**Sand and Sediments Questions** , **Part 1** Names:

**Sample 1:** This is a sand from Ophir Beach in Oregon.

1. What type of tectonic setting is this? (Research this.)
2. Are the grains in this sand mineral grains, rock fragments, shell fragments or a mixture?
3. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
4. Shape:

Roundness:

Sorting:

**Sample 2:** This is a beach sand from Punta Uva, near Puerto Viejo, Limon, Costa Rica. The tectonic setting for this region is similar to the setting for Sample 1. (Research this.)

1. Are the grains in this sand mineral grains, rock fragments, shell fragments or a mixture?
2. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
3. How are Sample 1 and Sample 2 the same?
4. How are Sample 1 and Sample 2 different?
5. Shape:

Roundness:

Sorting:

Sample 3: This beach sand from near Marineland, Florida is composed of many coarse (1 - 2mm) grains.

1. What are these grains? (If these are shell fragments, note which mineral they are composed of.)
2. Use your mineral chart and mineral and rock sample boxes to suggest some other possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
3. Shape:

Roundness:

Sorting:

Sample 4: This is an oolitic sand from the Great Salt Lake, UT.

1. How do oolites originate? (Research this.)
2. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
3. Shape:

Roundness:

Sorting:

**Sample 5:** This sand is from the Cache la Poudre River on the east side of the Rocky Mountains in Colorado.

1. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
2. This sand has some flat, shiny grains that you find only a couple of these sands. What is It?
3. Suggest some reasons that might explain why you find it in this sand but it is absent in most of the other sands.
4. Shape:

Roundness:

Sorting:

**Sample 6**: This sand is from the Rio Grande Rift near Albuquerque, New Mexico.

1. What rock types would you expect to be present in a continental rift? (Research this.)
2. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
3. Shape:

Roundness:

Sorting:

**Sample 7**: This is a beach sand from Montserrat, British West Indies.

1. What rock types would you expect to be present in this geologic setting? (Research this.)
2. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
3. Shape:

Roundness:

Sorting:

Sample 8: This is a beach sand from the Big Island of Hawaii.

1. What are the black grains? (If these shell fragments, note which mineral they are composed of.)
2. What is the origin of the black grains?
3. Shape:

Roundness:

Sorting:

Sample 9: This is another beach sand from the Big Island of Hawaii.

1. What are the black grains? (If these are shell fragments, note which mineral they are composed of.)
2. Compare these grains to the ones in Sample 8. Explain the differences that you see.
3. Shape:

Roundness:

Sorting:

Sample 10: This is a beach sand from Hapuna Beach near Kona on the Big Island of Hawaii.

1. What is this sand composed of? (If you have shell fragments, note which mineral they are composed of.)
2. Compare this sand to the sands in Samples 8 and 9. Explain the differences that you see.
3. Shape:

Roundness:

Sorting:

**Sample 11:** This is a sand from a dry wash near Block Mountain, Montana. Identify as many of the different the mineral or rock grains that you can.

1. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
2. Shape:

Roundness:

Sorting:

Sample 12: This is a sand from the Sahara Desert.

1. What is the composition of these sand grains? (If you have shell fragments, note which mineral they are composed of.)
2. This sand has a reddish appearance. Are the sand grains red throughout or is the red a coating?
3. Use your mineral chart and box of mineral samples to come up with some suggestions as to why this sand is red.
4. Shape:

Roundness:

Sorting:

**Sample 13**: This is outwash sand from the base of St. Mary’s Glacier in Colorado.

1. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
2. Shape:

Roundness:

Sorting:

**Sample 14**: This beach sand is from Bell’s Beach near Victoria, Australia.

1. What are the light colored grains in this sand? (If you have shell fragments, note which mineral they are composed of.)
2. Notice how the dark grains clump together. Hold the magnet under the glass dish and move it around. What happens?
3. What are these dark grains? (If these are shell fragments, note which mineral they are composed of.)
4. Use what you have learned so far, your mineral chart, and mineral and rock sample boxes to suggest other possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
5. Shape:

Roundness:

Sorting:

**Sample 15**: This beach sand is from Lake Ontario in Canada. Noticed the pink and red grains.

1. Use your mineral chart and mineral and rock sample boxes to suggest some possible minerals/rocks making up this sand. (If you have shell fragments, note which mineral they are composed of.)
2. Based on the pink and red grains, do you think this sand results from the weathering and erosion of igneous, sedimentary, or metamorphic rocks.
3. Shape:

Roundness:

Sorting**:**

**Sand and Sediments Questions** , **Part 2** Names:

For this part of the Sands Project, you will be learning about one of these sands in greater depth. You will not, however, start out knowing which of the sands you are investigating.

**Sample 1:** Sand from Ophir Beach in Oregon.

**Sample 2:** Beach sand from Punta Uva, near Puerto Viejo, Limon, Costa Rica.

**Sample 5:** Sand from the Cache la Poudre River on the east side of the Rocky Mountains in Colorado.

**Sample 6**: Sand from the Rio Grande Rift near Albuquerque, New Mexico.

**Sample 7**: Beach sand from Montserrat, British West Indies.

**Sample 11:** Sand from a dry wash near Block Mountain, Montana

**Sample 13**: Sand from the base of St. Mary’s Glacier in Colorado.

**Sample 14**: Sand from Bell’s Beach near Victoria, Australia.

**Sample 15**: Sand from Lake Ontario in Canada.

Your job is to determine which of the above samples is the one you are investigating. To do this you will:

* Use the electron dispersion spectrometer (EDS) to determine the composition of your mineral grains.
* Use the scanning electron microscope (SEM) to look at quartz grain surface texture and determine the depositional environment of your sand.
* Once you have narrowed down the options for locations based on SEM depositional environment, you will need to research your candidate locations to which one best fits your EDS compositional data and your rock and mineral information from your reflective microscope work.

1. Using your EDS information (EDS report), summarize your results here:

2. Using your SEM information (Vos Quartz Sand Tally Sheet), summarize your results here:

3. Using your reflective microscope work (Sands Questions), summarize your results here:

4. Which sample do you believe you investigated? Please provide a summary of your supporting evidence here: