Saving Springer

How NOAA helped an orca go home

This Activity Book belongs to _____

Grades 2–3 Activity Book
April 2012

Saving Springer

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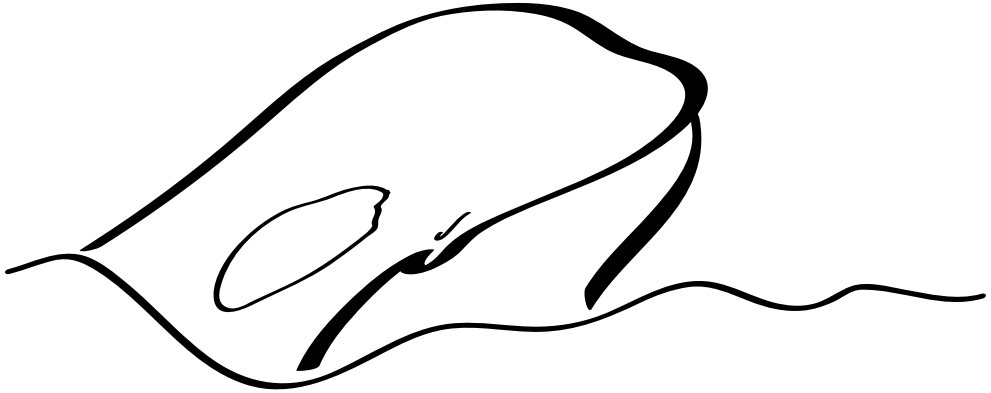

Lesson 1. Introduction

Know, Wonder, Learn (KWL)

Know, Wonder, Learn (KWL)

What do you **KNOW** about Springer or killer whales in general?	What do you **WONDER** about Springer or killer whales in general?	What have you **LEARNED** about Springer or killer whales in general?
What do you **KNOW** about NOAA?	What do you **WONDER** about NOAA?	What have you **LEARNED** about **NOAA**?

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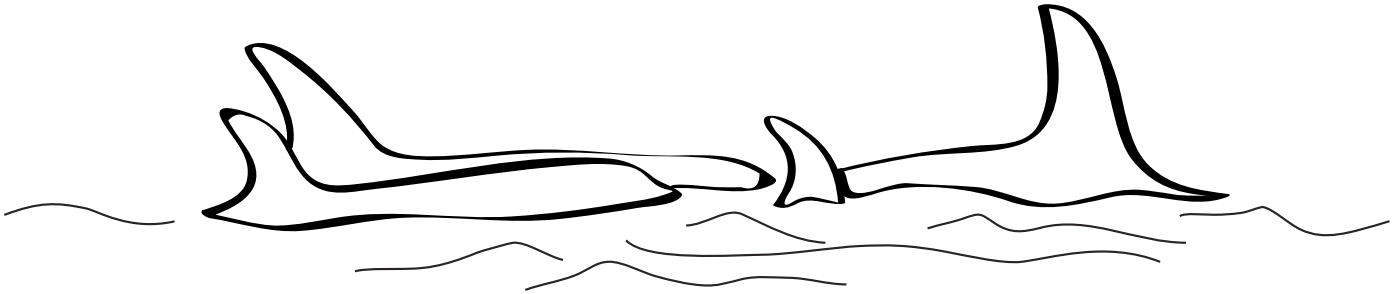


Lesson 2. All About Orcas

Map activity

Parts of a whale

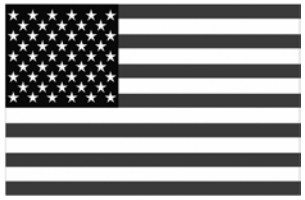
Map activity

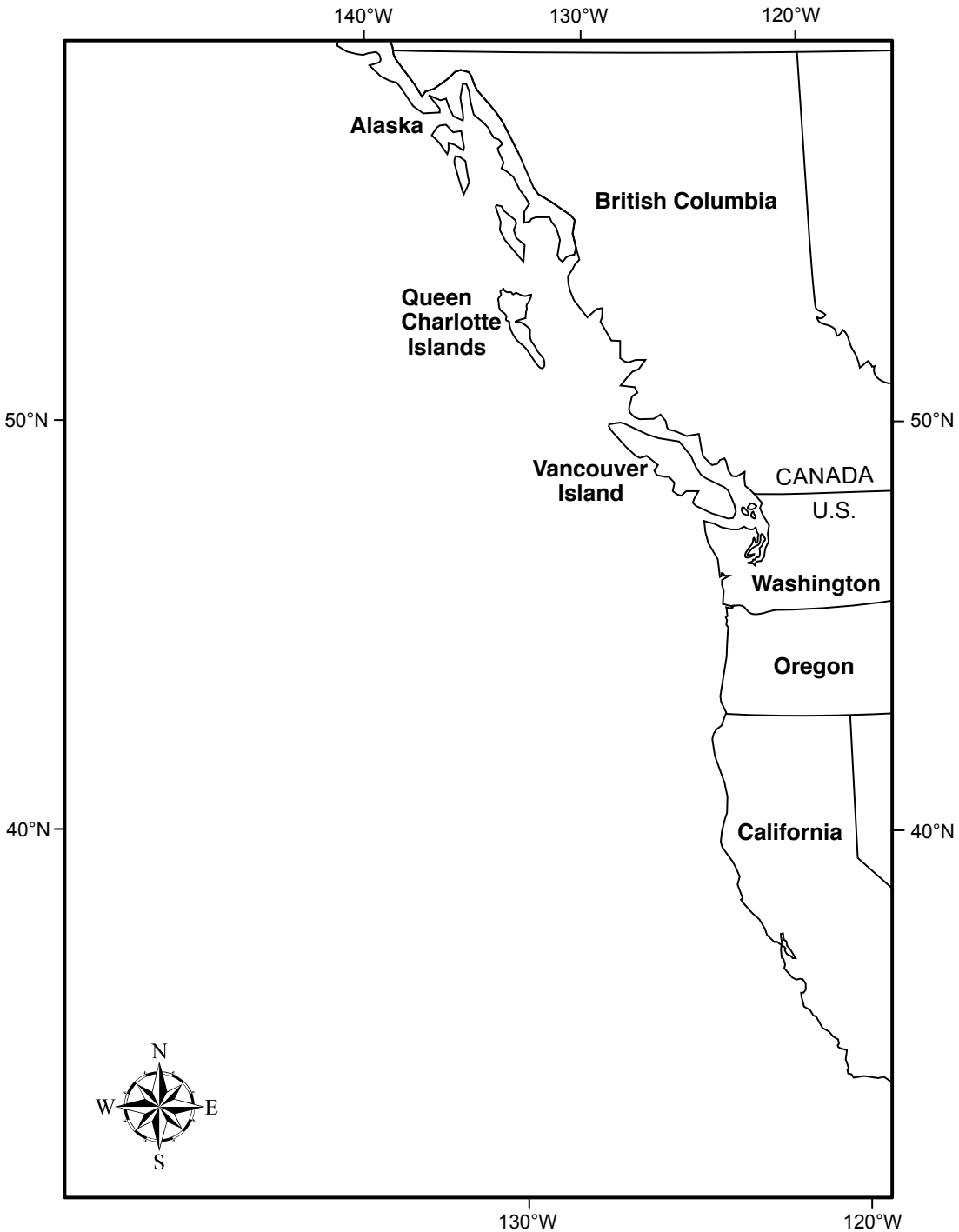
Color the following locations:

- Washington – blue
- Oregon – blue
- California – blue
- Alaska – blue

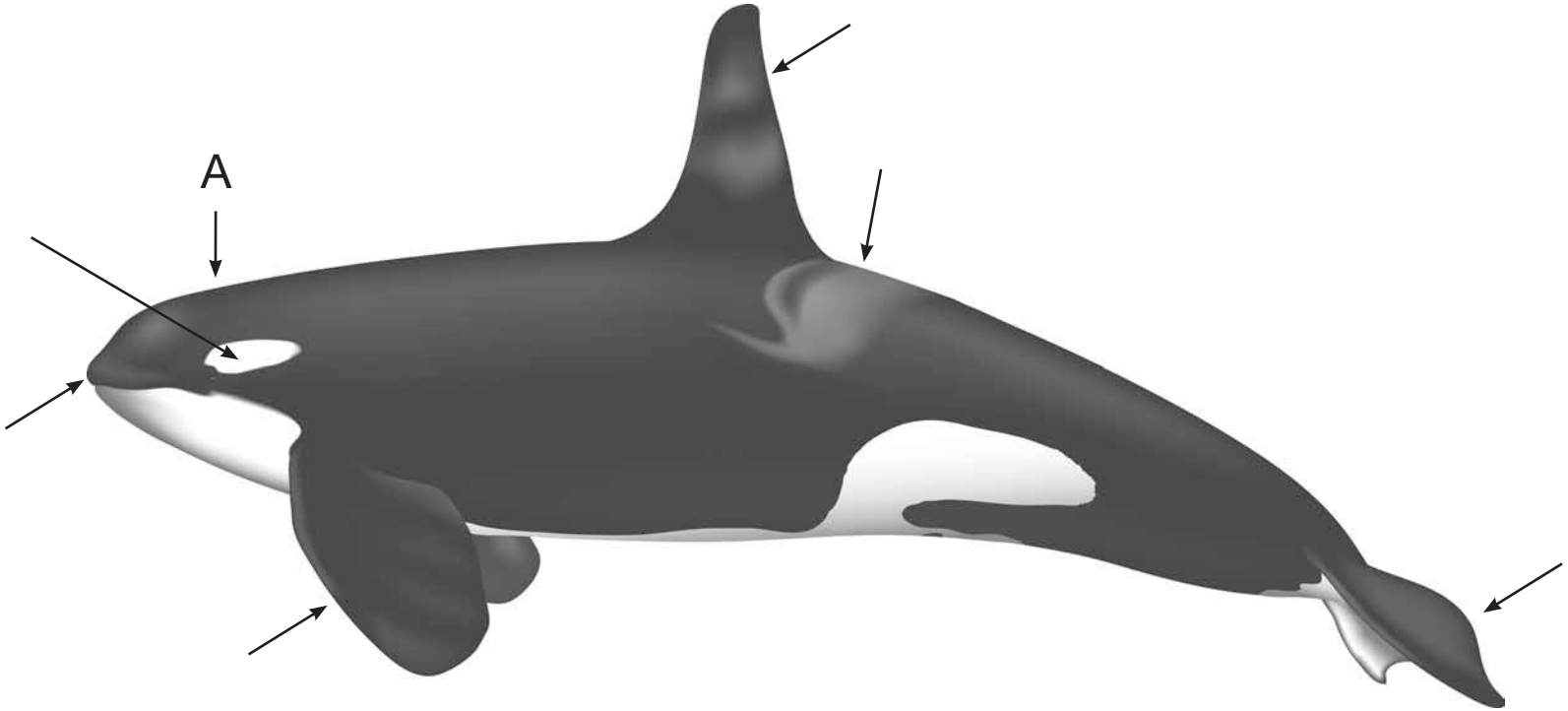
- British Columbia – green
- Vancouver Island – green
- Queen Charlotte Islands – green

The blue on your map shows part of the USA and the green shows part of Canada.





Label the parts of an orca



Put the letter of the body part next to where it belongs on the orca (see example A). For extra credit, describe how the body part is used.

A. blowhole
B. dorsal fin
C. eye patch
D. flukes
E. pectoral fins
F. rostrum
G. saddle patch

Resource Page Background Information on Orcas

Non-Fiction Books

Field Guide to the Orca by David G. Gordon and Chuck Flaherty

The Whale Called Killer by Erich Hoyt

Siwiti: A Whale's Story by Alexandra Morton

Websites

Learn more about orcas…
http://www.nwr.noaa.gov/Marine-Mammals/Whales-Dolphins-Porpoise/Killer-Whales

Invite an educator into your classroom, fact sheets, and more
http://www.acsonline.org

Classroom visits and activities
http://www.killerwhaletales.org

Seattle Aquarium
http://www.seattleaquarium.org

Play a Game and Learn more about NOAA science
http://scijinks.jpl.nasa.gov/noaa/spuzzled

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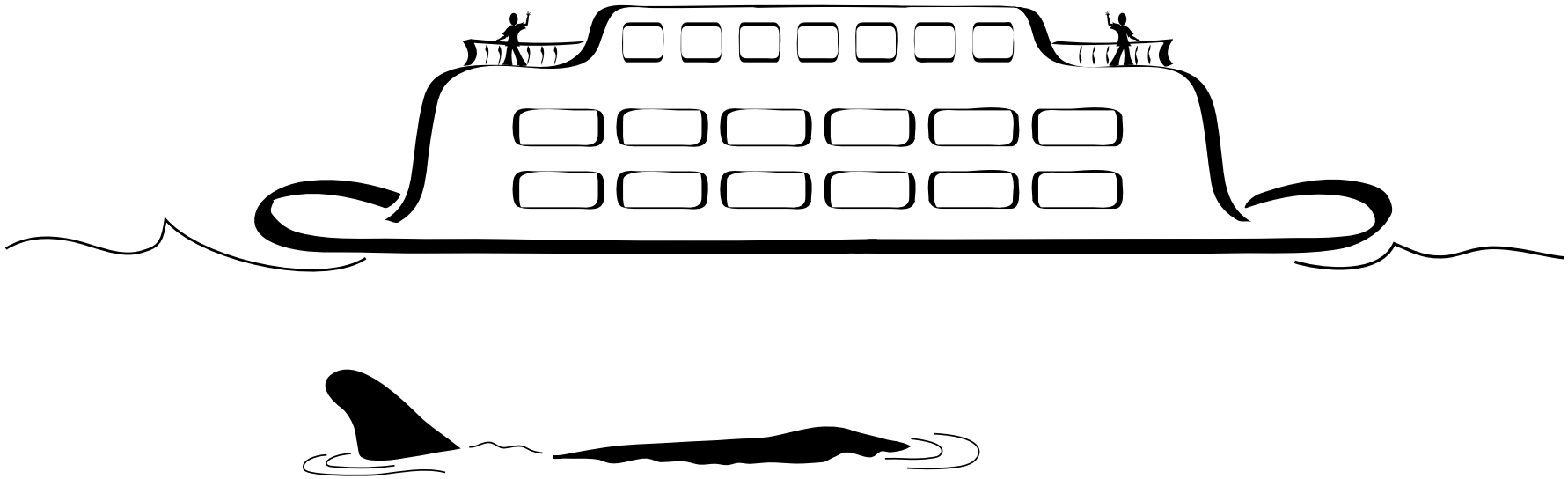


Lesson 3. Who's that Whale?

Map activity
Thumbprints and saddle patches
Whale calls

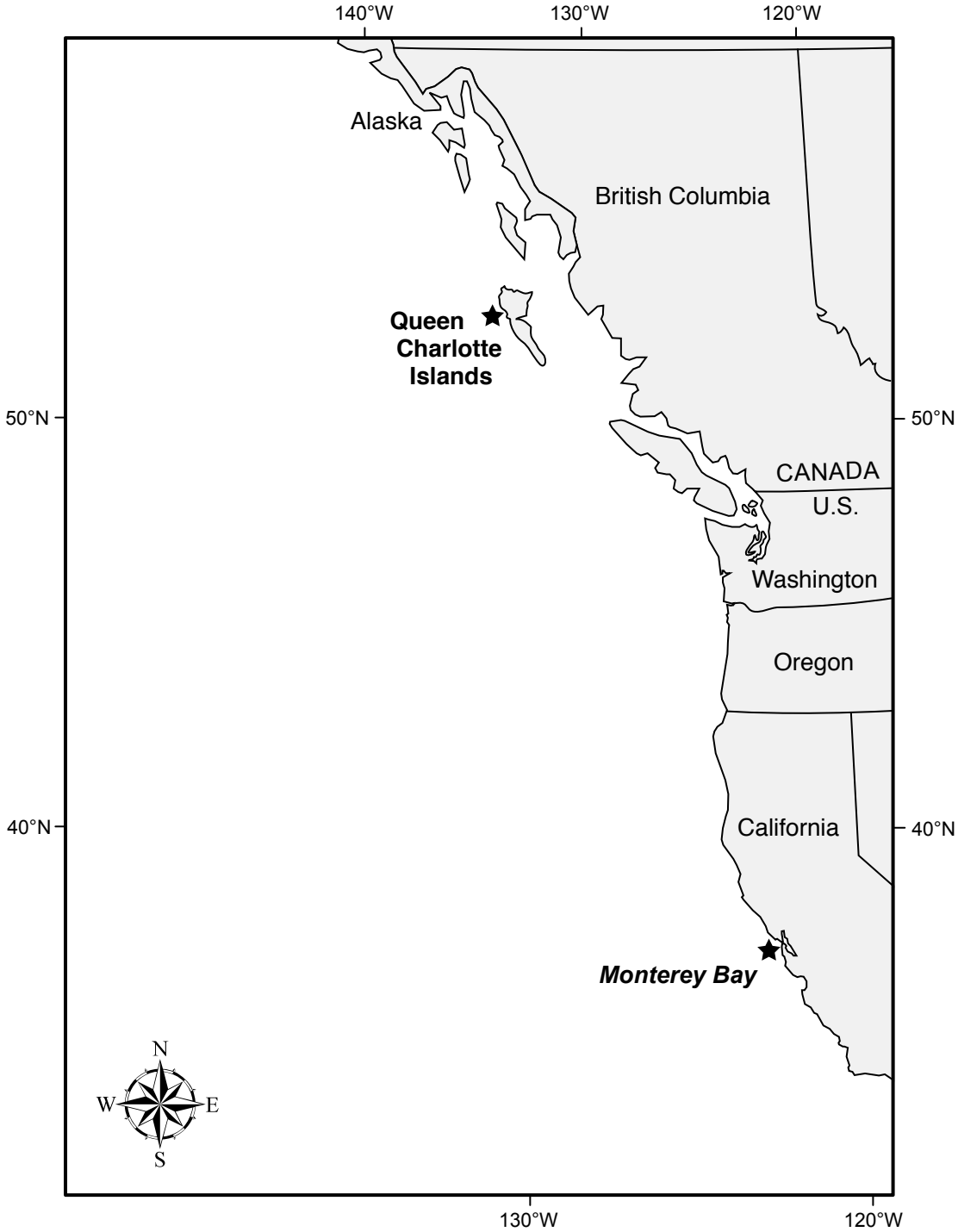
Map activity

Draw a red line between the two stars on your map. Draw your line close to the land.

★ Queen Charlotte Islands

★ Monterey Bay

Using your red crayon, color all the water between your line and the land. See the teacher's red area on the class map. This is where J, K, and L pods live. They swim, hunt, rest, and play in this large area of water. We call this area their range.



Thumbprints and Saddle Patches

Arch

Loop

Whorl

No two fingerprints are the same. Compare your thumbprint to your neighbor's thumbprint. How are they alike and how are they different?

Place your thumbprint here

Place your neighbor's thumbprint here

Describe your patterns:

J27's saddle patch

J28's saddle patch

How are they alike?

How are they different?

No two saddle patches are the same either! How might a scientist use this information? What else do you notice?

Whale Calls

Killer whales produce three types of sound: echolocation clicks, whistles and calls.

Describe how these sound different.

Clicks _____

Calls _____

Whistles _____

Make your own whale call

Now it's your turn! Use balloons to make your own killer whale calls, and write them down using the following notation to "draw" a sound:

Separate vertical lines indicate distinct clicking sounds. Space between the lines can show how fast the clicks go.

Swooping upward lines indicate sounds that start low and go higher.

Swooping downward lines indicate sounds that start high and go lower.

A wiggly line indicates sound that goes up and down.

Create three whale calls with your balloon, write them down and make the sounds to your friends!

1.

2.

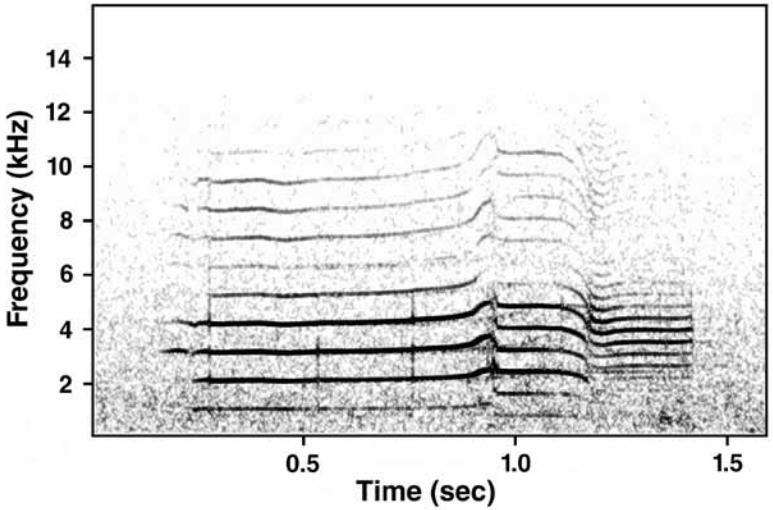
3.

Have fun and describe what each sound means!

Whale calls

Researchers used a hydrophone in the water to listen to Springer's calls. Scientists studied her calls using a spectrogram.

Springer's calls and whistles were not like the calls of killer whales in J, K, and L pods in Puget Sound. They matched the calls of killer whales from A pod, who live in Canadian waters.



Use the glossary in the back of this activity book and define the following terms:

1. hydrophone _____

_____

2. spectrogram _____

Resource Page Photo ID and Acoustics

Books

Killer Whales by John K.B.Ford, Graeme M. Ellis, and Kenneth Balcomb

Transients: Mammal-Hunting Killer Whales by John K.B. Ford and Graeme M. Ellis

The Whales' Song by Dyan Sheldon and Gary Blythe

Websites

The Center for Whale Research on San Juan Island
http://www.whaleresearch.com/orca_ID.html

British Columbia Wild Killer Whale Adoption Program
http://killerwhale.vanaqua.org

The Whale Museum: S. Resident Killer Whale Adoption Program
http://www.whale-museum.org

See Springer's family tree: click A clan, A24 matriline and find Springer
http://www.orcinusorca.nl

Discovery of Sound in the Sea website
http://www.dosits.org/animals/intro.htm

Learn more about other whales, dolphins, and porpoises
http://acsonline.org/education

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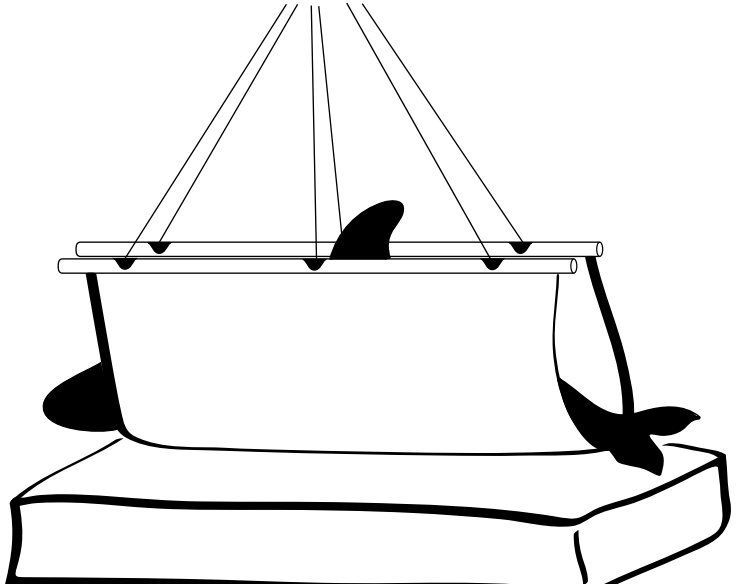


Lesson 4. What Should We Do?

Map activity
You're the vet
Stranding network

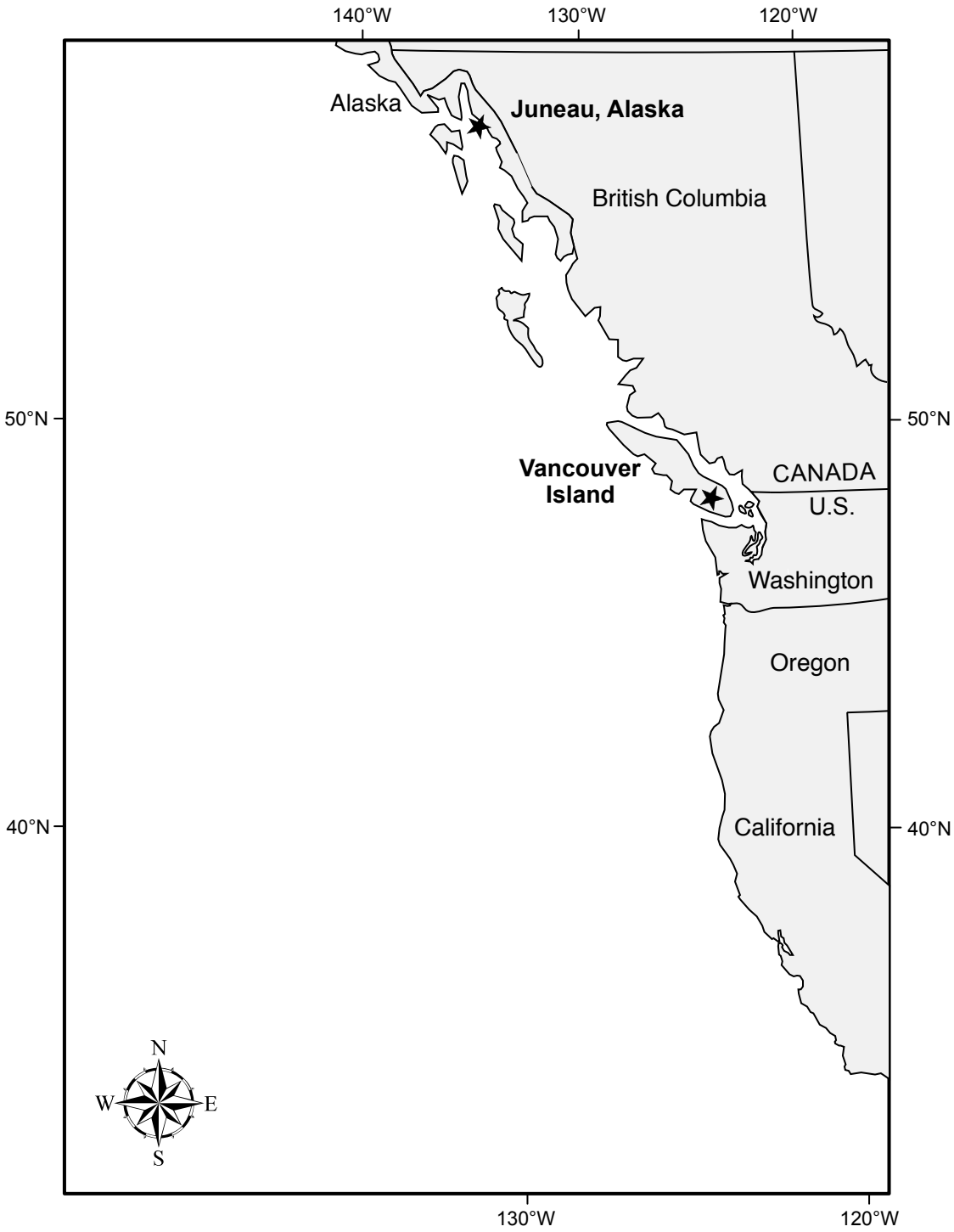
Map activity

Draw a blue line between the stars on your map. Draw on the ocean side of all the islands.

- ★ Juneau, Alaska
- ★ Vancouver Island

Using your blue crayon, color all the water between your line and the land. See the teacher's blue area on the class map.

Springer's family lives in this blue area or range.



You're the vet

We need to see if Springer is healthy enough to be reunited with her family.

Springer's Health Report

Test: Size

Method (how information was collected):
Length of a typical killer whale calf?
Length of an average adult female?
Length of an average adult male?
Results: Compare Springer's length to those above. Based on the test result, is Springer healthy?

Springer's Health Report

Test: Blood

Method (how information was collected):
Describe the healthy blood sample.
Describe the unhealthy blood sample.
Results: Compare Springer's blood sample to the other samples. Based on the test result, is Springer healthy?

Springer's Health Report

Test: Exhaled breath

Method (how information was collected):

Describe the healthy breath odor.

Describe the unhealthy breath ordor.

Define ketosis.

Results: Compare Springer's breath odor to the other sample. Based on the test result, is Springer healthy?

Springer's Health Report

Test: Fecal sample

Method (how information was collected):

Describe the healthy fecal sample.

Describe the unhealthy fecal sample.

Results: Compare Springer's fecal sample to the other samples. Based on the test result, is Springer healthy?

Springer's Health Report
Summary

Test	Result	Treatment required? What should we do?
Size		
Blood		
Exhaled breath		
Fecal sample		

Based on these results, should we reunite Springer with her family?

Stranding networks

When you come across a wild animal that might be stranded, alone, or injured you should…

S =

T =

O =

P =

Using NOAA's stranding hotline number, make a magnet promoting "Sharing the Shores" 1-800-853-1964

Resource Page Stranding Networks and Education

Books

The Rescue of Nanoose by Mary Borrowman and Chloe O'Loughlin

Humphrey the Lost Whale by Wendy Tokuda and Richard Hall

Baby Whale Rescue: The True Story of J.J. by Caroline Arnold and Richard Hewett

Websites

NOAA Stranding Networks
http://www.nmfs.noaa.gov/pr/health

Wildlife Rehabilitation Center
http://www.wolfhollowwildlife.org

Learn more about other whales, dolphins, and porpoises
http://acsonline.org/education/fact-sheets

Washington Department of Fish and Wildlife
http://wdfw.wa.gov/conservation/health/rehabilitation

OrcaNetwork
http://www.orcanetwork.org/index.html

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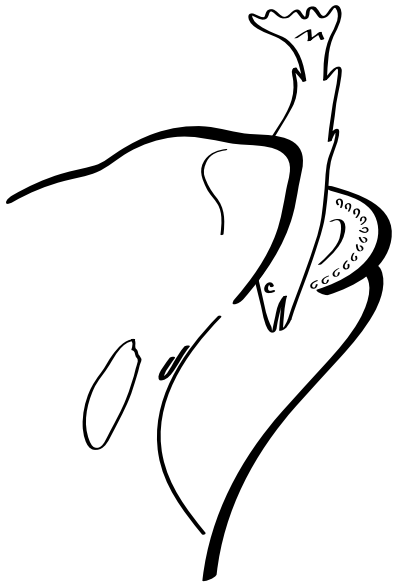


Lesson 5. Journey to Health

Map activity

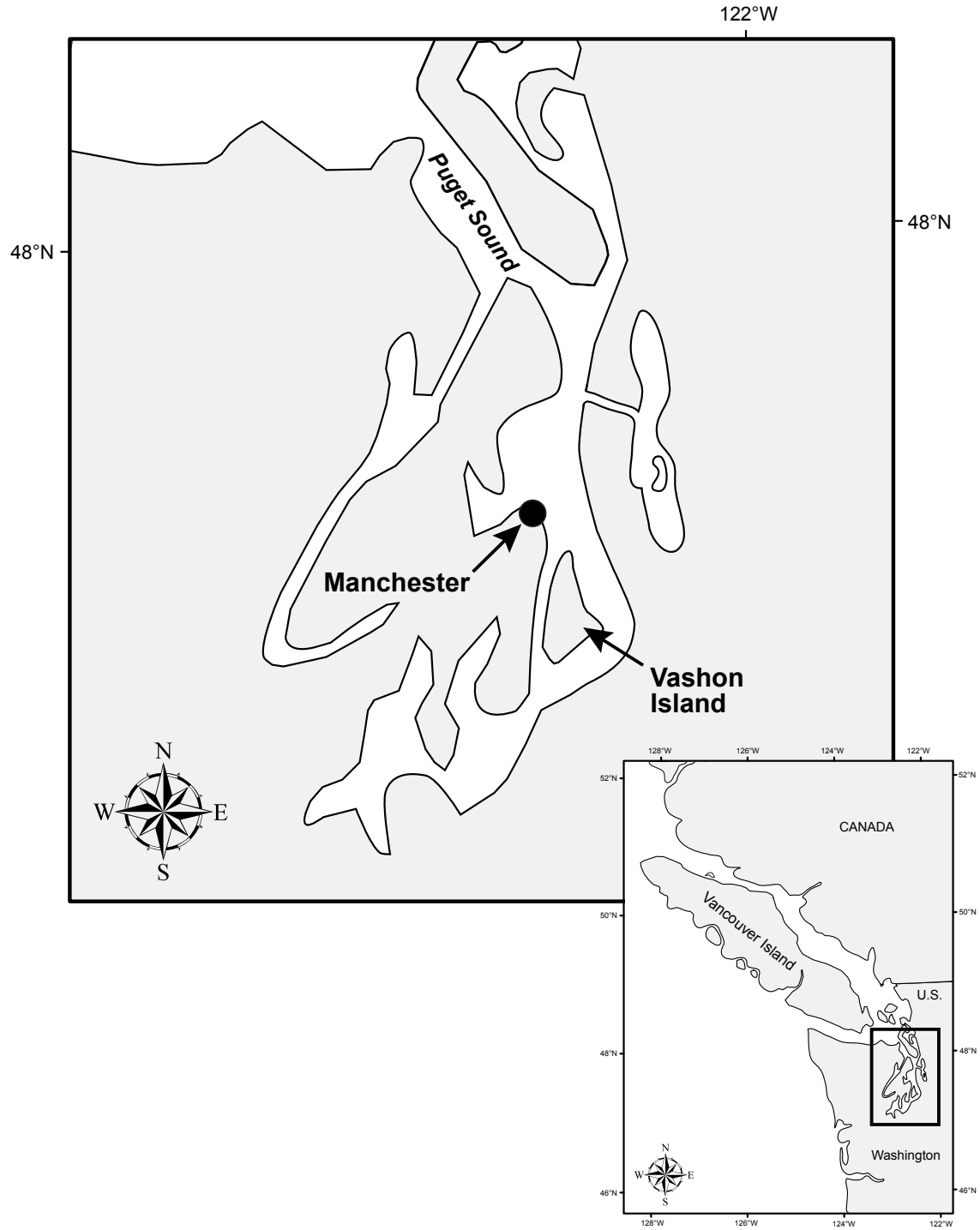
Killer whale food chain

Map activity

Circle the following places:

- Puget Sound
- Vashon Island
- Manchester (holding pen)

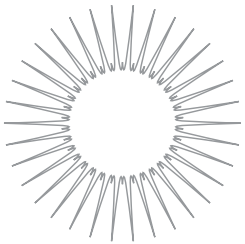
Springer was seen at these places. She was rescued near Vashon Island and stayed in a pen at Manchester.



Killer whale food chain

Draw arrows FROM prey (things that are eaten) TO predator (animals that eat others).

Draw a picture food chain starting from the sun and ending with Springer (a fish-eating northern resident killer whale). Look up words in your glossary if you don't know what they mean.

					
sun	**phytoplankton**	**zooplankton**	**herring**	**salmon**	**Springer**

Who else eats herring besides salmon?

Who else eats salmon besides killer whales?

Resource Page Killer whale behaviors and Salmon issues

Books

Killer Whales of the World by Robert Baird

Killer Whales by Seymour Simon

Davy's Dream A Young Boy's Adventures with Wild Orca Whales by Paul Owen Lewis

Come back, Salmon by Molly Cone

A Salmon for Simon by Ann Blades

Life in the Sea by Maria Rius

Websites

NOAA Education and activities
http://www.education.noaa.gov

Learn more about other whales, dolphins, and porpoises
http://www.acsonline.org/education/fact-sheets

Washington Department of Fish and Wildlife
http://wdfw.wa.gov/conservation/salmon

Salish Sea Activity Book from NOAA's NCCOS
http://coastalscience.noaa.gov/education/ssbook.pdf

Go see salmon at the Ballard Locks, local hatchery or visit Cedar River Education Center
http://www.cedarriver.org

Salmon and Trout
http://www.kingcounty.gov/environment/animalsandplants/salmon-and-trout/identification.aspx
http://www.fish.washington.edu/hatchery/education.html

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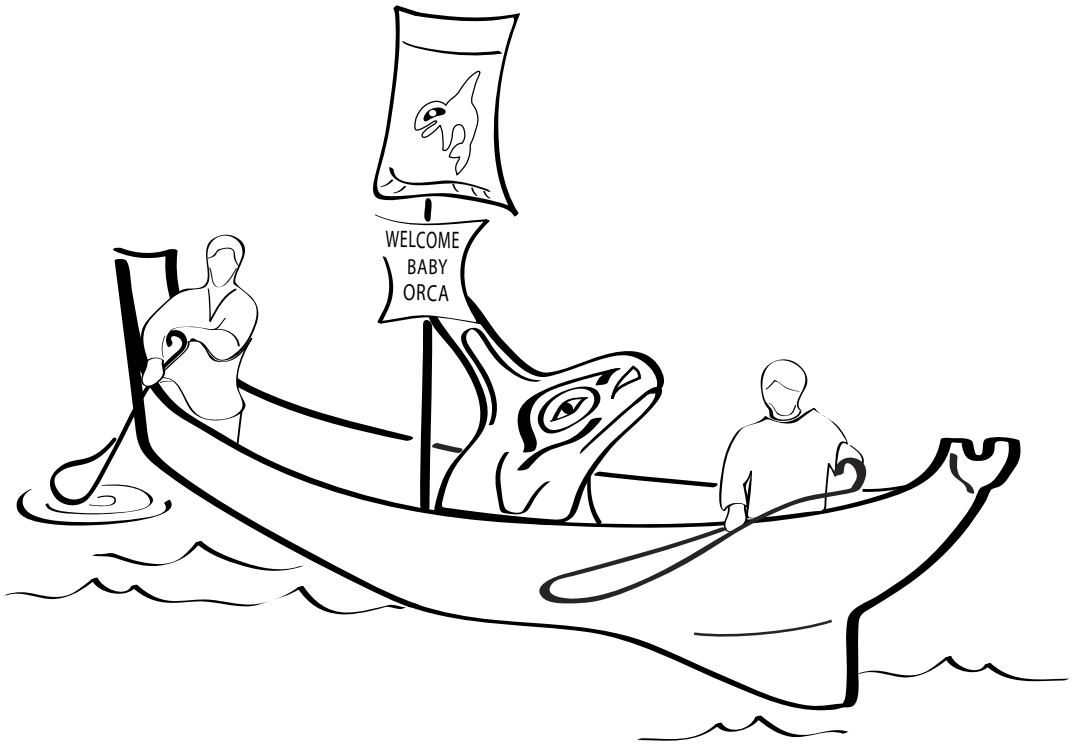


Lesson 6. Homecoming

Map activity
Comic strip
Rubric

Map activity

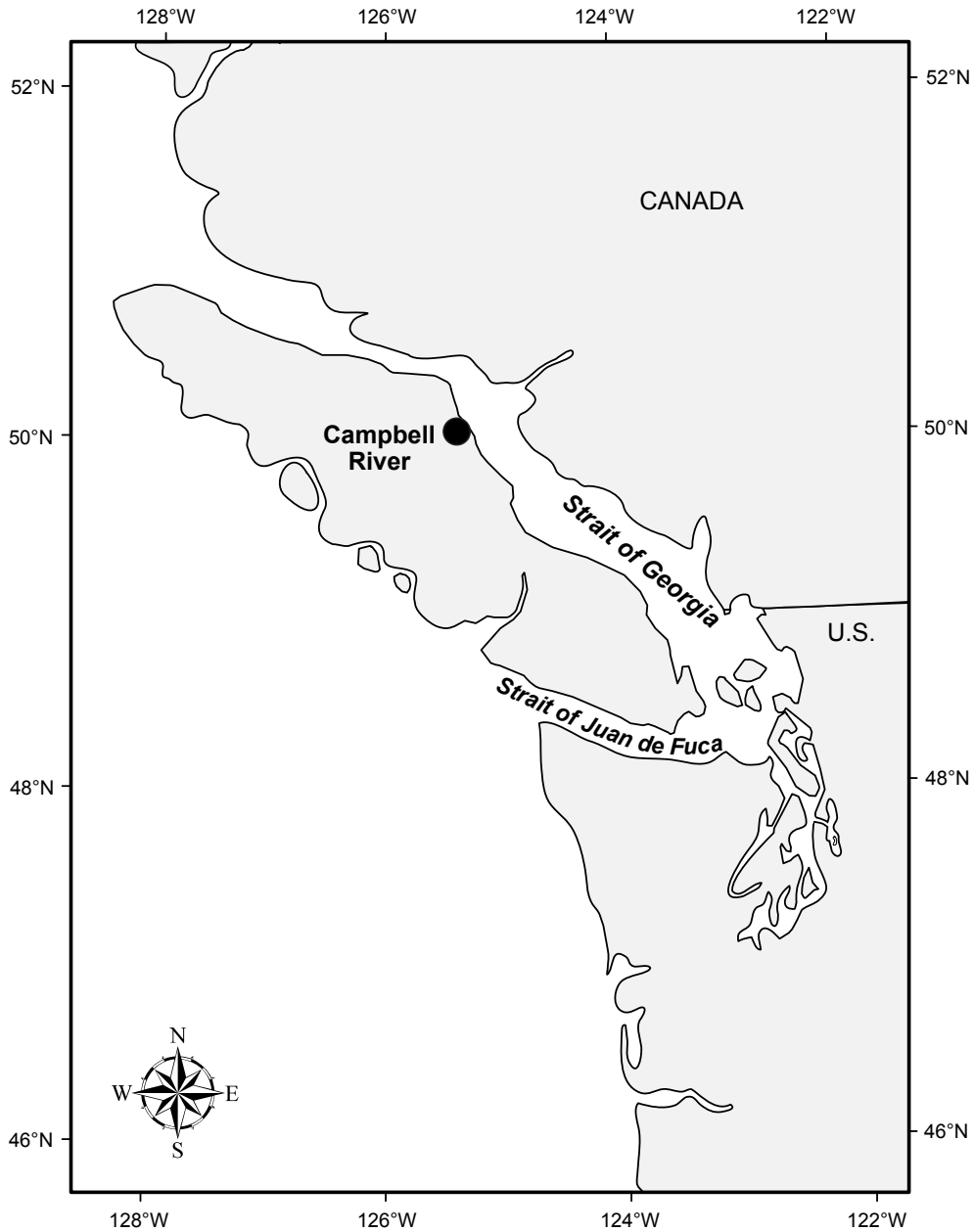
Color the following bodies of water light blue:

- Strait of Juan de Fuca
- Strait of Georgia

Circle the following city:

- Campbell River

The boat that carried Springer home stopped in Campbell River to get ice to keep her cool. A local tribe presented a ceremonial mask to the captain of the boat.



Comic strip

What do you suppose Springer was saying to these closely related whales? Were her calls recognized? How did Springer's family know it was her? What happened next? Tell your version in a comic strip.

Springer's first calls home!

Comic strip rubric

	Content	Organization	Mechanics
4 Wow! Terrific!	Contains detailed information about the communication between Springer and the whales. Extra additions and attention to detail. Labeling easy to read and follow.	Information is organized and in the right order. The dialogs are clearly written and accurate according to the CD recordings.	All words spelled correctly and no mechanical errors. Nicely colored and outlined with a marker.
3 You've got it!	Contains detailed information about the communication between the whales. A lot of thought is given to the details of Springer's story.	Information is organized and in the right order. Information is written clearly.	Three or fewer misspellings or mechanical errors. Colored and outlined with a marker.
2 Not yet?	Contains some information about the communication between the whales, yet is not descriptive enough.	Not quite the right order or some details are left out. Information is not written clearly and is hard to read.	Four misspelled words or grammatical errors. No craftsmanship in drawing.
1 Try again	Information about the communication between the whales is not complete or realistic. Story or details are not captured.	Information is not organized, is not in the right order, or is not written clearly.	More than four errors in spelling or grammar, or drawing and tracing are not acceptable.

Resource Page Homecoming/Native Tribes

Books

Storm Boy by Paul Owen Lewis

Catching Spring by Sylvia Olsen

Orca's Song by Anne Cameron

Whale Song: A Novel by Cheryl Kaye Tardif

Son of the Salmon People by Hubert Evans

Mist on the River by Hubert Evans

First Salmon by Roxane Beauclair Salonen

A Symphony of Whales by Steve Schuch

Salmon Summer by Bruce McMillan

Websites

Tribes of the Pacific Northwest
http://www.ahsd25.k12.il.us/Curriculum%20Info/NativeAmericans/Index.html

Alert Bay, Home of the Killer Whale
http://www.alertbay.ca

Kwakwaka'wakw Learn more about First Nations and their culture
http://www.maltwood.uvic.ca/nwcp/kwakwaka/intro.html

U'mista Cultural Center in Alert Bay
http://www.umista.org

Look at Google Images and type in orca clipart or cartoon for Comic strip ideas
http://images.google.com

Activities/Games
http://nativeamericans.mrdonn.org/games.html

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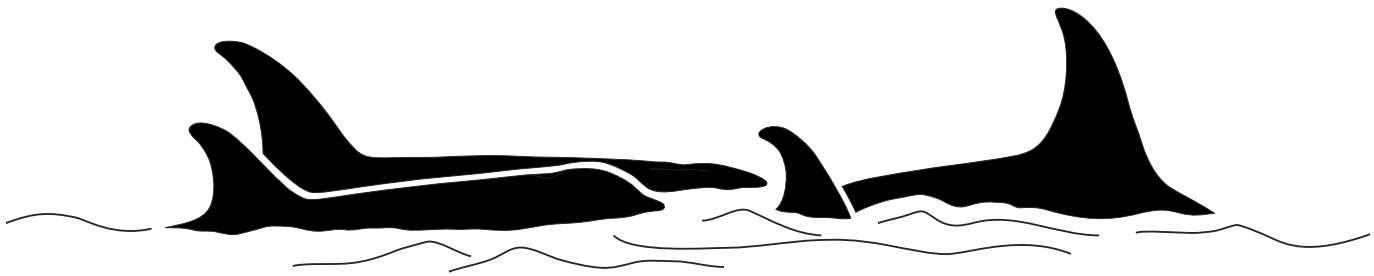


Lesson 7. Stewardship

Map activity

How can I help?

Map activity

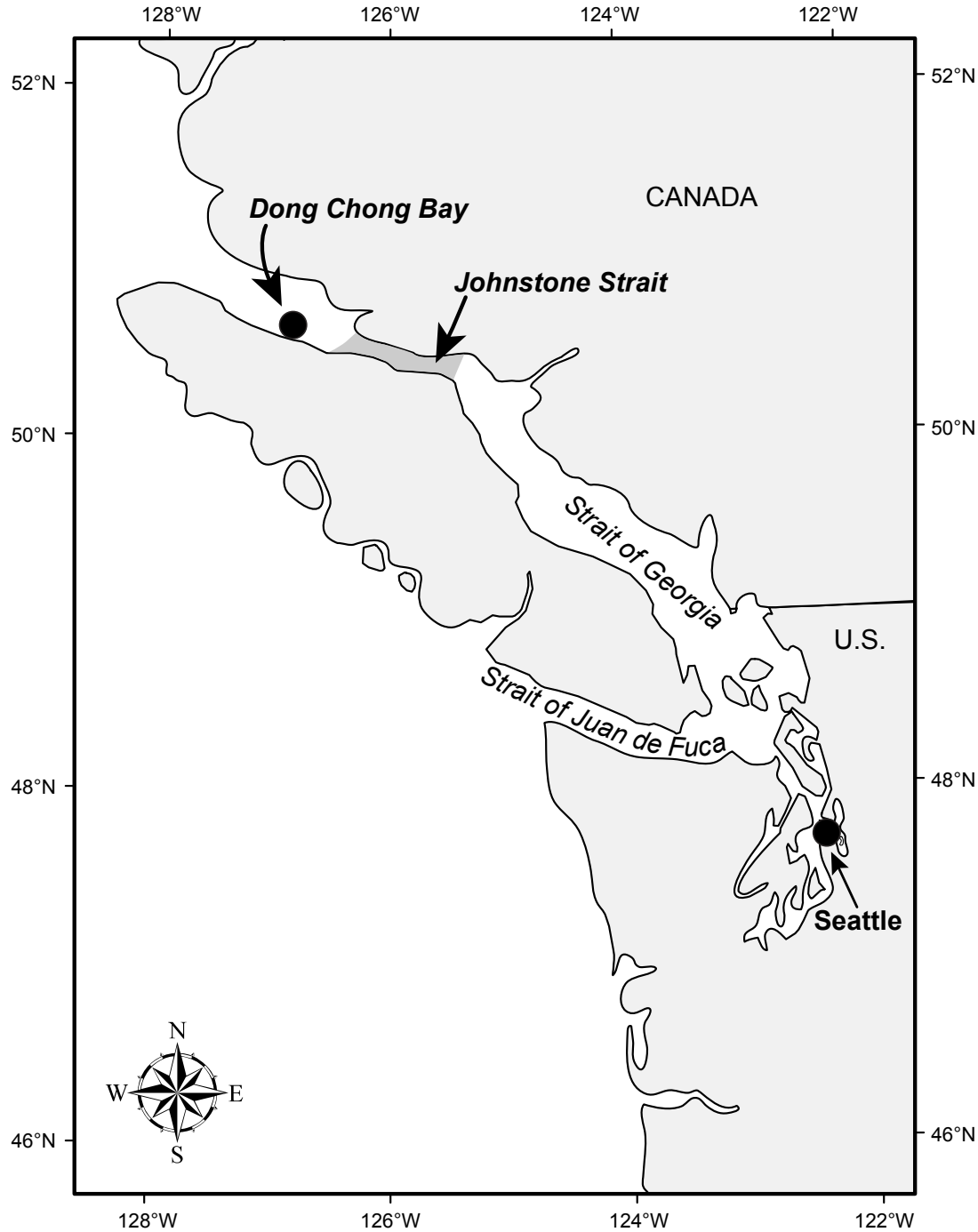
Circle the following locations:

- Johnstone Strait
- Dong Chong Bay on Hanson Island
- Seattle

Draw a line from Seattle to Dong Chong Bay to show Springer's whole journey.

Springer returned to her home waters in Johnstone Strait. First Nation leaders from Alert Bay (Springer's home) greeted her from a native canoe, draped in cedar boughs, with a ceremonial killer whale mask.

Springer's homecoming was a true success story that happened with the help of government agencies in two countries (NOAA in the U.S.A., and Fisheries and Oceans Canada), community involvement, and school kids in Washington State. We hope you share this story and inspire others to learn more too.



How can I help?

Now that you've learned how NOAA helped save one whale, let's focus on the killer whale population of the Pacific Northwest. From the activity we just did, list the things you will do at home or at school that will make a difference to the whale population. Then see how many you can do.

	Things I can do at home or school...

	I pledge to...

Resource Page Stewardship

Books

50 Simple Things Kids Can Do to Save the Earth by Andrews McMeel

Simply Greener by Jeff Thomas

Venus Peters Save the Whale by Christopher Rush and Mairi Hedderwick

In the Company of Whales by Alexandra Morton

The Tree by Dana Lyons and David Lane Danioth

A Garden of Whales by Maggie Steincrohn Davis

Websites

Learn more about endangered animals
http://www.nmfs.noaa.gov/pr/laws/esa

Ways you can help make a difference
http://www.pugetsound.org/education

Learn more about ways to help
http://www.psp.wa.gov

Kids for Saving the Earth
http://www.kidsforsavingearth.org

Glossary

acoustics The study of sounds. Scientists study the sounds made by killer whales (whistles, clicks, and calls).

baleen Long, flat plates that form the comb-like structure that hangs from the upper jaw of plankton-eating whales. These plates help filter food from the water.

baleen **whale** A whale with baleen in its mouth instead of teeth. Three examples of baleen whales are blue whale, humpback whale, and gray whale.

blowhole The nostril of a whale, located at the top of its head. Whales with teeth, like orcas, have one blowhole. Baleen whales have two blowholes.

breaching A behavior where a whale leaps out of the water.

calls Sounds made by whales to communicate with one another.

catamaran A boat with two hulls.

cetaceans The group of marine mammals that includes whales, dolphins, and porpoises.

clicks Repetitive ounds used by toothed whales to navigate and find food. Also known as echolocation clicks or sonar clicks. A whale emits clicks; when a click hits an object, the echo returns to the whale and is used to “see” underwater.

conservation The act of protecting or preserving natural resources in order to prevent depetion or loss.

DFO An abbreviation for the Department of Fisheries and Oceans (now called Fisheries and Oceans Canada), the government agency in Canada that studies and manages Canada’s oceans and freshwater areas.

dorsal fin The fin on the back of most whales, dolphins, and porpoises.

echolocation **clicks** Sounds, made by whales, that sound like fast taps repeating over and over. These sounds are used to “see” underwater and find food. Also known as sonar clicks.

ecosystem A community of living organisms and their environment, and the interactions between the two.

eye **patch** The white oval area above the eye and above the mouth of an orca. The eye patch can be one of many identifying features.

fecal **sample** An animal's feces (poop), collected to help understand more about the animal's diet and health.

feces Bodily waste discharged from animals; also called stool, scat, or poop.

First **Nations** The first people of Canada, like Native Americans in the U.S.A..

flukes The two flattened fins that make up a whale's tail.

food **chain** A food pathway that links different plants and animals within a community or ecosystem.

food **web** A network of food chains in an ecosystem.

foraging The act of searching and hunting for food.

herring Small silvery fish that swim in large groups or schools. Herring are food for many types of animals (for example, larger fish, seabirds, marine mammals). Young herring feed on phytoplankton, and adult herring feed on zooplankton.

hydrophone An underwater microphone used to hear underwater sounds, such as whale calls and the many noises in the ocean.

identification Using the unique characteristics of an individual to separate it from others.

kelping A behavior where whales drape kelp or seaweed over their flippers, tails, and other body parts.

ketosis The process of breaking down fat (blubber) for energy. In this process, a chemical that smells like nail polish remover can sometimes be found in the urine or on the breath.

killer **whale** Another name for an orca.

Kwakwaka'wakw (kwalk-walk-ya-walk) The First Nations people whose ancestral territory includes the area around Dong Chong Bay. The Kwakwak'wakw includes many tribes or bands who share a common language known as Kwakiutl or Kwak'wala (also known as Kwakiulth).

lobtailing A behavior where a whale slaps its tail flukes at the surface of the water, creating a loud sound that can be heard long distances above and below the surface. Also see tail lob.

logging A behavior where a whale rests at the surface of the water without swimming. The motionless whale looks like a giant floating log.

makinulth The Kwakiulth word for orca.

matriarch The oldest female in a pod or family group, who leads the group.

matriline A family tree for the mother's side of the family.

Namgis The First Nations band whose chief performed a ceremonial welcome for Springer when she returned to Dong Chong Bay.

net **pen** An enclosure in an open area of water that is created by using nets.

NOAA An abbreviation for the National Oceanic and Atmospheric Administration, a U. S. government agency. People who work for NOAA study the world's oceans and atmosphere.

orca A black and white toothed whale that is actually the largest member of the dolphin family. When a whale, dolphin, or porpoise is longer than 30 feet, it is considered a whale.

orphan A young animal without its mother or father.

pectoral **fins** The flippers on the underside of a whale, close to the head. They are similar to arms in humans. They are used mainly for balance and steering.

pectoral **slap** A behavior where a whale lifts one or both pectoral flippers out of the water and slaps them against the surface of the water. This creates a loud sound that can be heard long distances.

phytoplankton Plant plankton (tiny plants) that live in the water. These small plants are at the base of the food chain, and are eaten by zooplankton and small fish.

plankton Tiny plants and animals that live in the water and float with currents. Most plankton can only be seen with a magnifying glass or microscope.

pod A group of whales. For killer whales, a pod usually includes an extended family of orca mothers and their children, usually consisting of 5-50 whales. Pods are given letter names to help scientists identify them.

porpoising A behavior where a whale, dolphin, seal, or penguin swims fast and most or all of its body breaks the surface of the water.

prey An animal hunted for food.

range The area where an animal lives.

resting A behavior where whales decrease speed, often swim close together, and breathe at the same time.

rostrum The very front end of a whale, porpoise, or dolphin. Also called the beak or snout.

saddle **patch** The light gray patch of skin behind the orca's dorsal fin. Saddle patches are different on every whale, and can be used to identify individual animals.

sonogram A picture or visual way to look at a sound.

spectrogram Another name for a sonogram.

Springer A fish-eating killer whale of the A4 pod and A24 matriline. Springer's scientific name is A73.

spyhopping A behavior where a whale sticks its head up out of the water and sinks back down underwater.

stewardship To take good care of the earth and the environment.

stranded **animal** An animal that is out of its element and is unable to survive without help.

stranding **network** A group of scientists and volunteers who help stranded marine mammals.

tail **lob** A behavior where a whale slaps its tail flukes at the surface of the water, creating a loud sound that can be heard loud distances above and below the surface. Also called lobtailing.

toothed **whale** A whale with teeth in its mouth, instead of baleen. Examples are killer whales, sperm whales, and pilot whales.

traveling A behavior where whales are moving from place to place.

vocalizations The sounds an animal makes. Killer whales use whistles and calls for communication, and clicks for echolocation.

zooplankton Animal plankton (tiny animals) that live in the water. Zooplankton are microscopic animals that eat other plankton (both plant and animal plankton).

The ***Saving Springer: How NOAA helped an orca go home*** curriculum for grades 2-3 and 4-6 was developed by NOAA's National Marine Fisheries Service, Alaska Fisheries Science Center. The curriculum was developed by Lisa Hiruki-Raring, Harriet Huber, Peggy Foreman and Donna Sandstrom. Graphics were developed by Wendy Carlson and Karna McKinney. Graphic layout was provided by Rebecca White and Karna McKinney. Photos were provided by Mark Sears, Bob Wood, Lynne Barre, John Durban, and Marilyn Dahlheim. Killer whale images were provided by Uko Gorter (*www.ukogorter.com*). OrcaLab (*www.orcalab.org*) donated the use of Track 7, First Contact. 1:30 am, July 14 from The Return of Springer CD, used in the Lesson 6 Comic Strip activity, with permission from Dr. Paul Spong. The Seattle Aquarium provided the J-pod trading cards, and Dyanna Lambourn, Washington Department of Fish and Wildlife provided the images of blood samples. Funding was provided by NOAA' s National Marine Fisheries Service (Headquarters office, Alaska Fisheries Science Center, and Northwest Regional Office).

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