Scottish Forestry / Coilltearachd na h-Alba

Outdoor & Woodland Learning SCOTLAND

Fire Guidance

Using fire for outdoor and woodland learning by OWL groups

Guidance

Outdoor & Woodland Learning (OWL) Scotland is dedicated to increasing the use of Scotland's outdoor and woodland environments for learning.

This summary guidance is not comprehensive, and should be supported by skills development, training and specialist guidance where appropriate. For example, teaching fire practice, and campfire cooking/ food hygiene to children/adults.

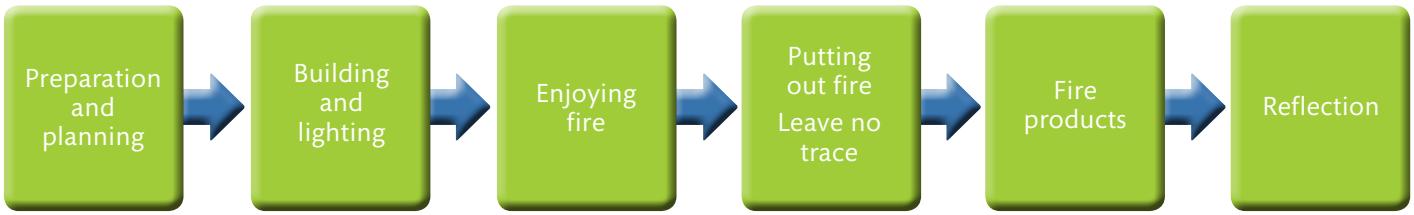
Each OWL Group should ensure it has the necessary insurance in place to cover activities and events using fire, or the person leading should have appropriate public liability insurance. For further advice, contact the OWL Scotland manager.

Why use fire outdoors?

This guidance has been provided to support best practice. Although fire is not an essential part of effective outdoor learning, it can be a central element in events and activities run by OWL groups and build a wonderful sense of community. For example, cooking food on a fire to share outdoors, or heating water in a Kelly kettle for hot drinks, can keep participants warm and engaged. Tools may be required as well, for example – bow saws to cut fuel wood, or fire steels to start the fire – as part of the learning activity. See also the OWL Scotland Guidance note on Using Tools for Outdoor and Woodland Learning by OWL Groups.

There is increasing awareness that the curriculum can and should be delivered through outdoor learning. Using fire in a real world learning setting can contribute to supporting all elements of health and wellbeing – mental, emotional, social and physical. Fire activities should be meaningful, and chosen to be age/ stage appropriate, to support progression in the development of these aspects and skills.

There are opportunities to link with curriculum outcomes at all stages of working with fire:



More details on curriculum links with fire can be found in the OWL Scotland resource Using Fire as a context for Learning (CfE links).

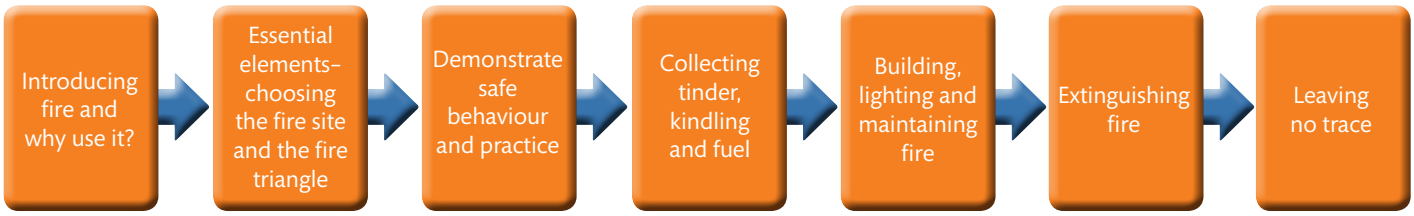
Introducing fire to groups: safe practice

First: Do your Risk Benefit Assessment for the site, the activity and the group

When introducing FIRE to groups:

1. Gather the participants together
2. Ensure correct staffing ratios i.e. work with small groups at a time
3. Check everyone can see, hear and understand you
4. Demonstrate safe practice
5. Be aware that schools will be required to follow their local authority H&S and Risk Assessment guidelines.

It is important to go through a structured process to build up appropriate respect, understanding and management of fire, in the following sequence:

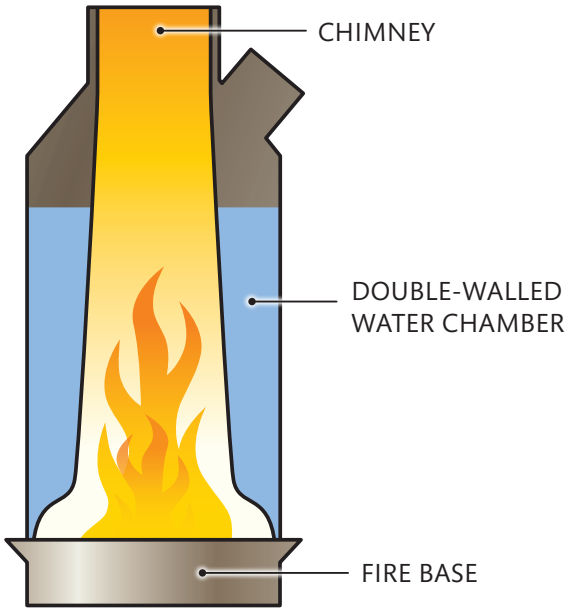


The size of fire should be appropriate for the activity, and can be determined by the type of fire container used. Raising the fire off the ground can protect the ground and be safer for children to observe and manage. Leaving no trace applies unless a permanently in-situ fire site is used.

'5 minute' fires– using tea lights, small fire bowls, Kelly kettle bases, old frying pans– to demonstrate small fire and flame, spark making, how to light fires, how to extinguish mini-fire. Tiny fires are often suitable for younger children/ additional support needs/one-to-one support.

Larger fires – in large fire bowls/pits/brazier/box/barbeque/recycled materials like washing machine drums/open fire – for introducing fire to a larger group, celebration, outdoor gathering, and outdoor cooking. Leave no trace and site management/behaviour safety is key.

Kelly kettle (also known as volcano/ghillie/storm kettle) – for boiling water in a container – for providing participants with hot drinks outdoors and introducing small scale fire and outdoor technology. Risk of scalding from tipping and boiling water, or burns when touching hot metal, means kettle and site management/behaviour safety is key. Do not place the cork in the Kelly kettle when being heated.



The Kelly Kettle

CHECKLIST

Fire safety kit

- Site and Activity Risk Benefit Assessment in place
- Insurance in place
- Inform participants of hazards and risks
- Water bucket to be available for burns close by.
- Water and fire blanket for extinguishing fire close by (+/- sand bucket)
- Spade
- PPE – Fire gauntlet gloves (CCE certified)
- First aid kit including instant cooling packs
- Mobile phones (share numbers with leaders)
- Incident reporting form/book

Choosing your site

- Seek landowner permission
- In urban areas inform the local fire brigade about the fire activity
- Do not light fires when there is a high (red) fire risk
- Leaders should discuss with the participants where a safe place would be to set up a fire site
- Avoid siting a fire where smoke will drift across a work area
- Stay clear of animal dens (e.g. badger sett/rabbit burrows)
- No overhanging branches or exposed roots
- Not by a tree trunk or lying dead wood
- On reasonably level ground
- Space to move safely around it
- Access to water
- No risk to adjacent areas
- Avoid windy conditions
- Check soil substrate – do not build fires on deep peat base – this can burn and spread underground
- Do not use stones for the fire circle
- Establish a fire site with log/ defined boundaries – with an inner fire and outer seating boundary
- Ensure a minimum 'trip' distance from the fire – greater than length of the tallest participant
- Ensure boundary logs are secured by upright stakes if there is a danger of the logs rolling
- Keep the space between the fire and seating circle clear – bags etc. should be placed behind the seat circle, to avoid tripping near the fire
- Ensure an agreed entrance/exit point between the logs and fire

Introducing fire – key points

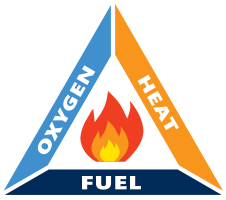
- Introduce age appropriate games/ activities to establish rules and boundaries around fire, inviting one person in at a time to demonstrate how to approach and behave by the fire
- With young children practice with no fire (unlit) and rope circle at 1.5m distance
- Check participants' feelings and prior experience of fire
- Fire needs oxygen, fuel and ignition
- Remember, fire is a great servant but a bad master
- What are the consequences of your actions?
- Raise awareness about the sustainable collection of wood and woodland habitats

Collecting tinder and wood fuel

- Assemble suitable tinder (newspaper, dry grass, cotton wool etc.)
- Explore different tree species and their differing value for wood fuel, as well as for wildlife
- Hanging dead wood (taking adequate safety precautions) is more likely to be dry
- Collect twigs in increasing grades of thickness depending upon the purpose and size of fire required:
    1. Matchstick thickness: Plenty of extra fine and fine kindling used to establish flame from tinder
    2. Pencil thickness: Brittle and dry. Good for controlling the heat of a small cooking fire.
    3. Thumb thickness: This is the beginnings of the fire proper
    4. Wrist thickness: Normally the largest fuel required. Anything larger is best left to overnight camps
- Sort wood in different piles sorted according to thickness – at a safe distance (and upwind) from the fire site
- Gather enough quantity to create an established fire before you light it

Demonstrate Safe Fire Craft/Behaviour

- Inform participants of risks
- One adult attending the fire at all times
- Appropriate fire size for the activity
- Don't lean over fire/ tie back long hair
- Always strike matches away from you
- Sit/squat with back to wind when lighting the fire
- Move away from the smoke, do not inhale, if the wind moves, you move
- Make sure there is enough fuel before you light it
- Tuck in loose clothing and check materials – be aware fleece and plastic clothes are highly flammable and cause dreadful burns. Wear natural fibres such as wool and cotton. Participants should remove any flammable gloves before lighting or adding anything to the fire
- Reinforce safe movement procedures around the fire circle with age appropriate games
- Demonstrate positions inside the fire circle – on knees to tend fire – and safe sitting
- Have fire blanket, sand bucket and water handy – and show participants.
- Water bucket to be available for burns
- Carefully place sticks on a fire – don't throw or dump sticks
- Sticks burning at one end should not be lifted out of the fire to be waved about as a torch



Building and lighting a fire

- Successful fires need the 'fire triangle' – Fuel + Oxygen + Heat
- Provide protection from wind and dampness – shield your fire by using your body, or a log shelter, or fire pit
- Stages:
  1. Build the fire on a small platform of dry sticks (thumb thick) to insulate it from the ground and provide a good heart of embers
  2. Create a nest of loosely rolled balls of paper or other suitable tinder on top of the platform
  3. On top of this lay a criss-cross pattern of match thin twigs in a waffle or tee-pee pattern, and light the paper. Once the twigs are alight and burning well, add twigs of pencil thickness and so on with increasing thickness of stick in criss-cross layers. 'Tee-pee' fire lays usually collapse at some point so keep sticks short
  4. Ensure the fire is burning well at each stage before adding more sticks to avoid smothering it.
  5. Follow environmental guidelines when sourcing firewood
  6. Demonstrate putting out fire safely and restoring site
- Take care with hot pots and fire containers – use fire gloves

Fire building stages

Before building and lighting a fire, make sure you have collected sufficient tinder, kindling and fuel wood for the size of fire you need, and sort it into piles.

Fuel wood: range of thicknesses up to wrist thick, as long as your arm

Kindling: no thicker than thumb, as long as hand to elbow; a generous armload – this burns fast!

Tinder: fine and fluffy materials/pencil lead thin – a good handful

Platform: first make a platform of dry sticks to slightly raise your fire off the ground and create a base for the tinder, kindling and fuel wood

Fire construction: can be of different styles – the 'teepee' is quick and simple but burns fast

Extinguishing fire

- Remember the fire triangle principles
- Leave enough time at the end of the day to allow the fire to burn low and be extinguished
- Always put out a fire thoroughly with water before leaving a site
- Sprinkle the water on the fire to avoid hot ashes being forced upwards
- Don't stamp on the fire

Environmental considerations

- Ensure wood to be collected is from a sustainably managed source and in accordance with the woodland management plan, with permission of the woodland owner/ manager
- Living wood should not be cut/ collected. Use hanging dead wood. Standing dead wood has ecological value so check against any conservation management plan. Tap any wood from woodpile to dislodge any living creatures before placing on fire
- Remember – Leave no trace. One of the seven principles is to minimise the effects of fire
- Ideally use a Fire Bowl, steel dustbin lid, Kelly Kettle or similar container for fire in woodland. This regulates the size of the fire, sets a good example, and reduces the chance of embers smouldering unseen
- Avoid placing the fire container directly on the ground or grass where this will leave scorch marks. Clear the ground of loose surface matter or remove surface turf before placing the container, then replace the litter or turf afterwards
- Ensure any remaining pieces of burned wood/ash are fully extinguished then remove all trace if this is not a permanently designated fire site

- Never tackle a scrub fire – call the fire brigade and advise them of the location of the fire, approximate size of the fire, a suitable entry point to the fire location, etc. and await further instruction

Other points to remember

- This activity can be built up progressively over a few sessions for safety reasons
- Depending on the group, individuals can first be supported by the leader(s) to build, and manage their own mini-fire, then progress to a group collective fire; later on, individuals can construct their own
- Peer review can be used to assess each other's fire sites (before lighting one)
- It is important to ensure all the elements are in place to maximise chances of success

Benefits of fire activities

Depending on your group and the intended outcomes of your activity, the following aspects can be considered for inclusion in your Risk-Benefit Assessment:

- Risk management is a key life skill. Participants* learn to take personal responsibility, develop resilience, take part in practical decision-making and develop an awareness of real risk versus perceived risk
- Fire is a potentially dangerous thing, so to entrust an individual with the responsibility to build and light a fire can be a huge boost to their self-esteem and a great sense of achievement
- Pleasure and fun
- Team building
- Engaging with local environment & elements
- Sense of achievement of end result
- Social inclusion
- Participants learn to manage own behaviour in risky situations
- Participants learn sustainability message of 'leave no trace'
- Supports general health and well-being
- Supports the Curriculum for Excellence, progression in learning and helps to develop the following skills:
  - understand and remember verbal instructions
  - understand process and sequence
  - work independently (e.g. choosing and sorting sticks)
  - work co-operatively (e.g. carrying logs together)
  - practice gross and fine motor skills
  - show care for themselves and each other
  - knowledge of different tree species and their properties as a natural resource.
  - better understanding of the environment, habitats and sustainability

* *Participants can be children, pupils/ students, adults. It may be helpful to distinguish as each group may have particular needs to meet, or particular beneficial outcomes.*

References and further resources

Fire safety from the Health and Safety Executive.

Muddy Faces provide a range of equipment for fire and cooking outdoors. Other suppliers are also available.

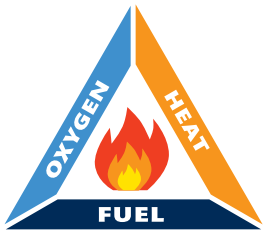
OWL Scotland Fire Workshop resources handout (updated May 2015) – Provides further links for using fire as a learning tool: outdoor learning, H&S, contacts, suppliers and more.

Scoutmaster 'how to build a campfire' online info graphic
http://scoutmastercg.com/wp-content/uploads/2012/11/campfireinfographic.pdf

Thank you

Many thanks to Penny Martin and all those individuals who contributed constructive comments and suggestions.

Using fire outdoors – flowchart



PLANNING:
Using fire outdoors – where and why?

Fire should only be used when there is a clear purpose for doing so.

What are the intended outcomes? (Skills/learning/environmental)

Do you have the required insurance?

PREPARATION – SITE
Site assessed and space organised
RBA for site, activity and group

Consider site sensitivities and possible environmental impacts of activity.

Have you sought permission from the landowner?

Are risk benefit assessments and accident procedures in place?

PREPARATION – RESOURCES
Materials to be cut identified/gathered
Fire Tool Box security and storage/sign out sheets
Fire safety equipment in place

Does your group have a safe secure storage?

What are the access arrangements?

Is there a signing-out process for equipment?

INTRODUCING FIRE
Fire talk to group – the fire triangle – starting, maintaining and putting out fire
Demonstrating safe positioning and behaviour around fire and handling of fire tools

Key principles for fire use:

- Count fire steels and other equipment in and out.
- Maintain safe working space.
- What are the consequences of your actions?

USE AND PRACTICE
Observe and support where required
Maintain safe practice and use of equipment

How can you recognise fire use skills by participants?

Consider providing a Record of Achievement or using award schemes like JMA.

EXTINGUISHING FIRE, STORAGE AND MAINTENANCE
Leave No Trace

Group leader(s) must ensure that all fire tools and equipment are returned to store (count in).

Leave work areas clean and tidy.

Leave no trace for non-permanent fire sites.

Does your group have a maintenance programme for fire tools?

ACTIVITY RISK/BENEFIT ASSESSMENT FORM (example template)			
Name:	OWL Group:	Date:	Grid Ref/ Postcode:
Location:		Participants:	
Activity:		Leader(s):	

Element Describe this part of the activity	Hazards List Significant hazards here	Risk From Encountering hazard	Benefits For the people taking part	Benefits List people at risk from the identified hazards	Evaluation List the control actions needed (suitable and sufficient, not perfect)	Risk of hazard with controls Aim to make ALL risks LOW	Record and Review Describe future practice to reduce hazards/who is responsible Keep written records≠
Walking to and around the site	Some uneven ground, tree roots and ground plant cover	Slips, trips, falls	Improved gross motor skills/awareness of environment	Participants and workshop leader	Talk about where we will go, and what to look out for and advise care where appropriate	Low	Choose suitable site at setting up stage Workshop leader
Haba fire pit/ small fire sites	Hot elements, trip hazards and other people.	Burns and wood smoke inhalation	Developing fire lighting and management skills Develop fine motor skills Group support and participation Understand leave no trace policy and fire as a resource Sense of wellbeing		Give clear instructions and provide distance from inhaling wood smoke Choose suitable site – contained area within fire circle and advise on correct procedures Fire 1st aid and burns kit on site and water/sand to extinguish Ensure Kelly kettle stability (with bricks) No cork in Kelly kettle when heating Provide PPE – fire gloves	Low	Workshop leader Leave no trace policy Fire 1st aid kit on site and water/ sand to extinguish Count fire steels in and out
Kelly Kettle	Boiling water, trip hazard; handling hot metal	Burns & scalds; and wood smoke inhalation				Low	
Fire lighting using knife and steel/ magnesium block	Mishandling of tools leading to cuts of self or another person	Penetrating injury Burns from ignited magnesium	Develop fine and gross motor skills Understanding of fire by friction		One-to-one support Advise appropriate handling and maintain all to observe '2 arms' length' working space	Low	Workshop leader Tools kept in secure area until needed – counted out and in Tools maintained
Collecting tinder and wood fuel	Sharp sticks and branches at eye level	Sticks poking in eyes	Awareness of tree types and wood fuel How to minimise environmental impact		Give clear instructions on collecting and how to avoid branches swinging back into own or another person's face	Low	Chose robust site Workshop leader and participants
Cooking marshmallows	Sharp sticks and hot marshmallows Sugar overload	Sticks poking in eyes/mouth Burned mouth Hyperactivity	Fun activity Wellbeing Fine motor skills Basic cooking skills using open fire		Check no dietary or other restrictions (e.g. diabetic/ vegetarian/halal etc.) Give clear instructions on cooking and eating	Low	Limit number of sweets Workshop leader
Sitting on ground	Wet grass, uneven or muddy ground	Getting wet and uncomfortable on ground	Shared experience; resilience		Provide sit on mats or logs and include the option to opt-out and stand if preferred	Low	Sufficient mats to hand Workshop leader
Fauna and flora	Wasps, bees or other stinging insects/ nettles/ toxic plants	Bites and stings	Close observation of the natural world/ appreciation of local biodiversity		Check at start of workshop if any known allergies. Remind all participants about care in approaching bees, wasps and if nettles/thistles on site First Aid kit handy	Low	Ensure information about participant allergies is known, plus site of first aid kit or any personal first aid for allergic reactions Workshop leader and individual participants if appropriate

Signed:

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