It’s About Time....

Use the Ball State University Libraries’ Digital Media Repository *World Standard Time Zone Maps* Collection to learn and teach about telling time around the world. This lesson specifically uses the map, *Standard Time Zones of the World, 2008*, published by the U.S. Central Intelligence Agency.

Time differs around the world. Since the sun is not directly overhead everywhere on Earth at the same time, clocks are adjusted to reflect the difference in the sun’s position.

The earth rotates on its axis once every 24 hours. In one hour, the earth makes one twenty-fourth of a complete revolution. Since there are 360 degrees in a circle, the earth turns 15 degrees each hour (360/24 = 15) in a west-to-east direction. If a place on Earth has the sun directly overhead at noon, for example, then a place 15 degrees to the west will have the sun directly overhead in one hour. The earth will have rotated eastward 15 degrees during the hour. This process is followed for each 15 degrees of longitude around the globe.

As a result, the earth is divided into 24 time zones. So one hour of time is *subtracted* for each 15 degrees moved *westward*. One hour of time is *added* for each 15 degrees moved *eastward*.

Time is measured from the Prime Meridian, which passes through Greenwich, England. For each time zone east of the Prime Meridian, clocks must be set one hour ahead. For each time zone west of the Prime Meridian, clocks must be set back one hour. So, for example, when it is noon in London, England, it is 1:00 P.M. in Paris, France—one time-zone to the east. And it would be 7:00 A.M. in Washington, D.C., five time zones to the west.

Note on the standard time zone map that time zones do not follow meridians of longitude exactly. The placement of time-zone lines is often determined by political boundaries. In Europe and Africa, for example, the time zones follow national boundaries. (Note that Egypt and Sudan, however, are in different time zones. China elects to have only one time-zone. And India and some surrounding countries have zones in half-hour time from Greenwich).
In the United States, time zones generally follow state boundaries, with four major time zones in the 48 contiguous states and Alaska and Hawaii separate. In the summer, most of the United States follows Daylight Saving Time.

The International Date Line is located at 180° on the time zone map. It is a north-south line that runs through the Pacific Ocean. At 180°, the time is 12 hours from Greenwich time. There is a difference of 24 hours between the two sides of the International Date Line. As you cross the Date Line from west to east, you gain a day. If you travel from east to west, you lost a day. (For example on the map, if it is Friday in the Marshall Islands, it is Thursday on Midway Island to the east).

Questions:

What is the longitude of the Prime Meridian?
0°

If it is 1:00 P.M. in San Francisco on Thursday, what time and day is it in Sydney, Australia?
6:00 A.M. on Friday

If it is noon in Dallas, Texas, what time is it in Denver, Colorado?
11:00 A.M.

If it is noon in Dallas, Texas, what time is it in Quebec, Canada?
1:00 P.M.

If it is 1:00 A.M. in Sao Paulo, Brazil, what time is it in Lima, Peru?
11:00 P.M. (previous day)

If it is noon in Riyadh, Saudi Arabia, what time is it in Khartoum, Sudan?
Noon

If it is 1:00 P.M. in Guangzhou, China, what time is it in Urumqi, China?
1:00 P.M.

If it is noon in Saint Petersburg, Russia, what time is it in Astana, Kazakhstan?
3:00 P.M.

If it is noon in Saint Petersburg Russia, what time is it in Vladivostok, Russia (just above the Sea of Japan)?
7:00 P.M.

If it is noon in Nairobi, Kenya, what time is it in Brasilia, Brazil?
6:00 A.M.

If it is 7:00 P.M. in Cairo, Egypt, what time is it in Johannesburg, South Africa?
7:00 P.M.

If it is 6:00 A.M. in Sydney, Australia, what time is it in Alice Springs, Australia?
5:30 A.M.

If it is 6:00 A.M. in Sydney, Australia, what time is it in Perth, Australia?
4:00 A.M.