

Science & Technology

INTERACTIVE

The Tools of Exploration

Out on the open seas, winds easily blew ships off course. With only the sun, moon, and stars to guide them, few sailors willingly ventured beyond the sight of land. In order to travel to distant places, European inventors and sailors experimented with new tools for navigation and new designs for sailing ships, often borrowing from other cultures.

INTEGRATED TECHNOLOGY

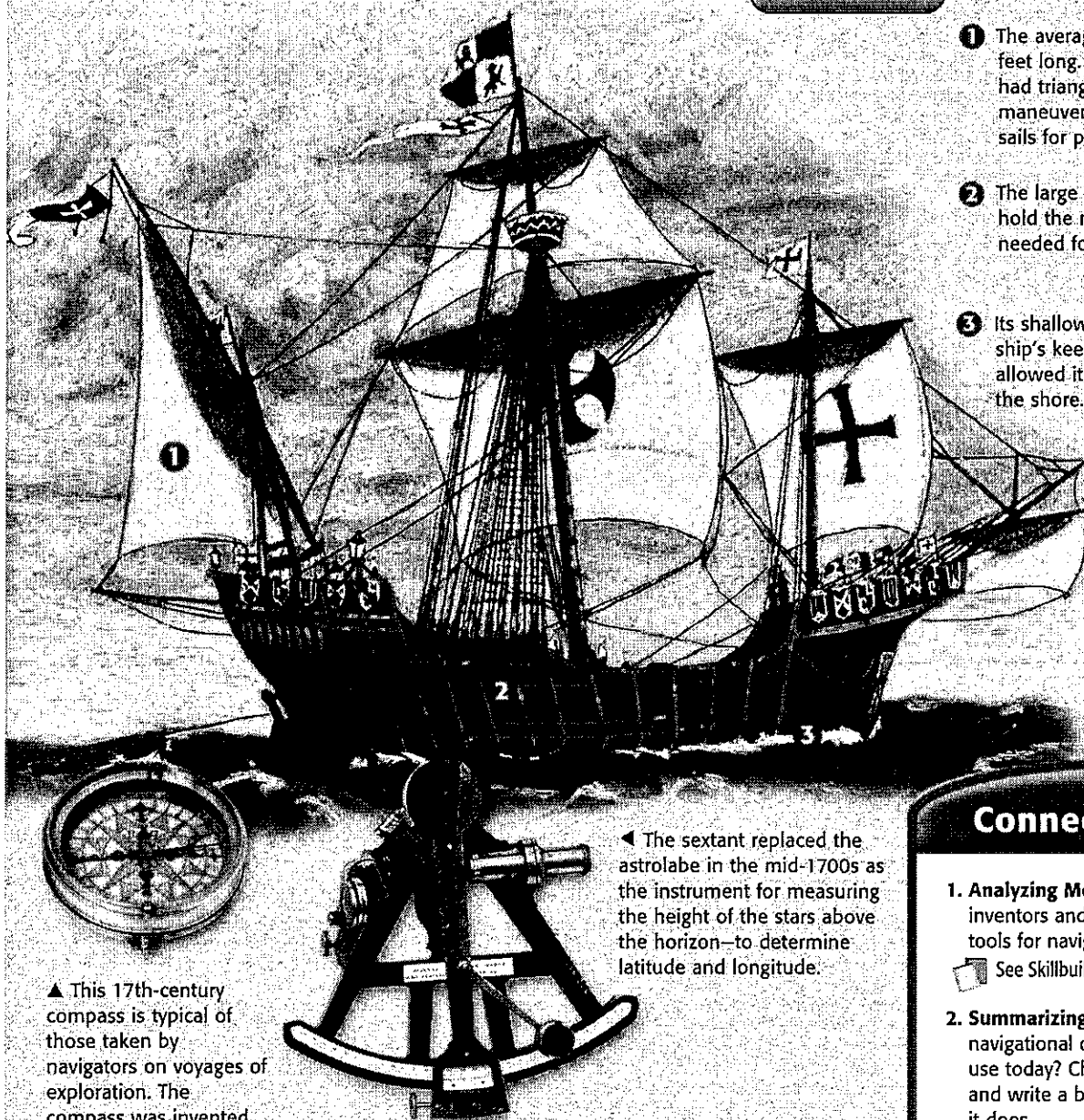
RESEARCH LINKS For more on the tools of exploration, go to classzone.com



▲ Here, a French mariner uses an early navigation instrument that he has brought ashore to fix his ship's position. It was difficult to make accurate calculations aboard wave-tossed vessels.

Interactive Feature

- 1 The average caravel was 65 feet long. This versatile ship had triangular sails for maneuverability and square sails for power.
- 2 The large cargo area could hold the numerous supplies needed for long voyages.
- 3 Its shallow draft (depth of the ship's keel below the water) allowed it to explore close to the shore.



▲ This 17th-century compass is typical of those taken by navigators on voyages of exploration. The compass was invented by the Chinese.

◀ The sextant replaced the astrolabe in the mid-1700s as the instrument for measuring the height of the stars above the horizon—to determine latitude and longitude.

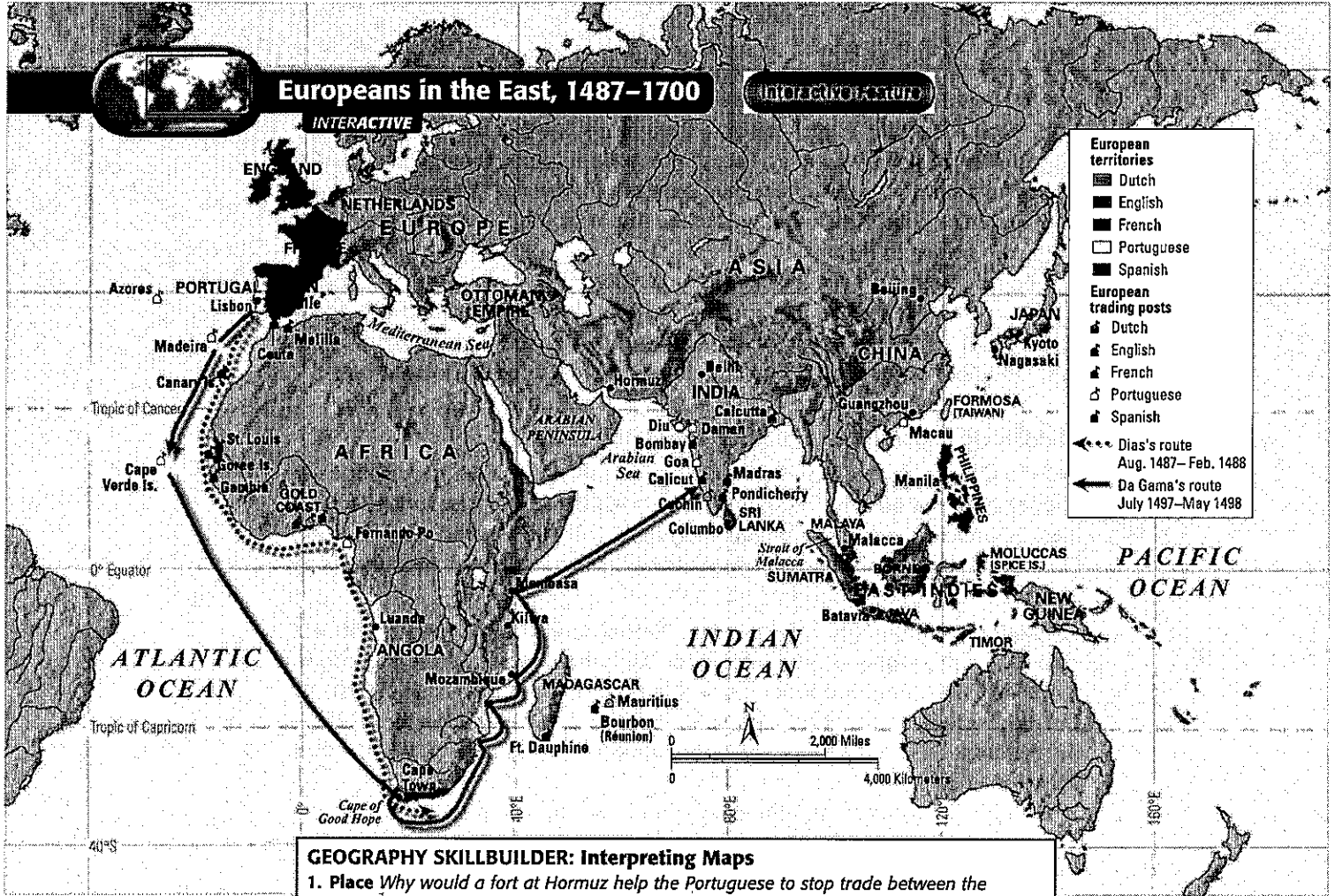
Connect to Today

1. **Analyzing Motives** Why did inventors and sailors develop better tools for navigation?
 See Skillbuilder Handbook, page R16.
2. **Summarizing** What types of navigational or other tools do sailors use today? Choose one type of tool and write a brief explanation of what it does.

Europeans in the East, 1487-1700

INTERACTIVE

INTERACTIVE



GEOGRAPHY SKILLBUILDER: Interpreting Maps

1. **Place** Why would a fort at Hormuz help the Portuguese to stop trade between the Arabian Peninsula and India?
2. **Region** Where was the Dutch influence the greatest?

MAIN IDEA

Analyzing Primary Sources

What did de Albuquerque see as the outcome of a Portuguese victory at Malacca?

PRIMARY SOURCE

If we deprive them [Muslims] of this their ancient market there, there does not remain for them a single port in the whole of these parts, where they can carry on their trade in these things. . . . I hold it as very certain that if we take this trade of Malacca away out of their hands, Cairo and Mecca are entirely ruined, and to Venice will no spiceries . . . [be] . . . conveyed except that which her merchants go and buy in Portugal.

AFONSO DE ALBUQUERQUE, from *The Commentaries of the Great Afonso Dalbuquerque*



Portugal did break the old Muslim-Italian domination on trade from the East, much to the delight of European consumers. Portuguese merchants brought back goods from Asia at about one-fifth of what they cost when purchased through the Arabs and Italians. As a result, more Europeans could afford these items.