Aim: How do you determine longitude?

Time: Earth Rotates 360° on its axis in 24 hrs.

\[
\frac{360°}{24\text{hr}} = 15°/\text{hr}
\]

Every 15° longitude = 1 hour time difference

Since the Sun rises in the East and sets West

locations to the East are later, their day begins First!

Locations to the East are Later (add time).
Locations to the West are Earlier (subtract time).

1. If two cities are 15° apart they have a 1 hour time difference.

2. If two cities are 30° apart they have a 2 hour time difference.

3. If there is a 3 hour time difference between cities there are 45 degrees latitude between them.

Ex: Your time is 2pm, Prime Meridian time is 10am. What is your longitude?

\[
\begin{align*}
-2\text{pm} & \quad 10\text{am} \\
4\text{hrs later} & \quad 60° \text{E}
\end{align*}
\]

Ex: Your time is 10am, Prime Meridian time is 2pm. What is your longitude?

\[
\begin{align*}
-10\text{am} & \quad 2\text{pm} \\
4\text{hrs earlier} & \quad 150° \text{W}
\end{align*}
\]

Locations to the East are Later (add time).
Locations to the West are Earlier (subtract time).

Ex: It is 3:00pm at the Prime Meridian and you are located 15°W longitude. What time is it where you are?

15°W = 1 hr earlier \[ 3\text{pm} - 1 = 2\text{pm} \]

Ex: It is 3:00pm at the Prime Meridian and you are located 30°E longitude. What time is it where you are?

2 hrs later \[ 3\text{pm} + 2 = 5\text{pm} \]

Practice handout...
Longitude/Time Zones Practice

1. Your time is 2:00 pm, Prime Meridian time is 10:00 am. What is your longitude?
   \[
   2 - 10 = 4 \text{ hrs} \times \frac{15^\circ}{\text{hr}} = (60^\circ) \text{ E}
   \]

2. Your time is 9:00 am, Prime Meridian time is 3:00 pm. What is your longitude?
   \[
   6 \text{ hr} \times \frac{15^\circ}{\text{hr}} = 90^\circ \text{ W}
   \]

3. Your time is 5:00 pm, Prime Meridian time is 4:00 pm. What is your longitude?
   \[
   1 \text{ hr} \times \frac{15^\circ}{\text{hr}} = 15^\circ \text{ E}
   \]

4. It is 2:00 pm on the Prime Meridian and you are located at 45°E longitude. What time is it where you are?
   \[
   \frac{45^\circ}{15^\circ/\text{hr}} = 3 \text{ hrs earlier} = 10 \text{ am}
   \]

5. It is 10:00 am at the Prime Meridian and you are located at 60°W longitude. What time is it where you are?
   \[
   \frac{60^\circ}{15^\circ/\text{hr}} = 4 \text{ hrs earlier} = 6 \text{ am}
   \]

6. It is 10:00 am at the Prime Meridian and you are located at 90°E longitude. What time is it where you are?
   \[
   \frac{90^\circ}{15^\circ/\text{hr}} = 6 \text{ hrs later} = 10 \text{ pm}
   \]

HW: Lat/Long Time handout, Lab Due 11:00am, Friday morning (TEST FRIDAY)