Name _____ Period _____

Regents Earth Science

Letchworth State Park Field Trip

Lower Falls and Lee's Landing

Schedule for the day:

8:45 Depart York Central for Castile entrance to Letchworth State Park

9:15 Arrive at the park, Lower Falls/Table Rock

9:15-10:45 Hike the down to the Lower Falls and Table rock, over footbridge to Cathedral Rock. When done in this area we will hike down to the Lee's Landing area for lunch. We have a covered pavilion reserved if needed for shade.

10:45-11:30 Lunch!

11:30-12:45 Hike down to river at Lee's Landing, observe rocks, etc. in the riverbed.

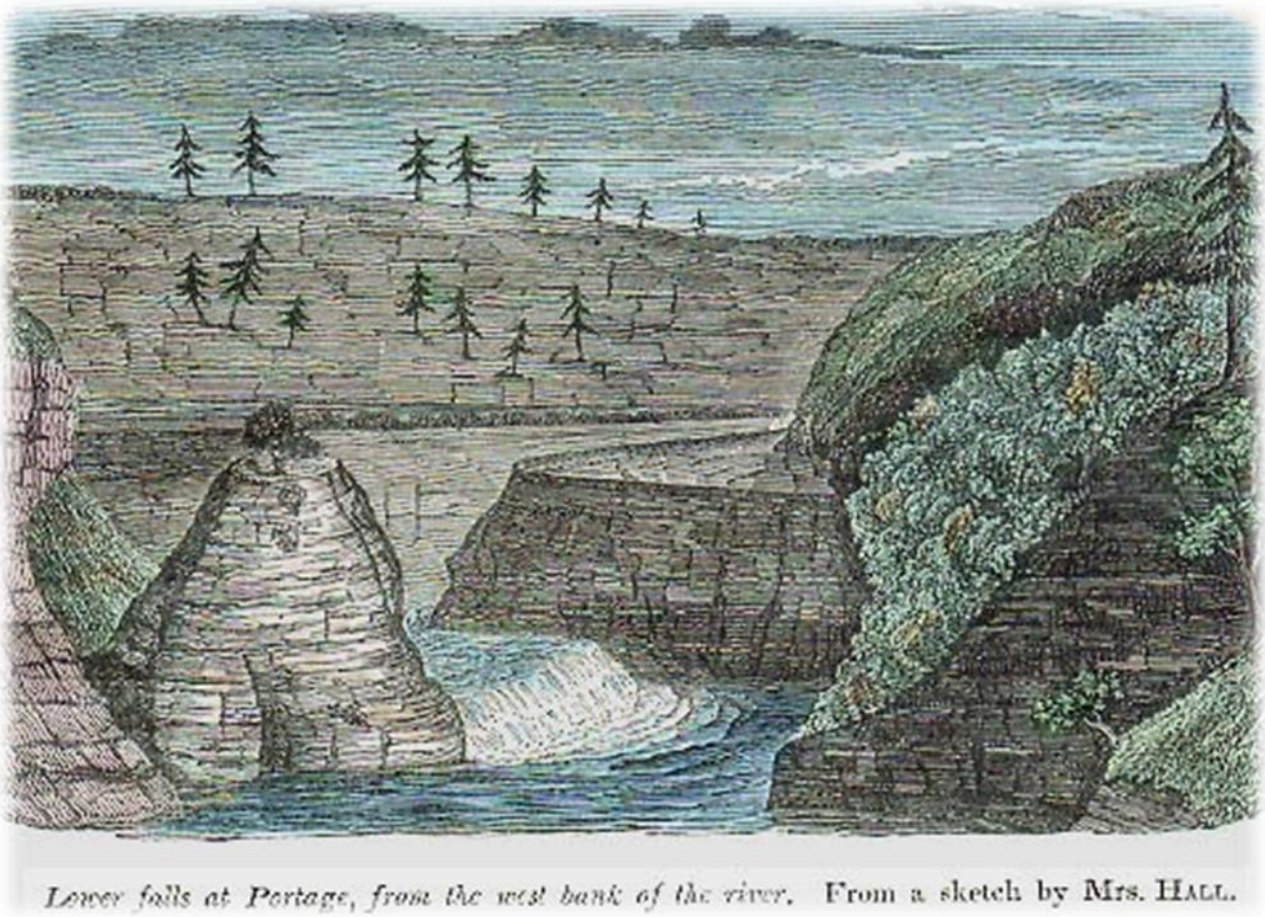
12:45-1:00 Pack up and board bus.

1:10 Stop at Archery Field overlook and observe where we just were from above as well as the current and past Genesee River valleys.

1:30-2:00 Leave Letchworth and return to York

Gorge Edge view to Cathedral Rock, Footbridge and Table Rock

Compare the picture below to what you can observe of the features in the gorge from this lookout point. The picture below is a sketch by the wife of James Hall, a geologist who wrote a report in 1843 on the geology of New York. The sketch shows Table Rock (middle right) and Sugar Loaf/Cathedral Rock (middle left) with the river flowing between them, forming what they observed to be the lower falls.



Lower falls at Portage, from the west bank of the river. From a sketch by Mrs. HALL.

1. a) How is the picture similar to what you see today?

   b) How is the picture different from what you see today?

2. a) Observe the features of the rock in the opposite all of the gorge. What is one distinguishing feature that they have?

   b) Based on this observation, what type of rocks most likely make up the gorge walls (igneous, sedimentary or metamorphic)?

Table Rock

3. a) What are the straight cracks in the rock called?

   b) How many sets of cracks can you identify?

   c) What may have formed these cracks?

4. a) What other feature do you notice on table rock?

   b) What may have created this feature?

Footbridge

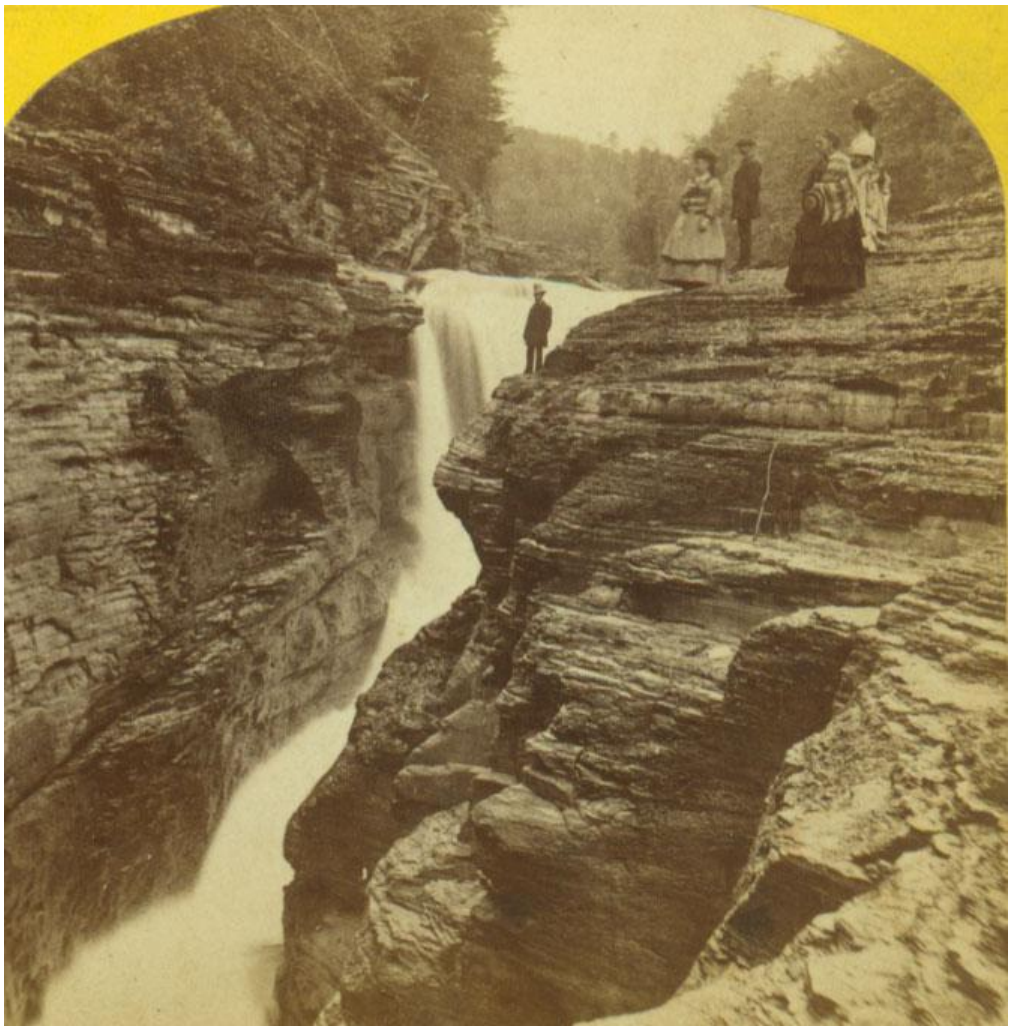
5. The picture below was taken after the rain from Hurricane Agnes on June 23, 1972. We will look at more pictures of the park during this time in class. The bridge survived the flood, a testament to the workmanship of Ray Wolcott and the CCC men who built it. The trail on either side was damaged however.

6. a) The plant that Mrs. Kent points out to you on the east/south side of the gorge is known as yellow mountain saxifrage, a tundra or alpine plant. The plant started growing here at the end of the last glacial period and now survives in only a few small micro-habitats like this (this is the furthest south it grows!). Why is this face of the gorge so cold?

   b) If what you answered above is true, what does that mean about the even the highest angles of the sun in this part of New York State? So what portion of the sky is the sun always in (N, E, S, W)?

   c) If you could pick one day of the year to find out if this part of the gorge received any sunlight, what day would it be and WHY?

7. Observe and compare the picture below and the current location of the lower falls. This picture is a view of the lower falls from approximately where the footbridge would be. The picture was taken in the 1870's, the footbridge was not built until the 1930's. The people in the picture are standing where the path to the footbridge currently is. What process has caused the changes you observe?



Lower Falls Edge

8. a) After observing the geology of Table and Cathedral Rocks, what type of sedimentary rock most likely makes up the top of the lower falls?

   b) Why is this rock forming an edge/drop off (instead of a gentle slope) for the water to flow over?

   c) What would happen to the shape of the lower falls if this layer didn't continue all the way upstream?

Things to ponder during lunch (or after our trip):

9. a) According to ESRT page 3, what is the age of the rocks found in this area?

   b) According to ESRT pages 8 and 9, what fossils might we find in rocks from this time period? (we will be looking for some on our afternoon hike)

   c) According to ESRT pages 8 and 9, what important geologic events were occurred in New York AFTER this time period that may have contributed to the formation of the straight cracks we observed in Table Rock?

   d) Most of the rocks in this part of the gorge are shale with some sandstone and siltstone layers. Would we be likely to find fossils in the shale layers? Why or why not? (Hint: Think about what type of environment shale forms in and what type of environment fossils form in.)

Lee's Landing

Fun activities to do with a partner before we start:
-Have one person find a pile of deer poop and stand next to it (preferably not *on* it). Have the second person find another pile of deer poop and stand next to it. About how far apart are you? Now ponder: What do you think that says about the deer population in the park?

-Observe the small trees planted near the Civilian Conservation Core Statue. Which way are they leaning? Why do you think that is?

On trail down to riverbed

10. Name one new plant you learned about on the way down to the river.

In riverbed

11. a) What type of rock are the majority of the rocks in the riverbed?

    b) Where did all the sediments for these rocks come from?

    c) Where did the metamorphic and igneous rocks in the riverbed most likely come from?

    d) What is the name for a large boulder transported by a glacier that doesn't match the local bedrock?

12. a) What side of the river has the steepest bank around the curve, the inside or the outside? WHY?

    b) What type/size of sediments do you notice on the inside of the curve?

13. a) Looking at the far side of the river we can see at least 4 different events that gives us a window into what the geologic history of this area might be. What is the name of the rule/law that says things that happened in the past occur the same way today (e.g. erosion occurred in the past and we observe it happening today)?

    b) When looking at the wall above the far side of the river, how do we know what event is the oldest? What is the name for this law/rule?

BONUS:
A youthful stream/river is considered one that is in a deep v-shaped gorge and has rapids and or waterfalls. A mature stream is one that is meandering in broad, flat valleys, with a gentle slope and relatively calmly flowing waters. The Genesee River shows characteristics of both of these (think Letchworth vs. the valley around Geneseo), but it can't be youthful and mature at the same time. Explain why the Genesee River shows characteristics of both, state which one it *really* is and why you think that.