Teacher Answer Key

Case Study

1. The reading says gunpowder was discovered around the 9th century CE by Taoist alchemists who were trying to create an elixir of immortality. Master Xu is an alchemist in the same situation, because his mixture exploded instead of doing what the formula described. The reading adds that alchemical texts began warning against mixing saltpeter with charcoal and sulfur after several laboratory fires and explosions, which is the kind of record Master Xu tells his apprentice to write down.

2. The discovery of gunpowder shows that some of history's most consequential inventions were unintended byproducts of pursuing different goals entirely. Accident, combined with curiosity and record-keeping, drove major technological breakthroughs — suggesting that innovation often requires freedom to fail and the discipline to document failures as carefully as successes.

Multiple Choice

1. A
2. C
3. D

Matching

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

Fill-in-the-Blank

1) Taoist, 2) 179–141, 3) diffusion

Short Answer (Sample Responses)

Q1: Technologies rarely spread in a simple straight line from inventor to receiver. They are often independently developed in multiple places, improved beyond recognition in the cultures that receive them, or transmitted through complex intermediary networks. The accurate picture involves invention, transmission, adaptation, and improvement across multiple cultures simultaneously.

Q2: Cheap, reliable paper made it possible to produce and distribute written knowledge on a scale that bamboo, silk, or papyrus could not match. When paper technology reached the Arab world and then Europe, it enabled the growth of bureaucracy, scholarship, religion, and eventually mass literacy — making the modern information-based world possible.

Q3: The story suggests that technological monopolies — even one maintained by death penalties for 2,000+ years — are ultimately unstable because the economic incentive to break them is so great. A technology worth having is worth the risk to obtain illegally, and determined actors will eventually find a way around even the most extreme protective measures.