



SHIPPING IN SCHOOLS PROJECT

Key Stage 2

Year 3 - 6

CURRICULUM OVERVIEW & LESSON PLANS

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Introduction

This unit has been developed by the Institute of Chartered Shipbrokers to be delivered by teachers in the classroom setting. Each lesson focuses on a different area of importance in the shipping industry and has been linked directly to the National Curriculum.

The unit comprises of six individual lesson plans each with a relevant presentation and appendices for classroom use and distribution. Each lesson is designed to take one hour with a starter activity, explicit teaching, core activity and a plenary.

The focuses of each lesson are:

- Trade and commodities
- Import and Export: Global Trade
- Vessels
- Navigation
- Letter to a Ship
- London as a Maritime Port

This unit could be complimented by a class trip or visit to one of the locations noted at the end of this document.

Resource list

Lesson 1

Food samples for origins matching game (orange juice, sugar, coffee, rice, olive oil, bread)

(Appendix 1) Photos of Plants & Countries of Origin – Matching Game (1 per group)

(Appendix 2) Matching Game Answers (1 per class)

(Appendix 3) Trade game playing cards (10 cards per group)

Lesson 2

(Appendix 4) Food Sources and images (1 per student)

(Appendix 5) Blank World Map – A3 (1 per student)

Atlases or Google maps (1 per pair)

Lesson 3

(Appendix 6) Investigation Template (1 per student)

Investigation resources (scales, metal spoon, empty metal tin, container of water)

Lesson 4

(Appendix 7) Making a magnetic compass method

Investigation resources per group (magnet, needle, cork, sticky tac, container of water)

Lesson 5

(Appendix 8) Sample Letter (1 per pair)

(Appendix 9) Letter plan (1 per student)

(Appendix 10) Introduction Letter Template (1 per student)

Lesson 6

(Appendix 11) Storyboard template (1 per student)

Curriculum Area & Grade				
Lesson	<i>Geography</i>	<i>History</i>	<i>Science</i>	<i>English</i>
1 Trade and Commodities	Year 3 - 6 - Locate the world's countries, using maps to focus on Europe (including the location of Russia) and North and South America, concentrating on their environmental regions, key physical and human characteristics, countries, and major cities.			
2 Import and Export: Global Trade	Year 3 - 6 - Locate the world's countries, using maps to focus on Europe (including the location of Russia) and North and South America, concentrating on their environmental regions, key physical and human characteristics, countries, and major cities.			
3 Vessels			Year 3 & 4 - Asking relevant questions and using different types of scientific enquiries to answer them. - Using straightforward scientific evidence to answer questions or to support their findings. Year 5 & 6 - Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. - Using test results to make predictions to set up further comparative and fair tests.	

			- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	
4 Navigation	Year 3 – 6 - Identify the position and significance of latitude, longitude, Equator, Northern Hemisphere, Southern Hemisphere, the Tropics of Cancer and Capricorn, Arctic and Antarctic Circle, the Prime/Greenwich Meridian and time zones (including day and night).			
5 Letter to a ship	Year 3 – 6 - Use the eight points of a compass, four and six-figure grid references, symbols and key (including the use of Ordnance Survey maps) to build their knowledge of the United Kingdom and the wider world.			Year 3 – 6 Draft and write by: - Composing and rehearsing sentences orally (including dialogue), progressively building a varied and rich vocabulary and an increasing range of sentence structures (English Appendix 2). - Organising paragraphs around a theme.
6 London as a Maritime City	Year 3 – 6 Describe and understand key aspects of: - human geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water	Year 3 – 6 - A local history study (a study of an aspect of history or a site dating from a period beyond 1066 that is significant in the locality.)		

Lessons 1 – Trade and Commodities

Overview:

Introduction to commodities – what they are and where do they come from. Students develop their understanding of the opportunities for international trade based on the different resources available in different parts of the world.

Success Criteria:

- I can locate countries on a world map.
- I can explain what trade is.
- I can explain what a commodity is.
- I can explain how the availability of commodities impacts the price.

Resources:

- Food samples
- Photos of Plants & Countries of Origin – Matching Game(Appendix 1)
- Matching Game Answers (Appendix 2)
- Trade game playing cards (Appendix 3)

Starter:

(5 – 10 minutes)

Place a variety of foods from the supermarket around the classroom. Students work in smalls groups to match the supermarket product to both its original plant and country of origin on the world map. (Coffee, Rice, Sugar, Orange Juice, Olive Oil, Bread). You will need photos of plants and countries of origins (Appendix 1) and the answers (Appendix 2)

Explicit Teaching

(10 minutes)

Ask the class “Why are different foods grown/ produced in different countries?” Students Think, Pair, Share (TPS).

Explain the impact of:

- Climate – the UK is too cold to grow many of the foods we need. Some of the products could be grown in greenhouses but the cost and carbon footprint of using these facilities is higher than importing the produce from other countries. Some produce which we can grow in the UK still needs to be imported if it is to be available out of season.
- Space – farming requires space. It’s no coincidence that the top producers of most food products are China, India and Brazil, these countries have a lot more land than the UK and this is contributing to the strength of their current economies.
- Expertise – crops may be grown in a country where they have been farmed for years, so the skills and infrastructure are readily available.
- Cost of production – labour, for example, can be cheaper overseas.

Introduce the concept of trade. Ask the class “How are supermarkets able to sell things that are not grown or produced in the UK?” Explain: Originally trade was carried out by **barter**; goods would be exchanged between countries. When each one had goods, or commodities, which the other wanted, an exchange could take place. However, this was not an ideal way to do business as different things had a different value. Eventually currency was introduced to pay for what you bought instead of trading.

	<p>Countries don't only trade food. Ask "Can you think of other things that countries might trade?"</p> <p>Explain: Countries also trade things like oil, water and timber. All of these raw materials which can be bought or sold are called commodities.</p>
<p>Activity (30 minutes)</p>	<p>Trading Game</p> <p>Explain that the class will be participating in a hypothetical trading game.</p> <p>1. Divide the class into small groups and set up the game.</p> <p>Divide the class into five groups and assign each group one of the following countries: United Kingdom, Brazil, China, United Arab Emirates and Kenya. List the following exports and their values on the board for reference during trading:</p> <p>Gold—5 points per unit Oil—4 points per unit Timber—3 points per unit Water—2 points per unit Coffee—1 point per unit</p> <p>Provide each group with a random set of ten trading cards from the handout.</p> <p>2. Introduce the objectives of the game.</p> <p>Explain that the objective is for each student to get the most points by trading their country's goods for products from another country. Each team will start with a set of trading cards that represents their country's worth. The game allows for "free trade," meaning any country can trade with another country, and any item and/or amount of product can be traded for another. Explain to students that they can creatively market their products or combine products to end up with something more desirable.</p> <p>3. Conduct the first round of trading.</p> <p>Allow for ten minutes of open trading. Then announce the following:</p> <p>GLOBAL EVENT: The world is running out of timber, making timber extremely rare and much more expensive.</p> <p>OUTCOME: The worth of timber increases by two points.</p> <p>Update the point system on the board to reflect the increase in points per unit for timber.</p>

	<p>4. Conduct the second round of trading. Allow for five additional minutes to trade. Announce that trading time is over and have groups tally points.</p> <p>5. Adjust the results to reflect a new situation. Offer the following world situation and outcome to see how it impacts the final results:</p> <p>GLOBAL EVENT: A new oil source has been discovered. There is now an oversupply of oil.</p> <p>OUTCOME: Oil reduces in value by 2 points.</p> <p>Re-tally the points and figure out who has finished the game with the most points.</p>
<p>Plenary (5-10 minutes)</p>	<p>Class discussion:</p> <ul style="list-style-type: none"> - Did any countries end the game richer or poorer than they started? Which ones? - What was it like to be a rich country? A poor country? - Was it easy or difficult to trade? Why? - Which items were most popular? Which were least popular? Why? - How does the availability of commodities impact the price?

Lessons 2 – Import and Export: Global Trades

Overview:

In this lesson, students will examine imports and exports and the need for global trade. They will consider why countries import and export different products. Students will use maps and atlases to locate the sources of popular food items while developing the understanding that not all foods enjoyed in the UK can be produced locally. They will map the most logical trade route for these items.

Success Criteria:

- I can identify the continents and oceans of the world.
- I can explain imports and exports.
- I can identify and record locations on a map.

Resources:

- Food Sources and images (Appendix 4)
- Blank World Map (Appendix 5)

Starter:

(5 – 10 minutes)

Recap “What is trade?” (The buying and selling of goods and services that we want or need.)

Explain to students that not everything we need or want can be grown or produced in the UK.

Ask students to consider their favourite foods. “Are all the ingredients in that food able to be grown in the UK? Why, or why not?”

Some foods we buy and eat are not grown here in the UK because of the location and climate of the UK. For example, tropical, exotic or out-of-season fruits, vegetables and spices must be imported from overseas. Also, some products such as wheat can be grown on a larger scale which reduces cost in countries with a greater landmass such as China or Australia.

Explicit Teaching

(10 minutes)

Explain:

- Import – in the UK we require many foods and resources that we cannot produce locally. To make sure these commodities (goods and services) are available we import them from other countries.
- Export – the climate and economy in the UK means that we can produce goods and services not available in other countries or regions. We sell and ship these commodities to other countries that require them. This is called exporting.
- Trade Routes – these are long-distance routes along which commercial goods and resources are transported. Moving goods by sea or waterways is by far the most cost effective method of transport. It is estimated that over 95% of the world’s trade is carried by sea.

View the items on the PPT. As a class sort the items to show which items are important, exported or both imported and exported.

	<p>As Martin Luther King Jr said, “Before you finish eating breakfast this morning, you have depended on more than half of the world”. Demonstrate this idea to the pupils by telling them their morning orange juice may be from Spanish oranges, tea from India, sugar from Brazil, and cereal from wheat grown in the UK.</p>
<p>Activity (30 minutes)</p>	<ul style="list-style-type: none"> • Display the list of common household items on the PPT. • Go through the items with the class and assess students pre-existing knowledge of the source of the items. • Pupils use the Food Sources and Images Sheet (Appendix 4), which includes the images of the items and their source location. • Explain to the students they first must use atlases to locate, clearly label and shade the relevant countries on their Blank World Map (Appendix 5 – enlarge to A3) and the Pacific, Atlantic and Indian Oceans. • Next, students cut out and stick the food images at their source location. Google Earth could be used alongside/instead of atlases if computers are available. • Students use atlases and/or Google to research and map the trade route of each product – the path it takes from the source to the UK, usually a sea route. (http://ports.com/sea-route/)
<p>Plenary (5-10 minutes)</p>	<p>Class discussion:</p> <ul style="list-style-type: none"> - Which food item travelled the furthest to reach our shops? Does this surprise you? - Would it be possible to source this food within the UK? - If we could source some of these foods locally, why might this be a better idea than importing them?

Lessons 3 – Vessels

Overview:

Students will identify the properties of different materials which make them buoyant, in particular different types of metals. Students will develop questions and undertake scientific enquiries to answer these questions. They will focus on how the shape of a metal affects its ability to float.

Success Criteria:

- I can conduct a scientific enquiry.
- I can explain why some materials float and others sink.
- I can investigate how objects less dense than water can float.

Resources:

- Investigation Template (Appendix 6)
- Investigation resources (scales, metal spoon, empty metal tin, container of water)

Starter:

(5 – 10 minutes)

Show a selection of boats on IWB (PowerPoint Presentation).
In talk partners ask children to discuss the main features of the boats. *What are they made of? What do they have in common? How are they different? How do they move?*
Show the diagram of a boat and label the parts.
Ask “What materials do you think boats past and present have been made from?” “Why don’t huge metal ships just sink?” Student TPS

Explicit Teaching

(10 minutes)

Explain:

- The Archimedes principle – A long time ago in ancient Greece, a mathematician named Archimedes was taking a bath. When he got in, water was displaced and overflowed over the rim of the tub. Archimedes figured out that if the weight of the object being placed in the water is less than the weight of water being displaced, the object will float. This is known as buoyancy or the Archimedes principle.

Activity

(30 minutes)

Float or sink investigation

1. Ask the students to weigh or feel a metal spoon and the empty tin can. Point out to the children that the objects have about the same mass.
2. Ask the students to predict if the spoon and the can will sink or float. Do they think both items will react in the same way?
3. Now ask the students to put both items into the water. The tin can will float and the spoon will not. Ask the students whether the spoon is more or less dense than water. They should discover that the spoon must be denser than water because it does not float. (To float an item must be less dense than the liquid it is in).

	<ol style="list-style-type: none"> 4. Ask the students why the tin can floats, even though its mass is the same as the spoons. Students should see that the can must have a lower density than the spoon. Ask the students if the volume of the can is less or more than the spoon. The answer should be that the can's volume is higher than the spoon's because it takes up more space. Next ask the students to think about what the tin can has that the spoon does not. The answer should be that the tin can has air. 5. Finally ask students to predict whether air would be more or less dense than water. Air is less dense than water because air does not sink in water! 6. If it has not sunk already, fill the can with water and ask the students what will happen when you let go. The answer should be that it will sink! Ask the students to explain why it no longer floats. The can no longer contains air, which is less dense than water. Instead it just contains metal which is denser than water, (and water which is, of course, the same density as water!) and so sinks.
<p>Plenary (5-10 minutes)</p>	<p>Ask the students to use what they have discovered in this experiment to explain why the Titanic sank when its hull was breached and water poured into the ship.</p> <p>Students should be able to understand that a ship floats because its total density - composed of the density of all its materials, such as wood, steel, and air - is less than the density of water. When the air on the ship is replaced by water, the density of the ship becomes greater than water</p>

Lessons 4 – Navigation

Overview:

In this lesson, students will develop their understanding of the navigation methods used by vessels while at sea including magnetic compasses, chronometers, sextants and Global Positioning Systems (GPS). They will learn that these methods have changed over time and explain how electronic aids can help with navigation.

Success Criteria:

- I can identify what latitude and longitude are.
- I can identify methods of navigation.
- I can explain how electronic aids help with navigation.

Resources:

- Making a magnetic compass method (Appendix 7)
- Investigation resources per group (magnet, needle, cork, sticky tac, container of water)

Starter:

(5 – 10 minutes)

Teacher initiates class discussion on "How do planes know where to land and ships know where to navigate to? Write all responses on board or chart paper. Focus on responses that include maps and latitude and longitude. Explain that this is largely the basis for planes knowing where to land and ships knowing where to navigate.

Explicit Teaching

(10 minutes)

Explain:

- Early travelers by sea would have kept the coastline in view as they went from place to place. One early civilization known to be able to navigate away from sight of land was the Phoenicians, around 4,000 years ago. They had basic charts, and could use the positions of the sun and the stars to determine their direction.
- Prime meridian - The **prime meridian** is 0 degrees longitude. This imaginary line runs through the United Kingdom, France, Spain, western Africa, and Antarctica. By using the equator and **prime meridian**, we can divide the world into four hemispheres, north, south, east, and west.

In talk partners students discuss "Why is this information important for navigation?"

Explain that latitude and longitude is used with other navigation tools including compasses to ensure planes and ships know where to navigate to.

Since then, there have been a number of milestones in improving how ships are navigated

Explain:

- The **Magnetic Compass** was the first instrument developed as a vital tool for navigators.

A magnetized needle points to magnetic north and south (not exactly the same as 'true north', a confusion which existed for some centuries).

It enabled navigators to take bearings on visible objects to fix the ship's position, as well as to set the direction in which the ship should sail.

It is believed that the Chinese were using magnetic compasses 2000 years ago, and they were first used in Europe around the 12th century.

Important improvements to the basic design of the magnetic compass were:

- Mounting the needle on a pin, so it can swing freely, with a card marked to show the direction
- Using a special mounting called a 'gimbal' so that the compass is not affected by the ship's movements.
- The **Sextant** was designed in the 17th century, although instruments with a similar purpose (such as the 'astrolabe') had existed since the time of the ancient Greek civilization.

It can accurately determine the 'altitude' of the sun or a star (this measures how high the object is in the sky), which can then be used to calculate the 'latitude' of the vessel.

(The position of a vessel is represented by its 'latitude' which shows how far north or south the vessel is from the Equator, and its 'longitude' which shows its position East/West.

To be able to calculate the 'longitude', one component was missing – an accurate measurement of time, so that the time of day difference between two points at sea could be compared. In 1764, a British clockmaker, John Harrison, constructed the **Chronometer**, which kept accurate time while the ship was at sea.

With this development, finally a navigator, using a sextant and chronometer could get an accurate fix on the position of the vessel, so long as the sun or stars were visible.

- In the last 50 years, there has been a further revolution in navigation as a result of the use of **Global Positioning Systems (GPS)**, satellite based navigation systems which use signals from different satellites to determine the ship's position to within a few metres.

	GPS has all but made earlier instruments redundant, though sextants are still kept on board ships, in case of failure of the ship's GPS equipment.
Activity (30 minutes)	Create a Magnetic compass. <u>What You Will Need</u> <ul style="list-style-type: none"> - Sewing needle about one to two inches long - Small bar magnet or refrigerator magnet - A small piece of cork (corks from wine bottles work well, but not the plastic stoppers) - A small glass or cup of water to float the cork and needle - Pair of pliers <u>Method</u> <ol style="list-style-type: none"> 1. Rub a magnet over the needle a few times, always in the same direction. This action magnetizes the needle. 2. Cut off a small circle from one end of the cork, about 1/4-inch thick. Lay the circle on a flat surface. 3. Using the sticky tack, carefully attach the needle to the top of the cork. 4. Fill the glass or cup about half full of water, and put the cork and needle assembly on the surface of the water. 5. Place your "compass" on a flat surface and watch what happens. The needle should point towards the nearest magnetic pole —north or south, depending upon where you live. 6. Try placing a magnet near your compass and watch what happens. How close does the magnet have to be to cause any effects? Try this again with a nail or other steel object. You can see why it's important to keep metal objects away from compasses on ships!
Plenary (5-10 minutes)	Match the navigation instruments to their definitions.

Lessons 5 – Letter to a seafarer (Long Lesson 1.5 – 2 hours)

Overview:

You may wish to split this lesson into two as it is a long lesson. Students will draft and write a letter to a seafarer. They will organise their ideas into logical paragraphs and understand the correct structure of a letter. Students will use maps to locate and chart the journey of their ship over the course of their correspondence, identifying major cities, oceans and seas. This activity may go on longer than one lesson depending on how long the class wishes to keep up correspondence with the seafarer.

Success Criteria:

- I can identify the features of a letter.
- I can draft and write a letter using the correct structure.
- I can use coordinates to locate points on a map.

Resources:

- Show Sample Letter (Appendix 8)
- Letter plan (Appendix 9)
- Introduction Letter Template (Appendix 10)

Starter:

(15 minutes)

Explain to the class that they will be writing a letter to a seafarer. This will give the children a chance to ask some questions to people working directly in the shipping industry. Show the class the world map you will be using to plot different ports. This will help the children to understand the routes the ship takes and the time away at sea. Discuss the definition of latitude and longitude and model how you would use these one a map. Plot the port of London to begin.

Show Sample Letter (Appendix 8) on the ppt presentation. As a class work together to match the labels to the correct features of a letter (*date, greeting, body, closing, signature.*) Point to each part and ask the class describe what they think then purpose of each part is. Students highlight and label the features of a letter on their own copy of Sample letter (Appendix 8). As students finish, check one student's answers and have that student check others, check another student and have that student also check others, and so on.

Explicit Teaching

(15 minutes)

Show students a copy of the Letter Plan (Appendix 9) on the presentation. Model for students how to write ideas in the boxes by thinking aloud and writing one idea in each box. Elicit another idea for each box.

Give students copies of the plan for them to fill in. Circulate and make suggestions as needed. Ideas do not need to be complete sentences at this point.

Show students both your filled in model copy of Ideas for a Pen Pal Letter and Introduction Letter Template

	<p>(Appendix 10). Ask students where you should write the different categories of ideas (Introduce Myself, Questions about life on a ship, etc.) on the template. Think aloud as you choose one idea and then write a sentence about it on the template. Continue with several more ideas.</p> <p>Show students your ideas page again and elicit from the class which idea you might write next on the template. Ask students what you should write and where you should write it. Repeat with one or two more ideas.</p>
<p>Activity (60 minutes)</p>	<p>Leave your model of the letter up on the board. If necessary, give a few students Introduction Letter Template (Appendix 11). Students draft their ideas using the class model on the board to guide them. You may need to remind students to use the ideas they wrote in their Ideas for a Pen Pal Letter. If necessary, have some students refer back to Sample Letter (Appendix 8) from earlier in the lesson for more ideas about how to write a letter.</p> <p>As students finish their letters, pair them up with others who are finished. Ask them to trade papers and read out loud to each other. Encourage them to ask each other questions and give each other some help with revising. This will probably naturally happen as they read out loud.</p> <p>As students are ready, give them clean, blank paper to copy their final drafts onto. You may also wish to provide students with laptops so they can type their letters, if time and resources allow.</p>
<p>Plenary (5-10 minutes)</p>	<p>Swap letters with a peer. Read their letter and provide them with feedback in the form of two stars and a wish on a post it note.</p>

Lessons 6 – London as a maritime port

Overview:

In this lesson students will investigate key periods in London's history in order to develop an understanding of the different factors that have made it a world city, including migration and trade. Students will learn about the city's Roman foundations, the role of the port in medieval and Victorian times and the transformation of the port into a financial district. They will draw on different types of evidence including film, text and painting.

Success Criteria:

- I can identify key periods in the history of London
- I can explain the importance of London as a port city
- I can explain how London has changed over time

Resources:

- Short film – Characters in London
- Storyboard template (Appendix 11)

Starter:

(5 – 10 minutes)

Explain that students will be finding out how London as a port has changed since it was founded almost two thousand years ago. They will be exploring the factors that have influenced the port of London and how they have had a direct effect on London today.

Ask all your students to stand up and then: 1. sit down if they were not born in London 2. Sit down if one (or both) of their parents was not born in London 3. sit down if one (or more) of their grandparents was not born in London Many if not all of the class are likely to be sitting down by this point. Ask your students where they were born (or their parents, grandparents etc). You could mark the countries using sticky notes on a large world map or, if you have a smartboard, open a world map in PDF format and add virtual sticky notes or pins. Ask students why they, or members of their families, chose to move to London. (Sensitivity may be required in some cases, for example students who arrived as asylum seekers, with or without their families.)

Explicit Teaching

(10 minutes)

Explain that London as a port city has changed significantly over the years. Show students the artist's impression of the Roman port of London. Compare this image to the Google image of the modern day city of London. Think, pair, share what similarities and differences can you see between the two images.

Watch the video describing the life of six different characters living around the port of London throughout history. While watching, students record facts about the port of London in each of the different time periods.

Collate the facts collected as a class on the presentation and discuss the differences in the role of the port of London as a group. Review the information on the following websites about the history of the Thames and the Port of London Authority. Add to your collection of information.

http://www.bbc.co.uk/london/content/articles/2009/03/03/pla_history_feature.shtml

	http://www.pla.co.uk/History
Activity (30 minutes)	Students should use the information and knowledge gained from the video and the timeline activity to create a storyboard representing each point in history (Appendix 11). On their storyboard students may choose to sketch a map of the port of London during one or all the historical periods. They may draw key features of London during each time period or write down key words and facts to demonstrate their understanding of the growth of London and the important role the port has played in trade and the development of the city overtime.
Plenary (5-10 minutes)	Discuss how London has benefited from world trade: <ul style="list-style-type: none"> - How did international trade help to make London one of the richest cities in the world? - What roles has shipping played in shaping the city of London?

Trips and visits

To supplement the content taught through this unit of lessons it is recommended that you class engages in a trip to one or more of the locations below.

Thames River Cruise - take a tour of London from the river.

Museum of London Docklands - a museum on the Isle of Dogs, East London that tells the history of London's River Thames and the growth of Docklands.

National Maritime Museum - the leading maritime museum of the United Kingdom and may be the largest museum of its kind in the world.

Museum of London – a museum documenting the history of London from prehistoric to modern times.

APPENDICES