Cyfoeth Naturiol Cymru
Natural Resources Wales

Information Note: Shelters and Dens

This information note aims to provide tips and tricks for a safe and successful shelter building experience.

Pre-shelter building

This can be a classroom based pre-activity task or discussed on site before shelter construction.

Ask your learners to think about what is required to build an effective shelter.

Consider the best location for building a shelter.

For example:

- What part of the site might make the best location for a shelter and why?
- Will the shelter be free standing or built against a tree?
- What natural resources could be used to build with?
- Which direction might the wind be coming from? Will this effect where the entrance is located?
- How strong will the shelter need to be?
- What could be used to make it water/wind proof?
- Will it need to be camouflaged and why?
- What materials could be sourced to make the shelter comfortable and warm?
- How will the group organise themselves during the build? Will they appoint roles, share responsibilities, etc?

If there is sufficient time, divide your learners into their shelter building groups and ask them to sketch how their shelter might look or build a small-scale model. Discuss the various shelter design ideas and allow the groups time to adapt and refine their initial plans.

Sustainable Use of Materials

Natural Resources Wales' purpose is to pursue the sustainable management of natural resources in all of its work. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

It is important to ensure that your activities are sustainably resourced and have minimal impact on the natural environment. You will require permission from the landowner to erect temporary shelters, harvest materials and will need to comply with site based policies and procedures.

An example of sustainably harvesting shelter building material:

Coppicing is a traditional method of sustainable woodland management, in which young tree stems are cut down to a low level. In subsequent growth years, many new shoots will emerge and after several years, (e.g. approximately 15 years for hazel) the cycle begins again with the coppiced tree (stool) ready to be harvested.

Typically, coppice woodland is harvested in sections, on a rotation. In this way a crop is available every year. This has the positive side effect of providing a rich variety of habitats, as the woodland always has a range of different aged stools growing in it. This is beneficial for biodiversity. The cycle length depends upon the species cut, the local custom and what the product is used for.

Most broadleaf trees are suitable for coppice. However, some of the best suited species are hazel, sycamore, ash and willow. Birch can be coppiced for faggots (branches and twigs bound together to form bundles) on a 3 or 4 year cycle, whereas oak can be coppiced over a 50 year cycle to produce poles or firewood.

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Shelter building session

Shelters can be built without the use of tools. If you are planning on using tools with your learners we recommend that the activity leader has:

- ✔ experience and knowledge of group management and risk benefit
- ✔ tool use policies and procedures in place
- ✔ holds a Level 3 Forest School Leader qualification or has other relevant experience

Leaners should:

- drag larger pieces of wood by their side or carry with a partner
- ensure the thickest end of wood is placed on the floor and 'walked up' if needed to a vertical position
- be aware of the position of other members of their group
- use tools safely and with consideration to others
- check shelter stability before entering

During the session learners should not:

- climb onto large logs or shelters
- enter shelters if any members of the group are building
- carry any large branches by themselves
- leave the construction site

Types of Shelter

The type of shelter is dictated by the type of species available (i.e. broadleaf or conifer), the amount of open space and the size of the group.

Guidelines can be found in the table below.

Shelter Type	Group size 1-12	Group size 12+	Broadleaf / Conifer
Lean-to	✔	✔	Both
A-frame	✔		Both
Bender shelter	✔		Broadleaf only
Combined	✔	✔	Mixed species
Wigwam	✔		Both
Tent shelter	✔		Both
Wall-less shelter	✔		Both

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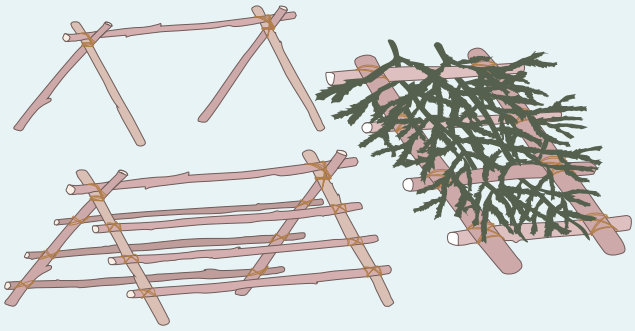
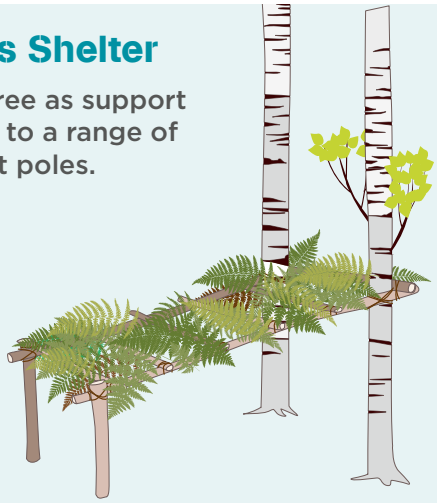
Wigwam Shelter

Tent Shelter



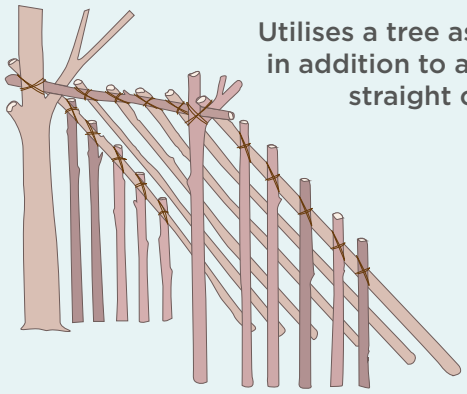
Wall-less Shelter

Utilises a tree as support in addition to a range of straight cut poles.



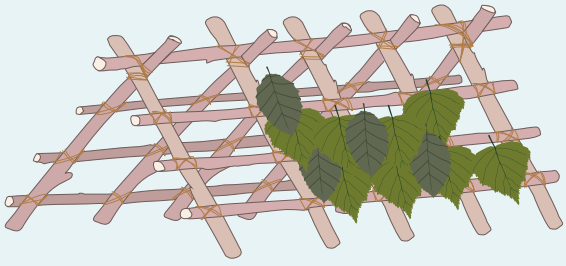
Lean-to Shelter

Utilises a tree as support in addition to a range of straight cut poles.



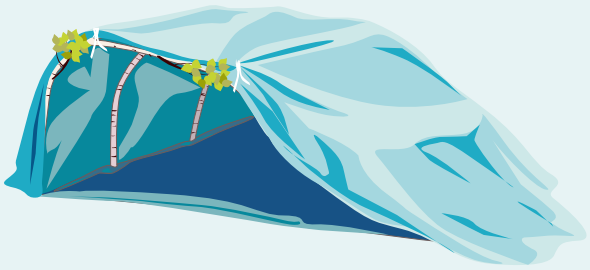
A-frame Shelter

A framework which is assembled using square lashings and a range of straight, coppiced poles.



Bender Shelter

A shelter built from flexible coppiced hazel poles which are placed into the ground, bent and tied together.



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Knots

There are several simple knots which are useful to know for the construction and strengthening of a shelter. The two knots described are relatively easy to learn and are key to successful shelter building.

Learn the knots prior to a session and find a way that you feel comfortable in teaching them.
Allow time to practice.

Reef Knot

A reef knot is a binding knot used as a standard, double shoelace knot minus the loops.

Hold both ends of the cord, apply equal pressure and place left over right, then right over left.
Then pull on both ends to tighten.

Clove Hitch Knot

The clove hitch is a simple knot to teach. It is a good starting knot to attach your string to the shelter before you start the square lashing. It is also used for 'hitching' a rope to a post for creating things such as a washing line.

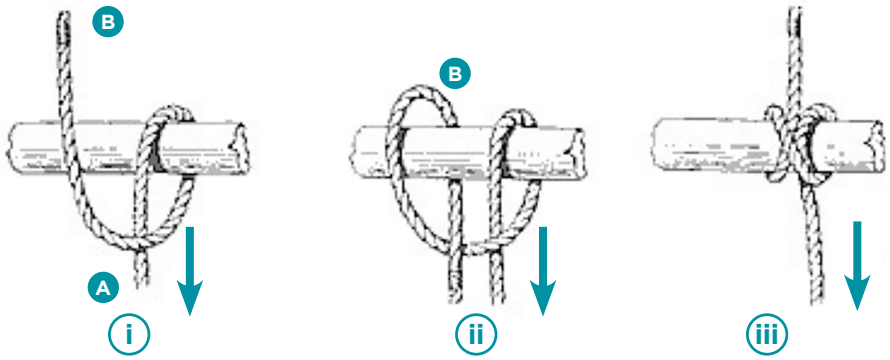
There are several ways to tie a clove hitch. The following techniques are the most commonly used.

Technique 1

i) Drape the string over the stick keeping the back end (B) longer. Bring B in front and over A.

ii) Drape B over the pole a second time and loop it back through itself.

iii) Pull both cords in opposite directions to tighten the hitch.

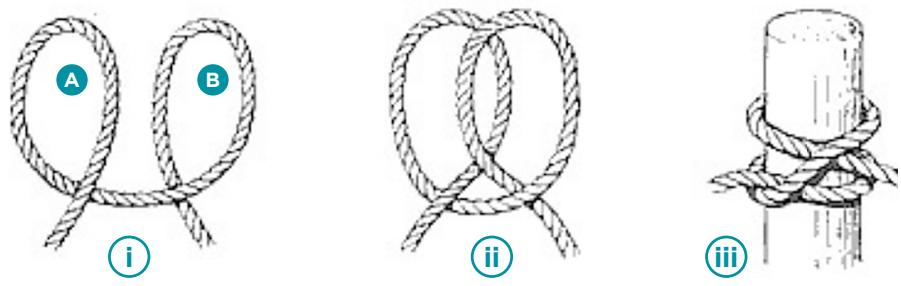


Technique 2

i) Form 2 loops – see picture.

ii) Slide loop A behind loop B.

iii Slip the loops onto the stick and pull ends in opposite directions to tighten.



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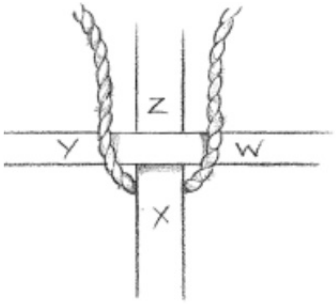
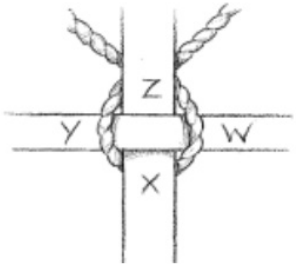
Square Lashing

Square lashing is a useful knot for shelter building. It is a very secure knot for holding two branches together which adds strength to the frame of a shelter.

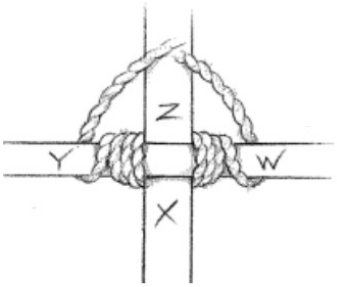
1. Place the horizontal pole on top of the verticle pole to form a cross. Pass the cord behind 'X' and over the top. of 'Y' and 'W'.



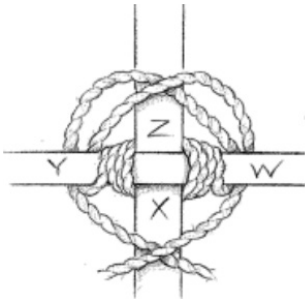
2. Pass the cords behind 'Z' so that they cross.



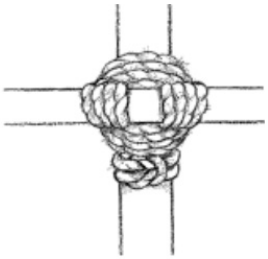
3. Follow the paths of the cord for three further turns, pulling the cord tight after each turn.



4. Frap using both ends of the cord to secure the lashing. Frap by crossing the cord over 'Z', then bring one cord under 'W', one under 'Y' and cross the cords over 'X'. Repeat this three or four times.



5. Tie a Reef Knot to finish and tuck in the ends.



Ref: directions and diagrams – The Knot Book, Girl Guiding UK

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Post-shelter building

The final product can be reviewed and evaluated by your learners and a retrospective plan/picture produced. The features of the design can be annotated on the plan and their function/use can be discussed.

Discuss the finished product, relate its end use to the quality of the workmanship and the materials used, i.e. fresh coppice poles versus dead wood from the floor.

Revisit the theories behind coppicing and other sustainable timber management practices, tree species and the wider ecosystem.

Investigate shelters from around the globe.

Where necessary, the group leader should ensure the safe demolition of shelters after completion of the activity.

Looking for more learning resources, information & data?

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or go to **www.naturalresources.wales/learning**

Alternative format; large print or another language, please contact:
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