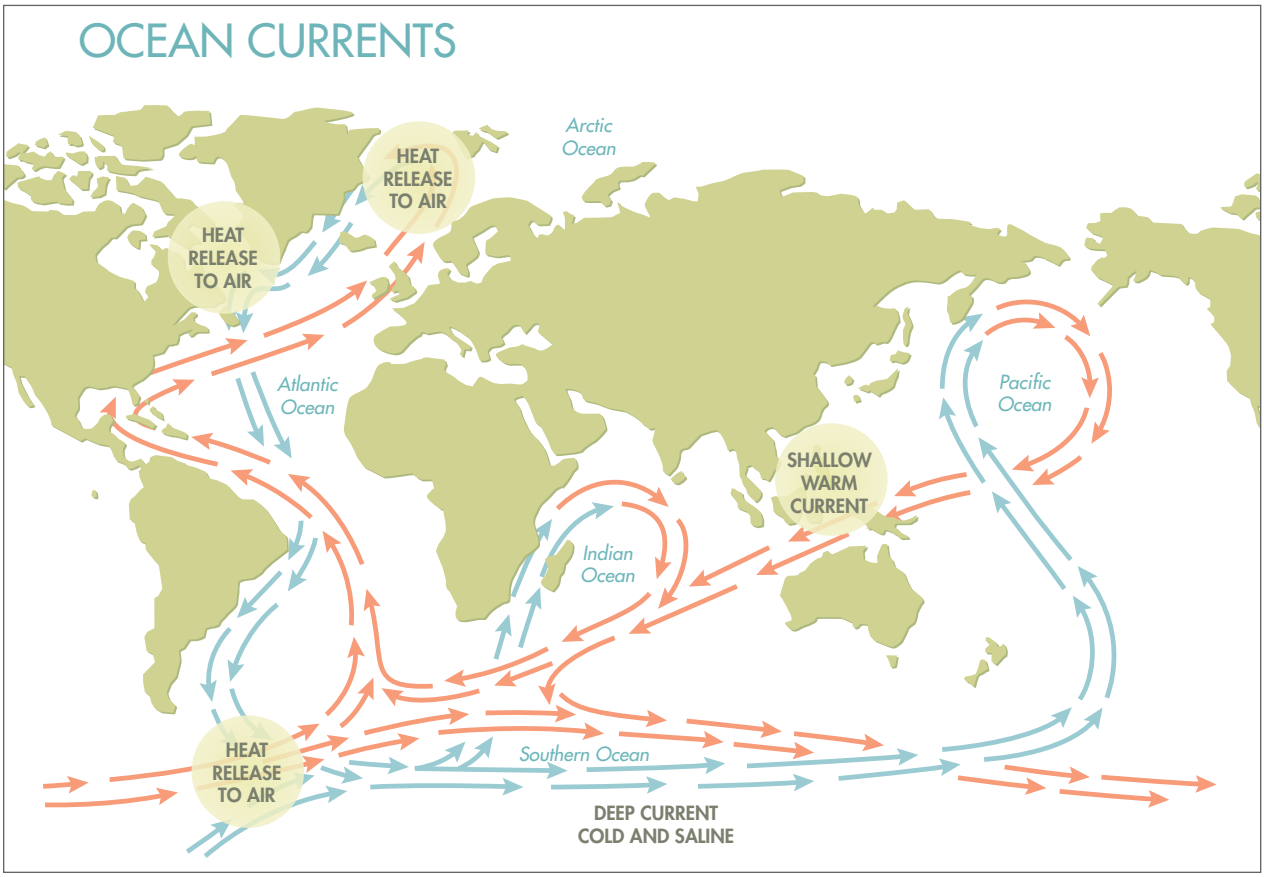
ACTIVITY

AGE GROUP 9 years and up

Tides

1. Tides are caused by:
   - The gravity of the moon (a new cycle every 29.5 days) and the sun.
2. Look at local tide tables.
   - What is the tidal period – the time between high and low tide – for your area?
   - What time will high and low tide be today? Is this the same every day?
3. A current is caused by tides, windblown waves, river estuaries and deep ocean currents. Currents often bring hot or cold water to a new area.
4. What could cause an increase of current? Consider influences such as floodwaters, ice melt, atmospheric pressure changes and others.
5. How can we make our boat slip more quickly through the water by moving our body weight? Discuss.





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ACTIVITY

AGE GROUP 11 years and up

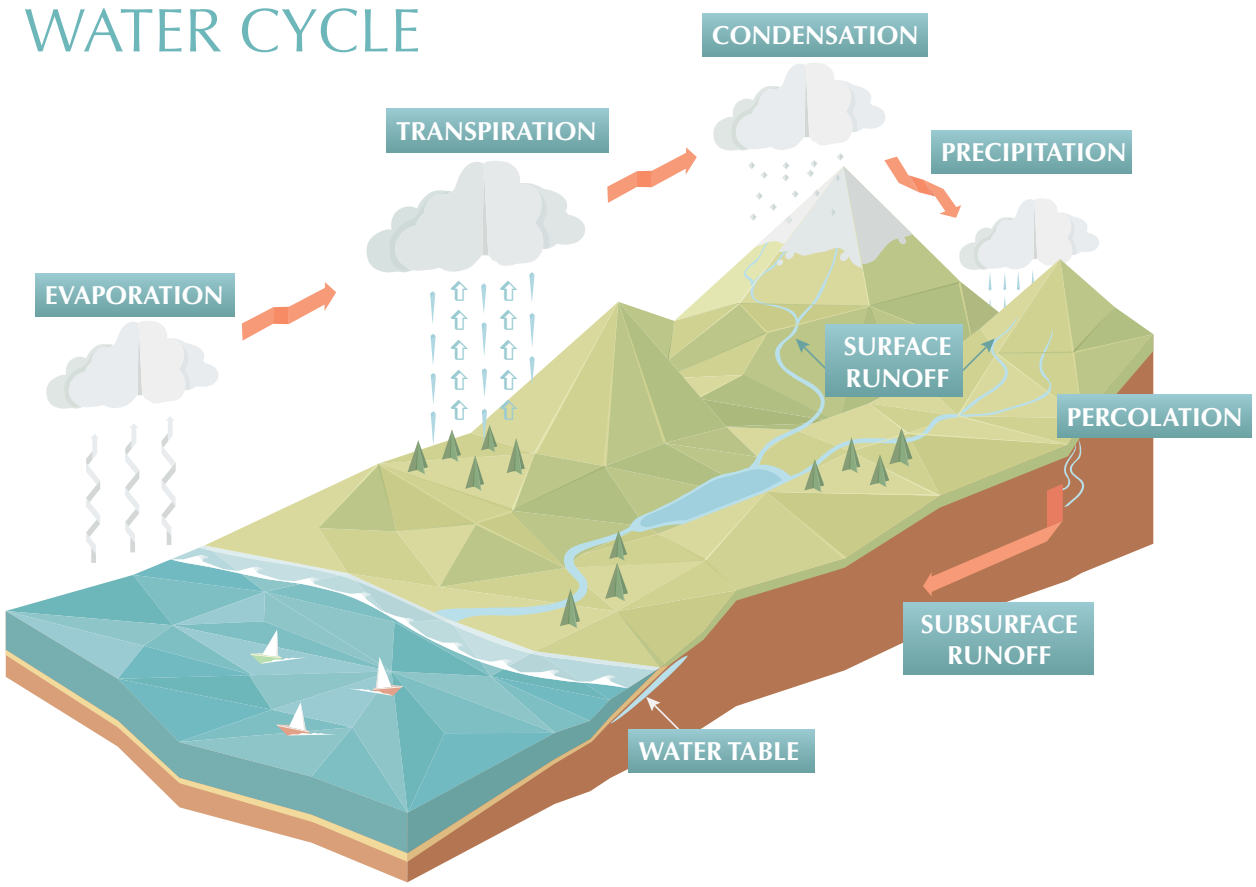
Water Cycle

1. Describe the basic water cycle using the chart below.

   Pour yourself a glass of water. How old would you guess that water is? It may have just come from a tap, but your drink has been on Earth for about as long as the Earth has been around. The water you are drinking today was also drunk by the dinosaurs!

   We call the system through which it circulates the *water cycle*. This process brings water from the ocean, to the atmosphere, to the ground and back to the ocean again. Water is the only substance that can exist naturally in three different forms: as a solid (e.g., ice and snow), as a liquid (e.g., in oceans and lakes), and as a gas (as water vapour). This is how it works:

   - Water is evaporated by the heat of the sun. It rises from the ocean into the air and forms clouds.
   - The clouds cool and form water drops, which eventually rain onto the ground.
   - That rain collects on the land masses in the area called watersheds. That water runs from streams and lakes into rivers.
   - The water eventually finds its way back from the watershed into the ocean.
   - This process – the water cycle – keeps the Earth cool and creates our weather systems.



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ACTIVITY

AGE GROUP 14 years and up

Rule of Twelfths

1. A typical tidal range has six hours from low water (LW) to high water (HW).
2. In the first hour, the tide rises 1/12, in the second hour 2/12, in the third hour 3/12, accelerating to mid-tide.
3. In the fourth hour, the tide lowers to 3/12, in the fifth hour 2/12, in the sixth hour 1/12, decelerating to high water.
   - What impact might this have on the rate of the current?
   - At what point is the tidal current flowing the fastest?
   - When does the tidal height change the least?
4. Mark a post or wall as the tide rises from LW to HW.
   - Measure the distance each hour.
   - Create a scale drawing to show the change.
5. Discuss how tides move water around and how this can affect wildlife. For example, fish feed when the tide moves in over the beach or mud flats and birds feed when the tide moves out and leaves these areas uncovered. In areas with large tidal ranges, such as the Bay of Fundy, fish and marine mammals often get stranded or trapped in small pools.

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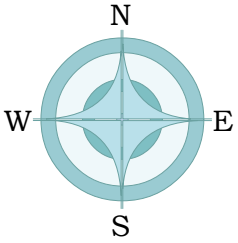
1.4: CHARTING AND NAVIGATION

Students learn to identify key points on a chart.

KEY IDEAS

1. Understanding where you are on the water with and without the use of charts is vital.
2. Learn to combine position themselves in the context of their environment and the compass.

Skills: application, charting, comparison, critical thinking, discussion, identification, independent learning, kinaesthetic concept development, observation
Duration: 20 minutes
Setting: outdoors
Materials: a basic diagram of the club to be used as a chart – it should show the N-S-E-W symbol correctly, like the one to the right; masking tape; black and red markers; one diagram on a clipboard and one red pen or marker per student; Ziploc bags



TIP: Make your clipboards from recycled cardboard boxes. Cut the boxes into sheets and tape a copy of the chart onto each one. Be sure the cardboard is thick enough to write on.

IN ADVANCE

Prepare the charts. These charts will be used by the students throughout the week; use the Ziploc bags to keep them safe and dry.

ACTIVITY

AGE GROUP ALL

1. Provide each student with marker and a clipboard with the club chart attached.
2. Help students to draw a compass rose, similar to the one illustrated above, on their charts. Make sure they correctly orient N-S-E-W.
3. Bring the students outside and help them to find their current position on their charts.
4. Next, show them some key locations in the club area, such as habitat areas where wildlife might be spotted. Help them mark these points on their charts.

ACTIVITY

AGE GROUP 8 years and up

1. Use the more detailed chart. Introduce the chart icons.
2. Let students identify the key locations on their charts without help.

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ACTIVITY

AGE GROUP 12 years and up

1. Introduce the notion of scale distance on the chart.
2. Discuss details such as depth contours with the students and identify these on the charts.
   TIP: For older students, provide each student with two copies of the chart. One can be used for reference onboard and the second for marking key locations and details.

DISCUSSION

1. Why are charts necessary? Create a list of answers.
2. Find where your local chart fits into a watershed map of Canada.

ISTOCK

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1.5: CHARTING SHORELINE HABITAT

Students will follow the contour of their shoreline (or a section of it) in a boat and chart wildlife habitat as they make observations along their route. ***TIP: This activity can also be carried out on foot, but a greater area can be covered from a boat.***

KEY IDEAS

1. People and wildlife share habitat along shorelines.
2. Different types of shorelines can provide different types of wildlife habitat.
3. A healthy shoreline is rich in biodiversity, including plant life. This is because a great range of habitats exist where land and water meet, so many resources are available. This is a recipe for biodiversity.
4. Human activities along a shoreline can influence the biodiversity of that shoreline.

Skills: art and illustration, charting, classification, cooperation, description, drawing, examination, identification, kinaesthetic concept development, measuring, reporting
Duration: 30 minutes
Setting: indoors and outdoors
Materials: chart; pencils; appropriate field guides; compass (if desired); binoculars (optional)

IN ADVANCE

1. Choose an appropriate shoreline area for students to chart. When choosing your space:
   - Try to find an area or two separate areas where there is a contrast between a healthy shoreline (lots of vegetation and life) and a human-modified shoreline (abrupt transition between land and water – e.g., grass, lack of vegetation or eroding slope right up to where the water begins).
   - Remember to consider the type of vessel being used and conditions that may be encountered (e.g., draft, hazards of lee shores in wind, etc).

   TIP: Find or create a basic chart of the area that younger students can add to.

ACTIVITY

AGE GROUP 9 years and up

1. Tell your students they will be charting wildlife habitat along a shoreline.
2. Provide students with a basic chart or explain how they will create their own.
3. Assign a section of shoreline for your students to follow in their vessel. Students can work together as a big group or be divided into smaller groups.
4. As students follow the contour of the shoreline in their vessel, they should use basic navigation to ensure it remains in safe navigable water with enough depth. This can be done by:
   - Following depth contours on their chart.
   - Using a lead line and/or depth sounder.
   - Observing the water colour as well as surface waves and ripples.
5. During this time, students should also indicate through drawings and writing on the basic chart the different kinds of habitat and life they see. Binoculars are not necessary but could be a fun item to bring along.

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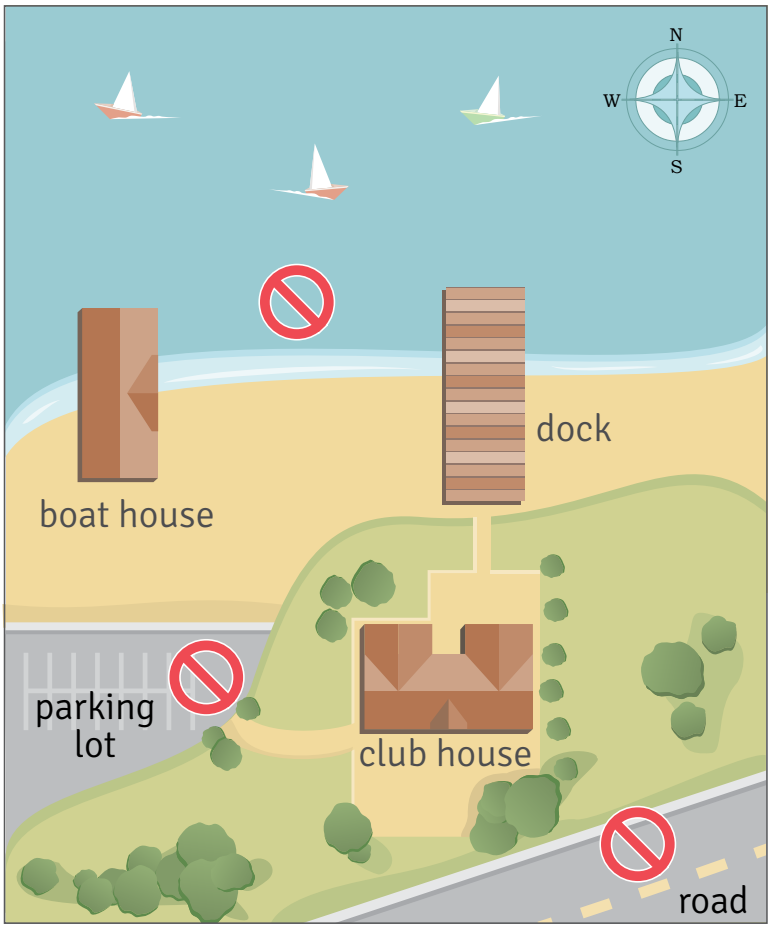
6. Students should note types of vegetation they see and indicate their locations along the shoreline (on land, in the water by the shore, far out from the shoreline). This can include trees, shrubs, grasses, cattails, lily pads, duckweed and other vegetation. *NOTE: If students come across something frequently but are unsure of what it is, they can try drawing or describing it. Later on, try to figure it out as a group.*
7. Students should also note:
   - » Any nests they have spotted, muddy footprints, animal droppings, cavities in trees or other signs of wildlife.
   - » Any animals they saw and where. For example, a hawk circling above the water, a muskrat swimming along the shoreline, a frog in shallow water, a kingfisher in a tall tree, fishes in clear water, et cetera.
   - » Any signs of human activity like buildings near the water, docks, altered shorelines, et cetera.
8. Once the exercise is complete, come together as a group to discuss what the students have mapped. Try to figure out any unknown species as a group.

DISCUSSION

1. Do you think the shoreline area you have mapped is healthy habitat that supports biodiversity? Why or why not?
2. What evidence of plant and animal life did you see? Do you think the shoreline habitat brought them there?
3. What kinds of animals that you did not see could live along the shoreline you've mapped? What makes you think that?
4. Why do you think healthy shorelines are rich in plant and animal life?



= OFF LIMITS

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1.6: COMPASS ROSE

Students are introduced to the compass and its function.

KEY IDEAS

1. Create a compass rose and the four points of the compass: north, south, east and west.
2. Use the compass rose to record aspects of the local environment.
3. Understand the relationship between the compass and chart.

Skills: analysis, application, cooperation, drawing, identification, measuring, observation, speculation
Duration: 20 minutes
Setting: outdoors
Materials: four metres of string; street chalk; a stick with a flag attached to the top, a pylon

IN ADVANCE

Find an open concrete space or a flat, clear section of sand (10 square metres if possible) with no road traffic and minimal foot traffic.

ACTIVITY

AGE GROUP ALL

1. Gather the students in your chosen concrete space. Ask for two volunteers to draw a perfect circle of three to four metres diameter using the string and chalk.
2. Place the pylon in the centre of the circle.
3. Ask the students how they would identify the direction north.
4. Now, ask the students to stand outside the circle at the point they think is north.
5. Using a compass, identify where north is found on the circle. Ask a student to mark it with some chalk.
6. Repeat this action with east, south and west.
7. How can you find north during the day? At night? Give students some pointers on finding the North Star.

ACTIVITY

AGE GROUP 8 years and up

1. Place the intermediate points on the compass rose: northeast, southwest, northwest, southeast.
2. Now, add the corresponding 0 to 360 degrees.

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ACTIVITY

AGE GROUP 12 years and up

1. Use the compass rose at various points during each day to track and record wind direction.
2. At the end of the week, ask students to discuss whether or not they have seen any pattern in the wind directions.
3. Introduce known wind patterns like gradient wind, sea breeze and local wind effects and explain how these and other patterns affect the local environment.

DISCUSSION

1. Introduce the concepts of sunrise and sunset. Use the shadow created by the stick in the centre of the compass to create a sundial.
2. Use the flag at the top of the stick to illustrate wind direction. With the students, talk about why this is useful.
3. Discuss navigation as it pertains to wildlife. How do animals navigate? Why is it important that wildlife species have navigational capabilities?

TIP: Discuss the concept of migration. Refer to activity 2.2 Leatherback Turtle Migration Game for help.

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1.7: WHALE OF A TALE, PART ONE

Students draw a whale and then draw it to scale (full size) on the ground using chalk as an introduction to marine mammals and the concepts of chart scaling and depths.

KEY IDEAS

1. Learn that marine mammals come in all shapes and sizes, and get a visual perspective on one species of whale.

Skills: application, communication, cooperation, drawing, organization, teamwork
Duration: 25 minutes
Setting: indoors and outdoors
Materials: graph paper; street chalk

IN ADVANCE

Find an open concrete space (15 square metres if possible) with no road traffic and minimal foot traffic. Draw a grid with two rows and seven columns where each square is two by two metres.

ACTIVITY

AGE GROUP ALL

1. Introduce your students to the humpback whale or a similar species if there is one specific to your area that you would like to use.
2. Ask the students to draw a picture of this species on a piece of graph paper.
3. Divide students into 14 groups; give each group a number from one to 14.
4. Choose one of the whale drawings and overlay a grid that is two rows by seven columns. Make 14 photocopies of this drawing with this grid on it; give each group one copy.
5. Assign one "block" from the grid to each group and ask them to re-create their square on the corresponding block on the concrete outside. The result should be a humpback whale about 15 metres in size.

DISCUSSION

1. Hold up the original scale drawing and compare it to the larger drawing on the concrete. Discuss how large things can be represented accurately in a smaller format. This is called scale.
2. Name some aquatic mammals found in your area.
   - » What brings them to your area?
   - » Are they searching for food? A mate? Something else?
   - » How might our activities disturb them?
   - » How can we minimize our impact?

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1.8 WHALE OF A TALE, PART TWO

Checking the water depth is a natural part of being safe on the water.

KEY IDEAS

1. Learn how to measure the depth of a section of water and scale it down to a chart.

Skills: application, communication, cooperation, drawing, organization, teamwork
Duration: 15 minutes
Setting: outdoors
Materials: a weight and string for depth measurement

IN ADVANCE

Find a section of water to survey. Any body of water will do: puddle, stream, river, lake et cetera.

NOTE: Consider participating in an adopt-a-stream/river/lake/coast program as an extension to this activity. Flip to page 65 for more details.

ACTIVITY

AGE GROUP 10 years and up

1. Discuss with students what it means to:
   - » Scale down or take depth measurements of a body of water and transfer them to a chart.
   - » Scale up or transfer depths from a chart to the body of water.
2. Whether you are scaling up or down, you can use a cross-section of the body of water to show students a perspective that is easier to understand.
3. If scaling down:
   - » Divide your water into equal sections.
   - » Measure the depth at each station using a lead line, depth sounder or similar method. Record.
   - » Transfer the measurements to your chart.
   - » On graph paper, create a cross-section profile drawing of the water depth.
4. If scaling up:
   - » Refer to the first part of this activity for tips on scaling up.
   - » When you are at a known position on your detailed chart, check the depth with what is on the chart. Use this as your reference.
   - » Continue to check and cross-reference the depth of the water continuously using visual observations such as water colour and break waves. If possible, use a lead line or depth sounder.

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DISCUSSION

1. Match the new measurements on your chart with:
   - A detailed chart of the area. Are there any surprises?
   - Your cross-section drawing.
2. What depth of water does your boat or kayak need?
   - Where is it not safe to go?
   - Draw the contour line on your chart that delimits the area where your craft has enough water.
3. How does water depth influence wildlife and its distribution?
4. With older students:
   - Look at the depth contours on your chart. Discuss.
   - Does the tide affect the depth in any way? High water (HW)? Low water (LW)?
   - Explain the "rule of twelfths" (see page 9) and how it helps us to estimate water depth as it pertains to tides.
   - What other elements affect water depth? Consider flood waters, wind, atmospheric pressure, et cetera.

For resources to supplement this section:
http://cwf-fcf.org/en/explore-our-work/education/wild-about-sports/water.html#One

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SECTION TWO:

HOW DO HABITATS WORK?

2

ISTOCK

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HABITAT REQUIREMENTS

Like us, wildlife needs four basic things to make a home: food, water, shelter and space, all arranged just the way they like it. This is called habitat. If even one of these requirements is not met, an animal must migrate, or move on to a habitat that suits all four of their needs, or they may die.

1. Food. Every wildlife species has unique food requirements that change from season to season as they get older.
2. Water. Water is the basis for all life, and animals need it year-round. Animals get their water from sources like springs, marshes, creeks, swamps, rivers and lakes.
3. Shelter. Wild animals need shelter, or cover, to protect themselves from predators and bad weather. Trees, grasses, rock piles and hollows in trees are just some examples of shelters that animals rely on.
4. Space. Every wildlife species has unique space or territorial needs. A loon will defend up to 40 hectares of lake or wetland when nesting, but wood ducks and purple martins do not defend territories and may even share their nesting areas.

ACTIVITY

AGE GROUP ALL

1. There are various types of habitats, including the four pictured below. Other habitat types can be found on the Great Lakes and by the sea coasts.
   - What types of habitat do you see in your water area?
   - What types of wildlife are specific to this habitat?

FRESHWATER - LENTIC

THINKSTOCK

FRESHWATER - LOTIC

THINKSTOCK

SALTWATER - SANDY SHORE

THINKSTOCK

SALTWATER - ROCKY SHORE

THINKSTOCK

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ECOSYSTEM AND HABITAT

ECOSYSTEM AND HABITAT

An **ecosystem** is a natural community of living (biotic) organisms and non-living (abiotic) elements. Living organisms, like plants, animals, fungi and bacteria, and the non-living environment, including land, water, temperature and air, interact and influence each other to operate as a whole system. An example of an ecosystem could be a rain forest, a frog pond or even a schoolyard.

Depending on your perspective, an ecosystem can be as big as a planet or as small as the palm of your hand. A tall-grass prairie or a rain forest is an ecosystem. Even your skin is an ecosystem; it has biotic elements (microscopic creatures like fungi, bacteria and mites) that depend on each other, along with the abiotic elements needed to survive. Other examples of ecosystems are mountains, swamps, meadows and the Arctic tundra. The biggest of all is the ecosphere. It includes the surface of the planet, the atmosphere, the continents, the oceans and all life on Earth.

Is an ecosystem the same as wildlife habitat? Not exactly. When speaking about an ecosystem, we are really concerned with the living and non-living elements of a natural community and how they interact. Wildlife habitat, in contrast, fulfils the needs of a certain species and is just one segment of an ecosystem.

Habitat is where an animal, plant or any other organism lives in nature. It must provide the organism with the things it needs – food, water, shelter and adequate space arranged in a way that is just right to support that particular species. Different habitats are often distinguishable from each other – but not always. Examples of habitat include leaf litter in a garden where insects and soil invertebrates live, a section of mountainous old-growth forest that supports American martens, sinuous marshlands by water for nesting ducks or a field of wildflowers near a bumblebee nest.

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FRESHWATER AND SALTWATER SPECIES

Here are some examples of the kinds of animals that you might find in freshwater and saltwater. Please note that this is not a comprehensive list. To best learn about the animals in your area, borrow some field guides from your library, consult a local naturalist group or check out some reliable web sources. For a list of some helpful web resources visit CWFWildAboutSports.org or search government and university websites.

Freshwater species:

- Water birds: loons, grebes, ducks, geese, herons, egrets, kingfishers
- Mammals: beaver, muskrat, mink, river otter, star-nosed mole, water shrew, moose
- Reptiles: painted turtles, spotted turtles, spiny softshell turtles, snapping turtles, water snakes
- Amphibians: green frogs, leopard frogs, tree frogs, spotted salamanders, red-backed salamanders
- Fish: bass, perch, pike, sunfish, shiners, minnows, catfishes, suckers, trout, sticklebacks, pickerel, whitefish
- Invertebrates: dragonflies, mosquitoes, mayflies, caddisflies, stoneflies, blackflies, beetles, crayfish, snails, clams, mussels, worms, leeches.


TED BUSBY


THINKSTOCK


THINKSTOCK


U.S. FISH AND WILDLIFE SERVICE, VIA WIKIMEDIA COMMONS


MEGAN LORENZ


THINKSTOCK


ANDREW ZANELLO


DEREK BISSELL

Saltwater species:

- Sea birds/Pelagic birds: albatrosses, fulmars, shearwaters, puffins, murres, gannets
- Marine mammals: polar bears, otters, seals, walruses, baleen whales, sperm whales, beaked whales, belugas, narwhals, ocean dolphins, porpoises
- Marine reptiles: leatherback sea turtles, loggerhead sea turtles, green sea turtles, kemp's ridley sea turtles
- Fish: sharks, sablefish, gunnel, sculpin, flounder, seabass, starsnout, ronquil, skate, eelpout, angler fish, viperfish, warbonnet, sole, herring, hagfish, cod, greenling, halibut, snailfish, flounder, poacher, rockfish, swordfish, herring, alewife, smelt, goosefish, haddock, pollock, mackerel, tuna
- Invertebrates: sponges, anemones, corals, jellyfish, marine worms, oysters, clams, snails, octopus, squid, shrimp, lobster, crabs, krill, barnacles, sea stars, sea urchins, sea cucumbers.

Freshwater and saltwater fish (diadromous fish):

- salmon
- smelt
- eel
- Sturgeon


CANADIAN WILDLIFE FEDERATION, OTTAWA RIVER EEL PROJECT


THINKSTOCK

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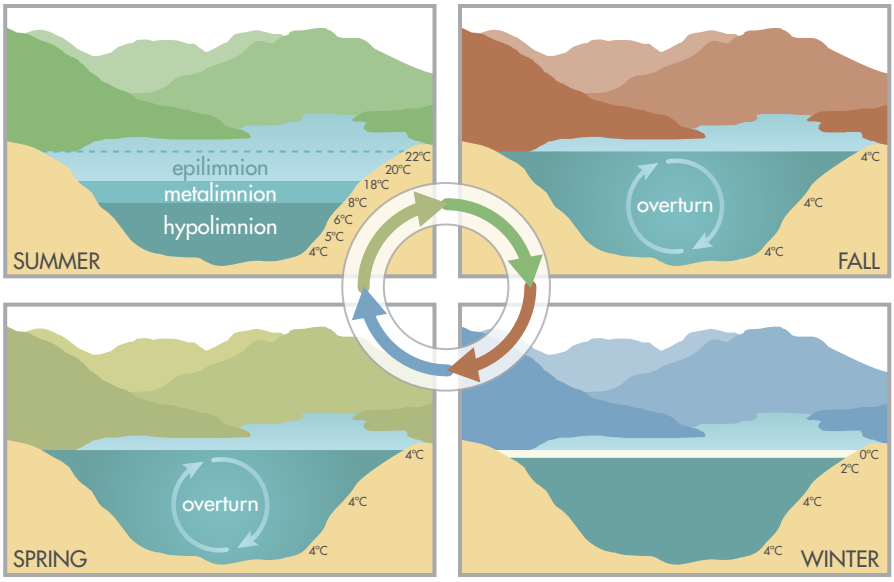
FRESHWATER ECOSYSTEMS

- Wetlands are areas where the land is saturated with water. Water covers the land area to create a shallow wetland habitat for at least a part of the year. Different types of wetland ecosystems include swamps, marshes, bogs, fens and shallow open waters.
- Streams and rivers with flowing water are lotic ecosystems. The movements of nutrients in this system depend on the movement of water as it moves downstream.
- Lakes and ponds are called lentic ecosystems; they are contained within a basin. Nutrient and energy flow in these types of systems stays mostly within the boundaries of the lake or pond, though it is strongly influenced by the surrounding area.

LAYERS IN A LAKE

The temperature of water in a deep lake greatly affects the structure of the lake. It also influences how nutrients, gases (like oxygen), plants and animals move within the lake. Because the heat from the sun and seasonal winds play a big role in water temperature, the water temperature profile changes with the seasons. This is illustrated in the diagram on the right.



Summer Layering
Cold water has a higher density than hot water, so cold water stays at the bottom of a lake (this is the hypolimnion layer), and the warmer water sits on top (called the epilimnion layer). In between is a third layer (the metalimnion), where the warmer and cooler water meet and mix. These three layers represent a temperature profile and make up the structure of a lake in summer.

Fall Turnover
As the heat from the sun decreases and more heat is released from the lake at night, the layered temperature profile from summer begins to break down. The natural movement of the water and wind play a role in this as well.

The top (warm) layer begins to cool, and its depth increases until there is very little difference in temperature between the top (epilimnion) and bottom (hypolimnion) layer. All it takes is a strong wind late in the season to mix these layers, giving the lake an even temperature from top to bottom.

Winter Layering
When temperatures drop below zero degrees Celsius, a layer of ice develops on the lake surface that insulates the water beneath and prevents winds from further cooling and mixing the water. Because of the unique chemical properties of water, the temperature profile of a lake is the opposite of what it looked like in summer. The top layer of the lake is ice, the coolest layer. Below the ice, the temperature increases slightly with depth. The bottom of a lake typically remains around four degrees Celsius.

Spring Turnover
As temperatures grow warm in spring, the ice melts and winds mix these cool waters into the lake. The heat from the sun grows stronger and warms the surface water. Eventually, the cool water settles at the bottom of the lake and warmer waters sit on top until the temperature profile looks like it did the past summer.

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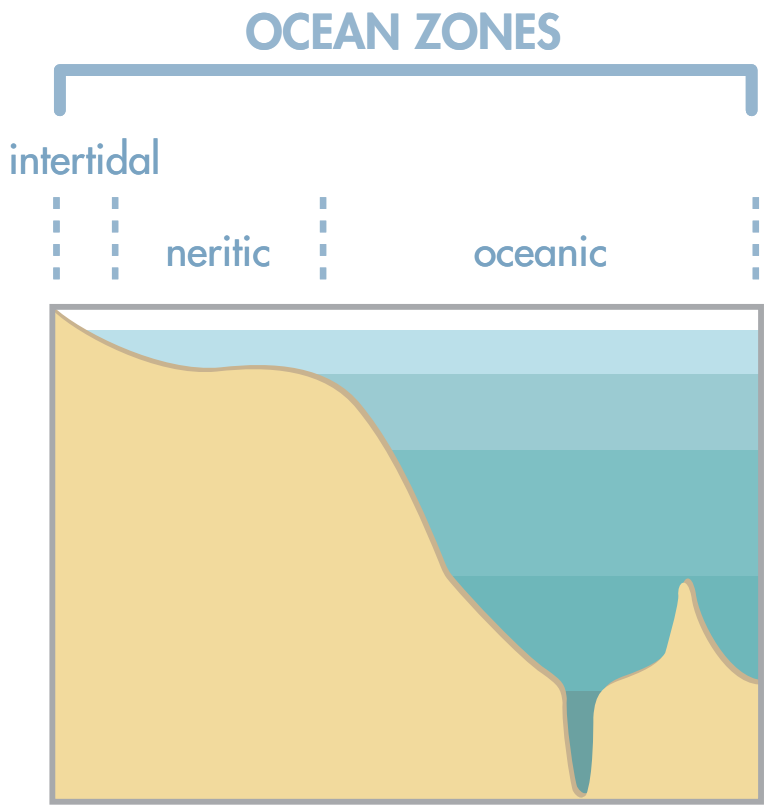
SALTWATER ECOSYSTEMS



OCEAN ZONES

Intertidal Zone

This is the area where land and sea meet: the area between high tide and low tide. Some examples of intertidal ecosystems include rocky shores, sandy shores, mudflats, estuaries and tidal marshes. Many animals and plants in these areas have to be able to withstand a variety of conditions. They may need to deal with flooding, wave action and periods of exposure to air.

Neritic Zone

This is a fairly shallow zone that extends along the continental shelf. A lot of sunlight reaches this zone, which is the perfect environment for primary producers like phytoplankton, so the neritic zone is often an area with a diversity of marine wildlife. A good example of an ecosystem here is coral reefs.

Oceanic Zone

This is the area of open ocean found beyond the continental shelf, where the ocean floor is very deep.

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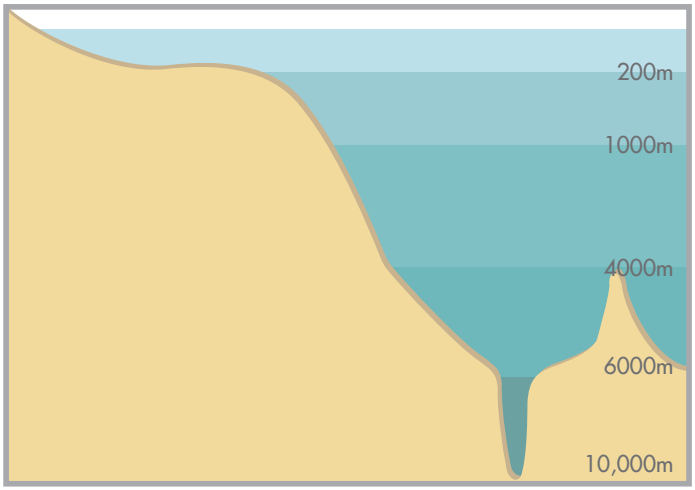
LAYERS IN AN OCEAN

Scientists divide the open water in the oceanic zone into five main layers, or zones. Each of these zones has different levels of light, pressure and temperature. Because of these differences, specific kinds of marine animals live within these layers.



OCEAN LAYERS

The **sunlight zone** (epipelagic zone) is the top 200 metres of the ocean surface. Sunlight reaches this zone very well, allowing primary producers, like phytoplankton, to thrive here. It is typically the warmest layer, though this can vary with the seasons and where you are in the world.

The next layer, the **twilight zone** (mesopelagic zone), reaches 1,000 metres and receives too little sunlight for photosynthesis to happen – plants cannot grow in this zone. The temperature is fairly cold in this zone and does not change with the seasons. The animals found in this zone have special adaptations to deal with living in near-darkness. Some, for example, have large eyes that can better capture the small amount of light that reaches this zone. Some very unusual fishes live in the twilight zone.

There are three zones below 1,000 metres. We know very little about these parts of the ocean because it is so difficult for humans (and machines) to reach these areas.

The **midnight zone** (bathypelagic zone) reaches depths of 4,000 metres. This zone receives no sunlight, is very cold and experiences a great amount of pressure. Despite these conditions, we know that many animals live here. Animals in this zone create their own light with their bodies (bioluminescence). Many of them are black or red in colour because there is no sunlight.

The **abyss zone** (abyssopelagic zone) extends from 4,000 metres to 6,000 metres below the surface. Here there is no light and temperatures are just above freezing. Not many creatures can live here, but some squids and fish do.

The **trench zone** (hadalpelagic zone) extends beyond 6,000 metres to the depths of the deepest trenches and canyons. Again, the temperature here is a touch above freezing. Sea stars and marine worms are often found at these depths.

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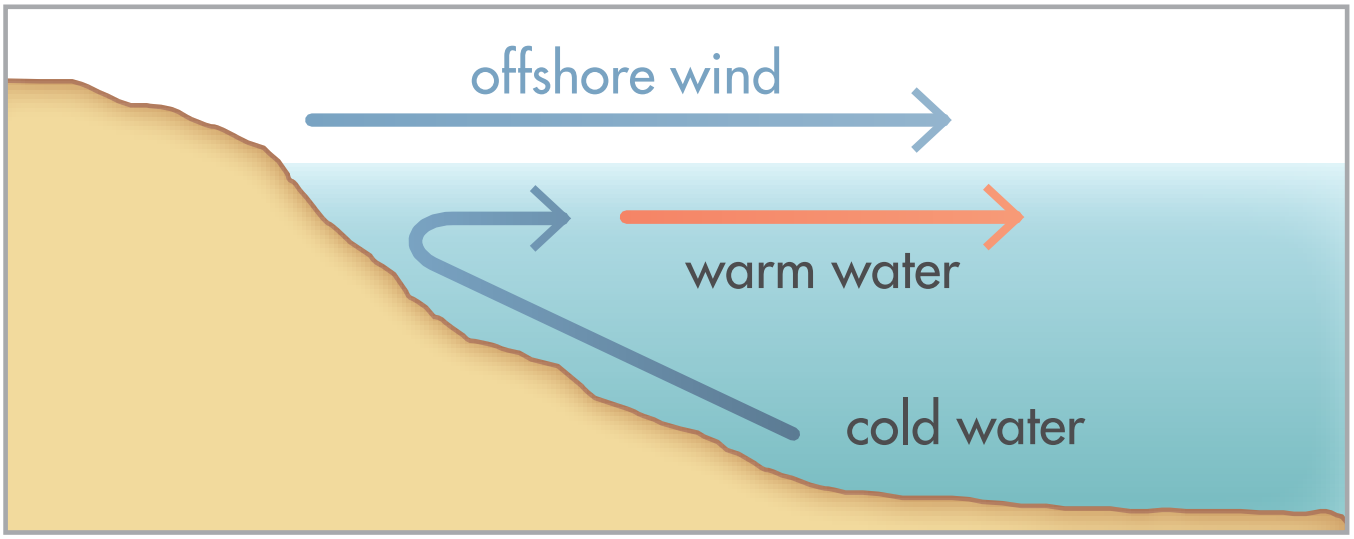
UPWELLING

Sometimes the top layers of the ocean mix because strong winds blow surface water parallel to the coast in a specific direction. If the conditions are right, cold, deep, nutrient-rich waters are forced upward and replace the warmer water that was pushed away by the wind. With nutrient-rich waters at the surface, seaweed can flourish and phytoplankton forms large groups called blooms. This creates an incredibly rich feeding opportunity for many marine mammals, fish and sea birds. In fact, many animals will travel great distances to feed at these upwelling sites.

NUTRIENT UPWELLING



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2.1: HABITAT HIP HOP GAME

Students play a simple game to show they are sharing spaces with wildlife.

KEY IDEAS

1. Wildlife shares the same space that we use for water sports and activities.
   - » Did you know that while you are on the water, you are sharing a place – the water – with many creatures and plants? They need that space to be healthy!
2. Like people, all wild animals have four main requirements that make up their natural home, or habitat. Those requirements are food, water, shelter and space, all arranged just right so they can survive.
   - » Food: Every wildlife species has unique food requirements.
   - » Water: Animals need water.
   - » Shelter: Animals need places that protect them from things like predators and bad weather.
   - » Space: Animals need enough space to live, breed and play.

If any one of these requirements is not met, an animal must leave an area in search of a new home. If there is no place to go, it may die.

Skills: analysis, discussion, generalization, group interaction, interpretation, psychomotor development
Duration: 20 minutes
Setting: outdoors
Materials: Popsicle sticks (two per student)

IN ADVANCE

You will need enough Popsicle sticks for each student to have two. To prepare, use a marker to mark half of the Popsicle sticks as "FOOD." Mark the second half of the Popsicle sticks as "WATER."

Choose a space where students can play safely. Hide Popsicle sticks in this area in a way that they will be easy to find. Choose a location to represent shelter within the play area – maybe the boat or canoe.

ACTIVITY

AGE GROUP ALL

1. Tell students that they will play a game where they pretend to be frogs.
2. Explain that you have hidden Popsicle sticks in the playing area.
   - » Their job is to hop around and collect as many as they can find.
3. Start the game.
   - » Let students hop around collecting sticks for ONE minute.
   - » Then, have students hop to their boat (or the spot you chose as a shelter).
4. Explain that wild animals such as frogs need a spot to live.
   - » Tell them that such a place is called their habitat, and that frogs, like animals and people, need four main things in their habitat: food, water, shelter and space.

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5. Tell students that their shelter represented a place they could hide for protection.
6. Tell students that their space was how much space they had to move around in while they looked for Popsicle sticks. How would this work if there were even more students running around? There would be too many frogs and not enough Popsicle sticks!
7. Explain that the Popsicle sticks represent food and water. Ask students if they each have a food and water stick.
   - » Those who have at least one of each survived! They got enough resources.
   - » Those who only have one or fewer Popsicle sticks did not survive.
8. Redistribute the sticks and try another round. This time ask a few students to play predators instead of frogs. Each predator should try to "tag" one frog. Tagged frogs will be escorted by their captors to the side of the playing field.
   - » What happened? Were Popsicle sticks easier to find? More difficult? Why was this the case?

?

DISCUSSION

1. What are the four habitat requirements a frog must have to survive?
2. What effect did the addition of predators have on the frog population?
   - » What effect might too many predators have on a population?
   - » How about not enough predators?
3. What are some other elements that can affect wildlife populations?
4. Are the requirements the same for all animals?
5. Are the requirements the same for human beings?
6. What might happen to the water in the area if there were an oil leak from a boat?
7. What could happen to frogs if the water becomes polluted?
8. What other wild animals live in your water area?

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FOOD CHAINS AND FOOD WEBS

Food provides energy and nutrition to people and animals. This is why we must eat to survive. A food chain shows who eats who, and in what order. It traces the flow of energy and nutrition as one organism eats another. A food web is similar, but it represents many food chains linked together. It shows all the interactions between many organisms in an ecosystem and paints a more accurate picture of what happens in nature.

The trophic level describes a plant or animal's position in the food chain:

TROPHIC LEVEL 1

Primary producers, also called **autotrophs**, are organisms that can produce their own food without having to eat another plant or animal. Most autotrophs get the food they need through photosynthesis (the process through which an autotroph makes its own energy by using carbon dioxide and water to create sugar using energy from the sun).

- Examples of autotrophs include terrestrial plants, algae and phytoplankton (microscopic plants that live in water bodies).

TROPHIC LEVEL 2

Primary consumers are **herbivores** that eat plants, algae and other autotrophs.

- Examples of primary consumers include rabbits and deer that eat soft plants, shrubs and trees; many species of fish, like minnows, that feed on phytoplankton, algae or sea plants; muskox; moose; and green sea turtles.

*NOTE: **Consumers** are organisms that must eat another living creature, plant or animal to survive. Consumers can be herbivores (eat plants), omnivores (eat both plants and animals) or carnivores (mainly eat other animals).*

TROPHIC LEVEL 3

Secondary consumers are animals that eat herbivores.

- Examples of secondary consumers might be a shrew that eats a grasshopper, which eats grass; a mink that eats a muskrat, which eats aquatic vegetation; some snakes; some hawks; and otters.

TROPHIC LEVEL 4

Tertiary consumers eat secondary consumers. For example, a seal that eats a fish, which eats smaller fish, which eat algae, or a great horned owl that eats a mink, which eats a muskrat, which eats aquatic vegetation, are tertiary consumers. Other examples are coyotes, pikes and anglerfish.

Top predators, or **apex predators**, eat other animals and generally do not have enemies in the wild (aside from humans). Examples of apex predators include bob cats, polar bears and great white sharks.

When organisms die, detritivores and decomposers are very important. **Detritivores** eat non-living plant and animal remains and animal waste (poo!). Examples of detritivores are earthworms, dung beetles, sea cucumbers and scavengers (whose diet includes dead animals) like vultures and raccoons. The little bits of matter that the detritivores leave behind will be eaten by the decomposers. **Decomposers**, such as bacteria and fungi, transform dead living matter into non-living nutrients, which return to the soil or ocean for use by primary producers on trophic level 1 – completing the cycle!

A food web can have several producers and many consumers from each trophic level. Some consumers may even belong to more than one trophic level. To better understand this, study the arrows on the diagram provided.

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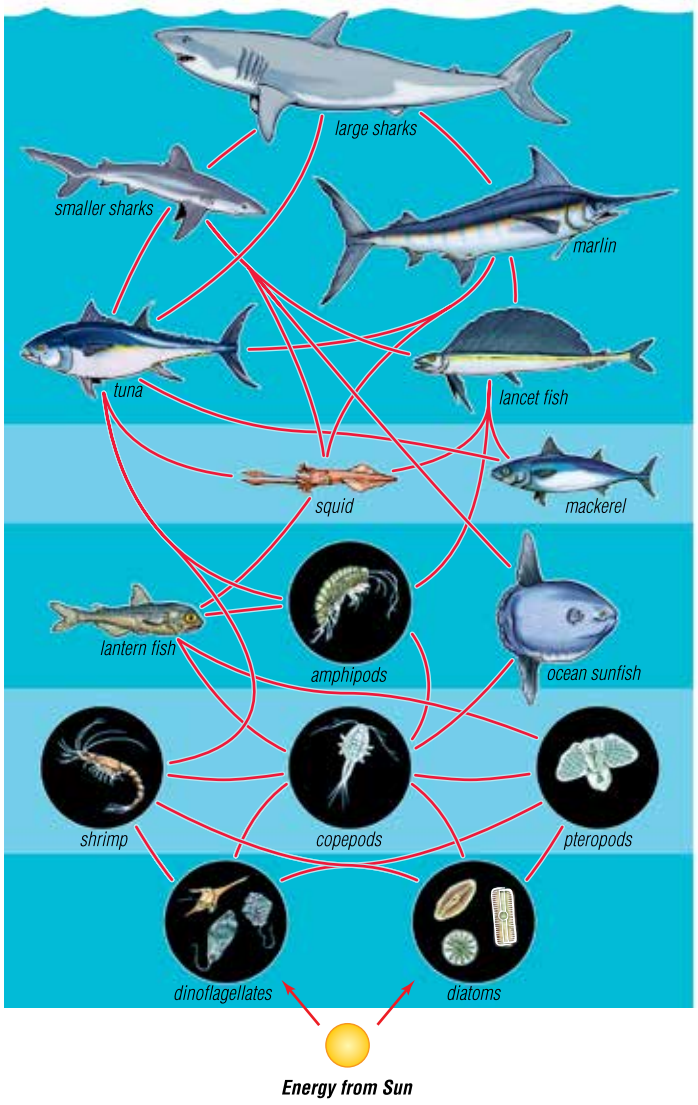
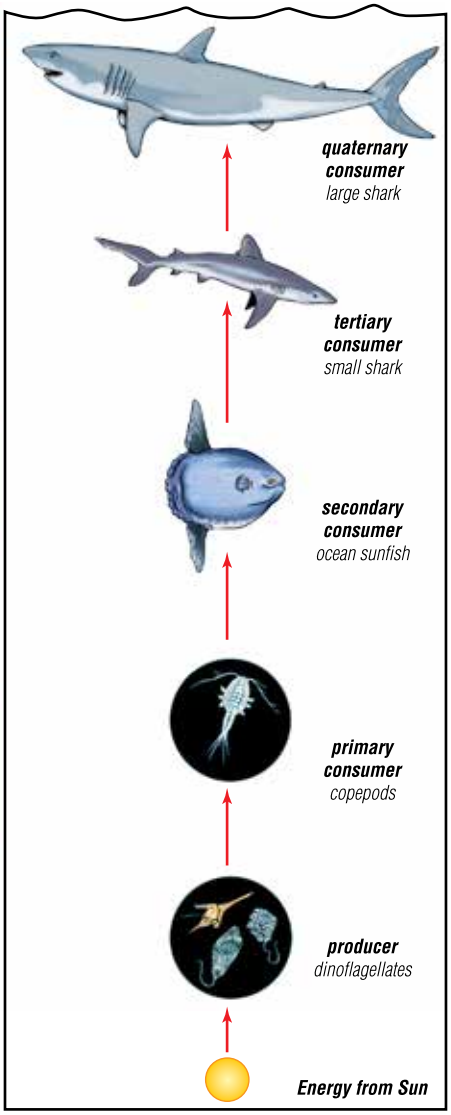
FOOD WEB



FOOD CHAIN



ACTIVITY

AGE GROUP ALL

1. Now that you have been introduced to the food chain, look at the illustration on the next page. Can you see some examples of the food chain in action?

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ILLUSTRATION: ASTRID COLTON

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MIGRATION

Migration is the seasonal movement of a population of animals from one area to another. It is usually a response to changes in temperature, food supply or the amount of daylight available. Everywhere, from the Arctic to Antarctica, finned, furred, fanged, and feathered travellers are on the go.

Countless species of birds, mammals, reptiles, amphibians, fish and invertebrates (spineless animals) migrate: woodland caribou by land, green darner dragonflies by air, northern bottlenosed whales by sea, yellow walleyes upriver, speckled trout downstream, muskoxen uphill, bighorn sheep down dale, garter snakes out of hibernacula and bull frogs into marsh bottoms.

We often think of migrations as seasonal events, but they can also occur daily. For example, some fish and zooplankton that live in deeper, darker depths of an ocean or lake will migrate upward in the water column at night to feed where the food supply is rich and the risk of being spotted by a predator is reduced. This daily movement is called diurnal, or diel, migration.

Shrinking food supplies, shifting winds, dwindling daylight, falling temperatures or the start of a particular stage in life are all examples of cues that give migrants the instinctive urge to take flight, make tracks or go to sea.

Different animals navigate their migrations in many different ways. Some use the position of the sun and stars; others use landmarks, such as mountains, rivers and coasts. Some use chemical cues – for example, salmon use the "smells" of familiar rivers. Others can sense and use the magnetic field of the earth, just like a compass. And there are still many animal migrations that scientists do no fully understand, like that of the leatherback turtle.

All wildlife needs healthy habitat, a place with suitable food, water, shelter and space (see page 20 for more on this). Animals that migrate need several habitats. They may breed in one habitat in summer, spend the winter in another and migrate along specific routes in spring and fall. These specific routes are sometimes called corridors; these are a chain of habitats for feeding and resting during a trip. These habitats might include wetlands, wooded wind-breaks, sandy beaches, abandoned railway lines or other habitats, depending on the species migrating.

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2.2: LEATHERBACK TURTLE MIGRATION GAME

Many aquatic animals move across great distances to feed or breed. This quick and lively game simulates that journey.

KEY IDEAS

1. Migration is the seasonal movement of a population of animals from one area to another. It is usually a response to changes in temperature, food supply or the amount of daylight available. Leatherback turtles are one example of a migratory species. They can travel an amazing 6,000 kilometres between the Atlantic and Pacific Oceans, and they make this long journey twice a year!
   - This game will increase understanding of the basic definition of migration, and of the difficulties that some species can face as a result of human activity.

Skills: analysis, discussion, group interaction, kinaesthetic concept development, psychomotor development, research
Duration: 20 minutes
Setting: outdoors
Materials: none

ACTIVITY

AGE GROUP ALL

1. Choose a playing field. Tell the students that they will now pretend to be leatherback turtles. One side of the field is where they live in the winter and the other side is where they go in the spring to lay their eggs.
2. Line the students up in their winter home zone. When you shout "migrate," they should walk or run to the other side of the field.
3. Select two students from the group to stand in the middle of the field. When you shout "migrate" this time, those two students will act as obstacles (e.g., pollution, fishing gear, ships, et cetera) and try to tag the others as they return to the wintering area.

DISCUSSION

1. Why do the leatherback turtles migrate?
2. Ask the students how they felt about being tagged on their way home.
3. Discuss examples of dangers that real leatherback turtles face in the ocean, such as:
   - Eating plastic floating in the water.
   - Eating food that is contaminated by plastic and other pollutants.
   - Becoming entangled in fishing gear.
   - Being hit by ships.

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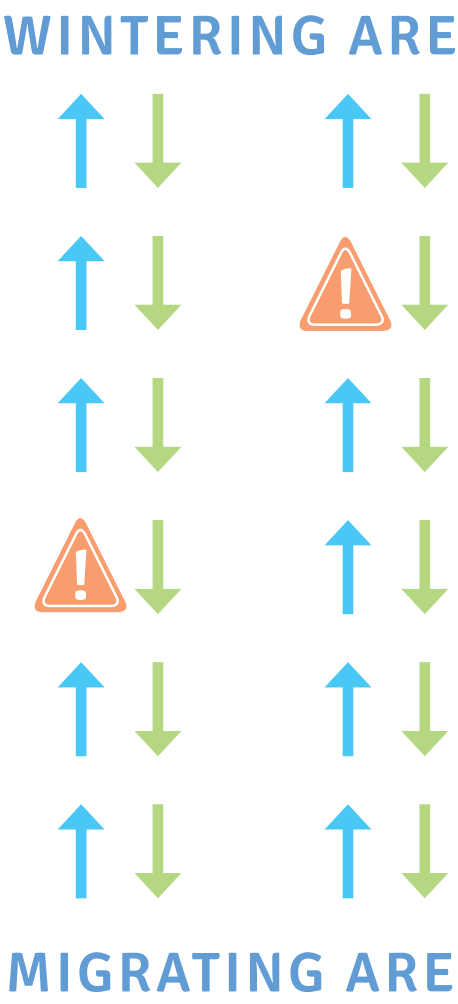
ACTIVITY

AGE GROUP 9 years and up

Leatherbacks undertake the longest migrations between breeding and feeding areas of any sea turtle, averaging 3,700 miles (6,000 kilometres) each way. After mating at sea, females come ashore during the breeding season to nest. The nighttime ritual involves making a hole in the sand, depositing around 80 eggs, filling the nest, leaving a large disturbed area of sand that makes detection by predators difficult and, finally, returning to the sea.



ISTOCK

DISCUSSION

1. Can you find out even more information about turtles? Try watching our **Leatherback Turtles webinar** or reading our **Great Canadian Turtle Race** resources.
2. Do any species migrate to, from or through your water area?
3. If yes, where are they going to or coming from?

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INVASIVE SPECIES

Invasive species are a big threat to wildlife habitat, biodiversity and the web of life. They can be plants, animals, fish, birds, reptiles, amphibians, invertebrates or even diseases. Often invasive species are also called alien species, but there is a distinction. Alien species are organisms that do not naturally occur in an area. Alien species are not always disruptive, but when they do disturb natural ecosystems and compete for resources with our native flora and fauna, they are problematic and are then considered invasive species.

Invasive species become super-abundant in an area (on land or in water) and begin to negatively affect other organisms, even eliminating some. This results in a loss of biodiversity and a changed ecosystem. An alien species can become invasive because it has no predators, parasites, diseases or competitors in the environment.

Invasive species can be introduced legally or illegally, intentionally or accidentally. For instance, purple loosestrife was intentionally introduced from Europe during the 1800s as an ornamental garden plant, and zebra mussels were accidentally introduced from the ballast water of ships.

EURASIAN WATER MILFOIL

ZEBRA MUSSELS

SEA LAMPREY

ROUND GOBY

RUSTY CRAYFISH

JAPANESE SKELETON SHRIMP

PHOTOS: FUNGUS GUY, VIA WIKIMEDIA COMMONS; ISTOCK; U.S. FISH AND WILDLIFE SERVICE; PETER VAN DER SLUIJS, VIA WIKIMEDIA COMMONS; CGOLDSMITH1, VIA WIKIMEDIA COMMONS; © HANS HILLEWAERT / CC-BY-SA-3.0, VIA WIKIMEDIA COMMONS

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Examples of problematic aquatic invasive species in Canada:

CATEGORY	COMMON NAME	INVASIVE TO	ORIGINALLY CAME FROM
FISHES	Sea lamprey	Great Lakes	Atlantic Ocean
	Round goby	Great Lakes	Europe and Asia
	Small mouth bass	British Columbia	Eastern central North America
CRUSTACEANS	Green crabs	Atlantic and Pacific coasts	Europe, North Africa
	Rusty crayfish	Fresh waters of Ontario and spreading	Ohio Basin River (USA)
	Japanese skeleton shrimp	Bay of Fundy and Gulf of St. Lawrence in Prince Edward Island	Eastern Asian
MOLLUSKS	Zebra mussels	Great lakes and inland waterways across Canada	Europe and Asia
TUNICATES (TYPE OF IN-VERTEBRATE)	Clubbed tunicate	Gulf of St. Lawrence in Prince Edward Island	Western Pacific Ocean
	Vase tunicate	Nova Scotia and Prince Edward Island	Northern Europe
	European sea squirt	Nova Scotia	Europe
PLANTS	Oyster thief	Nova Scotia, Gulf of St. Lawrence	Japan
	Eurasian water milfoil	Great Lakes, St. Lawrence, many inland lakes, British Columbia	Europe, Asia, North Africa
	Didymo	Vancouver Island and other areas in British Columbia	Northern North America and Europe

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2.3: INVASIVE WILDLIFE GAME

This lively game will introduce the students to invasive species, specifically the zebra mussel.

KEY IDEAS

1. Every species, or type of living thing, has a place on Earth where it belongs – a place where it lives and grows naturally. Sometimes, humans bring a species to a new place, either on purpose or by mistake. These living things might not hurt their new living space. If they do, however, they are called invasive species.
   - » One example of an invasive species is the zebra mussel. They were brought to the Great Lakes of Canada on large boats from overseas, and since then they have been clogging water pipes, eating large quantities of plankton (tiny organisms floating in the water), and taking over the areas where fish lay their eggs. They are very harmful to the native species in the area – that is, the types of plants and animals that normally live there.

Skills: generalization, kinaesthetic concept development
Duration: 15 minutes
Setting: outside
Materials: none

ACTIVITY

AGE GROUP ALL

1. Play a game of tag, but instead of being "it," one student is a zebra mussel, and the rest of the students are native species. Any students that the "zebra mussel" tags will become zebra mussels and hold hands with their fellow zebra mussels to chase the remaining "native species." This continues until all the students become zebra mussels.

DISCUSSION

1. Discuss with students that just like in the game they played, invasive species are taking up the food, water, shelter and space that native species need to survive.
2. Why must we clean and wash our equipment before changing lakes?
3. Why do we not empty bait buckets or aquarium species into rivers and lakes?

ACTIVITY

AGE GROUP 9 years and up

1. Investigate some ways to help curb the spread of invasive species.
2. Do a bit of light investigating. Has an invasive species ever caused a problem in your area?

For resources to supplement this section:
http://cwf-fcf.org/en/explore-our-work/education/wild-about-sports/water.html#Two

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SECTION THREE:

WHAT IS MY CONNECTION TO WATER?

3

ISTOCK

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3.1: FOLLOWING WATER'S PATH

Many people use positive visualization to help improve their performance in sports or in life. Like the world around us, we are made up of a lot of water. In fact, 75 per cent of your body is water. We all play a natural part in the water cycle.

KEY IDEAS

1. Visualization can help link ideas in our mind with more tangible plans and goals.
2. Visualization in the context of a water droplet in the water cycle will help students understand the ripple effects of their actions, particularly regarding their treatment of water.

Skills: creativity, description, discipline, listening, personal and social values, visualization
Duration: 10 minutes
Setting: indoors or outdoors
Materials: none

IN ADVANCE

Identify a quiet place, ideally close to the water, where the group can spread out and focus on the day's goals without interruption.

ACTIVITY

AGE GROUP ALL

1. Students should sit down or lie comfortably on the floor or ground, close their eyes and listen.
2. Outline the objective(s) for the day.
3. Ask the students to quietly imagine a drop of water falling from the sky.
   - » Where does it land?
   - » Where does it end up?
   - » Will it stay there forever?
4. Ask the students to picture themselves encountering that water drop as it travels.
   - » Where is it going?
   - » Where is the student going?
5. Finally, ask the students to consider their own personal objectives:
   - » For the day
   - » For their lives
6. Ask the students to open their eyes and slowly get up.
7. Start the day with great energy and focus!

DISCUSSION

1. Why might this kind of activity be effective?
2. Why compare our own movements to the movements of water? Is this effective?
3. When might an activity like this be useful in everyday life?

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3.2: WATER GIVES US GIFTS

It is important for us to be aware of all of the wonderful things we get from water.

KEY IDEAS

1. Whether you live next to the ocean or far away from it, you are still connected to it. All inland water – lakes, streams, rivers and even puddles created by falling rain or snow eventually drain into the world's oceans.
   - » People get many great products and experiences from water. Since all water eventually makes its way to the ocean, it is important for us to understand that everything we do has an impact.

Skills: analysis, brainstorming, communication, critical thinking, discussion, group interaction, listing, personal and social values
Duration: 10 minutes
Setting: indoors or outdoors
Materials: none

ACTIVITY

AGE GROUP ALL

1. Ask students if they can think of anything that water gives them. Here are some examples to get the conversation going:
   - » Food (e.g., fish).
   - » Drinking water.
   - » Weather (the ocean affects the wind, rain and snow).
   - » Air (the ocean is part of a cycle that gives us the air we breathe).
   - » Recreation (swimming, surfing, sailing and much more).

DISCUSSION

1. Ask students to name some favourite products or experiences that they get from the ocean.

DID YOU KNOW: Every second breath you take comes from the ocean!

ACTIVITY

AGE GROUP ALL

1. Show students the watershed map on page 41.
2. Explain that if we throw litter on the ground or in the water it will eventually end up in the ocean.

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3.3: WATERSHEDS – FROM SINK TO SEA

A watershed is an area of land that all water flows across or through on its way to lakes, streams, rivers, wetlands and eventually the ocean. Everybody lives in a watershed.

KEY IDEAS

1. Water pollution – what happens when a lot of waste is added to a body of water – is getting worse. Since all water goes to the ocean, we are creating quite a mess!
   - » Everything that is rinsed down the sink, bathtub and toilet at home eventually ends up in the ocean by way of watersheds. This can hurt plants and animals living around or in the water.
   - » The majority of our waste water does go through a waste treatment plant, but this is an imperfect process that can leave behind residual pollutants such as heavy metals, et cetera.
   - » Rain and snowfall pick up pollutants – for example, fertilizers and pet waste – and carry them to streams, rivers and lakes. Streams and rivers are unfortunately ideal systems for carrying pollutants and loose litter straight to our lakes and oceans.
   - » Animals in the ocean are harmed when they mistake litter for food.

Skills: application, art and illustration, critical thinking, discussion, drawing, inference, kinaesthetic concept development, personal and social values, problem solving
Duration: 10 minutes
Setting: indoors or outdoors
Materials: paper; markers or crayons; safety scissors; tape

NOTE: Students from ages seven to 11 will need individual charts.

ACTIVITY

AGE GROUP ALL

1. Ask students to draw a picture of a fish. If desired, cut them out using safety scissors.
2. Find a sink (or other drain) in the club and tape the fish pictures next to it.
3. As you place the fish, explain that anything that is rinsed down this – and all – drains could eventually end up in the ocean and cause harm to animals and plants that live in the water!
4. Suggest that students make fish pictures and tape them up next to drains at home – with parental permission!

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ACTIVITY

AGE GROUP 7 years and up

1. Have students sit in a circle and close their eyes.
2. As they sit with eyes closed, ask them to picture a single drop of water falling onto the tip of a mountain. Now, ask students to consider these questions:
   - » Where did the water fall from?
   - » Where will it go?
3. Students can open their eyes.
4. Explain to the group what the water cycle is and how it works. Use the diagram on page 8 for reference.
5. Explain to the group what a watershed is and how it works. Use the map of Canada's watersheds on page 41 for reference. Keep your explanation simple, especially for ages seven to nine.
6. Have students draw ocean links on their own charts.

DISCUSSION

1. As a group, come up with some types of pollution that come from the land, such as house waste, road waste and industry and farm runoff.

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OCEAN PLASTICS

BIOACCUMULATION

concentration of pollutants increase as they move from environment to organism

plastic waste in our water

pollutants in water

plastics attract pollutants in water

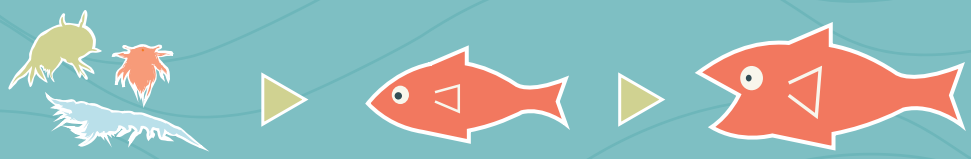
plastics break into smaller pieces

plankton eat plastics/pollutants

CONCENTRATION OF POLLUTANTS INCREASE

BIOMAGNIFICATION

concentration of pollutants increase as they move up the food chain



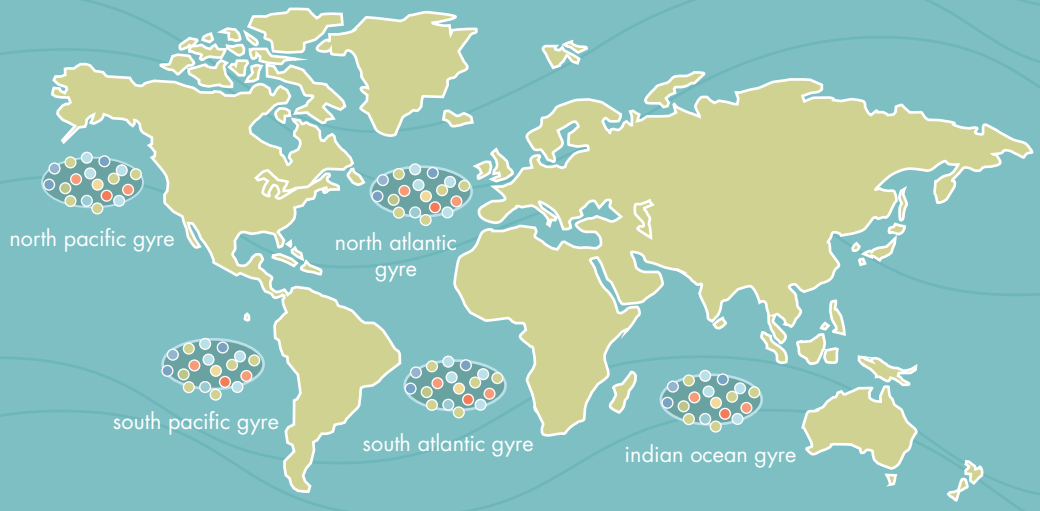
PLANKTON
(primary consumers)

SMALL FISH
(secondary consumers)

LARGE FISH
(tertiary consumers)

CONCENTRATION OF POLLUTANTS INCREASE

OCEAN GYRES



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PLASTICS IN THE OCEAN AND GREAT LAKES

Plastics are the most common types of marine debris. They are an issue in all major oceans and in some inland areas, such as the Great Lakes. Most plastics reach the ocean because they are not properly disposed of, but even plastic that is disposed of properly can find its way to the ocean because of accidents or careless handling. Trash from inland can travel by way of wind and water currents to our lakes and rivers, eventually reaching our oceans.

Plastics are human-made substances. There are no natural plastics and they do not readily biodegrade. It takes several hundreds of years for most plastics to break down. They break down into smaller and smaller pieces and eventually become so small that they are difficult to see or become microscopic. These tiny particles are called microplastics, and even though they are small they still effect wildlife. Many animals consume microplastics by mistake (because they are everywhere) or on purpose because they think they are a natural food, like fish eggs.

Plastics are especially dangerous when ingested because they attract pollutants that can affect human and animal health. They attract natural pollutants so effectively that certain chemicals, like polychlorinated biphenyls (PCBs - a chemical that is dangerous to the environment because it persists for a very long time) can accumulate in plastic materials from 100 000 to 1 000 000 times the levels that are found in ocean waters. When plastics with these pollutants are ingested by an organism, the concentrations of the pollutants further increase in the organism's body; this is called bioaccumulation.

Then, as one animal eats the next, the concentration of chemicals increases further by biomagnification, a process wherein the concentration of a chemical increases with each trophic level (see page xy for a review on food chains). This can be hazardous for any fish, marine mammal or bird that ingests these plastics and even more so for humans if they eat these animals.

Debris, including plastics in the ocean, often end up in a mass together. This is because ocean currents and strong winds push them to a common area, a gyre. A gyre is essentially a large-scale circular swirl of ocean current. The swirl allows garbage to accumulate altogether in one area, over time.

The great Pacific garbage patch is a popular example of an ocean gyre where trash has collected. It is difficult to estimate how large these trash vortexes are and how much plastic is in the patch. In fact, garbage patches are not visible trash islands as we may have come to think of them. They are largely made up of microplastics that cannot readily be seen.

Plastics in our oceans and the great lakes are problematic because they:

- Can entangle marine animals and cause injury, starvation, and suffocation – sometimes leading to death.
- Are often mistaken for food by fish and other marine animals. Ingesting plastics can cause internal problems (e.g. issues with digestion or starvation) sometimes leading to death. Sea turtles, for example, often mistake floating plastic bags for jellyfish.

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- Naturally attract pollutants that can affect human and animal health.
- Can transport alien species (see page 35 for more on alien and invasive species). Plastics and debris can provide surfaces that some species will stick to. Wind and ocean currents can transport these bits of debris to areas where these species are not native.
- Interfere with the beauty of the environment.
- Can transport alien species (see page 35 for more on alien and invasive species). Plastics and debris can provide surfaces that some species will stick to. Wind and ocean currents can transport these bits of debris to areas where these species are not native. Introduced species are problematic because they compete with native species for resources like food and space.

HOW TO REDUCE YOUR PLASTIC FOOTPRINT

What you can do:

- Remember that your actions on land affect our oceans, no matter where you live.
- When you are on the water, be conscious of the waste you are creating and be sure to bring it back to land with you.
- Participate in shoreline clean-ups or organize your own with family and friends. Visit **CWFWildAboutSports.org** to get started.
- Avoid using plastic – it is everywhere, but the less we use, the better off our oceans and our planet will be. Instead, try:
  - Carrying reusable bags instead of relying on plastic ones.
  - Using reusable mugs, water bottles and utensils.
- Avoid commercial body scrubs, face washes, toothpastes and other personal care items with micro-exfoliating beads. These are often tiny plastic beads have recently been found in significant amounts in the Great Lakes. Instead, look for natural exfoliating products on the market or make your own with ingredients from your kitchen.
- Choose products with minimal packaging.
- Reduce the amount of disposable items you use.
- Reuse and repurpose items before purchasing something new.
- Recycle your waste.
- Dispose of unwanted items appropriately.
- Where plastic cannot be avoided, put pressure on companies to produce safer plastics.
- Purchase safe, reuseable plastics if buying plastic water bottles or reuseable containers.
- Tell your family and friends about this issue and why you are concerned. Spreading the word is so important!

For resources to supplement this section:
http://cwf-fcf.org/en/explore-our-work/education/wild-about-sports/water.html#Three

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SECTION FOUR:
POSITIVE HUMAN ACTION

4

ISTOCK

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4.1: MY WILDLIFE-FRIENDLY PLAN

By learning and sharing best practices, young people can help take care of the Earth's water and the wildlife that depends on it for survival.

KEY IDEAS

1. Students will learn some basic best practices as they begin their lives on the water and understand that many kinds of wildlife live underneath the surface of the water.

Skills: brainstorming, communication, critical thinking, discussion, inference, listing, logic, personal and social values, problem solving, reporting, writing
Duration: 10 minutes
Setting: indoors or outdoors
Materials: a blank list for each student to draw or write in; Best Practices on and Around the Water for Youth on page 58.

ACTIVITY

AGE GROUP ALL

1. Talk to the students about wildlife – wild animals and plants. Just like humans, wildlife needs a safe, clean, healthy place to live. Remind students that there is a lot of wildlife living under the surface of the water.
2. Ask the students to suggest some best practices that would help them be environmentally friendly.
3. Write them on the board, complete the list together and print a copy for each student. Leave some lines blank for new ideas.
4. See Best Practices on and Around the Water for Youth.

DISCUSSION

1. Ask students to come up with one or more harmful effects that might come from ignoring best practices, such as:
   - Aquatic wildlife – animals and plants that live in the water – might mistake a floating plastic bag for a piece of food. If they eat it, it might make them choke!
   - Plastics and toxins that we put into the water will eventually end up in our own food.
2. How can we help others to maintain best practices with us?
   - Share your best practices lists with friends and family.
   - Encourage others at your club to help maintain a Clean Club Checklist (page 64).


JOHN PIZNIUR


JENNIFER DEEKS


LISE GAGNE

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4.2: LITTER PATROL

Many Canadians love to go to the lake and enjoy water sports, from sailing to fishing to water skiing. It is important to remember that if we are not careful, water sports can harm the environment.

KEY IDEAS


ISTOCK

1. Litter can harm wildlife, including wild plants and animals living on or under the surface of the water. It is important that we do not throw things in the water.
2. Noise can disturb wildlife. For example, birds might get startled by loud boats and fly away, leaving their eggs alone and unprotected.
3. Invasive species – a plant or animal that was brought to the area by humans but would not normally be found there – can disrupt the plants and animals that were already there.
4. Pollution caused by powerboats (boats with gas-fuelled engines) can have a negative effect on aquatic wildlife when not used carefully.

Skills: analysis, application, cooperation, discipline, discussion, examination, kinaesthetic concept development, observation, personal and social values, problem solving, reporting
Duration: 10 minutes
Setting: outdoors
Materials: none

ACTIVITY

AGE GROUP ALL

1. Bring students on a "litter tour" of the local area. Talk about what you find – what it is and where it might have come from.
2. If desired, the instructor can collect and safely dispose of litter as it is found.

   NOTE: Be sure to wear gloves and avoid – and report – any litter that could be harmful.

DISCUSSION

1. Is the beach or shore clean? If not, what was found?
2. Is there litter in the water? Is it a healthy colour? Brown is often a healthy colour for water.

ACTIVITY

AGE GROUP 7 years and up

1. Fill in the Clean Club Checklist and post it for all to see in the club (see page 64).
2. Organize a clean-up of the local area. Invite family, friends and members of the community.
3. Develop a Plastic Footprint Offset program at your club.

   NOTE: Everyone should wear gloves, and young students must be supervised.

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4.3: ASSESSING WATER'S HEALTH

This is a hands-on activity loosely adapted from methods that scientists use to evaluate stream health by examining which animal species are present or absent. If desired, students can travel by water to get to an appropriate sample site.

KEY IDEAS

1. The health of a stream can be assessed by examining the types and variety of organisms at different points along the stream.
2. Macroinvertebrates are animals without a backbone that are easily seen with the naked eye. They are often used as bioindicators to assess stream health.
3. Biological indicators, or bioindicators, are species used to monitor the health of an ecosystem. They can give scientists important information about pollutants in that system that might otherwise be difficult to assess.

   NOTE: Pollution tolerance of some major groups of stream macroinvertebrates (these are very general) can vary depending where you live. For more specific information, check ***CWFWildAboutSports.org***

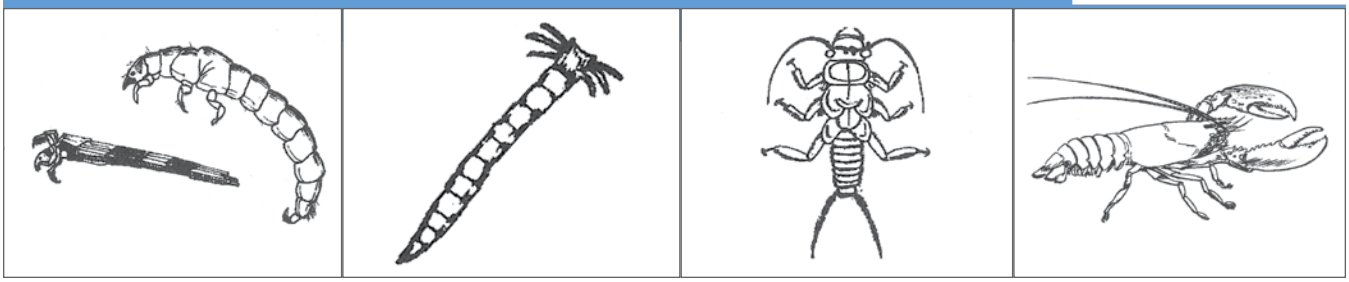
   - *Low tolerance: stoneflies, mayflies, caddisflies, dobsonflies, craneflies, beetles.*
   - *Medium tolerance: black flies, midges, dragonflies, crayfish, scuds.*
   - *High tolerance: some damselflies, aquatic sowbugs, snails, aquatic worms, leeches.*

Skills: analysis, application, classification, comparison, cooperation, description, drawing, examination, identification, kinaesthetic concept development, observation, reporting
Duration: 25 minutes
Setting: outdoors
Materials: field guides for stream animals in your area; identification manuals on macroinvertebrates; nets for sampling; sieves; buckets of all sizes; white-bottomed trays; magnifying glasses or lenses

IN ADVANCE

Gather supplies. For a list of excellent macroinvertebrate identification sources, visit **CWFWildAboutSports.org**.

THESE ARE JUST A FEW EXAMPLES OF COMMON BENTHIC INVERTEBRATES.



CADDISFLY LARVAE | CRANEFLY LARVAE | STONEFLY NYMPH | CRAYFISH

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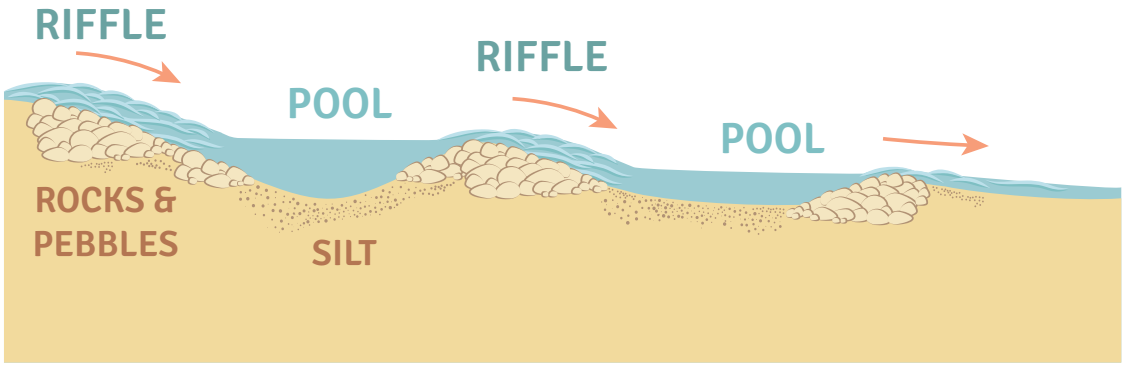
ACTIVITY

AGE GROUP ALL

1. Have students begin to fill in data sheet with date, time, name of the river, location, weather conditions, and visibility of the water.
2. Students should note any wildlife they see nearby or in the stream before they begin to sample macroinvertebrates.
3. To sample macroinvertebrates, choose a riffle (an area with a bit of turbulence that leads to a pool of water below) and approach it from downstream. Plant your net at the base of the riffle.

   NOTE: Riffles tend to have a greater variety of organisms, making them a good sample site.



4. Collect the sample by picking up the rocks from the area in front of the net and gently rubbing the rocks in front of the net, beneath the water. Use the stream flow to help capture your samples. If possible, sift through the substrate beneath the rocks as well.
5. Put the rocks back as they were and put samples in a bucket of cool water in the shade.
6. Repeat this procedure until you have a good variety of invertebrates.
7. Sort your samples in the white trays or buckets.
8. Younger students may wish to draw the collected invertebrates on their data sheets.
9. Older children can try to place similar organisms together and learn the major groups of stream invertebrates. As a group, use field guides and identification manuals to classify the organisms. Challenge older students to get as specific as they can (family level will do). Have them record their findings on the data sheet.

DISCUSSION

1. Do you think the section of the stream sampled was healthy? Why or why not?
   - » For example: number or variety of organism, presence of sensitive or tolerant organisms, et cetera.
2. What might scientists do differently?
   - » For example: sample from many sites, use a standard net to regulate sample size, measure several water quality parameters, take data from the same sites each year.

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4.4: WILDLIFE IN THE LIMELIGHT

This is a course summary.

KEY IDEAS

1. Students can create art to reflect the messages about helping wildlife that they have learned throughout the week.

Skills: analysis, application, art and illustration, brainstorming, creativity, discussion, drawing, personal and social values, psychomotor development, public speaking, reporting, writing
Duration: 10 minutes
Setting: indoors or outdoors
Materials: paper; markers or crayons; tape

ACTIVITY

AGE GROUP ALL

1. Discuss briefly with students the things they have learned about wildlife and how to take care of it, such as:
   - Never throwing litter on the ground or into the water
   - Not disturbing wildlife (for example, not taking sea creatures home with them)
   - Being aware that anything you rinse down the sink may eventually end up in the ocean
2. Ask students to pick their favourite message and draw a picture representing how they feel about it. Post their artwork around the club.

DISCUSSION

1. Ask each student to explain briefly what they have drawn and why it is important to them.
2. Ask students to present any work they have done, such as their chart, complete with points of interest that they have added during the course.

OPTIONAL: Leave the artwork up and show it to families and members of the community at the graduation celebration!

For resources to supplement this section:
http://cwf-fcf.org/en/explore-our-work/education/wild-about-sports/water.html#Four

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SECTION FIVE:

GRADUATION CELEBRATION

5

ISTOCK

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5.1: GRADUATION CELEBRATION

Encourage students to spread the word to family and community members about everything they have learned this week. Invite families, water sport fans and other community members to join in on the fun!

NOTE: Instructors – Why not register with CWF and get certified as a WILD Educator? Visit CWFEducation.ca for details.

KEY IDEAS

1. Students take everything they have learned about the environment, including keeping wildlife healthy and using best practices, and share it with the group!

Congratulations! It is time for the instructor to give out the Canadian Wildlife Federation course certificates.

Skills: application, personal and social values, public speaking
Duration: 10 to 30 minutes
Setting: indoors or outdoors
Materials: Canadian Wildlife Federation course certificate

ACTIVITY

AGE GROUP ALL

1. Present certificates to all. Congratulate students on a job well done!
2. To celebrate the fun they have had over the past week, students might:
   - Display any artwork from the week.
   - Bring the group on a wildlife tour of the area and point out signs of wildlife.
   - Play a game with the group.
   - Share their Wildlife-Friendly Plan with attendees and talk about best practices.

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CANADIAN WILDLIFE FEDERATION
FÉDÉRATION CANADIENNE DE LA FAUNE

CanadianWildlifeFederation.ca

Certificate of Completion

has completed the environmental program provided by the Canadian Wildlife Federation and is making a difference for the environment.

Damian Foxall,
CWF Rivers to Oceans and Sports Ambassador

Instructor Signature

Date

CANADA

For a presentation copy of this certificate that you can frame and display, contact the Canadian Wildlife Federation Sailing Program at **CWFEducation.ca**

SECTION SIX:
APPENDICES

ISTOCK

6

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EDUCATIONAL CONCEPTS

A. AWARENESS AND APPRECIATION

- Earth's oceans and the water cycle.
- Water is the source of all life.
- Wildlife is everywhere.

B. HOW DO HABITATS WORK?

- A habitat contains food, water, shelter and space.
- Habitats come in many shapes and sizes.
- Wildlife adapts naturally to change.

C. WHAT IS MY CONNECTION TO WATER?

- We need the rivers to oceans network, but its resources are finite.
- Human activity has an impact (e.g., litter and pollution).
- Habitat loss and invasive species are two of many big changes that result from human activity.

D. POSITIVE HUMAN ACTION

- Practise positive action.
- Lifestyle choices can affect wildlife.
- Use best practices in and around the water.

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BEST PRACTICES ON AND AROUND THE WATER FOR YOUTH ✔

ON THE WATER

I have learned the rules of my sport, and I know how to be prepared.	
I never throw litter over the side of the boat; my garbage does not belong in the water.	
Anything that I bring onto the boat must come back off the boat with me.	

CLEAN VENUE

If I see a problem, such as a lot of litter or spilled oil, I tell my parents or instructor.	
I clean up the beach or water area as necessary, but only with adult supervision, and I always wear gloves.	
I put my trash in garbage buckets, and when I recycle I place things in the correct bins.	
I regularly update a Clean Club Checklist.	

CLEAN BOAT

I make sure that I clear the trailer, boat and other equipment of plants and other debris every time we take it out on the water, especially if we are transferring from one body of water to another. This helps to reduce the spread of invasive species.	
We use bio-friendly cleaners.	

FLORA AND FAUNA

I respect wild areas and other water users by not making too much noise.	
I am respectful of the fact that there may be sensitive or endangered species and habitats in my local area, and I try to learn about them.	
As per the Best Practices Around Marine Mammals on page 63, I understand how to react if I find myself in proximity to a sensitive or endangered species.	
I enjoy looking for wildlife, but I try not to disturb it.	
If I see an injured animal or damaged habitat I tell my instructor or another adult.	

CONSERVATION

I use a reusable water bottle instead of single-use plastic ones.	
I bring my lunch in a lunch box instead of plastic bags.	
I put paper fish on the drains and sinks at home to remind everyone that our liquids end up in the sea.	
I use only the water I need; then I turn off the tap.	
If something is broken, I ask for help to fix it before asking for a new one.	
I use the things that I own or consider donating them to others.	

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BEST PRACTICES ON AND AROUND THE WATER FOR YOUTH ✔

ADOPT

I am looking into or have already adopted a local river, lake or shoreline.	
I have joined a wildlife watch program.	

GENERAL

I have defined my personal vision and list of environmental objectives.	
I enjoy going outside.	
I like to walk or ride my bicycle instead of getting in the car.	
When I go camping I apply the "leave no trace" approach.	
I love learning about the world around me, and I ask lots of questions about it!	

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BEST PRACTICES ON AND AROUND THE WATER FOR ADULTS AND YOUTH LEADERS

BEFORE THE WATER

I prepare a list and mark my chart with important local elements, such as protected or sensitive areas (this might change depending on nesting, migratory or spawning seasons); pump out facilities; campsites; local numbers; and any other information that might be useful.	
I ensure that my craft and equipment comply with Transport Canada regulations.	
I maintain and prepare my craft in an bio-friendly way.	
I use non-metallic, nontoxic bottom paint.	
I prepare my boat in a controlled environment.	

ENGINE

I fuel my boat with biodiesel.	
I refuel away from the water when possible and take extra precautions using absorbent pads if I must refuel while afloat. I fill the tank slowly and do not use auto shutoff.	
I do not top up (overfill) the fuel.	
I keep an oil spill kit on hand. I never pour detergent to dispel an oil spill; it makes the problem worse.	
I have installed a bilge water filter sponge.	
I do not pump bilge water overboard if it is oily or has diesel in it.	
I have replaced our two-stroke engine for a cleaner four-stroke engine.	
I recycle engine liquids and other hazardous materials (e.g., antifreeze, engine oil, batteries, et cetera) properly.	
I prefer to use solar, wind or hydro charging systems.	
I turn off the engine of my boat when I can.	
I use electric options for slow speed work, or I drift, paddle, sail or anchor instead.	

ON THE WATER

I am aware of the best practices for the craft I am using, and I teach these habits to my group.	
I never throw litter over the side of the boat; my garbage does not belong in the water.	
Anything that I bring onto the boat must come back off the boat.	
If I see a problem such as a lot of litter or spilled oil, I report it to the Coast Guard or local authorities.	
If I see a problem such as an injured animal or damaged habitat, I contact the local vet, rescue centre or park authorities.	
All of my garbage is sorted, recycled and left ashore at recovery sites.	

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BEST PRACTICES ON AND AROUND THE WATER FOR ADULTS AND YOUTH LEADERS

CLEAN VENUE

I organize regular beach and shoreline clean-ups as part of our objective to maintain a neutral or positive plastic footprint.	
I work with youth and club members to maintain a Clean Club Checklist.	
I have installed and use our water sewage holding tanks.	
I empty these tanks ashore at the provided pump out stations, or find an acceptable alternative far away from the water.	
I select the most eco-friendly options for disposing of waste.	
I will never dump waste from chemical toilets overboard.	
When I notice a lack of pump out stations, I alert my local authority to the issue.	

CLEAN BOAT

We ensure that the trailer, boat and all other equipment are clear of plants and debris every time we take them out of the water. We are especially careful about this when changing from one body of water to another. This helps to reduce the spread of invasive species.	
We use water and bio-friendly cleaners and substances to maintain our craft and equipment. *NOTE: Even if a product says it is biodegradable, it might not be bio-friendly. Look for phosphate free).*	
I know that hydrogen peroxide, vinegar, lemon juice, Borax paste, baking soda, elbow grease and a high-pressure hose are all bio-friendly cleaning alternatives.	
When we wash our equipment we do so away from the water's edge so that it does not drain directly back into the water.	

FLORA AND FAUNA

I minimize my presence (e.g., by not making too much noise) to show respect to wild areas and other water users.	
I am respectful of the fact that there may be sensitive or endangered species and habitats in my local area.	
As per the Best Practices Around Marine Mammals on page 63, I understand how to react if I find myself in proximity to a sensitive or endangered species.	
I enjoy looking for wildlife, but I try not to disturb it.	

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BEST PRACTICES ON AND AROUND THE WATER FOR ADULTS AND YOUTH LEADERS

CONSERVATION

I use a reusable water bottle instead of single-use plastic ones.	
I bring my lunch in a container instead of single-use plastic bags.	

DIVING AND SNORKELING

I do not bring anything into the water that could contaminate it.	
If I bring an item into the water, I bring it with me when I return to land.	
I take special care not to touch or damage fragile habitats and species.	
I never remove specimens from the water.	

FISHING

I have a fishing licence and catch only the species I need. I avoid unnecessary bycatch overfishing.	
I return undersized and undesirable fish to the water unharmed.	
I take care not to leave snagged, broken fishing net behind, because nets, hooks and monofilament are virtually indestructible and continue to "ghost fish" wildlife long after it is lost.	
I do not empty bait buckets into the water. I empty them ashore, and always prior to moving to a new body of water.	

ANCHORING AND/OR CAMPING

I understand that anchoring is damaging to wildlife and choose other options whenever possible, such as regular defined anchoring areas, moorings, and tying my boat to a durable surface on the shoreline.	
When I must pull my craft ashore, I consider its impacts on the landing site. I try to land as close to my campsite as possible.	
When I camp, moor or anchor outdoors I apply a "leave no trace" approach.	
I use predefined camping spots whenever possible.	
I treat my stopping site with respect and never alter it to suit my needs.	
I stop on durable surfaces, such as campsites, gravel, dry grasses and snow.	
If I have to wash while afloat I use baby shampoo because it is PH neutral and phosphate free.	

ADOPT

I encourage my students to adopt a local river, lake or shoreline, because this helps them develop personal connections with their local environment.	
I encourage my students to join a wildlife watch program, because these programs help specialists keep track of species and habitats across Canada.	

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BEST PRACTICES AROUND MARINE ANIMALS*

***NOTE: This includes marine mammals in the water, like whales and porpoises, as well as those on land, like seals and sea lions. We must also protect sensitive spots like sea bird colonies and nesting areas.**

LAWS AND REGULATIONS

I understand that it is illegal, according to Canada's Fisheries Act, to disturb marine mammals.	
I will report harassment of marine mammals to the Department of Fisheries and Oceans (1-800-465-4336).	
As I plan my trip, I will use a nautical chart to check for any special protected areas along my route and find out if there are specific regulations about approaching animals in these areas.	

DISTANCE*

**NOTE: These are precautionary guidelines. Regulations in your area may vary.*

I will stay 200 metres away from whales, dolphins and porpoises in the water.	
I will stay 200 metres away from areas where there are seals, sea lions and bird colonies on land.	
I slow down to less than seven knots when I see a marine mammal or sensitive area within 400 metres.	
If I accidentally end up closer than 200 metres to a marine mammal or pod, I will stop my vessel and drift or stay stationary until the animal(s) pass.	
I will increase my distance if an animal acts agitated or alarmed.	

TRAVEL

I do not cut off or cross a marine whale, dolphin or porpoise's path (for motorized boats, this helps reduce propeller injuries).	
I always travel parallel to the direction of any whale, dolphin, porpoise or pod and stay out their path.	
I avoid chasing, sneaking up behind or approaching a whale, dolphin, porpoise or pod head on.	
I stay on the seaward side of marine animals when they are close to shore.	

DISTURBANCE

I am cautious and observant in areas known to have marine mammals.	
I reduce the noise from the engine and wake as much as possible when marine animals are present.	
I stay quiet when viewing marine mammals (e.g., no yelling, whistling or clapping).	
I stay in my vessel and do not swim with marine wildlife.	
I do not feed marine wildlife.	
I do not touch marine wildlife.	
I do not attempt to handle or rescue any marine animals myself. I will call a local rescue group if an animal seems to be abandoned, sick or injured. Visit CWFWildAboutSports.org for a list of such organizations.	
I limit my observation time to 30 minutes or less, out of respect for the animals and other viewers.	

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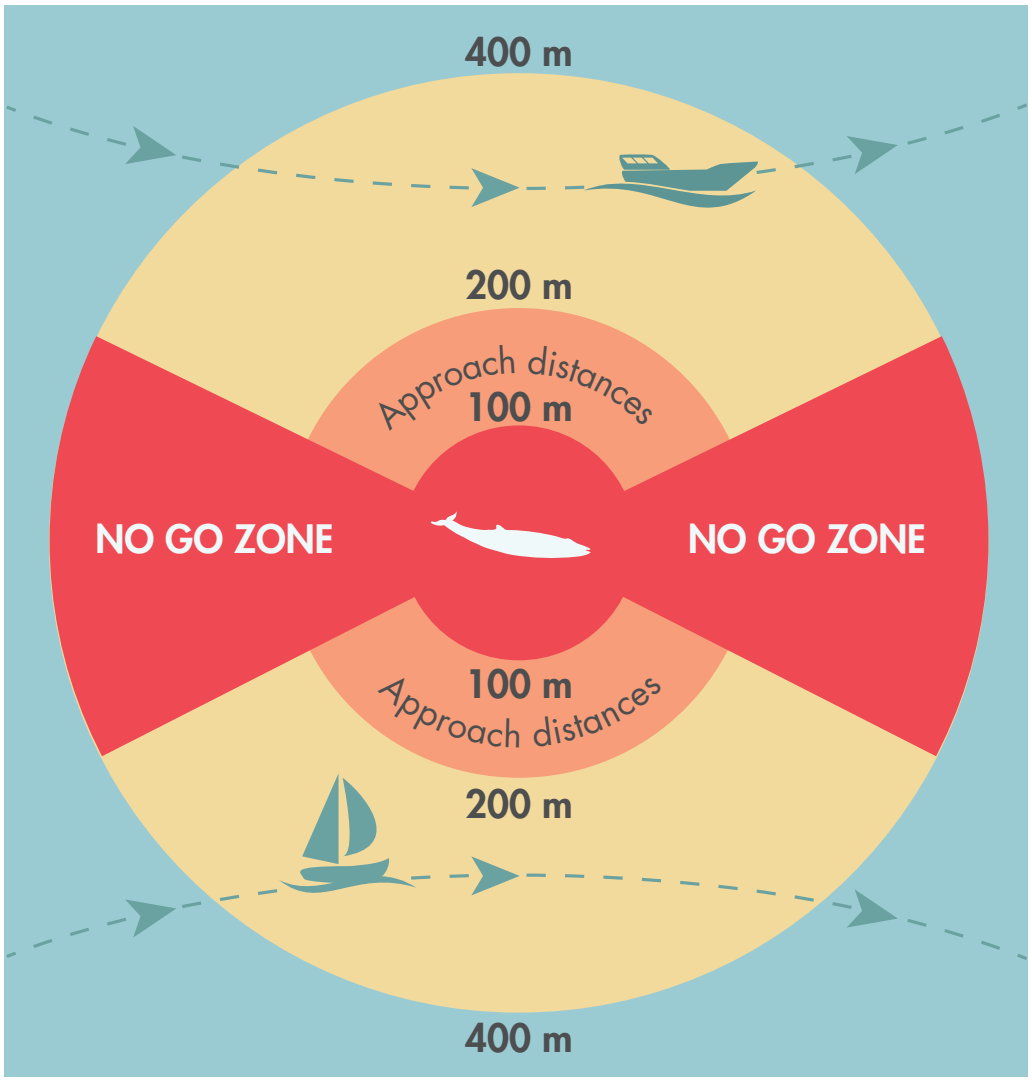
BEST PRACTICES AROUND MARINE ANIMALS*

MARINE MAMMAL "ZONES" FOR BOATERS



100 m Minimum approach distance

200 m Approach distance in the Sagienay-St. Lawrence Marine Park and the future St. Lawrence Estuary MPA

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CLEAN CLUB CHECKLIST

CLUBHOUSE

Designate an Environmental Officer.	
Coordinate the club's environmental program with local and regional programs.	
Eco certification is up to date.	
Clean Club Checklist is posted and maintained.	
Emergency telephone numbers are posted.	
Up-to-date seasonal and environmental information is posted, such as local MPAs, pump out stations, et cetera.	
Recycling bins are available and clearly marked.	

OUTSIDE GROUNDS

This area is clear of litter.	
Oil spill kits are ready to use if necessary.	
Used oil and hazardous material recovery is available.	

SHORELINE AND LAUNCH SITE

This area is clear of litter.	
Our boat-washing facilities drain into water recovery systems or a natural filter zone.	
Marsh land has been retained on the waterfront as a natural filter for drainage.	
We maintain a water monitoring program.	

EVENTS AND REGATTAS

Our events are environmentally friendly.	
Our events are environmentally certified.	
We have a Plastic Footprint Offset program.	
Drinking water refill stations are provided for participants.	
Single-use bottles are not permitted for use during our events.	
Race, rally or event routes have been checked with the Canadian Wildlife Federation to highlight potential conflicts with sensitive species or habitats.	

ON THE WATER

There is no obvious pollution.	
There is no visible litter.	
Sensitive areas have been marked.	
Habitats are being treated with care.	

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TAKE ACTION

Show that you care for Canada's rivers, lakes and oceans by taking action. You have already started by following the activities in this guide. If you are excited about what you've learned here, why not take a few extra steps?

1. **REPORT** wildlife species that you have seen and correctly identified while on the water. This information can help scientists learn more about these species and their habits.
2. **HELP** rescue sick or injured marine mammals that you encounter by calling rescue organizations.
   IMPORTANT: Never attempt to handle these types of emergency situations directly.
3. **ADOPT** a waterway. Join a local group and take responsibility for a stream, river, lake or shoreline near you.

To find out more visit: **CWFWildAboutSports.org**


ISTOCK


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MARINE PROTECTED AREAS

marine protected areas

areas of interest

For resources to supplement this section:
http://cwf-fcf.org/en/explore-our-work/education/wild-about-sports/water.html#Appendices

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CROSS-REFERENCE BY SKILLS

The following is a list of major skills that WILD About Sports: Water activities have been designed to teach or develop. The list is not intended to be comprehensive; most activities teach additional skills. Activities may also be adapted to emphasize additional and different skills.

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ACTIVITY ICONS

INDOORS AND OUTDOORS

Most activities can be conducted outdoors. However, this listing is designed to indicate those activities tending to require an outdoor setting or at least a large open area.

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