

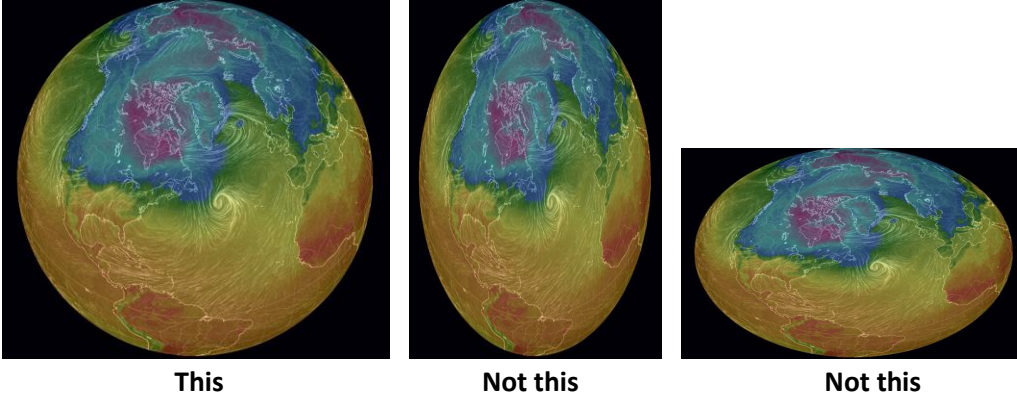
# Global Weather Patterns



This is a project that asks you to use some internet tools to investigate some large-scale weather & circulation features of the earth. Use PowerPoint or a similar program to put together slides that showcase these features. You will capture some images from various sources, put them in as slides, and annotate them with text, arrows, etc. For PC users you will find the “snipping tool” very useful for this. For Mac users, command+shift+4 does roughly the same thing. We are using PowerPoint like an electronic notebook, not a preparation for a speech.

## Some guidelines:

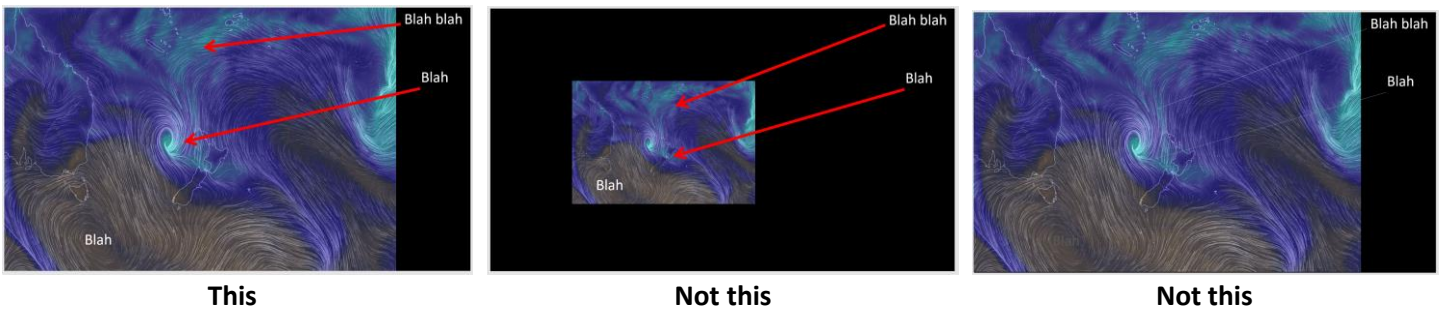
When you import an image and resize it, make sure that the proportions are correct.



When you capture an image of a feature, figure out an appropriate zoom level so that the viewer has the right context to understand what you are showing. For example, if I were to ask you to find and label a cluster of cumulonimbus in Africa:



When placing an image into a slide, resize it so that it fills the entire slide as much as you can without distorting its shape. Increase the thickness of arrows so they show up. Choose arrow and text colors that are easy to see:



**Slide 1:** Your name.

**Slide 2: Midlatitude Cyclone as seen from space.** Navigate to <https://worldview.earthdata.nasa.gov/>



**\*\*Change the date from today to Dec 17<sup>th</sup> 2014\*\***

There is a big midlatitude cyclone out in the Pacific Ocean. You should be able to find it pretty easily. Capture an image that shows the entire thing and place it into Slide #2. Then, add labels to annotate the following. You can put the label directly on the object if you can. Sometimes you might need to add an arrow to make it clearer.

On your slide annotate the following parts of the midlatitude cyclone:

- Cirrus clouds
- Stratoform clouds
- Cumulonimbus clouds
- Use a series of short blue arrows (at least 10) to show the movement of cold dry air into the cyclone. Use a series of short red arrows (at least 10) to show the movement of warm humid air into the cyclone. Remember that midlatitude cyclones are the result of mixing up two different airmasses. The arrows are to show the viewer the paths of these two airmasses as they are mixed together. Hint: make one arrow that you like and then copy & paste it instead of having to make new arrows over and over.
- Place a large “L” over the center of low pressure. Remember the L is going to be at the center of the counterclockwise rotation.

**Slide 3: Mixing of air masses.**

Now we are going to look at the same midlatitude cyclone using earth.nullschool.net. Either use the link below or type it in to get to the correct day:

<https://earth.nullschool.net/#2014/12/18/0600Z/wind/surface/level/>

Navigate around until you can find the same midlatitude cyclone that you found in Slide #2. Change the settings so that you are looking at TPW (moisture in the atmosphere) Earth → Overlay → TPW. Brown colors are dry air (low dew point), blue colors are humid air (high dew point).

Large midlatitude cyclones are the result of mixing of two very different types of air (air masses). Capture an image of this happening with this midlatitude cyclone. Zoom in such that the midlatitude cyclone takes up most of the screen. Label the moist air and dry air. Place a “L” over the center of low pressure.

**Slide 4: The easterlies and the ITCZ.** Leave the settings for earth.nullschool.net the same as you had for slide 3. Find a place on Earth that is showing the easterlies and the ITCZ. Remember – easterly winds are FROM the east. You can see where the convergence zone because the winds will be colliding together. And – this region will typically have the highest amount of TPW (the air will have the most water vapor).

- Label the convergence zone
- Label the easterlies both north and south of the ITCZ

**Slide 5+6: Subtropical Highs.** Using earth.nullschool.net, find a subtropical high in the northern hemisphere. Capture it and place it in slide 5. Then find a subtropical high in the southern hemisphere and place it in slide 6.

- Which way will the winds be rotating in each instance?
- Where is the center of high pressure going to be? Place a “H” on each at the appropriate spot.
- Would you expect the subtropical highs to be mostly humid or dry air? Why? Does the atmospheric moisture on earth.nullschool.net show this?

**Slide 7: The Westerlies.** On earth.nullschool.net switch “height” to 500 mbar. Change overlay to “wind.” The colors now represent wind speed at the 500mb level. Find a good example of the westerlies anywhere in the northern hemisphere. Capture it, place it in Slide 7. Label where the westerlies are. Remember: westerlies are winds that come FROM the west.