

Science Aids Exploration



Scientific discoveries and technological advancements have always fueled our ability to explore. When the Americans sent men to the moon in 1969, it took a team of scientists, mathematicians, and engineers to make it happen. Without the science and without the technology, the US astronauts would have never left the planet. The 16th and 17th Century explorers were like the astronauts of the 20th Century. Not only were they incredibly brave and daring, but they also relied upon the most up-to-date science and knowledge in order to do what they did.

Exploration was fueled by a quest for knowledge, the potential of riches and a desire to spread religious beliefs. However, exploration could not have occurred without the technology that science provided. Up to the 15th Century, sailors could not sail out of sight of land because if they did, they could get lost at sea and die. Sailors would come to rely upon the knowledge of the stars, the inventions such as the log line, quadrant and compass and knowledge of diseases and nutrition in order to sail overseas for long periods of time and return home safely.

It Pays to Explore

There was a huge economic **incentive** for science at this time, because if someone could solve the problems of **scurvy**, how to sail by the stars, or how to find your way home when you couldn't see land, then it was more likely that you could return with a ship full of gold or spices that could be sold for a huge profit.

The science of navigation took a big leap in the 16th and 17th Centuries. Inventions such as the quadrant combined knowledge of the stars with the knowledge of the shape of the Earth to determine how far North or how far South a person had travelled. For example, if a ship was lost at sea in the Atlantic, they could use the quadrant to determine their **latitude**. If they kept sailing until they hit 51^o latitude, they could then sail directly East, and they would eventually bump into London because London is located at 51^o Latitude. Science would help them find their way home.

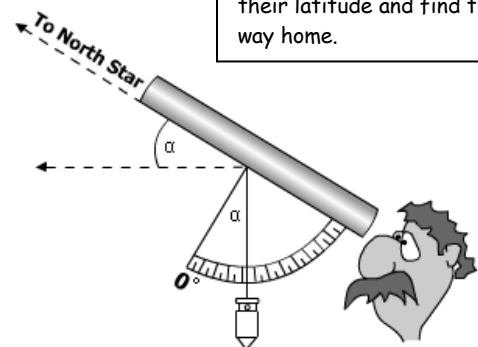
Problems such as the health of your crew were also important. If your crew became sick and died, then you had no one to sail your ship. Finding cures or preventions of diseases such as scurvy became very important, and it would require experimentation and truthful knowledge to solve these problems.

Incentive - something that encourages or motivates someone.

Scurvy - a fatal disease that affected many sailors during the age of exploration. The disease is caused by a lack of vitamin C or lack of fresh fruit or vegetables.

Latitude - artificially created lines that run East to West that divides the world in measurements either North or South of the equator. The opposite of latitude is longitude.

The quadrant was a very important tool that enabled navigators to determine their latitude and find their way home.



The Desire to Spread Christianity

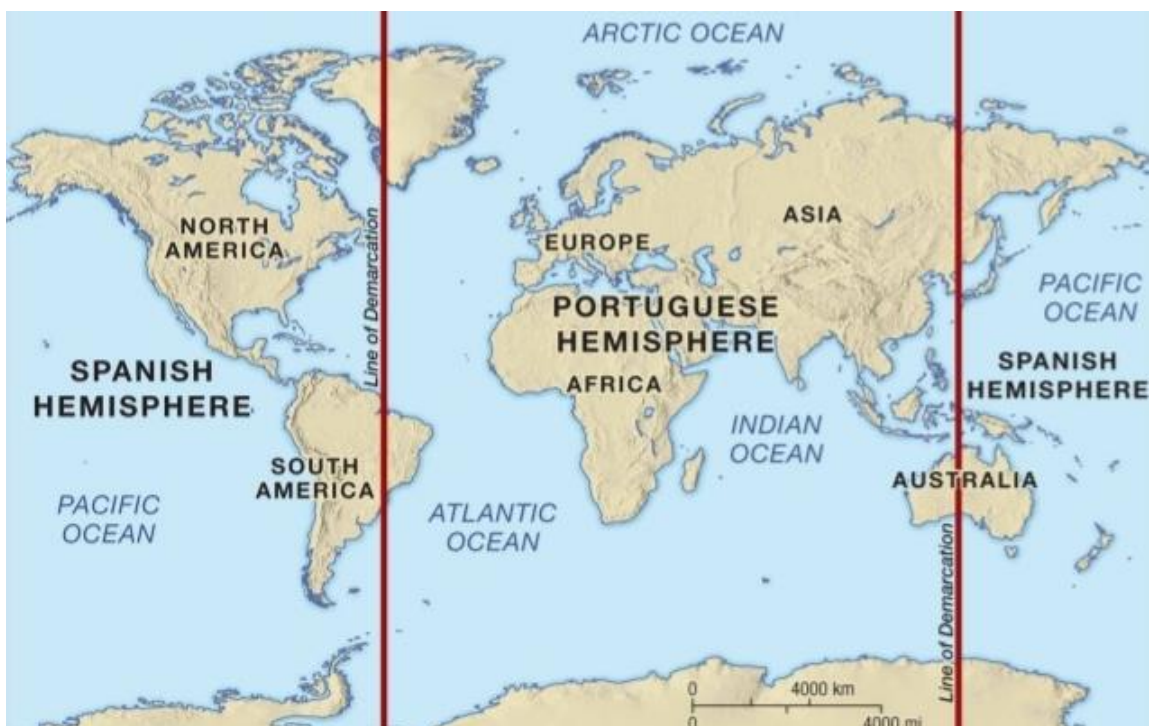
Although the major incentive for exploring was to make money, either by exploiting the resources or people that they explorers encountered, or by trading for goods that could then be sold back in Europe for vast profits, the desire to spread Christianity was another reason to explore. People were very religious in the 16th and 17th Centuries and many Europeans felt it was their duty to spread their religion around the world. Missionaries or priests such as the Catholic Jesuits were often sent along with exploring ships and while the captains sought trade with the ports and people they visited, the missionaries would try to introduce and convert the local people to Christianity.

Countries would also often seek religious approval for their voyages. The Catholic Church was that one institution that could speak for all Catholic countries, and the Catholic Church would go so far as to divide the world between European countries. The **Treaty of Tordesillas** was a treaty created by the Church that divided the "undiscovered" lands between the Catholic countries of Spain and Portugal. The Church was not concerned with the fact that some of these "undiscovered" countries were in fact fully functioning and highly developed nations onto their own. In reality, the Church had no real authority to say that China should belong to Portugal or that the land that was to become Western Canada or the Western United States should belong to Spain.

Despite the fact that the Treaty of Tordesillas was completely **"Eurocentric"** or something that came from a European point of view that didn't take into account anybody else, it could not have been created without the proper scientific knowledge of the world and how it can be divided. Science and truthful knowledge were the tools that allowed exploration to occur.

Treaty of Tordesillas - a document made by the Catholic Church that arbitrarily divide the world into two hemispheres that were then given to the Catholic countries of Spain and Portugal.

Eurocentric - to take the view that Europe is the centre of the world and the only region of importance.



The Treaty of Tordesillas divided the world between the two Catholic countries of Spain and Portugal. The Treaty did not take into account any other nation and is an example of a "Eurocentric" view of the world

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Directions: READ the handout entitled; "Science Aids Exploration" and then answer the following questions.

1. Use your handout, the internet, or a dictionary to provide definitions for the following terms: (1 mark each)

Incentive	Scurvy	Latitude
Treaty of Tordesillas		Eurocentric

2. On a separate piece of paper, answer the following questions using **COMPLETE SENTENCES**.

- a. In your own words, describe what "fueled" the desire to explore the world in the 16th and 17th Centuries. Describe a particular challenge or danger that had to be overcome in order to sail overseas or long distances away from land. (2 marks for quality of response and inclusion of details)
- b. In your own words describe the economic incentive to explore. What was another incentive for Europeans to explore new lands and new peoples? (2 marks for the quality of your response and evidence of thought and effort)
- c. In your own words, describe what the Treaty of Tordesillas was and why can it be considered to be "Eurocentric"? (2 marks for quality of response and evidence of insight)

3. Map - Colour and label the following map that outlines the Treaty of Tordesillas which divided up the world between Spain and Portugal.

You will be marked out of 5 for proper labelling, quality of work and evidence of effort.

Total: ____ /16

