



YOUR FOREST SCHOOL TRAINING MANUAL

LEVEL 3 CERTIFICATE FOR FOREST SCHOOL LEADERS

LEVEL 2 CERTIFICATE FOR FOREST SCHOOL ASSISTANTS

THE HIVE

**AMAZING
OUTDOOR
MISSIONS**

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**FOREST SCHOOL TRAINING LEVEL 2 & LEVEL 3
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WELCOME, CONTACT DETAILS & SUPPORT

Welcome to The Hive Forest School Training Course.

This handbook includes a wealth of information to support you throughout the course: you will find a reading list, an overview of the curriculum, handouts for all units, detailed guidance on the development of your portfolio and a summary of what to expect on assessment days.

We are also here throughout the process to answer questions, provide support and help in any way we can, so do feel free to get in touch if you're worried about any aspect of the course or would just like a sounding board on your practical skills, portfolio or assessment days! Remember that as part of the course, you have access to your tutor beyond the face-face guided training and assessment days.

We're very much looking forward to supporting you on your Forest School journey.

Caroline & The Hive team

Contact details

Caroline Leroi is your first point of contact for any training-related question. Sarah Belsey and Marlon Gibbins are our two Lead Trainers. They deliver your training and assessment days and mark your portfolio.

The team can be contacted by email or phone.

Email: team@thehive-kids.com

Telephone: 020 3435 6848

Process for submissions

- All submissions must be sent via email or WeTransfer to team@thehive-kids.com.
- Submissions **must** include the following in the subject line and document/folder title:
 - Your Name
 - Which submission you are sending (i.e. First Draft, Second Draft, Final Portfolio)
 - What you are sending (i.e. Units 1, 3 and 4 & Handbook)
- Submissions should be sent in **one transfer or email**. Please do not send multiple transfers for separate units.

SUGGESTED READING LIST

MUST HAVE BOOKS

“Learning with Nature” by Marina Robb
Published by Green Books

“Forest School for All” by Sara Knight
Published by Sage

“Play the Forest School Way” by Jane Worrol and Peter Houghton
Published by Watkins Publishing

OTHER RECOMMENDED BOOKS

“No Fear; Growing up in a Risk Averse Society” by Tim Gill
Published by CGF

“Let’s Go Outside” by Steph Sco and Kae Akers
Published by Batsford

“101 Things for Kids to do Outside” by Dawn Isaac
Published by Kyle Books

“The Stick Book” by Jo Schofield and Fiona Danks
Published by Frances Lincoln Ltd

“Games, ideas and activities for Primary Outdoor Learning” by Paul Barran
Published by Pearson

“Dirty Teaching. A beginner’s guide to Learning Outdoors” by Juliet Robertson
Published by Independent Thinking Press

“A Year of Forest School” by Jane Worrol and Peter Houghton
Published by Watkins

“Balanced and Barefoot” by Angela J. Hanscom
Published by New Harbinger

“Last Child in the Woods: Saving our Children from Nature deficit Disorder” by Richard Louv
Published by Atlantic Books

“Free to Learn” by Peter Gray
Published by Ingram

FLORA AND FAUNA BOOKS

“Collins Complete Guide to British Birds” by Paul Sterry
Published by Collins

“Birds of Britain and Europe” by J.Nicolai, D.Singer and K.Wothe
Published by Collins

“Collins Complete Guide to British trees” by Paul Sterry
Published by Collins

“Trees in Britain, Europe and North America” by Roger Phillips
Published by Pan Books

“Mushrooms and Toadstools of Britain and Europe” by Edmund Garnweidner
Published by Collins

“Collins Nature Guide - Butterflies and Moths” by H.Hofman and T. Marktanner
Published by Collins

“British Wildlife: A photographic guide to every common species” by Paul Sterry
Published by Collins

“Garden Wildlife of Britain and Northern Europe” by Michael Chinery
Published by Collins

SUGGESTED KIT LIST

Item	Quantity per 8 children	Item	Quantity per 8 children
Vaseline	1 small tub	Paint brushes	8
Cotton balls	1/2 bag per session	Pestle & Mortar	2
Fire gloves	2 pairs	Plastic pots	8
Fire blanket	1	Pigments	1
Matches	1 box	Chalk	1
Bucket	1	Clay	1/4 bag
Fire bowl	1	Twine	2 balls
Kindling	4 bags	String	2 balls
Firewood	1 large bag	Wool	1 ball
Scallop shells	4 for group of 8	Small scissors	8
Charcloth	1 bag	Sheath knives	4
King Alfred's cakes	1 bag	Potato peelers	4
Fire grill	1	Sharpening stone	1
Metal skewers	8	Billhooks	2
Kelly kettles	2	Rigger gloves	8 pairs
Skillet	1	Mallet for billhook	2
Dutch oven	1	Bow saw	2
Zebra Billy cans	2	Pruning saw	1
Teapot	1	Loppers	1
Drinking cups	One per child	Palm drills	4
Cutlery	Container	Secateurs	2
Cutting knife	1	Tarps	2
BBQ tongs	1	Groundsheet	1
Popcorn maker	1	Paracord	1 roll
Wooden spoons	4	Lighter	1
Plastic bowls	4	Tent pegs	1 bag
Chopping board	2	Mallets	4
Plastic plates	One per child	Sitting mats	One per child
Kitchen foil	1 large roll	Logs to sit on	One per child
Washing up liquid	1	Ropes for swings	10 meters
Washing up bowl	1	First aid kit	1
Sponges	1	Blindfolds	4
Tea towels	1	Balls	2 medium sized balls
Hand wash	1		



UNIT 1

FOREST SCHOOL PROGRAMME PLANNING AND PREPARATION

UNIT 1 | FOREST SCHOOL PROGRAMME PLANNING AND PREPARATION

HANDOUT 1 | HISTORY OF FOREST SCHOOL IN THE UK

1800s

The Romantic movement responded to the industrial movement of the 1700s. Creative freedom, childhood innocence and highlighting the power of finding connection in the natural world vs rationalism, capitalism and enlightenment.

German child centred educators emerged – Pestalozzi, Froebel and Steiner created educational philosophies where the natural world was used as a learning environment.

Early 1900s

Scouting movement created by Baden-Powell began

Margaret McMillan (1860-1931) created the ‘Open air movement’ - imaginative play approach within open air nursery school environments in Bow and Deptford in order to change and improve children’s health in the 1920s

Maria Montessori (1870-1952) emphasis on children appreciating beauty and order within nature as a living educational force.

Susan Isaacs (1885-1952) influenced by Piaget to facilitate real-life learning journeys with outdoor play. She highlighted the importance of close observation and documentation, sensitivity of response when interactive with children, reflecting on practice to support next steps and scaffolding where necessary.

Mid 1900s

Woodcraft folk formed after WW1 ‘the skill of living in the open air, close to nature’ – all members have an equal say in decision making and it was that may have influenced child-centred practice within the progressive movement.

Outward Bound Trust opened its first centre in Aberdovey in 1941 - problem-solving, experiential learning within wild landscapes. Forest school was not emphasized but became common practice within educational settings.

Scandinavian influences in the UK

In 1957 the Swedish Friluftsliv ‘free air life’ culture influenced Skogsmulle movement for early years. Meanwhile the Metsamoon movement in Finland was established – practice in both countries was based on characters, songs, stories and connections with the outdoors. In Denmark the åbørnspædagogik movement where Forest school became integral to the early years’ movement – local woodlands as a learning environment to help children become independent and socialised within their communities.

Post WWII

Rise of child- centred practice – Plowden report (1967) recommended that the UK primary education system to emphasise strengthening children’s intrinsic interests in leading their own learning, play based experiences, learning by discovery and using observation to evaluate.

1980s

The Plowden report’s recommendations were abandoned in support traditional pedagogy however the play work movement continued to advocate free, spontaneous play through adventure playgrounds – experimentation, building and using risky play.

1990s

A group from Bridgewater college went to Denmark to observe the early years settings and created their own Forest school on their return, and a training curriculum in 1995.

2000s

Creation of various Forest school networks across the UK and within local authorities with support from the Forestry Commission and other agencies supporting Forest school. These evolved into a variety of bodies e.g. Forest School Education Initiative.

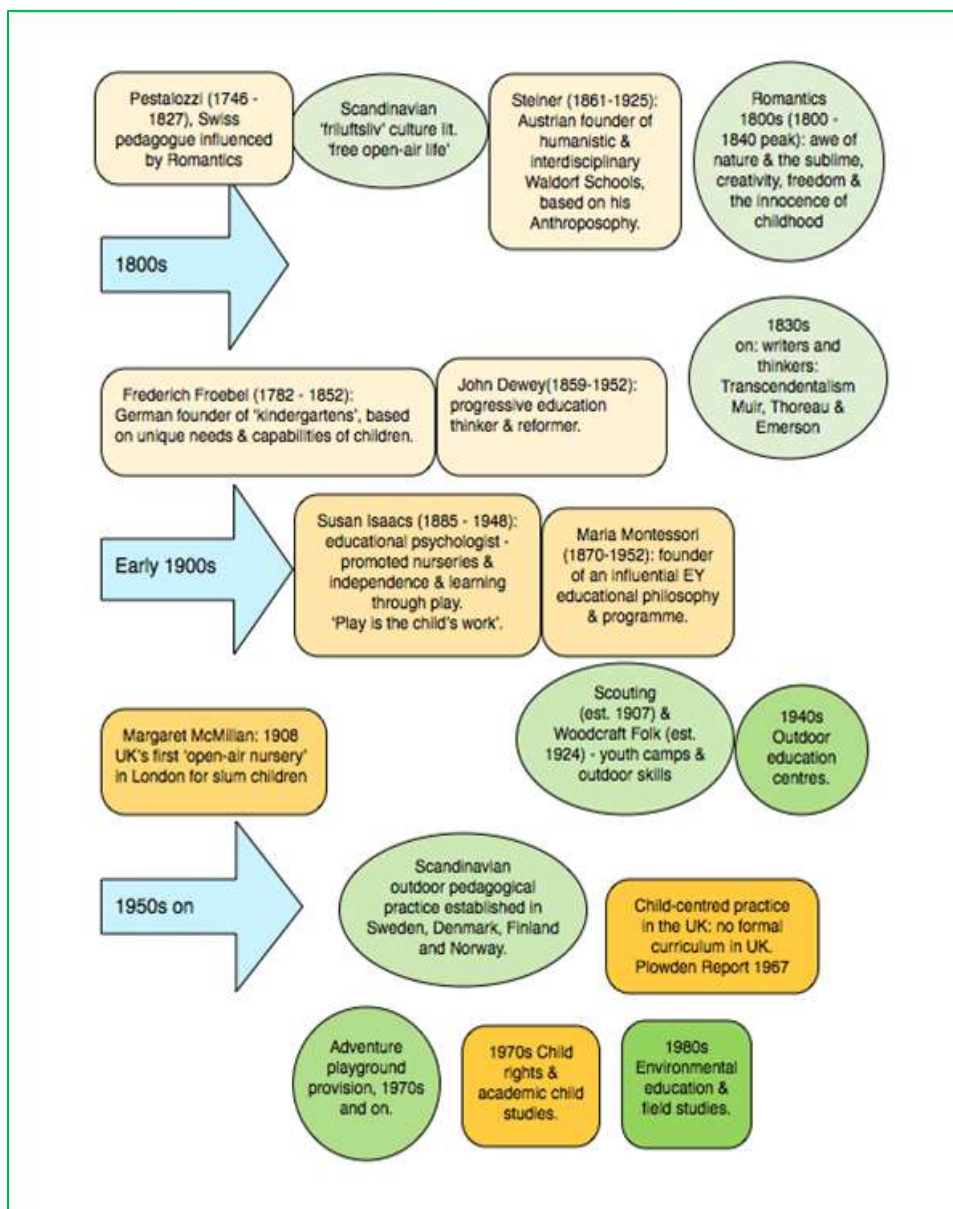
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Forest School Association created to train practitioners, support and monitor practice as a governing professional body.

More recently

Over the past two decades a growing network of Forest School practice have been evolving across the UK, ranging from outdoor nurseries based in expansive woodlands to weekly sessions held within the grounds of inner-city schools.

Although the natural environments used may vary significantly, they all focus primarily upon how the outdoors can offer an enabling environment with endless opportunities for children to explore, interact and discover. A place where child-initiated play provides the building blocks for children’s development, influencing how children learn and informing the practice and pedagogical approach of the Forest School educators, and settings as a whole. It is this relational and experiential learning that forms the foundation for confident and independent learners, and ultimately creating a community of learning among both the children and adults.



UNIT 1 | FOREST SCHOOL PROGRAMME PLANNING AND PREPARATION

HANDOUT 2 | FSA HEALTH & SAFETY GUIDANCE

Introduction to health and safety law and duties of care Contents

- What does the Health and Safety at Work Act 1974 say?
- Other duties of care and national frameworks
- Suggestions for applying health and safety law to Forest School contexts
- Links to further reading on Health and Safety Executive website

Introduction

Health and safety law is often used as an excuse to stop children taking part in exciting activities, but well-managed risk is good for them. It engages their imagination, helps them learn and even teaches them to manage risks for themselves in the future. They won't understand about risk if they're wrapped in cotton wool. Risk itself won't damage children, but ill-managed and overprotective actions could!

(Health and Safety Executive Website -Myth of the Month)

Health and safety is paramount to many aspects of Forest School. Having a strong understanding of Health and safety law and putting appropriate paperwork in place allows the Forest School practitioner to facilitate beneficial risk opportunities for the learners, that are appropriate to their needs and experience, as well as supporting the learners to develop their own risk awareness and decision making.

For definitive guidance on health and safety in the UK please visit the Health and Safety Executive [website](#).

What does the Health and Safety at Work Act 1974 say?

The Health and Safety at Work Act outlines the general legal duties an employer has to their employees and members of the public to ensure their health, safety and welfare as far as reasonably practicable. It also outlines the duties employees have to the employer and each other.

Employers' duties include:

- Deciding what could cause harm in the workplace and the precautions to stop it. This is part of risk assessment.
- Explaining, in a way employees can understand, how risks will be controlled and tell them who is responsible for this.
- Consulting and working with employees and health and safety representatives in protecting everyone from harm in the workplace.
- Give employees the health and safety training they need to do their job, free of charge.
- Provide employees with any equipment and protective clothing (PPE) they need, free of charge, and ensure it is properly looked after.
- Provide toilets, washing facilities and drinking water.
- Provide adequate first-aid facilities.
- Report injuries, diseases and dangerous incidents at work to HSE.
- Have appropriate insurance that covers all staff and members of public for tasks undertaken. Display a hard copy or electronic copy of the current insurance certificate where it can be easily read.
- Work with any other employers or contractors sharing the workplace or providing employees (such as agency workers), so that everyone's health and safety is protected.

At Forest School the 'employers' could be the Local Educational Authority in county, controlled and special agreement schools (England), or the Local Authority in Scotland. The governing body is the employer in city technology colleges, voluntary-aided, non-maintained and grant-maintained schools (England). The owner, governors or trustees are the employers in independent schools, businesses or not-for profit organisations (England and Scotland). Self-employed individuals (sole traders) are also considered 'employers' within the law.

Employees' duties include:

- Following the training they have received when using any work items, the employer has given them.
- Take reasonable care of their own and other people's health and safety.
- Co-operating with the employer on health and safety.
- Reporting to someone (employer, supervisor, or health and safety representative) if they think the work or inadequate precautions are putting anyone's health and safety at serious risk.

The Health and Safety at Work Act was originally written to support industry workplaces. However, it is still applicable to all workplaces, including Forest School.

It is important to remember that these duties are to be met ‘as far as reasonably practicable’. Much of the debate around health and safety issues is about this ‘reasonability’ – which is subjective to each individual. What may be reasonable to one person may be unreasonable to another. Therefore, before addressing these duties it is useful to reflect on our individual (and staff team) views on reasonability.

Other duties of care and national frameworks

In addition to Health and Safety Law, teachers and other practitioners in charge of children have a duty of care to act as any ‘reasonable parent’ would do in similar circumstances.

The Outdoor Education Advisors’ Panel (www.oeap.info) issues national guidance about making offsite outdoor learning visits – www.oeapng.info. (England). Scotland’s framework for safe practice in off-site educational visits is called ‘Going out there’.

If you are a Forest School practitioner who is not employed by a school but is working with them, it is still advisable to make yourself familiar with the procedures and guidance documents for schools so that you are better able to support your client groups. There are also certain things that schools will have to check for providers of educational experiences – such as policies and procedures, insurance, risk assessment etc.

Suggestions for applying health and safety law to Forest School contexts

As every Forest School programme is unique and there is great diversity between them, it is important that Forest School Leaders have a working understanding of Health and Safety Law and how they can apply it appropriately to their own context.

Using the legal duties for employers (listed above) as a framework we can consider the different areas covered and how it may be appropriate to apply them:

Aspect of H&S	What this might look like in a Forest School context
Risk Management	<ul style="list-style-type: none"> • Forest School leader actively shares their value judgement about risk and reasoning with other stakeholders. • Risk assessment and risk benefit processes are in place and implemented. • COSHH (Control of Substances Hazardous to Health) assessments undertaken & measures in place if needed. • Risk management policy and procedures written within the Forest School handbook.

<p>Effective Communication</p>	<ul style="list-style-type: none"> • Appropriate communication with learners about health and safety issues & methods in place to help learners develop their own awareness and judgements. • Ensuring learners know what to do if they encounter an unacceptable risk (who to tell, what to do etc) or when an emergency signal is made. • Communication of risk management systems and findings with other staff, volunteers, partner organisations, visitors etc. • Awareness of which member of staff is responsible for overseeing health and safety in your organisation & ensuring they are aware of Forest School. • Awareness of other groups/users of the Forest School site/location and appropriate communication undertaken to ensure they are aware of Forest School. • Communication strategy – key stakeholders identified and systems in place for effective communication.
<p>Appropriate training & supervision</p>	<ul style="list-style-type: none"> • Forest School leader appropriately trained and qualified (Level 3 Forest School practitioner) • Assistants appropriately trained, either through accredited training (Level 2 Forest School Assistant) or by the Forest School leader themselves. • Clear & appropriate processes in place for higher risk activities (such as tree climbing, wild food foraging, using tools or fire etc). These processes are shared with learners so that they understand the protocols. • Appropriate adult to learner ratios based on the risk management process.

<p>Providing & maintaining Personal Protective Equipment</p>	<ul style="list-style-type: none"> • Understanding that the decision to wear PPE is the last step within the risk assessment process and should be made after all other reasonable control actions have been implemented. • Ensuring all participants (learners and adults) have appropriate outdoor clothing and footwear for the season, terrain and weather conditions and providing this if required. • Providing any other additional PPE item required for specific tasks being undertaken (e.g. protective gloves for handling rough or thorny material, high visibility clothing for walking alongside roads, safety boots if carry heavy items or using edged tools near feet, hard hats if harvesting poles or pulling down hanging dead wood etc). • Ensuring any PPE items used meet the appropriate specifications for the task, are in good condition and size appropriate for the user. • Systems in place for storing, cleaning, checking and maintaining any PPE items and records kept.
<p>Adequate welfare facilities</p>	<ul style="list-style-type: none"> • Ensuring access to drinking water at all times. • Ensuring access to adequate hand hygiene facilities. • Ensuring appropriate toilet facilities are available or have appropriate toileting systems in place for more remote locations.
<p>Appropriate first aid provision</p>	<ul style="list-style-type: none"> • Receiving outdoor first aid training that is appropriate for the groups worked with, planned activities and site's remoteness. • Identifying a first aider who accompanies the group at all times. • Emergency equipment (including first aid kit) carried within a specific bag/box. Equipment carried is based on the site's remoteness, group and activities being undertaken. • First aid and emergency procedures in place and known by all staff/helpers. Site specific information carried in emergency bag/box. • Means of communication carried at all times (and all staff/helpers know its location).

Reporting systems	<ul style="list-style-type: none"> • Awareness of who to report incidents to within your workplace, and what information must be recorded and how. • Awareness of what must be reported to HSE according to RIDDOR (Reporting of Incidents Diseases and Dangerous Occurrences) and their guidance for schools. • Accident book/forms carried and systems in place for confidentiality. • System in place for collecting details of ‘near misses’ • Reflective processes within risk management systems to evaluate incidents/near misses and use this to inform future practices.
Insurance	<ul style="list-style-type: none"> • Ensuring appropriate insurances are in place for the site and the Forest School programme. This may involve sharing insurance documentation between different organisations. • Providing copies of insurance documents to show partners/stakeholders. • Creating a contractual agreement between the landowner/manager and the Forest School programme regarding roles, responsibilities and liability.

Ultimately one of the roles of a Forest School practitioner (Level 3) is to ensure their practice operates within all legal requirements, including the Health and Safety at Work Act.

The topics above should inform the contents of each practitioner’s health and safety policies and procedures (within their Forest School handbook).

A good understanding of health & safety and risk is what enables us to do what we do within our Forest School programmes. Careful practices that are reasonable and proportionate enable the learners we work with to experience risks and challenges that expand their experiences without putting their health and safety under unacceptable levels of risk.

UNIT 1 | FOREST SCHOOL PROGRAMME PLANNING AND PREPARATION

HANDOUT 3 | ENVIRONMENTAL IMPACT ASSESSMENT TEMPLATE

Forest School Site Description	
Name of wood/site	Location
Owner (include full contact details)	
Other identified stakeholders	
General Description: Landscape context and topography Geographical location and features (e.g., alongside river, steep slopes etc.)	

Woodland Description		
Flora	Trees	
	Plants	
	Fungi	
	Mosses	
Fauna	Birds	
	Mammals	
	Insects	

Abiotic Elements	
Water	
Soil	
Bedrock/ surface rock	

Proposed Activities					
Activity	Impact on Ground layer	Impact on Field Layer	Impact on Shrub Layer	Impact on Canopy Layer	Mitigations

UNIT 1 | FOREST SCHOOL PROGRAMME: PLANNING AND PREPARATION

HANDOUT 5 | EXAMPLE RISK ASSESSMENT

Generic Risk Assessment	
Setting Name	[...]
Site Name	[...]
Carried out by	[NAME AND POSITION]
Date	[...]
Re-assessment Date	[...]

Each Forest School session will include a **pre-session dynamic risk assessment**, which will be completed on arrival.

An **ongoing dynamic risk assessment** will also take place throughout the session. Where appropriate it may be shared with participants, so they are informed of any measure and / or expectation on them.

Physical Hazards					
Hazard	Who is harmed and how	Precautions and control measures in place	Action by who	Action by when	Further action required (Y/N)

Participant Details, Medical Information and Allergies					
Hazard	Who is harmed and how	Precautions and control measures in place	Action by who	Action by when	Further action required (Y/N)

Forest School Activities					
Hazard	Who is harmed and how	Precautions and control measures in place	Action by who	Action by when	Further action required (Y/N)

Environmental Considerations					
Hazard	Who is harmed and how	Precautions and control measures in place	Action by who	Action by when	Further action required (Y/N)

UNIT 1 | FOREST SCHOOL PROGRAMME PLANNING AND PREPARATION

HANDOUT 6 | FOREST SCHOOL RISK BENEFIT ASSESSMENT FORM

Site	
Assessor	
Date	
Review date	

Your overall risk rating – low, medium or high – is based on your judgement about whether the BENEFITS of the activity or opportunity outweigh the RISKS.

Activity	How will young people benefit from this activity?	Possible hazards	Who is at risk?	Precautions in place to reduce the risk of injury	Risk rating: l/m/h
<i>POND DIPPING: Slippery pond decking or edges</i>	<i>The decking allows close access to the contents of the pond and is an essential component of exploring this habitat.</i>	<i>Slips, trips and falls. Cuts, grazes and abrasions. Drowning.</i>	<i>Young People Adults</i>	<ul style="list-style-type: none"> ● <i>Banks shallow and planted to prevent accidental entry.</i> ● <i>No access to banks for participants; use decking or 'beach' area.</i> ● <i>Deepest area is centre of pond – keep to edges.</i> ● <i>Perimeter kept clear of dense or high foliage so pond edges are clearly defined and can be seen / avoided.</i> ● <i>Dipping platform kept clear of trip hazards (e.g. nets, trays)</i> ● <i>Pond use rules clearly displayed & reviewed before each session.</i> 	<i>Low</i>



UNIT 2

FOREST SCHOOL PROGRAMME PRACTICAL SKILLS

UNIT 2 | FOREST SCHOOL PROGRAMME PRACTICAL SKILLS

HANDOUT 1 | EFFECTIVE TOOL MAINTENANCE AND STORAGE

Storage and General Care



- Keep all tools clean and dry. Carry a rag with you to wipe off the handles in wet weather. Keep edges free from mud, or they will dull very quickly. Clean tools immediately after use. If mud is left to harden, tools will be more difficult to clean and sharpen.
- Oil all metal parts before storing to prevent rust. Ordinary vegetable oil is suitable. Wipe unvarnished wooden handles with linseed oil when new and occasionally thereafter, as this helps keep them supple.
- If handles are rough or splintery, sand them smooth. Nicks in metal handles should be removed by filing.
- Store tools in a dry, well aired building, preferable in racks or on wall brackets. Keep similar tools together.
- Hang bowsaws with the blade tension released
- Edged tools should be protected with plastic guards or with sacking or similar
- In cars, tools should be transported in a boot or covered hatchback area, preferably in a strong container

Sharpening Edged Tools



- Edged tools should go into the field sharp. Major sharpening is a workshop task and is to be avoided in the field.
- Sharpen tools at least twice a day when in use, or more often as necessary. Axes and billhooks should be checked whenever you use them.
- Use the correct whetstone for sharpening each tool. Cylindrical (cigar shaped) or flat (canoe shaped) stones can be used for billhooks. Axes are best sharpened with flat rectangular stones or round stones, fine on one side, coarse on the other.
- Stones are fragile and should be carefully stored and transported in a box. Broken stones are dangerous and should not be used.
- With a combination stone, use the coarse side first to eliminate any flaws and bring to an edge, and then the fine side after to give an even taper and good polish. Sharpen with small circular motions, as this is safer than sweeping the stone along the edge and is easier to use.
- To check for sharpness, sight along the edge. You should see a uniform taper with no light reflected from the edge itself. Reflected light indicates a dull spot, so keep sharpening until this disappears. **Don't touch the edge to check for sharpness.**

Saw Maintenance



- Oil blades frequently. When sawing through trees with resin e.g. pine trees, keep blades clean and free cutting by dousing them with an oiling mixture of 7 parts paraffin, 2 parts white spirit and 1 part lubricating oil. Wear gloves to protect your hands.
- Change bow saw blades when they are blunt or have lost their 'set'. Blunt blades are not worth sharpening and should be removed from the saw and broken in half to avoid re-use and dispose of safely.
- To change the saw blade, first release the tension. If this is hard to do by hand, put the saw on the ground with the frame upright and the blade pointing away from you, and pull back on the lever, using a metal bar if necessary. Then put your foot on the lever to hold it and push the saw frame away from you.
- Remove the rivets, position the new blade and then replace the rivets. Re-tension the blade by pressing the lever against the ground until it closes.
- A bow saw blade must be under high tension to cut straight. Increase the tension by fixing the blade using the inner holes of the pair at each end of the blade. The frame can be opened when held in a vice to increase the blade tension.

UNIT 2 | FOREST SCHOOL PROGRAMME PRACTICAL SKILLS

HANDOUT 2 | STEP BY STEP SCRIPTS FOR SAFE TOOL USE

Billhook

- This is my billhook
- This is the handle
- This is the cover
- I take the cover off like this
- This is the blade
- This is the cutting edge
- When I have finished with my billhook, I put the cover back on like this...
- I stand with my billhook like this
- I walk with my billhook like this
- I pass my billhook like this
- When I use my billhook, I have bare hands
- When I use my billhook, I use it two arms and a tool length away from everyone else who is not my partner. This is my blood bubble.
- I use the billhook to split wood
- When I am not using my billhook, I put it down with the handle facing forwards and the blade facing in
- When I have finished with my billhook, I replace the cover and put it on the ground like this or I take it back to the toolbox area

Sheath Knife

- This is my sheath knife
- This is the handle
- This is the sheath
- I take the sheath off like this
- This is the blade
- This is the cutting edge
- When I am not using the knife, I put the sheath on like this
- I stand with my sheath knife like this
- I walk with my sheath knife like this
- I pass my sheath knife like this
- When I use my sheath knife, I use it two arms and a tool length away from everyone else who is not my partner. This is my blood bubble/safe circle
- When I am cutting string or whittling, I wear a glove on my helping hand
- When I am not using my sheath knife, I put it down with the handle facing forwards and the blade facing in
- When I have finished with my sheath knife, I replace the sheath and put it on the ground like this or I take it back to the toolbox area

Bow Saw

- This is my Bow saw
- This is the handle
- This is the blade
- This is the blade cover... it comes off like this
- This is the cutting edge
- I hold my bow saw like this
- I walk with my bow saw like this
- When I use my bow saw I wear a glove on my helping hand
- I use my bow saw to cut logs that are bigger than a 50p piece
- When I use my bow saw I use it two arms and a tool length away from everyone else who is not my partner. This is my blood bubble.
- I saw with my bow saw like this
- When I have finished with my bow saw I replace the blade cover and put it on the ground like this or I take it back to the toolbox area

Palm Drill

- This is my palm drill
- This is the handle
- This is the drill
- I hold my palm drill like this...
- When I use my palm drill, I sit on a log or chair with my ankles and knees together
- I use my palm drill to drill holes into wood or sticks
- When I use my palm drill, I use it two arms and a tool length away from everyone
- I pass my palm drill like this... (handle first)
- I twist my palm drill like this...

UNIT 2 | FOREST SCHOOL PROGRAMME PRACTICAL SKILLS

HANDOUT 3 | FIRE PIT CONSTRUCTION GUIDANCE

Process

1. Carry out all site risk assessments
2. Design the fire area to fit the site you will use
 - Create a map/plan of how the area will be developed
 - Create a timescale for when stages of the map/plan will be completed
 - Construct a resources list
3. Investigate the ground and soil to understand the makeup of the soil and what could be flammable. In most woodlands the soil is made up of leaf litter, which creates a peat like soil so if not taken care of an underground fire could occur without being noticed.
4. Clear the top layer of leaf litter. Dig down to expose the soil and investigate. If the top soil is flammable consider having a sunken fire pit sat on non-flammable soil below.

Clay	Non-flammable	If the soil is dense (without much air) it is less likely to catch fire.
Stony/soil	Non-flammable	
Brown muddy soil	Non-flammable	
Peaty	Flammable	
Light, fluffy woody	Flammable	
Leaf litter	Flammable	

5. Make sure the area around the fire area is free of trip hazards to avoid participants falling into the fire and as a precaution if hot food or water is going to be carried.

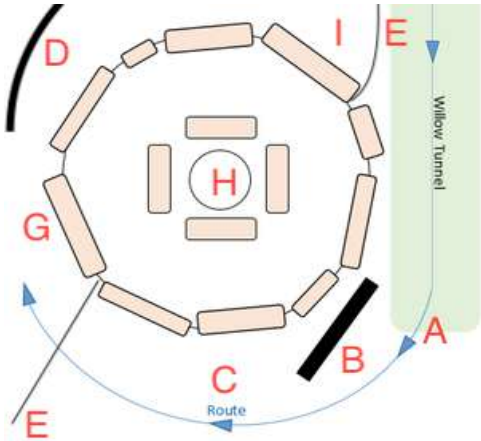
Plants, brambles	Trip hazard	Use correct tools and gloves to remove
Logs, sticks	Trip hazard	Use correct tools and gloves to remove (keep for firewood or building animal habitats)
Holes, lumps	Trip hazard	Fill in and flatten to level ground
Roots	Could become exposed to create trip hazards after site has been trampled and used	When removing consider the environmental impact. Will it affect a nearby tree or plant?
Overhanging branches	Fire hazard	Use correct tools and procedures to cut down any branches that could catch fire

6. Use the kneeling position to prevent injury around the fire. Use fire gloves to remove pots and pans off the fire.


7. Make sure you follow the guidelines below for fire site maintenance

- A bucket of water should be near the fire at all times (for extinguishing and treating burns. You may choose to have 2 containers)
- Fire area should be clear and free of trip hazards
- Check the fire area for other people’s debris (could be hazardous)
- Keep fires small and usable
- Once fire is finished spread the fire out and allow it to die down
- Use stored water to douse the fire before leaving the site
- All food debris and rubbish should be removed to prevent vermin

Fire Pit Diagram 1

 <p>The diagram shows a circular fire pit layout. In the center is a fire pit/bowl (H) with three log benches (F) around it. An outer ring of log benches (G) surrounds the inner area. A curved black line (D) represents a wind shelter. A thick black bar (B) is an entry log. A blue arrow (C) shows the direction of movement. A blue arrow (E) points to an emergency fire exit. A blue arrow (A) points to the entrance. A blue arrow (I) points to the exit. A blue arrow (E) points to a Willow Tunnel. A blue arrow (C) is labeled 'Route'.</p>	<ul style="list-style-type: none"> A. Enter from this side B. Entry log. This seat creates a barrier to stop people walking straight into the fire area C. Direction of movement. Walking behind stops people walking near or across the fire D. Wind shelter. A fence to create a wind break and stop people from approaching fire. Could include a sign directing towards the entrance E. Emergency fire exit F. Log benches G. People step over the log to sit down H. Fire pit/bowl I. Everyone exits here to avoid collisions
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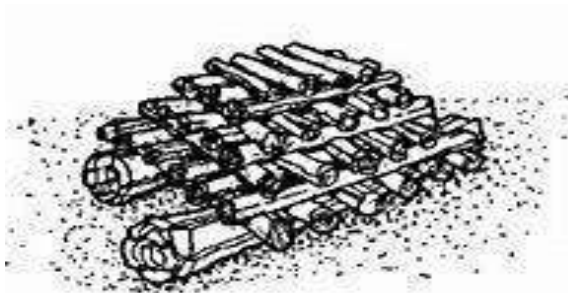
Fire Pit Diagram 2

 <p>A photograph of a stone fire pit built in a grassy area. The fire pit is circular and made of stones. A fire is burning inside, with smoke rising. The surrounding area is grassy with some weeds.</p>	<ul style="list-style-type: none"> • Carry out soil assessment first before building. • If soil is high risk, build an outer ring of stones or logs may be used to create a further barrier between the fire and the surrounding soil • N.B Porous rocks can explode or split if heated so choose your rocks carefully
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UNIT 2 | FOREST SCHOOL PROGRAMME PRACTICAL SKILLS

HANDOUT 4 | STEP BY STEP FIRE MAKING PROCESS

Waffle or Pyramid Method



Before building your fire make sure you forage for as much firewood as possible beforehand. Make sure you have a selection of kindling (the smaller/finer sticks) as well as tinder (cotton wool, hay or other material) and organise the firewood into piles starting with the smallest up to the biggest.

1. Place the first layer of the waffle/pyramid (using sticks no wider than the width of your little finger) with even spaces in between sticks.
2. Layer up the waffle/pyramid using similar/slightly smaller sized sticks until you have at least 3 or 4 layers (you could add up to 5 or 6 layers if you're making a fire on the ground or in a fire bowl) on top to create a platform.
3. On the top layer add the tinder with some kindling
4. Ignite the fire and add a handful of kindling straight away and keep feeding the fire using the firewood you've collected at regular intervals



Tepee Method



Before building your fire make sure you forage for as much firewood as possible beforehand. Make sure you have a selection of kindling (the smaller/finer sticks) as well as tinder (cotton wool, hay or other material) and organise the firewood into piles starting with the smallest up to the biggest.

1. Build a platform using 3 or 4 flat pieces of kindling
2. Place some tinder at the centre of the platform and place a bit of kindling on top
3. Place the 2- 4 of the thinnest sticks around the tinder and kindling before igniting the fire
4. Keep adding the fuel around the fire using the organised piles of firewood you collected



Fire Pyramid



When building your fire and keeping it alight always remember the elements that will keep your fire going. If your fire is going out, try to identify which part of the triangle needs attention.

UNIT 2 | FOREST SCHOOL PROGRAMME PRACTICAL SKILLS

HANDOUT 5 | ROPES, KNOTS AND SHELTERS TECHNIQUES

Rope and Cord Suppliers

Suppliers of rope and chord:

<http://www.ropesdirect.co.uk>

<http://www.ropesandtwines.com>

<http://www.skylandequipment.com/tree-rigging/rigging-rope.html> (For rope swings we recommend static rope with breaking strain of 20 kg plus)

For paracord look at the Forest school shop or Muddy Faces websites:

<http://www.forestschoolshop.co.uk>





<http://www.muddyfaces.co.uk>

Resources for Learning Knots






We find the following 3 apps the most helpful:

- Animated knots by Grog
- Useful knots
- Knots 3D







Timber Hitch Knot

	<p>1. Create a half hitch on the tree to start</p>
	<p>2. Twist the working end around the rope next to the tree</p>
	<p>3. Keep twisting the rope around until you have gone around the rope three times</p>
	<p>4. Pull both ends tight until the rope is tight against the tree</p>






Clove Hitch with Hitches Knot


	<p>1. Make two loops in a rope - starting with the loop on the left (making a fish and then a plate)</p>
	<p>2. Place the loop on the left on top of the one on the right (putting the fish on top of the plate)</p>
	<p>3. Place the loops over the top of the post</p>
	<p>4. Take both ends of the rope to tighten</p>
	<p>5. Pull the rope tight against the tree</p>

Square Lashing Knot




	<p>1. Make a clove hitch on the end of one stick</p>
	<p>2. Place another stick across the stick above the clove hitch</p>
	<p>3. Take the working end of the rope to go over the horizontal stick</p>
 	<p>4. Keep passing the rope over and under both sticks until you have passed the rope around the sticks three times</p>
	<p>5. After the third lashing frap the rope in between the sticks, pulling it tight as you go and tie the ends using a reef knot</p>

Prusik Knot

	<p>1. Hold a loop in front of a ridgeline between two ends</p>
	<p>2. Pass the loop over and behind the ridgeline, keeping the loop in between the two ends.</p>
	<p>3. Pass the loop over the ridgeline another two times - keeping the loop in the middle each time and pulling it tight each time.</p>
	<p>4. Once you have six lines on the ridgeline take a hold of the ends of the rope and keep the loop open</p>
	<p>5. Pass the ends in, down and through the loop</p>

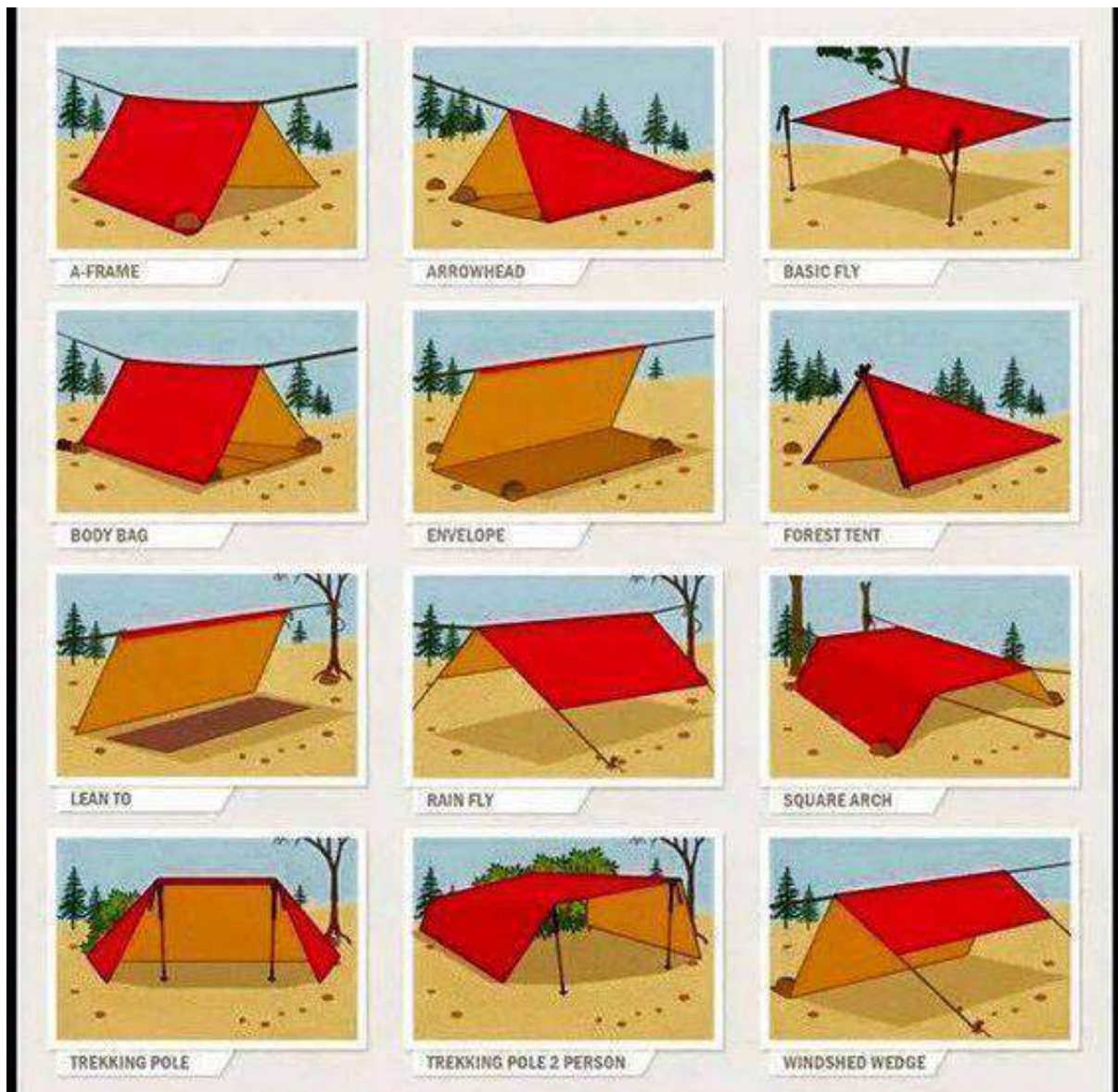
	<p>6. Pull the ends tight. Test the knot by sliding it up and down the ridgeline before tying the knot to a tarp.</p>
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Reef Knot

	<p>1. Take the right end of the rope and pass it over the left and pass it under</p>
	<p>2. Take the left end of the rope and pass it over the right and pass it under</p>
	<p>3. Pull the ends tight to make the knot</p>

UNIT 2 | FOREST SCHOOL PROGRAMME PRACTICAL SKILLS

HANDOUT 6 | OVERVIEW OF SHELTER TYPES



Types of Natural Dens

Debris Shelters



1. Create a tripod structure using one pole as long as your body to make the ridgeline and two shorter poles with a V shape at the top
2. To make the rib cage use a series of logs that lean against either side of the ridgeline pole
3. Once the structure is complete cover the shelter with leaves or other material to keep you dry once inside

Useful videos:

https://www.youtube.com/results?search_query=bushcraft+shelter

<https://www.youtube.com/watch?v=Cfx6l0rajOo>

Lean to Shelters



1. Find 3 poles with a Y shape at the top of each one and saw to make them equal in length and whittle the end of each one to make spiked ends and put them in the ground at equal distances
2. Place a pole across the top of the three poles to make a frame
3. Use poles to lean against the back of the frame towards the horizontal pole
4. Cover the back frame with as many as poles as you can to cover the poles to create warmth



UNIT 3

**FOREST SCHOOL PROGRAMME
LEARNING AND DEVELOPMENT**

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING & DEVELOPMENT

HANDOUT 1A | TAXONOMY OF PLAY TYPES

COMMUNICATION PLAY

Play using words, nuances or gestures e.g. mime, jokes, play acting, teasing, singing, debate, poetry

CREATIVE PLAY

Play that allows a new response, the transformation of information, awareness of new connections, with an element of surprise e.g. enjoying creating using a range of materials and tools for their own sake

DEEP PLAY

Play that allows the child to encounter risky or life-threatening experiences, to develop survival skills and conquer fear e.g. climbing trees to an out of reach heights, balancing on a beam etc.

DRAMATIC PLAY

Play that dramatizes events in which the child is not a direct participant e.g. presenting a TV show, a festival or party or another significant event

EXPLORATORY PLAY

Play to access factual information consisting of manipulating actions such as handling, throwing, banging or mouthing objects e.g. engaging with an object or area by movement, assessing its properties, content and latent possibilities such as stacking bricks, mixing mud and water

FANTASY PLAY

Play that rearranges the world in the child's way in a way that is unlikely to happen to the child in the immediate e.g. being a wizard, a pilot or the owner of an expensive car

IMAGINATIVE PLAY

Play where the conventional rules, which govern the physical world, don't apply e.g. pretending to be a tree, ship or animal

LOCOMOTOR PLAY

Movement in any direction e.g. chasing, playing tag, hide and seek

MASTERY PLAY

Control of the physical and affective elements of the environments e.g. digging holes, building shelters and fires, using tools

OBJECT PLAY

Play that uses infinite and interesting sequences of hand-eye movements e.g. examining and alternative uses of an object such as a paintbrush or cup

RECAPITULATIVE PLAY

Play that is a recap of human historical evolutionary events e.g. rituals, fire making, den making, using weapons, caring for other species

ROLE-PLAY

Play exploring ways of being, although not normally of an intense personal, social, domestic or interpersonal nature e.g. sweeping the floor, dialling with a phone, driving a car

ROUGH AND TUMBLE PLAY

Close- encounter play that is less to do with fighting and more to do with touching, tickling, testing strength and flexibility and the exhilaration of display e.g. playful fighting, wrestling and chasing where the children are unhurt and having fun

SOCIAL PLAY

Play where the rules and criteria for social connections and interactions are revealed, explored and adjusted e.g. social, interactive scenarios where the rules and protocols are to be followed i.e. games, conversations, making something

SOCIO-DRAMATIC PLAY

The enactment of real and potential experiences of an intense personal, social or domestic nature e.g. playing at house, going to the shops, being 'mums and dads', organizing a meal or having an argument

SYMBOLIC PLAY

Using symbols to represent as other 'real' objects. This play supports children's control, gradual exploration and increased understanding of the world without being out of depth e.g. a stick to represent a person, a stone as a pet dog

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT**HANDOUT 1B | SEVEN PRINCIPLES FOR CHILDREN AND NATURE**

PRINCIPLE 1: ADVENTURE

This includes activities that include a physical challenge, risk taking, and kinaesthetic components e.g. adventure-based games, balancing, jumping and other ways of moving through the natural world

PRINCIPLE 2: FANTASY AND IMAGINATION

This includes activities that inspire creative imaginative stories, plays, puppet shows, and dreams. e.g. props to use for storytelling, dressing up costumes and accessories

PRINCIPLE 3: ANIMAL ALLIES

This includes spaces and activities that connect children to the animal kingdom e.g. activities such as building bird boxes, making bird feeders, observing animals in their habitats

PRINCIPLE 4: MAPS AND PATHS

This includes activities that include map making, following paths and trail blazing e.g. scavenger hunts, steppingstones, journeys, following trails etc.

PRINCIPLE 5: SPECIAL PLACES

This includes activities that offer the opportunities for children to hide away e.g. hidden dens, sit spots

PRINCIPLE 6: SMALL WORLDS

This includes activities that centre around miniature worlds e.g. small world models and toys that encourage building and deconstructing worlds

PRINCIPLE 7: HUNTING AND GATHERING

This included activities that include hunting and gathering games, collecting treasures and climbing e.g. collecting pebbles/stones, sticks, treasure hunts

See *“Childhood and Nature. Design Principles for Educators.”* by David T Sobel published by Stenhouse Publishers (2008)

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT**HANDOUT 2C | RISKY PLAY CATEGORIES**

PLAY WITH GREAT HEIGHTS

Climbing trees, jumping off trees, balancing on branches, slippery fallen trees

PLAY WITH HIGH SPEED

Running, cycling, speeding downhill, rolling, sliding on mudslides

PLAY WITH HARMFUL TOOLS

Using knives, saws, billhooks, hammers and other 'dangerous' tools

PLAY NEAR DANGEROUS ELEMENTS

Playing near fire, ponds, rivers, cliff edges

ROUGH-AND-TUMBLE PLAY

Playing chase and catch, wrestling, sword fighting, snowball fights etc.

PLAY WHERE THE CHILDREN CAN 'DISAPPEAR' OR GET LOST

Playing hide and seek, hiding in trees/shelters etc.

When children engage with risky play activities, they experience a combination of fear and exhilaration - this is the 'emotional goal' of the risky play for them as they seek to feel exhilarated but keep the fear at bay. Finding a balance between the two emotions becomes important in order for children to discover the benefits of those activities. The child will be focused on the experiencing the enjoyment of the risk, while balancing on the edge of the fearful emotions. If a child experiences too much fear, then the risk of injury or withdrawal from the activity becomes more likely.

See "Children's Expressions of Exhilaration and Fear in Risky Play" by Ellen Beate Hansen Sandseter published in Contemporary Issues in Early Childhood Volume 10 Number 2 2009 for full details of the study.

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT

HANDOUT 2 | RECENT DEVELOPMENTS IN PLAY POLICY

The last Labour government had introduced a 12-year Play Strategy for England, but Children’s Play has not been as prominent in the national debate since the Coalition Government abandoned that strategy in 2010.

There are however a number of developments around Play and Play Policy, both at the national and international level, which the links below cover.

UN Convention on The Rights of The Child	https://www.unicef.org/crc/files/Rights_overview.pdf
Children’s Play Policy Forum	https://childrensplaypolicyforum.wordpress.com/
Play England Charter	http://www.playengland.net/wp-content/uploads/2015/09/charter-for-childrens-play.pdf
Children’s Rights Alliance for England	http://www.crae.org.uk/media/78665/crae_civil_society_report_to_un_web.pdf
World Economic Forum Real Play Coalition	https://www.weforum.org/agenda/2018/01/to-play-is-to-learn/ https://www.realplaycoalition.com/about-us/

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT

HANDOUT 3 | JEAN PIAGET’S THEORY OF SCHEMAS AND COGNITIVE DEVELOPMENT

Piaget believed that intelligence is not fixed but a process that evolves and changes as biological maturity occurs and as interaction with the environment happens. Therefore, cognitive development is something that can be influenced and adapted.

One aspect of Piaget’s theory focused on the building blocks of human behaviour, which he classified as schemas. These spontaneous actions are the responses that children use when engaging with the world and are unique to each child. Some children use a pattern of schemas, some use one distinctively and others are less obvious in their use. As children demonstrate their use of schemas, we have the opportunity to support children to connect what drives them with the activities that they choose to participate in.

The schemas that Piaget observed cover a variety of interests and impulses.

Trajectory	
Vertical Trajectory	Horizontal Trajectory
<ul style="list-style-type: none"> • Jumping up and down • Fascinated with running water • Likes building high • Enjoys carrying sticks • Bouncing balls • Climbing up and down • Sliding down slides 	<ul style="list-style-type: none"> • Placing objects in a line or a row • Enjoys pushing prams and trolleys • Walking on lines • Sweeping or mopping the floor • Rides a bicycle in lines

Transporting
<ul style="list-style-type: none"> • Carrying bags containing objects • Pushing prams/trolleys with objects in • Carrying water in containers • Carrying planks and bricks • Being a ‘driver’ and taking friends on rides/trips

Connection

- Glue, sew or fasten fabric in lines
- Nail pieces of wood together in construction
- Use string, rope, wool etc. to tie objects together
- Drawings and paintings sometimes show linked parts
- Tying things together
- Enjoying toys that link or connect

Rotation

- Enjoys using whisks
- Turning or spinning objects
- Spinning on chairs
- Watches washing machines
- Fascinated with wheels, keys, cogs, taps
- Constructs with objects with rotating parts in wood etc.
- Loves cars, bikes, trucks and objects with wheels
- Rides a bicycle round and around in circles

Circularity

- Circles appear in paintings, drawings as heads, bodies, eyes etc.
- Circles to represent animals, flowers, wheels, the sun and other objects

Enveloping

- Completely cover objects, space or themselves
- Like to dress up using hats, scarves and other items
- Wraps dolls or teddies in blankets
- Wraps things in paper, encloses them in pots and boxes with covers and lids
- Wraps themselves in a blanket, or creep under a rug
- Glue layers of paper or fabric into a collage
- Fill bags with collections of things

Enclosure

- Builds enclosures with blocks, Legos, bricks, crates and maybe name them e.g. pond, boats, beds
- Leaves the enclosure empty or carefully fills it
- Puts an enclosing line around the paintings or drawings

Filling

- Filling containers with a variety of materials e.g. sand in buckets, holes in the ground
- Putting water in containers
- Placing objects in bags

Boundary

- Moving, crawling through boundaries e.g. pushing a train through a tunnel, water through a hose, crawling through a tunnel

Orientation

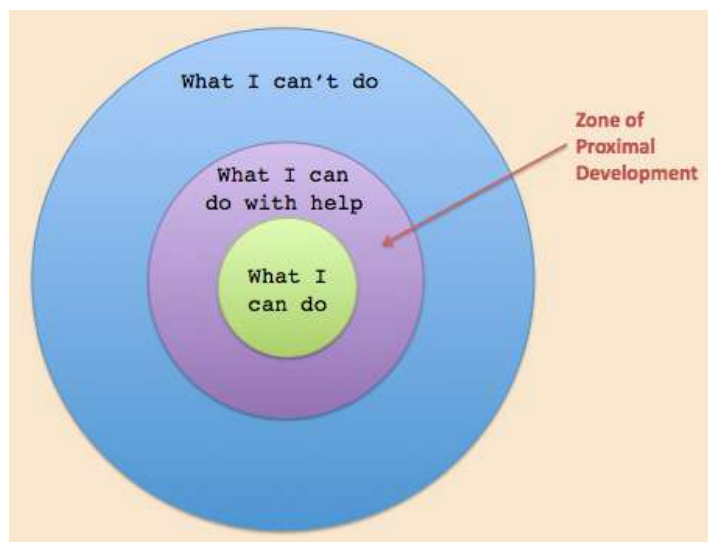
- Turning things upside down to look at them
- Examining underneath objects
- Hanging upside down to observe others
- Bending to look at the world from different directions including between their own legs

See "Again! Again! Understanding schemas in young children" by Stella Louis, Clare Beswick, Liz Magraw, Lisa Hayes published by A&C Black (2008)

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT

HANDOUT 4 | VYGOTSKY'S SOCIAL DEVELOPMENT THEORY

The Zone of Proximal development or ZPD is what Vygotsky defined as the space or difference between what a learner can do without help and what they can do with guidance and support from an educator or skilled partner. The term 'proximal' refers to the skills that the learner is 'close' to mastering and becoming able to carry out independently.



The ZPD becomes the area where instruction and 'scaffolding' (Wood, Bruner and Ross 1976) becomes beneficial. The scaffolding can take the form of focused questioning, positive interactions and the creation of small achievable tasks to help the learner feel success and supported.

As the task or activity is repeated over time the support provided is reduced as the learner becomes more competent and closer to becoming an independent problem solver.

Wood et al (1976) recommended particular strategies to support the scaffolding process.

- Gain and maintain the learner's interest
- Make the task simple
- Emphasise certain aspects to help with the solutions
- Control the learner's level of frustration
- Demonstrate and model the task

How do you think this theory relates to the skills taught through a Forest school experience?

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT

HANDOUT 5 | HOWARD GARDNER'S THEORY OF MULTIPLE INTELLIGENCES

PEOPLE SMARTS ARE NORMALLY GOOD AT...

- Caring about others
- Sharing with others
- Working with others
- Making/having lots of friends
- Communicating
- Playing games with others
- Explaining a point of view

NATURE SMARTS ARE NORMALLY GOOD AT...

- Investigating the natural world
- Being at ease in the natural world
- Understanding natural phenomena
- Fascinated by nature, plants and creatures
- Gardening/growing
- Looking after animals
- Understanding environmental issues
- Being outdoors

SELF-SMARTS ARE NORMALLY GOOD AT...

- Working independently
- Being alone
- Imagining/telling stories
- Needs quiet spaces and alone time
- Self-motivation
- Planning and organising
- Thinking

WORD SMARTS ARE NORMALLY GOOD AT...

- Learning by listening
- Reading/understanding word sounds
- Verbalizing feelings and emotions
- Discussions
- Word games
- Remembering words from songs/lyrics / Remembering trivia

MATHS/LOGIC SMARTS ARE NORMALLY GOOD AT...

- Counting
- Puzzles
- Problem solving
- Using clear reasoning
- Finding abstract patterns
- Computer games

BODY SMARTS ARE NORMALLY GOOD AT...

- Lifting and carrying
- Communicating through gestures
- Learning by touch and feel
- Building structures
- Role-playing
- Dancing
- Sports and physical activities
- Shaping and sculpting materials

MUSIC SMARTS ARE NORMALLY GOOD AT...

- Singing
- Remembering songs and rhymes
- Enjoying playing an instrument
- Listening to music
- Noticing non-verbal sounds in the environment
- Learning a rhythm
- Tapping and clapping

PICTURE SMARTS ARE NORMALLY GOOD AT...

- Learning by watching and looking
- Attention to detail
- Making things look right
- Being creative
- Noticing colours and form
- Choosing their own clothes to wear or dress up in

What intelligences do you see in your group of children?

How could we plan a Forest School session to cater for children displaying these intelligences?

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT

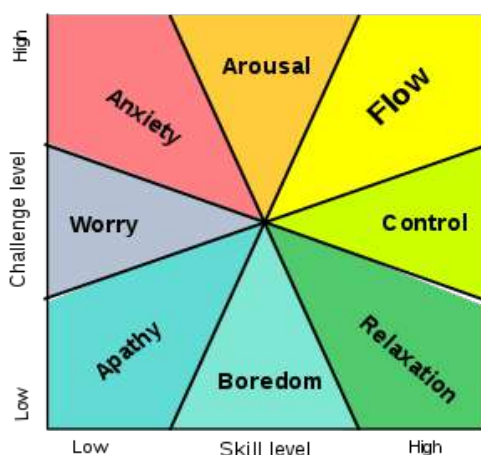
HANDOUT 6 | MIHALY CSIKZENTMIHALYI'S FLOW THEORY

Csikszentmihalyi's theory of the flow state of mind seeks to explain how we can immerse ourselves in a state of complete happiness when participating in a variety of activities. Those activities extend across all human life, including how we work, play and relate to others. Csikszentmihalyi's theory shows that if we understand how we can tap into this concept of flow, how we engage with the world can become more enriching, feel more harmonious and a state of inner happiness can be established.

According to the studies completed by Csikszentmihalyi, when we immerse ourselves in an activity, we can experience true enjoyment when the following components occur:

- The task we are trying to complete feels achievable.
- We are able to concentrate on the task
- The task has clear goals
- Immediate feedback is provided after the task is complete
- We can immerse ourselves so completely and effortlessly in the task that we become removed from external worry and frustrations
- We are able to control our actions
- Once the task is complete our sense of self is strengthened

In essence, it is a balance between the level of challenge involved in an activity and the skill required to complete it.

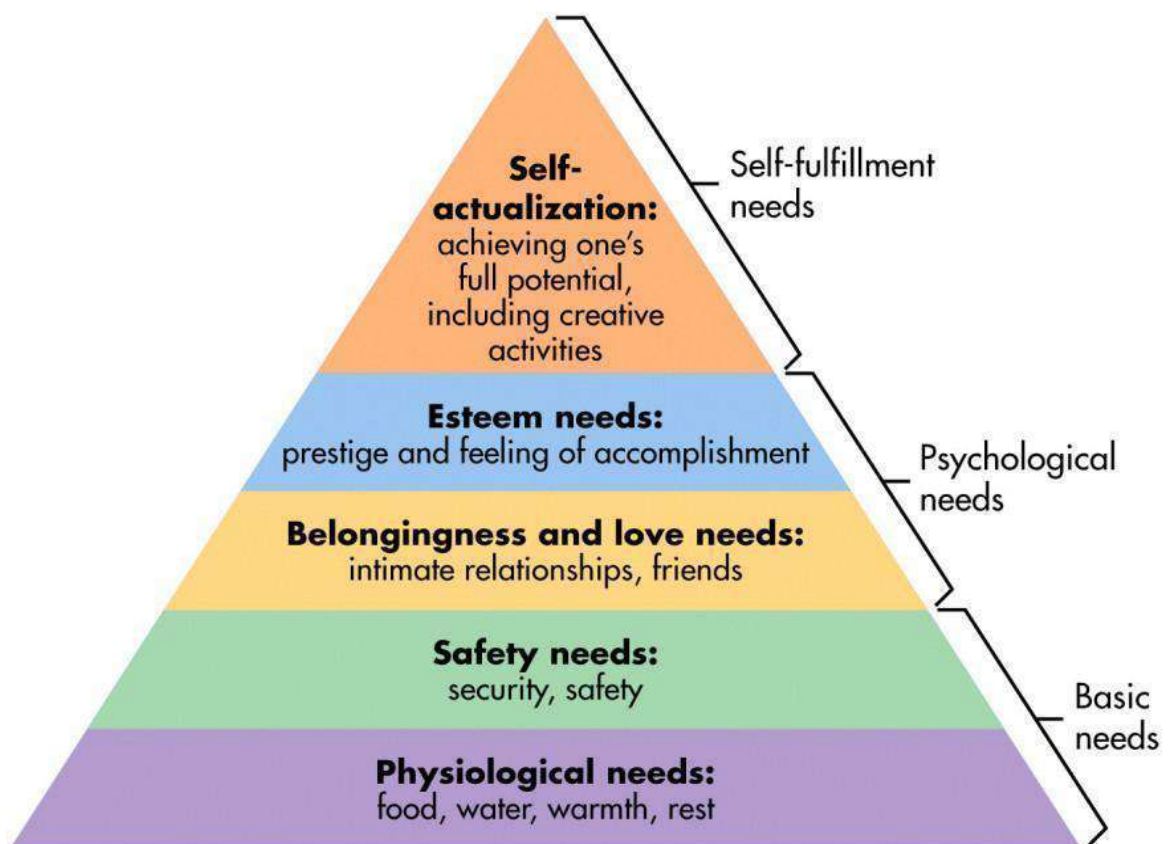


See "Flow. The Classic Work on How to achieve happiness" by Mihaly Csikszentmihalyi published by Random House (2002)

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT

HANDOUT 7 | MASLOW'S HIERARCHY OF NEEDS

Maslow's theory focuses on how we understand our motivations and how they interrelate within a hierarchy. Maslow stated that we have 5 motivational needs, which are connected and are in relationship with each other (see the image below).



The first stages of the hierarchy are what are known as the basic needs (physiological, safety and security, love and belonging, self-esteem) and our motivation is stimulated when those needs are not met according to their position in the hierarchy. In addition, the longer we go without one element the stronger the desire becomes e.g. the more we go without eating the hungrier we become. In order to progress we have to satisfy our lower level needs before moving onto the higher levels. If we fulfil the needs at each level, we become more able to reach the growth level or self-actualization. Although, our self-actualization can take us in different directions we all experience it through peak experiences and the emotions of euphoria once they are experienced.

Maslow stated that there are particular behaviours that lead to self-actualization and help us satisfy our basic needs as we progress through the hierarchy. These behaviours are:

- Experiencing life like a child with full absorption and concentration
- Trying new things rather than sticking to the same paths
- Listening to your own feelings when evaluating experiences instead of the traditional voices of authority
- Avoiding pretence and being honest
- Being prepared to be unpopular
- Taking responsibility and working hard
- Trying to identify personal defences and have the courage to give them up

UNIT 3 | FOREST SCHOOL PROGRAMME LEARNING AND DEVELOPMENT

HANDOUT 8 | THE BENEFITS OF FOREST SCHOOL TO CHILDREN

There is a growing body of research that illustrates the importance of environmental experience and contact with nature in childhood to promote children's physical and mental health and wellbeing. Forest School is proven to play an important role in this regard.

The benefits of being outdoors: Improved Mental Health, Wellbeing and Self Confidence

Many studies show a link between outdoor activities and significant improvements in psychological and emotional wellbeing in children.

The freedom to play in the fresh air, running free and just "be a kid", away from the confines of four walls, is important to them. When playing outdoors, there are fewer rules.

Outdoor play allows children's bodies to produce vitamin D from its best natural source, the sunlight. Vitamin D enhances mood by helping to release serotonin in the brain. Children need healthy levels of serotonin for good mental health and development.

Playing outdoors in a natural environment is also thought to help relieve stress by reducing levels of cortisol, a "stress hormone", in the brain. Children are frequently exposed to stressful environments such as busy, noisy urban areas, flashing screens and pressured classrooms, which can lead to anxiety and depression. Playing outdoors offers some escape.

With improved well-being comes self-confidence. From having the freedom, time and space to learn, grow and develop independence. When playing outdoors, children discover nature and how the world works for themselves. They'll naturally play with peers and learn how to interact with others. They may fall, have bumps and scrapes, but they'll learn to pick themselves up and learn from their own mistakes. These are all good life skills that will see them well into adulthood.

The benefits of being outdoors: Physical Development and Battling Obesity

Childhood obesity is one of the most serious global public health challenges for the 21st century. Obese children have an increased risk of developing health problems. They're also more likely to become obese adults. The UK has the highest level of childhood obesity in Western Europe.

Regular exercise is an essential part of keeping fit, maintaining a healthy weight and combating obesity. Getting children outdoors and moving can help solve the problem of obesity.

PHYSICAL HEALTH

Below are the key findings from broad reviews of studies and research relating to children, nature and physical health.

- ▶ Modern life has brought astonishing technological advances, but it has also led to rapid changes in ways of living that have pervasive health outcomes.
- ▶ Lifestyles have so changed that obesity has within a generation risen in incidence to take it from 3–6% of adult populations to more than 25% in many industrialised countries.
- ▶ Wales has among the highest levels of overweight or obese children in European and North American countries, at 21% and 18% for 15-year-old boys and girls respectively.
- ▶ The cost of physical inactivity to the economy in England is calculated to be £8.2 billion per year (£1.7 billion for the NHS, £5.4 billion for work absence and £1 billion for early mortality).
- ▶ There is strong evidence to show that by the time children leave secondary school their attitude to exercise is highly predictive of whether they will be physically active as adults.
- ▶ The strongest relationship is with the quality of exercise they have experienced, as opposed to the quantity of exercise.
- ▶ Nature is a major motivating factor for exercise. There is very strong evidence that being outdoors is the most powerful correlate of physical activity, particularly in pre-school children.
- ▶ Children increase their physical activity levels when outdoors and are attracted to nature.

Sources: Bird (2004); Prety at al (2009); WAG (2009)

MENTAL WELLBEING

Building on the research on physical health benefits, researchers subsequently reviewed studies about nature and mental wellbeing, finding:

- ▶ The estimated total cost of mental health in England is £77 billion per year.
- ▶ 8.3% of children and young people aged 5–15 years in Scotland are reported to have a mental disorder. This figure includes emotional disorders, conduct disorders and hyperkinetic disorders.
- ▶ There is a steady increase in the use of medication in childhood mental illness. More than 40,000 children now use anti-depressants, following a sharp rise over recent years.
- ▶ The immediate outcomes of contact with nearby nature include enjoyment, relaxation and lowered stress levels. The longer-term, indirect impacts also include increased levels of satisfaction with home and work life, and with life in general.
- ▶ Children with stressful life events are more likely to develop mental health problems. There is evidence that children who experience stressful events in their lives are less stressed and have a higher global self-worth the more they are exposed to nature.
- ▶ Attention Deficit Hyperactivity Disorder (ADHD) is a significant public health problem that affects 5–10% of school children in the UK. It is characterised by overactive and impulsive behaviour and difficulty in paying attention, causing disruption to those around and reducing the chance of success as an adult.
- ▶ Outdoor activities in nature appear to improve symptoms of ADHD in children by 30% compared with urban outdoor activities and threefold compared with the indoor environment. All children with ADHD may benefit from more time in contact with nature, greener routes to school and more natural views from their windows.

Sources: Bird (2007); SDC (2008); Munoz (2009)

The Benefits of Forest School to the Emotional Well-being of Children

The natural environment offers children opportunities to establish the deep thought processes that are needed in order to assimilate into their lives, the causes and consequences of change, new situations or distressing occurrences. These processes need time, space, peace and freedom, which are less available in an indoor environment.

Creating a forest school environment and ethos for children in early years settings helps children to develop the strength and resilience needed to cope with emotional challenges and difficulties. Children taking part in forest school sessions quickly show evidence of a greater emotional maturity.

Great empathy for the living environment may emerge, with much tree hugging and care taken not to disturb animals and growing plants. The children frequently show concern for each other and take responsibility for ensuring each other's safety, they may remind each other of areas of risk or spontaneously use familiar safety games to ensure everyone remains within hearing. Stronger bonds often emerge between children, resulting in greater support for each other, both at forest school and outside.

The Benefits of Forest School to the Physical Well-being of Children

A forest school environment gives children the space and freedom that may not otherwise be available in their lives. Children are growing all the time and need space to experiment with their changing size and strength. Some children's lives have little space to move, houses are smaller, parents are more cautious, classrooms are too full and expectations within them are restrictive, but developing strong bones and muscles requires space for physical challenges and extended movement opportunities.

The natural environment also promotes the development of children's learning through their senses and can help to protect those senses. Research shows evidence that spending time engaged in activities in a natural environment helps to prevent the deterioration of children's eyesight.

Many behavioural difficulties also have their roots in children's struggles with physical and emotional issues. While the ethos and expectations of forest school sessions may help children to control the consequences, the natural environment offered by forest school can also go some way to enabling children to cope with the causes of their behavioural difficulties.

Children have preferred learning styles. Forest school activities provide opportunities for visual, auditory and kinaesthetic learning within each activity. Forest school activities are flexible, enabling all children to achieve with a degree of challenge, building confidence and self-esteem and encouraging the perseverance that will help to build resilience.

Forest school activities encourage children to form bonds with children and adults as they work together to achieve. Children learn to take responsibility for themselves and for others as well as developing their sense of self preservation.

Just as the natural environment can be calming and reassuring to children so can it also for the adults involved. We should not underestimate the impact of this on children's behaviour and expectations, children easily pick up on an adult's emotional state – calm adults can equal calm children.

At forest school children have an environment that is rich, varied and ever changing. Less restrictive than a classroom it enables confident exploration in a safe but challenging environment. Forest school enables children to develop their awareness of safety and to take control of their environment. Forest school is full of opportunities for exploration, which is at the heart of learning. Children discover connections and find new and innovative ways of doing things and achieving, supported by adults to think critically. Forest school and forest school activities support the holistic nature of children's exploration and learning.

FURTHER READING

Forest Schools & Mental Wellbeing, Anna Roberts
Canterbury Christchurch University, 2017

http://create.canterbury.ac.uk/16363/1/Anna_Roberts_MRP_2017.pdf

Investigating the effectiveness of Forest School sessions on children's physical activity levels
Clare Austin, Dr Zoe Knowles and Jo Sayers, 2013

<https://www.merseyforest.org.uk/.../Austin,+C.,+Knowles,+Z.+and+Sayers,+J.+Forest+...>

Forest and nature school in Canada: A head, heart, hands approach to outdoor learning
H. Andrachuk. et al., 2014

<http://childnature.ca/wp-content/uploads/2017/10/FSC-Guide-1.pdf>

Student outcomes and natural schooling, Karen Malone & Sue Waite, 2016

https://www.plymouth.ac.uk/uploads/production/document/path/6/6811/Student_outcomes_and_natural_schooling_pathways_to_impact_2016.pdf



UNIT 4

**FOREST SCHOOL PROGRAMME
DELIVERY**

UNIT 4 | FOREST SCHOOL PROGRAMME DELIVERY

HANDOUT 1 | FOREST SCHOOL SESSION PLAN TEMPLATE

As much as possible, Forest School sessions should be child-led and free-flowing, and lesson plans need to reflect that by being more fluid than traditional lesson plans.

The idea is to make notes to help you structure your session and encourage you to think about what you are planning to do, what experiences you will offer your learners and the impact you may have.

1	What is the theme for the session?	
2	How does it fit in with previous / forthcoming themes?	
3	What are your learning objectives for this session?	
4	What sequence could your activities follow? <ul style="list-style-type: none"> ● Activity 1 ● Activity 2 ● Activity 3 ● Activity 4 ● Etc. 	

5	How could you differentiate these activities?	
6	What health & safety considerations should you keep in mind?	
7	What resources, equipment and tools will you need?	
8	What opportunities are there for reflection?	

UNIT 4 | FOREST SCHOOL PROGRAMME DELIVERY

HANDOUT 2 | PARTICIPATION & OBSERVATION IMPACT FORM

Child's Name:				
Child Observation Form		Score 0 – 5 (0 is lowest - 5 is highest)		
Area of Development	Skills	Before Week 1	Week 3	Week 6
Self-esteem & confidence	Happy to take risks			
	Able to speak up for themselves			
	Wanting to try something new			
	Aware of own needs			
	Able to tolerate obstacles to fulfilling tasks			
	Able to lead group in tasks			
Social Skills	Able to work in a team			
	Able to wait and take turns			
	Able to form relationships			
	Contributing to group discussions			
	Total			

Child's Name:				
Child Observation Form		Score 0 – 5 (0 is lowest - 5 is highest)		
Area of Development	Skills	Before Week 1	Week 3	Week 6
Language and Communication	Able to share ideas with a friend			
	Able to take turns to speak			
	Listening to instructions			
	Holding eye contact			
	Responding to stories, songs and poems			
Motivation and Concentration	Excited and interested in activities			
	Able to take time to perfect a task			
	Maintaining attention			
	Asking questions during a task			
	Total			

Child's Name:				
Child Observation Form		Score 0 – 5 (0 is lowest - 5 is highest)		
Area of Development	Skills	Before Week 1	Week 3	Week 6
Physical	Able to move around on uneven ground			
	Has physical stamina			
	Has spatial awareness			
	Aware of physical space of self and others			
	Able to climb up onto trees and grip branches			
	Total			
	Overall total of all areas			

Summary of child's abilities/strengths/areas of development

Provide recommendations for extending the children's learning and development in future sessions

UNIT 4 | FOREST SCHOOL PROGRAMME DELIVERY

HANDOUT 3 | FOREST SCHOOL LEADER REFLECTION ON PRACTICE

Thinking points for reflection diary

You can complete your reflection diary using any method that feels meaningful and purposeful. This may take the form of an actual diary or illustrated scrapbook, but you can also use other methods, such as video clips, a blog, a podcast or photo diary.

You should complete a reflection after each of your six Forest school sessions, but you could also complete additional reflections when you're practising your practical skills e.g. tool use, fire building etc.

Here are some key questions and thoughts that you might find helpful when completing your reflection diary.

- Include a summary of what happened during each Forest school session
- What were the memorable 'magical' moments from the session?
- What kind of reactions did you observe from the children in the group?
- Did any of the children say anything that captured their thoughts and feelings about the session?
- What role did you play during the session?
- Is there anything you would have done differently in this session?
- What will you plan for the next session?
- What were the key learning points for you as a Forest school leader from this session?

UNIT 4 | FOREST SCHOOL PROGRAMME DELIVERY

HANDOUT 4 | PUPIL EVALUATION FORM

The following provides guidance on the type of evaluation you can carry out with the children attending your Forest School sessions.

Your approach will need to be adapted, based on their age, ability to give feedback and the specifics of the setting in which you work.

This type of evaluation is usually carried out at the end of a block of Forest Schools sessions, at the end of term or at the end of the school year – whichever suits your particular setting.

The format is flexible too: you could use a form that you ask the children to fill in, you could ask them to draw, or you could run a group discussion.

Some of the questions you could ask....

1. I thought that Forest School was....

Children put a x in the box they agree with or you could use smiley faces or pictures for children who can't read yet

Amazing	Good	OK	Rubbish
😄😄	😊	•	😞

2. Something I remember doing at Forest School....

Children could write or draw

3. The best thing about Forest School was....

Children could write or draw

4. The worst thing about Forest School was....

Children could write or draw

5. Something I learned at Forest School...





Children could write or draw

6. During Forest School I got better at....

Children could write or draw





7. Since going to Forest School my [teamwork / focus / confidence / etc.; you could use the area's most important to your setting] has....

Children put a x in the box they agree with or you could use smiley faces for children who can't read yet

Got a lot better 	Got a bit better 	Stayed same •	Got a bit worse 	Got a lot worse 
---	---	------------------	--	--





8. If I got the chance to do Forest School again I....

Children put a x in the box they agree with or you could use smiley faces for children who can't read yet

Would definitely want to go 	Would probably want to go 	Wouldn't mind if I went or not •	Wouldn't want to go 	Definitely wouldn't want to go 
--	--	-------------------------------------	--	---

9. I found being able to choose what I wanted to do...

Children put a x in the box they agree with or you could use smiley faces for children who can't read yet

Brilliant 	Good 	OK •	A bit confusing 	Really difficult 
--	---	---------	--	---

10. Write anything else you want to say about Forest School – or draw a picture!

UNIT 4 | FOREST SCHOOL PROGRAMME DELIVERY

HANDOUT 5 | STAFF EVALUATION FORM

The following provides guidance on the type of evaluation you can carry out with the staff attending your Forest School sessions, or the client(s) who commissioned your services.

This type of evaluation is usually carried out at the end of a block of Forest Schools sessions, at the end of term or at the end of the school year – whichever suits your particular setting.

It is used to measure how well staff / clients think the sessions met the programme aims. In particular it should focus on changes in pupils’ behaviour, learning, attitude, self-esteem, overall confidence, confidence in the outdoors, anything that has had an impact outside of Forest School and can help assess the benefits (or not) of Forest School.

Some of the questions you could ask....

1. How well did Forest School help promote personal, social and emotional development in the children who attended?				
Brilliantly	Well	OK	A little	Not at all
Comments:				

2. How well did Forest School help build confidence amongst the children who attended? How well did it help them feel more comfortable and confident in working in a different environment?				
Brilliantly	Well	OK	A little	Not at all
Comments:				

3. How well did Forest School help develop teamwork and co-operation? How well did it provide opportunities to work together and challenges that enable all to succeed in line with their learning style?

Brilliantly	Well	OK	A little	Not at all

Comments:

4. How well did Forest School help develop communication and listening skills? How well did it provide opportunities for different types of communication and opportunities for empathy, reflection and space and time to talk and listen?

Brilliantly	Well	OK	A little	Not at all

Comments:

5. How well did Forest School support children in understanding themselves better by helping them take responsibilities, assess risk, motivate and regulate themselves and others?

Brilliantly	Well	OK	A little	Not at all

Comments:

6. How well did Forest School help children become more aware and knowledgeable about the environment they are in and relate this to their lives?

Brilliantly	Well	OK	A little	Not at all

Comments:

7. How well did Forest School help deliver the term theme of 'XXXXXXXXXX'? How well did it relate to the school curriculum help develop learning with different opportunities?

Brilliantly	Well	OK	A little	Not at all

Comments:

8. Do you have any other observations, comments or feedback on the programme as a whole?

Comments:



UNIT 5

**FOREST SCHOOL PROGRAMME
THE WOODLAND ENVIRONMENT**

THE HIVE

UNIT 5 | THE WOODLAND ENVIRONMENT

HANDOUT 1 | BROADLEAF & CONIFEROUS WOODLANDS

It is important to gain an understanding of the environment you will be working in. This understanding will enable you and your learners to become stewards of the woodland and develop a real appreciation of the natural environment.

As part of your Forest School portfolio, you'll need to explain the main differences between broadleaf and coniferous woodlands.

As part of your Forest School site survey, it may be useful for you to identify the species of tree and state whether they are broadleaf or coniferous.

BROADLEAF WOODLAND



Broadleaf refers predominantly to trees that lose their leaves in the autumn/winter. Their leaves are flat and wide that vary in shape but are not needle like. Most tree species found in broad leaf woodlands are native to the UK. The most common species are Oak and birch. However, Ash, Beech and Sycamore are also quite widespread. In a broadleaf woodland, seasonality is very visible.

In winter, the trees are bare, but there is a lot happening on the forest floor. The leaf litter will be decomposing, releasing nutrients into the soil. It also provides nesting materials for birds and animals and ground cover for insects. The soil in a broadleaf woodland is usually neutral pH and is full of the nutrients required to keep the woodland life cycles in action.

In the spring, the absence of leaves allows for large amounts of light to get through to the forest floor. This gives species in the lower layer of the woodland like Wood Anemone, Bluebells and Snowdrops a chance to grow, flower and seed as well as providing a food source for early insects.

In the summer months when the canopy of the trees is full, there will be thousands of species all finding their place in the woodland ecosystem. Flowers are abundant and the pollinator species will be fulfilling their purpose.

In autumn, as the temperature falls, and the air becomes damper, we will see the fruiting bodies of fungi on the forest floor. We will also see the fruiting bodies of the trees – these could be nuts or berries and the many insects and small mammals will be making the most of this plentiful supply.

As well as providing a habitat for thousands of organisms, broadleaf woodlands play a crucial role in soaking up the regular large downpours and this can help to minimise damage caused by flooding.

CONIFEROUS WOODLAND



Coniferous trees have leaves that are like scales or needles. The shape of a coniferous tree differs to that of a broadleaf tree as they normally grow in colder climates and have adapted to not having a full canopy at the top of the tree but almost a conical shape to allow for snowfall to fall off the tree. Coniferous woodlands are evergreen, so there aren't the seasonal changes that we see in a broadleaved woodland.

Therefore, there isn't the same level of diversity in a coniferous woodland. The soil is more acidic, so there are less invertebrates living in them, the needles are constantly falling from the trees giving a thick layer of them and decomposition is slower so the soil is less nutritionally valuable. As the trees are evergreen, there is no portion of the year that light can flood the forest floor, so there isn't the diversity of plants within this woodland type either.

There are native coniferous species in the UK. These are Yew, Juniper and Scot's Pine. However, many of our coniferous woodlands are planted for timber production and are dense stands of Douglas Fir and Sitka Spruce.

Further Reading

Broad leaf woodlands

There are over 50 different types of broadleaf woodlands in the UK. If you'd like to learn more about broadleaf woodlands, the Countryside Info website has useful information:

http://www.countrysideinfo.co.uk/woodland_manage/broadleaf.htm

Coniferous woodlands

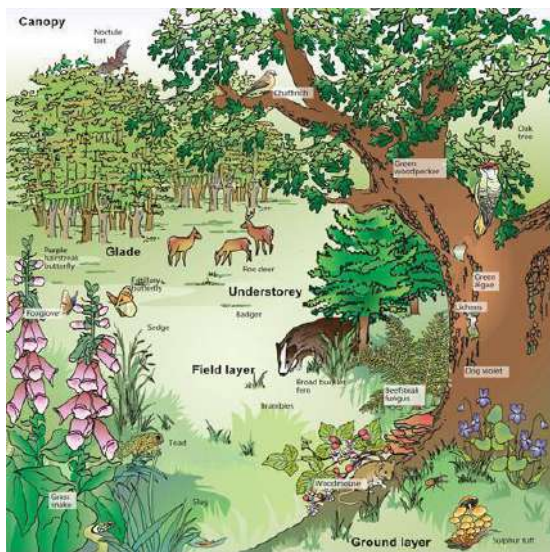
Coniferous woodlands in Britain are mostly planted woodlands (plantations). The vast majority are made up of introduced conifer species.

http://www.countrysideinfo.co.uk/woodland_manage/conifer.htm

UNIT 5 | THE WOODLAND ENVIRONMENT

HANDOUT 2 | WHAT A WOODLAND ENVIRONMENT LOOKS LIKE

What is the vertical structure?



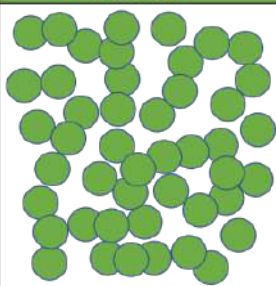
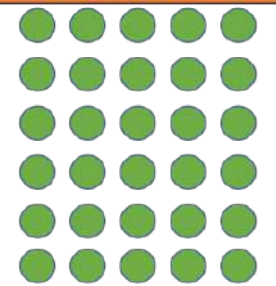
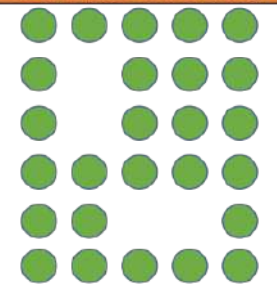
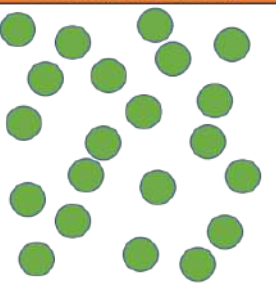
This refers to the layers we see in a woodland from ground level up to the top of the trees, the canopy. There are several layers in between, the field or herb layer and the shrub layer or understorey.

Most woods have a number of vegetation layers.

- There is the **canopy**, or top layer, where the tallest trees are found, such as oak, ash, beech or birch. These trees receive the maximum amount of light available
- The **understorey** is composed of shorter trees or shrubs, such as field maple, hawthorn or hazel, which are adapted to grow successfully with less light, as well as saplings of canopy tree species.
- The **herb** or **field layer** may include ferns, flowering plants and grasses.
- The **ground layer** is composed of mosses, lichens, ivy and fungi. On the woodland floor there is usually a layer of rotting leaves and vegetation, which is home to a range of invertebrates.

What is the horizontal structure?

If you imagine you are above a woodland, you will be able to see different features eg. water bodies (rivers/ponds), rocky outcrops, clearings and hedges. These all form the horizontal structure. The image below shows different 'stands' within a woodland – this is how the trees grow, the table describes some of these features in more detail.

Wild Woodland	Managed Woodlands		
Wild Stand	Evenly Spaced	Evenly Spaced with openings	Unevenly with opening
			

The horizontal woodland structure refers to the differences found at different points of a woodland. These differences can be caused by a number of factors including rides, banks, hedges, edges, glades & water, aspect (geography) and topography.

- Generally, you find a wider variety of plants towards the outer edge of a woodland where the canopy is less dense.
- The plants you find towards the edge will likely be younger or have a shorter life cycle.
- As you move deeper into the woodland you find the number of different species decreases but the age and height of the plants and trees increase.

UNIT 5 | THE WOODLAND ENVIRONMENT

HANDOUT 3 | DEFINITIONS OF KEY ECOLOGICAL TERMS

Biodiversity

Source: The Woodland Trust

Biological diversity, or biodiversity, is defined as ‘the number, variety and variability of living organisms. It is considered at three levels:

- genetic diversity,
- species diversity,
- community diversity.

Each of these types of diversity are essential for life on earth.

1. Genetic diversity

Each individual within a population usually has slightly different forms of the genes that give them their unique traits. You have probably heard the term ‘gene pool’, which is the total array of genes within a population. Genetic diversity is necessary for any species to maintain reproductive viability, resistance to disease, and the ability to adapt to changing conditions. Those individuals that are better able to survive and reproduce pass on these favourable genes. This is known as natural selection.

2. Species diversity

Species diversity is a measure of the number of different species and their relative abundance in an ecological community. The identification and classification of species is known as taxonomy. Each species has its role in the ecosystem, be as predator, prey, pollinator or seed disperser, amongst many others. If one species goes extinct, there are repercussions throughout the whole ecosystem. For example, if bees went extinct, fruits and vegetables could be next, and then the animals that feed off them.

3. Community diversity

This is the number of different species assemblages within a particular area. For example, at the coast you may have the beach and sand dunes, then further inland heath and woodland. Each of these has its characteristic vegetation and different animals associated with it. Community diversity supports the continuity of proper ecosystem functioning, which provides crucial services to people. These include clean water for drinking and agriculture, flood control, protection from soil erosion, filtering of air, climate stability, pollution absorption, medicinal resources, and more.

Biotic & abiotic factors*Source: Sciencing.com*

An ecosystem is composed of two main components: biotic and abiotic factors:

- Biotic factors are the living parts of the ecosystem, such as plants, animals, insects, fungi and bacteria.
- Abiotic factors are the non-living parts of the ecosystem, which influence the size and composition of the living parts: these are components like minerals, light, heat, rocks and water.

Biotic factors

The most obvious features of any forest ecosystem are its trees, the dominant biotic feature. They dominate the ecosystem: both in terms of visibility and in terms of biomass. However, they are only one type of organism living in a forest. Other biotic factors include shrubs, flowering plants, ferns, mosses, lichens, fungi, mammals, birds, reptiles, insects, worms and microbes.

Ecologists frequently group an ecosystem's factors by what role they play in the system, rather than by what particular species they are. This is known as functional classification. These functions relate to the movement of energy through an ecosystem, and trees — along with other photosynthetic plants — are the chief primary producers. This means that trees convert the sun's energy into food energy, which is then used by other members of the ecosystem.

These other members of the ecosystem can also be categorized. Primary consumers are, for example, herbivores that eat the primary producers. Secondary consumers are the carnivores and omnivores that eat the primary producers. Decomposers are the scavengers, microbes and fungi that consume the droppings and the carcasses of other organisms.

Abiotic factors

The most important abiotic feature of a forest ecosystem may not be obvious, despite its ubiquity and importance: sunlight. Tangible abiotic factors include soil, minerals, rocks and water. But abiotic factors can be intangible, such as temperature, other types of radiation and the chemistry of soil and water.

The abiotic factors of a forest fall less obviously into functional classifications, but keep in mind that the energy transferred among the various biotic categories is itself a foundational abiotic element. This energy occurs in the form of solar radiation, which includes both visible light and heat (infrared).

Primary producers (plants like trees and shrubs) convert the light into carbohydrates, a form of energy that can be consumed by other organisms. The function of other abiotic factors relies on the minerals they contain, such as the nitrogen in the soil or the hydrogen in water molecules.

Natural / Ecological succession

Source: Countryside Info

Ecological succession is the gradual process by which ecosystems change and develop over time. Nothing remains the same and habitats are constantly changing. There are two main types of succession, primary and secondary:

- Primary succession is the series of community changes which occur on an entirely new habitat which has never been colonized before. For example, a newly quarried rock face or sand dunes.
- Secondary succession is the series of community changes which take place on a previously colonized, but disturbed or damaged habitat. For example, after felling trees in a woodland, land clearance or a fire.

Ecosystems

Source: Royal Geographic Society

A forest ecosystem is the basic ecologic unit in a particular forest that exists as "home" for a community of both native and introduced classified organisms. A forest ecosystem is named for the primary tree species that form the canopy. It is defined by all the collective living inhabitants of that forest ecosystem that co-exist together in symbiosis to create a unique ecology.

In other words, a forest ecosystem is typically associated with land masses covered in trees and those trees are often classified by foresters into forest cover types.

A forest ecosystem community is directly related to species diversity. Generally, you can assume that the more complex the structure, the greater is its species diversity. You should remember that a forest community is much more than just the sum of its trees. A forest is a system that supports interacting units including trees, soil, insects, animals, and man.

Habitats

Sources: European Nature Information System; Woodland Trust

A habitat is a place where plants or animals normally live, characterized primarily by its physical features (topography, plant or animal physiognomy, soil characteristics, climate, water quality etc.) and secondarily by the species of plants and animals that live there.

A habitat can be a salt marsh, a meadow or a pine forest, but a habitat can also be recognised at the landscape level of a tundra type or a deep-sea mud covering several hundreds of square kilometres. At the other extreme, it may be a microhabitat of less than 1 m², for example decaying wood, or animal dung in grassland environments.

Habitats change over time. Changes can be slow or rapid, natural or human induced. Some human activities can be catastrophic or provoke major changes to certain habitats, which may lead to their collapse, while other activities can recreate habitats, as has happened in the many biodiversity rich semi-natural habitats of Europe. Some habitats are rich in terms of number of species or may host threatened species, some are connected with cultural or historical values and some are appreciated for their high aesthetic value.

A woodland is a habitat where trees are the dominant plant form. The individual tree canopies generally overlap and interlink, often forming a more or less continuous canopy which shades the ground to varying degrees.

Standing dead wood

Source: Trees for Life

The value of dead wood

Dead wood (coarse woody debris or CWD) is extremely important to the health of the forest, and this is being increasingly recognised by conservationists. Not only is it an aspect of the process of nutrient cycling, providing a steady, slow-release source of nitrogen, but it is also thought to play a significant role in carbon storage. Fallen logs can also increase soil stability within a woodland.

Microhabitats

Standing dead trees (snags) and fallen debris provide a fantastic array of 'microhabitats'. There is a breath-taking range of saproxylic (deadwood-dependent) organisms including [fungi](#), lichens, invertebrates, mosses and birds, many of them having very specific requirements, and some specialising exclusively on one particular microhabitat. A remarkable 40% of woodland wildlife is dependent on this aspect of the forest ecosystem.

Lifecycles*Source: The Woodland Trust***Phase one: germination**

Life starts small for plants, with most species having humble beginnings as a seed - the seeds of some flowers, such as foxglove, are no bigger than a grain of salt! A seed contains a tiny plant, which will start to emerge once the conditions are right - a process that is called germination. To be able to grow, most seeds need to be covered with soil, have access to water and a warm temperature. This is why the majority of flowers and plants start to grow in spring, as winter is too cold for germination.

Phase two: shoots and roots

Germination ends when the plant emerges from the soil and appears above ground. No longer a seed, it is now called a shoot. Once the shoot is exposed to sunlight, leaves will begin to grow, and it is able to start producing its own food through photosynthesis. As well as growing up, the plant will have been growing down; roots develop and delve deep into the soil, absorbing the water and minerals needed for growth.

Phase three: flowering

Once the shoot and roots are established, the plant will begin to flower. This is a key part of the life cycle, as it allows the plant to reproduce by making seeds of its own. The snowdrop is one of the first plants to flower in the UK, providing a sign that winter is coming to an end and spring is on its way.

Once grown, flowers produce pollen. To develop seeds, this pollen must then be transferred to another plant of the same species. This is achieved with a little help either from the wind or insects like bees and butterflies. Plants that rely on insects, such as bluebells and primroses, attract the creatures by producing bright and colourful flowers. The pollen is then transported as the insects fly from plant to plant. Those that transfer pollen through the wind, like grasses, have much smaller flowers that are harder to see. It's not just insects that are attracted to flowers, however. The sight of a woodland with wildflowers in full bloom is one of nature's greatest spectacles and has been drawing people to the woods for centuries.

Phase four: fruiting

Once pollinated, the plant is able to produce seeds. But how do they make it into the soil where they can start to grow? The answer is fruit. Fruit develops around the seed, protecting it and helping it to reach the ground. For example, bramble produces blackberries, tasty fruit that is eaten by a variety of animals. When these animals go to the toilet, the seeds come out in their poo and some will find their way into the soil, where they can germinate when the time is right. Other plants produce fruit that is transported by attaching itself to passing animals, while some rely on wind and water to carry their seeds.

Phase five: death

The life cycle of a plant is very different to our own and they do not die of old age in the same way humans do. Some, known as annuals, will complete their cycle within one year and then die, while a biennial will take two years to go through its life cycle. Other plants, called perennials, can repeat their life cycle over many years, with some, such as trees, potentially living for over a thousand years.

Food chains / webs

A *food chain* is a linear sequence of organisms through which nutrients and energy pass as one organism eats another. Let's look at the parts of a typical food chain, starting from the bottom—the producers—and moving upward.

- At the base of the food chain lie the **primary producers**. The primary producers are autotrophs and are most often photosynthetic organisms such as plants, algae, or cyanobacteria.
- The organisms that eat the primary producers are called **primary consumers**. Primary consumers are usually **herbivores**, plant-eaters, though they may be algae eaters or bacteria eaters.
- The organisms that eat the primary consumers are called **secondary consumers**. Secondary consumers are generally meat-eaters—**carnivores**.
- The organisms that eat the secondary consumers are called **tertiary consumers**. These are carnivore-eating carnivores, like eagles or big fish.
- Some food chains have additional levels, such as **quaternary consumers**—carnivores that eat tertiary consumers. Organisms at the very top of a food chain are called **apex consumers**.

Food webs

Food chains give us a clear-cut picture of who eats whom. However, some problems come up when we try and use them to describe whole ecological communities. For instance, an organism can sometimes eat multiple types of prey or be eaten by multiple predators, including ones at different trophic levels. This is what happens when you eat a hamburger patty! The cow is a primary consumer, and the lettuce leaf on the patty is a primary producer.

The raw materials of photosynthesis, water and carbon dioxide, enter the cells of the leaf, and the products of photosynthesis, sugar and oxygen, leave the leaf. Water enters the root and is transported up to the leaves through specialized plant cells known as xylem vessels. Land plants must guard against drying out and so have evolved specialized structures known as **stomata** to allow gas to enter and leave the leaf. Carbon dioxide cannot pass through the protective waxy layer covering the leaf (**cuticle**), but it can enter the leaf through the **stoma** (the singular of stomata), flanked by two guard cells. Likewise, oxygen produced during photosynthesis can only pass out of the leaf through the opened stomata. Unfortunately for the plant, while these gases are moving between the inside and outside of the leaf, a great deal of water is also lost. Cottonwood trees, for example, will lose 100 gallons (about 450 dm³) of water per hour during hot desert days.

Wildlife corridors

A **wildlife corridor** is a link of **wildlife habitat**, generally native vegetation, which joins two or more larger areas of similar **wildlife habitat**. **Corridors** are critical for the maintenance of ecological processes including allowing for the movement of **animals** and the continuation of viable populations.

UNIT 5 | FOREST SCHOOL PROGRAMME - THE WOODLAND ENVIRONMENT

HANDOUT 4 | TYPES OF TIMBER AND THEIR USE

Deciduous trees are classified as hardwoods and coniferous trees are softwoods.

Alder - *Alnus Glutinosa*



Physical appearance – Dark green, racquet shaped leaves between 3cm and 9cm in length grow on long stems. Leaves are waxy with serrated edges and a rounded or indented tip.

Alder produces both male and female catkins which is where the flowers can be found. Female catkins become the cones in the autumn, these contain the seeds of the tree. Alder can grow to nearly 30m tall.

Habitat – Alder likes to grow in wet areas and can often be found near ponds and streams.

Interesting facts – When cut the pale wood turns orange which was associated with bleeding, this was something to be feared and passing an Alder tree on a journey was considered unlucky.

Ash



One of the toughest hard woods. Good for making tools and sport handles e.g. hammers, axes, spades, hockey sticks. Good for firewood and making charcoal

Beech



Used as a fuel and good for making furniture, cooking utensils and tool handles.

Downy Birch



Tough and heavy wood suitable for furniture making, handles and toys. The bark is used for tanning leather.

Silver Birch



Tough and heavy wood suitable for furniture making, handles and toys.

Hazel



Hazel is coppiced frequently as a way of managing woodland habitats. The wood is used for making pea sticks and bean goles for gardening.

Holly



The whitest of all woods. Its heavy, hard and fine grained. It can be stained and polished and used for furniture and engraving. It's good for making walking sticks and good for firewood.

Field Maple



The hardest and highest density of timber. It can be used for wood-turning, carving, musical instruments in particular harps.

English/Pedunculate Oak



Acorns grow on stalks and be used for making flour. It is the hardest, most durable timber. Used historically for ship building until the mid-19th century. Used for making architectural beams, flooring, wine barrels and firewood. Tannin in the bark used for dyeing leather.

Sessile Oak



Stalkless acorns. It is the hardest, most durable timber. Used historically for ship building until the mid-19th century. Used for making architectural beams, flooring, wine barrels and firewood. Tannin in the bark used for dyeing leather.

Scots Pine



The strongest of softwoods used for construction and joinery, telegraph poles, gateposts and fencing. The resin makes turpentine, the inner bark can make rope, the roots can make tar and the cones can make dye and kindling if dry.

Sycamore



A hard and strong wood used for making furniture and kitchenware as the wood doesn't taint or stain the wood.

Wood for campfires

Oak, ash and beech are best for cooking as they produce heat and create a long burn. Fruit woods are also good burners and positively affect the flavour of the food. Softwoods e.g. spruce and pine will burn faster and at times may be too hot.

Toxic woods

Tannic woods e.g. oak are not suitable for carving spoons and other utensils as the wood is toxic. Trees that can be used for carving utensils are alder, apple, ash, beech, birch, blackthorn, cherry, elm, field maple, hawthorn, holly, plum, quince, sycamore and willow. See <http://www.spooncarving.org.uk> for more information.

UNIT 5 | THE WOODLAND ENVIRONMENT

HANDOUT 5 | PRINCIPLES OF SUSTAINABLE WOODLAND MANAGEMENT

In order to keep a woodland healthy and safe, some management or intervention might be needed. If a woodland has been previously managed then you might find this has to be maintained over a certain period of time in order to keep the trees healthy. If a woodland hasn't been managed then it may require a tree inspection to make sure the trees are safe if you are going to be taking learners into a new area.

There are various methods of management which are covered below. Some of the may not be applicable to your setting but it is important to understand the reasons behind these methods and the possible benefits they could have in a woodland. There are also management techniques that even very young learners can get involved in.

Coppicing



Coppicing or cutting down a tree to produce new growth has been a way of harvesting wood for thousands of years. Far from being destructive, coppicing has been the reason why many woodlands have survived, because the woodland had an economic value. Coppicing rejuvenates the tree, so some coppice stools or 'stools' are hundreds of years old and are an important genetic link back to the ancient woodlands. In the past, the rural economy was based on coppicing and coppice products were used for building, fencing, fuel, furniture and many other uses. Coppicing requires only simple hand tools and produces material which can be manually handled.

When the tree is cut down, new shoots arise from dormant buds on the side of the stump, or from adventitious shoots around the edge of the cut surface. Root buds which are close to the stump can also produce coppice shoots, especially in hazel and birch. The buds are stimulated into growth by plant hormone levels produced when the previous top growth is removed.

Most native broadleaved species coppice, but some are stronger than others. The species which produce the strongest growth over the longest time are ash, hazel, oak, sweet chestnut, field maple and small-leaved lime. Birch and black polar only produce regrowth if cut young when the stump is fairly small. The native wild cherry, aspen and elm, and the non-native white poplar and grey alder produce suckers from the roots, rather than growing from the stump. Conifers die if cut to the stump.

Pollarding



Pollarding was traditionally done to stop deer or cattle grazing on the young shoots of trees. Pollarding of wood-pasture, farm, waterside and woodbank trees should be started when the trees are fairly young, before major branches have grown thick and heavy. It is repeated at five-to twenty- year intervals, in the same way as coppicing, depending on the size of poles required.

Such trees can reach immense age and girth, and pollard management should be maintained even when the poles are no longer needed, to keep the crowns from collapsing under their own weight, and to prolong the life of the tree.

Pollarding involves working from a height and should only be done by a trained and competent person.

UNIT 5 | THE WOODLAND ENVIRONMENT

HANDOUT 6 | WELLBEING AND WOODLANDS

There has been a lot of recent research into the benefits of spending time in woodland on human health. Spending time in woodland has been shown to reduce stress, improve mood and even help to boost the immune system. (*The Woodland Trust*)

In the post pandemic world, there is a raft of research showing the benefits of simple contact with the natural world and the benefits it has on our busy lives. Many of the medications that are prescribed have their roots in nature, willow contains the compounds for Aspirin and traditionally willow would have been chewed to relieve aches and pains.

But in a simpler way, being in nature can help with daily stresses and help to develop coping mechanisms. Mental health conditions have been recognised as more impactful than previously thought and through trials it has been seen that simply spending time in nature can help support mental health.

There is also increasing demand for improvements in physical health, in the UK there are pressures on the health care system. Lack of exercise is a well-known problem in UK healthcare. A quarter of adults are obese, and physical inactivity is predicted to cost the NHS £10bn a year by 2050. Exercising in nature can offer a better workout, increase vitamin D and provide a much more pleasant setting than the average gym. (*The Woodland Trust*),