

Name: _____ Date: _____

Reactive Reasoning: The 8th Grade Lab Logic Challenge

Synthesize safety protocols and analyze chemical compatibility in this high-level assessment of laboratory risk management.

1. While distilling an unknown solution, you notice a small crack forming in the distillation flask. According to standard safety synthesis, what is the immediate risk and correct course of action?

- A. The crack will likely self-seal under vacuum; continue at a lower temperature.
- B. Thermal stress can lead to implosion; immediately cease heating and alert the instructor.
- C. Apply high-temperature tape to the exterior and finish the collection.
- D. Increase the flow of cooling water to the condenser to offset the pressure.

2. When preparing an aqueous solution of a strong acid, you must always add _____ to _____ to prevent the concentrated liquid from Boiling and splashing due to the exothermic reaction.

- A. Base to Acid
- B. Water to Acid
- C. Acid to Water
- D. Solvent to Solute

3. In a lab setting involving volatile organic compounds (VOCs), a standard dust mask provides sufficient respiratory protection against chemical vapors.

- A. True
- B. False

4. You are tasked with cleaning up a spill of 1M Hydrochloric Acid. Which substance would be the most chemically appropriate for neutralizing the spill before disposal?

- A. Sodium Bicarbonate (Baking Soda)
- B. Concentrated Sodium Hydroxide
- C. Distilled Water
- D. Vinegar

5. The safety device used specifically for the 'Pass, Aim, Squeeze, Sweep' (P.A.S.S.) technique is the _____.

- A. Safety Shower
- B. Fire Extinguisher
- C. Fire Blanket
- D. Filing Cabinet

6. If a classmate's clothing catches fire, the most effective tool to smother the flames quickly is the emergency eyewash station.

- A. True

Name: _____ Date: _____

B. False

7. Examine the scenario: A student is heating a test tube over a Bunsen burner. Which element of their technique represents a 'synthesis level' understanding of safety?

- A. Pointing the mouth of the tube toward the nearest wall or empty space.
- B. Sealing the test tube with a rubber stopper to prevent evaporation.
- C. Holding the tube stationary in the hottest part of the flame.
- D. Wearing safety goggles over prescription eyeglasses.

8. According to the Globally Harmonized System (GHS), a pictograph showing a skull and crossbones indicates that a chemical has _____ toxicity.

- A. Chronic
- B. Acute
- C. Low
- D. Flammable

9. Advanced labs often use 'Secondary Containment' for chemical storage. What is the primary purpose of this practice?

- A. To organize chemicals by their alphabetical name.
- B. To prevent accidental mixing of incompatible chemicals in the event of a primary container leak.
- C. To keep chemicals away from sunlight and UV degradation.
- D. To increase the shelf life of reactive metal catalysts.

10. If a non-corrosive chemical makes contact with your skin, you should flush the area with water for a minimum of 15 to 20 minutes.

- A. True
- B. False