

## **Earth Science Google Maps exploration**

Freshman Earth science

**Overview:** this is a beginning of the year activity to replace the normal measure your desk, your shoe, etc activity. We will be using and discussing the river sites as the year progresses, so it seems like a good idea to get an idea from the “crows view” of what we are talking about before we get into the actual data gathering process. It is also a great way to introduce local sites that the kids may or may not be familiar with as well as map reading before hunting season arrives. Does anyone use maps anymore? I love them, and maybe that is the surveyor training in my early career, but i find them fascinating and hope that getting more familiar with them will be equally exciting and interesting for students rather than - measure your desk, the door, etc to talk about metrics and conversion math.

**Goals:** to give students a chance to work with maps, both digital and hardcopy topo maps in the classroom. Additionally to give them some real world math and conversion experience that may be more useful and meaningful than standard charts.

**materials:** Missoula Quad hard copy topo maps for an introduction to reading Topo maps; then computer lab time to do this google doc assignment using google maps.

[https://mapsengine.google.com/map/edit?mid=zcqDnHnQ8UyY.kvA\\_k6gMLhw0](https://mapsengine.google.com/map/edit?mid=zcqDnHnQ8UyY.kvA_k6gMLhw0)

Students will have access to this document both in hardcopy form and as a google doc.

**Student Directions:** using the Google map I have shared with you please complete the following questions. Please be sure to fill out your hard copy form to be handed in at the completion of our time in the computer lab. Be sure to read the questions carefully so you know what they are asking. If you have any questions about how to use the map please ask as we go.

### **Using the Clark Fork River locations Layer:**

1. Find these specific locations around Missoula - University of Montana; Hellgate High School; one of your choice.

Use the Base map menu to find these in both street map and satellite view. List coordinates for each here:

2. Describe in a 4 word statement how to find each of these easily. You can use one of the pins as a reference point.

3 Use the measuring tool to trace your path from home to school. Report this distance in miles and KM. Be sure to write down your address/ street here so i can check your math.

4 Find Milltown Dam State Park - then follow the map to where it meets the Bitterroot river. the Bitterroot river flows into the Clark’s fork river - which point on the Bitterroot/ clark fork joining

points labeled is the true confluence of the Bitterroot with the Clark fork? Defend your answer with at least 2 sentences.

5. Now find the Hellgate track and playing field. How far is it down river from Milltown Dam State park? Record your distance in Mi and KM

6. Find 3 other tributaries that flow into the Clark fork in the Missoula area- and Name and rank them in size relative to the Clark Fork river which we will call # 1.

7. Measure the distance as the crow flies from Milltown Dam to where the Bitterroot river drops in - distance in Mi, KM and now convert that to cm.

8. Measure the distance between - Milltown dam State Park pin and the Madison Street Bridge Pin along the river and as the crow flies.

- calculate the sinuosity value = river distance / as the crow flies distance

**Bonus:** find the slough on the map that we measured it's bottom profile and water volume. give its origin point and ending point.

**Using The Hellgate High School Layer** - find the following using the Topographic map image.

1. what is the distance from Hellgate high school to the M, using the switchback trail in actual foot distance.

2. what is the change in elevation from Hellgate HS to the M? show your work.

3. What is the elevation at the top of North Sentinel?

4. Calculate what the slope from the Bottom of the trail to the top of Mt Sentinel would be using the topo lines and the distance tool.
  
5. Use two sentences to explain how the elevation of Mt Jumbo and MT Sentinel are related.
  
6. Use a paragraph to describe the combination of features that make the Hellgate Canyon unique to someone who has never seen it before.

**Bonus:**

give someone walking directions and distance to get from Hellgate HS to Playfair Park on the South side of the park, where the covered pavilion is located.

**Grading:**

students will be graded on class time participation (being on task and working on the project); each question is worth 3 pts, except #6 paragraph - which is primarily an early writing assessment which will receive participation points, but be used for a portfolio keeper piece to compare to the mid and end of year writing sample.

**Montana Standards:**

**Content Standard 1**—Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate results and reasonable conclusions of scientific investigations.

**Content Standard 4**—Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

**Content Standard 6**—Students understand historical developments in science and technology.

**Next Generation National Science Standards:**

**HS-ESS2** Earth's Systems

## HS-ESS3 Earth and Human Activity



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