Wind & Weather Tour – SOS Explorer (SOSx) Name: _____
Secondary Students' Exploration – *Teacher Version*

Instructions:

- Click on the Wind and Weather Tour icon in the lower left corner of SOS Explorer (SOSx) to begin.
- Look for the text below in *italics* to match the text in the SOSx tour. Then, answer the question/prompt that follows on this worksheet below.
- Make sure to interact and think about the questions that are asked in SOSx during the tour. Questions here, in this worksheet, are deeper thought questions or summaries of the information that is presented to you in the tour.
- During the tour you can press Play or Enter key to move to the next slide, but you cannot go backward.

1. Blue Marble with Real-Time Clouds – *Notice the green, blue and white colors on the planet we know as Earth. The white is snow, ice or clouds. The satellite image shows the clouds we can see, which represent the weather as it is today. Rotate the sphere around to see the weather around the world.*

- Where do you think there might be weather going on? Where? What kind of weather?
  Answers might be: Clear weather, rain, tropical storms, snowstorms.

2. Blue Marble with Real-Time Clouds – *Here's a forecast weather map for the U.S. for today. Do you see the patterns of clouds ahead of where the front lines (blue and red curved lines) would be on the sphere?*

- Explain the pattern(s) that you see.
  In front of both warm (red) and cold (blue) front lines (the side where the symbols are) you might see clouds, indicating that there is likely precipitation. Where there are H's (high pressure) should see no clouds or clear/fair weather.

3. Layer – Lat Lon Grid, Surface Temperature – *One factor is the tilt of the Earth with respect to the Sun, another is latitude.* Point out a few examples of places on Earth where the temperature is distinctly related to latitude.

- Explain how you know the places that you highlighted are related to latitude?
  Obvious places include high latitudes where temperature difference throughout the year is extreme due to lack of direct sunlight in the winter, and low latitudes where sunlight is plentiful year 'round and temperature changes little.

4. Layer – Ocean Circulation, Sea Surface Currents and Temperature – *Go to the ocean for answers. Notice the red warm ocean currents move toward the poles in each hemisphere. The blue cold ocean currents move away from the poles toward the equator. Also seen in the animated dataset are surface currents that move in different directions east and west, driven by the wind.*

- Instructions: You may need to close the textbox to view the sphere to answer the following prompts that take you a little deeper into understanding the movement of the ocean.

- Rotate around to the Pacific Ocean. Notice the North Pacific Gyre. By following the major ocean currents there, which direction do you think the gyre rotates? (counterclockwise or clockwise)

- Notice the South Pacific Gyre. By following the major ocean currents there, which direction do you think the gyre rotates? (counterclockwise or clockwise)

- Is this the same in other oceans on either side of the equator? Yes

- Which coast (E or W) of all of the continents has the warmest water? East

5. Pushpins, Hurricane Sandy – *This is satellite imagery taken during Hurricane Sandy. Watch where it forms, how it moves and where if finally dissipates. Discuss what you see.*

- Explain what you see. For example, where does it form and where does it end?
  It forms near the Caribbean Sea and moves over Jamaica, Cuba, Haiti, Dominican Republic, Puerto Rico, Bahamas before moving up the East Coast to make landfall in the Mid-Atlantic States, most dramatically New York City and New Jersey coasts.

- Click on at least one of the icons and look at the image or watch the video. Summarize what you learned.

6. Hurricane Tracks: Cumulative – 1950 - 2005 – *Finally, when we see the patterns of hurricane tracks over decades, we can se how tropical storms move. Take a moment to summarize what you've learned about the causes of wind, weather, and currents. Then consider: Why don't hurricanes ever cross the equator?*

- Research the answer if you don't know why hurricanes never cross the equator.
  The Coriolis Force (due to the rotation of the Earth) is 0 near the equator; therefore, you don't get the turning needed to spin air into a tight center. Also, the Coriolis Force pulls storms in the northern hemisphere, near the equator, to the NW, which is opposite the direction they would need to move.