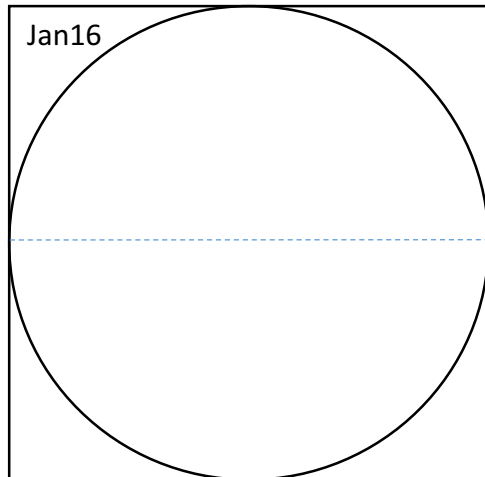
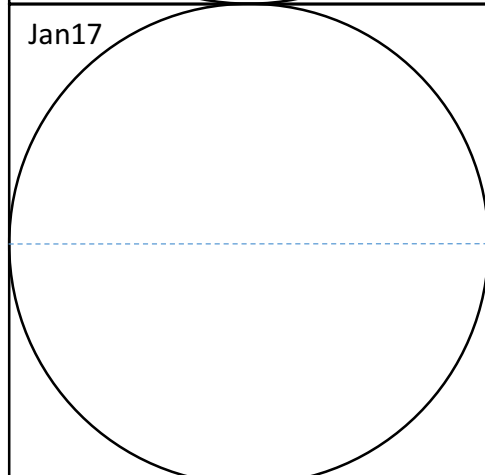
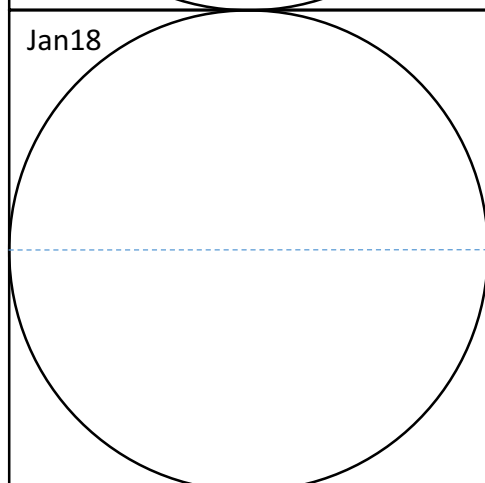


Astro 102 – Lab#1

Lab objectives

- 1) Track sunspots and their associated features on the solar atmosphere
- 2) Learn about auroras and the Kp index
- 3) Learn about solar storms and how these solar events can affect the earth

Jan16 	
Jan17 	
Jan18 	

1) Track sunspots and their associated atmospheric features

1a) At www.thesuntoday.org/the-sun-now/, click on the "2048" under the **HMI Continuum Flattened** image of the sun to see an enlarged image of the solar **photosphere**. Sketch out the sunspots. Use a different color for (1b).

1b) Click on the "2048" under the **AIA 171** image of the sun to see an enlarged image of the solar **atmosphere**. Sketch out the magnetic loops around the sunspots (do *not* sketch out the entire atmosphere, sketch just the magnetic loops associated with the sunspot groups. Try to link the sunspots with the magnetic loops.

You can click on the "**48hr mp4**" link to see a movie of how the solar features changed over the past 2 days.

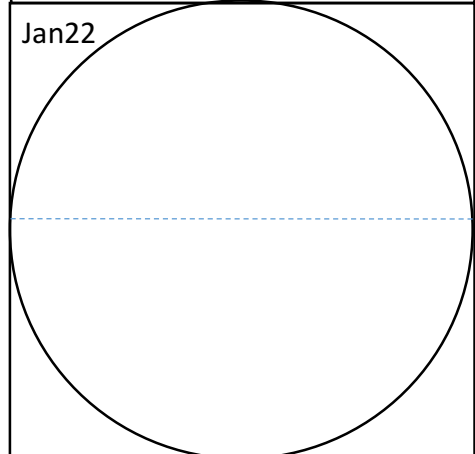
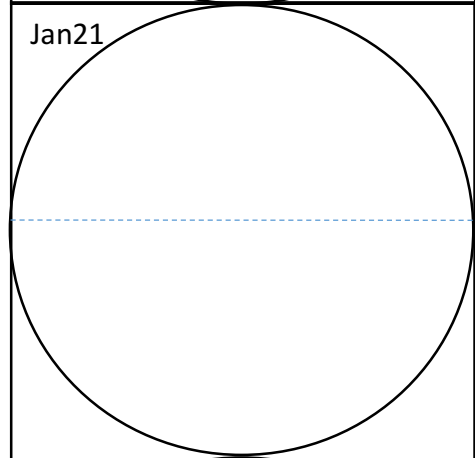
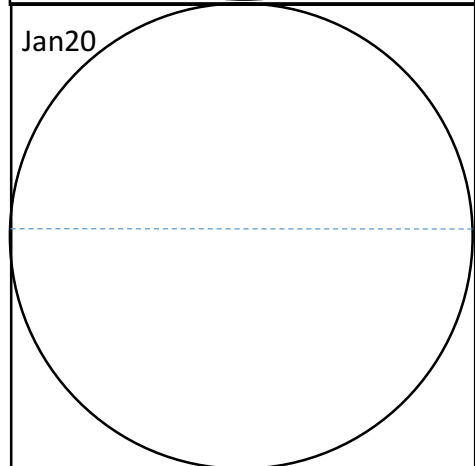
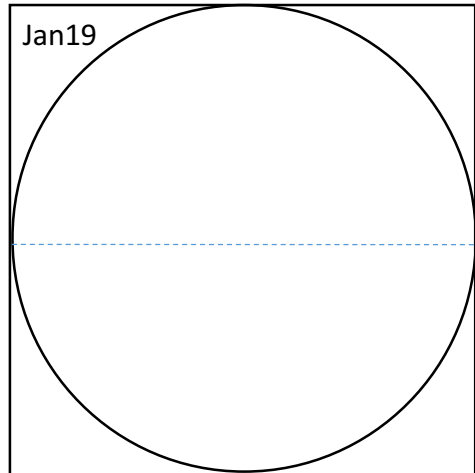
1c) At www.spaceweather.com, click on the "**Daily Sun**" image to see an enlarged image of the sun. Label the active region numbers associated with the sunspots.

1d) Over the next week, continue sketching the sunspots & magnetic loops and label the active regions numbers.

1e) Roughly, how long will it take a sunspot to travel from the eastern edge to western edge of the sun?

About _____ days

Draw the sunspot locations accurately



2) Auroras and the Kp index

2a) At www.spaceweather.com, track the Kp index over the week and record the highest measured value each day by using the Kp index **bar chart** from the **“more data”** link under the Planetary K-index sidebar. Do **NOT** use the 24-hr max value in the sidebar.

Date	Kp maximum
Jan 16	
Jan 17	
Jan 18	
Jan 19	
Jan 20	
Jan 21	
Jan 22	

2b) What is the Kp index a measurement of?

2c) Kp index _____ or more indicates a geomagnetic storm

2d) To see auroras in WA state, the Kp index needs to be higher than about _____ (use the number given in class)

2e) Did the Aurora Oval cross into WA state over the past week? _____

Name: _____

3) Solar storms and their effects on the earth

Click on the "**more data**" link under the Planetary K-index sidebar. Next, click on the "**NOAA Scales**" link next to CURRENT SPACE WEATHER CONDITIONS at the top of the page.

3a) A Kp index of 9 is equivalent to what value on the Geomagnetic Storms scale? G _____

3b) During the most extreme **Geomagnetic Storms**, what effects do they have on **power systems**? _____

3c) During the most extreme **Solar Radiation Storms**, what effects do they have on **humans** and **satellites**? _____

3d) During the most extreme **Radio Blackout**, what effects do they have on **radio communications** and **navigation**? _____
