

Maps made during Muslim civilization usually showed **south at the top** and **north at the bottom**—**UPSIDE DOWN TO A WESTERN VIEW TODAY.**

**2** THE CHINESE INTRODUCED **paper** to Baghdad in the 8th century, which **MADE IT POSSIBLE FOR THE MUSLIM WORLD TO CREATE MAPS FOR EVERYONE TO USE.**

**3** In the 9th century, astronomers in the Muslim world were **SO ACCURATE IN THEIR CALCULATIONS OF THE EARTH'S CIRCUMFERENCE** THAT THEY WERE ONLY 125 MILES (201 KM) OFF THE 24,897 MILES (40,068 KM) ACCEPTED TODAY.

**13** **Piri Reis** is best known for the incredibly accurate **"MAP OF AMERICA"** HE CREATED IN **1513.**

**14** The **"MAP OF AMERICA"** was compiled using numerous other maps, including Arab and Portuguese ones and one made by Columbus on his third voyage to the **THE AMERICAS.**

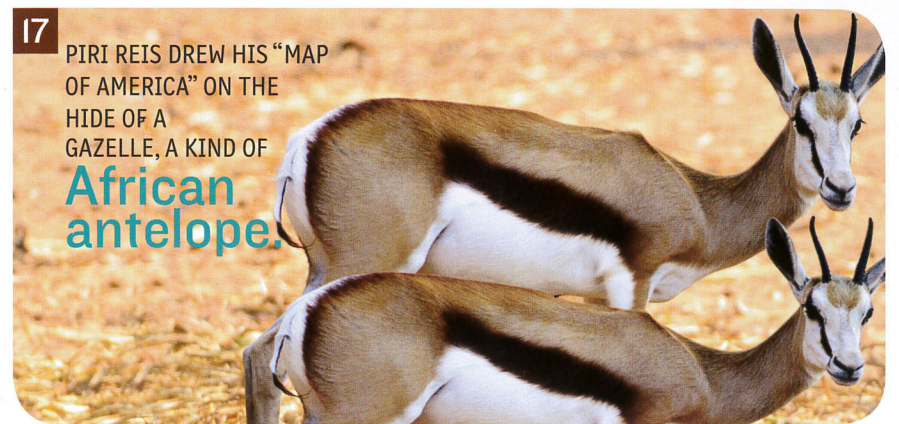
**15** The Columbus **map** that Piri Reis used **was lost** after Columbus sent it to Spain in 1498, so the Piri Reis version is the **only record** we have of it.

**4** In 1073 Turkish geographer Mahmud al-Kashghari created **A CIRCULAR WORLD MAP** showing where various languages were spoken.

**5** In 1154 the Muslim geographer Al-Idrisi finished **the first atlas**, which showed most of North Africa, Asia, and Europe. This was about a hundred years before Marco Polo wrote about his travels to China and back.



**16** THE **"MAP OF AMERICA"** SHOWS MOUNTAINS (NOW CALLED THE ANDES) IN SOUTH AMERICA THAT SPANISH EXPLORERS CLAIMED TO HAVE FOUND FIRST IN 1527—**14 YEARS AFTER PIRI REIS MADE HIS MAP.**



# 25

## GLOBAL FACTS

## ABOUT GEOGRAPHY

**6** AL-IDRISI SPENT **15 years CREATING 70 maps** for the atlas of Roger II, King of Sicily.

**7** Christopher Columbus studied maps created by Muslim geographers to make the voyages that helped him to reach the Americas.

**8** Ibn Majid, **A MASTER NAVIGATOR FROM ARABIA**, guided the Portuguese explorer **Vasco da Gama** around Africa's Cape Horn to India in the 15th century.

**18** Piri Reis drew a **second map** covering the northwestern part of the Atlantic Ocean, including **NEWFOUNDLAND**, on Canada's east coast.

**19**

The earliest known maps were inscribed on **clay tablets** MORE THAN 3,500 YEARS AGO IN BABYLON.

**20** Building on the work of the Romans, scholars in Muslim Spain created **triangulation**, A METHOD STILL USED TO SURVEY LAND AND CREATE MAPS.

The **earliest known** description of a **magnetic compass** is in a collection of stories written by the Persian Muhammed al-Awfi in 1233.

**11** *The Book of Sea Lore*, which included **more than 200 charts and maps**, was a guide to the coasts, islands, ports, and waterways of the Mediterranean.

**21** Muslim sailors weren't lost at sea **BECAUSE THEY DEVELOPED COURSE-PLOTTING INSTRUMENTS AND BECAME MASTER NAVIGATORS.**

**22** TO CHART THE EARTH'S FEATURES, GEOGRAPHERS IN THE EARLY MUSLIM WORLD USED ASTROLABES, INSTRUMENTS THAT CALCULATE HEIGHT AND DISTANCE.

**10** One of the most important navigators of the 16th century, Turkish admiral **PIRI REIS**, wrote a manual of sailing directions called **THE BOOK OF SEA LORE.**

**12** Originally printed in **1521**, *The Book of Sea Lore* was a **must-read for navigators** for more than a century.

**23** Trouble finding your way? **THE NAVIGATION TECHNIQUES OF THE PAST HAVE ALL CONTRIBUTED TO MODERN DIRECTIONAL DEVICES LIKE GLOBAL POSITIONING SYSTEMS (GPS).**

**24** Today's **GPS** is **extremely accurate.** — A 2011 STUDY SHOWED THAT GPS IS OFTEN ACCURATE TO WITHIN 3 FEET (1 M).

**25** Want to know how people saw the world **1,000 YEARS AGO**? Take a look online at *The Book of Curiosities*, written in Egypt in the 11th century (see page 92).