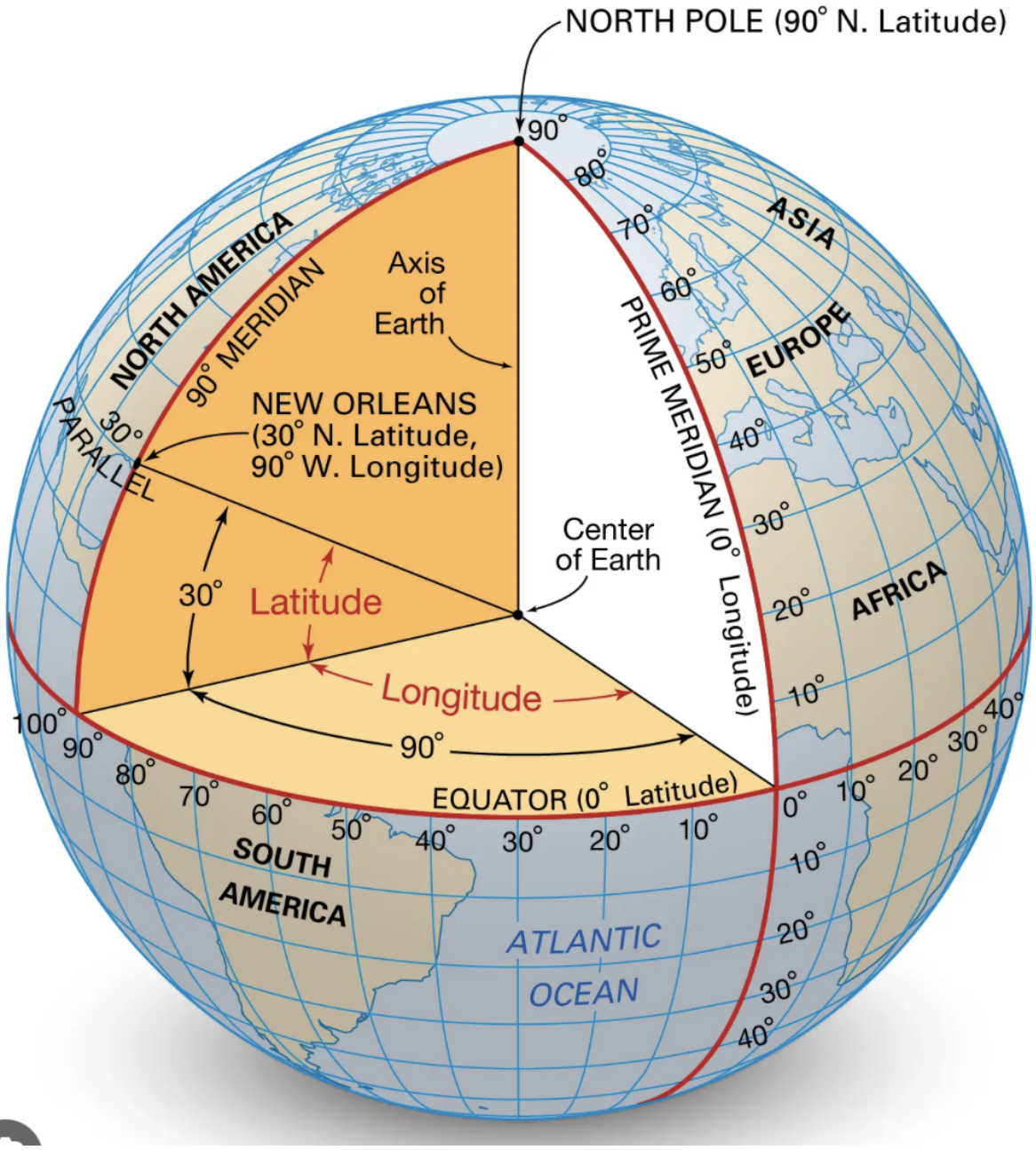
Lab 06b: navigation: calculate longitude

Calculating longitude ("long lines")

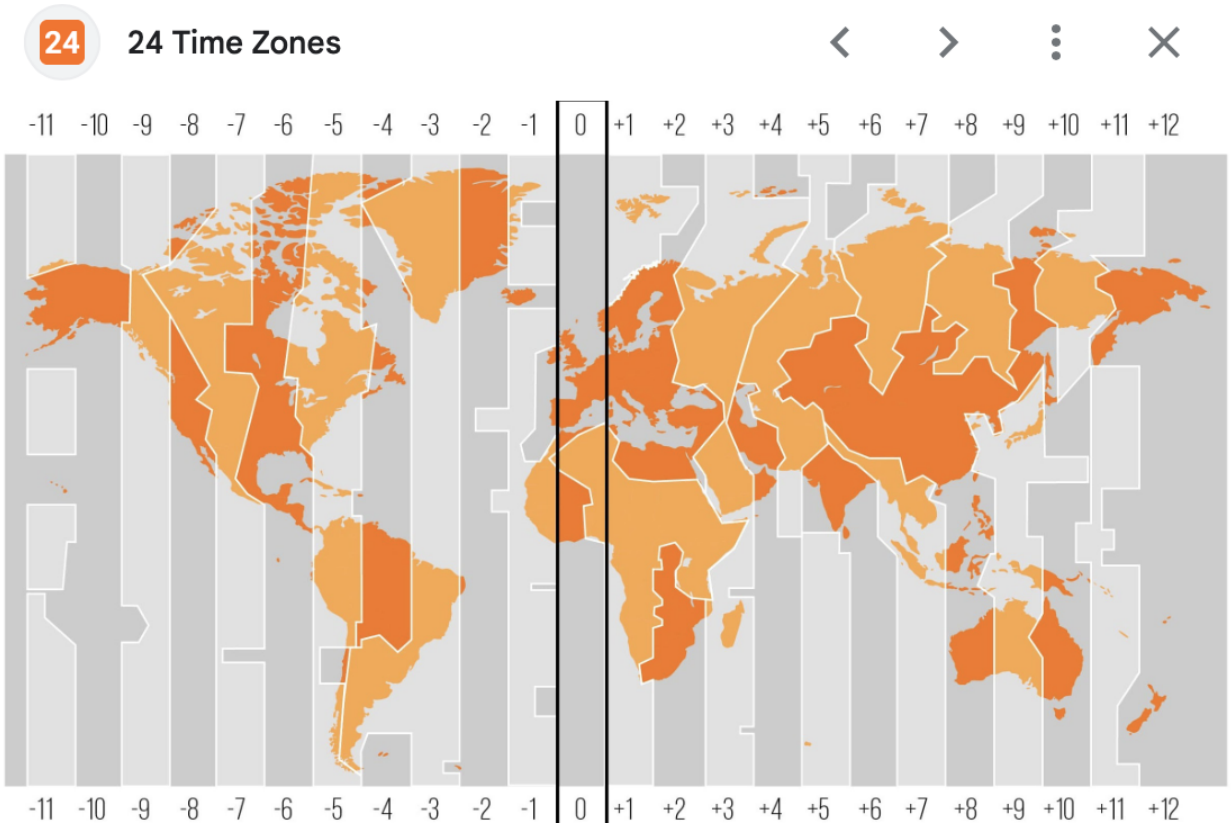


Screenshot 2026-02-03 at 2.52.47 PM.png

First we have to understand a bit about astronomy, and why there is a famous telescope at a place called Greenwich near London...

- on a globe, find London
- notice the longitude of London
- find the longitude of where you are from and record this
- if every 15° of latitude is one hour, calculate how many degrees away from London your home is exactly
- the telescope at Greenwich near London calculated noon exactly. If you had a clock with you, wherever you were on the planet, if you knew what time "local noon" was, you could calculate your latitude.
- Local noon was found at sea by tracking the sun as it rose, and noting the time it was the highest, "local noon"
- Interestingly, dawn in Waimea is a bit earlier than dawn on Oahu, you can check this by talking to someone in the morning there, or even more fun, time our sunset with theirs-who will be later?
- there are a set of radio stations around the world that now broadcast this time signal on the radio, so ships and lost students can determine their latitude if they know local noon.
- on a radio, listen for WWV or WWVH (Hawaii version) on 10 MHz shortwave here:

  https://wwv.mcodes.org/
- notice that when the chirps make a long beep, your phone, your computer and any device changes the minute-EXACTLY
- notice that the time on the radio or online is UTC, so everyone on the planet can use it
- why do you care? if your computer or phone is on the wrong time even by a few minutes your web browser, email and everything on the internet will not work-why?
- Since our class does not meet at exactly noon, you can look up local noon on the web for this location
- calculate our longitude from this number
- since you can look on your super-fancy big island map, label our latitude and longitude if you have not already
- how many hours and minutes should we be from GMT (Greenwich Mean Time)?
- China has one time zone-how does this impact life there?
- Look at these time zones-we are always at -10h



Screenshot 2026-02-03 at 2.49.19 PM.png

Putting it all together:
You now know how to find your latitude using an astrolabe, and your longitude using an astrolabe and a good clock
Look up how to do this with your hands if you are lost in the wilderness or at sea...

Questions:

1. Why would having a really accurate clock aboard a shop enable you to navigate better?
2. China has one time zone for the entire country-how does this impact life there?
3. We are at 155°W, so is our solar noon earlier or later than GMT? Explain

---

Migrated from Apple Server Wiki. Original page ID: _6i0i388_

Revision #2
Created 2026-09-29 06:30:57 UTC by Admin
Updated 2026-09-29 06:34:32 UTC by Admin