



# IED and Explosive Effects Fundamentals

DHS-MITG-253

*Version 4*



Office for Bombing Prevention

## Objectives

At the end of this module, participants will be able to:

- 1) *Define the term “Improvised Explosive Device” (IED)*
- 2) *Identify the components of an IED*
- 3) *Describe blast, thermal, and fragmentation effects*
- 4) *Explain factors to take into consideration when responding to a potential IED*



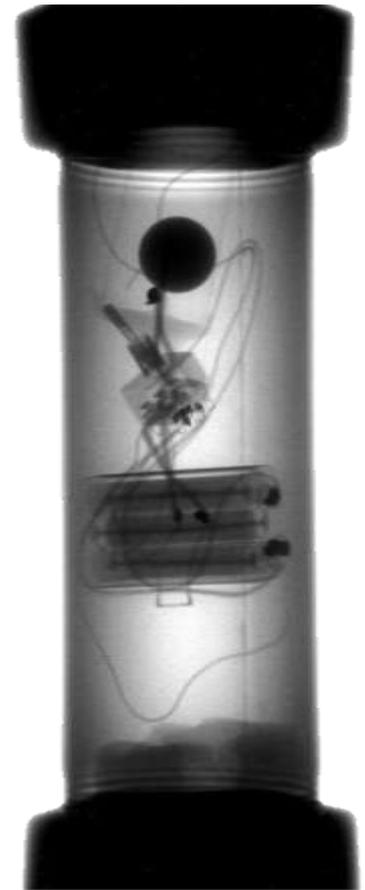


**Exercise Your Brain**

## IED Definition

A device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract. It may incorporate military stores, but is normally devised from nonmilitary components.

*Department of Defense Joint Publication 1-02  
Dictionary of Military and Associated Terms*



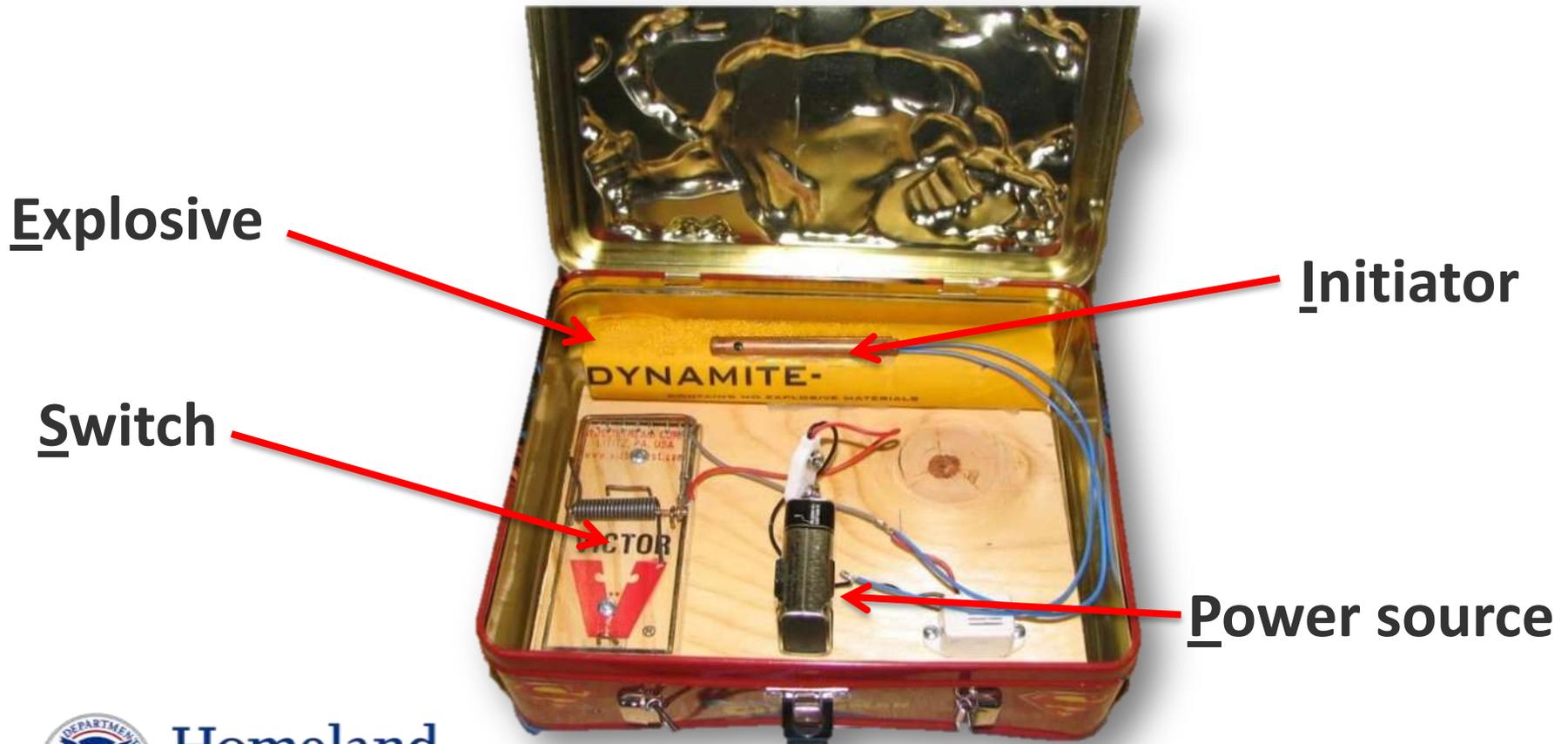
## Why Use IEDs?

- Proven effective
- Instructions and materials readily available
- Inexpensive
- Psychological effect



# IED and Explosive Effects Fundamentals

## IED Components: “PIES”

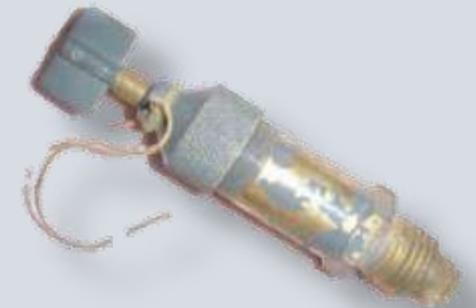
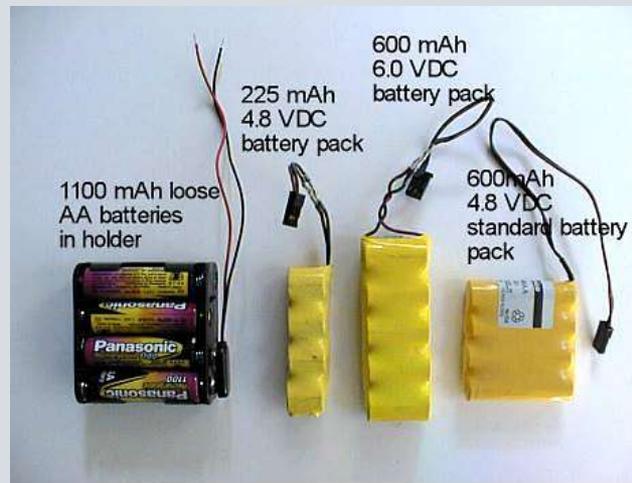
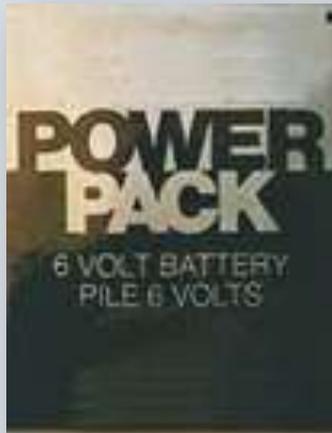


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# IED and Explosive Effects Fundamentals

## Power Source



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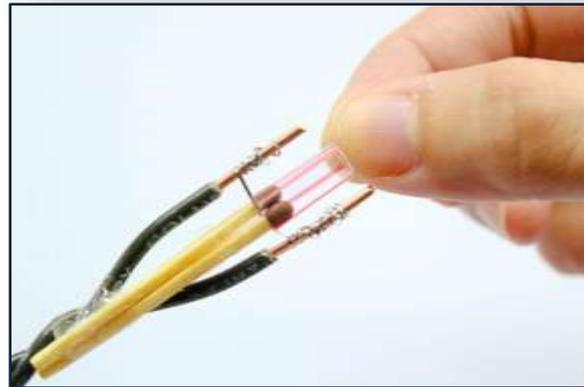
# IED and Explosive Effects Fundamentals

## Initiator

**Commercial  
or Military:**



**Improvised:**



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## Explosives

### Low explosive:

- Chemical compound or mixture designed to deflagrate (burn rapidly)
- Generally requires confinement to explode

### High explosive:

- Chemical compound or mixture capable of supporting or sustaining a detonation wave



# IED and Explosive Effects Fundamentals

## Explosives

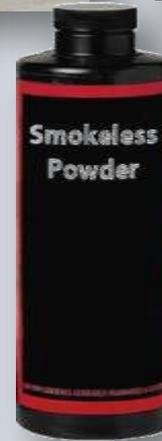
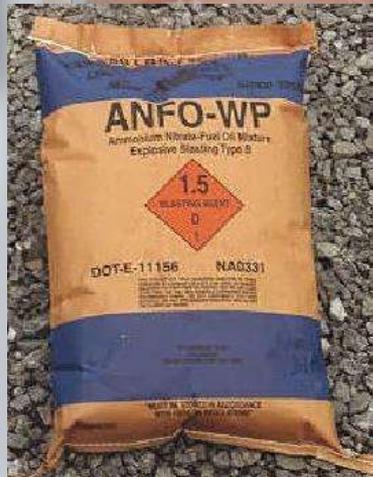
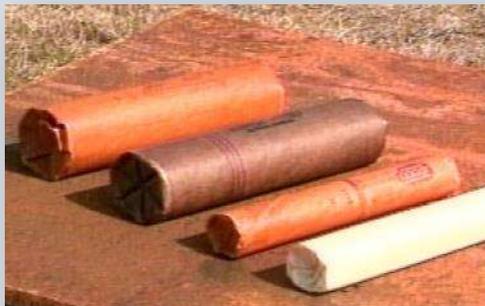
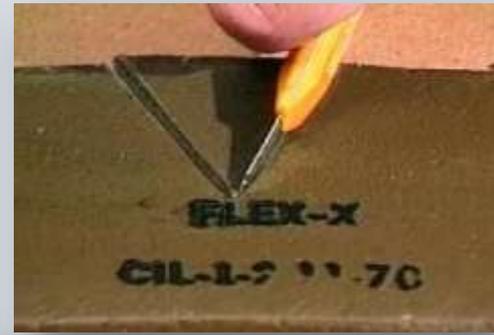


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# IED and Explosive Effects Fundamentals

## Commercial/Military Explosives

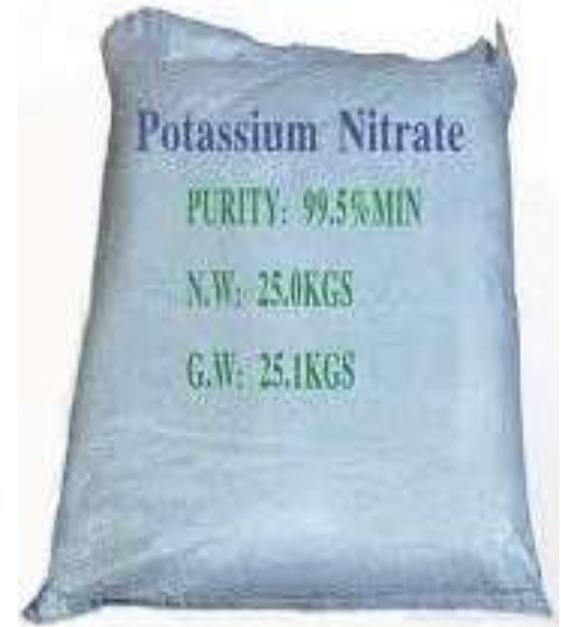


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## Homemade Explosives (HME)

- Easily manufactured
- Ingredients readily available
- Easily initiated

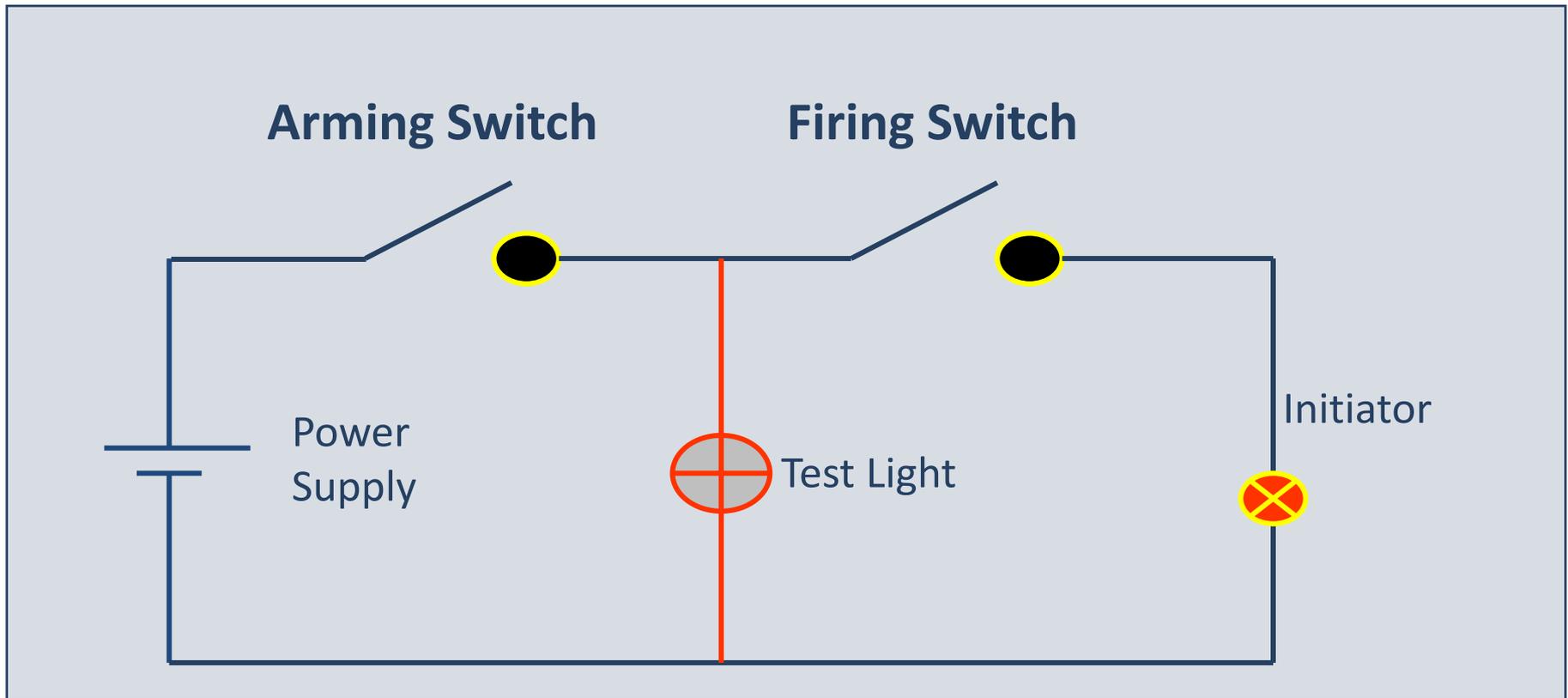


# IED and Explosive Effects Fundamentals

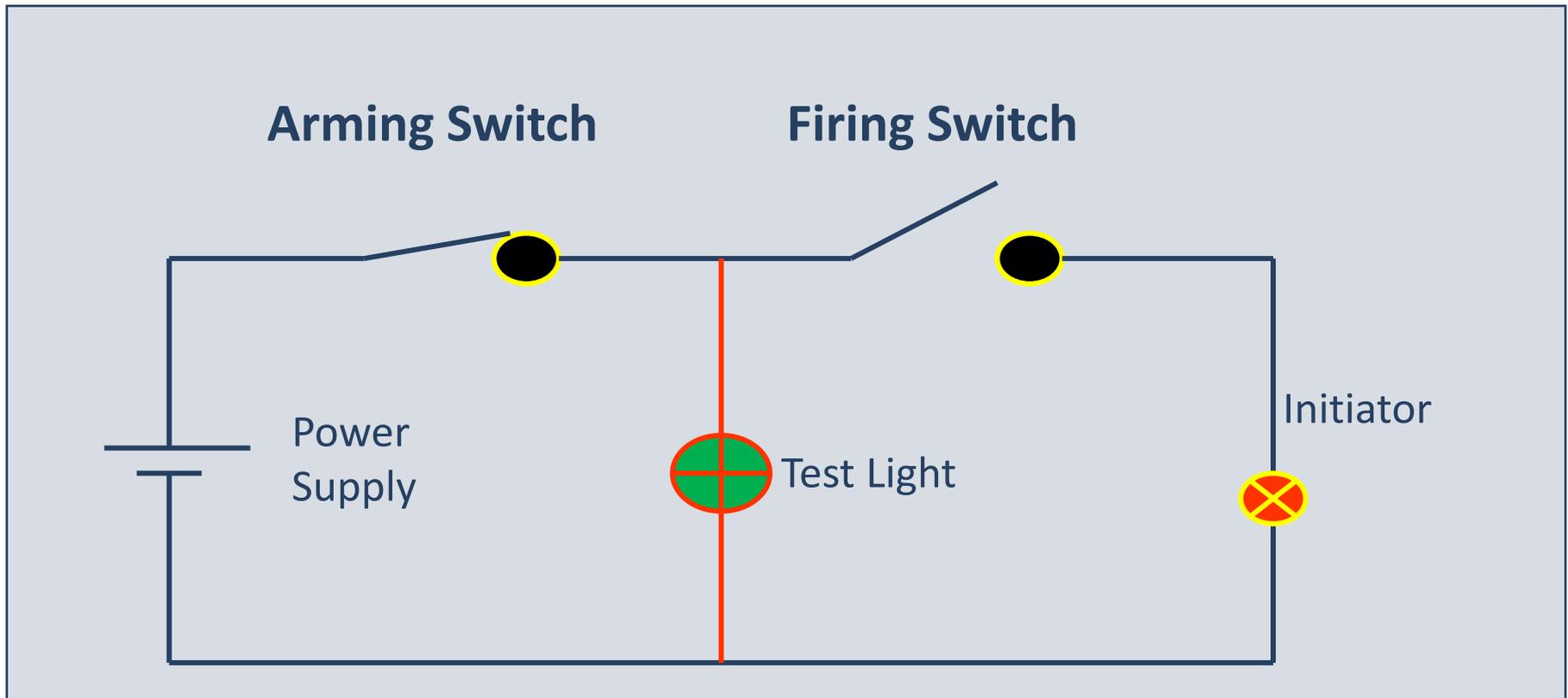
## Switch



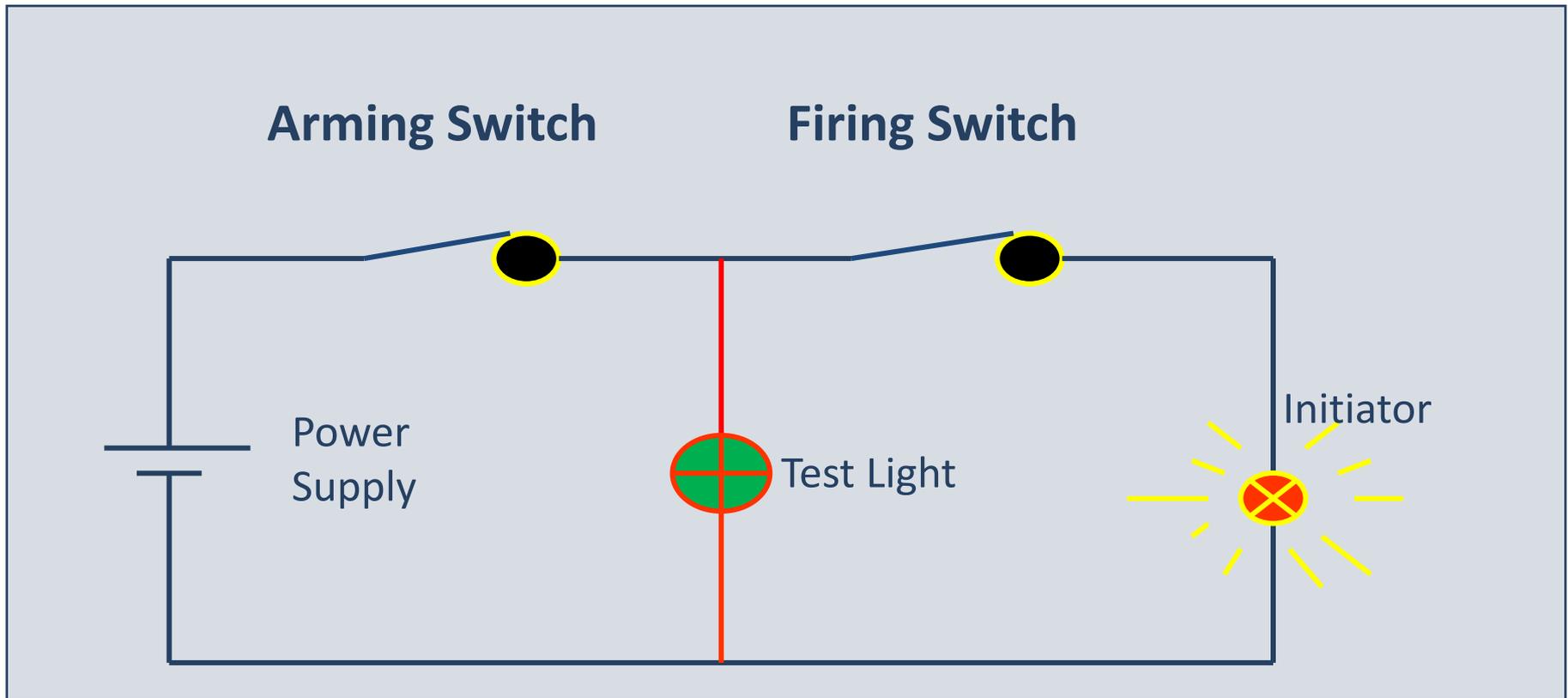
## Switch Functioning



## Switch Functioning

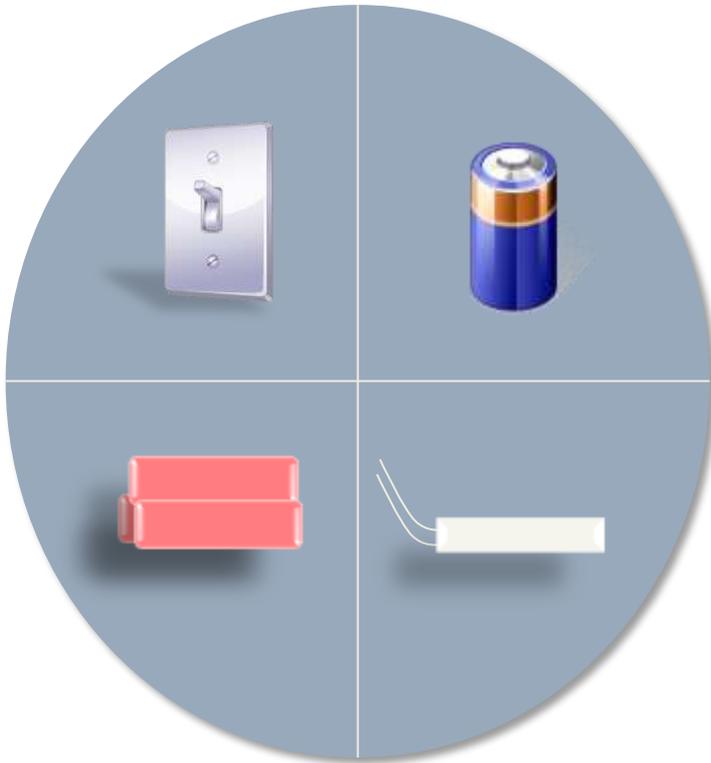


## Switch Functioning

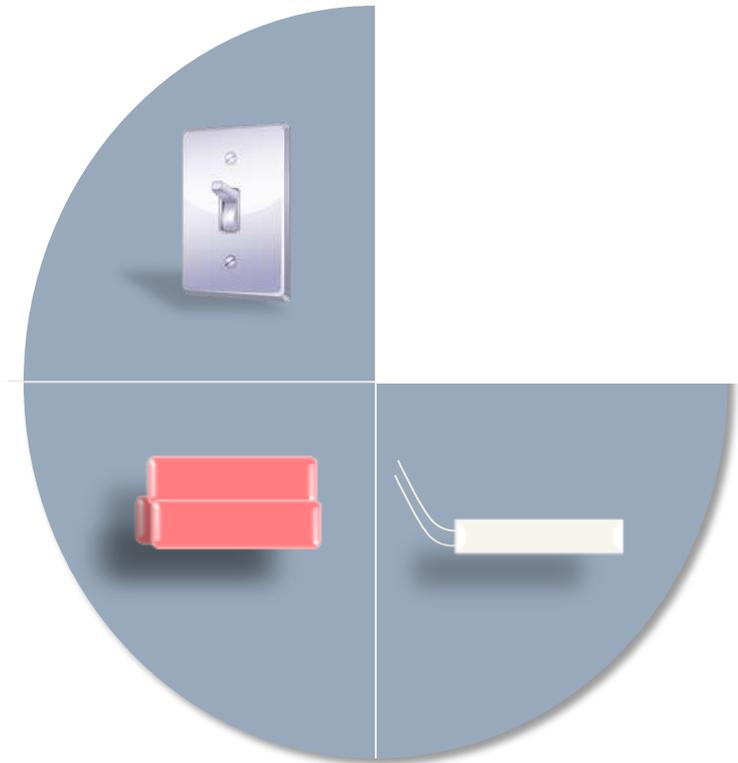


# IED and Explosive Effects Fundamentals

## PIES



“PIES” = IED



No “P” = **No IED**



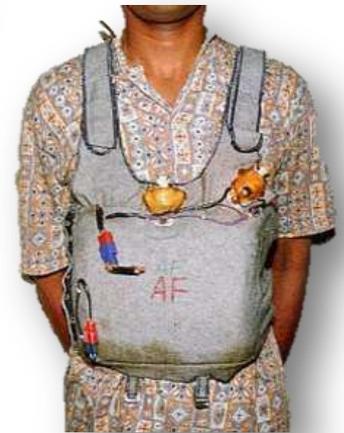
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# IED and Explosive Effects Fundamentals

## IED Containers

- Provide concealment
- Provide transport
- Increase lethality



# IED and Explosive Effects Fundamentals

## Which Items Could Contain an IED?



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# IED and Explosive Effects Fundamentals

## Identify the “PIES”

Shoe Bomber – Richard Reid

- **Power** = Heat (match)
- **Initiator** = Improvised TATP detonator
- **Explosives** = Plastic explosive (PETN) and detonation cord
- **Switch** = Richard Reid and time fuse



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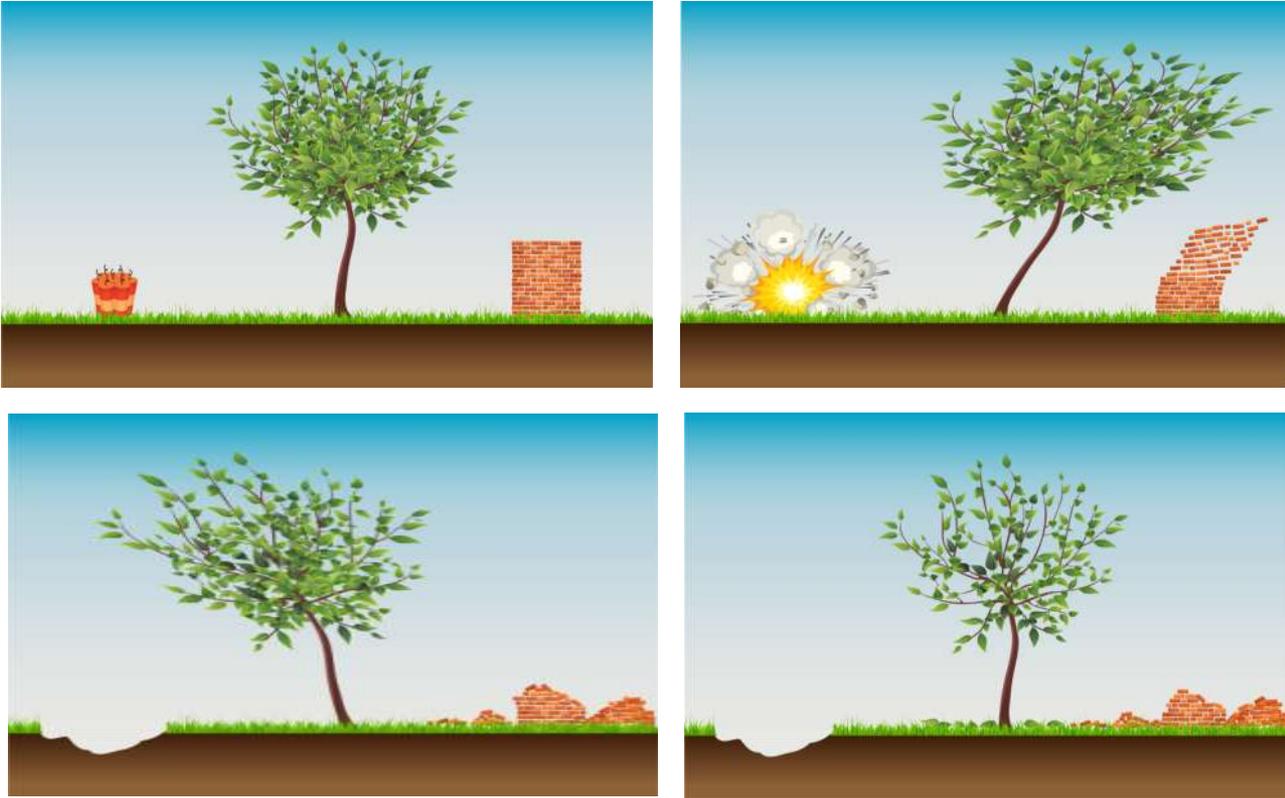
## Explosive Effects

- **Blast:** Broken, crushed, or deformed items
- **Thermal:** Burned, charred, or deformed items
- **Fragmentation:** Shrapnel from bomb parts or debris



# IED and Explosive Effects Fundamentals

## Blast



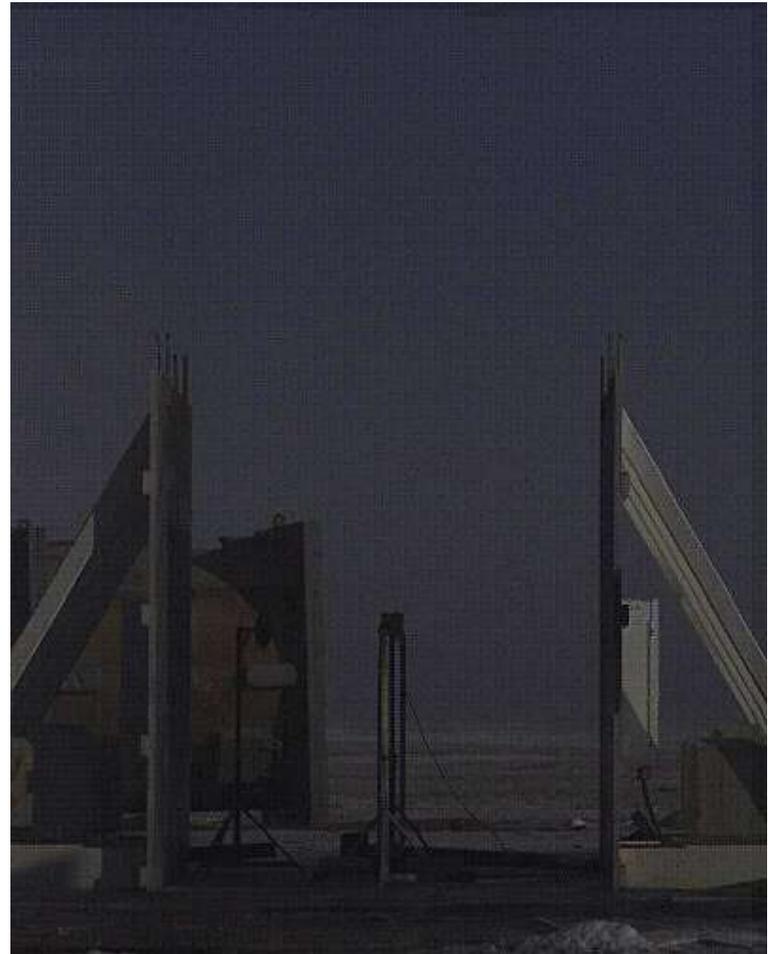
## Example 1: Secondary Blast Effects

- Reflection
- Focusing
- Shielding



# IED and Explosive Effects Fundamentals

## Example 2: Secondary Blast Effects



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## Thermal Effects

Temperatures reach thousands of degrees

- High explosives – short duration
- Low explosives – long duration



## Fragmentation

### Primary (1000s of feet per second)

- Container
- Munitions case
- Shrapnel

### Secondary (100s of feet per second)

- Includes primary fragmentation
- Debris located near the seat of the blast



## Response Considerations

- Secondary devices and explosions
- Multiple simultaneous devices



## Basic Precautions



- Do not touch suspicious items
- Notify proper authorities



## Explosive Hazards



- Heat
- Shock
- Friction
- Static



## Evacuation Considerations

- Communicate the need for evacuation
- Determine approximate “evacuation distance”
- Conduct evacuation away from the threat
- Prevent others from approaching



The image shows a 'BOMB THREAT STAND-OFF CARD' from the U.S. Department of Homeland Security. It is a table with five columns: Threat Description, Explosives Capacity, Mandatory Evacuation Distance, Shelter-in-Place Zone, and Preferred Evacuation Distance. The table lists eight types of threats with their corresponding capacities and distances. The Mandatory Evacuation Distance column is highlighted in red, the Shelter-in-Place Zone column is highlighted in yellow, and the Preferred Evacuation Distance column is highlighted in green.

Threat Description	Explosives Capacity	Mandatory Evacuation Distance	Shelter-in-Place Zone	Preferred Evacuation Distance
Pipe Bomb	5 lbs	70 ft	71-1199 ft	+1200 ft
Suicide Bomber	20 lbs	110 ft	111-1699 ft	+1700 ft
Briefcase/Suitcase	50 lbs	150 ft	151-1849 ft	+1850 ft
Car	500 lbs	320 ft	321-1899 ft	+1900 ft
SUV/Van	1,000 lbs	400 ft	401-2399 ft	+2400 ft
Small Delivery Truck	4,000 lbs	640 ft	641-3799 ft	+3800 ft
Container/Water Truck	10,000 lbs	860 ft	861-5099 ft	+5100 ft
Semi-Trailer	60,000 lbs	1570 ft	1571-9299 ft	+9300 ft





**Exercise Your Brain**

## Summary

Are you able to:

- Define the term “Improvised Explosive Device” (IED)?
- Identify the components of an IED?
- Describe blast, thermal, and fragmentation effects?
- Explain factors to take into consideration when responding to a potential IED?



# IED and Explosive Effects Fundamentals

**Questions?**



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# DHS – Office for Bombing Prevention



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For more information visit:

<http://www.dhs.gov/obp>

Or contact us at:

[OBPTraining@hq.dhs.gov](mailto:OBPTraining@hq.dhs.gov)



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