



Names: \_\_\_\_\_ Date: \_\_\_\_\_

## Module 3B: SDO Solar Storm Prediction Data Sheet

### Space Weather Forecast Submission Form

Answer the following questions in Part A through Part F to determine the current solar activity level of the Sun. By using current SDO data, your team will predict if the environment on the Sun is active enough to produce space weather, just as solar scientists do. Use the online information buttons (i) and video clips to help you along the way.

Click on the link to make your team's space weather prediction online and fill out this form to keep a written record of your team's Space Weather Forecast (this form will be an artifact as part of your team's Module 4 SDO Exploration Museum 3-D Solar Exhibit):

[Camilla Space Weather Forecast Submission Form](#)

### Part A

In Part A, your team will use an intensitygram image to locate sunspots and learn how sunspot positions on the Sun are important in space weather prediction.

**Use the HMI Intensitygram to answer questions 1 - 5**

[» See instructional video for part A](#)

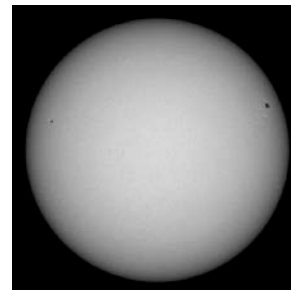
1. Are there any sunspots?

Yes: ☐ No: ☐

2. How many sunspots are there?

3. Are the sunspots grouped in clusters?

Yes: ☐ No: ☐





4. Where are the sunspots located compared to the sun's equator? Use the hands of a clock and North/South to describe position (i.e. 10 o'clock north).

## Part B

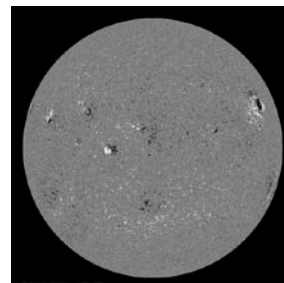
In Part B, your team will examine a magnetogram image to analyze the position and intensity of magnetic fields on the Sun.

**Use the HMI Magnetogram to answer questions 6 - 8**

[» See instructional video for part B](#)

5. Do you observe any pairs of black and white areas on the magnetogram? Black and white indicate magnetic poles "+" and "-." Grey means no magnetic activity.

Yes: ☐ No: ☐



6. Are the black and white areas clearly separated or mixed together?

Separated: ☐ Mixed: ☐ Not Sure: ☐



7. Do the black and white areas occur near sunspots? Explain below.

### Part C

In Part C, your team will use an AIA image identify solar active regions and learn how these relate to space weather events.

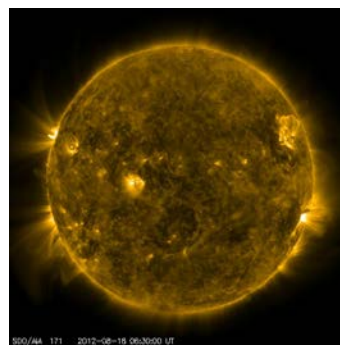
Use the AIA images to answer questions 9 - 11

» [See instructional video for part C](#)

8. Are there any bright active regions on the AIA images?

Yes: ☐ No: ☐

9. How many bright active regions do you observe on the 171 angstroms image?





10. Do the active regions correspond to the sunspots you observed on the intensitygram? Explain below.

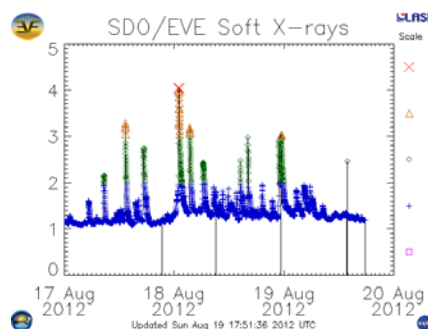
## Part D

In Part D, your team will interpret EVE data from a line graph that shows changes in the brightness of the Sun over time.

### Use EVE data to answer questions 11 & 12

11. Looking at the SDO-EVE data line to the right, do you see a large spike in the data line to over 3, denoted by either triangles or X's?

Yes: ☐ No: ☐



12. How many spikes to over 3 have there been in the last 72 hours?



## Part E

In Part E, your team will analyze LASCO data to identify coronal mass ejections (CMEs) and determine if they are heading towards Earth.

**Use the LASCO C2 & C3 to answer questions 13 - 16**

**[» See instructional video for part E](#)**

13. Do you observe any CME's leaving the surface of the sun?

Yes: ☐ No: ☐

14. Where are they? Use the quadrant map of the Sun to identify where the CME is, if any.

15. Do you see a "Halo Effect" in either LASCO image? This may indicate that a storm is either coming directly towards or away from the earth.

Yes: ☐ No: ☐



16. To determine if the CME is earth facing, refer to the SDO AIA video to the right showing the last 48 hours of activity on the sun. Do you see an event (i.e. a flash, a change in brightness etc.)? Describe what you observe in the space below.

17. If you observed a CME, was it earth-facing?

Yes: ☐ No: ☐ Did not observe: ☐

## Part F

In Part F, your team will then determine the probability of a space weather event occurring in the next 24 hours, based on your team's data analysis from Parts A-E.

### Based on the data you have used, make your forecast

18. You have now just looked for an event that has happened in the last 48 hours, but you have also looked at data to determine if the sun is active enough for a solar flare or a CME. Based on what you have seen, do you predict that there will be an event (a flare or a CME) in the next 24 hours?

Yes: ☐ No: ☐



19. What do you think the probability is?

20. What should Camilla tell her friends?

**SUBMIT!**

Done! Submit your team's online Camilla Space Weather Forecast and save this completed form as an artifact for your Module 4 SDO Exploration Museum 3-D Solar Exhibit.

Images: NASA