Teacher Answer Key

Case Study

1. Khalid had to maintain a very precise and consistent downward slope over nearly two kilometers to ensure water would flow by gravity alone. Carving through sandstone required careful calculation because too steep a slope would cause erosion and channel damage, while too shallow a slope would leave water standing and stagnant. The terrain's natural irregularities meant constant adjustments during construction.

2. Khalid's project reflects the Nabataean philosophy of capturing and controlling every available drop of water through integrated engineering systems. Rather than relying on a single water source, the Nabataeans built redundant networks of dams, channels, cisterns, and pipes that worked together to support a large urban population in an environment that would otherwise be uninhabitable. This systematic approach to water management was the foundation of Petra's success as a major trading city.

Multiple Choice

1. D
2. C
3. B

Matching

1-C, 2-E, 3-D, 4-A, 5-B

Fill-in-the-Blank

1) dams and cisterns (or: dams, cisterns, and channels), 2) sandstone, 3) Siq

Short Answer (Sample Responses)

Q1: Petra receives less than 15 centimeters of rainfall per year, making it impossible to support a large population without engineered water systems. The Nabataeans built an extensive network of dams, cisterns, channels, and ceramic pipes that captured seasonal flash floods and distributed water throughout the city. This system was so effective it supported fountains, gardens, and tens of thousands of residents.

Q2: Modern excavations and satellite imagery have revealed structures far beyond the famous tombs and facades, including a massive platform discovered in 2016, evidence of marketplaces, residential neighborhoods, and industrial areas.

Archaeologists estimate that only about 15 percent of Petra has been excavated, meaning most of the city's buildings and infrastructure remain buried beneath sand and debris.

Q3: Petra sat at the intersection of major caravan trade routes connecting Arabia, Egypt, and the Mediterranean, making it a natural hub for the lucrative incense and spice trade. Its location within a narrow desert canyon with limited entry points made it extremely difficult for enemies to attack, providing natural fortification that complemented its commercial advantages.