Brought to You by Ship

Game for science

Teaching guide
Summary

The *Brought to You by Ship* game offers students the chance to take the helm of a marine transportation company. They will have to use their logistics skills to manage the growth, profitability and environmental efficiency of their company.

The purchase and storage of goods and fuel, the hiring of the crew and the selection of orders are some of the tasks the players will have to complete.

Mishaps can happen at any moment at sea and stop or slow the ship. Will students know how to rectify the situation by answering quiz questions about the St. Lawrence?

The game allows players to realize the importance of the marine industry in our lives and to become aware that it is the greenest way to transport goods.

The *Brought to You by Ship* teaching guide is designed for 3rd cycle primary school teachers. It allows to draw on video game concepts while linking them to the Quebec school training program, mainly in English, mathematics and geography, history and citizenship education.

The present guide contains the following sections:

**Link with the Quebec school training program (p. 2)**
- Broad area of learning
- Subject-specific competencies
- Prescribed concepts

**Planning (p. 4)**
- The detailed activities in a glimpse

**General notes (p. 5)**
- Notes concerning the guide and the video game

**Teaching notes (p. 8)**
- Notes concerning each activity’s execution

**Answer key (p. 16)**

**Annexes (p. 41)**
Broad area of learning

Environment and consumerism

Educational aim
Encouraging the student to maintain a dynamic relationship with his surroundings, while keeping a critical distance from the exploitation of the environment, technological development and consumer goods.

Areas of development
Construction of a viable environment with a view to sustainable development.

Subject-specific competencies

English

Writing various texts
- Using one’s wealth of knowledge and experience.
- Exploring the varied resources of the written language.
- Using writing for various purposes.
- Using the strategies, knowledge and skills required by the writing exercise.
- Evaluating one’s writing process in order to improve it.

Mathematics

Solving a situational problem in mathematics
- Decoding the elements of the situational problem.
- Modelling the situational problem.
- Applying different strategies in order to find a solution.
- Validating the solution.
- Sharing the information related to the solution.
Prescribed concepts

<table>
<thead>
<tr>
<th>Subject</th>
<th>Concepts being used</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Interrogative sentences</td>
</tr>
<tr>
<td></td>
<td>Writing a narrative text</td>
</tr>
<tr>
<td></td>
<td>Writing a descriptive text</td>
</tr>
<tr>
<td></td>
<td>Conjugation</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Divisions</td>
</tr>
<tr>
<td></td>
<td>Arithmetic average</td>
</tr>
<tr>
<td></td>
<td>Rounding numbers</td>
</tr>
<tr>
<td></td>
<td>Fractions (representation and reduction)</td>
</tr>
<tr>
<td>Geography, history and citizenship education</td>
<td>Skills specific to geography</td>
</tr>
</tbody>
</table>
All implementation activities are à la carte.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Subject</th>
<th>Notion</th>
<th>Length</th>
<th>Reproducible material (Student guide)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREPARATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Brought to You by Ship: the tutorial</em></td>
<td></td>
<td></td>
<td>1 period</td>
<td>p. 1</td>
</tr>
<tr>
<td><strong>IMPLEMENTATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A few questions about the marine industry</td>
<td>English</td>
<td>Interrogative sentences</td>
<td>20 minutes + playtime</td>
<td>p. 4</td>
</tr>
<tr>
<td>The great journey</td>
<td>English</td>
<td>Writing a narrative text</td>
<td>2 periods</td>
<td>p. 5</td>
</tr>
<tr>
<td>The types of ships</td>
<td>English</td>
<td>Writing a descriptive text</td>
<td>2 periods</td>
<td>p. 8</td>
</tr>
<tr>
<td>Come aboard!</td>
<td>English</td>
<td>Conjugation</td>
<td>20 minutes</td>
<td>p. 11</td>
</tr>
<tr>
<td>Let’s go!</td>
<td>Mathematics</td>
<td>Time</td>
<td>30 minutes + playtime</td>
<td>p. 13</td>
</tr>
<tr>
<td>Exchanging Polo$ and Talent$</td>
<td>Mathematics</td>
<td>Divisions</td>
<td>20 minutes + playtime</td>
<td>p. 15</td>
</tr>
<tr>
<td>Some information about orders</td>
<td>Mathematics</td>
<td>Arithmetic average Rounding numbers</td>
<td>30 minutes + playtime</td>
<td>p. 17</td>
</tr>
<tr>
<td>In the containers!</td>
<td>Mathematics</td>
<td>Fractions (representation and reduction)</td>
<td>30 minutes + playtime</td>
<td>p. 19</td>
</tr>
<tr>
<td>A waterway</td>
<td>Geography, history and citizenship education</td>
<td>Skills specific to geography</td>
<td>30 minutes</td>
<td>p. 22</td>
</tr>
<tr>
<td><strong>INTEGRATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Brought to You by Ship: the conclusion</em></td>
<td></td>
<td></td>
<td>15 minutes</td>
<td></td>
</tr>
</tbody>
</table>
General notes

The length of activities is given for information purposes only. It can vary depending on the needs of every class.

To save time, have the students register in advance in the Game for science virtual world.

Here are the directions to access the video game:

1. Access the Game for science website via the following link: www.gameforscience.com, and click on “Play! Click Here”.

2. a) If the player has already registered to Game for science: fill in the “Members Log in” section.

2. b) If the player has not registered yet to Game for science: click on “Register!” and fill in the identification form.
3. Click on the globe symbol to make the world map appear.

4. Click on the container ship in the lower right.

5. Accept Captain Harbor’s quest.
6. Follow the steps of the tutorial in order to understand how the game works.
Preparation

Worksheet: *Brought to You by Ship*: the tutorial

Working method: Variable
Length: One period
Reproducible material: p. 1 of the student guide

- This activity can be done individually, in teams or with the whole group.
- Read the presentation with the students.
- Ask the students what they know about marine transportation. Note their answers on the chalkboard in the form of a brainstorm:

  ![Brainstorm Diagram]

  - Marine transportation

- Keep the answers of the brainstorm.
- Ask the students to do the *Brought to You by Ship* tutorial. Precisions:
  - It is strongly suggested to test the game before making the students play it in order to become familiar with the controls and to be able to easily answer their questions.
  - If needed, present the game and the tutorial in front of the class before making the students play it.
- Ask the students to complete the worksheet.

Implementation

Worksheet: A few questions about the marine industry
Subject: French
Notion: Interrogative sentences

Working method: Variable
Length: 20 minutes + playtime
Reproducible material: p. 6 of the student guide

- This activity can be done individually, in teams or with the whole group.
- Read the presentation with the students.
- The sidebar is a theoretical section. It is possible to use that section to:
  - Begin the study of the concept with the students;
  - Remind of the concept before completing the task.
- Ask the students to play Brought to You by Ship until an event stops their ship, then to note the question they will be asked. Precisions:
  - Encourage the students to choose orders bound for Gourmania. An event will certainly stop the ship during the journey.
  - If playtime is limited in class, this step can be done as homework.
- Ask the students to answer questions 1 and 2.
- Invite the students to go around the class to find 3 classmates who have different questions. Ask them to answer question 3.
- Conduct a discussion about the activity. Go through all the questions of the game. You can find the answers to those questions in an annex, on pages 65 to 68.

Worksheet: The great journey
Subject: French
Notion: Writing a narrative text

Working method: Individual
Length: 2 periods
Reproducible material: p. 9 of the student guide

- Read the presentation with the students.
- The sidebar is a theoretical section. It is possible to use that section to:
  - Begin the study of the concept with the students;
  - Remind of the concept before completing the task.
- Ask the students to complete the worksheet.
- Note that to answer question 1, the students must first have played Brought to You by Ship.
- Conduct a discussion about the activity. Encourage the students to read their text to their classmates or make their stories available to read.
Variant – Multidisciplinarity – Visual arts

Ask the students to draw a scene from their story. This drawing could be used as the cover page of their text.

Worksheet: The types of ships
Subject: French
Notion: Writing a descriptive text

Working method: Individual
Length: 2 periods
Reproducible material: p. 12 of the student guide

- Read the presentation with the students.
- The sidebar is a theoretical section. It is possible to use that section to:
  - Begin the study of the concept with the students;
  - Remind of the concept before completing the task.
- Ask the students to choose a type of ship.
- Invite them to do a document search on the subject. If needed, offer them to visit the following websites:
  - [http://www.csmoim.qc.ca/Secure/En/Information_about_the_marine_industry/Merchants_and_ships.html](http://www.csmoim.qc.ca/Secure/En/Information_about_the_marine_industry/Merchants_and_ships.html)
- Ask the students to complete the worksheet.
- Note that the third element is not mandatory. A few suggestions: size, equipment, capacity, speed, etc.
- Conduct a discussion about the activity. Encourage the students to read their text to their classmates or make their stories available to read.

Worksheet: Come aboard!
Subject: English
Notion: Conjugation

Working method: Variable
Length: 20 minutes
Reproducible material: p. 15 of the student guide
This activity can be done individually, in teams or with the whole group.
Read the presentation with the students.
Note that there is no theoretical section for this worksheet since it’s a revision activity.
Ask the students to complete the worksheet.
Conduct a discussion about the activity.

Worksheet: Let’s go!
Subject: Mathematics
Notion: Time

Working method: Variable
Length: 30 minutes + playtime
Reproducible material: p. 17 of the student guide

This activity can be done individually, in teams or with the whole group.
Read the presentation with the students.
The sidebar is a theoretical section. It is possible to use that section to:
  o Begin the study of the concept with the students;
  o Remind of the concept before completing the task.
Ask the students to play Brought to You by Ship. Precisions:
  o The students must first note the time.
  o The students must gather the relevant information from the order book.
Mention to the students that if the orders on the first page of the book are not all available, it’s possible to make other orders appear by clicking on the green button on the upper right:
  o If playtime is limited in class, these steps could be done as homework.
Ask the students to complete the worksheet. If the calculation space is insufficient, tell the students to use additional sheets.
• Conduct a discussion about the activity.

Worksheet: Exchanging Polo$ and Talent$
Subject: Mathematics
Notion: Divisions

Working method: Variable
Length: 20 minutes + playtime
Reproducible material: p. 19 of the student guide

• This activity can be done individually, in teams or with the whole group.
• Read the presentation with the students.
• The sidebar is a theoretical section. It is possible to use that section to:
  o Begin the study of the concept with the students;
  o Remind of the concept before completing the task.
• Ask the students to play Brought to You by Ship. Precisions:
  o The students must gather the relevant information from the gold Polo$ purchasing system:
    o If playtime is limited in class, these steps could be done as homework.
• Ask the students to complete the worksheet. If the calculation space is insufficient, tell the students to use additional sheets.

Worksheet: Some information about orders
Subject: Mathematics
Notion: Arithmetic average, rounding numbers

Working method: Variable
Length: 30 minutes + playtime
Reproducible material: p. 21 of the student guide

- This activity can be done individually, in teams or with the whole group.
- Read the presentation with the students.
- The sidebar is a theoretical section. It is possible to use that section to:
  - Begin the study of the concept with the students;
  - Remind of the concept before completing the task.
- Ask the students to play *Brought to You by Ship*. Precisions:
  - The students must gather the relevant information from the order book.
    Mention to the students that if the orders on the first page of the book are not all available, it’s possible to make other orders appear by clicking on the green button on the upper right:
  - If playtime is limited in class, these steps could be done as homework.
- Ask the students to complete the worksheet. If the calculation space is insufficient, tell the students to use additional sheets.
- Conduct a discussion about the activity.

**Worksheet: In the containers!**
**Subject: Mathematics**
**Notion: Fractions (representation and reduction)**

Working method: Variable
Length: 30 minutes + playtime
Reproducible material: p. 23 of the student guide

- This activity can be done individually, in teams or with the whole group.
- Read the presentation with the students.
The sidebar is a theoretical section. It is possible to use that section to:
  o Begin the study of the concept with the students;
  o Remind of the concept before completing the task.

Ask the students to play *Brought to You by Ship*. Precisions:
  o The students can figure out the answer to the question by consulting the order book.
  o If playtime is limited in class, these steps could be done as homework.

Ask the students to complete the worksheet.
Conduct a discussion about the activity.
Worksheet: A waterway
Subject: Geography, history and citizenship education
Notion: Skills specific to geography

Working method: Variable
Length: 30 minutes
Reproducible material: p. 26 of the student guide

- This activity can be done individually, in teams or with the whole group.
- Read the presentation with the students.
- Ask the students to complete the worksheet.
- Note that the students will only write down a few ports on their map. Hence, complete the map with them.
- Conduct a discussion about the activity.
- Visit the following websites to obtain more information about the ports on the St. Lawrence:

INTEGRATION

Activity: *Brought to You by Ship*: the conclusion

Working method: With the whole group
Length: 15 minutes
Reproducible material: None

- Revisit the answers of the brainstorm that was done during the preparation activity. Complete it with the current knowledge of the students.
Brought to You by Ship

Answer key
**Brought to You by Ship: the tutorial**

*Brought to You by Ship* is a video game that puts you at the helm of a marine transportation company. You must use a ship to deliver goods to the different islands of the *Game for science* world. Will you know how to manage your company well? This activity will help you to complete your first delivery successfully.

1. Connect to *Game for Science* and, from the world map, access the *Brought to You by Ship* game:

2. Accept the quest offered by Captain Habor and complete all the steps of the tutorial. In the process, answer the following questions:

   a. What is the cost of each terminal?

   ![Image of terminal costs]

      | Cost     | Gold Polo$ |
      |----------|------------|
      | 10       |            |
      | 5,000    |            |
      | 15,000   |            |
b. Write down the following labels at the right place on the order below:

- Loading time
- Necessary quantity of groups of container ships
- Reward
- Necessary quantity of fuel in liters
- Delivery time

![Diagram of a game interface with options for loading time, necessary quantity of groups of container ships, reward, necessary quantity of fuel in liters, and delivery time.]

c. Which event stopped your ship from moving?

Variable answer.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
d. In the order book, which button must you click to display new orders? Draw your answer in the box below:

![Refresh button]

e. What happens if you click on the number of gold Polo$ that you own?

*An interface allowing me to buy gold Polo$ with Talent$ opens.*
A FEW QUESTIONS ABOUT THE MARINE INDUSTRY

Interrogative sentences

By playing *Brought to You by Ship*, you have surely noticed that ships can run late for various reasons. For the game to continue, you had to answer quiz questions. By analyzing those questions, you will learn more about interrogative sentences.

An interrogative sentence is used to ask a question.

It ends with a question mark (?).

It can:

- contain an interrogative word (*Example: Where is the captain?*);
- include an inversion of the pronoun and the verb (*Example: Are you the captain?*).

1. Play *Brought to You by Ship* until an event stops your ship. Write down the question that will be asked to you.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

2. Circle the interrogative word of the sentence.

3. Write down three different questions from your classmates. For each sentence, circle the interrogative word.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Answer key

What does the expression “merchant navy” refer to?

How do we call this type of ship?

In the shipping world, what is a flag?

Approximately how many ships travel on the St. Lawrence each year?

According to you, how many commercial ports are there in Quebec?

On average, how many days does it take for a ship leaving from a St. Lawrence port to reach Europe?

What is the use of the whistle or siren of a ship?

According to you, during which seasons do ships travel on the St. Lawrence?

What percentage of the goods you use that come from outside the North American continent has arrived by ship?

Up to how many containers do you think a container ship can transport?

How many iPad devices do you think a container ship can transport?

How many trucks are needed to transport the equivalent?

According to you, what is a shipowner?

According to you, who is the leader on a ship?

How many people, on average, work on a ship intended for the transportation of goods on the St. Lawrence?
The purpose of a narrative text is to tell a story. Here are the different parts of such a text:

**The initial situation**
- Who is the character?
- Where does the story take place?
- When does the story take place?

**The inciting incident**
- What is the problem that the character must face?

**The adventures**
- What are the actions or the events that happen?

**The climax**
- Has the problem been solved?
- If so, how?
- If not, why?

**The final situation**
- How does the story end?

1. Use your experience of playing *Brought to You by Ship* to complete the following chart.

<table>
<thead>
<tr>
<th>Initial situation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Who?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Circle the inciting incident that you choose for your text:

<table>
<thead>
<tr>
<th>Storm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distress call from another ship</td>
</tr>
<tr>
<td>Mechanical breakdown</td>
</tr>
<tr>
<td>Ship blocked in ice</td>
</tr>
<tr>
<td>Ship attacked by pirates</td>
</tr>
<tr>
<td>Sick crew member</td>
</tr>
</tbody>
</table>

3. Fill in the following chart, which is devoted to the 3 last parts of a narrative text:

| The adventures     | |
|---------------------||
|                     | |

| The climax          | |
|---------------------||
|                     | |

| The final situation | |
|---------------------||
|                     | |
4. Write your text.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
The types of ships

Writing a descriptive text

Here are a few of the ships that can be observed on the St. Lawrence: bulk carrier, tanker, container ship and tugboat. During this activity, you must do a document search about one or another of those ships and write a descriptive text on the subject.

The purpose of a descriptive text is to describe a phenomenon, a place, an object, etc. Here are the different parts of such a text:

**Introduction**
- Grab the attention of the reader
- Present the subject
- Present the elements that will be explored in the main body

**Main body**
- Element 1
- Element 2
- Element 3

**Conclusion**
- Reminder of the essential elements of the text
- New information

1. Circle the ship of your choice:

   - Bulk carrier
   - Tanker
   - Container ship
   - Tugboat

2. Do a document search about the ship. Take notes on the next page’s plan.
3. Write your text.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Conjugation

Marine transportation has existed for a very long time. As such, it’s a perfect subject to work on the different conjugation tenses! From past to future by the way of present, this activity will allow you to revise the tenses and moods of verbs.

1. Make the verbs in brackets agree in the indicated mood and tense.

**Present indicative**
I (make) *make* the list of all the advantages of marine transportation.

**Present conditional**
You (like) *would like* to work as a deckhand.

**Future perfect indicative**
In two months, he (finish) *will have finished* his navigation officer training.

**Present perfect indicative**
We (go) *have gone* to visit the port.

**Simple past indicative**
You (come) *came* aboard the ship for the first time.

**Present conditional**
They (wear) *would wear* a safety helmet.

**Future progressive**
I (need) *will be needing* your advice about buying a ship.

**Simple future indicative**
You (be) *will be* a competent sea captain!

**Present indicative**
She (say) *says* goodbye to her friends who come aboard.
Perfect conditional
We (see) would have seen, the ship arrive by looking on that side.

Simple past indicative
You (be) were eager to sail away!

Present perfect indicative
They (eat) have eaten the food prepared by the ship’s cook.
The goods circulating on the St. Lawrence come from all around the planet. Ships from Europe, the United States, Asia or Oceania dock every day in the different ports of Quebec. The journeys are very long: days and even weeks. In the Brought to You by Ship game, the length of the journeys is much shorter. In this activity, you will use those lengths to perform various calculations.

Time corresponds to the length of a phenomenon. There are many units of time: century, decade, year, month, week, day, hour, minute, second…

To add or subtract hours, minutes and seconds, it’s necessary to remember that:

- 1 minute (m) = 60 seconds (s)
- 1 hour (h) = 60 minutes (m)

1. Write down precisely the current time. This will be the departure time of your ship.
   
   Example of answer:
   
   10:56 AM

2. In the Brought to You by Ship game, open the order book. Write down the delivery time for the six first orders in the next page’s chart.

3. Calculate the length of each delivery in seconds, then write down the answers in the next page’s chart.

4. Determine the arrival time of the ship, then write down the answers in the next page’s chart.
The journeys
The answers are given as examples

<table>
<thead>
<tr>
<th>Order</th>
<th>Delivery time</th>
<th>Delivery time in seconds</th>
<th>Arrival time of the ship</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10m</td>
<td>600 s</td>
<td>11:06 AM</td>
</tr>
<tr>
<td>2</td>
<td>2h</td>
<td>7,200 s</td>
<td>12:56 PM</td>
</tr>
<tr>
<td>3</td>
<td>4h51m</td>
<td>17,460 s</td>
<td>3:47 PM</td>
</tr>
<tr>
<td>4</td>
<td>4m</td>
<td>2,40 s</td>
<td>11:00 AM</td>
</tr>
<tr>
<td>5</td>
<td>2h25m</td>
<td>8,700 s</td>
<td>1:21 PM</td>
</tr>
<tr>
<td>6</td>
<td>35m</td>
<td>2,100 s</td>
<td>11:31 AM</td>
</tr>
</tbody>
</table>

Calculation space:
Exchanging Polo$ and Talent$

Divisions

Talent$ are the official currency of the Game for science virtual world. However, the Brought to You by Ship game has its own currency, the gold Polo$. It’s that currency that allows you to manage your marine transportation company. Did you know that it’s possible to buy gold Polo$ with Talent$ to make your company progress faster? This activity offers you a chance to learn more about currency exchanges.

Division is an operation making it possible to split a quantity in a certain number of equal parts. The dividend is the number being divided. The divisor is the number that divides. It’s the number of parts in which the dividend will be split. The quotient is the result of the division.

<table>
<thead>
<tr>
<th>Dividend</th>
<th>250</th>
<th>10</th>
<th>Divisor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quotient</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. In the Brought to You by Ship game, click on the quantity of gold Polo$ that you own. Write down the information about the purchase of gold Polo$ in the chart below.

Purchase of gold Polo$

<table>
<thead>
<tr>
<th>Quantity of gold Polo$</th>
<th>Cost in Talent$</th>
<th>Unit cost of each gold Polo$</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>500</td>
<td>10</td>
</tr>
<tr>
<td>1,000</td>
<td>9,000</td>
<td>9</td>
</tr>
<tr>
<td>20,000</td>
<td>140,000</td>
<td>7</td>
</tr>
</tbody>
</table>
2. Calculate the unit cost of each gold Polo$\$, i.e. the quantity of Talent$\$ needed to buy a gold Polo$. Perform the calculation for each row in the chart.

Calculation space:

3. What do you notice?

_The more gold Polo$\$ you buy, the lower the unit cost is. Hence, it’s more beneficial to buy big quantities of gold Polo$\$ than small quantities._

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

_Brought to You by Ship_
Some information about orders

Arithmetic average
Rounding numbers

While playing Brought to You by Ship, you have experienced the logistics associated with transporting goods by ship: the purchase and storing of goods and fuel, the hiring of crew members, profitability, etc. During this activity, you will play with those values while working on arithmetic average and rounding numbers.

The arithmetic average is the sum of all the values observed, divided by the number of values.

\[
\text{Average} = \frac{\text{Sum of all the values}}{\text{Number of values}}
\]

Rounding a number is replacing it by a nearby value. For example, to round a number to units, we replace it by the nearest whole number:

- If the digit after the decimal point is lower than 5, we round down to the lower whole number;
- If the digit after the decimal point is higher or equal to 5, we round up to the higher whole number.

1. In the Brought to You by Ship game, open the order book. For the six first orders, write down the information below in the chart on the next page:
   - the number of gold Polo$ earned as a reward for successfully completing the delivery;
   - the number of minutes allowed for the loading time of the order;
   - the number of liters of fuel needed for the journey.

2. Calculate the arithmetic average of each column in the chart. If needed, round the numbers to units.
### Order information

The answers are given as examples

<table>
<thead>
<tr>
<th>Order</th>
<th>Number of gold Polo$ as a reward</th>
<th>Number of minutes allowed for loading</th>
<th>Number of liters of fuel needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2,335</td>
<td>15</td>
<td>1,900</td>
</tr>
<tr>
<td>2</td>
<td>1,360</td>
<td>55</td>
<td>1,000</td>
</tr>
<tr>
<td>3</td>
<td>8,000</td>
<td>5</td>
<td>1,923</td>
</tr>
<tr>
<td>4</td>
<td>1,965</td>
<td>34</td>
<td>950</td>
</tr>
<tr>
<td>5</td>
<td>4,000</td>
<td>10</td>
<td>3,000</td>
</tr>
<tr>
<td>6</td>
<td>1,000</td>
<td>25</td>
<td>7,692</td>
</tr>
<tr>
<td><strong>Arithmetic average</strong></td>
<td><strong>3,110</strong></td>
<td><strong>24</strong></td>
<td><strong>2,744</strong></td>
</tr>
</tbody>
</table>

Calculation space:
Fractions (representation and reduction)

The container ships circulating on the St. Lawrence can have different capacities, i.e. they can transport various quantities of containers. Furthermore, the type of goods stored in those containers can vary: cereals, fruits and vegetables, electronic devices, etc. In the following activity, you will use fractions to represent those values.

A fraction is a number that represents part of a whole or a collection divided into equal parts. It is represented like this:

$$\frac{\text{Numerator}}{\text{Denominator}} \leftarrow \frac{2}{3} \rightarrow \text{Fraction bar}$$

The numerator indicates the number of equal parts being considered. The denominator indicates the number of equal parts that form the whole.

$$\frac{2}{3} \quad \text{of a whole} \quad \quad \quad \frac{2}{3} \quad \text{of a collection}$$

An irreducible fraction, i.e. a fraction reduced to lowest terms, is a fraction whose numerator and denominator can’t be divided anymore by the same divisor. The first fraction given as an example above is an irreducible fraction.

1. Connect to the *Brought to You by Ship* game and determine the total number of groups of containers that it is possible to load on a ship.
2. Here are various orders of groups of containers to load on a ship. What fraction represents the quantity of each group of containers?

<table>
<thead>
<tr>
<th>Group</th>
<th>Fraction</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 2, 13</td>
<td>$\frac{2}{15}$</td>
<td><img src="image1" alt="Representation" /></td>
</tr>
<tr>
<td>b) 2, 3, 10</td>
<td>$\frac{2}{15}$</td>
<td><img src="image2" alt="Representation" /></td>
</tr>
</tbody>
</table>

2. Here are various orders of groups of containers to load on a ship. What fraction represents the quantity of groups of containers of electronic devices? Complete the representation of that fraction.

<table>
<thead>
<tr>
<th>Group</th>
<th>Fraction</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 5, 10</td>
<td>$\frac{5}{15}$</td>
<td><img src="image3" alt="Representation" /></td>
</tr>
<tr>
<td>b) 5, 3, 7</td>
<td>$\frac{7}{15}$</td>
<td><img src="image4" alt="Representation" /></td>
</tr>
</tbody>
</table>
3. Here are various orders of groups of containers to load on a ship. What fraction represents the quantity of each group of containers? Reduce each fraction that can be reduced.

a) 

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Reduced fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/15</td>
<td>2/5</td>
</tr>
<tr>
<td>9/15</td>
<td>3/5</td>
</tr>
</tbody>
</table>

b) 

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Reduced fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/15</td>
<td>1/5</td>
</tr>
<tr>
<td>9/15</td>
<td>3/5</td>
</tr>
<tr>
<td>3/15</td>
<td>1/5</td>
</tr>
</tbody>
</table>
Skills specific to geography

To go from one destination to another, ships must use a well-established waterway or navigational channel. In *Brought to You by Ship*, there are several waterways connecting the different islands of Game for science. In Quebec, the port network consists of more or less 20 ports, most of which are located on the St. Lawrence River, if we exclude remote ports.

The map on the next page shows the St. Lawrence’s hydrographic system. The location of the main ports is indicated by a red circle. Here is the list of the main ports in Quebec, in alphabetical order:

<table>
<thead>
<tr>
<th>Baie-Comeau</th>
<th>Bécancour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chandler</td>
<td>Gaspé</td>
</tr>
<tr>
<td>Gros-Cacouna</td>
<td>Havre-St-Pierre</td>
</tr>
<tr>
<td>Matane</td>
<td>Montreal</td>
</tr>
<tr>
<td>Pointe-au-Pic</td>
<td>Port-Alfred</td>
</tr>
<tr>
<td>Port-Cartier</td>
<td>Port-Saguenay</td>
</tr>
<tr>
<td>Quebec</td>
<td>Rimouski</td>
</tr>
<tr>
<td>Sept-Îles</td>
<td>Sorel-Tracy</td>
</tr>
<tr>
<td>Trois-Rivières</td>
<td>Valleyfield</td>
</tr>
</tbody>
</table>

1. Give a title to the map.
2. Circle the map scale.
3. Cut out each strip, then paste it in the right place on the map.
4. Next to the red circles, write down the name of the ports that you know.
The main ports of the St. Lawrence’s hydrographic system

- North: Sept-îles, Port-Cartier, Baie-Comeau
- South: Valleyfield, Montreal, Sorel-Tracy, Bécancour, Trois-Rivières
- West: Pointe-au-Pic, Port-Saguenay, Port-Alfred
- East: Gaspé, Chandler, Havre-St-Pierre, Matane, Rimouski, Gros-Cacouna, Quebec
Brought to You by Ship

Annexes
**Game Questions**

**Question 1:**
How many people, on average, work on a ship intended for the transportation of goods on the St. Lawrence?
- a) About 20 people
- b) About 10 people
- c) About 100 people

Professions related to marine transportation are numerous and are not uniquely limited to the crews that work on ships. In Quebec, 36% of workers hold a navigational job (aboard a ship) and 64%, a non-navigational job (in ports, for instance).

**Question 2:**
According to you, who is the leader on a ship?
- a) The captain
- b) The shipowner
- c) The pilot

The captain is the leader of the marine expedition. A representative of the shipowner, he is responsible for the ship, its cargo and its passengers.

**Question 3:**
According to you, what is a shipowner?
- a) He's the owner
- b) He prepares tasty meals for the whole crew
- c) He maintains and repairs the ship's electrical circuits

The shipowner is the person who equips one or several merchant ships. He fits out the ship, i.e. he provides a crew, equipment, supplies and everything that is necessary for the marine expedition.

**Question 4:**
On average, ships on the St. Lawrence are loaded with 25,000 tons of goods. How many trucks are needed to transport these goods?
- a) 870 trucks
- b) 500 trucks
- c) 300 trucks

While the transport sector (road, air, marine, rail, off-road) is the one that produces the most greenhouse gas (GHG) emissions in Quebec, only 4.3% of that total is generated by marine transport.
**Question 5:**
How many iPad devices do you think a container ship can transport?
- a) 182 million iPad devices
- b) 1 million iPad devices
- c) 182,000 iPad devices

The biggest container ship currently in service is longer than the Eiffel Tower and can transport 182 million iPad devices!

**Question 6:**
Up to how many containers do you think a container ship can transport?
- a) 18,000 containers
- b) 10,000 containers
- c) 5,000 containers

The biggest ships can transport up to 18,000 containers. However, those ships don't visit the St. Lawrence River. On the river, ships transport on average up to 4,500 containers.

**Question 7:**
What percentage of the goods you use that come from outside the North American continent has arrived by ship?
- a) 90%
- b) 75%
- c) 50%

On average, around the world, 90% of the goods people use are transported by ship. Whether it is cereals, electronic devices or clothes, you use goods that have transited through the St. Lawrence River. Without it and ships, your life would be very different.

**Question 8:**
According to you, during which seasons do ships travel on the St. Lawrence?
- a) Spring - summer - fall - winter
- b) Spring - summer
- c) Spring - summer - fall

Since 1960, navigation is possible up to Montreal during wintertime. Hence, ships travel year-round thanks to the work of the Canadian Coast Guard's icebreakers.

**Question 9:**
What is the use of the whistle or siren of a ship?
- a) Indicating upcoming course alteration manoeuvres
b) Letting sailors know that the meal is served  
c) Indicating that the ship must be evacuated  
The course alteration and stopping manoeuvres of a ship are slow and can take several minutes. 
As such, it's important for a ship to warn other ships of its intentions. Coded light and sound 
signals make it possible to indicate manoeuvres and speed changes. 

**Question 10:**  
On average, how many days does it take for a ship leaving from a St. Lawrence port to reach 
Europe?  
a) About a week  
b) About three weeks  
c) About a month  
It takes between seven and ten days for commercial ships to cross the Atlantic and thus connect 
North America to Western Europe. 

**Question 11:**  
According to you, how many commercial ports are there in Quebec?  
a) 20 ports  
b) 10 ports  
c) 5 ports  
There is a network of 20 commercial ports throughout the Quebec territory. These ports are 
used for loading and unloading goods, and the main ones are Montreal, Quebec City, Sept-Îles, 
Port-Cartier, Trois-Rivières, Saguenay and Sorel-Tracy. 

**Question 12:**  
Approximately how many ships travel on the St. Lawrence each year?  
a) 5,000 ships  
b) 1,000 ships  
c) 2,500 ships  
More or less 5,000 ships travel on the St. Lawrence each year. They are mostly used to transport 
goods.
Question 13:
In the shipping world, what is a flag?
   a) A rectangular piece of cloth hoisted at the back of a ship
   b) The part of a ship where sailors can rest
   c) The captain's summer house or cabin
A flag indicates the ship's nationality, i.e. the country in which it is registered. For a ship registered in Canada, we say «to fly Canadian flag».

Question 14:
How do we call this type of ship?
   a) Container ship
   b) Bulk carrier
   c) Tugboat
Container ships are the ones that transport finished manufactured products (electronic devices, furniture, etc.) and other refrigerated goods (fruits and vegetables, meat, etc.). These products are bundled and carried in metal boxes that we call containers.

Question 15:
What does the expression «merchant navy» refer to?
   a) The marine transportation of goods or people
   b) Military marine transportation
   c) The sale of navy blue products
The merchant navy transports different types of goods. The products being transported determine the type of ship that will be used. Thus, across the world's seas, we find specialized ships: bulk carriers, self-unloaders, tankers, tugboats and container ships.