**Activity 4 Natural History in Space and Time**

Directions:

1. After you turn on the computer and login, find the google Earth icon on the desktop and double click with the mouse to open Google Earth.
2. You will be looking at North America and the United States
3. Now, hold down the left mouse button to grab on to the image and move the mouse to spin the Earth. If you release the mouse button the Earth will keep spinning for a moment.
4. Keep spinning until you make it all the way around to where you started.
5. Using your mouse pointer, go up to the two circles on the upper right of the screen, the outer circle has an “N” on it.
6. Use the left mouse button to grab the “N” and spin the circle so that the N is on the bottom.
7. What just happened to the Earth?
8. You just turned the world upside down! This is the controller for North orientation.
9. Maps almost always have the “N” facing upwards but not always. Look for this next time you see a road map.

**Where are you on Earth?**

1. Use the mouse to move the hand pointer over the United States. Using the scroll wheel on the mouse, spin the wheel away from your body to start zooming in.
2. Now you will see the state names appear. In the state of Arizona you will see a push pin icon. Place the hand pointer on top of the push pin and keep zooming in. You will zoom in all the way to the Bryant Bannister Tree-Ring Building. This is where you are today!
3. Now move the hand pointer back to the upper left circle with the “N”. This time move the pointer to the middle of the circle. An eye icon with four direction arrows will appear. Click on the top arrow and hold down the button until you can see the mountains in the distance. This is the tilt controller.
4. Now use the bottom arrow on the tilt controller to tilt back on top of the Bryant Bannister tree-ring building.
5. In the lower left corner you will see the date 1992 with a clock and arrow. Click on this icon.
6. Now in the upper left corner of the screen a slider bar will appear. Use the mouse to grab the slider and move it from 1992 to 2014. See how it changes the photographs?
7. What building is missing from the image if you move the slider to 2011? Is the push pin still on top of this building? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

What happened? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What year was this building built? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Use the time scroll bar to scroll back to 2014.
2. For your last step, now look at the lower left panel again and notice the scale bar with numbers on it. These numbers indicate the distance from one place to another. If you zoom in what happens?
3. What happens when you zoom out?
4. Using the scale bar as your reference, how wide is the bottom of the Bryant Bannister tree ring building? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Now zoom out to the state of Arizona. Using the scale bar, what is the distance from Nevada to New Mexico if you travel across Northern Arizona?

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**Part 2 using Google Earth to explore a forest fire.**

1. Move the pointer to the top left of the screen to the menu bar and click on **View.** A drop down menu will appear. Click on the second choice **Sidebar**.

A check mark will appear and on the left side of the word Sidebar and a new screen menu with boxes will appear. Click on the box next to the push pin labeled “**Miller Peak**”. Uncheck the box next to the push pin labeled “**Bryant Bannister Tree-Ring Building**”.

1. Now zoom out to the state of Arizona. You will see a new **Miller Peak** push pin. Zoom in on **Miller Peak**.
2. Use tilt and zoom to take a tour of the Huachuca Mountains. Look at where the trees are dense or thin and the different colors of the vegetation.
3. Now go back to the side bar and click on the box next to “Miller Peak Fire”.

Lots of bright colors will appear on your map. Under the **Data Layers** menu, uncheck all the boxes except **fire perimeter**.

1. Zoom out from Miller Peak to see the full size of the fire.
2. Using the scale bar for reference how big was the fire from West to East (left to right)? \_\_\_\_\_\_\_\_\_\_\_\_\_

How big was the fire from North to South (top to bottom)? \_\_\_\_\_\_\_\_\_\_\_\_

**Now let’s learn more about this fire**

1. Zoom back in on Miller Peak. This time look closely at the trees along the ridge to the southeast and down in the canyon to the south. Are these big trees or little trees?
2. In the Sidebar click on the box next to “Fire Severity”.

Now zoom out to look at the Fire. In the upper left corner there is a list of colors and fire severity ratings.

What color is the canyon to the southeast of Miller Peak? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the fire severity rating for this color? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In low or moderate fire severity, trees usually survive, but often they have a scar or change in growth that is a signal of fire. In high fire severity, almost all the trees die so there are no fire scars are growth changes, only stumps and standing dead trees.

Now that we know this area burned hot and killed most of the trees. Let’s use the time scroll bar in the upper left corner to figure out when this fire happened.

1. Zoom back in on an area that is bright red that burned hot in the fire. Now uncheck the box next to “Fire Severity”. Also uncheck the box next to “Legend” to turn off the color key for fire severity.
2. Using the time scroll bar in the upper left, drag the scroll bar arrow back in time until you see big dense trees growing on the mountain.

What is the last date you can find that has dense trees? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

So the fire happened sometime after this date.

1. Scroll forward in time just a little bit. Do you see a white haze in the photo? That is smoke from the fire. This is a picture of the Miller Peak Fire still burning.

What is the date of this image? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

We can use Google Earth to look back in time to see when a fire happened, but only as far back as there are good photos. In most cases, only into the 1990s.

What if we want to know about the size and severity of a forest fire more than 30 years ago? Our last exercise for today will answer this question