UNIT 5
SPACE EXPLORATION

TOPIC 1 –
FOR OUR EYES ONLY

FRAMES OF REFERENCE

-before we begin, we first need to know “where we are” and how to locate different objects from this place

-to do this, we use a FRAME OF REFERENCE

•a set of points (axes) of any kind that is used to find the position or motion of objects

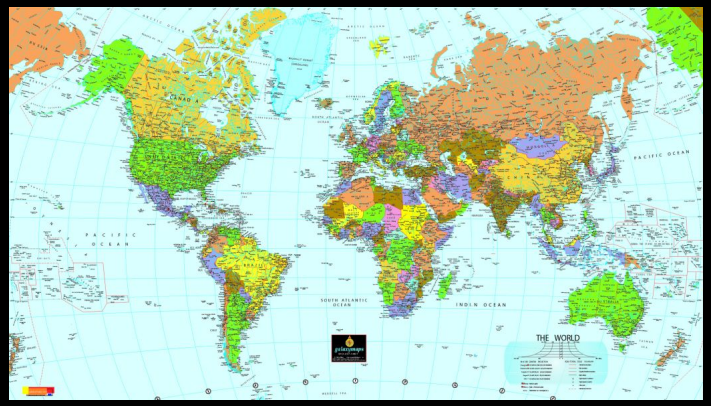
•Set objects that help us compare our location and/or speed

Ex. We use LATITUDE and LONGNITUDE to find our position on Earth (2 sets of points)

Ex. Streets and Avenues to find our location in a city

Frame of Reference will shift based on individual location.

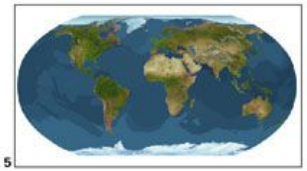
Like points of view, different Frames of Reference are neither correct or incorrect. They are just different.



North American World Map

Take the quiz! Compare country size.
Which of the images on both sides of this placemat are "area accurate?" How is the Hobo-Dyer projection below different from the one on the reverse side? Answers and details about all the images are at www.odt.org/hdp. To the right:

(5) Van Sant's Geosphere,
(6) Guelke's Toronto-centered projection,
(7) the Oxford Globe, and
(8) Goode's Homolosine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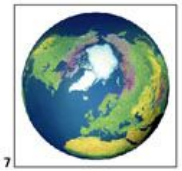
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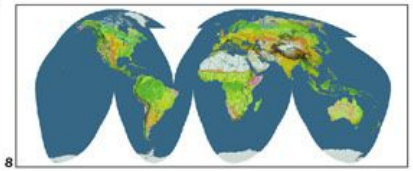
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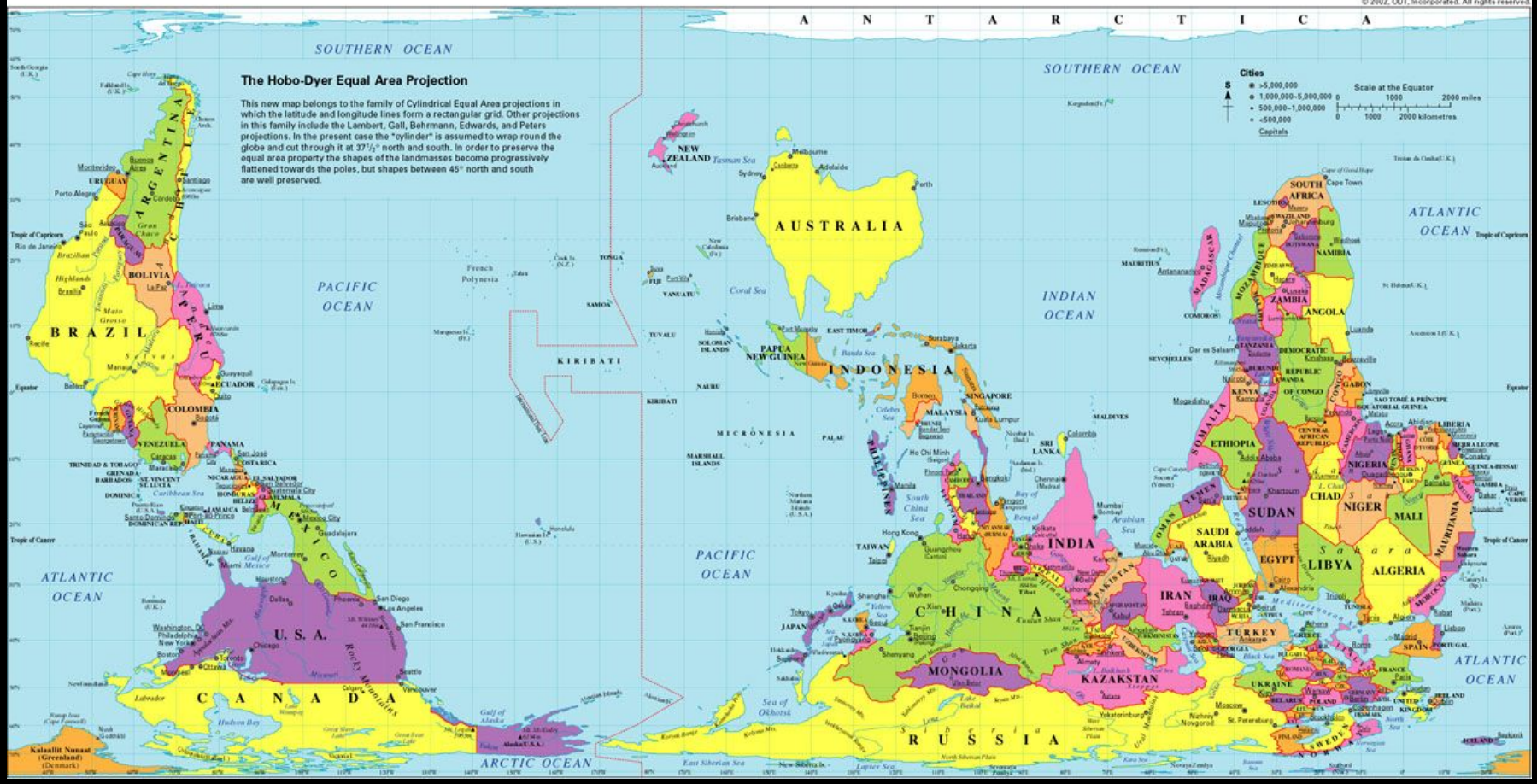


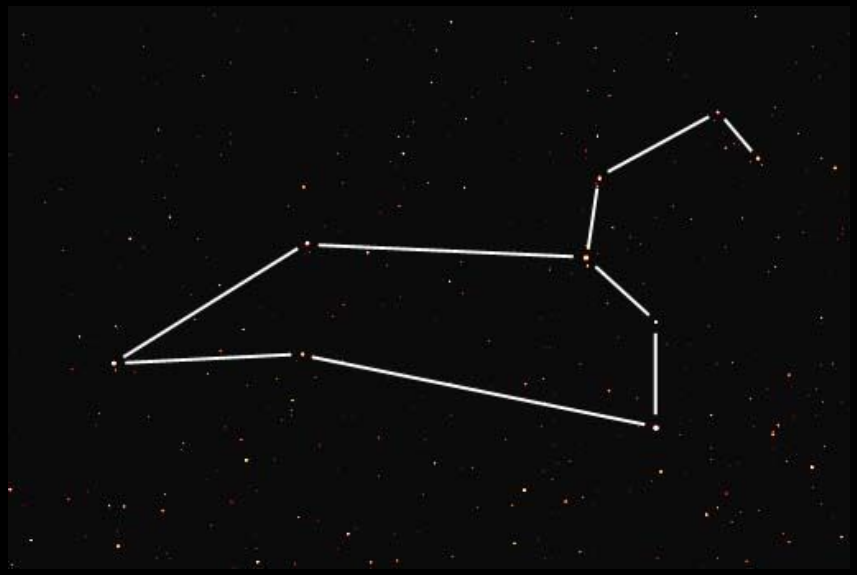
What our ancestors saw

- *Ancient Civilizations* thought that the stars revolve around the Earth. They learned the following through observing celestial bodies which refers to sun, moon, stars, and planets

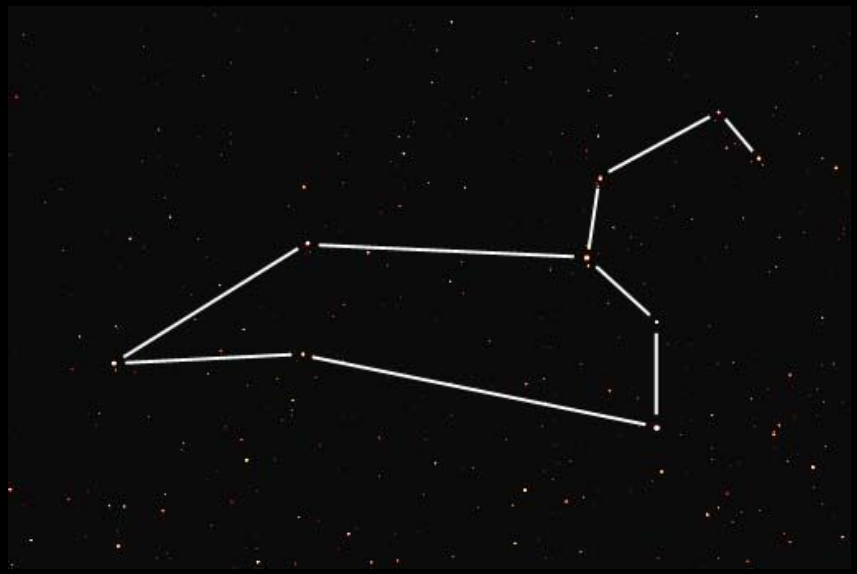
https://www.youtube.com/watch?v=RdrGcg_WNaM

Some of the things they learned

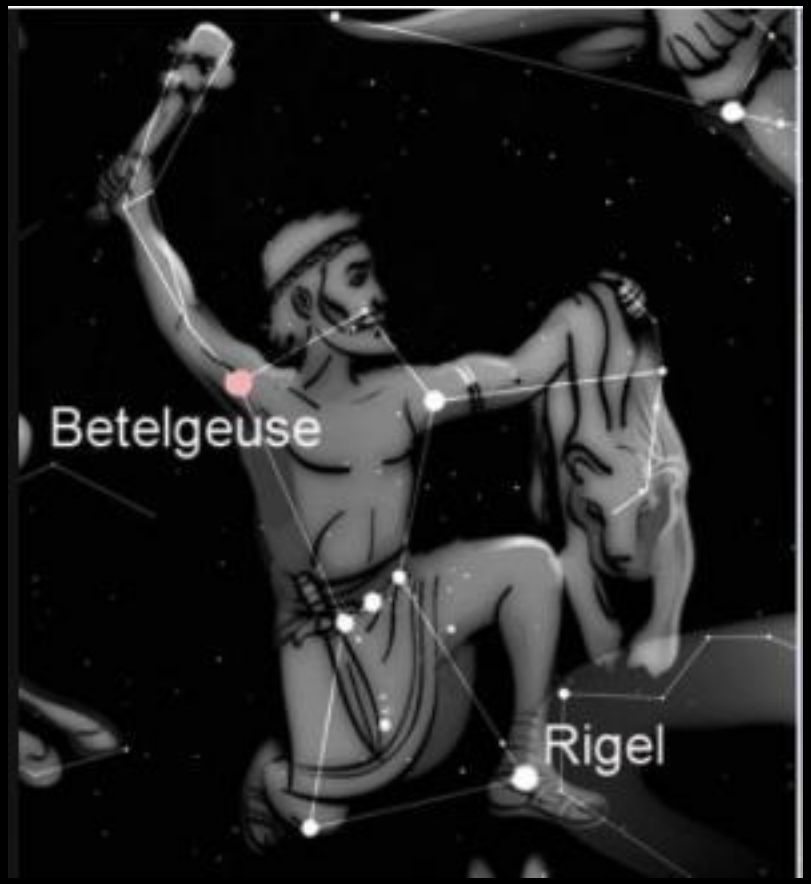
- Stars make unchanging patterns. Groups of stars that form particular patterns and look like objects are called constellations.



LEO



Orion

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Ursa Major

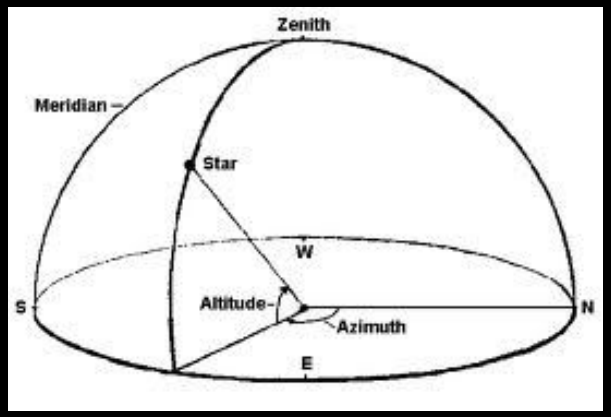
- Each successive day a given star will rise and set 4 min earlier than the day before.
  - This means that over a period of months different stars are in the night sky.
  - Using this pattern, people began to predict seasons. (Calendars)
-

- The Moon rises and sets at a different rate than stars. The Moon also shows phases. (Full moon, half moon, quarter moon).

- Five other bodies – Mercury, Venus, Mars, Jupiter, and Saturn - had different patterns than the stars. Why did the ancient Greeks refer to these objects as **"Planets"**? What did this mean?
- → planets means "wanderer" in Greek.

Sky co-ordinates

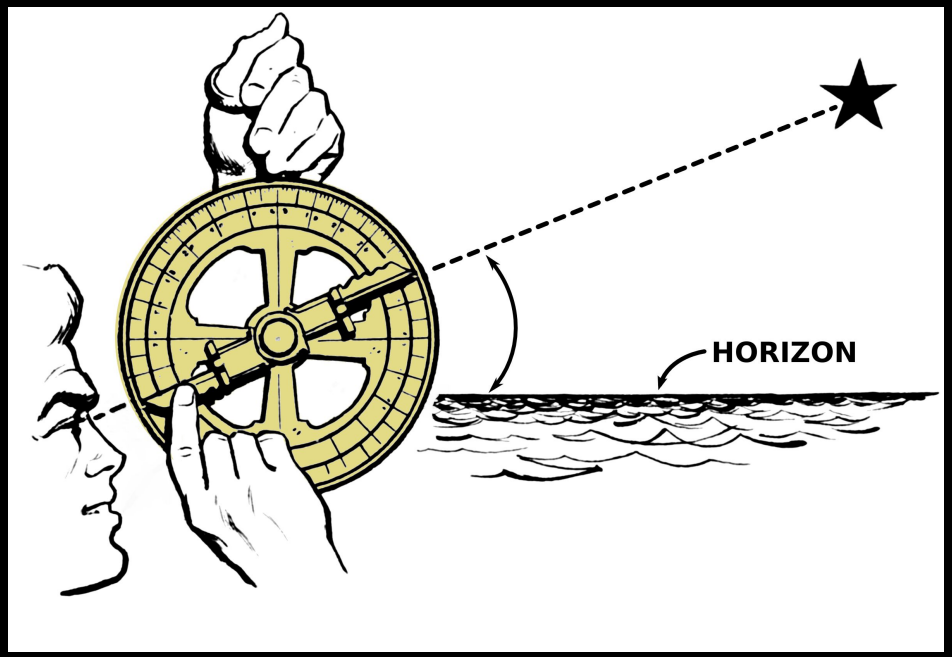
- To accurately measure celestial bodies; locations in the sky, ancient people gave them 2 co-ordinates measured in degrees. Angles used to specify the co-ordinates of a celestial body are called altitude azimuth co-ordinates



Altitude and Azimuth

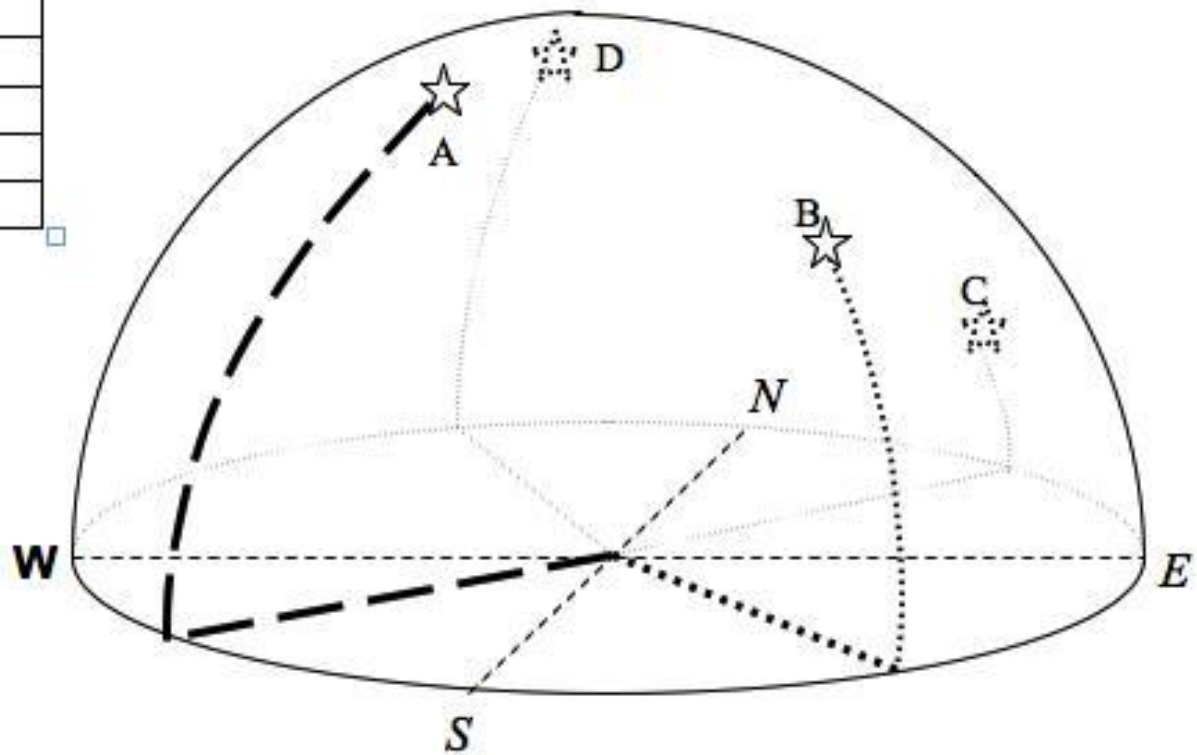
	Altitude	Azimuth
What does it measure?		
How it works.	The Horizon would be 0^0 because it is straight ahead. As look higher than the horizon, the degrees would increase until straight up which would be 90^0.	Always starts at North (0^0) and then rotate Clockwise. Therefore, East would be 90^0, South 180^0, and West 270^0.
What device do you use to measure this angle?		

Altitude & Azimuth- depend on your frame of reference



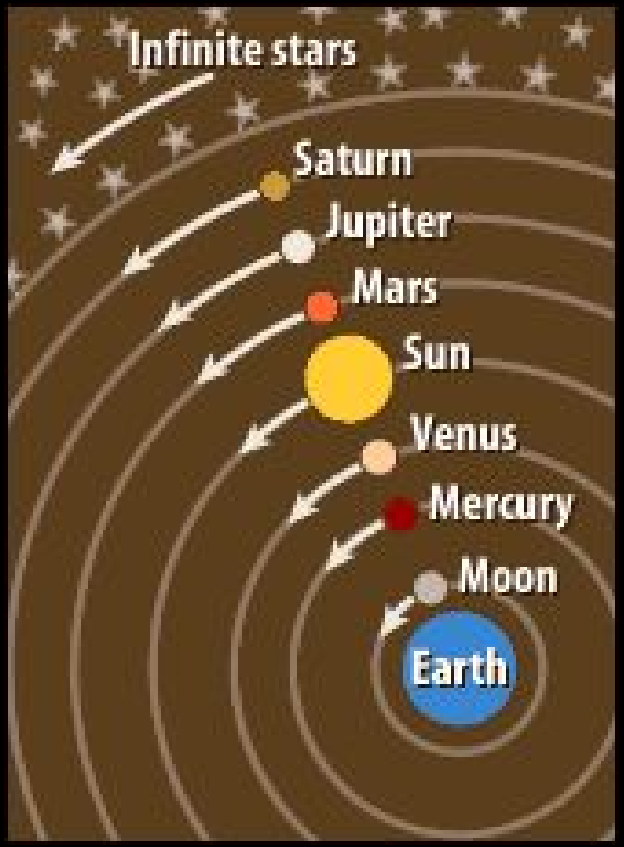
Identify the following stars based on the altitude/azimuth coordinate.

Star	Altitude	Azimuth
	80°	330°
	45°	135°
	70°	245°
	25°	50°



Models of the solar system

- **1. Earth-Centered (geocentric) Model**:
- This was the belief of the ancients that the stars moved around the Earth.
- This model had difficult explaining why 3 planets (Mars, Jupiter & Saturn) sometimes reversed their direction. (retrograde motion)



- **. Sun-Centered (heliocentric) Model**:
- proposed on 1500 by Nicholas Copernicus.
- In this model the Sun was fixed, with a rotating Earth revolving around it.
- was able to explain the problem of retrograde motion