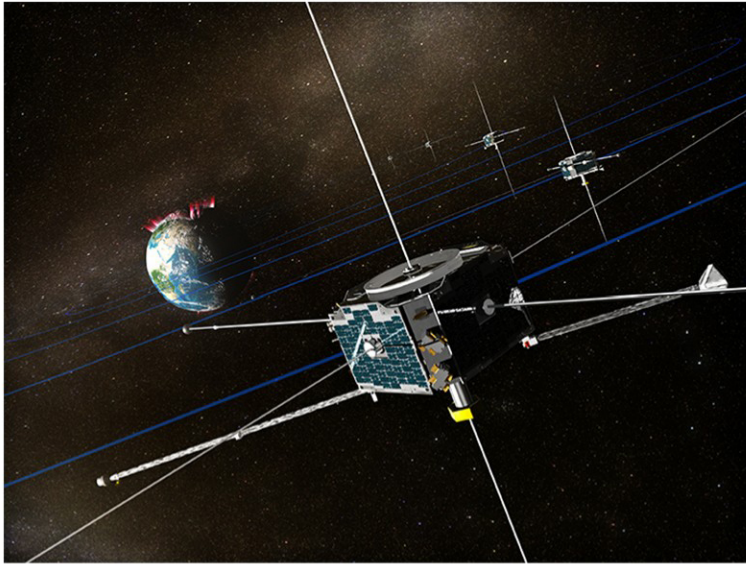


THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



THEMIS (Time History of Events and Macroscale Interactions during Substorms) mission, will help resolve the mystery of what triggers geomagnetic substorms . For the first time, scientists will get a comprehensive view of the substorm phenomena from Earth's upper atmosphere to far into space, pinpointing where and when each substorm begins.

Substorms are fundamental modes of explosive energy release in Earth's environment . They are often embedded within large space storms, and can also occur in isolation . Scientists believe some of the most intense space storms – the ones producing the most penetrating radiation – are accompanied by substorms . Understanding substorms is a prerequisite to understanding space weather and protecting commercial satellites and humans in space from the adverse effects of particle radiation.

THEMIS is NASA's first five identical satellite mission, launched as a constellation, to resolve the tantalizing mystery of what causes the spectacular sudden brightening of the Northern Lights or the aurora borealis – the fiery skies over Earth's northern pole. These lights are the visible manifestations of sudden large energy releases (called substorms) in near-Earth space, out to halfway to the moon. THEMIS will answer the 30-year old question: where and when do substorms start?

The THEMIS satellites were launched February 17, 2007 from Cape Canaveral Air Force Station Space Launch Complex 17 aboard a Delta II rocket.

On May 19, 2008 the Space Sciences Laboratory (SSL) at Berkeley announced NASA had extended the THEMIS mission to the year 2012. NASA officially approved the movement of THEMIS B and THEMIS C into lunar orbit under the mission name ARTEMIS (Acceleration, Reconnection, Turbulence and Electrodynamics of the Moon's Interaction with the Sun). They will conduct measurements of the Moon's interaction with the solar wind and its crustal magnetic fields.

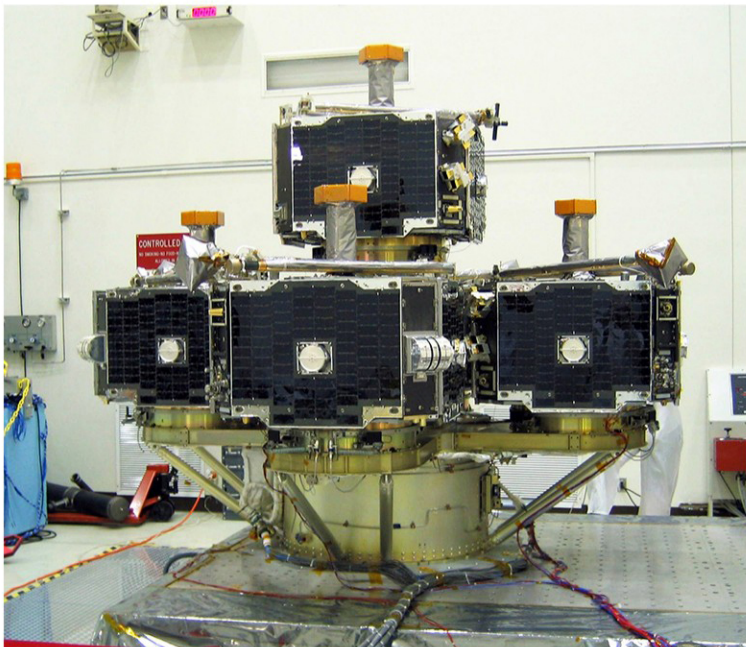
As of November 2013, both probes are in very stable orbits, and the health of all instruments and the spacecraft remains very good.

Mission science goals:

To establish where and when the explosive energy releases that power auroral eruptions called substorms start in Earth's environment .

To determine how the solar wind is affected by its interaction with Earth's bow shock prior to energizing the Earth's magnetosphere .

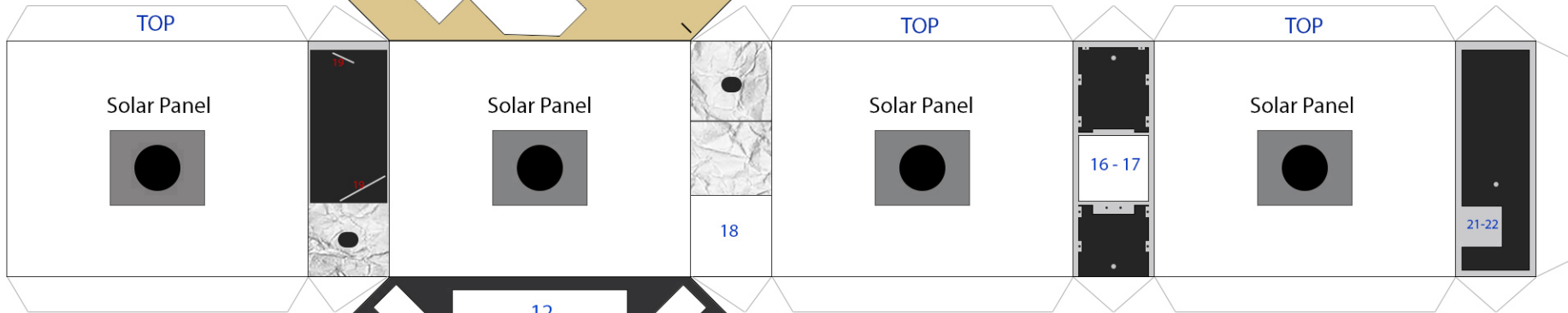
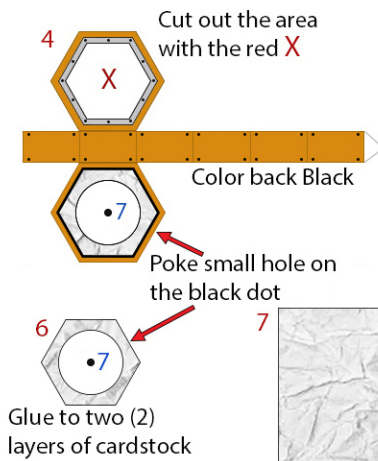
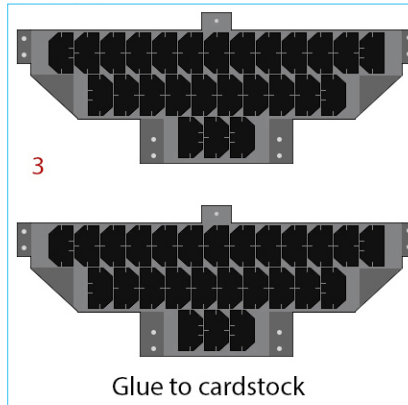
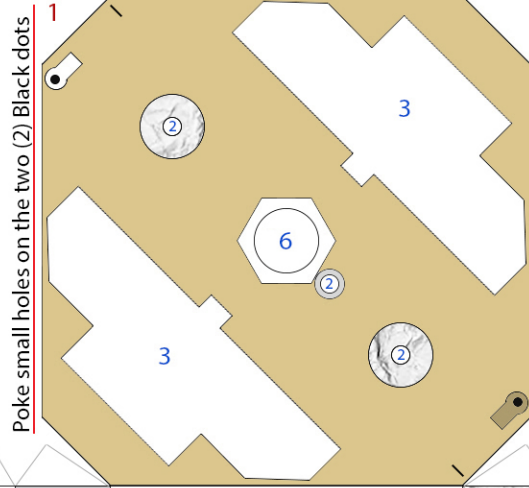
To determine how the "killer" electrons in the Earth's radiation belts are accelerated .



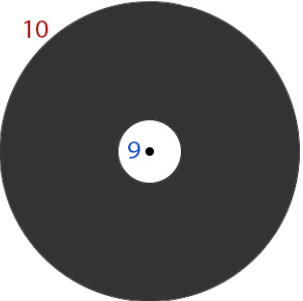
THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



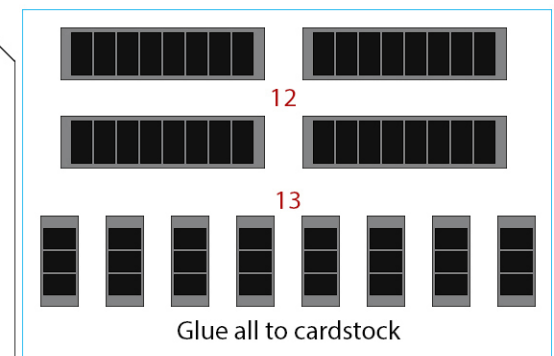
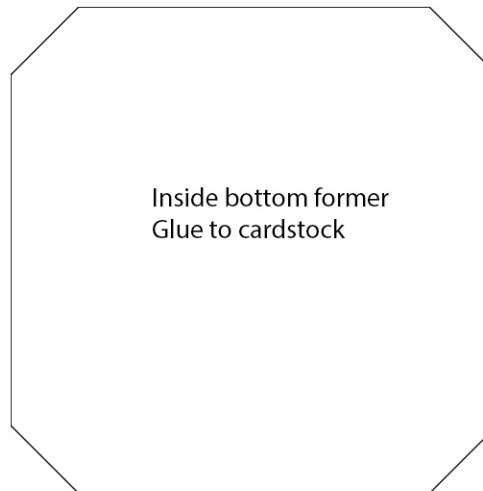
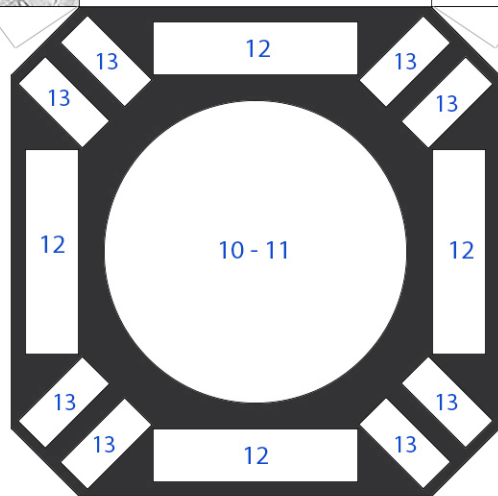
Poke small hole on the Black dot



Glue to cardstock, then poke small hole on the Black dot



11

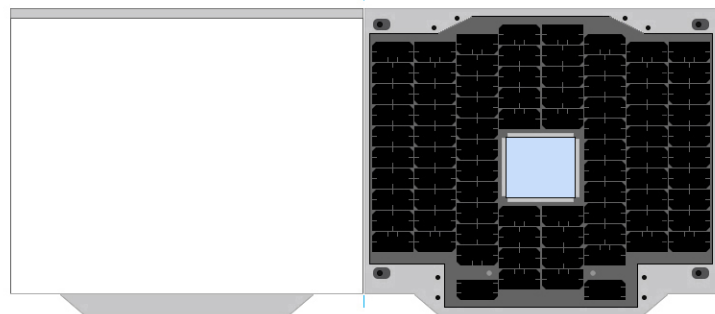
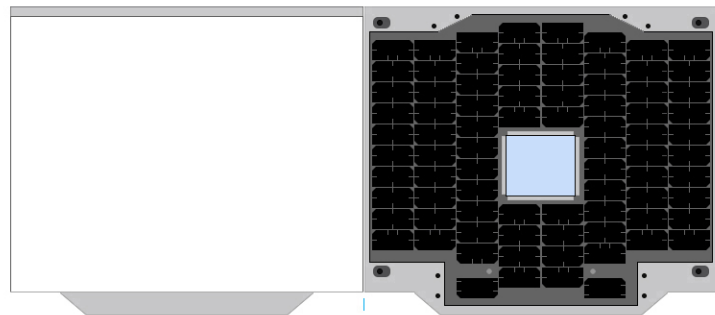
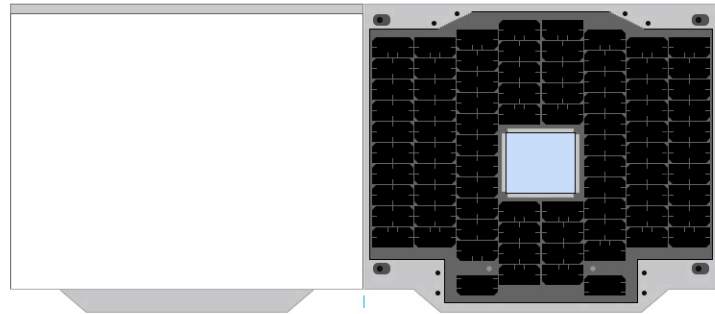
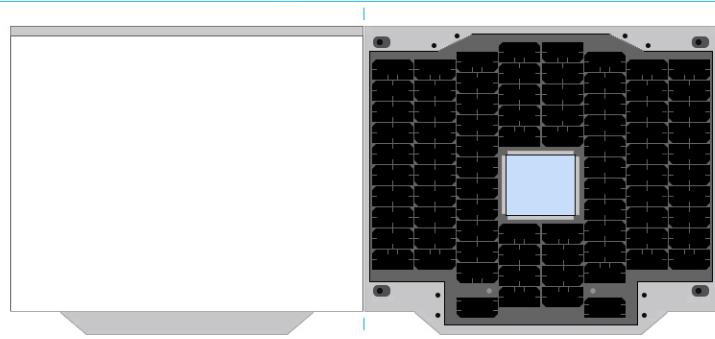


Cut four (4) plastic broom straws 5 inches long colored light grey or silver for the Radial antennas.

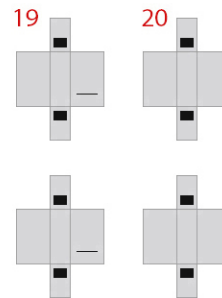
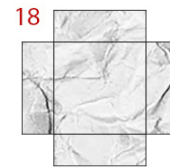
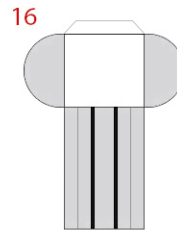
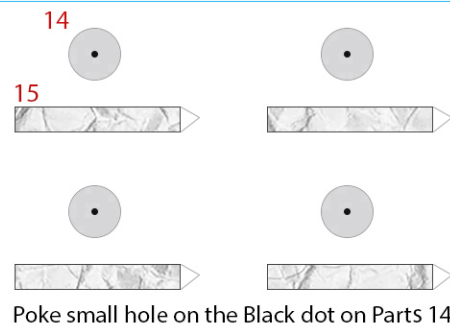
Cut two (2) thin music wires around 1mm diameter the same length as the line below. colored light grey or silver for the Axial Booms.

Color back dark grey

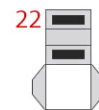
THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



Score, fold and glue each solar panel back-to-back at the Blue lines, then cut out the Blue squares.

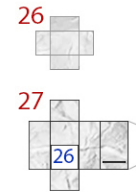


Glue this to cardstock
21
22



Fold, glue back-to-back at the Blue lines

24
Color back Black



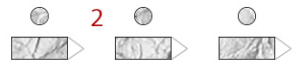
Glue both of Parts 28 to cardstock, then back-to-back.

Glue both of Parts 29 to cardstock-but not the tabs with the black dots. Glue 29a on top of the matching tabs with the black dots and poke small holes onto the black dots. Glue these back-to-back. There should be a gap between the tabs that acts as a hinge for parts 30.

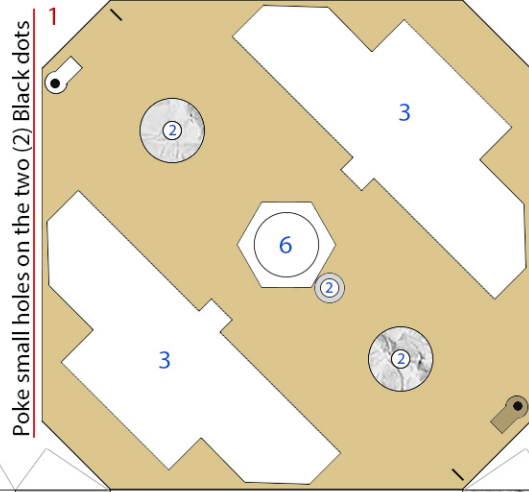
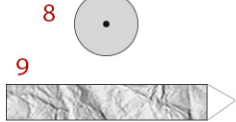
Glue one of Parts 30 to cardstock-poke small holes on the black dots. Then back-to-back with the other Part 30.



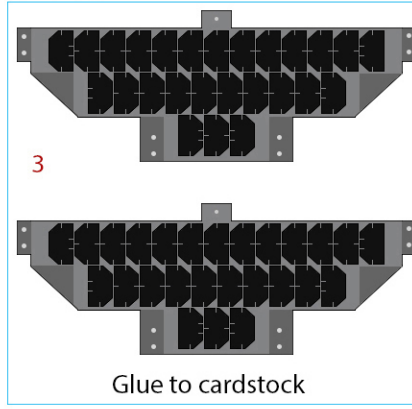
THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



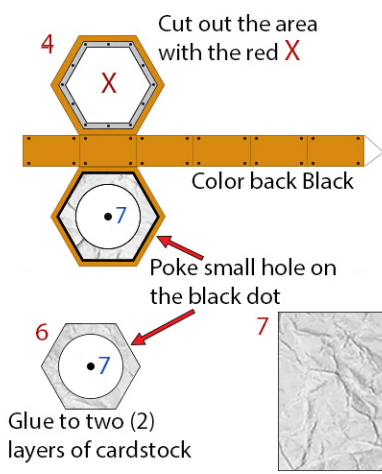
Poke small hole on the Black dot



Poke small holes on the two (2) Black dots



Glue to cardstock

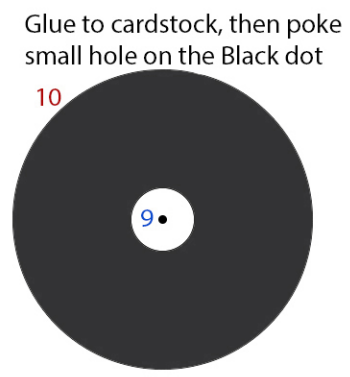
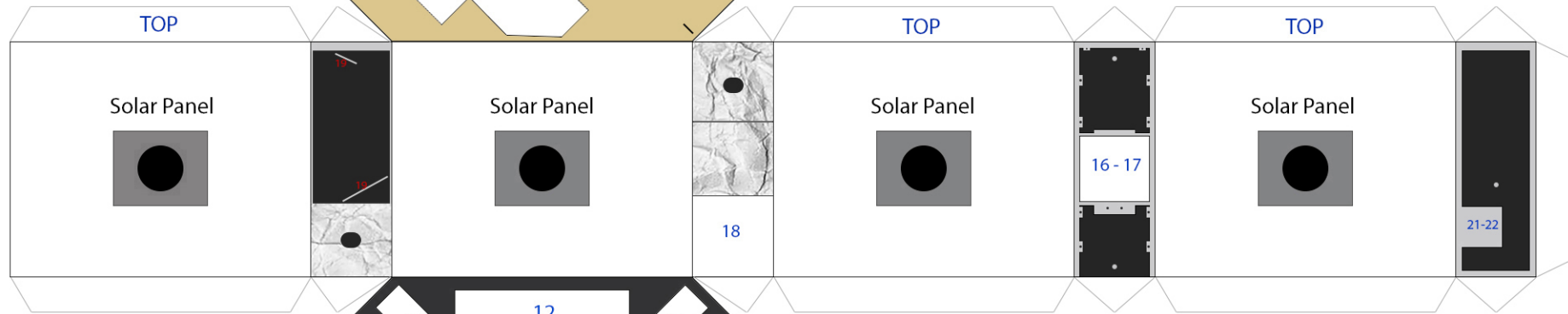


Cut out the area with the red X

Color back Black

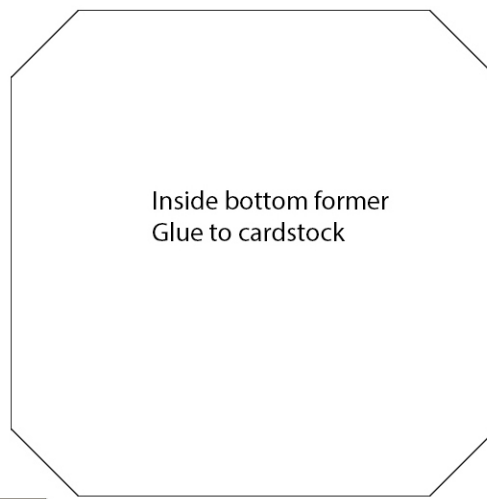
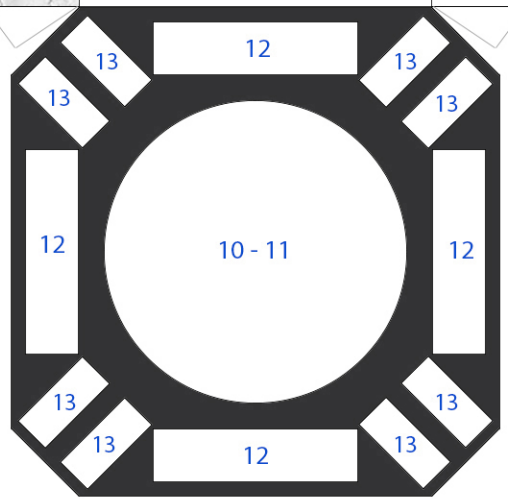
Poke small hole on the black dot

Glue to two (2) layers of cardstock

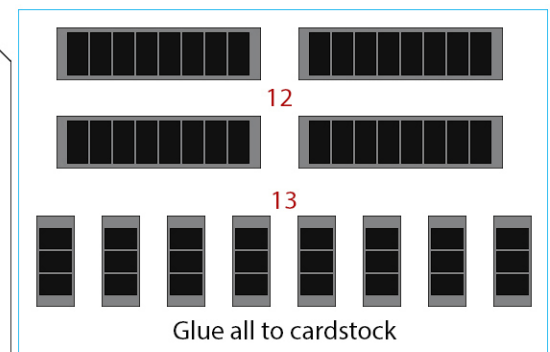


Glue to cardstock, then poke small hole on the Black dot

10



Inside bottom former
Glue to cardstock



Glue all to cardstock

Cut four (4) plastic broom straws 5 inches long colored light grey or silver for the Radial antennas.

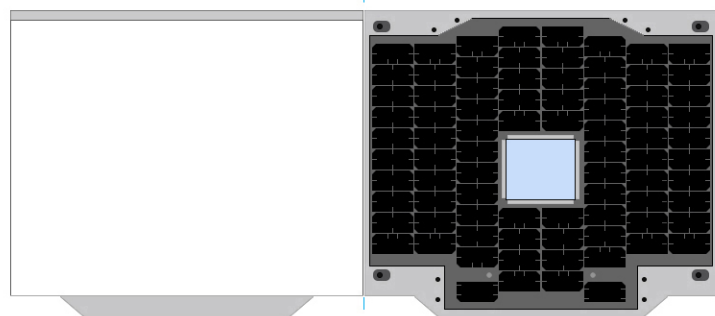
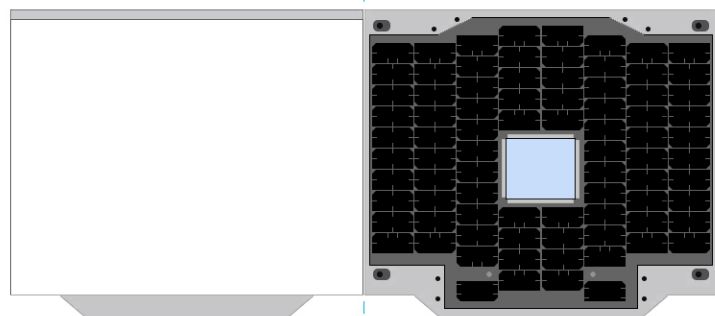
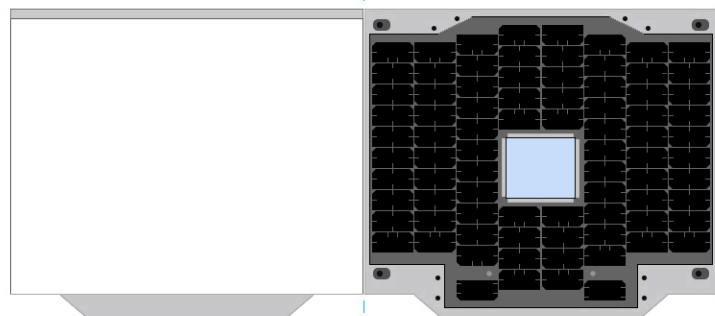
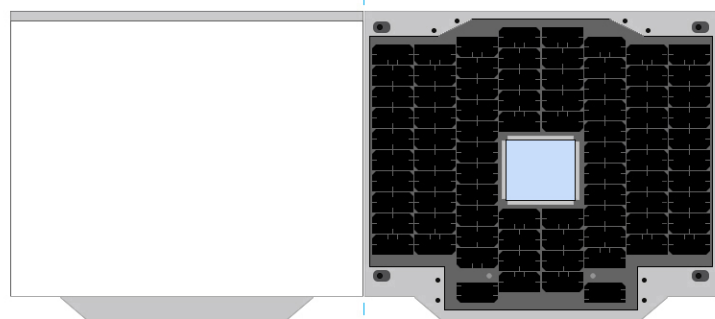
Cut two (2) thin music wires around 1mm diameter the same length as the line below. colored light grey or silver for the Axial Booms.

11

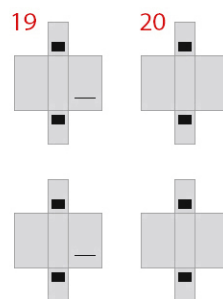
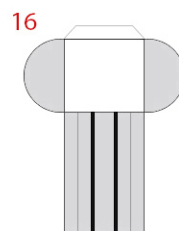
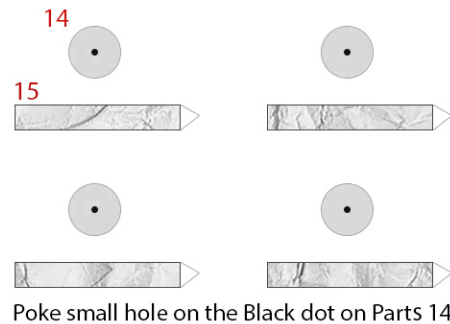


Color back dark grey

THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



Score, fold and glue each solar panel back-to-back at the Blue lines, then cut out the Blue squares.

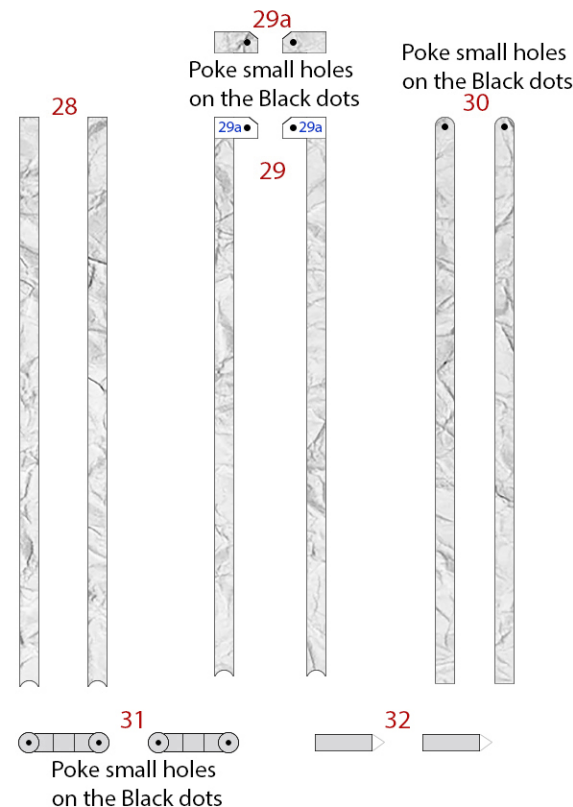
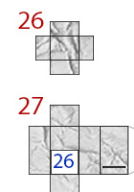


Glue this to cardstock
21
22



Fold, glue back-to-back at the Blue lines

24
Color back Black



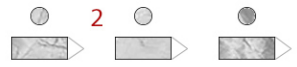
Glue both of Parts 28 to cardstock, then back-to-back.

Glue both of Parts 29 to cardstock-but not the tabs with the black dots. Glue 29a on top of the matching tabs with the black dots and poke small holes onto the black dots. Glue these back-to-back. There should be a gap between the tabs that acts as a hinge for parts 30.

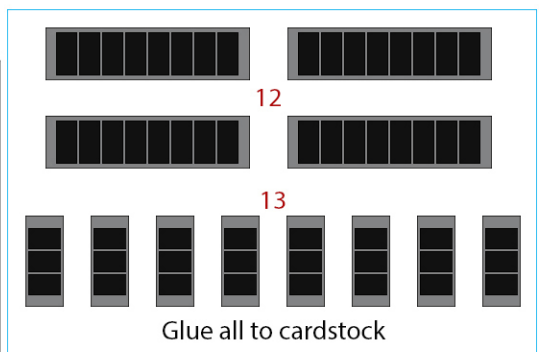
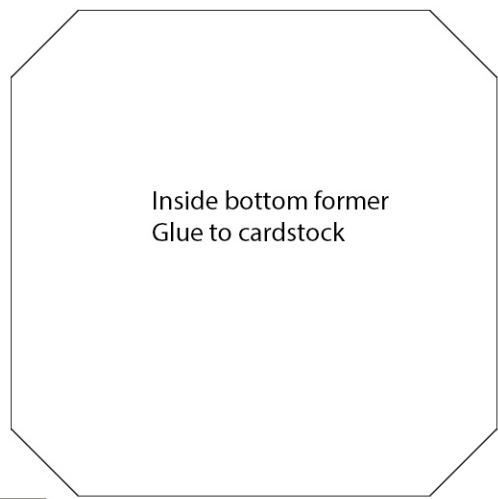
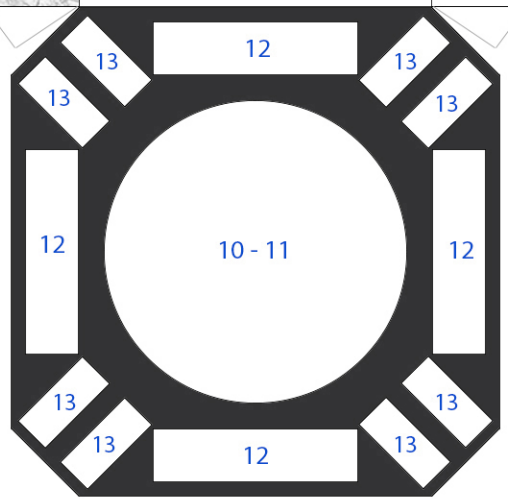
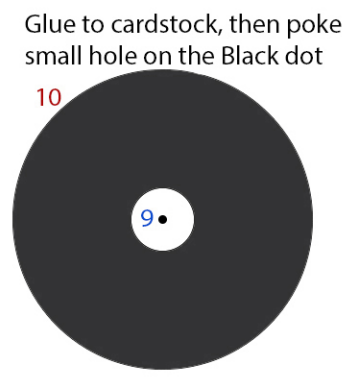
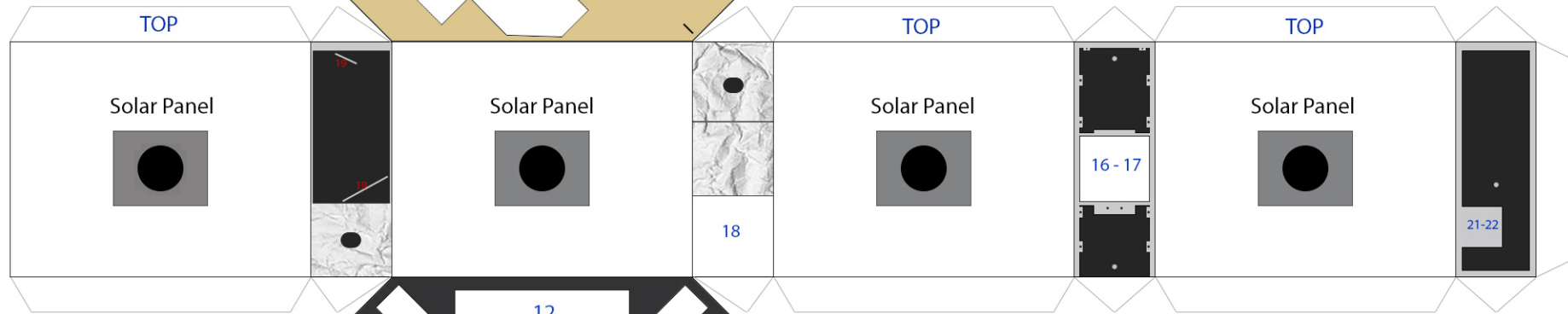
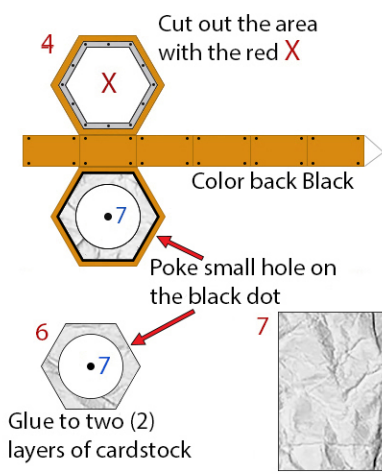
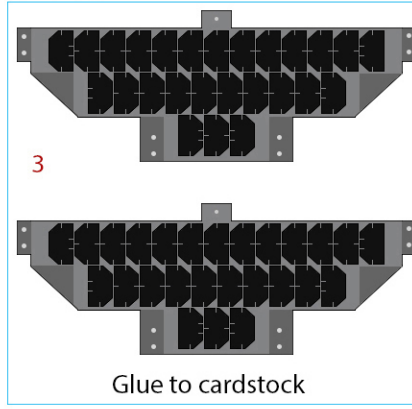
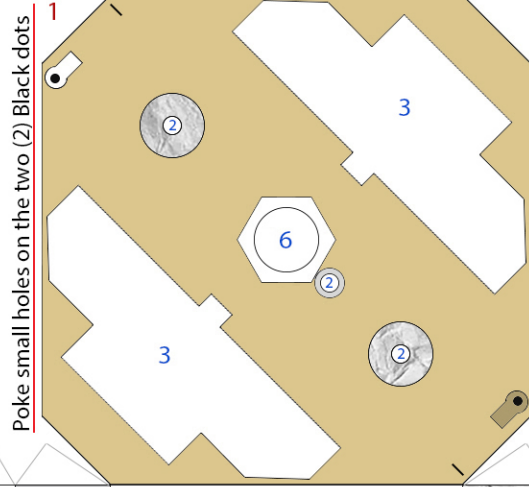
Glue one of Parts 30 to cardstock-poke small holes on the black dots. Then back-to-back with the other Part 30.



THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



Poke small hole on the Black dot

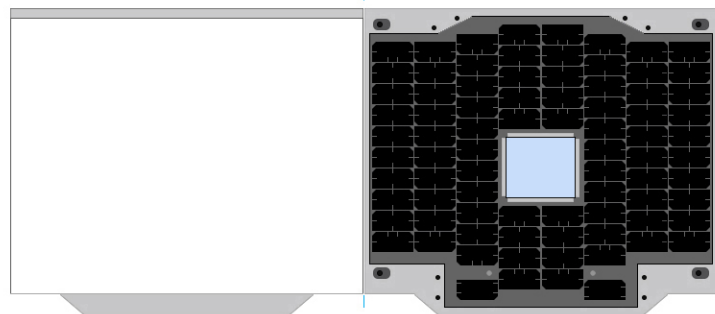
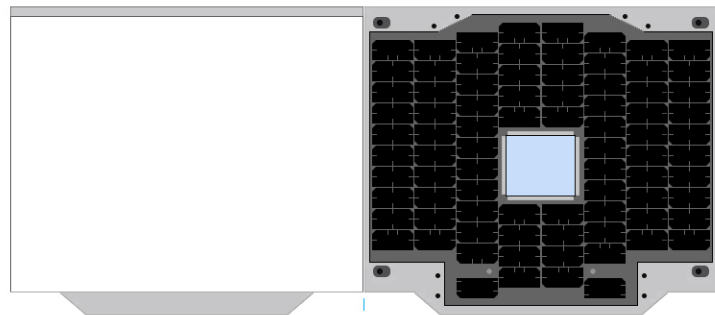
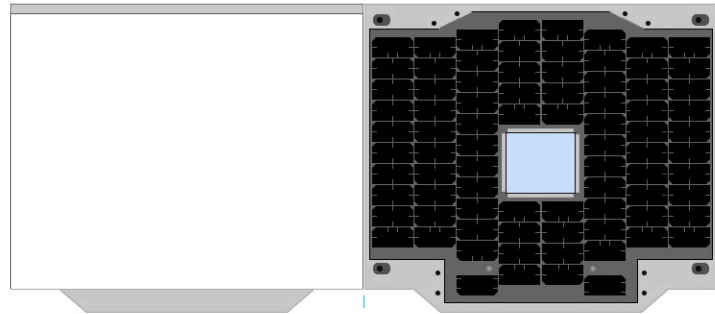
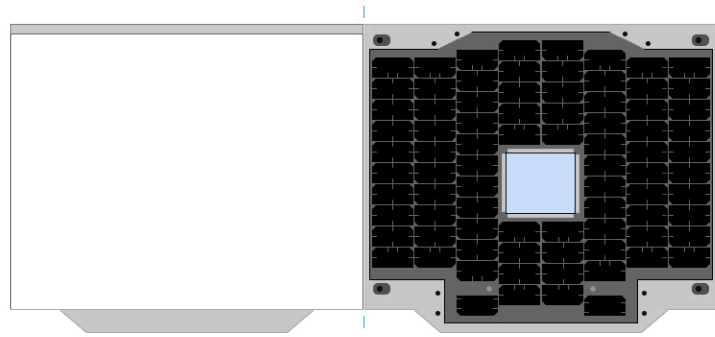


Cut four (4) plastic broom straws 5 inches long colored light grey or silver for the Radial antennas.

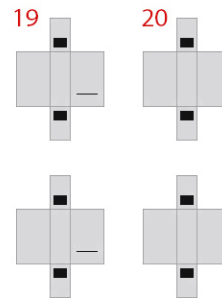
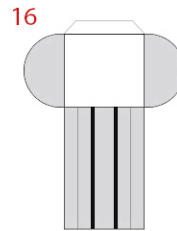
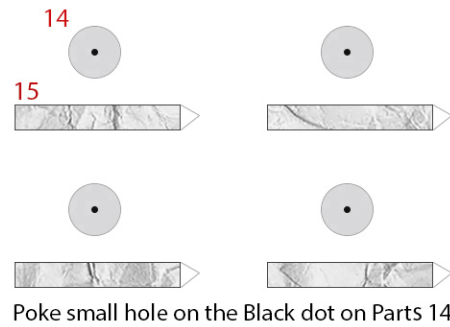
Cut two (2) thin music wires around 1mm diameter the same length as the line below. colored light grey or silver for the Axial Booms.



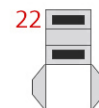
THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



Score, fold and glue each solar panel back-to-back at the Blue lines, then cut out the Blue squares.

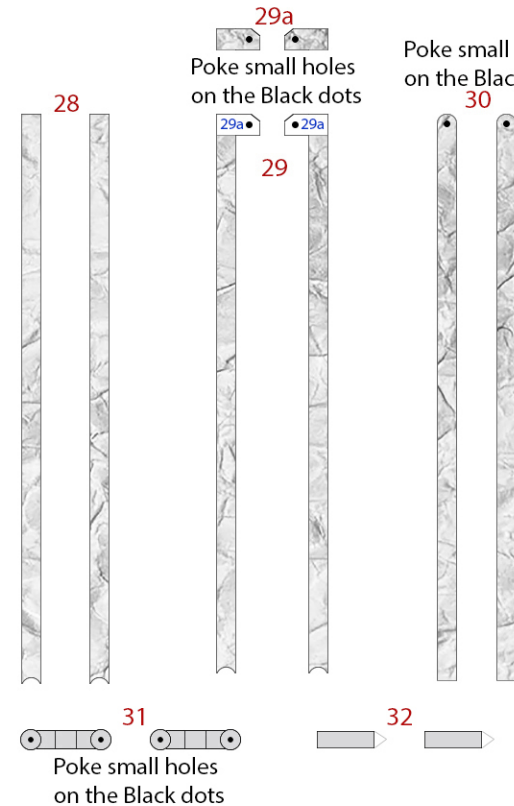
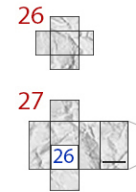


Glue this to cardstock
21
22



Fold, glue back-to-back at the Blue lines

24
Color back Black



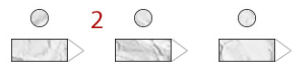
Glue both of Parts 28 to cardstock, then back-to-back.

Glue both of Parts 29 to cardstock-but not the tabs with the black dots. Glue 29a on top of the matching tabs with the black dots and poke small holes onto the black dots. Glue these back-to-back. There should be a gap between the tabs that acts as a hinge for parts 30.

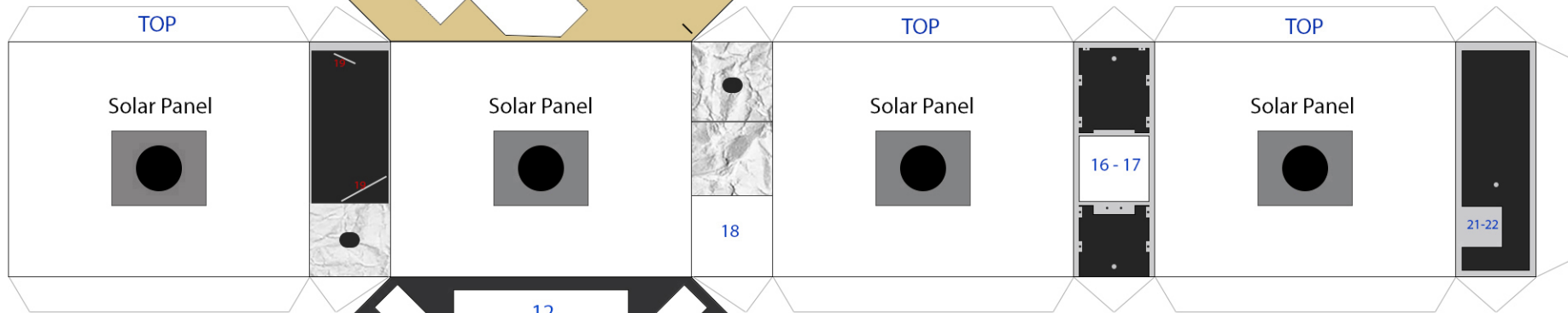
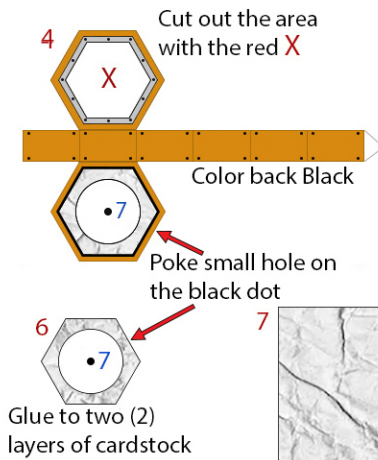
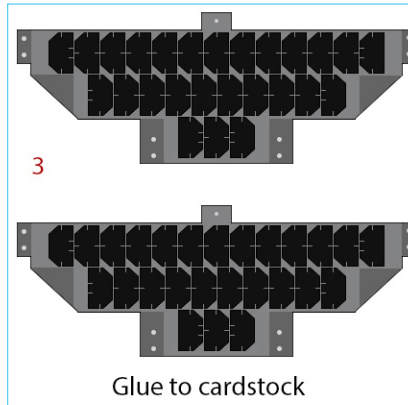
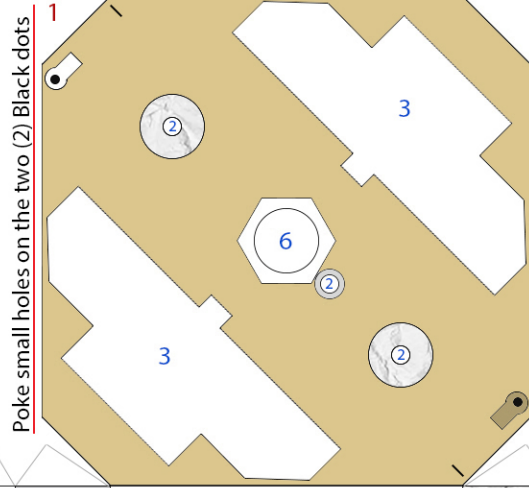
Glue one of Parts 30 to cardstock-poke small holes on the black dots. Then back-to-back with the other Part 30.



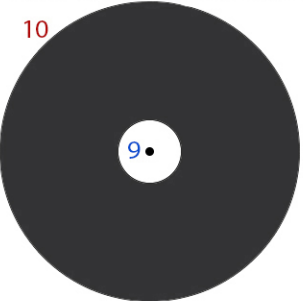
THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



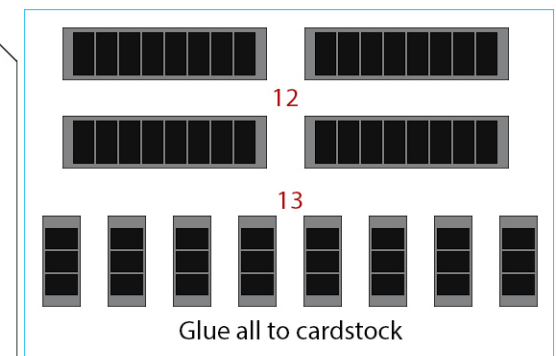
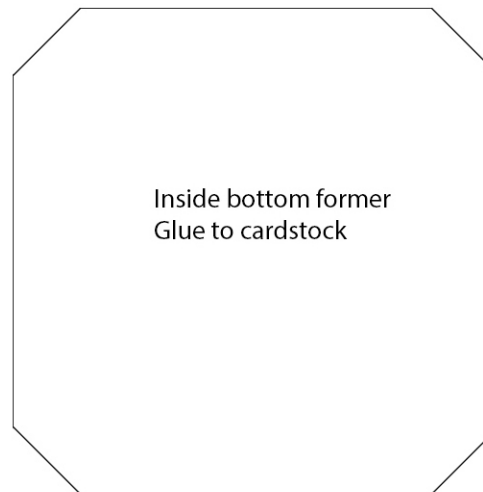
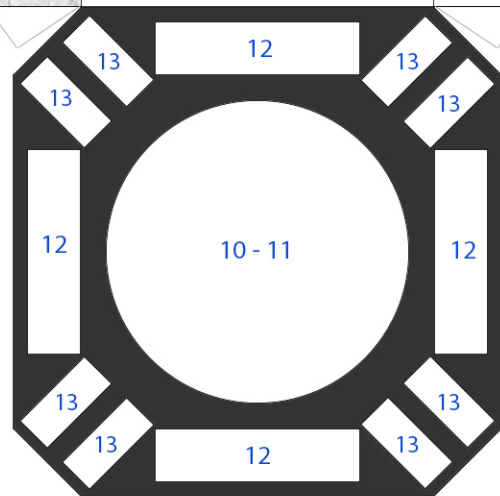
Poke small hole on the Black dot



Glue to cardstock, then poke small hole on the Black dot



11

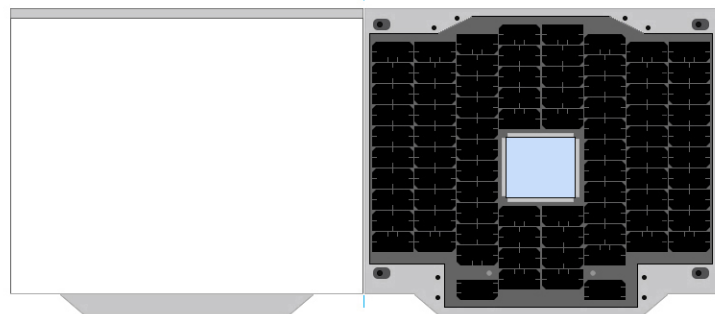
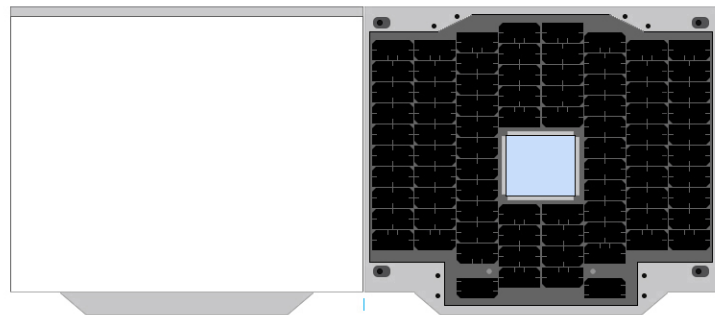
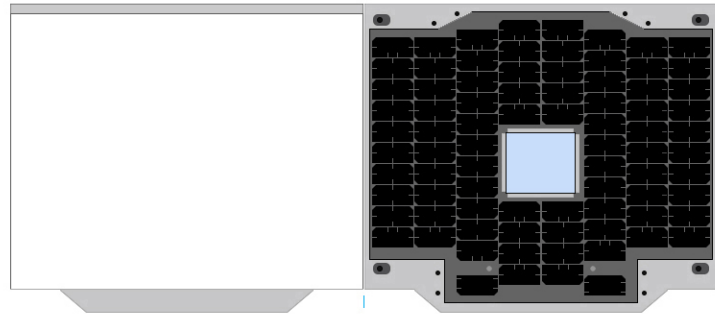
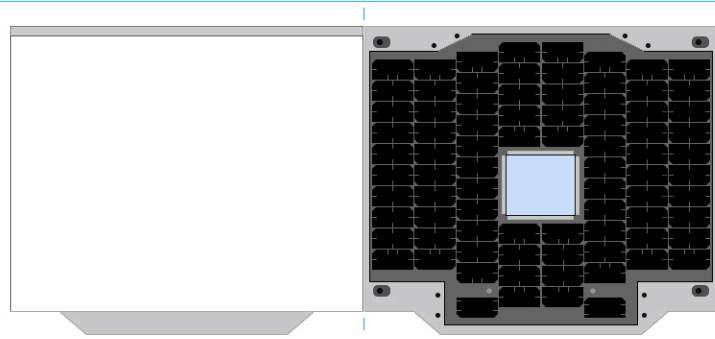


Cut four (4) plastic broom straws 5 inches long colored light grey or silver for the Radial antennas.

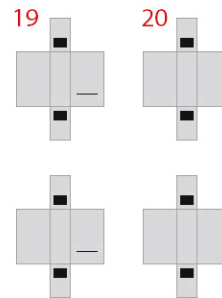
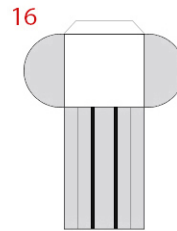
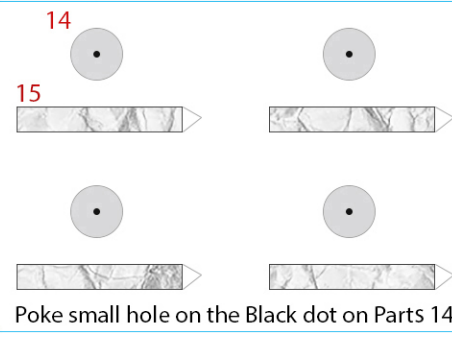
Cut two (2) thin music wires around 1mm diameter the same length as the line below. colored light grey or silver for the Axial Booms.

Color back dark grey

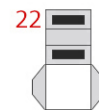
THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



Score, fold and glue each solar panel back-to-back at the Blue lines, then cut out the Blue squares.

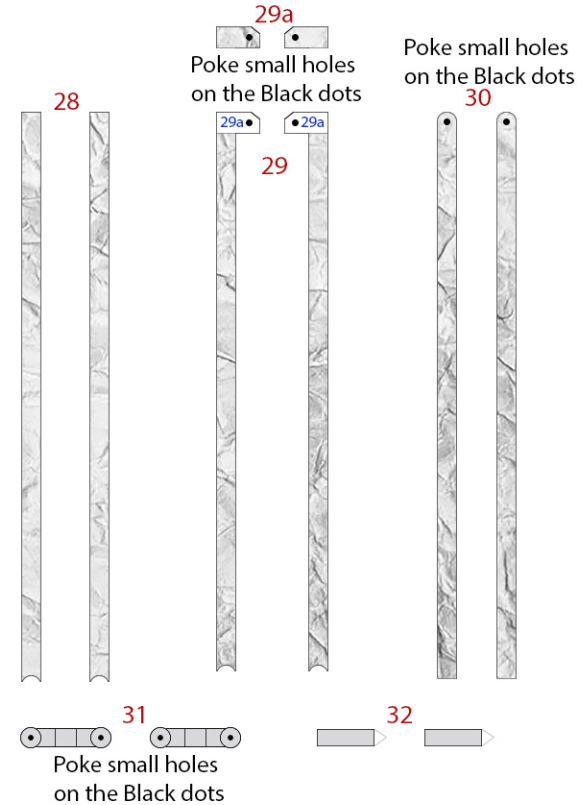
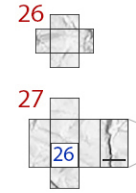


Glue this to cardstock
21
22



Fold, glue back-to-back at the Blue lines

24
Color back Black



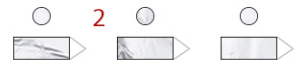
Glue both of Parts 28 to cardstock, then back-to-back.

Glue both of Parts 29 to cardstock-but not the tabs with the black dots. Glue 29a on top of the matching tabs with the black dots and poke small holes onto the black dots. Glue these back-to-back. There should be a gap between the tabs that acts as a hinge for parts 30.

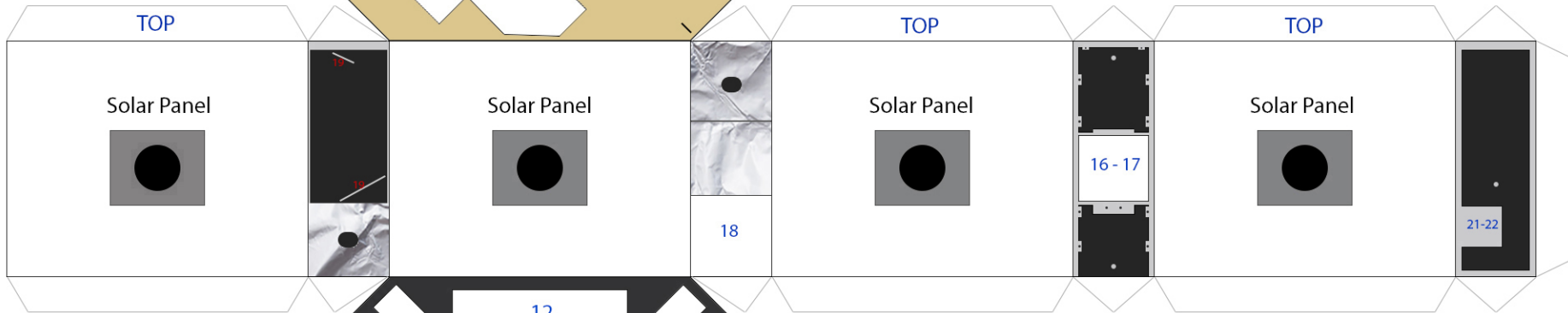
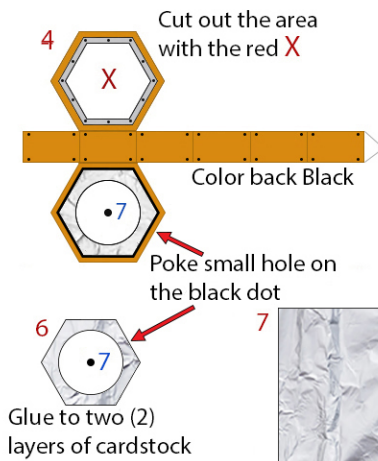
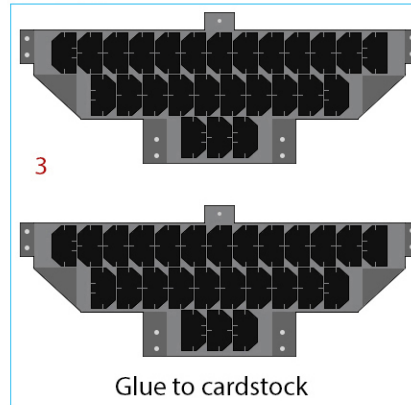
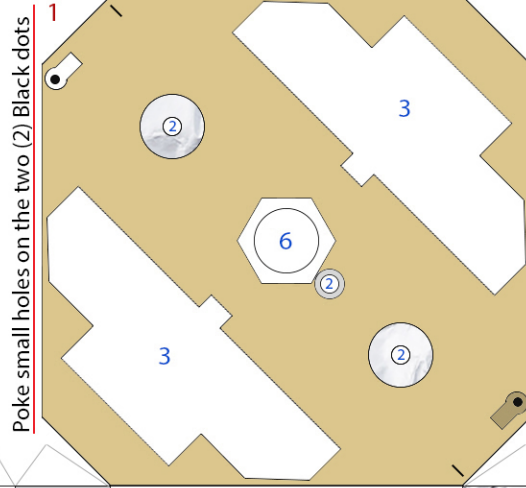
Glue one of Parts 30 to cardstock-poke small holes on the black dots. Then back-to-back with the other Part 30.



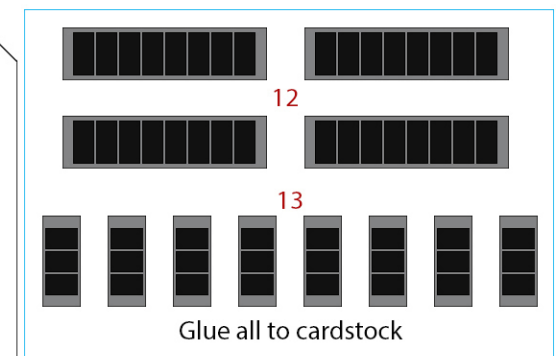
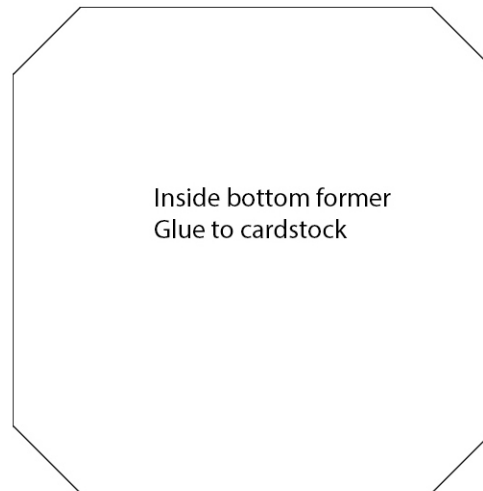
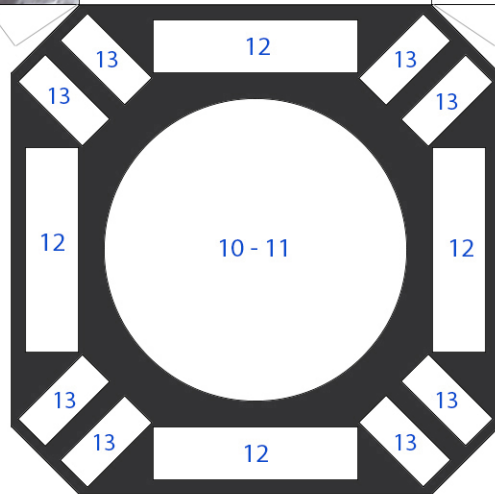
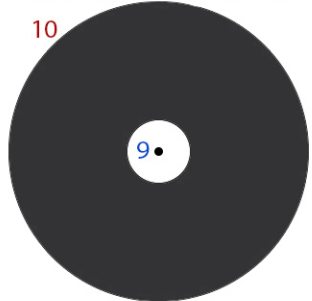
THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



Poke small hole on the Black dot



Glue to cardstock, then poke small hole on the Black dot



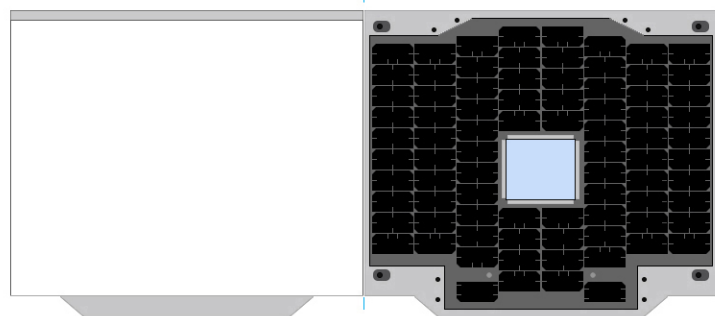
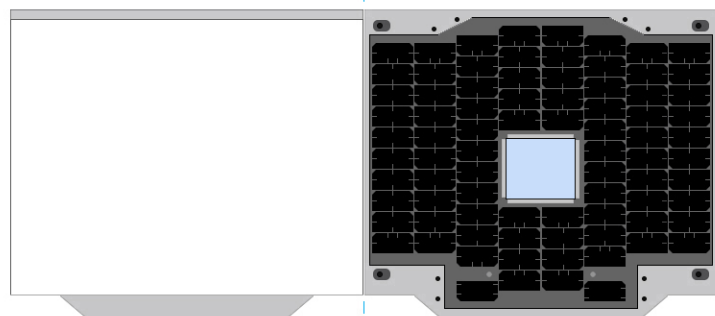
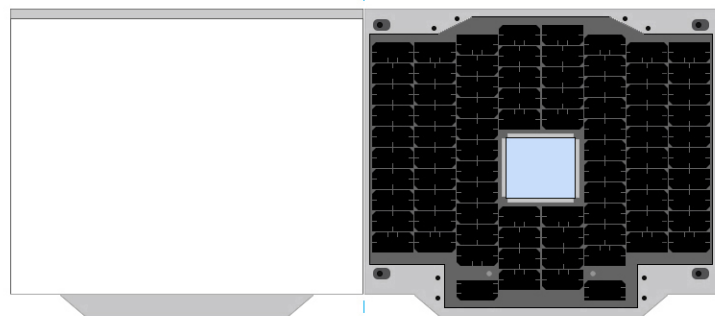
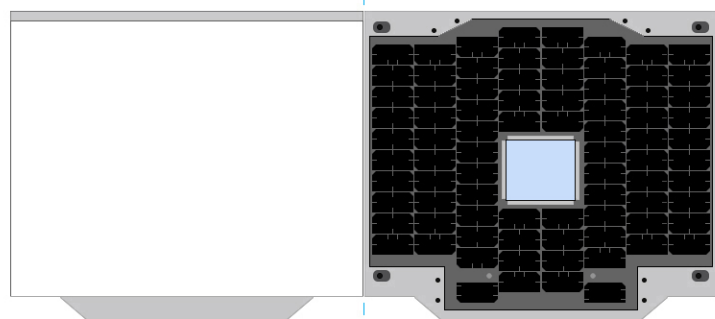
Cut four (4) plastic broom straws 5 inches long colored light grey or silver for the Radial antennas.

Cut two (2) thin music wires around 1mm diameter the same length as the line below. colored light grey or silver for the Axial Booms.

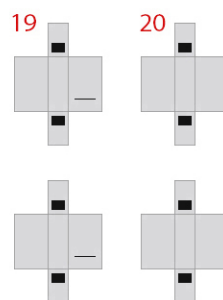
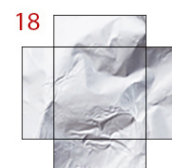
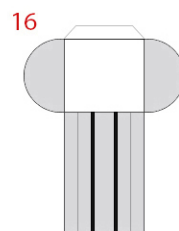
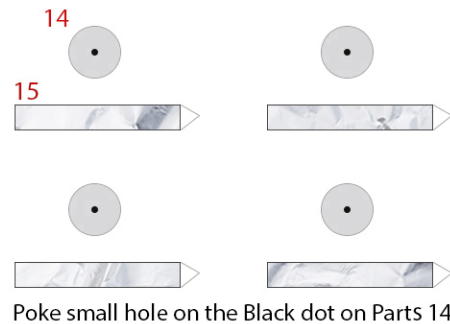
11

Color back dark grey

THEMIS (Time History of Events of Macroscale Interactions During Substorms) - Version 2



Score, fold and glue each solar panel back-to-back at the Blue lines, then cut out the Blue squares.

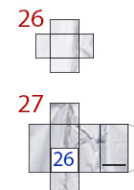


Glue this to cardstock
21
22



Fold, glue back-to-back at the Blue lines

24
Color back Black



Glue both of Parts 28 to cardstock, then back-to-back.

Glue both of Parts 29 to cardstock-but not the tabs with the black dots. Glue 29a on top of the matching tabs with the black dots and poke small holes onto the black dots. Glue these back-to-back. There should be a gap between the tabs that acts as a hinge for parts 30.

Glue one of Parts 30 to cardstock-poke small holes on the black dots. Then back-to-back with the other Part 30.

