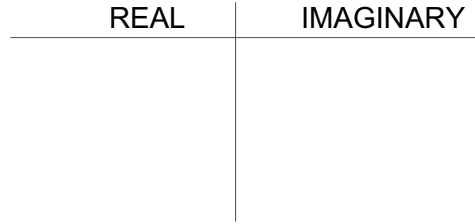
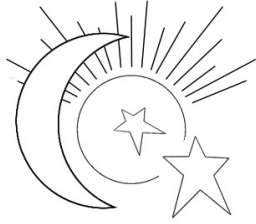


Time and Time Zones Note Guide

Time is both real and imaginary. If you didn't have any way to measure time, how could you tell time is still passing?



Measuring longitude on the Earth's surface compared to celestial objects is extremely difficult because the Earth is constantly rotating on its axis. The difficulties of calculating accurate longitude caused numerous shipwrecks and led the British government in 1714 to offer a prize for finding a method of accurately determining longitude at sea. The prize was £10,000 for measuring longitude within 1 degree, £15,000 within 40 minutes of a degree, and £20,000 within a half degree. John Harrison spent over 30 years to develop a spring driven clock that could be used to calculate longitude within a half a degree. The board administering the prize only awarded him half of the prize because they did not believe that longitude could be determined accurately without the use of astronomical calculations. Harrison continued to work on his clocks for another 12 years before King George III convinced the British Parliament to award the rest of the prize without the board's approval.

Because the Earth is constantly rotating on its axis, places of different longitudes have different times. Before 1884, each location set its time based on the sun. When the sun reached its zenith (the highest position in the sky), it was noon local time. Since travel was so slow, it really didn't matter the exact time from one location to another. But as trains made travel over greater distance faster and more common, rail schedules would be too confusing if each community kept their own time. Thus railroad companies urged the US government to establish *standard* time zones. The International Meridian Conference in Washington, DC not only established Greenwich as the prime meridian, but Greenwich Mean Time (GMT) as the world standard time from which all other time zones would be calculated.

What is the relationship between longitude and time?

How long does it take for the earth to complete one rotation?

How many degrees does the earth turn in one day?

How far does the earth turn in one hour?

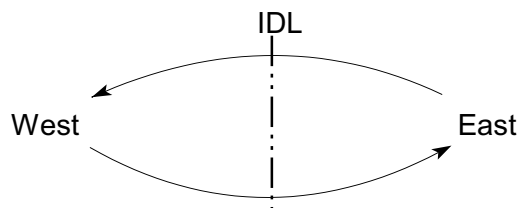
Places to the east of you are _____ in time.

The International Date Line (around 180 longitude) is a special case. Whenever one crosses the IDL, the day on the calendar must change. When crossing the IDL, one must change the day to the calendar. To see why, pretend it is 8 am on Wednesday in Lindon, Utah. Count time zones to the east (right) until you get to New Zealand (two small islands at the bottom right of the map). What time did you get?

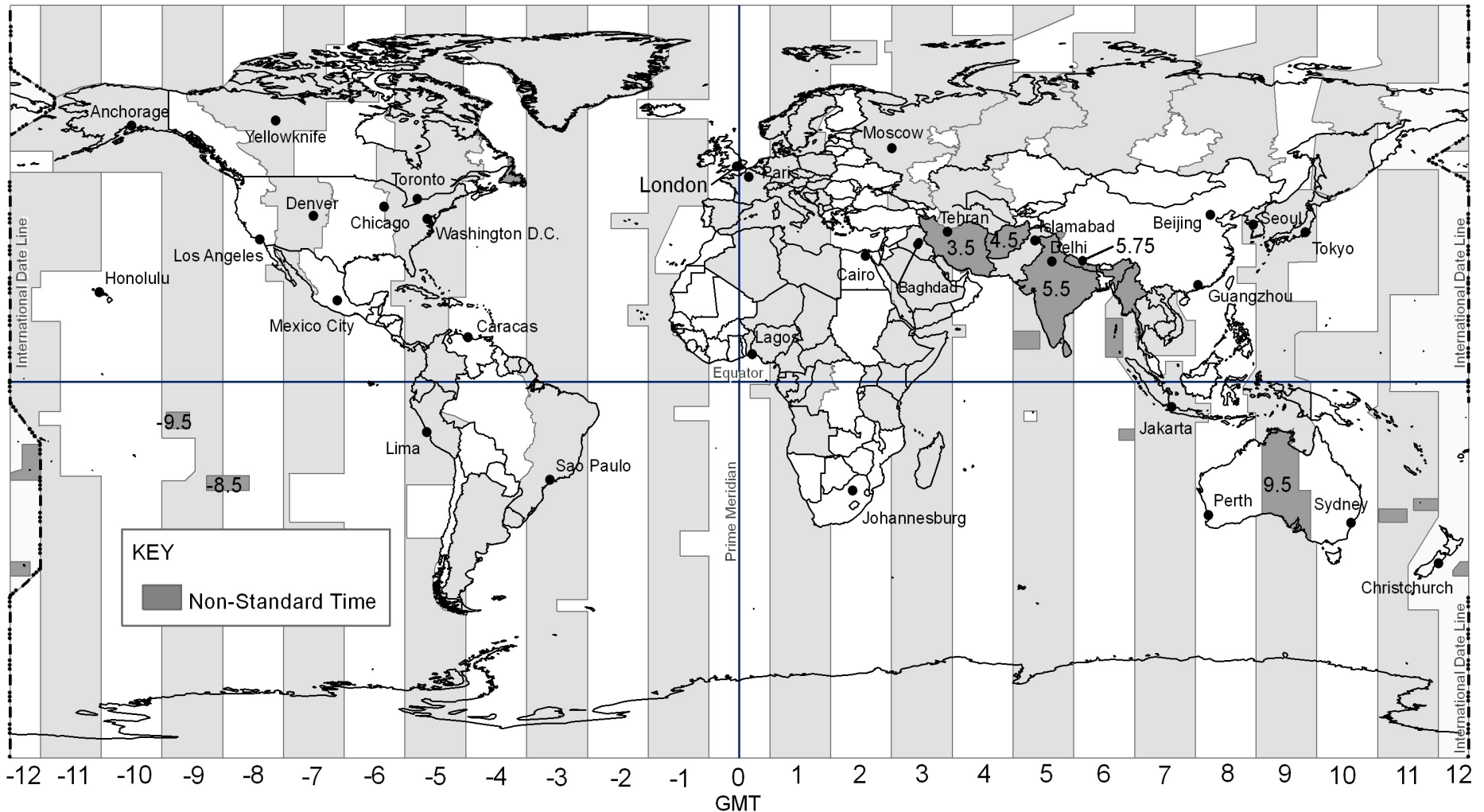
When you crossed midnight, did you remember to change the day? Now start again in Lindon, but count to the west (left). Cross the IDL and go to the other side of the map. What time did you get?

Because you crossed the IDL from east to west (like going from California to Japan), you had to _____ a day—Thursday. So the IDL makes it possible to calculate time counting east or west.

As you cross the International Date line from east to west, you _____ a day on the calendar.



World Time Zones



1. When it is _____ am/pm, _____ in London, what time is it in California? Alaska? Hawaii? Illinois? New York?
2. When it is _____ am/pm, _____ in London, what day and time is it in London?
3. When it is _____ am/pm, _____ in London, what day and time is it just across the IDL?
4. When it is _____ am/pm, _____ in London, what day and time is it Yellowknife?
5. When it is 10 pm, Wednesday in Washington, DC, what day and time is it in Paris?
6. When it is 12 noon, Tuesday in London, what day and time is it in Delhi?
7. What is the time difference between Moscow and the eastern most part of Russia (near Alaska)?
8. What is the official name of Mountain Time Zone?