Imagining a spinning **Celestial Sphere** surrounding Earth still aids in thinking about the position and motion of the sky.

**Position Lecture Tutorial (pg. 1-2)**
- Work with a partner or two
- Read the instructions and questions carefully.
- Discuss the concepts and your answers with one another. **Take time to understand it now!!!!**
- Come to a consensus answer you both agree on and write complete thoughts in your workbook.
- If you get stuck or are not sure of your answer, ask another group.
- If you get really stuck or don’t understand what the Lecture Tutorial is asking, ask me for help.

**Looking at the Night Sky**
How to find your way around:
- Position -> where is that object?
- Distance -> how much space between these two things?
- Motion -> where will that object be later tonight?

**Using Angles**
Distances on the sky are measured in degrees, arc-minutes, and arc-seconds
- 1 degree = 60 arc-min
- 1 arc-min = 60 arc-sec
- Width of index finger = 1°
- Width of three fingers = 5°
- Width of entire hand = 10°

Earth’s rotation causes the Sun, Planets, Moon and stars to appear to move when viewed from Earth.
Rising and Setting Stars

• The Earth’s eastward rotation causes stars to appear to move westward.
• Stars near the North Celestial Pole move in small circles, and are called circumpolar.
• Stars far from the pole move in long arcs.

Tutorial: Motion – p. 3-6

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What can you see?

If you go outside tonight, you’ll see a particular set of constellations. What factors do you think determine what you’ll see in your sky?

Why can’t we see the same constellations all year round?

The Sun is in front of different constellations!

Zodiac -
The 13 Zodiacal constellations that our Sun covers-up (blocks) in the course of one year
(used to be only 12)

<table>
<thead>
<tr>
<th>Constellation</th>
<th>Dates of Sun's Passage Through</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pisces</td>
<td>March 13-April 20</td>
</tr>
<tr>
<td>Aries</td>
<td>April 20-May 13</td>
</tr>
<tr>
<td>Taurus</td>
<td>May 13-June 21</td>
</tr>
<tr>
<td>Gemini</td>
<td>June 21-July 20</td>
</tr>
<tr>
<td>Cancer</td>
<td>July 22-August 11</td>
</tr>
<tr>
<td>Leo</td>
<td>August 11-September 18</td>
</tr>
<tr>
<td>Virgo</td>
<td>September 18-November 1</td>
</tr>
<tr>
<td>Libra</td>
<td>November 1-November 22</td>
</tr>
<tr>
<td>Scorpius</td>
<td>November 22-December 1</td>
</tr>
<tr>
<td>Ophiuchus</td>
<td>December 1-December 18</td>
</tr>
<tr>
<td>Sagittarius</td>
<td>December 19-January 19</td>
</tr>
<tr>
<td>Capricorn</td>
<td>January 19-February 18</td>
</tr>
<tr>
<td>Aquarius</td>
<td>February 18-March 13</td>
</tr>
</tbody>
</table>

Table 1.1
The 13 Constellations of the Zodiac
The Zodiacal Constellations that our Sun covers-up (blocks) in the course of one year (only 12 are shown here)

Figure 1

Which constellation is the Sun in front of for the situation shown?

Figure 2

Lecture-Tutorial: Seasonal Stars (p. 7-9)

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Review: Coordinates on the Earth

• Latitude: position north or south of equator
• Longitude: position east or west of prime meridian (runs through Greenwich, England)

The sky varies with latitude but not longitude.

Altitude of the celestial pole = your latitude