Routes Beyond Sight

How knowledge and technology changed European voyages

SS24.8.11a "Summarize how expanding knowledge of geographical features and the development of navigational technology contributed to global exploration by Europeans."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline details about geographical knowledge, circle navigation tools or ship features, and number the results of exploration described in the passage.

Finding a Way Across

1 In the 1400s, European sailors did not have complete maps of the Atlantic or the African coast. Portuguese crews sailed south in stages, recording bays, headlands, and places to obtain fresh water. Each report helped later captains judge where to stop and where a coastline bent. Sailors also learned that winds and ocean currents did not always lead straight home. By following winds that carried ships away from shore before turning toward Europe, some crews found a safer return route. Growing geographical knowledge made longer voyages less of a blind guess.

2 New equipment made those reports more useful at sea. A magnetic compass gave sailors a direction when clouds hid the sun or land was out of sight. An astrolabe could help estimate latitude by measuring the height of the sun or a star above the horizon. Latitude showed how far north or south a ship was, but it did not reveal how far east or west. Caravels, sailing ships used by the Portuguese, could steer effectively in changing winds. These tools did not remove danger, but they helped crews keep a course and use known routes.

3 Knowledge and technology worked together on voyages with very different destinations. Portuguese captains combined records of Africa's coast and Atlantic winds with compasses and other instruments. In 1488, Bartolomeu Dias rounded Africa's southern tip, showing that a sea route toward the Indian Ocean was possible. In 1498, Vasco da Gama reached India by sailing around Africa. In 1492, Christopher Columbus crossed the Atlantic and reached Caribbean islands while seeking a route to Asia. His voyage also depended on ships that could cross open water and on sailors' growing knowledge of Atlantic winds.

2 ANSWER WITH EVIDENCE

Use the passage

1. How did records of bays and headlands help Portuguese crews make longer voyages?

2. How could a compass and an astrolabe help a crew out of sight of land? What could these tools still not tell the crew?

3. How could knowledge of Atlantic winds and a caravel's design work together on a return voyage?

4. Why did Dias's voyage matter to later exploration, and how could navigation tools help sailors use what he learned?

3 YOUR TURN

Your own words

Write a four-sentence captain's log planning a voyage from Europe across the Atlantic and back. Use two geographical observations and two navigation tools from the passage, and explain how each would change a decision you make.

ANSWER KEY

Routes Beyond Sight

GRADE 8 · SS24.8.11a

PART 1 · READ AND MARK

Underline details about geographical knowledge, circle navigation tools or ship features, and number the results of exploration described in the passage. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How did records of bays and headlands help Portuguese crews make longer voyages?	**The records helped later crews find places to stop for water and judge where the coastline bent.**
2	How could a compass and an astrolabe help a crew out of sight of land? What could these tools still not tell the crew?	**A compass gave direction, and an astrolabe helped estimate latitude. Neither told the crew how far east or west it was.**
3	How could knowledge of Atlantic winds and a caravel's design work together on a return voyage?	**Sailors could follow winds that carried them away from shore before turning toward Europe, while a caravel helped them steer in changing winds.**
4	Why did Dias's voyage matter to later exploration, and how could navigation tools help sailors use what he learned?	**Rounding Africa's southern tip showed that a sea route toward the Indian Ocean was possible. Tools such as a compass and astrolabe helped later sailors keep a course along that route.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I will stop at a recorded bay on the African coast to fill our water barrels before crossing the Atlantic. When land disappears, I will use a compass to hold our direction toward an unfamiliar coast. I will check our latitude with an astrolabe so I can correct our course if we move too far north or south. For the return trip, I will follow winds that carry us away from shore and then toward Europe instead of trying to sail straight back.

Accept accurate cause-and-effect explanations in students' own words. In the captain's log, look for two distinct geographical observations, two tools, and a decision linked to each.