# Answer Key XRF Analysis

**Question 1**: You apply XRF analysis on three of the tools you found and produce the following results. Use the graph above to estimate where individuals at this site in the past acquired the obsidian they used to manufacture these tools.

**Answer:** Tool A was made from Teton Pass material, Tool B from Bear Gulch material, and Tool C from Obsidian Cliff material.

**Question 2:** Return to the map on the previous page. Use the map scale to estimate how many miles these people covered from their settlement to the obsidian sources (1 km = 0.62 miles). How would individuals have traveled to these areas from the Osprey Beach site?

Archeologists found that although tools are manufactured from a distant source that does not always mean that they were necessarily a result of trade. Instead, individuals made a conscious effort to travel to these sources themselves. Why might this be?

**Answer:** Following a straight line, Osprey Beach is approximately 100 kilometers (62 miles) from Teton Pass, 160 kilometers (99.2 miles) from Bear Gulch, and 90 kilometers (55.8 miles) from Obsidian Cliff.Individuals could travel by foot or boat to these sources. Individuals might have chosen obsidian sources that were further away because of better material quality or the obsidian source’s cultural or spiritual significance. Individuals might have been traveling through the area already while hunting. Some groups moved their settlements seasonally and therefore would have been closer to certain sources during specific times of the year.

**Question 3:** Archeologists found tools such as these in Hopewell Culture (c. 200 BCE-400 CE) burial sites in Ohio, over 1,000 miles away from Yellowstone National Park. What does this tell you about the significance of these obsidian tools to ancient cultures? Hypothesize how this trade occurred. Did the two cultures directly interact? What other information might an archeologist use to answer these questions?

**Answer**: The distance between Yellowstone and Hopewell sites shows that individuals were willing to put in a large amount of effort to obtain these obsidian tools. Obsidian was the highest-quality material for tool-making. It might also have had a symbolic meaning for its sharpness, color, or other qualities. However, the fact that the tools were found in burial sites suggests another type of symbolic importance as well. There, the tools may have illustrated the deceased individual’s hunting or tool-making skills, social status, or spiritual beliefs.

The two groups may have directly interacted through long-distance trade. The artifacts may also have been traded over short distances many times, perhaps through “middlemen” traders. Archeologists may look for other signs of cultural interaction, such as trade items and artistic styles that could have passed from one culture to another. They can also use historical documents, oral histories, and modern trade routes as comparative evidence.