Name: _____ **Date:** _____

Searing Solutions and Reactive Risks: A 9th Grade Lab Safety Case

Risk assessment, chemical compatibility, and protocol synthesis; develop the high-level intuition required for complex secondary science investigations.

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1. While refluxing a flammable solvent, a student notices a small crack forming in the round-bottom flask. What is the most rigorous sequence of actions to mitigate a catastrophic failure?

A. Immediately douse the flask with a fire blanket to prevent oxygen contact.
B. Remove the heat source, alert the instructor, and evacuate the immediate splash zone.
C. Quickly transfer the boiling liquid to a secondary beaker to save the yield.
D. Increase the stirring speed to redistribute the thermal stress on the glass.

2. The GHS (Globally Harmonized System) pictogram featuring a burning circle, known as the _____, indicates that a substance can provide oxygen to a fire.

A. Flammable symbol
B. Corrosive agent
C. Oxidizer
D. Carcinogen

3. When diluting a concentrated acid, it is scientifically safer to pour the acid into the water rather than water into the acid to utilize the heat capacity of the water.

A. True
B. False

4. A student is analyzing a Safety Data Sheet (SDS) for an unknown reagent. Section 10 indicates 'Incompatible with Organic Solvents.' What does this imply for experimental design?

A. The reagent should be stored in a wooden cabinet.
B. The reagent must be discarded in the sink with plenty of water.
C. Mixing this reagent with ethanol or acetone could cause a dangerous reaction.
D. The reagent can only be used when wearing a double layer of nitrile gloves.

5. To ensure maximum effectiveness during a minor chemical splash in the eyes, the eyewash station must be used for a minimum of _____ minutes while holding eyelids open.

A. 5
B. 10
C. 15
D. 30

6. In a scenario where a secondary container of clear liquid is found unlabeled, which action demonstrates the highest level of safety leadership?

A. Carefully waft the vapor to identify the substance by scent.

B. Assume it is water and use it to clean the lab bench.
C. Isolate the container and immediately notify the instructor for hazardous waste disposal.
D. Perform a pH test with litmus paper to categorize the risk level.

7. If a student's clothing catches fire, the primary recommendation is to run to the emergency shower if it is more than 10 feet away.

A. True
B. False

8. When working with a centrifuge, the most critical step to prevent mechanical failure and potential injury is to ensure the load is _____.

A. Capped tightly
B. Balanced
C. Chilled
D. Sterilized

9. You are heating a test tube over a Bunsen burner. Which technique demonstrates proper analytical safety?

A. Pointing the mouth of the tube toward the back of the fume hood or a wall.
B. Sealing the tube with a rubber stopper to prevent vapor loss.
C. Holding the tube stationary in the hottest part of the flame.
D. Looking directly down into the tube to observe the transition state.

10. Contact lenses are generally discouraged in the lab because they can trap chemical vapors against the cornea, even when wearing impact-resistant goggles.

A. True
B. False