

FIRE SAFETY AND PREVENTION



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AGENDA

- Fire Safety
- Fire Extinguishers
- Evacuation Ladders
- Smoke Alarms
- Carbon Monoxide
- Fire Facts



FIRE SAFETY – PREPARE FOR A FIRE

Install the right number of smoke alarms. Test them once a month and replace the batteries at least once a year (twice a year is even better)

Teach children what smoke alarms sound like and what to do when they hear one

Ensure that all household members know two ways to escape from every room of your home and know the family meeting spot outside your home

Practice escaping from your home at least twice a year. Press the smoke alarm test button or yell "Fire" to alert everyone that they must get out.

Make sure everyone knows how to call 9-1-1



FIRE SAFETY – SAFEGUARD AGAINST FIRE

Make sure your house number is easily readable from the street, even at night.

Make sure your home heating sources are clean and in working order. Many home fires start due to poorly maintained furnaces or stoves, cracked or rusted furnace parts, or chimneys with creosote buildup.

Check electrical wiring in your home:

- Fix or replace frayed extension cords, exposed wires, or loose plugs
- Make sure wiring is not under rugs, attached by nails, or in high traffic areas
- Make sure electrical outlets have cover plates and no exposed wiring
- Avoid overloading outlets or extension cords
- Make sure outdoor outlets are protected from the elements

Store combustible materials in open areas away from heat sources. Place rags used to apply flammable household chemicals in metal containers with tight-fitting lids.



FIRE SAFETY – SAFEGUARD AGAINST KITCHEN FIRES

Remain in the kitchen when frying, grilling or broiling food. Stay in the house while simmering, baking, roasting or boiling food.

Keep pets off cooking surfaces and countertops

Keep the stove area clean and clear of things that can catch fire, such as pot holders, towels, curtains, bags, and other appliances

If you are cooking and a fire starts in a pan, slide a lid over the burning pan and turn off the burner. Leave the lid in place until the pan is completely cool. Moving the pan can cause serious injury or spread the fire. Never pour water on grease fires.



FIRE SAFETY – BEDTIME ROUTINE

Many fires in the home start at night. Make sure you have a bedtime fire safety routine to help keep you and your family safe.

- Switch off and unplug all electrical appliances not designed to stay on.
- Make sure no cigarettes, cigars, or pipes are still burning. Never smoke in bed.
- Before emptying ashtrays make sure the contents are cold
- Make sure grills, firepits, etc. are not still burning and the contents are cold
- Switch off portable heaters
- Close the doors of all rooms
- Make sure your escape route is free of any obstructions and that there are no loose floor coverings that could trip you. Make sure everyone in the house is aware of the escape route.



WHAT TO DO IF A FIRE BREAKS OUT?

- If you can safely do so, close the door of the room where the fire has started and close all other doors behind you
- Before opening a closed door, use the back of your hand to touch it. Never open doors that are warm to the touch.
- Get everyone out as quickly as possible
- If your primary escape route is blocked by heat, smoke, or fire, use your secondary escape route.
- Never go back into your home until a fire officer has told you it is safe



WHAT TO DO IF YOU ARE CUT OFF BY FIRE?

- If you are prevented from getting out because of flames or smoke, close the door nearest to the fire and use towels or sheets to block any gaps. This will help stop smoke spreading into your room.
- Go to the window, if the room becomes smoky, go down to the floor level. It is easier to breathe closer to the floor because smoke and heat will rise upwards.
- Open the window and try to attract attention of others who can alert the fire department.
- If you are in immediate danger and your room is not too high from the ground, drop cushions or bedding to the ground below to break your fall from the window.
- Get out feet first and lower yourself to the full length of your arms before letting yourself drop. This is where escape ladders in each room can be used.

Better to be an injured victim from a fall than deceased from smoke inhalation – broken bones can heal

Human lungs can only take 130 degrees of heat before they fail



Fire Safety

FIRE EXTINGUISHERS



FIRE EXTINGUISHERS

- Fire extinguishers are useful for small fires, before they grow and involve other items.
- Should keep a good fire extinguisher in the garage/storage area, and in the kitchen.
- Different types of extinguishers are used for different types of fires.
- Good general rule for a home is a dry chemical/ABC extinguisher
- Know that it is going to fill the air with chemical dust, and quite a bit of chemical on the surface you are protecting, so you don't want to stay inside once you have set one off.
- Fire extinguishers will not work to get you through a fire to safety, they are only useful when the fire is in the growth phase.



FIRE CLASSIFICATION

- Class A Fire: Ordinary Combustible
- Class B Fire: Flammable Liquids and Gases
- Class C Fire: Electrical Equipment
- Class D Fire: Combustible Metals
- Class K Fire: Cooking Oils and Fats



CLASS A FIRE: ORDINARY COMBUSTIBLE

Ordinary Combustibles include:

- **Wood:** logs for fireplaces, furniture, and wood-building structures
- **Paper:** such as the paper you might find in the trash or books on a shelf
- **Plastic:** Tupperware containers, toys, bags
- **Cloth:** Clothing, curtains
- **Rubber:** shoes, door mats

Suppression Techniques:

- Water or Dry Chemical (ABC fire extinguishers) or Fire Blankets for small fires



CLASS B FIRE: FLAMMABLE LIQUIDS AND GASES

Flammable Liquids include:

- **Fuels:** Gasoline, Diesel, Kerosene
- **Most oils:** Car oil, Chainsaw, 3-in-1 oil
- **Most paints:** Oil-based paints are considered flammable liquids
- **Alcohol:** Anything with 40% alcohol by volume or greater

Flammable gases include:

- **Hydrogen:** Party balloons
- **Butane:** used for cigarette lighters and in some refrigerators
- **Methane:** Natural gas
- **Propane:** Grills and firepits

Suppression Techniques:

- Dry Chemical fire extinguisher or Foam. Water will only spread the fire.



CLASS C FIRE: ELECTRICAL EQUIPMENT

Electrical equipment that commonly causes fire includes:

- **Clothes Dryers:** Clothes dryers can cause fires when not adequately maintained. Lint build-up acts like kindling for sparks, and poorly installed or maintained lint traps can cause problems.
- **Wiring and Cords:** Poorly installed wiring can cause sparks. Overloaded power banks can lead to short circuits and power surges.
- **Space Heaters:** It is common for people to leave space heaters near loose clothes like bedding, curtains, and clothes left to dry.

Suppression Techniques:

- Dry Chemical (ABC fire extinguishers) unless it involves electrical equipment such as a transformer or breaker box, then a CO2 extinguisher is needed to prevent electrocution. Water should never be used on an electrical fire due to risk of electrocution.



CLASS D FIRE: COMBUSTIBLE METALS

Combustible metals include:

- **Sodium** is a highly reactive metal that can cause combustion when exposed to air or water.
- **Lithium:** Such as in laptops, cordless tools, and cell phone batteries

Suppression Techniques:

- **Dry powder:** Dry powder is not the same as dry chemical extinguishers (ABC). Should be marked for Class D. The only way to stop combustible metals is to take oxygen away until it cools. Due to the chemical reaction, water can be broken down into Hydrogen and Oxygen and will make the fire more intense.



CLASS K FIRE: COOKING OILS AND FATS

Common materials include:

- **Vegetable Oil:** Oils such as vegetable oil, canola oil, butter, etc. used in cooking.
- **Cooking Grease:** Grease can accumulate behind and under cooking appliances.

Suppression Techniques:

- Foam, Fire Suppression blanket to suffocate the fire. Water will only cause the fire to spread.



ABC FIRE EXTINGUISHER





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FIRE BLANKET





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DRY POWDER EXTINGUISHER





Fire Safety

EVACUATION LADDERS



EVACUATION LADDERS

Make sure they are kept in an easy to find location in the room and are clearly marked

Make sure everyone in the home knows where they are kept (same location if every room is a good practice)

Make sure everyone in the home knows how they work and how to properly deploy them

Practice deployment (don't actually go down the ladder) at least twice a year



TELESCOPING LADDER





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2-STORY ESCAPE LADDER 13'





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3-STORY ESCAPE LADDER 25'





Fire Safety

SMOKE ALARMS



SMOKE ALARMS

- If you have a fire, smoke alarms can cut nearly in half your risk of dying in a fire.
- Smoke alarms sense abnormal amounts of smoke or invisible combustion gases in the air.
- In new homes, code (NFPA72) requires hard-wired, interconnected smoke alarms with battery backup on every level of the home, outside each sleeping area, and inside each bedroom. Alarms must be wired together so that if one sounds, they all sound.
- In existing homes, at a minimum install them on every level of the home and outside each sleeping area. For the best protection, install interconnected smoke alarms so that if one sounds, they all sound.
- To prevent nuisance alarms, vacuum cobwebs and dust from your smoke alarms monthly.
- If you have battery-powered smoke alarms, replace the batteries at least once a year. A good practice is to follow the time change. Change your clock, change your batteries.
- Replace your smoke alarms every 10 years as they become less sensitive over time.



POTENTIAL TOXINS IN SMOKE

COMPOUND	MATERIAL SOURCE	SELECTED ENVIRONMENTAL ORIGINS
Acrylonitriles and isocyanates	Polyurethane	Furniture, upholstery, building insulating materials
Ammonia	Wool, polyurethane, resins	Clothing, upholstery, carpeting, insulation, kitchen items
Carbon monoxide	Wood, paper, cotton	Furniture, clothing, household fabrics
Formaldehyde	Melamine resins	Kitchen appliances
Hydrogen chloride	Polyvinyl chloride, polyester	Upholstery, clothing, floor coverings
Hydrogen cyanide	Wool, silk, polyurethane, various resins	Clothing, furniture, carpeting, plastic components
Phosgene	Polyvinyl chloride	Upholstery, pipe coverings, flooring
Sulfur dioxide	Rubber	Vehicle tires



Fire Safety

CARBON MONOXIDE



CARBON MONOXIDE (CO)

- Carbon monoxide is an invisible, odorless, colorless gas created when fuels (such as gasoline, wood, coal, natural gas, propane, oil, and methane) burn incompletely.
- Carbon monoxide is heavier than air and will tend to pool near the floor and then rise as the concentration increases
- One danger is the improper use of gas generators, charcoal grills, and fuel-burning camping heaters and stoves inside of the home or in other enclosed or partially-enclosed space during power outages.
- Install a carbon monoxide (CO) alarm in the hallway of your home near sleeping areas. Avoid corners where the air does not circulate.
- CO poisoning can be confused with flu symptoms, food poisoning, and other illnesses with symptoms including shortness of breath, nausea, dizziness, light headedness or headaches. High levels of CO can be fatal, causing death within minutes.
- If you suspect CO poisoning, get to fresh air immediately and then call 9-1-1.



CARBON MONOXIDE ALARMS

- Install a carbon monoxide (CO) alarm in the hallway of your home near sleeping areas. Avoid corners where the air does not circulate.
- Do not use a CO alarm in place of a smoke alarm. Have both.
- Before buying a CO alarm, check to make sure it is listed with Underwriter's Laboratories standard 2034 or that it meets the requirements of IAS 6-96 standard.
- Follow the manufacturer's instructions to test the CO alarm every month.
- Treat the alarm signal as a real emergency each time. If the alarm sounds and you are not experiencing symptoms, press the reset button. If the alarm continues to sound, call the fire department and exit the home.



CARBON MONOXIDE EXPOSURE

ORGAN SYSTEM AFFECTED	SYMPTOMS AND SIGNS
Acute Exposure	
Neurologic	<i>Mild exposure:</i> headache, dizziness, myalgias, neuropsychological impairment <i>Significant exposure:</i> confusion, loss of consciousness
Cardiovascular	Tachycardia, increased cardiac output, arrhythmias, cardiac ischemia
Ophthalmologic	Retinal hemorrhages
Cutaneous	Cherry-red skin color
Chronic Exposure	
Multisystemic, subtle findings	Chronic fatigue, behavioral changes, memory lapses, impaired sleep, changes in bowel habits, peripheral neurologic findings



Fire Safety

FIRE FACTS



FIRE TERMS

Rollover – This is a stage of a structure fire when fire gases in a room or other enclosed area ignite. This occurs when smoke begins to spread out horizontally after rising to the ceiling. As the smoke begins to bank down, it will start to burn as the temperature of the smoke reaches 1,000 degrees Fahrenheit. The air below the smoke could still be breathable at this stage.

Flashover – Occurs fairly shortly after rollover. This is a circumstance where everything in the room suddenly and simultaneously ignites. This occurs between 1,100 and 1,200 degrees Fahrenheit. In full protective gear, a firefighter is even unlikely to survive this event.

Backdraft – Occurs when there is an explosion due to oxygen being let into a room full of hot gases. A fire in an enclosed area will eventually burn up all of the oxygen. Opening a door will allow a burst of oxygen that allows the flammable gases to burst into flame.

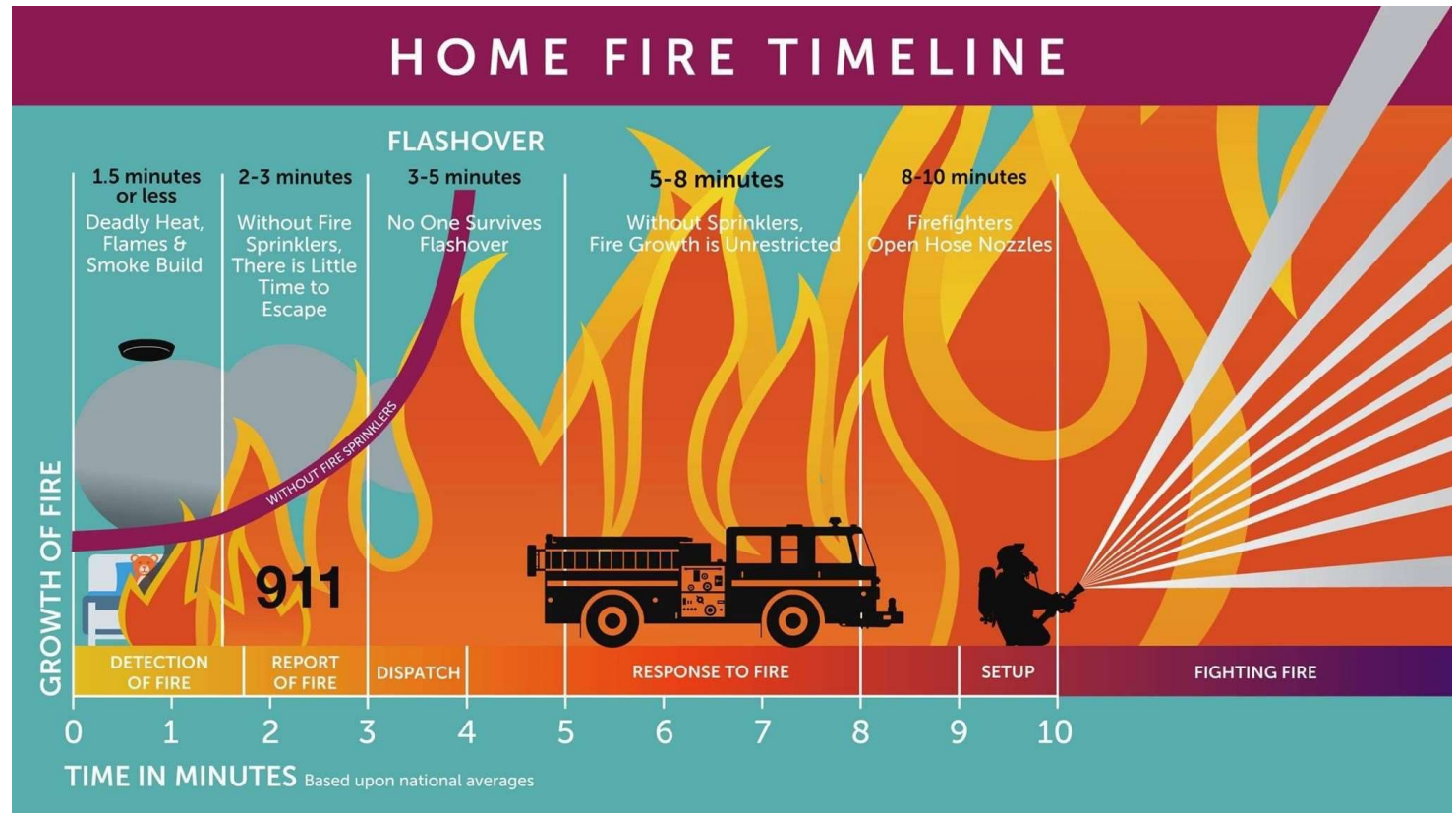
IDLH Environment – Immediately dangerous to life and health



Research shows that 30 years ago, you had about 17 minutes to escape a house fire. Today it's down to 3 or 4 minutes. The reason: the synthetic furniture and materials that are used in home construction today actually burn hotter and faster than natural materials do.



FIRE TIMELINE





BEACH HOUSE FIRES

- All of our structures in Jamaica Beach are elevated above the ground level, which means a one-story house in Jamaica Beach is the same as a two-story house on the mainland.
- Most homes have combustible material stored in the garage/storage area and vehicles parked underneath (golf carts plugged in charging)
- 90+% of the structures only have one set of stairs from the living area to the ground
- Canal homes typically have the entrance over the canal, which means you have to cross the deck to get down the stairs
- Canals can block firefighters from access to the fire from that side of the structure
- Trex and other synthetic decking lose structural integrity under heat load



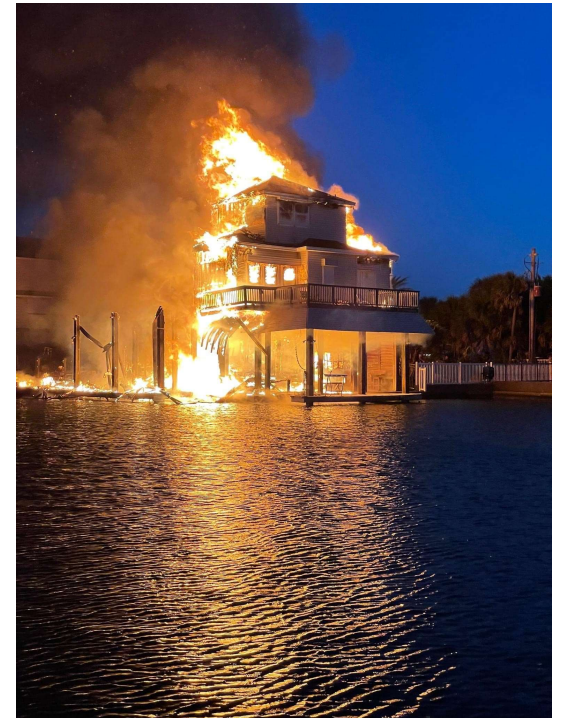
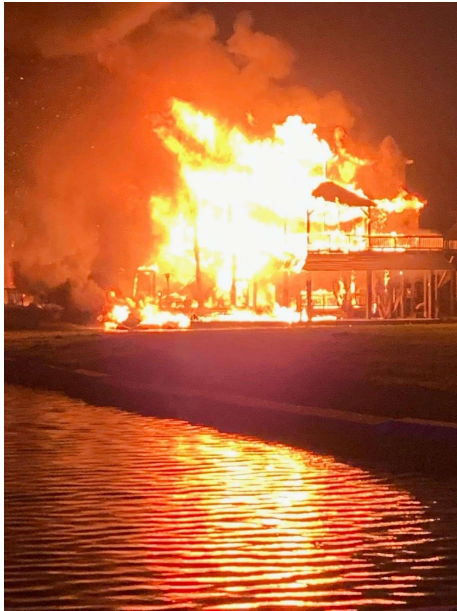
BEACH HOUSE FIRES





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BEACH HOUSE FIRES





FIRE VIDEOS

Flashover Demonstration:

<https://youtu.be/BtMmymOxdjc>

Home Furnishings Comparison:

<https://youtu.be/87hAnxuh1g8>

Rollover example:

<https://youtu.be/f4o9b-E7yDo>



THANK YOU

Kyle Baden

Fire Chief

Jamaica Beach Volunteer Fire Department

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