

FIRE

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This section is relevant for the following units of competency and their assessment requirements:

- CHCCCS027 Visit client residence
- CHCECE002 Ensure the health and safety of children
- CHCECE015 Attend to daily functions in home based child care
- CHCHCS001 Provide home and community support services
- CHCHCS002 Coordinate and monitor home based support
- HLTAHW014 Work with Elders in Aboriginal and/or Torres Strait Islander communities
- HLTAHW040 Promote burns prevention in homes and the community
- HLTWHS002 Follow safe work practices for direct client care.

This section covers fire speed and spread, and the role of fire services.

Information about fire speed and spread will help community services workers and health workers to understand why knowing about high risk groups is important in preventing fire.

FIRE SPEED AND SPREAD

Fire spreads very quickly.

Fire services' research has confirmed it can take only a few minutes for a fire in the home to fully take over the room where it started.

The bad effects of a fire in the home can be minimised by stopping the fire from spreading.

HEAT TRANSFER

Fire spreads through heat transfer.

Heat is transferred by:

- radiation
- convection
- conduction.

RADIATION

Radiation is the transfer of heat by rays. The best example of heat being transferred by radiation is heat from the sun.

Radiant heat does not need a medium to travel through. It can travel through space.

When radiant heat hits an object, the object absorbs the heat and its temperature rises. The intensity (hotness) of radiant heat decreases as the distance from the source of the radiant heat to the object increases.

Radiant heat from a fire will directly affect nearby unprotected fuel, raising its temperature. The hotter a fire, the more radiant heat is produced.

An example of heat transfer by radiation in the home is:

- an electric bar heater, which can radiate enough heat to make clothing placed too close to the electric bar heater ignite.

CONVECTION

Convection is the transfer of heat through a liquid or gas due to the circulation of that liquid or gas. The best example of heat being transferred by convection is water boiling in a pan.

Convection cannot happen in solid materials.

For example, heating the bottom of a container that has liquid or gas in it makes the hot liquid or gas rise, and the cooler liquid or gas fall to the bottom of the container. This creates a circulation system where the heated parts of the liquid or gas continually rise and carry heat to all parts of the container.

Hot-water heaters have their heating element at the bottom of the tank so convection circulates heat through the container.

An example of heat transfer by convection in the home is:

- hot smoke and air rising above a fire, for example up a chimney.

CONDUCTION

Conduction is the transfer of heat through a solid material from an area of higher temperature to an area of lower temperature.

Different substances conduct heat at different rates. For example, metals are better conductors of heat than wood.

An example of heat transfer by conduction in the home is:

- heat on one side of a steel door or roller shutter will be conducted to the other side of the steel door or roller shutter.

COMBUSTIBLE FUELS

Typical fire fuels include:

- common solid combustibles such as wood, leaves, grass, scrub, rubber and paper
- flammable liquids such as diesel fuel, petrol, kerosene and alcohol — the flammable vapour given off by the liquid burns, although the liquid itself does not burn
- flammable gases such as liquefied petroleum gas (LPG), natural gas, acetylene and hydrogen.

Knowing about fire fuels will make it easier to recognise many fire hazards.

SOURCES OF HEAT

Fires are started and kept going by heat.

A key to fire prevention is to remove heat sources or to keep them away from combustible fuels.

OPEN FLAMES AND SPARKS

An open flame can ignite combustibles.

Examples of open flames as a source of heat in the home are:

- stove-top gas jets
- candles
- kerosene lamps or heaters
- open fires in fireplaces or 'campfires' in the yard
- barbecues
- cutting torches
- welding equipment.

Highly flammable materials such as flammable gases and vapours can be ignited by sparks.

Examples of sparks as a source of heat in the home are:

- electric motors
- relays, which are electromagnetic switches operated by small electric currents to create larger electric currents — in the home, relays are used in refrigerators, washing machines, dishwashers, and heating and air-conditioning controls
- switches, telephones, radios and power tools.

SMOKING MATERIALS

Smoking materials are a common cause of ignition and fire, especially when they are not put out properly.

Examples of smoking materials as a source of heat in the home are:

- cigarettes
- cigars
- matches.

ELECTRICAL EQUIPMENT

Electricity produces heat when it flows, for example, in electrical equipment used for heating.

Heat is also produced in other types of electrical equipment.

Examples of electrical equipment as a source of heat in the home are:

- electrical equipment that over-heats because it is overloaded and/or is not maintained properly
- electric heaters placed too close to combustible materials
- overloaded power boards and double adaptors.

HOT SURFACES

Many processes produce hot surfaces. A hot surface can set fire to solid combustibles that touch it.

Examples of hot surfaces in the home as a source of heat include:

- appliances that may be constantly running, such as computers, televisions, BluRay/DVD/CD players, VCR players
- electric blankets
- heaters including fixed electrical or gas heaters, heating vents, portable heaters
- hot water service
- oven.

OTHER HEAT SOURCES

Other heat sources that may ignite a fire include:

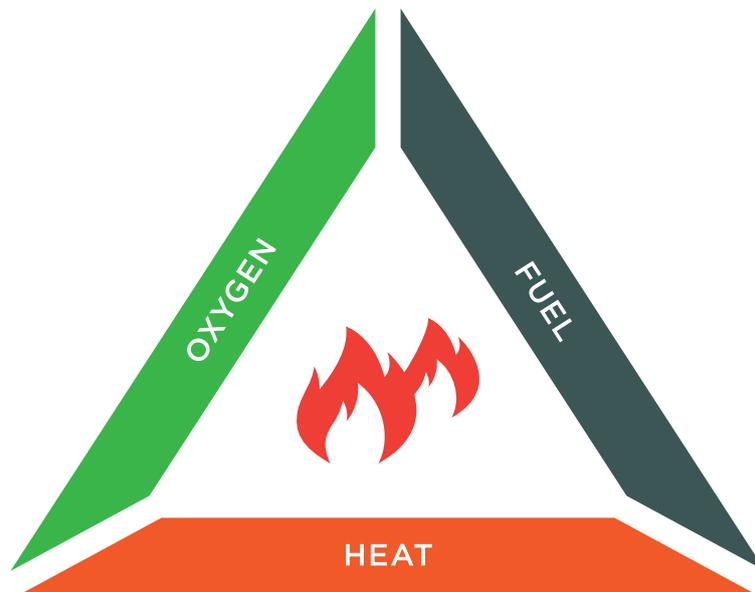
- heating from friction in machinery
- static electricity sparks, which may be produced when some non-conducting surfaces are separated from each other
- heat from some chemicals reacting with each other
- external sources such as lightning.

STOPPING FIRE IN THE HOME

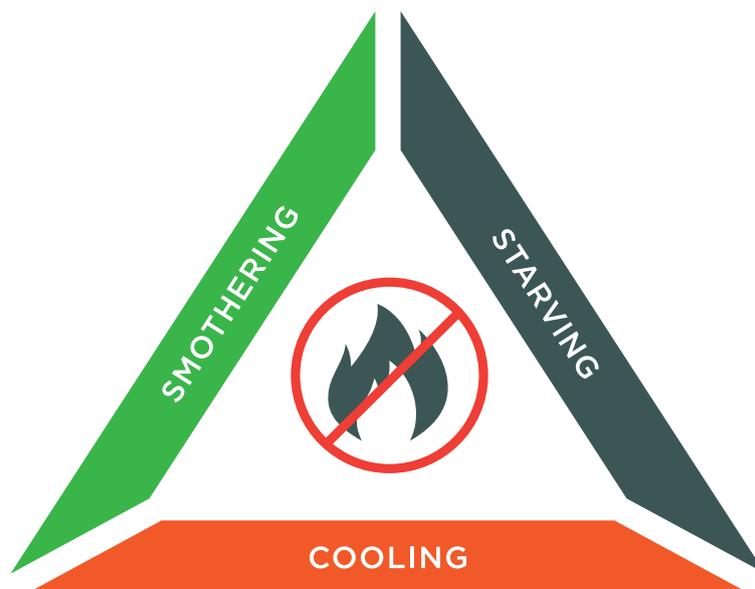
Fire needs three things to burn: oxygen, fuel and heat.

Fire can be stopped if one (or more) of these things is removed.

ELEMENTS REQUIRED FOR A FIRE



STOPPING A FIRE



ROLE OF FIRE SERVICES

Australian fire services provide a government-funded service to enhance community safety; fire services also provide a fee-for-service to businesses.

The role of fire services is to prevent and reduce injury, the loss of life and property, and damage to property and the environment due to fires and other incidents.

This is underpinned by four key principles:

- prevention
- preparation
- response
- recovery.

Fire services also operate under an 'all hazards' approach in responding to emergencies. This means that while these services develop safety information according to their particular purpose and geographical location, all fire services and emergency services help each other to respond to emergencies, as needed. The all hazards approach is covered further in **Section 6**.

The role and responsibilities of fire services are to:

- actively promote fire safety prevention information to the community to reduce the potential of a fire occurring
- improve community safety by engaging in community activities to make sure individuals are prepared and can respond appropriately to a fire
- confine the fire to the room of origin (the room where it started) and reduce the spread of fire to the entire building
- help with the recovery process after a fire.

Community services workers and health workers who know about basic home fire safety and what to do if there is a fire in the home will reduce the possibility of fire occurring and, in doing so, support the work of fire services.

Fire services investigate how, why and where fires in buildings and wildfires start. During this process, fire services may find products and/or procedures that are deemed unsafe or are potentially faulty and therefore likely to cause a fire. This process may also identify gaps in knowledge, policy and practice. When this happens, fire services work with the relevant authorities to amend legislation or to communicate relevant information to industry and the public.

SUMMARY

- Fire spreads very quickly.
- The impact of a fire can be minimised by preventing the spread of the fire.
- To prevent fires, eliminate heat sources or keep them away from combustible fuels.
- Sources of heat include open flames and sparks, smoking materials, electrical equipment, hot surfaces and other heat sources.
- The investigation of fires by fire services provides valuable information.
- The role of fire services is to prevent and reduce injury, and the loss of life and property due to fires and other incidents.
- Knowledge about basic home fire safety and about what to do if there is a fire in the home will reduce the possibility of fire occurring.
- Removing oxygen, fuel or heat will stop a fire.

SELF-CHECK QUESTIONS

1. How long do fire services estimate that it takes from the start of a fire in a home to the full involvement of the fire in the room of origin?
2. Give two examples of heat sources in the home that need to be eliminated or managed to prevent a fire occurring.
3. How does fire spread?

ACTIVITIES

Outline four sources of heat in three client's homes (clients with different support needs) and how potential risks from these sources could be eliminated.

Identify four sources of heat in your own home, potential risks and how these could be eliminated.