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## Unit 2 – Understanding Motion and the Celestial Sphere

**Focus:** Visualizing Earth as a spinning observer inside a giant "star globe."

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0:00–0:10 – Find cardinal directions (apps, maps)

- Google Earth
- maps.google.com
- zenith and nadir
- meridian

0:10–0:15 – Rotation and Revolution

0:15–0:20 – The Solar Day and the Sidereal Day

- SkySafari
  - Hands-on!

0:20–0:30 – The Celestial Sphere

- Snow Globe Analogy

0:30–0:40 – Earth's rotation the 4 minute difference

0:40–0:50 – Annual Motion and the Zodiac

- Zodiac
- Other Constellations

0:50–1:00 – Star Distances: The 3D Illusion

- Stars in a constellation look close together but are often hundreds of light-years apart in depth.
- Distance in the sky is related to time.

### **Moché References:**

- *Chapter 1: Understanding The Starry Sky*

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**Optional Homework: Use SkySafari to find Polaris and Orion.**

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## Miscellaneous Comments

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- **Finding Latitude via Polaris**
    - The angle of Polaris above the horizon equals your latitude.
  - **Circumpolar Constellations**
    - The Big Dipper and Cassiopeia never "set" in Maine.
    - They are so close to the Polaris that they never dip below our horizon.
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## Unit 02 – Understanding Motion and the Celestial Sphere

### Fast Facts Handout: The Rotating World

<b>Feature</b>	<b>Comment</b>
<b>Earth's Rotation Speed</b>	~1,000 mph at the Equator; ~740 mph in Maine
<b>Diurnal Motion</b>	The apparent daily motion of stars from East to West
<b>Circumpolar</b>	Objects that never set (e.g., Ursa Minor, Draco, Cepheus)
<b>The Zenith</b>	The point directly $90^\circ$ overhead
<b>The Meridian</b>	The North-South line where stars reach their highest point
<b>Sidereal Day</b>	23 hours, 56 minutes (Stars rise 4 mins earlier each night)

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