



PORT of
vancouver



Teacher's Field Trip Guide

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* Master pages that are in black and white and are for you to duplicate and hand out to your class

Hello teachers,

Thank you for booking a school program at the port!

The Port of Vancouver is more than cranes, ships and cargo. We are a gateway for trade and tourism and a major economic force that strengthens the Canadian economy.

We are also recognized globally as a naturally beautiful and clean port with a commitment to the environment, to our operating communities, and to innovation. We look forward to showing your students how what we do connects to their everyday lives.

This package includes three sections to enhance your field trip experience:

- 1 Planning information - including directions to our Discovery Centre for you and your volunteer drivers.
- 2 Pre- and post-visit lessons - designed to meet BC Curriculum Guidelines for grades 4, 5, 6 Social Studies.
- 3 A self-guided tour of the port - use as an extension on your field trip day.

We encourage you to read through this material and prepare your students with pre-visit brainstorming, discussions, or lessons before you come. Also, please visit us online at portvancouver.com and on our  Twitter and  Facebook pages for port updates, photos, videos and more.

We welcome your feedback and encourage you to share your own port stories on social media #portvancouver.

“Sea” you soon!

The Port Authority's Education Team

Planning



Planning your field trip

PROGRAM OVERVIEW

Introduction (5 minutes)

- Overview of program

Activity Stations (80 minutes, details subject to change depending on time and level)

- Trivia Challenge on the touch screen benches - maximum 24 groups (groups of 2-3 people)
- Ship cargo loading (divide the group into 6 groups numbered 1-6)
- Solve environmental solutions quiz
- Enact story about import process
- Scavenger Hunt on the touch screen benches (groups of 2-3 people)
- Map puzzle (in-class only)

Wrap-up (5 minutes)

GETTING HERE

- The Vancouver Fraser Port Authority office is located at the northern end of Canada Place right below FlyOver Canada in downtown Vancouver. It is easily accessible by bus, SeaBus and SkyTrain. There is also pay parking under Canada Place for personal vehicles under 6'9".
- This guide includes a Field Trip Day Teacher "Grab & Go" sheet with directions to the meeting spot and other important details.

SAFETY AND SUPERVISION

- Canada Place can be very busy - especially when a large convention is underway or cruise ships are at port. Please make a supervision plan for each phase of your field trip.
- This guide includes two "Field Trip Day" information sheets - one with directions for your drivers and one for the volunteers who will stay and help during the field trip.



PLANNING

PARENT VOLUNTEERS

- One port authority staff member will be leading the program. We recommend bringing at least two parents to help supervise, depending on the needs of your students.
- It helps if these volunteers engage with the students, circulate and help with group work, and are available to take students to the washrooms if necessary.

WASHROOMS

- The Discovery Centre does NOT have public washrooms. Please walk inside Canada Place and then walk down the inside corridor to the Harbour Cafe where the washrooms will be unlocked. Please make sure your group has enough time to stop on the way. (*Note washroom location on map above.)

LUNCH SPOTS

- We recommend eating your picnic lunch on the North point at Canada Place. On rainy days, many schools visit the Waterfront Centre Food Court on the lower level of Canada Place or eat in the connecting tunnel from Canada Place to Convention Centre West where the First Nations walk, Royal BC Museum gold rush wall and Olympic medals and torches are located.
- There are also many restaurants in the area. Plan ahead to avoid the lunch rush.

PLANNING

OTHER THINGS TO DO DOWNTOWN

- Walk along the outer promenades to the North Point of Canada Place and use the Self-Guided Tour of Vancouver's Harbour provided in this guide.
- FlyOver Canada offers group discounts. Please contact them directly.
- Vancouver Lookout at Harbour Centre - 360 degree view of the port. A single class may book in with the Lookout for \$5.00 per child and free adult escorts - valid Oct-April. Note that they can accommodate one class (max 35 people). Please contact them directly. (eat your lunch there & photo scavenger hunt activity)
- Ride the SeaBus back and forth from Lonsdale Quay for a ship's view of the port.

NOTES:

FIELD TRIP DAY TEACHER “GRAB & GO”**Parent Volunteers (Cell No.):**

Volunteers Staying to Help During the Program (at least two):

Contact:

Education Outreach Assistant Phone:
604.665.9038 or cell: 778.231.2974

Address:

Port of Vancouver Discovery Centre
100 The Pointe, 999 Canada Place

Washrooms Reminder

- Please visit the washrooms near the street entrance to Canada Place before the program begins.

Meeting Spot

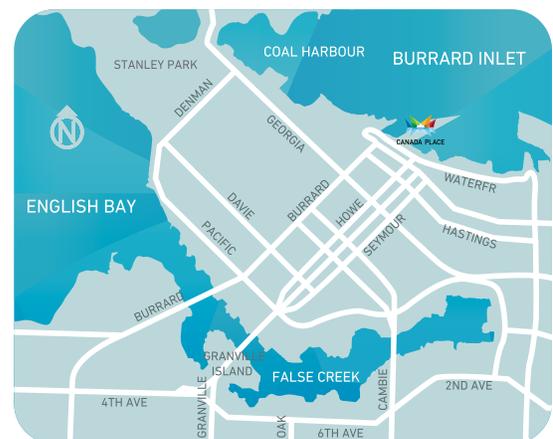
- Just inside the sliding glass doors of the port authority's discovery centre at the north end of the concourse in Canada Place (walk the inside corridor to the far end of the long hallway on the west side of the building). We are located underneath FlyOver Canada.

Directions from SkyTrain or SeaBus:

- Exit at Waterfront Station
- Walk west on Cordova Street
- Turn north on Howe Street
- Enter Canada Place.

Parking at Canada Place:

- Entry to the Canada Place parkade is at the very north end of Howe Street in downtown Vancouver
- Tickets are obtained from the ticket dispenser or the ticket booth
- There are two parking levels. Park at the far north end of the parking lot
- Take the elevators to level G (ground level).



FIELD TRIP DAY DIRECTIONS FOR VOLUNTEER DRIVERS

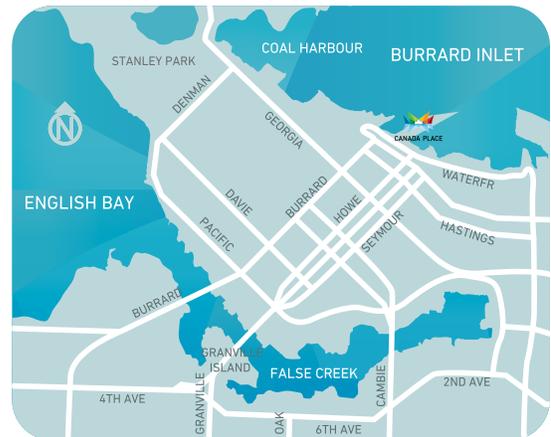
Thank you for helping us with the field trip today. Please keep your group close together - Canada Place can be a very busy place.

Emergency Contact Information:

Students in your car:

Parking at Canada Place:

- Entry to the Canada Place parkade is at the very north end of Howe Street in downtown Vancouver
- Tickets are obtained from the ticket dispenser or the ticket booth
- There are two parking levels. Park at the far north end of the parking lot
- Take the elevators to level G (ground level).



When you arrive at Canada Place:

- Tell students that the Discovery Centre does not have washrooms.
- Use the public washrooms by the Harbour cafe on your way down the inside concourse.
*Note that if you walk outside on the Canada Trail, you will need to enter at the cafe for the washrooms.
- Meet just inside the sliding glass doors of the Discovery Centre at the north end of the concourse in Canada Place (walk inside to the far end of the long hallway on the west side of the building).

FIELD TRIP DAY INFORMATION FOR VOLUNTEER HELPERS

Thank you for volunteering to help with the field trip today. Please keep your group close together
- Canada Place can be a very busy place.

Emergency Contact Phone Number:

The students you will be supervising are:

Schedule for the day:

Lunch will involve:

Other Notes:

Pre- and Post- Visit Activities

This guide includes a selection of classroom activities, organized into four topic sections, to help connect your students' experience at the Port of Vancouver with their learning at school. Most activities can be used either before or after the field trip.



PRE- AND POST-VISIT ACTIVITIES

CURRICULUM CONNECTIONS 2017-2018

The following activities in this guide meet the following Big Ideas and Curricular Competencies:

Social Studies	What happens at the port of Vancouver	Maps, maps, maps	History of the port of Vancouver	Importance of trade
GRADE 4 - Big Ideas: The pursuit of valuable natural resources has played a key role in changing the land, people and communities of Canada.	X		X	X
GRADE 5 - Big Ideas: Natural resources continue to shape the economy and identity of different regions of Canada.	X		X	X
GRADE 6 - Big Ideas: Complex global problems require international co-operation to make difficult choices for the future.	X			X
Curricular Competencies:				
Use Social Studies inquiry processes and skills to ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions.	X	X	X	X
Ask questions, corroborate inferences, and draw conclusions about the content and origins of a variety of sources, including mass media (evidence).	X	X	X	X
Sequence objects, images, or events, and recognize the positive and negative aspects of continuities and changes in the past and present (continuity and change).			X	
Differentiate between short and long term causes, and intended and unintended consequences, of events, decisions, or developments (cause and consequence).	X			X

PRE- AND POST-VISIT ACTIVITIES

What happens at the Port of Vancouver

The Port of Vancouver is more than ships, cranes and cargo. The port's operations include shipyards, tugboats, railways, trucks, shipping agents, freight forwarders, suppliers, builders, administrators, and environmental specialists. The port has 27 major marine terminals. Thousands of ships visit every year. All that cargo travels across the country, creating jobs throughout Canada.

LEARNING OBJECTIVE

- Students will test their current knowledge of the port and compare it to their knowledge after their visit or program. They will also imagine the port in 2050 - we'd love to hear their ideas!

PIQUE THEIR INTEREST

- Announce a field trip. Explain that you are going to study an organization in Vancouver that supplies 115,300 jobs across Canada. Ask students to guess the organization you are going to visit.

SUGGESTED ACTIVITIES

A. Pre- Visit Current Knowledge Brainstorm

- Have students complete the "What Happens at the Port of Vancouver: Predict and Draw" activity (master included).

B. Post- Visit Knowledge Summary

- Students use the "What Happens at the Port of Vancouver: Post-Visit Summary" (master included) to reflect on their learning. Compare and discuss their pre- and post-visit impressions of the port.

C. The Future of the Port of Vancouver

- The world is changing quickly and the Port of Vancouver is working hard to imagine and create a world class port facility for the future which is efficient and sustainable, with benefits for all. We would love your students' input! Have your students draw their vision of the port's future on "What Happens at the Port of Vancouver: Imagine the Future" (master included)
- The Education Team at the port authority would love to receive copies of your students' drawings. Please email education@portvancouver.com or fax them to: 1.866.284.4271.

QUICK PORT FACTS FOR THE TEACHER

- Five major types of ships visit the Port of Vancouver: RoRo's ("roll on, roll off" automobile transport ships), breakbulk (e.g., lumber), bulk (e.g., sulphur, potash), container ships, and cruise ships.
- Including indirect and induced effects, in round numbers, the total impacts of businesses related to the Port of Vancouver across Canada are: 115,300 jobs; \$7 billion in wages; \$11.9 billion in Gross Domestic Product (GDP); \$1.4 billion per year in tax revenues.
- The port was the first port in Canada to have an environmental team with chemists, marine biologists, experts on soil and air quality and many others that put ideas into action to ensure the port stays clean and beautiful for you and I to live nearby.

Name: _____

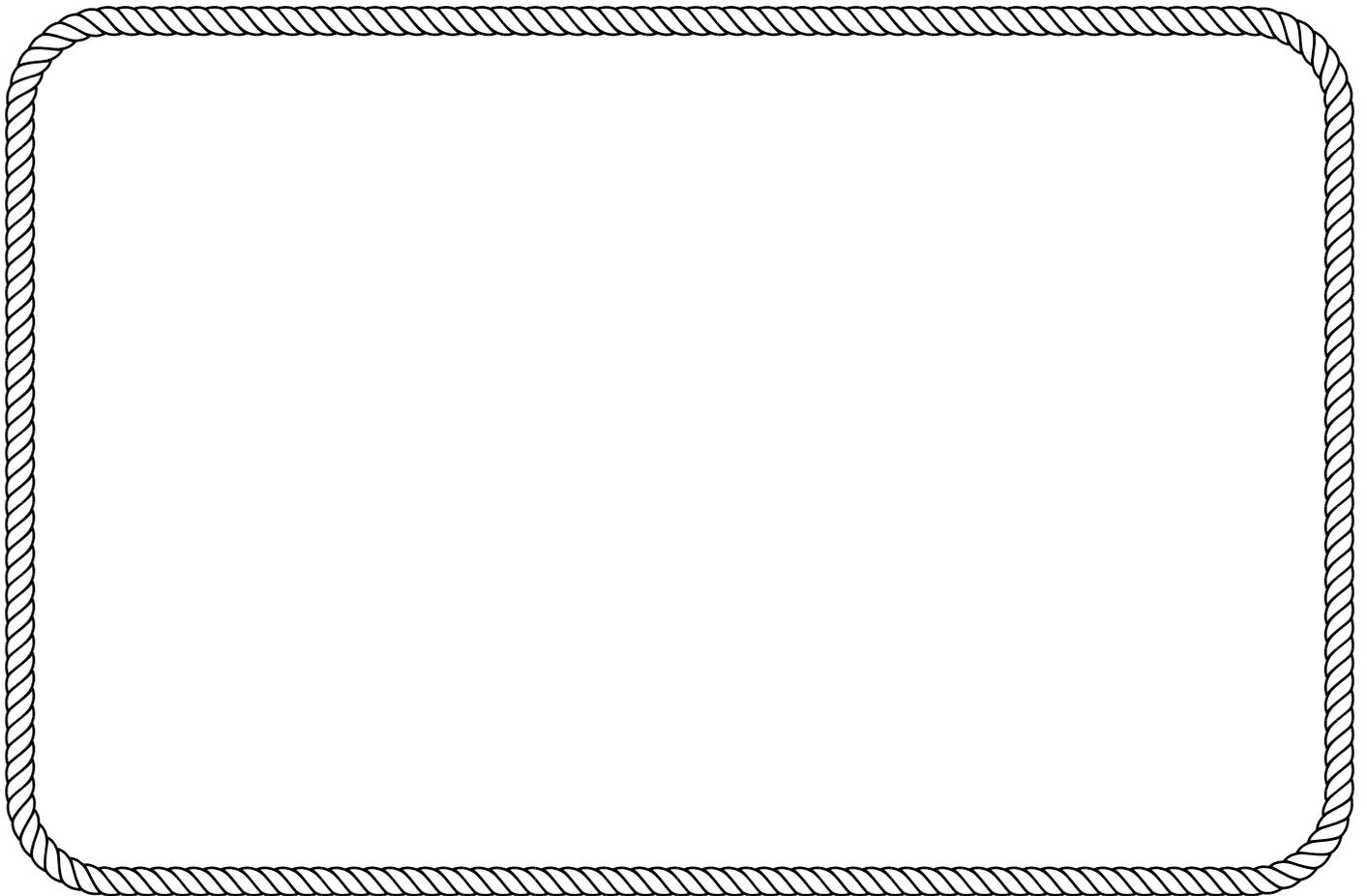
What happens at the Port of Vancouver

PRE-VISIT PREDICT AND DRAW

Vancouver is a port city (a port is a place where ships load and unload cargo). In fact, the port of Vancouver is the largest in Canada and handles more types of cargo than any other port in North America.

Activity: Draw a picture of what you think happens at the port of Vancouver. Use your memory or your imagination. If you don't know, make a good guess.

- 1 Your drawing should have _____ different features.
- 2 Use labels to identify the main features of your drawing.





Name: _____

What happens at the Port of Vancouver

POST-VISIT SUMMARY

Describe what you've learned about the port on this page.

Choose ONE of the following methods:

- Sketch the port in detail (label your drawing)
- Record your thoughts in point form
- Write a descriptive paragraph
- Draw a mind map of what you've learned



What is the most interesting or memorable thing you have learned about Port of Vancouver?



Name: _____

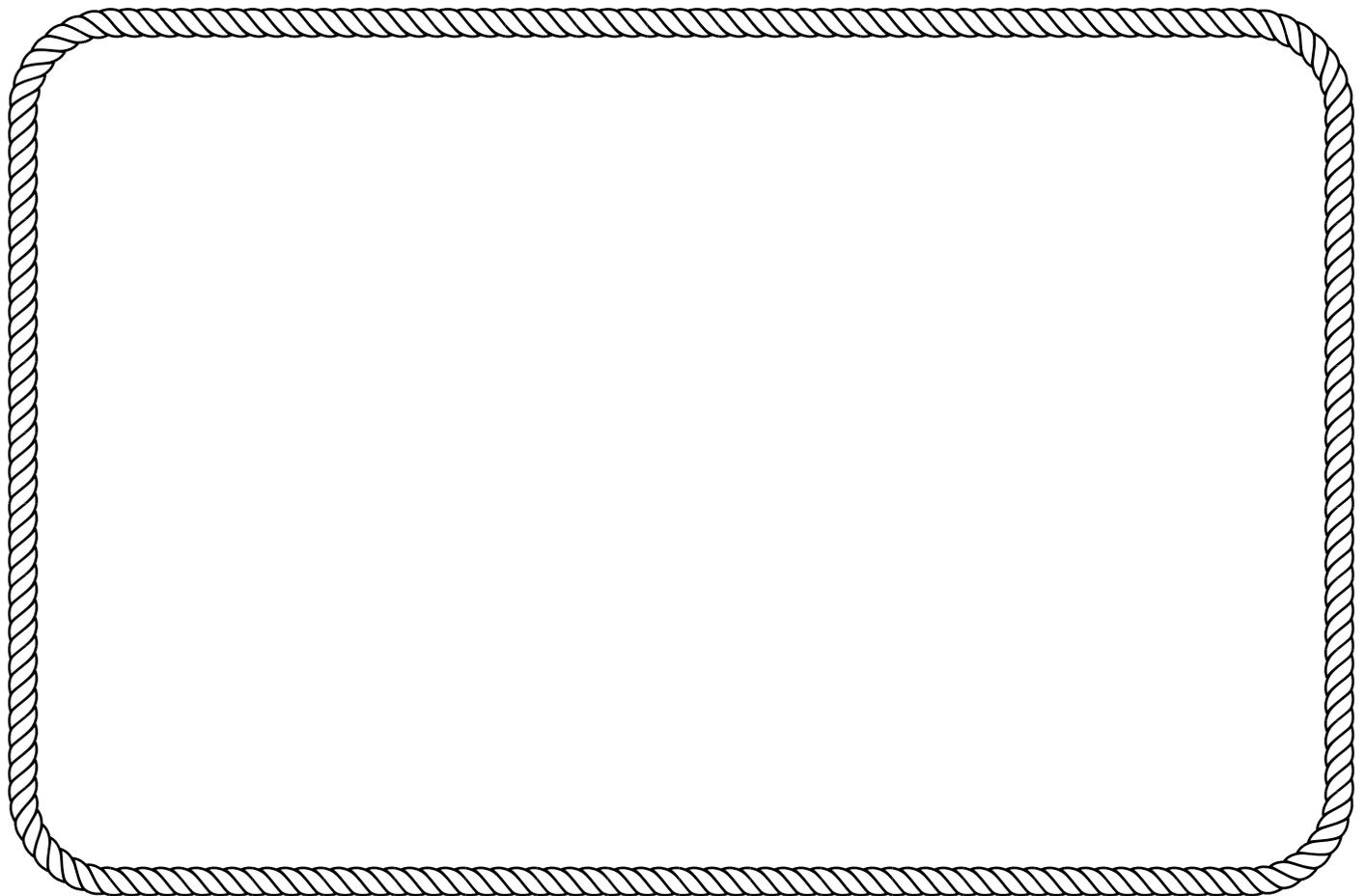
What happens at the Port of Vancouver

IMAGINE THE FUTURE

Draw a picture of what the port might look like in the year 2050.

- What could the ships, trucks and trains look like?
- Are new modes of transportation available?
- What fuels are used?
- What kinds of cargo are we shipping and receiving?

Your drawing should have _____ different features.



PRE- AND POST-VISIT ACTIVITIES

Maps, Maps, Maps

The Port of Vancouver borders 16 municipalities and intersects with the traditional territories of several First Nations and one treaty First Nation. The port authority works with many groups and governments in our jurisdiction to balance the needs of the shipping industry, other businesses on the waterfront, local communities and the environment.

LEARNING OBJECTIVE

- Use a variety of maps to learn about the extent of the waterfront around port of Vancouver, and its many inhabitants and uses.

PIQUE THEIR INTEREST

- Ask students to guess: If the shoreline at the Port of Vancouver were stretched into a straight line, how long would you have to drive to reach the same distance?

Answer: The shoreline is 350 km long. Driving at 50 km/hr you would need to drive for over 7 straight hours. That's as far as Kamloops, BC.

- Discuss why Vancouver is a good place for a large international port, e.g., deep water, proximity to the border.

SUGGESTED ACTIVITIES

BUILD YOUR OWN MAP

The Port of Vancouver

- Have students locate and label landmarks on the blank map (master included), such as major bodies of water, your school, the 16 municipalities in Vancouver, the Port of Vancouver, shipping terminals, Canada Place, the habitat ranges of animals, railways, etc.
- 16 municipalities bordering the Port of Vancouver are:
 - Belcarra
 - Burnaby
 - City of North Vancouver
 - Coquitlam
 - Delta
 - District of North Vancouver
 - Langley
 - Maple Ridge
 - New Westminster
 - Pitt Meadows
 - Port Coquitlam
 - Port Moody
 - Richmond
 - Surrey
 - Vancouver
 - West Vancouver

EXPLORE PORT OF VANCOUVER ONLINE

A. Port Details

- Using Google Maps, navigate around Vancouver and zoom in and out on images of your school, and then on ships at anchor, terminals, the sulphur piles, cargo on the docks, the giant red cranes, the railways, and other parts of the port.

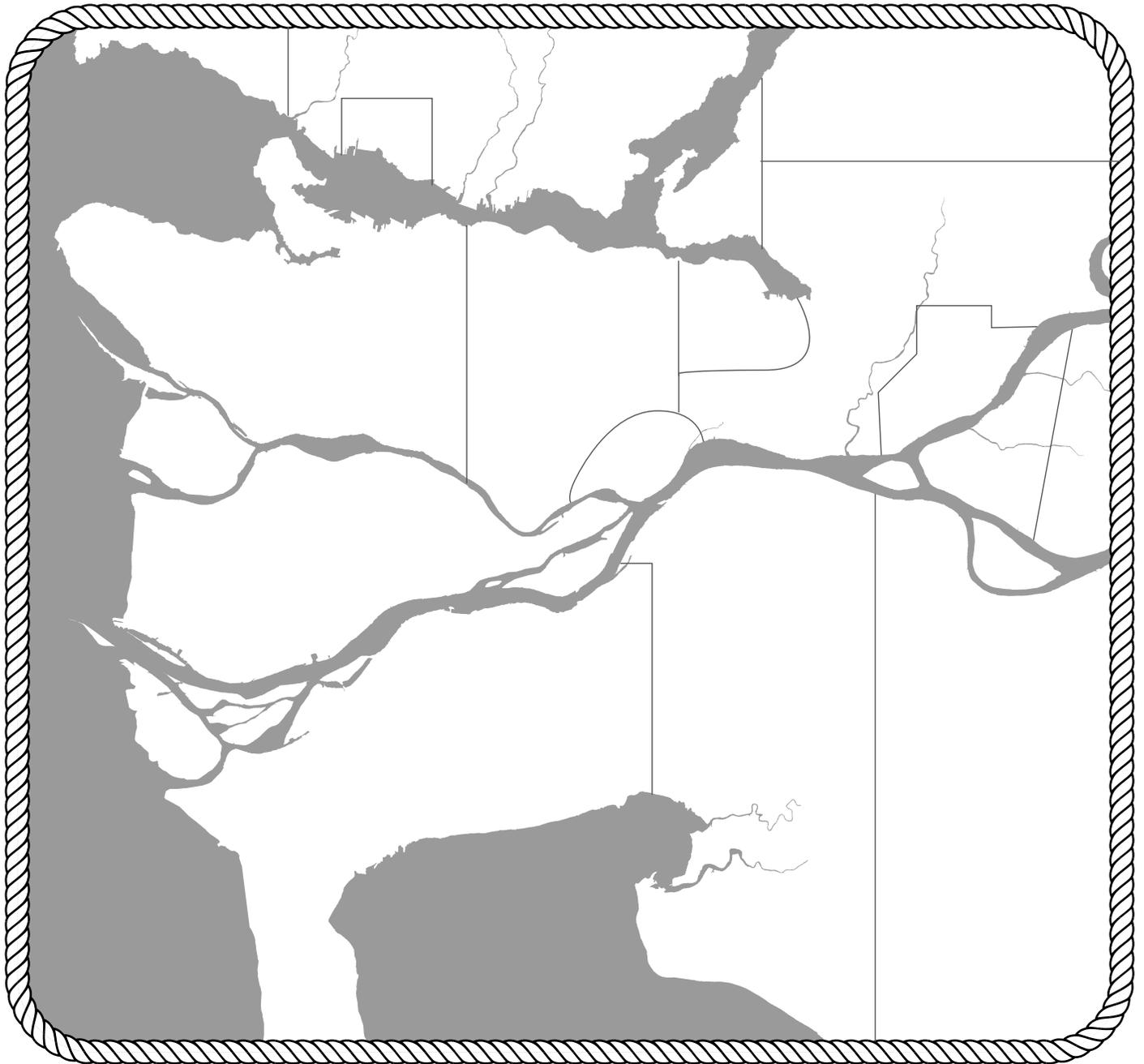
B. Find the Ships in the Port

- Google "Port of Vancouver Interactive Port Map" and have students use this online mapping tool to track real-time status of ships in our harbour
- Click on "Map Regions" and select "Vessel" from the dropdown menu. Hover your pointer and click a ship icon and a pop-up text box will tell you the ship details.



Name: _____

Map of Metro Vancouver



PRE- AND POST-VISIT ACTIVITIES

The History of the Port of Vancouver

Since Time Immemorial Coast Salish peoples have lived in and around what is now the Burrard Inlet. In the early 1800s, European explorers recognized this place as an ideal trading region. Today, the Port of Vancouver is Canada's largest port and the most diversified port in North America.

LEARNING OBJECTIVES

- Learn about early explorers and the development of shipping and trade in BC.
- Practice converting historical events from text to timeline.

PIQUE THEIR INTEREST

- One of the first cargo ships to sail from Vancouver left the docks in Burrard Inlet for Australia in 1864. Ask students to guess:
 - How long it took to load the ship? (2 months)
 - How long it takes to fill a modern bulk carrier with sulphur? (up to 48 hours)

SUGGESTED ACTIVITIES

A. Our First Nation Neighbours

- Since Time Immemorial Coast Salish peoples have lived in and around what is now the Burrard Inlet. Their traditional territories intersect the lands and waters managed by the Vancouver Fraser Port Authority, and they had complex systems for trade and commerce in the Salish Sea, Burrard Inlet and the Fraser River long before European settlers arrived and recognized this area as an ideal trading region. Using the links below, and any other resources you may have access to, ask students to identify a local First Nation community and research what that community might have traded and with whom.
Ask the students to demonstrate what they learn by drawing a picture, creating a short story, or giving a presentation.
 - First Nation Community Profiles Interactive Map: <http://fnpim-cippn.aandc-aadnc.gc.ca/index-eng.html>
 - Try Googling "Coast Salish History" and see what comes up!

B. Port Timeline

- 1 Historical Shuffle
 - Copy, cut and shuffle the "History of the Port of Vancouver Timeline Cards" (master and answer key included). Have students work in partners to place the cards in chronological order. Remove some cards from the activity for younger grades.
- 2 Build a Timeline
 - Ask students to choose the 5 or 6 most interesting events listed on the cards and convert them into an accurate timeline. Students can reference the "Heritage Horns at Canada Place Timeline" as an example (master included).
- 3 Perspective Taking
 - Ask students to choose one event in the timeline and either a) write a letter by a fictional person witnessing the event describing what happened or b) draw a picture of the event from the point of view of a bystander.

If your students will be downtown at noon on field trip day, make sure you listen for the sounds of the Heritage Horns!



C. Ships of the Past and Future

- Have students create a poster showing how cargo ships have evolved since 1859. Ask them to design a cargo or cruise ship of the future which is environmentally friendly, efficient, and safe.

Name: _____

The History of the Port of Vancouver

Timeline Cards

<p>Since Time Immemorial Coast Salish peoples have lived in and around what is now the Burrard Inlet.</p>	<p>Captain George Vancouver explores Burrard Inlet. He sees that the deep waters would make an excellent port.</p>	<p>Simon Fraser first arrives at the mouth of the river which is now named for him.</p>
<p>The Hudson's Bay Company builds Fort Langley and starts shipping salted salmon around the Pacific.</p>	<p>The Gold Rush brings many sail and steam ships to the Fraser River. A port authority is created to help control all the traffic</p>	<p>The DL Clinch is the first ship to carry a cargo of BC produce for export. It leaves from New Westminister carrying 50 barrels of cranberries.</p>
<p>The first sawmill opens in New Westminster.</p>	<p>The Ellen Lewis is the first cargo ship to leave Burrard Inlet. She carries lumber and railway ties to Australia. It takes two months to load the ship.</p>	<p>The first train arrives in downtown Vancouver.</p>
<p>The New Westminster Harbour commission, the North Fraser Harbour Commission and Vancouver Harbour Commission are established.</p>	<p>The Canadian government orders the harbour's first dredge of the First Narrows.</p>	<p>The first grain elevator is constructed in Vancouver. Ten years later the elevator breaks world records for grain trade.</p>
<p>Pier B & C opens on the current site of Canada Place. The pier was built for Empress ships that sailed across the Pacific Ocean</p>	<p>On its first voyage, the MV Elizabeth Bakke sets a speed record for making the trip from Sweden to Fraser River in just 22 days.</p>	<p>The Clifford J. Rogers, the first container ship in the world, sets sail from Vancouver. At this time, containers are called "Unitized Freight Transportation".</p>
<p>Construction of a coal terminal begins at Roberts Bank. Upon completion, it becomes Canada's largest coal export terminal. It still is!</p>	<p>Fraser Wharves opens in Richmond, becoming the first automobile terminal in the Lower Mainland.</p>	<p>Canada Place opens, replacing the former Pier BC.</p>
<p>Canada Place is made bigger so that three gigantic cruise ships can dock there at the same time!</p>	<p>The Fraser River Port Authority, North Fraser Port Authority and the Vancouver Port Authority amalgamated into one organization known as the Vancouver Fraser Port Authority</p>	<p>The Port of Vancouver becomes the first port in Canada to offer shore power for cruise ships. (Shore power lets ships turn off their diesel engines and use electricity while docked.)</p>

The History of the Port of Vancouver

HISTORICAL SHUFFLE ANSWER KEY

Since Time Immemorial - Coast Salish peoples have lived in and around what is now the Burrard Inlet.

1792 - Captain George Vancouver, the first European to explore Burrard Inlet, notes the deep waters would make an ideal location for a port.

1808 - Simon Fraser arrives at the mouth of the river that now bears his name.

1827 - The Hudson's Bay Company establishes Fort Langley and begins shipping salted salmon to markets throughout the Pacific.

1850s - So many sail and steam ships begin arriving on the Fraser River during the Gold Rush that an official port is set up to deal with all the traffic.

1859 - The DL Clinch becomes the first vessel with a cargo of BC produce to head for a foreign port. A 13-gun salute sends her on her way from New Westminster, carrying 60,000 feet of cabinet wood and 50 barrels of cranberries.

1860 - The first sawmill opens in New Westminster. Soon many mills become located along the Fraser River.

1864 - The Ellen Lewis is the first export ship to leave Burrard Inlet. She departs Moodyville for Australia, carrying lumber, fence pickets and railway ties that took two months to load.

1887 - The first train arrives in downtown Vancouver.

1910 - The Canadian government orders the harbour's first dredge of the First Narrows.

1913 - The New Westminster Harbour commission, the North Fraser Harbour Commission and Vancouver Harbour Commission are established.

1914 - The first grain elevator is constructed in Vancouver. Ten years later the elevator breaks world records for grain trade.

1927 - Pier B & C opens on the current site of Canada Place to accommodate trans-Pacific Empress ships.

The History of the Port of Vancouver

1937 - On its maiden voyage, the MV Elizabeth Bakke sets a speed record for travelling from Sweden to Fraser River Port in just 22 days, including a 12-hour delay at the Panama Canal.

1955 - The Clifford J. Rogers, the first purpose built container ship in the world, sets sail from the Port. At this time, containers are called "Unitized Freight Transportation."

1967 - Construction begins at Roberts Bank. Upon completion in 1970, it become (and remains) Canada's largest coal export terminal.

1971 - Fraser Wharves opens in Richmond, becoming the first automobile terminal in the Lower Mainland.

1986 - Canada Place replaces Pier BC, built on the original CPR pilings.

2003 - Canada Place is extended to accommodate three cruise ships, with room for a fourth.

2008 - The Fraser River Port Authority, North Fraser Port Authority and the Vancouver Port Authority amalgamated into one organization known as the Vancouver Fraser Port Authority

2009 - The Port of Vancouver becomes the first port in Canada to implement shore power for cruise ships. Shore power reduces emissions by enabling ships to connect to the local electrical grid while docked and shut down their engines.

Name: _____

Heritage Horns at Canada Place



1967



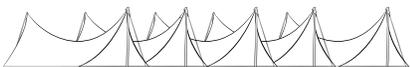
Ten air horns, later called the “Heritage Horns” were built and installed on top of the BC Hydro building. They play the first four notes of ‘Oh Canada’ every day at 12 noon.



1990



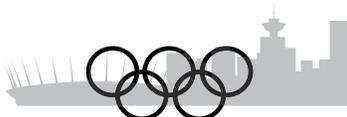
The horns were removed from the BC Hydro Building on Burrard Street.



1994



The horns were restored and moved to the top of Canada Place.



2010



The horns sounded 26 times to celebrate each medal won by Canadian athletes during the 2010 Olympic Games.



2014



The horns sounded 25 times to celebrate each medal won by Canadian Athletes during the 2014 Olympic Games in Sochi, Russia.

PRE- AND POST-VISIT ACTIVITIES

The Importance of International Trade

The Port of Vancouver is a major economic engine for Canada, trading \$202 billion in goods, with more than 170 trading economies each year.

LEARNING OBJECTIVE

- Students make connections between the benefits of trade to Canadians, the role of the Port of Vancouver in international trade, and the impact of trade on their own lives.

PIQUE THEIR INTEREST

- Ask how many kindergarten students (average 18 kg) it takes to make a metric tonne. (1000 kilograms/18 kilograms = 55.56). Have students guess how many metric tonnes of cargo traveled through the port in 2015. (138 million metric tonnes).

SUGGESTED ACTIVITIES

A. International Trade in Your Fruit Bowl

- Brainstorm one list of domestic products and one of products from abroad, including food, clothing, building materials, electronics, and other materials in our lives.

B. Lead a Discussion about the Benefits of International Trade

- What are some direct jobs in Canada supported by international trade? (e.g., port crane operators, ship captains, harbour patrol, dredgers)
- Indirect jobs? (e.g., store owners, forestry workers, warehouse workers)
- Why is it often cheaper for businesses to make their product in large quantities? (e.g., they can buy raw materials in bulk, assembly lines)
- What are some products we don't grow or produce in Canada? Why not? (oranges - climate; spices - native to a specific country ie. true cinnamon native to Sri Lanka)
- What are some of the environmental impacts of trade? (Positive: e.g., new technologies/innovations to solve problems. Negative: e.g., emissions from transport.)

C. "Plus-Minus-Interesting" Chart

- Have students complete the "Impacts of International Trade PMI" chart (master included) to outline the impacts of trade on a) their own lives, b) the average Canadian, c) citizens of other countries, or d) on the environment.

D. Top Trading Partners

- Ask older students to use statistics summaries provided on portvancouver.com to find out how many metric tonnes of cargo we traded with our top trading partners last year and what we were trading with them.

Name: _____

The Impacts of International Trade

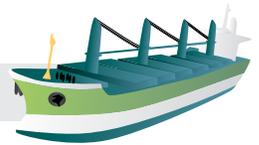
IMPACT OF INTERNATIONAL TRADE ON:	PLUS	MINUS	INTERESTING
YOUR LIFE			
THE AVERAGE CANADIAN			
OTHER COUNTRIES			
THE ENVIRONMENT			

Port Vocabulary

BERTH A place at a terminal where a ship docks.

BREAKBULK CARGO Cargo that is too large to be poured into a ship and does not require the protection of a container, including logs, steel, machinery and wood pulp.

BREAKBULK SHIP Vessel used to transport breakbulk cargo. Cranes onboard load the cargo.



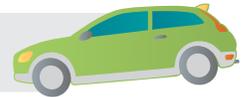
BULK CARGO Cargo poured directly into the hold of a ship, including coal, grain, potash, and sulphur.



BULK SHIP Vessel used to transport bulk cargo. Usually does not have onboard cranes.

CARGO Goods/products/commodities moved through the port.

COAL The largest bulk export at the Port of Vancouver. Thermal coal is burned to generate power. Metallurgical coal is burned to produce steel and metal for automobiles and machinery.



CONTAINERS Large metal storage boxes used to transport cargo that needs protection like clothes, electronics and toys. Can be stacked and loaded onto ships, trains or trucks.

CONTAINER SHIP - Vessels used to transport containers.



CRANES Large machines used to move breakbulk cargo and containers on and off ships.

Port Vocabulary

CRUISE SHIP Unlike other ships that visit the port, these ships carry passengers!

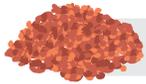


EXPORT Sending cargo from Canada to other countries.



IMPORT Cargo arriving to Canada from other countries.

PORT A place where ships load and unload cargo.



POTASH A sea salt used for the production of many things including fertilizer.

REEFER A slang term for a refrigerated container. Food products, plants and flowers are shipped inside these containers to maintain freshness.

RORO Vessel used to transport automobiles. A ramp inside allows automobiles to be driven on and off the ship (roll on/roll off).



SULPHUR A bright yellow by-product of natural gas excavation with more than 500 different uses including fertilizer, fireworks and soap. Stored in huge piles outdoors.



SHORE POWER Enables ships to connect to the electrical grid for necessary power while docked. This reduces emissions by allowing ships to shut down their diesel engines.

TERMINAL A place where ships dock to unload and load cargo. Most terminals at the port have two or more berths.

TRADE The exchange of goods cargo between Canada and other countries.

TUGBOAT A small but powerful boat that help guide ships into berth. One of the most helpful vessels at the port!



Links and Resources

Port of Vancouver Website

www.portvancouver.com

Shore Power

<https://www.portvancouver.com/environment/air-energy-climate-action/marine/shore-power>

Learn more about one of the environmental programs at the Port of Vancouver that students always seem to find interesting - we plug in our cruise ships!

TED-Ed Talk on Shipping Containers

<https://ed.ted.com/lessons/how-containerization-shaped-the-modern-world- Five minute video on Malcolm McLean and the Invention of the shipping container.>

Buster Bear Adventures - suitable for younger grades

Part 1 - <http://www.busterbear.ca/episode/133-2827-life-is-a-highway>

"Go West, Young Bear, A Buster Bear Adventure", Captain Nemo sends Buster on a quest around Vancouver... Buster learns about First Nations settlements in the area, and the history of Moodyville, and its famous mill..."

Part 2 - <http://www.busterbear.ca/episode/133-2899-we-can-bear-ly-contain-it>

In this next episode in Buster Bear's Vancouver quest, Steve Adore fills Buster in on the importance of containers to shipping, and how the first containers EVER were shipped from North Vancouver... Buster gets a bird's-eye "bear-spective" on Burrard Inlet, and all the amazing things that move through the port each year..."

FIELD TRIP FEEDBACK SURVEY

Thank you for coming the port! Your feedback is important to us - please let us know what you thought by going to the link below and filling out the survey.

- 1 <https://www.surveymonkey.com/r/55G2MJW>

Self-Guided Tour of Vancouver's Harbour



SELF-GUIDED TOUR OF VANCOUVER'S HARBOUR

THE PORT OF VANCOUVER IN ACTION

The goal of this activity is to create awareness of the Port of Vancouver's operations in Vancouver's harbour through a self-guided tour.

LEARNING OBJECTIVES

After participating in the Port of Vancouver in Action, participants will be able to:

- 1 identify vessels working in the port
- 2 name some of the cargoes that move through the port

MATERIALS REQUIRED

- 1 A Port of Vancouver map (from the port authority)
- 2 Vessel ID cards
- 3 Photos of vessels
- 4 Information on vessels
- 5 Information on terminals
- 6 Notebooks/paper and pencils

LOCATION OF ACTIVITY

This activity can be conducted anywhere there is a great view of Vancouver's Harbour. Recommended locations are the viewing deck at the North Point of Canada Place or any of the waterfront parks around the harbour.

INTRODUCTION

- Here's the Port of Vancouver live!
- Identify current location on map using some key landmarks such as Stanley Park, Lion's Gate Bridge, Ironworkers Memorial Bridge, Grouse Mountain, SFU, downtown Vancouver
- Vessels of all shapes and sizes work in Vancouver's Harbour. Let's identify some of them and figure out what they are doing.

ACTIVITY SUMMARY

In small groups, students will spot 3-5 vessels to identify. Through observation and knowledge gained through the port authority's school program, students will identify the vessels and draw the identifying features. Students will come up with some ideas about the boats such as what they are doing and where they might be going. Each working group will share its findings and as a class, see how many different vessels are identified.

ACTIVITY INSTRUCTIONS

- 1 Divide students into groups of about five
- 2 Have each group work in a different part of the viewing area and spot 3-5 vessels in the harbour to identify
- 3 Students will sketch out the vessels, note their features and identify them using the Vessel Identification Card
- 4 Students also generate ideas on what the vessels are doing, cargo they may be carrying and where they may be going
- 5 Groups share their findings and the class as a whole ticks off the vessels on the Vessel Identification Card
- 6 Teacher summarizes vessels identified and highlights various terminals and quick facts associated with them. As a group, they will look for any vessels on the ID Card that were not spotted
- 7 Teacher also mentions major ships of the 5 business sectors that are not present and reasons why (Ro/Ro terminals on river, not cruise season etc.)

SOME OF THE POSSIBLE VESSELS THAT CAN BE SPOTTED IN VANCOUVER'S HARBOUR

CONTAINER SHIP

- Most ships that come to this terminal hold between 2,000 to 5,000 containers. The largest container ships can hold over 17,000 containers!
- It takes about 7 days for a container ship to cross the Pacific Ocean from Asia to Vancouver
- They move at about 25 knots. That's how speed on the water is measured and that is equal to under 50 km/h so you're travelling below the speed limit on city streets.

CARGO SHIP (could be bulk or break bulk carriers)

- Breakbulk ships have large open hatches and deck cranes. Look for cargo sitting right on the deck. They move slower at about 14 knots
- Bulk ships also have large hatches so cargo can be poured in and then covered so it is protected.

CRUISE SHIP

- Some of the cruise ships that dock at Canada place are almost 300 m long. That's 24 school buses lined up end to end or the length of almost 5 NHL rinks!

SEA TRAIN/RAIL BARGE

- These vessels have rail tracks mounted to their decks to carry train cars across water.

TUGBOAT

- Tugboats are used to move other vessels. They may tow barges or push large ships to their positions in port.

BARGE

- A flat-bottomed boat that usually requires another vessel such as a tugboat to move it.

SEABUS

- Each ferry seats up to 400 passengers and departs every 15 minutes during the day
- It takes 12 minutes to cross the inlet.

RORO

- These specialized vessels are like giant parkades and automobiles are driven on and off. "RoRo" comes from "roll on/roll off". The RoRo terminals are along the Fraser River. The Port of Vancouver receives 100% of overseas Asian import vehicles destined for Canada. In 2017, that was about 425,000 units!

HOVERCRAFT

- The Canadian Coast Guard has two hovercraft based out of Sea Island, Richmond. They are mainly used for search and rescue
- Its air cushion allows it to move over water, mud or even land.

ADDITIONAL INFORMATION FOR TEACHERS

TERMINALS

- These are some of the terminals operating in Vancouver's harbour. Use this information to connect the vessels identified by students with the live operation of the port. If students point out a bulk carrier at the sulphur piles then you can talk about what happens at that terminal. Terminal locations can be found on the Port of Vancouver map.

VANCOUVER WHARVES

- Handles dry and liquid bulk such as sulphur, wood pellets, mineral concentrates (copper, zinc & lead), agricultural products and liquids.
- 5 vessel berths
- Serviced by a rail system to transport products.
- Facilities to store dry and liquid bulk until ready for transport.

SUGGESTED POINTS OF DISCUSSION AND QUESTIONS TO ASK STUDENTS:

What kind of ship is needed to transport sulphur?

Sulphur is transported by bulk ships.

Sulphur is the most noticeable of the cargoes shipped from this terminal. Sulphur has hundreds of different uses including in medicine, soap and fireworks. It is stored here until a ship comes to pick up and deliver it to other parts of the world. It takes less than five hours to unload 104 railcars of sulphur.

Do you see ships in the berths? How full are they? How do you know?

Every ship has a reference mark called the Plimsoll mark located on most ships where the black paint meets the red paint on the hull. This reference mark is used to determine to what depth a ship may be safely immersed to when loaded with cargo. The appropriate Plimsoll line is determined using factors such as the type of cargo, time of year and the density of water the ship will encounter (fresh or salt water). When a ship is full, the water line sits about where the two colours of paint meet.

FIBRECO EXPORTS

- Handles wood chips and wood pellets
- Six storage silos for wood pellets.

SUGGESTED POINTS OF DISCUSSION AND QUESTIONS TO ASK STUDENTS:

What kind of ship is needed to transport wood chips?

Fibreco is one of the largest woodchip terminals in North America. The wood chips piled on the terminal are collected from sawmills around BC, and are shipped worldwide for use in pulp and building materials. Barges or bulk ships are used to transport them.

What kind of ship is needed to transport wood pellets?

Bulk ships are used to transport wood pellets, an environmentally friendlier alternative to fossil fuels such as coal. They are a renewable, sustainable fuel source made from materials that would otherwise be wasted.

Burning wood pellets means less carbon dioxide going into the atmosphere.

SELF-GUIDED TOUR OF VANCOUVER'S HARBOUR

SEABUS TERMINAL

- Part of Translink and the Lower Mainland's public transportation system
- Passenger ferry connecting downtown Vancouver and the North Shore.

SUGGESTED POINTS OF DISCUSSION AND QUESTIONS TO ASK STUDENTS:

Has anyone ever taken the SeaBus? How else can you get to the North Shore?

The next time you cross The Lions Gate Bridge and the Ironworkers Memorial Bridge take a look around at the great view of the port!

RICHARDSON INTERNATIONAL

- Exports canola, wheat and other grains
- Offers grain cleaning and storage.

SUGGESTED POINTS OF DISCUSSION AND QUESTIONS TO ASK STUDENTS:

How is the grain stored before it is loaded on to a bulk ship?

Grain comes to the terminal by rail and is stored in storage silos

Storage capacity is being expanded to be able to handle over 5 million metric tonnes per year (an African male elephant may weigh about 5 metric tonnes or 5,000 kg - imagine a million elephants!)

LYNNTERM TERMINAL

- Handles many different breakbulk cargoes such as steel products, lumber, logs and wood pulp
- Serviced by rail and truck
- Ship schedule <http://www.westeve.com/services/terminal-operations/lynnterm-terminal/ship-schedules>
- Can unload 100 rail cars per day
- 4 vessel berths

SUGGESTED POINTS OF DISCUSSION AND QUESTIONS TO ASK STUDENTS:

What type of ship is needed to transport lumber and steel?

Breakbulk cargo is too big to fit in containers and has to be individually loaded. Picture bundles of lumber or huge tubes of steel. Pallets are often used to move cargo.

CENTERM

- Two vessel berths
- Rail connections to eastern Canada and US Mid-West
- One of four container terminals within the Port of Vancouver.

SELF-GUIDED TOUR OF VANCOUVER'S HARBOUR

SUGGESTED POINTS OF DISCUSSION AND QUESTIONS TO ASK STUDENTS:

What type of ship is needed to transport containers?

A TEU (twenty-foot equivalent unit) is the measurement used for containers worldwide. A container that is 40 feet long is 2 TEUs

In 2017, 3.2 million TEUs passed through the port of Vancouver

What is in the containers?

Items arriving in containers include clothing, electronics, furniture, toys and fruit from other countries

*Empty containers are filled with items such as specialty grains, pulp or lumber to be exported as backhaul cargo
How do containers get on and off ships?*

Look and you may see cranes working to lift containers on or off trucks and loading and unloading containers from a ship.

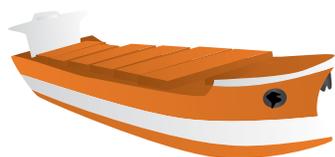
The people operating the cranes train for many years and they operate the crane using a big joystick controller similar to a video game – but this is no game! They move about 26 containers per hour.

CANADA PLACE

- Cruise ship terminal
- This is where the Vancouver Fraser Port Authority's offices are and also the location of the Operations Centre which oversees everything we are looking at today. Visitors can explore the Discovery Centre here and find out more about the port.

SELF-GUIDED TOUR OF VANCOUVER'S HARBOUR

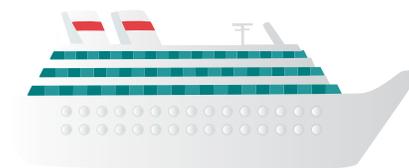
VESSEL IDENTIFICATION CARD



CARGO SHIP



CONTAINER SHIP



CRUISE SHIP



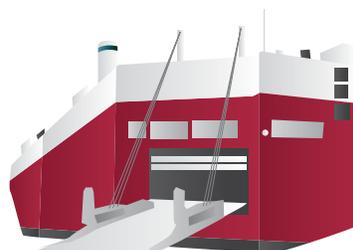
TUGBOAT



SEABUS



HOVER CRAFT



RORO