**Introduction to Hazardous Materials**

**Short Answers and Scenarios Activity Sample Answers**

**Part 1: Short Answers**

1. *Personal protective equipment (PPE) can range from latex gloves to a full “Level A” hazardous materials suit. Firefighting turnout gear and a self-contained breathing apparatus (SCBA) protect against toxic gases. Face masks, protective gowns, and safety glasses are also PPE commonly used by firefighters. Firefighters must analyze the incident to identify the risks and then choose the level of PPE that provides MORE security than they need. It is better to have too much protection than not enough.*

*Every article of protective equipment has limits: fire-rated gear allows firefighters to be in high-temperature environments for only a few minutes before it loses effectiveness; latex gloves and body suits cannot withstand high temperatures; acids eat through almost all types of materials if given enough time. Every type of PPE has its limitations and those wearing it must be cautious to avoid exposing themselves to environments for which their gear is not rated.*

1. *Every article of protective equipment has its limits. Fire-rated gear only allows firefighters to be in high-temperature environments for a few minutes before it lose effectiveness. It is also bulky and difficult to move around in. It causes the wearer to get very hot and can only be worn for short periods of time.*

*Latex gloves and body suits cannot withstand high temperatures and cause the wearer to sweat due to their inability to let moisture in or out. Acids eat through almost all types of materials if given enough time, and every car contains acid within its battery. Every type of PPE has its limitations and those wearing it must be cautious to avoid exposing themselves to environments for which their gear is not rated.*

1. *First, effectively size up the scene. What is involved? Can you see injured people? How many? What are the injuries? If fire is involved, how bad is the fire and are an appropriate number of firefighters currently responding to the incident? Can you tell what materials are involved by placards or Department of Transportation (DOT) numbers? If so, do you have access to the necessary material safety data sheets (MSDS)? If it is a gas, what way is the wind blowing? If it is a liquid, what direction is the leak flowing? How many people are downwind/downhill from the incident?*

*Once you ask yourself these questions you can get the proper resources ordered to handle the event. Keep in mind that hazmat incidents are always changing, and it is important to constantly change your size-up as it progresses. What may have started as one type of incident can easily change to another.*

1. *a) Control – having an effective plan in place to deal with a hazmat incident while protecting citizens from injury and reducing damage to property*
   1. *Containment – keeping a material within its container or vessel*
   2. *Confinement – stopping a material from further leaking out of its container*
2. *Washing hands with soap and water; removing contaminated clothing when moving from the warm zone to the cold zone; Using 5-step hazmat decontamination pools/showers:*
3. *Step 1: remove personal belongings from the contaminated individuals* o *Step 2: remove clothing*

o *Step 3: wash with soap for 1 to 3 minutes*

o *Step 4: rinse*

o *Step 5: don clean clothing*

**Part 2: Scenarios**

Scenario 1:

*As a firefighter, I would wear full PPE (turnout gear with SCBA), stay upwind from the incident, and determine the contents of the truck before moving closer. A perimeter should be set to keep the general public away, and additional resources should be ordered if needed. Gas monitors should be used to test for air quality.*

Scenario 2:

*At any medical emergency I would wear general PPE precautions, including latex gloves. In the event a person appears to have a communicable disease, I would wear a face mask (N95 is best). Then I would place a mask on the individual who is sick to stop particulates from becoming airborne. If there is the risk that I might come into contact with blood or other bodily fluids, then I would wear a disposable gown.*

Scenario 3:

*If I need to enter a toxic atmosphere that contains fire, I would don both the standard fire turnout gear and an SBCA. This includes approved gloves, hood, helmet, and boots. I would also follow the mandatory two-in, two-out procedures.*