



Activity 2: Trade Routes and Distances

Module: GEOGRAPHY *Where In the World Is This Painting?*

Associated Exhibit: *What's In a Maritime Painting?*

Grade Level: 5-8

Like modern day highways, many trade routes both on land and at sea were well defined, but unlike roads on land there are no marked paths at sea. Ships and cargo traveling between England and New York used a straight route cutting directly across the Atlantic, although due to the bulge of Earth's spherical shape, the route appears bowed when drawn on a map. Routes that follow the Earth's natural curve are called *Great Circle* routes.

The shortest distance between China and Liverpool, England or Boston, Massachusetts is across the North Pole, but that is not possible for any ships except Nuclear submarines. Therefore the route to China was much longer and often filled with danger, as well as many stops for water and provisions along the way. Huggin's painting of the *Sir David Scott* represents both these factors in the long trip from England. The Straits of Sunda were notorious for the pirates laying in ambush and the port at the Java Island was a good location to restock low water supplies after a long voyage.

Prior to 1869 when the Suez Canal opened, ships could not take a short cut from the Atlantic Ocean through the Mediterranean to the Indian Ocean. Nor could ships cut through from the Atlantic to the Pacific before the opening of the Panama Canal in 1914. The routes to China, India and Indonesia were long, but there were two options open to sea captains on these routes.

- Using the downloadable world map, draw the two routes by water (one around Africa and one around South America) for:
 - Boston, USA to Hong Kong, China
 - Liverpool, England to Hong Kong, China
 - New York, USA to Sydney, Australia
 - New York, USA to San Francisco, USA
 - London, England to Tahiti, French Polynesia
- Draw the best route from San Francisco, California to Honolulu, Hawaii.
- Draw the best route from New York, USA to Liverpool, England
- Using the search function of the Collections section, find paintings that place ships at different ports along these routes.
- Find the distance between
 - New York, USA and London, England
 - San Francisco, USA and Hong Kong, China
 - London, England and Hong Kong China
- At 30° North Latitude, which ocean is wider the Pacific or the Atlantic? By how much?
(NOTE: For measuring distance on the World map, the distance shown on the map between 20° North Latitude and 30° North Latitude is approximately 600 miles.)

Optional Activity

Materials:

Ball of string

Downloadable map

Globe

Optional Activity

Using a ball of string, stretch a length of string from Liverpool to New York along the surface of the globe. This is a Great Circle route. Determine the distance from the scale on the globe. Then, take the string and lay it on a flat map and determine the distance from the scale on the flat map.

1. How much shorter is the great circle route than the route shown on the flat map?
2. Determine the location of a number of latitude and longitude points at which the string crosses the globe on the great circle route, plotting these latitude and longitude points on the flat map to see the great circle curve plotted on the flat map. Note that when the course is visually directly East-West on the same latitude, the Great Circle course is the same as a course plotted on a flat map because lines of latitude are great circles. See the route from Lisbon, Portugal ($38^{\circ} 42'$ North) to Washington D.C. ($38^{\circ}53'$ North) and from Los Angeles, California ($34^{\circ}03'$ North) to Tokio, Japan ($35^{\circ}42'$ North)