



Outdoor Classrooms Ltd

senco's - Play Natural Initiative Handbook



Four FREE natural resources sets, for just the cost of postage and packaging.
Available to UK primary settings SENCOs, to support SEND children's healthy
development and integration into mainstream education.



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#play-natural-initiative senco's Play Natural Initiative Pack



EN71-1; EN71-2; EN71-3;
2024 / 2025
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Warning! Not suitable for children under 36 months due to small parts – choking hazard!
For children aged 3 -12 years

For further information or to order, please contact us:

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AIM:

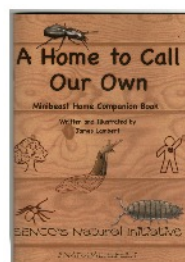
- ◆ To allow every child the opportunity to reach their own personal potential.
- ◆ To support all children's health and development through environmental improvements. Healthy learners are better learners.
- ◆ To make primary education provision 'SEND-friendly'.

Objective:

1. Promote the use of natural resources, instead of those made from artificial, synthetic or chemically treated materials.
2. Promote healthy garden practices to complement individual SEND children's ability to thrive.
3. Empower SENCO practitioners with information (see pg 14 to 26) to support them to :-
- ◆ Reduce Environmental Toxins in Educational Gardens, such as weedkiller and treated timber.
- ◆ Reduce exposure to man-made chemicals and heavy metals, like those in plastic grass, rubber crumb fall surfaces and treated timber, all to provide a healthier educational environment.
- ◆ Aid healing, growth and repair for optimal development, by reducing the work our bodies need to do to clear extra unwanted and unnecessary chemical toxins.
- ◆ Allow nature and life to flourish in a healthy environment, for us all to share.
4. To provide information and resources to enable education settings to demonstrate best practice in supporting health and sustainability to the wider community.
5. Provide samples and examples of well thought-out education resources that are made from natural, sustainable UK wood and tested to the high CE/CA Toy Standards. **SENCO'S Pack Contains:**

Minibeast Box

- 1 x 50x50mm wooden surround;
- 1 x Minibeast Home Lid;
- 1 x Minibeast Home Book
- A Link to additional Teachers' Notes



Language Pack

- The 3 Pigs,
- The 3 Bears
- Imagination Door
- A Link to additional Learning Resources

Natural Construction Set

- 5 x 10 x 10cm rustic tree squares
- 5 x 2cm thick tree slices;
- 5 x 3cm thick tree slices;
- 5 x 4cm thick tree slices;
- 6 x 5cm thick tree slices;
- 6 x 10cm thick tree slices;
- 6 x 15cm thick tree slices

Maths Set

- 6 x Oval dot number counters (1-6);
- 15 x 40cm diameter x 1cm thick button counters;
- 1 x 50cm Ruler;
- 1 Spinner Spindle;
- 1 x Double sided spinner
- (1-6 numerals on one side and dots on the reverse)





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Care and Safety Instructions:



Please keep these instructions for further reference.



EN71-1; EN71-2; EN71-3;
2024 / 2025

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Warning: May contain loose parts (bark)
Not suitable for children under 36 months
For children aged 3-12 years

*This product has been tested to UK, CA/CE standards –
for use by children over 36 months.*

Do not allow the children to put any of the loose parts in their mouths.
If these parts are to be used by children under 3 years old, all bark must be removed.

The adult is responsible for risk assessing each pack, making a judgement relative to the age and developmental stage of the child – and, either remove any small wooden pieces from the child's reach, or supervise appropriately.

This is a natural product which may (or may not) contain bark. If the bark peels off, remove it completely and check that the surface underneath is smooth. If necessary use sandpaper to smooth it over. Should any pieces become damaged or broken, these must be removed immediately, discarding any small pieces. Those with sharp edges must be discarded, or the wood smoothed over with sandpaper.

Do not allow the children to throw the blocks, as some of the pieces/blocks may be heavy.

These sets are made from natural and durable UK grown wood, pine, ash, oak, larch or Western Red Cedar - containing **no** poisonous chemical treatments. All the wood, has been passed to stringent toy standards CA/CE EN71-2 and EN71-3. The sets have also passed EN71-1.

It is not advisable to put the equipment away wet, damp, or in a wet bag, especially for long periods of time, e.g. Holidays. It is also recommended that the components are not placed on or near excessive heat, e.g. next to a heater; as this can stress and damage the wood.





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Pack Information and Activity Suggestion

Minibeast Home



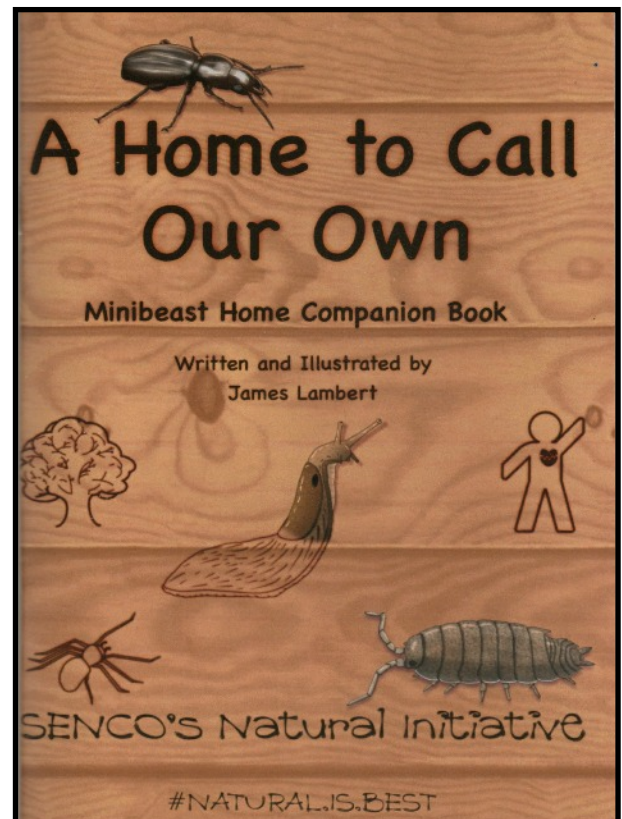
The 'A Home To Call Our Own' mini-beast activity is designed to develop the children's empathy and their knowledge and understanding of the world around them. This is achieved through their careful observation of, and caring for, the life that surround us all.

The children are encouraged to construct a home for the minibeasts in the garden, thinking about each animal's need for food and shelter. The resources are made from UK sustainable wood, which is natural and untreated. The Resources come with a story book and teachers' technical notes.

Minibeast Home Instructions:

Find a garden area with natural shade, ensuring that the Minibeast Home will stay cool and damp. Shaded areas (i.e. under trees) are ideal. Place the wooden surround onto the ground, making sure it sits without rocking. Always lower the lid carefully – showing respect for the minibeasts living inside.

Supervise the children in its correct use, i.e. the Minibeast Home should never be stood on, to avoid harming the life inside.





Minibeast Home Activity Suggestions



1. 'A Home To Call Our Own' Story

Instructions: Read 'A Home To Call Our Own' book to the children. Look at, and name the minibeasts on each page.

Focus:- Exploring the world, recognising similarities and differences, categorizing.

Extension:- Identify each different minibeast and repeat each (sometimes strange) name out loud. Read the 'Fact-files' to learn many fascinating (and quirky) things about them!



2. Name The Minibeasts

Instructions: Look at the, 'A Home To Call Our Own' book and other minibeast books with the children.

Identify minibeasts and name their different features, i.e. their colour, how many legs they have, etc.

Focus:- Exploring the world, recognising similarities and differences, categorising. asking/answering questions

Extension:- Go minibeast-hunting in the school garden. Identify/name the minibeasts found, name their different features, i.e. their colour, how many legs they have, etc.

3. Set up the 'Minibeast Home'

Instructions: In an appropriate outdoor space (*see p4 for instructions*, or inside front cover of the, 'A Home To Call Our Own' book), gather the appropriate items to make up the minibeasts home. Looking at the book for reference.

Focus:- Recall, exploring the world, recognising similarities and differences, categorising.

Extensions:- Along with the children, construct other minibeast habitats, i.e. bee homes, (drill holes in wooden blocks); bark bundles for minibeasts (tie lengths of bark together string), log piles, etc. Make sure to use only untreated timber.

4. What is inside the 'Minibeast Home'

Instructions: After a few days, carefully open the lid of the minibeast home and see what minibeast have moved in! Show respect for the minibeasts living inside by being careful and gentle.

Focus:- Care for others, curiosity about the world, observation and vocabulary.

Extensions:- Identify ways of looking after the minibeasts, i.e. replacing the lid carefully, (because minibeasts like darker places) and being gentle, etc.

5. Minibeast Hunting.



Instructions: Look at the different environments surrounding the 'Minibeast Home', i.e. bushes, grass, fallen leaves. Discover what minibeasts are found there. For bushes and trees, place a white sheet on the ground under the branches. Using a sweeping brush, shake the branches and identify what falls onto the white sheet. Compare the types and number of minibeasts found there, as apposed to those found in the 'Minibeast Home'.

Focus:- Identify differences and similarities, explore the natural world.

Extensions:- Look at books like; 'Collins Complete Guide to British Wildlife'[67] and 'Garden Wildlife of Britain and Europe' [18] to identify what you find. Read all about the minibeasts the children discover, gaining more information about their food, habitats and differing life-cycles.

6. Minibeast Hunt Throughout the Seasons.

Instructions: Look for minibeast hunt at different times and seasons. Look inside the 'Minibeast Home', and amongst bushes, grass, fallen leaves, walls etc. Compare the types and number of minibeasts found now, to those found at other times and seasons. How has what you found changed? What are the changes you can see, if any?

Focus:- Identify differences and similarities, explore the natural world, understand important processes and change.

Extensions:- Look at books like; 'Collins Complete Guide to British Wildlife'[67] and 'Garden Wildlife of Britain and Europe'[18] to identify what you find. Read all about the minibeasts the children have discovered, gathering more information about their differing life- cycles and activity levels throughout the different seasons of the year.





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Language Pack

These resources include 'solid wooden characters' like the 'three bears' and the 'three little pigs'. They are there to support the story-telling, retelling and enactment of popular, traditional tales. They also encourage the children to use their gross motor skills, and to explore a broad range of emotional aspects, like empathy. An 'Imagination Door' is also included to encourage learners to construct their own narratives.



The 'wooden characters' can be used alongside the other resources in the SENCO's pack, or with other props. These can help the children to recall familiar stories like; 'We're going on a Bear Hunt', 'Where's my teddy?'; 'Goldilocks and the Three Bears', etc. Retelling the story enables the children to better remember the narrative, with each pertinent section located in its correct sequence of 'beginning', 'middle' and 'end'. The 'solid wooden characters' encourages the children to compose their own stories.



The 'Imagination door' is an amazing way to turn speech practice into play – encouraging children to explore language and imagination in fun, meaningful ways. Creating new worlds and fantastic original ideas. Through this type of open-ended play, children aren't just having fun – they're strengthening their speech, language, creativity, and social skills all at once. A simple little door is a big spark for children's play and learning! Allowing them the freedom to begin imagining the magical places it could lead to – a fairy garden, a castle, or even a dinosaur world! This kind of play helps them build stories, try out new words, and have conversations with friends as they decide "what's on the other side". It is also brilliant for growing their confidence, building their ideas around the 'Imagination Door', making it easier for them to express themselves.



The 'wooden characters' can be used to share good practice with parents, carers and others. For example - take photos of your lessons, during a phonics activity – listening to the sound "at" "cat" "mat" or a maths activity looking at subitising numbers to five. Take photos with a bear taking part in the lesson instead of a child, upload these child-free photos onto social media, along with explanations of the activity. The aim is to encourage parents, children and others to follow the bears' learning adventure. These explanations will be helpful in the learning process, sharing good practice like these effectively helps children with their homework, thus encouraging learning support at home. (Similar 'child-free' lessons can also be shared with other settings via Instagram, by adding the hash tag, '#Play-natural-initiative').

Story Characters Activity Suggestions:-

Contributions by Leona King & Instagram@Early_years_diaries (Primary Teachers)

1. Reading Familiar Stories

Instruction: Read familiar stories to the children, allowing them to hold the relevant 'characters'.

Focus: Sequencing, recall, story language

Extension ideas: The children begin to read the story along with you as you read or retell the story from memory. Ask children about the beginning, middle and end of the story.



2. Story Re-telling

Instructions:- Place familiar story books and appropriate props for the children to play with. Allow the children to act out familiar stories the with 'wooden characters'.

Focus: Sequencing, recall, story language

Extension ideas:

1. Add extra props, i.e. bowls, chairs, blocks for houses etc.
2. Children create their own new endings.



Story Creation:-

3. Story Adventures

Instructions: Find a particular place to begin the story adventure, i.e. a garden, a room – anywhere accessible and safe. Place the ‘wooden characters’ in this place. Encourage the children to develop their own narrative, being careful *not* to steer the story along in the way that *you* think it should go.

Focus: Creativity, flexible thinking, narrative building

Extension: Ask open-ended questions; (recalling the, ‘who’, ‘what’, ‘where’, ‘when’, why, and how?).

Such questioning will open new pathways, e.g. “What are the ‘pigs’, or ‘bears’ going to do?” **It’s important to remember, and to emphasize with the children, that there are NO wrong answers.**

For pre-schoolers use; Beginning, middle & end.

For Reception children use; Who?, When?, Where?, Why? & What? and How?

For KS1 use; Who?, When?, Where?, Why?, What? ... and ... Problem and Solution.

For example, if the children want the ‘characters’ to fly to a tree, ask, “**Why** are they flying to that tree?”; “**How** do they fly there?”, “**What** do they see from the tree?”; “**Where** do they go next?”, and so on.

Story Sequencing Counters, available from Outdoor Classrooms Ltd, can be used as visual prompts whenever you wish to create or retell the story.



4. Story Creation -

Instructions: Combine bears, pigs and/or imagination door to make new adventures.

Focus: Creativity, flexible thinking, narrative building

Extension: Children can *perform* their new story– create a puppet show area!

5. Holiday Adventures -

Instructions: Take the ‘wooden characters’ with you when visiting a place of interest - like the beach or the countryside. **Take photos of the ‘wooden characters, in the settings.** On your return, show the children the photos. Use the photos to ignite the children's imagination, so they will recount their own version of what the ‘wooden characters’ did on their holiday adventure.

Focus: Creativity, flexible thinking, narrative building

Extension: Children draw or write down the story of the character adventures.

6. What Goes in the Bag? -

Instructions: Bring a chosen object into the classroom and encourage the children to ask questions about it; using the, ‘who’, ‘what’, ‘when’, ‘where’, ‘why’ and ‘how’ format. If it’s a bag, for example, “**What** are the characters putting inside their bag?”

Focus: Creativity, flexible thinking, narrative building

Extension: Provide a bag for the children to gather a range of items for the characters adventures, the use these as part of their imaginative play, to act out their adventures.

7. ‘Hot Seating’ the Characters -

Instructions: A child takes on the role of a bear, sheep or pig. The other children ask them questions, i.e. ‘What are they doing?’. ‘Where are they going?’ Any question they wish to ask. If the children wish, they could base their questions on familiar stories i.e., ‘Goldilocks’.

Focus: Speaking in role, asking/answering questions

Extension ideas: Try ‘interviewing’ alternative characters i.e. ‘Goldilocks’ from the three bears or the ‘wolf’ from the ‘three little pigs’.

8. Bears Talking -

Instructions: Encourage the children to give each ‘wooden character’ a ‘voice’, and make them talk to each other.

Focus: Vocabulary, sentence structure, intonation, building dialogue

Extension ideas: 1. Add limited props to extend conversations. 2. Introduce speech bubbles for children to write /draw inside.

9. Guess the characters

Activity: - One child hides a character. Others ask, questions requiring a ‘yes’ or ‘no’ answers to work out which character is hidden.

Focus: Questioning, listening, logical thinking.



10. Scene in a Box -

Instructions: Use a tray/box with a scene and props (pigs, door etc.) for children to explore and describe.

Focus: *Vocabulary building, descriptive language, imaginative storytelling*

Extension ideas: Ask extension questions beyond what the children can see, feel, etc. Why do they think the characters are there? What are they doing? Where are they going?

11. Mystery Bag -

Instructions: Fill a bag with story-related props. A child takes an item from the bag and guesses its link to the 'wooden characters'.

Focus: *Questioning, inference, making connections*

Extension ideas: Invent a brand new story - using all of the props together.

12. Snap Shot Scenes -

Instructions: Children create a snap shot of a particular scene, lifted from a story. They role-play and act out that scene. Others describe the scene. Should the children not feel confident enough or aren't physically able to be this, then the 'wooden characters' and props can be used instead.

Focus: *Speaking in sentences, using positional language*

Extension ideas: Children bring characters to life by acting out and speaking their part, continuing the story.

13. How Are They Feeling?:

Instructions: Read familiar stories, ask how the 'wooden characters' might be feeling in any given situation. Alternatively, pass them around, and ask how the characters might be feeling today and why?

Be mindful of any child protection (safeguarding) issues which may become apparent and make use of the relevant procedures for such situations.

Focus: *Emotional literacy, empathy, expressive vocabulary*

Extension ideas: 1. Children to tell you about the narrative of their play, and how the characters are feeling.

Children to play together in groups. (Be alert for possible safeguarding child protection issues).

2. Link to children's own experiences i.e. When have you felt left out/scared?'

Imagination Door Activity Suggestions:-

1. Discovery -

Instructions: Place the 'imagination door' in an appropriate place outside. Make this into a fun exploration activity - where the children need to **find** the door.

Focus: *Vocabulary building, imagination, descriptive language*

Extension ideas: Ask to children to tell you about what's behind the door.

2. Small World Imagination Play - Place the 'imagination door' and 'wooden characters' so the children can use them as part of their small world play.

Focus: *Vocabulary building, imagination, descriptive language*

Extension ideas: Ask the children to tell you about their play, retelling the story verbally, along with makaton.

3. What's behind the door? -

Instructions: Look at, the 'imagination door' closely with the children (use senses!). Ask them to imagine and describe what's behind the wooden door .

Focus: *Vocabulary building, imagination, descriptive language*

Extension ideas: Draw/write what they imagine, or, use small world props.

4. Who lives behind the door?

Instructions: Look at the door with the children, and encourage them to invent a character who lives behind it.

Focus: *Character description, imagination, empathy.*

Extension ideas: 1. Children draw and label their characters. 2. Children make the characters in the creative area using recycled materials.

5. Knock, knock, who's there? –

Instructions: Children knock on the door and the adult appears with a mystery character. The children must ask questions to discover things about this character.

Focus: *Turn taking, question/answer, dialogue, imagination.*

Extension ideas: Children invent their own character.





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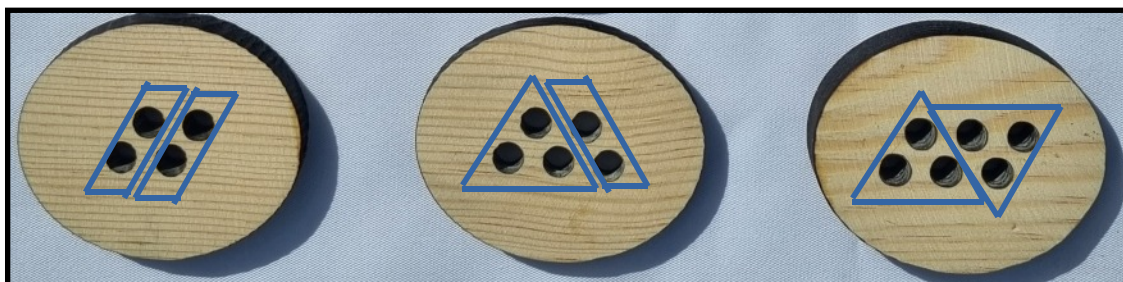
Maths Set

A simple, yet elegant set of counters and a spinner, to explore numbers 1 - 6.

The double sided spinner is an excellent tool to begin fine-motor manipulation and co-ordination. Practising spinning with both hands develops even greater skill levels. It's a great achievement to gain a satisfying spinning motion! The spinner has 1 – 6 numerals printed on one side, and on the reverse are dotted patterns corresponding with the numerals. The dots can be felt and counted by touch and are also fun to use when 'subitising'.



The oval counters represent numerals as holes, which can be felt from both sides. The holes allow natural sunlight (or torch light) to shine through them, clearly showing their dot pattern. These dot patterns, seen on both the spinner and the oval counters, have been configured in such a way as to copy the '*triangle positioning*' of eyes and mouth. Babies use this in-built triangle pattern recognition, to identify their parent's face. This type of configuration also helps children to quantify (through visual subitising), groups of dots. These patterns of ones, twos and threes, enable the children to break down larger quantities into smaller groups (subitising). The children can also see the repeating patterns of smaller amounts, so helping to more easily to identify larger amounts (here to six). These dot patterns making it easier for learners to recognise the components of numbers. These activity supports children to more accurately assess quantities and number bonds.



The oval dot counters are compatible with a larger 'Oval Counters' product range, which uses a 'cam lock' feature. This feature is designed to work with several boards to make learning fun and easier to understand.





Maths Set Activity Suggestions:-

by *Instagram@Early_years_diaries (Primary Teacher)*



1. Spin Mastery

Instructions: The children practise spinning the number spinner. Can they make it spin successfully?
Encourage the use of both hands.

Focus: *fine motor skills (hand-eye and bilateral coordination, tripod grip and strength); concentration; patience and self-regulation.*

Extension Ideas: 1. Count how long it takes for the spinner to stop spinning.

2. Compare spinning times.
3. Teach a friend how to spin.

2. Quick Recognition

Instructions: Spin the spinner and name the number that it lands on. Try with both the numeral and dot sides of the spinner.

Focus: *number recognition; subitising; counting; fine motor skills*

Extension Ideas: 1. Write down the number, using various tools/surfaces (in sand, mud, chalk etc.)

2. Make a body movement to match the number spun (e.g. 3 star jumps or 4 hops)

3. Spin and Match

Instructions: Spin the spinner, using either the numeral or dot pattern side of the spinner, find the corresponding oval counter to match the number shown on the spinner. Start with the dots and progress to the numeral side, as the children develop numeral recognition..

Focus: *number recognition; subitising; matching; fine motor skills.*

Extension Ideas: 1. Write down the number, using various tools/surfaces (in sand, mud, chalk etc.)

2. Hide the oval counters inside a 'sensory tray' (e.g. a nature or sand tray) so that the children can find and match them.

4. Spin and Count

Instructions: Spin the spinner and count out the number of button counters to match. Use both the numeral and dotted sides of the spinner.

Focus: *Number recognition; one-to-one counting; subitising; fine motor skills.*

Extension Ideas: 1. Write down the number, using various tools/surfaces (in sand, mud, chalk etc.)

2. Hide the button counters inside a 'sensory tray' (e.g. a nature or sand tray) so that the children can find and match them to the number from the spinner.

5. Spin, Count and Build

Instructions: Spin the spinner and count out the matching number of counters, then stack them into a balanced tower.

Focus: *Number recognition; one-to-one counting; fine motor skills; persistence; spatial awareness.*

Extension Ideas: 1. Spin the spinner twice and build two towers. Build each tower with of the correct quantity of counters, to match the number landed on when spinner spun – compare numbers of counters in each tower and their heights.

2. Experiment with the structure of the towers. Can they be built / balanced in different ways by changing their shape and height?

6. Spin and Add

Instructions: Spin the spinner **twice**, recording each amount (using the button counters or the oval dotted counters then add each number together. Record this final number.

Focus: *Number recognition; subitising; counting; addition; combining two groups; fine motor skills.*

Extension Ideas: 1. Write down the number sentence to match the number problem, using various tools/surfaces (in mud, chalk, sand etc.)

2. Hide the round and oval dot counters inside a 'sensory tray' (e.g. a nature or sand tray). The children can find and match them to the two numbers the spinner landed on, showing the final total.



7. Spin and Compare

Instructions: Spin the spinner **twice**, recording each amount by counting out the button counters or the oval dot counters. Compare the amounts. Which is more? Which is less?

Focus: *Number recognition; counting; subitising; comparing quantities; vocabulary (less, more, equal, Same as); fine motor skills.*

Extension Ideas: - Spin the spinner **3 times** and record 3 amounts. Place these in order - from the smallest to the largest amount (or vice versa)

8. Explore Sharing

Instructions: Spin the spinner, recording each amount, by finding the number of counters to match. Explore further by finding out whether these can be shared evenly into 2 groups.

Focus: *Number recognition; counting; early division; fairness; 'grouping' vocabulary (even, odd, equal); Fine motor skills.*

Extension Ideas: 1. When the counters are in groups, write down the numeral to match each group (use various tools/surfaces – mud, chalk, sand etc.)

2. * **'Doubles'** (see below) can be explored here, whenever the children find numbers that have been shared evenly*

9. Doubles

Instructions: Spin the spinner, recording the amount. Find its **'double'** using the counters.

Focus: *Number recognition; counting; doubling; early multiplication; fine motor skills.*

Extension Ideas: - Once the 'double' has been created, write down the number sentence to match. Use various tools/ surfaces, (in mud, chalk, sand etc., e.g. $5 + 5 = 10$)

10. Number Bonds to 6

Instructions: Spin the spinner and count out the number of button counters to match the numeral the spinner lands on. Use both the numeral and dotted sides of the spinner. Then, work out what's needed to add up to 6. Encourage the children to find the additional counters (or oval counters) that match the amount they need to add in order to end with 6 in total..

Focus: *Number recognition; counting; subitising; number bonds; part-whole understanding; fine motor skills.*

Extension Ideas: 1. Put the bond into a part-whole model frame.

2. Write the number sentence to match the bond, using various tools/surfaces, (in mud, chalk, sand, etc.)

11. Tactile Counting (Mystery Match)

Instructions: Place the oval dotted counters into a small bag. Spin the spinner then try to feel for the correct counter to match the numeral on the spinner. (The child needs to 'feel' for the holes in the counter). Encourage the child not to look!

Focus: *Number recognition; subitising; tactile discrimination; fine motor skills.*

Extension Ideas: - Write down the number (in sand, mud, chalk etc.)

12. Shadow Play

Instructions: Use the maths set outdoors in the sunlight (or with a torch) with white paper or a sheet. Hold the oval counters between the sunlight (or torchlight) and paper/sheet. Can the children count the dots created by the shadows that appear? Once this concept has been understood, spin the spinner again and see what number it lands on. Can the children find the correct oval counter whose shadow dot pattern match the number?

Focus: *Number recognition; counting; subitising; light and shadow exploration; visual representation.*

Extension Ideas: 1. Explore further by moving the oval counters closer/further away from the white paper or a sheet surface.

2. Draw over the shadow created and write the numeral to match.

3. Explore pattern making, using some of the oval counters and drawing over the shadows they create.





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Natural Construction Set



A 40 piece set of natural wooden shapes consisting of; mini logs (15cm and 10cm long); log slices, (in metric sizes of, 5cm, 4cm, 3cm, and 2cm thick); 1cm thick button counters; rustic squares, (10 x 10cm wide); and a 50cm ruler.

This natural construction set, allows the children to explore freely structure, shape and balance. It also supports the concept of building and measuring and creates an infinite variety of small world adventures for the children to enjoy! It can also be used for a wide range of mathematical learning activities, as shown below.

Guidance for Reception Teachers:

Written by Michelle Hague and Jenny Elvins

These activities are designed to support early mathematical development. This is achieved through hands-on, engaging experiences using small wooden button counters and logs. The focus is on developing children's number sense, comparison skills, pattern recognition, and spatial reasoning.



1. Early Number Sense and Subitising.

Use the small button counters to support subitising. Hide some of the five logs underneath an upturned bowl, e.g. three logs hidden and two, that the children can see. Inform the children that there are five logs altogether. Ask them to suggest how many are hidden.



- Start with perceptual subitising (instantly seeing one group).
 - Progress to conceptual subitising (seeing two groups and combining them to find the total).
- Show small quantities in familiar patterns (e.g. dice, tens frame) and random arrangements.

2. Comparison and Measurement.

Fill a basket with a variety of logs. Ask children to select two and compare them using vocabulary, like: *bigger, smaller, heavier, lighter, longer, shorter, wider, thinner.*

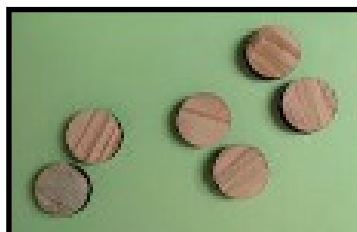
- Encourage estimation: ask children to suggest how many logs tall the object might be, or how many smaller logs equal one larger block



3. Conservation and Numerosity.

Ask children to choose six logs and arrange them in different patterns and orientations.

- Use this to develop understanding of conservation: the quantity remains the same even when the arrangement changes.
- Use a variety of logs - all shapes and sizes (i.e. large, small, wide, narrow) to explore numerosity – six is still six, regardless of the size or shape of the objects.



4. Pattern Making

Use logs to create and extend patterns (e.g. AB, ABC, ABB).

- Start by providing a pattern for children to continue, then challenge them to create their own.

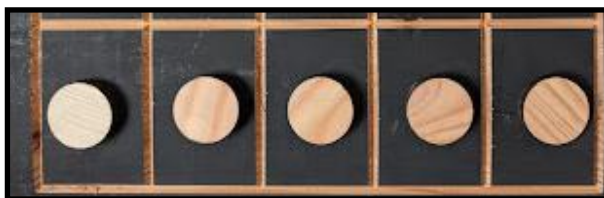
Include intentional errors in patterns and invite children to spot and fix them. Begin with linear patterns and progress to more complex arrangements, such as circular patterns.



5. Subtraction and Frames

Use small button counters with 'five' or 'tens frames' to explore subtraction from five or ten.

- Use pre-printed frames, or have children draw their own (e.g. outside with chalk). [Chalk board five and ten frames, material five and ten frames, and five and ten frame rails all available from Outdoor Classrooms Ltd]
- Place all counters on the frame, then remove some and discuss how many are left, link to language of part and whole



6. Hidden Object Games

Play quick memory games using button counters or logs: Shuffle and hide a selection underneath a bowl.

- Briefly lift the bowl and ask: *How many did you see?* or *How many are missing?*

7. Exploring Equivalence

Use logs to explore equivalence: Provide opportunity to explore how different logs can be combined to make the same height as another single taller log, or stack of logs.

- Build a 'staircase' - each step one unit higher than the last.

8. Construction and Spatial Awareness

During block play, model and encourage spatial language:

Position: *in, on, under*, Direction: *up, down, across*, Viewpoint: *in front of, behind, forwards, backwards*

- Challenge children to draw their construction from a 'bird's eye view' - looking down from above.



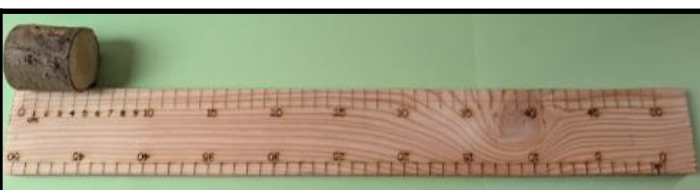
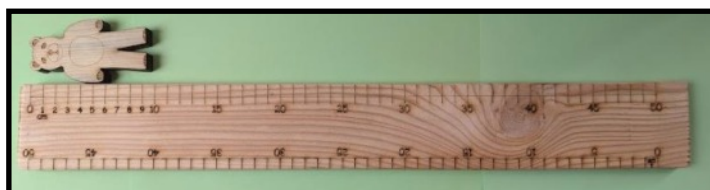
9. Exploring Equal Groups

Use both similar and different objects to create numerically equal groups.

- Discuss how groups can be numerically the same even when they look different.

10. Measurement

- Use the ruler to measure logs or items in the environment.
- Use the logs as a non – standard measuring tool.





Outdoor Classrooms Ltd



senco's Play Natural Initiative Pack #play-natural-initiative

We at Outdoor Classrooms want a healthy environment for all - one that benefits the health of all. An environment where all can thrive - from us humans to down to the tiniest minibeast. This underpins Outdoor Classrooms Ltd ethos, from our woodland management to the products we make. The following is some information on environmental factors that can affect both the environment and us. Please Note: The following information is provided to aid your further research, and to support future planning and development.

It is not *Medical, Nutritional or Health Advise.*

Getting The Best From The Education Garden

The human race has survived and has thrived in many diverse environments across planet earth. As far as human history is concerned, we evolved on the earth mainly in outside environments, in natural light and fresh air. It's no surprise then, that our bodies are geared to work best - to grow, heal and develop, within the earth natural system. We are part of planet earth's biological system - which we affect and it affect us - in both positive and negative ways.[13][21][25][30][34]

It's important to note that *we are more than just our human genes.* [33] We have evolved with symbiotic biological partners, i.e. mitochondria and gut microbes. We as the host provide a home and environment for a great many microbes, over 100 trillion! [76] Many of these microbes, in turn, support our body's needs in a great many ways. Mitochondria are vital and integral to every cell in our bodies, except red blood cells. In fact, we could not live without them! The same can be said for the wider ecological systems.[34] Although, we can live outside the natural system, it is becoming more apparent as time goes on, that we as a species, are no longer at our best. For example, the problems caused when these 'natural systems' are disrupted is showing most acutely with space travel. The Guy Foundation is finding it difficult to solve the detrimental health implications on the human gut bacteria and mitochondria present in those who have undergone space travel. This has a negative affect on the body's immune system.[38][44][78] Our inside modern largely urban environment is showing many of the same issues, but in a less pronounced way.

There are many environmental factors within our control in the outdoor provision, that may affect health. These factors may influence physical and neurological development, and therefore learning outcomes. The choices we make, when creating and using outdoor provision impact the health of the garden, and the health of all that use it. If we reduce the insults to nature and make environmental improvements, while providing appropriate challenges and opportunities, children can strive and thrive, achieving better outcomes. [6][7][8][16][19][25][29][36]

Some of the key factors to promote health, human development and biodiversity, are as follows:-

Light - Natural Light

Light is life, the energy from the sun powers *virtually* all living systems on the planet. The rich frequencies within the spectrum of natural light work in more ways than one might think. The different frequencies blend differently through the day. Mornings and evening light has larger amounts of longer wave length, red light and Infra-red light. We are able to see red light wavelengths with the human eye, however, infra-red light (IR) we can't see. Whereas, midday has greater portions of shorter wavelength, blue light and non-visible ultra violet (UV). These blends of light frequencies, change as the sun moves through the sky throughout the day, and with the changing seasons. These light changes give different signals to our biology.



For example, animals like dogs shed their thick winter coat, not from the day to day changes in temperature but by the signals from seasonal changes in light frequencies. However, with many dogs living indoors, in artificial light, their building-up and then shedding of winter coats, is now different from those dogs living largely outside. [56B][63] Although we are affected in different ways, to the above example, we are no less sensitive to changes in light frequencies. (*Please see artificial light*). Our mind and bodies are aware of such changes as:- day to night, and night to day (diurnal), and to seasonal changes throughout the year. Ideally we need to gain access to **natural sunlight, all year round, and in all weathers**. This is critical in 'setting' our internal body clocks, for correct brain and body function. Full spectrum natural light enables the water molecules inside us to organise (or *structure*) into a gel-like consistency. This reduces friction allowing for better blood flow, which maximises the smooth delivery of oxygen, nutrients and hormones. This greatly benefits day to day metabolic functioning at the minute cellular level.[57] This supports the body to more effectively detoxify and get rid of anything harmful thus aiding, healing, growth and repair. The body's exposure to sunshine also allows for sugars to be burnt more efficiently, thus increasing energy potential, leading to improved function, growth and repair. (Should you wish to learn more on this subject please refer to '[Cells, Gells and The Engines of Life](#)' by G. Pollack. [57]) Also, please check out the articles referenced in our bibliography [13][29][31][49][60]

Artificial Light

Our modern energy saving LED light bulbs, and light from computer/mobile phone screens, have a narrow (concentrated) band width of frequencies. [13][25] These restricted light frequencies do save on electrical energy, but importantly and sadly, they also detrimentally affect our hormones in several ways. One effect of such artificial light is to raise the body's cortisol levels. Cortisol sends a message to the liver to release glucose, (the simplest form of sugar), into the blood stream. When too much glucose is present in the blood, the storage hormone, insulin, stores it away in fat cells. Therefore, raised cortisol levels can lead to an increase in fat storage within the body. In addition, an increase in cortisol levels has the potential to raise our stress levels. [13][32]

Another effect of artificial light, is in how it reduces the release of the hormone melatonin, after the sun has set. Melatonin is critical, (together with cortisol), in regulating our sleep / wake cycle. [49] Melatonin for sleep, and cortisol to raise blood sugar to give us the energy to wake up again. Quality sleep is essential for growth and repair throughout the night, as well as for effective learning and self regulation during the day. So - yes modern lighting does save on electrical energy, but its presence also causes, us to store more energy as fat, experience greater inner stress, and disrupts our sleep. [3][13][25]

To better balance the light frequencies, open windows and doors whenever possible. This allows the natural and broader light frequency of sunlight to enter more fully into the classrooms. Replace/reduce the use of electronic devices like white boards, with chalkboards, and other non-light emitting physical and *concrete* resources. Decrease in the amount of exposure to such concentrated light frequencies, (which emanate from computers and electronic devices), is the ideal to aim for. Screen time (blue light) exposure, can be balanced at least, to some extent, by taking breaks from such screens; opening windows so welcoming in a broader array of light frequencies and placing red light bulbs (or red light panels) behind the screen user. By adding red light bulbs within your workspace, you are introducing other light frequency to that of the blue light emitted from the screens.[13] Other possible beneficial interventions can be accessed via ; computer apps for screens like '*LUX*'; '*blue block*' glasses; 'black out' curtains in bedrooms and low level red light plug-ins, in hallways. '*Daylight computers*' (with broader light frequency screens), although not available at present, are in the process of development. Regular access to an outdoor learning environment, strengthens the circadian connection between the broader light frequencies present in the natural environment and the human internal body clock.



Actively planting and surrounding ourselves with trees and grass, bathes our bodies in beneficial light frequencies. These infra red and green light frequencies support our health and help to balance out those times when we are exposed to indoors artificial light. Infra red light can penetrate through up to seven layer of clothing. [47][58][59][60][61]

Should you wish to wish to learn more on the subject of light frequencies see YouTube– [Med-cram Medical Lectures Explained, 'Sun-lights Deep Impact on the Body' Dr Roger Seheult MD \[61\]](#) ; also see YouTube– [Med-cram Medical Lectures Explained, 'See Infrared Light with Your Own Eyes' by Dr Roger Seheult MD \[60\]](#) Also please check out the articles referenced in our bibliography. [13][25][29][31][47][49][56B][59][63]

Light Activity Suggestions

1. **Sundial** - Place a stick (or the maths spinner spindle) into the ground. Place 12 of the wooden counters (or pebbles) around the spindle, beginning with north. Use a compass to identify north. Space the counters evenly around the stick in a circle. Observe how the shadow changes as the day goes on. Sundials are also available to buy from Outdoor Classrooms Ltd.

2. **Grass Patches** - Cut a square of cardboard and place onto the grass, weigh it down so it doesn't move. After a few days remove the cardboard and see if/how the grass has changed colour. Look at the concept of photosynthesis with the children. Do not re-instate the cardboard leave it off the grass and see how/if the grass recovers.

3. **Light Permeability** – Choose a range of objects and shine a torch onto them. Which items let all the light, partial light, or no light through? Do this with a human hand and see how the longer wavelength of red light penetrates further into, or through the human body. Other shorter light frequencies are not capable of achieving this effect. [31][59]

4. **Rainbows** – Observe rainbows in the sky at every available opportunity! Use this as a lead in to talking about light. Look for other examples, like the surface of bubbles where the light frequencies spilt into their different rainbow colours.

5. **Prism** – Use a prism to split the sunlight into its different colour spectrum.

7. **Sunrise and Sunset** - Look at sunrise and sunset with the children in real life where possible, and photos where this is not possible. Compare the colours of light at dawn and dusk to midday. Using paint, crayons or coloured pencils create sunrise / sunset art work. Use this as a talking point to discuss colour of sky, clouds, differences and change.

With older children talk about, and discover light frequencies/ wave lengths and how colours differ. Look at how various wave lengths of light penetrate the earth atmosphere differently depending on the angle of entry. For example when the sun is lower in the sky at dawn and dusk, the light has more atmosphere to travel through, than when the sun is overhead at midday. Therefore, dawn and dusk light is richer in the longer wavelength red light, as it can penetrate further. [31]





Fresh Air



Good quality fresh air is important for optimal to health. Cities often have a lower level of oxygen, while having higher levels of carbon dioxide and oxides of nitrogen and other pollutants. [77] Airborne pollutants from car tyres, vehicle exhausts, and the 'off gassing' of plastics and rubber resins are also problematic. [2][15] Particles present in the air can enter the human body/ bloodstream via the lungs. *Fresh air* - present in and around a healthy garden, can be further enhanced through thoughtful and considered planting. Trees and plants act as filters sifting out airborne dust and pollutant particles from such places as industry, traffic fumes, rubber wear from tyres and a whole host of other sources. Trees and plants also improve air quality by releasing oxygen into the atmosphere. [27] Historically, trees were specifically planted in cities at the roadside for their pollutant filtering properties. Plants and trees also have the added benefit of reducing traffic noise and acting as wind breaks. [71]

Yet another benefit in using of real plants is that they make use of the blue light spectrum to photosynthesise effectively, and reflect the (unwanted by them) near infrared frequencies of light, beneficial to *our* biological life. People adversely affected by light sensitivities report that green and infrared light reflecting from leaves, is easier on the eye than light reflected from concrete. It seems, that people certainly benefit in many ways when spending time in a natural garden, not least due to reduction in stress levels and improvement in mood and a positive sense of well-being. [6][36][69][72]

Free packs of native trees are available in order to plant a 'shelter' belt around the school grounds. They are available from, [The Woodland Trust](https://www.woodlandtrust.org.uk/plant-trees/schools-and-communities/). <https://www.woodlandtrust.org.uk/plant-trees/schools-and-communities/>. [Outdoor Classrooms Ltd](https://www.outdoorclassrooms.co.uk/) can supply willow, free on request, for general weaving and for living willow structures: Contact us for details; queries@outdoorclassrooms.co.uk. Orchard Trees are available from [The Tree Council](https://treecouncil.org.uk/grants-and-guidance/our-grants/orchards-for-schools/); <https://treecouncil.org.uk/grants-and-guidance/our-grants/orchards-for-schools/>

Fresh Air Enhancing Activities Suggestions

1. **Growing Willow.** Choose an appropriate place to plant the willow cutting. They prefer, damp areas but will tolerate most soil types. Remove the willow from the pot and plant into the ground. Water well. When the leaves fall off in autumn take, pencil length cuttings and push them into the ground (or a plant pot) for self-rooting. By taking repeated cuttings the original willow tree is duplicated over and over, providing a large resource of materials for activities or for willow structures.



2. **Harvesting Willow.** Willow is harvested and used for weaving activities or den making. When the leaves fall off in autumn cut lengths of the willow stems called (wands), the length of wands will depend on the growing conditions. When cutting, leave at least one or two buds above the ground for future regrowth. Use the lengths as required.



3. **Planting a Willow Structure.** If planting for a wigwam or tree tunnel, plant the willow as above (1.), spaced about 60cm apart. The growth speed will vary on soil conditions, as well as the quantity of light and water. As the willow grows, bend the branches and weave them together, making a living wall. Natural cord can be used to hold the branches in the desired position until they have grown into a more fixed structure. This 'living structure' will provide enjoyment for years to come, that will also absorb carbon-dioxide and release oxygen.

4. **The Carbon / Oxygen Cycle.** Use the living willow structure as an example, to study the carbon / oxygen cycle, photosynthesis, and any other topics, of relevance to the children.





Biodiversity



We are all part of a wider biological system, inside, and outside of our human bodies. Generally speaking, one sign of an unhealthy biological system is a narrowing of bio diversity. [21]

“Bio diversity is essential for the processes that support all life on Earth, including humans. *Without a wide range of animals, plants and microorganisms, we cannot have the healthy ecosystems that we rely on to provide us with the air we breathe and the food we eat. And people*

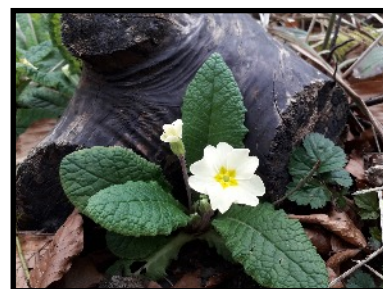


also value nature of itself..... Some aspects of bio diversity are instinctively widely valued by people but the more we study bio diversity the more we see that all of it is important –even bugs and bacteria that we can’t see or may not like the look of. There are lots of ways that humans depend upon bio diversity and it is vital for us to conserve it. Pollinators such as birds, bees and other insects are estimated to be responsible for a third of the world’s crop production. Without pollinators we would not have apples, cherries, blueberries, almonds and many other foods we eat. Agriculture is also reliant upon invertebrates – they help to maintain the health of the soil crops grow in. Soil is teeming with microbes that are vital for liberating nutrients that plants need to grow, which are then also passed to us when we eat them.”

The Royal Society [70]

Natural Aroma Therapy

Planting aromatic plants, like mint, lemon balm, lavender, thyme, geraniums and many more aid the body and mind to relax. The mechanism responsible for this is believed to support the reduction of ‘glutamate excitotoxicity’ present in the brain. The scent from certain aromatic plants aids in the recycling of glutamate (the brain’s main neurotransmitter), into the beneficial relaxatory neurotransmitter (GABA). For example, rather than the brain getting stuck in a cycle of; Action - Action - Action - Relax; by making use of such scented plants, it can instead lead to a more relaxed process; Action - Relax. The presence of Glutamate excitotoxicity can present as seizures, cognitive delay, petit mal seizures, anxiety, depression, memory loss, agitation, difficulty in concentration, with delay in processing speeds. [28]



Although the benefits of scented plants are not a ‘cure all’, they have, nevertheless, been shown to be worth while, and should be viewed as another piece of the ‘holistic’ jigsaw puzzle. Their additional benefit is their importance to many butterflies and other pollinators. Also sensory benefits of their different colours, shapes and scents, along with the abundance of microbial life they encourage in a garden, provide a rich and profound learning platform.



Biodiversity Activity Suggestions

1. **Herbs for Cooking.** - Plant culinary herbs (and other safe scented plants) in the school Garden. Use the herbs in recipes. For example, plant mint, then harvest them with the children and make minty potatoes, mint ice cubes or mint sauce.
2. **Herbs for play.** - Plant culinary herbs, (and other safe scented plants) in the school garden near the nature / mud kitchen area. Allow the children to pick them and use for pretend cooking.



Ban Weedkiller on and Around School Campus.

Many chemicals found in weedkillers are designed to penetrate the cellular structure of the plant, blocking it from absorbing essential nutrients. The chemicals also act as antibiotics, killing soil microbes. These and other chemicals found in agricultural and domestic weedkillers, show a *too* strong statistical correlation with neurological conditions, some cancers and other health problems. **They must not be sprayed in children's gardens.** Although you would *never* bring such chemicals into the school classroom it is sadly, still routine practise for these weedkillers to be used in school gardens. Grounds maintenance crews regularly spray chemical weedkiller

along paths, boundary edges and even around children's physical development apparatus.

[11][30][46][52] [53][62][64] If you wish to learn more about this subject, see [Dr. Stephanie Seneff's](#) book, 'Toxic Legacy'[62] or contact 'Pesticide Action Network UK' [52])

So, by renegotiating grounds maintenance contracts - categorically requesting that weedkiller is not to be sprayed in school grounds - a huge unseen risk can be eliminated. Instead, request the use of mechanical means to cut around fences and play equipment, whenever necessary. Identify the plants which are growing in the school grounds. Pull up the unwanted ones and use the others as part of the learning curriculum. Plant wild flower seeds with children, to the benefit of all, not least the bees and other pollinators.

Biodiversity Activity Suggestions

1. Wildflower Meadow - Purchase packs of wildflower seeds. Make a seed shaker by (safely) piercing large enough holes in the lid of a container, so that the seeds can pass through. Mix wildflower seeds and sand inside the container. Choose an appropriate area for a wildflower patch. The children can shake the container, spreading the seeds around the chosen area. (The mixed in sand helps the seeds to spread more evenly).



2. Bio diversity Study. Place an Outdoor Classroom 'surround' on the ground like on the lawn, (internal dimensions of 50 x 50cm which is 1/4m²). Identify the types of plants/minibeasts found within the surround and count how many are present. Move the surround to another area of the garden with a different habitat, i.e. from a grassed area to a border or concreted area. Observe how the types and quantity of plants and minibeasts change from one location to another.

3. History of Plant Use. Once the plants have been identified in the garden, discover how some of them may have been used historically. For example, teasels were used in the cloth industry, from the 13th to the 20th centuries, (though occasional still used today) for brushing and aligning the wool fibres to make the woollen cloth softer and smoother. Plantain was used medicinally, due to its anti-inflammatory properties. For example, it was used to treat eczema and insect bites.

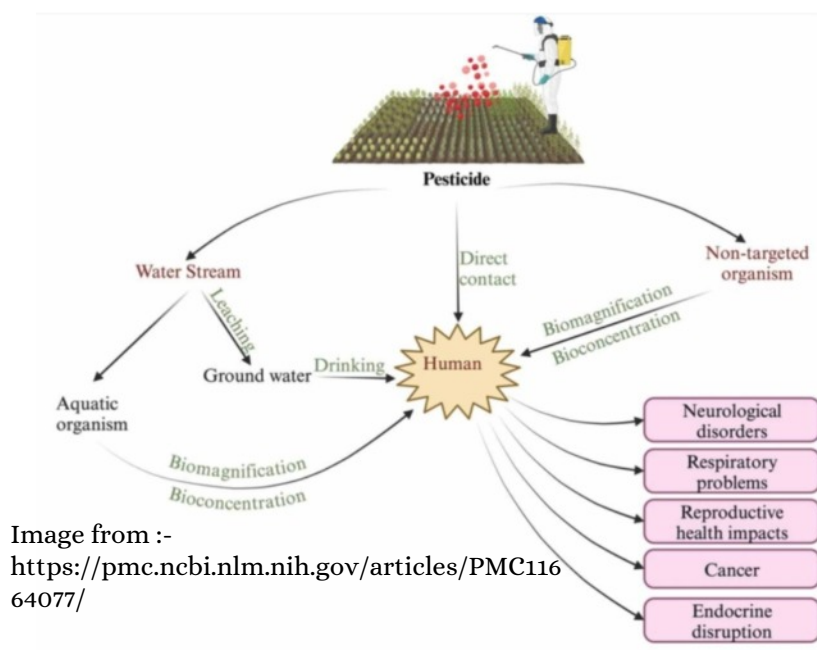


Image from :-
<https://pmc.ncbi.nlm.nih.gov/articles/PMC11664077/>





Wood and Timber



Timber has been an essential human resource for over 500,000 years.[22] Crafts people understood the characteristics of different timber species and which types suited which applications. For example, a cart wheel has traditionally composed of a variety of timber types, i.e. an ELM knot for the hub (it is resistant to splitting) straight grain OAK for the spokes (great compression strength), and ASH for the rim (both strong and flexible).

Wood Traceability and Timber Treatment in 'SEND' Gardens

Nowadays, the majority of commercially available timbers tend to be those species that quickly deteriorate in an outdoor environment. These timbers, (felled from forestry plantations) are mostly Spruce and Fir. When originally planted, these types of timbers, were intended for indoor use in house building. In order to use these timbers in an outdoor environment, industry routinely has to treat these particular species with preservative chemicals, forced into the timber, under pressure. These chemicals are designed to kill living organisms like wood boring insects, fungi and bacteria, which, if left alone would break down the cellular structure of the wood. Europe is still in talks concerning the labelling of timber - in terms of its origin and of the presence of any **preservative treatments and their toxicity**. This should allow for more informed choices in relation to the possible negative effects of such preservatives on human health and the health of biological systems. [79] California is calling for clearer labelling of products generally [50] Arsenic (thankfully) is no longer used in UK timber treatments. However, without clear labelling, data sheets or chemical analysis of the timber, we cannot be certain which cocktail of pesticides, herbicides and fungicides, children are being exposed to, in *children's education garden*. [45][48][65][75]

The advice for adults handling treated timber is to protect against splinters and cover any broken skin. Also .. *"After handling or working with treated timber, all exposed skin should be washed before commencing other activities, especially eating, drinking, smoking or going to the toilet."* [1] Contact by adults working with wood is arguably increased due to dust residue, e.g. after sawing the timber. However, the long-term exposure to treated timber by children using play equipment on a *daily basis*, should be of concern. This is especially so in relation to the softer permeability of a child's skin, and their, as yet, under-developed bodily detoxification pathways. Possible children's exposure could come from splinters on rough sawn treated timber fences; through hand to mouth transfer and skin contact with hand rails on treated playgroup apparatus.

An additional concern, is the possible exposure to harmful chemicals from food grown inside treated timber frames (or tyre planters). Chemicals from timber treatments can leach into the soil, and be subsequently picked up by vegetables. It is relevant to know brassicas, such as cabbage, broccoli, etc. can actually be used to clean up contaminated soils, (this process is known as 'phytoremediation'). These same plants can also be used to absorb heavy metals, like lead (Pb), cadmium (Cd), arsenic (As), mercury (Hg), chromium (Cr), and nickel (Ni) from contaminated soils. Therefore, plants like brassicas are more susceptible to absorbing any chemical leached into surrounding soils. [10]

It's difficult to find out exactly which chemicals are currently in use in timber treatments. The timber industry seems slow in research the possible migration of timber treatment chemicals into soils. By looking at studies of older treated timber (which show significant migration of chemicals from wood to surrounding soil over several years) we may get some clue as to the likely contaminants.

So buyer beware! Education and playground suppliers, professional landscapers, well-meaning corporate volunteer day workers and caretakers' DIY projects, can each (often inadvertently) introduce chemically treated timber into children's gardens. *To learn more about chemical migration from treated timber, look into a number of studies and report like:-*

- Mercer, T. G.; Frostick, L.E, Leaching characteristics of CCA-treated wood waste: [45]
- Aziz Shiralipour ; Research into vegetable absorption of arsenic. [65]
- Leeds University investigation into leaching from fence posts into surrounding soil.



Plywood and Phenolic Resin Board

These types of material may contain synthetic formaldehyde, and other chemically based glues. These can enter the environment when the board delaminates from the effects of weathering. Instead, use real wooden boards whenever possible.

Alternative to Treated Timbers

The best (and most environmentally friendly) alternative to that of using chemically treated timber is to check and insist on the use of natural untreated UK Wood. Timber from Cedar, Larch, Oak, Sweet Chestnut, Douglas Fir and others, have evolved to be resistant to decomposing agents, in a natural outdoor environment. These naturally durable species are long lasting outdoors, with no need for artificial poisons. (Please see our woodland management project for more information.) The Gold Standard is UK grown wood that has been laboratory tested for heavy metals, toxins and chemical migration to toy standard CA/CE EN71-3. This toy standard CA/CE EN71-3 has been applied to all the timber used in the '*SENCO's Natural Initiative*' set of resources. Outdoor Classrooms provide a full range of naturally durable educational resources. However, this initiative seeks to encourage all education suppliers to improve their health and sustainability processes in relation to the wood and materials they provide, for the good of all.

Fungicides on Play Bark

Be aware that some bark, bagged in plastic bales, may have been treated with chemical fungicides to prevent mould growth inside the air tight bag. Instead, opt for untreated woodchip. Outdoor Classrooms makes a path-grade woodchip from durable species of UK wood. It's long lasting and is not treated with chemicals.



Natural Timber Based Activity Suggestions



1. Understanding the Importance of Trees and Timber Read '*The Woodland Story*' with the children. Identify those items in their environment which are made of wood (Trees), like classrooms shelves and chairs. '*The Woodland Story*' is available from Outdoor Classrooms Ltd, (queries@outdoorclassrooms.co.uk)

2. Identify the Trees in the Garden Count the trees in the garden. Identify and name the different types. Find out how they have been used throughout history. Do these particular trees have any local industrial connections?

4. Den Making.

Provide natural untreated wooden poles and other resources, i.e. hazel, willow, cedar, sycamore, for the children to make their own dens.



5. Wood Working Project – Provide basic tools like ball peen hammers, hacksaws and rasps. Teach the children their safe use and provide them with wood to work on. Free off-cuts (for woodworking projects) are available - all safe to handle non-treated timber. For collection by appointment from Outdoor Classrooms Ltd.

6. Bird Box, Bat Box kits – These kits are available to purchase from Outdoor Classrooms Ltd. They are suitable for older children to work on, to further develop their woodworking skills. Constructing kits like these all help to promote positively the bio diversity of the school garden.





Our Woodland Management Projects



When I started working in school gardens in 1992, one of my first projects was in a special need school. I realised straight away just how often the children touched the wooden and other surfaces, then touched their faces and mouths. I was concerned that chemically treated timber was not the right thing to have in a children's garden. I began researching into alternatives and realised that naturally durable species of timber were a much safer option. I found it difficult to get the correct timber species from local suppliers and this led me down a career path into forestry. I wanted to be completely sure that we could get the correct type of wood to create safe and ethical children's gardens." Richard, Project Co-coordinator

We now (2025) have our own local woodland management projects. We choose the sources of our timber with great care - almost all are naturally durable. We fell the trees ourselves, sensitively and sympathetically. We use a *continuous management* woodland system - which encourages natural regeneration, which promotes greater bio diversity.



(The alternative of unmanaged woodland and clear felling does not achieve this outcome). We are always working for the benefit of wildlife and the welfare of the woodland habitat as a whole. We have our own tree nursery, and have grown trees and planted new woodlands since the mid 1990s.

We process the timber in-house, in our own sawmill. This means, we can use the timber sizes we wish, and the best timber type for each application. We know the origin of every piece of timber and that it is totally free of chemical treatments.



The main species we use have all been CE/CA tested to Toy Standard EN71 - 2 & 3.

This way we make ethical resources for children's gardens, that are beautiful, safe, durable and are long lasting!





Plastic & Rubber



Plastic can be found throughout almost every aspect of our daily lives. [5][7] There are occasions when it is the best material for the job, - i.e. when insulating electric cables. However, it's often not the best material to use especially considering its effects on health and environmental. There is a growing move within educational settings, to replace plastic with natural alternatives, such as stainless steel, baskets made from natural fibres, and natural wooden products.

Flexible and Ridged Plastics

Ultra violet light (UV) breaks down the chemical compounds present in plastics and releases them into the environment. Plastic are exposed to UV light in an outdoor environment, so the potential weathering effects are greatly increased. 'Bisphenols' (BPA - which make plastics ridged) and 'Phthalates' (which make them flexible), are just two of the types of chemicals released into the environment as plastic degrades. BPA's and Phthalates are 'Xenoestrogens', (known as endocrine disrupting chemicals - EDCs). These EDCs also known as obesogenes, disrupt hormone communication within body. They particularly adversely affect oestrogen and testosterone, hormones, for example for by confusing the natural hormonal signals, which have important roles in the bodies effective function. These and many more chemical compounds connected with plastic, have associated negative health outcomes but it is beyond the scope of this brief overview to explore them. For more information please refer to [Balch, Bridget, Microplastics are inside us all. What does that mean for our health?](#) [5] and other articles referenced in the bibliography. [5][7][8][16][66]

The most positive way forward is to limit the quantity of plastic resources in the outdoor provision. In its place, use natural untreated wooden resources or other non toxic materials. Free, natural wooden off-cuts are available (for loose parts play), from Outdoor Classrooms Ltd, collection by appointment .



Artificial Grass

Artificial grass is plastic, with the same innate problems of chemical release into the environment. However, the larger surface area of plastic grass and its daily exposure to sunlight, causes it, (especially in the summer months), to heat up. This heating process releases the chemicals into the air (called off-gassing), Which can then enter the bloodstream directly through the lungs. When chemicals off-gas it can also make it easier to absorb through the skin. There are also environmental issues in relation to plastic wearing and breakdown into micro plastics which then contaminate the soil, watercourses and our own bodies. Additionally, artificial grass retains heat and can simply become far too hot for animals and children, on particularly sunny days. Whereas, real grass has a cooling affect on hot days! (Should you like to learn more please refer to the study by [The University of Maryland 2010](#), Also, [Ryan-Ndegwa, et al; Exploring The Human Health; Impact of Artificial Turf Worldwide: A Systematic Review](#) [57B] and other articles referenced in the bibliography [35] and [12][20][57B][58][68]

Rubber Resin Bound Play Surfaces

Chopped up old tyres, chemical dyes and chemical resins are routinely used to create playground 'fall' surfaces. Unfortunately these surfaces off-gas volatile organic compounds (VOC's) including mercury, benzene and polycyclic aromatic hydrocarbons (PAH's). UV sunlight breaks down the chemical bonds over time allowing this cocktail of chemicals to be released into the environment. *The danger lies in these chemicals being absorbed and stored, in the body through touch, ingestion and inhalation, which can overwhelm the liver.* [2][3][4][15][23][43][55][56]



In a 2007 study at California's OEHHA, tyre rubber was wiped (to simulate children touching them), and the wipe was analysed. This (and other studies) discovered the presents of toxins, including zinc oxide, cadmium, lead and arsenic. Also found were polycyclic aromatic hydrocarbons of cheysene, fluoranthene, phenathrene and pyrene. [3][15] Although one study found very high levels, the other found that *most* of these carcinogenic chemicals in levels *considered to be safe*. These 'safe levels' simply can't take into account the combined effect of the many different products children are exposed to on a daily basis. So should we be exposing children to these carcinogenic chemicals at all, especially when there are good, natural and healthier alternatives available. [33][7]

Real Grass

Real grass is classed as a low level 'fall surface'. So, opt for real grass which remains cool and is far better for health and the environment. Organic turf and grass is available to purchase through reputable suppliers. [26] It reflects a greater quantity of red-light, absorbs carbon and provides a home for a diverse range of life.[36] Woodchip also works as an appropriate 'fall surface', when placed around physical play equipment. Grassed surface which experience high use would benefit from the addition of stepping stones and woodchip paths.

Tyres

Tyres are combustible. Tragically this fact was seen in 2020 in Derbyshire, where arsonists piled up playground tyres and paper from the bins to start fires that burnt down two schools. There are also health implications, which need great consideration in relation to the use of tyres in an education setting. The most simple and straightforward solution is this: Never use tyres in any education or child care setting! [3][4]

The offer of 'free' tyres, can be very tempting. Tyres are classed as a 'controlled material' (following the EU wide ban on dumping tyres in landfills). Its illegal to dispose of tyres in landfills as they are a fire risk, can be a breeding ground for mosquitoes and release harmful toxins as they degrade. Therefore, the vehicle industry has to pay to correctly disposals of tyres by other methods. Methods such as recycling into products such as rubber crumb surfaces, which in itself is steeped in environmental controversy. In recent times, stretched school budgets have made receiving adult's waste tyres into children's educational settings seem attractive. However, is 'free' always free when there could be health and environmental impacts - especially for our precious and vulnerable children. [2][3][4][15][43][55][56] Using tyres for planting is common, but there are many concerns with this practice. Again, certain plants like brassicas (Cabbages, cauliflower, sprouts , and others) can be used to clean-up such contaminated soils [10].

Although the below statement refers to tyres in road use, older (recycled) tires will still be breaking down, due to the effects of the sun, weather and wear [4]. *'As tyres break down they release a range of particles, from visible pieces of tyre rubber to nanoparticles. Large particles are carried from the road by rain into rivers, where they may leach toxic chemicals into the environment, whilst smaller particles become airborne and breathed in. They are small enough to reach into the deep lung. These particles may contain a range of toxic chemicals including polyaromatic hydrocarbons, benzothiazoles, isoprene, and heavy metals like zinc and lead.'* Professor Terry Tetley National Heart and Lung Institute, as cited by Caroline Brogan in the article - [Prioritise tackling toxic emissions from tyres, urge Imperial experts](#) [15] If you would like to learn more about this subject please check into articles referenced in the bibliography [2][3][4][5][7][8][10][12][15][16][17][20][23][35][43][47][50][55][56][57B][66][74]



As Booker; et al asks, in their article; [Children and Athletes at Play on Toxic Turf and Playgrounds](#). [12] ... “Why are chemicals that are banned from children’s toys allowed in artificial turf and rubber playground surfaces? [As noted in their article], “numerous studies indicate that the hormone-disrupting chemicals found in rubber and plastic cause serious health problems. That is why the Consumer Product Safety Commission has banned several endocrine-disrupting chemicals from toys and products used by young Children.”

The best alternative to the use of tyres anywhere is untreated wooden garden planters for growing and playground area dividers (see below). Use real grass and woodchip for playground areas instead of plastic and recycled tyres.

Natural Resource Activity Suggestions

1. **Composting.** Sweep up winter leaves, along with other rubbish like packet wrappers or sweet papers. Place into the composter bin, let a few plastic wrappers to be placed in too. Once the leaves have composted into soil, see how the plastic wrappers have still not composted. Consider with the children how this will affect the environment.

Micro-Friends Composter and Double Bay Composters are available to purchase from Outdoor Classrooms Ltd



2. **Natural Timber Loose Parts Play** – Free loose timber off cuts of natural non treated timber are available from Outdoor Classrooms Ltd on collection, by appointment. Please contact for details.



3. **Natural Planters, Edging and Resources** - A wide range of natural timber products are available to purchase from Outdoor Classrooms Ltd. They provide a great alternative to many plastic products.





Our Living Human System



Microbial Inheritance -

(Not for Dietary, Nutritional or Medical Advise, it is simply information for you to research further.)

We inherit specific microbes from our maternal line; from grandmother to mother, mother to baby and so on. These key microbial species are sensitive to the influence of external environments. Influencing factors, for example, are agricultural chemical on food, weed killers and the over use of medical antibiotics, (which doctors are now starting to limit except for serious infections). Agricultural chemicals are often found in higher level in shelf stable processed foods and are in lower levels in organic fresh produce. [33][44]

Besides the effects of antibiotics on key microbial species, chemicals can also damage the effectiveness of critical intestinal enzymes, particularly when a genetic weakness is already present. These enzymes are important for many function, including detoxing chemicals and heavy metals, that can accumulate over time. Intestinal enzymes, together with microbes in the gut, are also responsible for a great many other functions. These range from the production of, important amino acids and vitamins, neurotransmitters for the brain and sulphate. Sulphate is necessary to move non water soluble nutrients around the body, is critical to the liver for detoxing, and aids the bodies ability to remove unwanted compounds. The role of microbes goes further, as they help us extract nutrients from our food, use up some of the excess sugar in our diet, make short chain fatty acids for our intestinal and colon cells, and much more. The effective and harmonious inter-connection of helpful microbes in our bodies, are critical to correct body and brain development and function. [39][42]

The lactobacillus and bifidobacterium species, should constitute half of the *'helpful'* microbes present in a healthy newborn's gut. [14] They have evolved, over millennia, to process mummy's milk. However, these particular species are especially sensitive to damage caused by the over use of antibiotic chemicals. Damage to these key species cause problems in digesting milk, affecting nutrients uptake. Many children become fixated on an overly-restricted diet, high in carbohydrates, i.e. wheat, potatoes, sweets, etc.. This type of diet may become more deeply embedded as time goes on. The mechanism behind this can be explained as follows: the presence of antibiotic chemicals in the human gut leads to the depletion of the *'helpful'* microbes. This reduction allows for the over growth of certain antibiotic resistant microbe strains, like clostridia. The sugar - loving microbes demand, more and yet more high sugar foods as fuel! They send signals to the brain, demanding more of their favourite foods. [9][40] Too many of these types of microbes can result in the production of too high levels of a short chain fatty acid in the colon, called 'propionate'. Certain neurological conditions can show higher than normal levels of this short chain fatty acid, which can lead to inflammation. Ingestion of a high level of carbohydrates can also lead to an overgrowth of yeast within the gut. This can produce *'Auto-brewery Syndrome'* where sugars have been fermenting in the gut into alcohol, presenting as giddiness, uncontrollable giggling and boisterous behaviour. The yeast over-growth, can also raise oxalic acid crystals which, as well as lectins (like gluten) can irritate the gut. This modern day depletion in the level of the *'helpful'* gut microbes, has led to the need for specific *'probiotic supplements'*. [40] For more information please read [Wang, Baohong; Yao, Mingfei; Microecology—Review; \[76\]](#)

These are available in the form of products such as; 'Biogia's Gastrus' – to support an infant's milk digestion. Lactobacillus and Bifidobacterium species are particularly important as they help to make a key set of amino acids, which are precursors to many neurotransmitters, like dopamine, serotonin, oxytogen and melatonin. They also help in the manufacture of the important B vitamins like B6 and B12 and thyroid hormone production. Sadly, our synthetic and antibiotic world is taking its toll on the diversity and number of beneficial gut microbes, needed for optimal health and development. [34] Also see (L.Routeri Yogurt [Recipes Dr Davis blog; www.drdavisinfinitehealth.com;](#))

So eating nutrient dense real food, with limited chemical processing and chemical load, is helpful to child development.





Send Diet Overview – Ideas for further research



Many SEND children (as well as others) have food sensitivities - most commonly to sulphur - containing foods, (i.e. eggs, onion and garlic); lectins in grains / cereal crops (i.e. those containing gluten) and casein found in dairy products (especially A1 Beta Casein in cows' milk). These sensitivities may not be immediately apparent. However, their presence can lead to intestinal inflammation, which allows larger particles of undigested food to pass through the tight junctions of the gut lining, and other bodily membranes. These particles of undigested food, as well as microbes or other unwanted particles, can then enter the blood stream - leading to heightening the immune systems response and autoimmune reactions. Unfortunately, many people tend to crave those very same foods that are causing the sensitivities (and subsequent inflammation) in the first place! These cravings can be caused by a narrowing of the diversity in the species of gut flora, and subsequent overgrowth of certain microbes that crave particular food types.[9][42] In general terms, these sensitivities are thought to be exacerbated by:-

- 1) The presence of chemicals in the environment that kill microbes, i.e. some cleaning products, weedkillers, and so on.
- 2) A genetic weakness in the bodies ability to copy certain enzymes.
- 3) The consumption of arable crops which have been previously sprayed with weedkillers and pesticides (with microbe killing properties).
- 4) The over-use of medical antibiotics. (Of course, their use is sometimes essential).

The Walsh Institute (in studies) have ascertained that 98% of children diagnosed with Autism show signs of reduced brain methylation (a pathway which clears toxins from the body including heavy metals).

Non-organic crops (i.e. Wheat, Barely, Rye, Oats, Soya Beans, Peas, Peanuts, Chickpeas, Lentils, Rapeseed, Maize, and many more) are often routinely sprayed with agricultural chemicals containing antibiotic properties. Many GM commodity crops have been specifically genetically modified so they survive being sprayed with weedkillers without killing them. For example, a GM soya croup can then be sprayed with weedkiller, killing only non-soya plants. This spraying leads to a greater soya yield per acre, but the soya being contaminated with weedkiller. So leading to an increased presence of chemicals in the food chain. [40] The UK Government in 2021 tested white and brown bread, crumpets, scones and muffins. Traces of 11 different pesticides, fungicides and herbicides were found. Of those tested, 50% showed the presence of two or more of the agricultural chemicals (REF.www.panuk.org) For further research see [Dr. William Davis' book, entitled, 'Wheat Belly'\[20B\]\)](#) and [\(Dr. Stephanie Seneff's Book, entitled 'Toxic Legacy' \[62\].\)](#) Also, see the information links in the bibliography [9][11][14][39][51]

The following are some Organisations which specialize in information to support the most optimal diets for SEND children. Please see contact detail below for further information:-

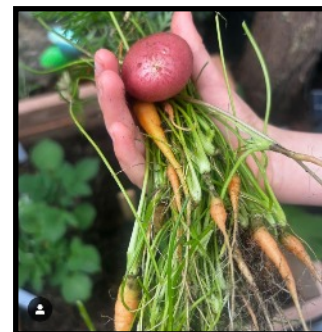
- **Charlie Foundation:** benthzk@charliefoundation.org – www.charliefoundation.org
The Charlie Foundation was set up to support children with drug resistant epilepsy, with an alternative approach using well formulated Ketogenic diets. The Charlie Foundation also supports children with many other neurological condition, that respond favourably to the Ketogenic diet.
- **The Weston A. Price Foundation:** info@westaprice.org - www.westonaprice.org.
The Weston Price Foundation advocates traditional eating practices to support healthy child development. It provides many educational lectures from Sally Fallon and others.
- **The Gaps Diet:** ask@gapsdiet.com www.gapsdiet.com The Gaps Diet offers an approach which views nutrition as a means to heal the gut and brain barriers to restore neurological health.



Real Food Activity Suggestions

1. Small Organic Food Growing Kits & System.

Outdoor Classrooms Ltd provides educational food growing projects. Kits are available (with instructions) for growing from supplied organic seeds, onions, beans, garlic, potatoes, in naturally durable untreated wooden growing surrounds.



2. School Garden Projects.

Outdoor Classrooms manufactures untreated, naturally durable wooden garden planters and 'raised beds.' These are used to support the growing of organic vegetables in schools.



3. School Farms

Outdoor Classrooms has also developed a range of child-friendly farm equipment for successful school and (community food) production. It's collectively known as; *'People Ploughing Equipment.'* Children can work as a team - using a range of pull / push hand ploughs and seed drills, for open field growing. This will provide significant quantities of produce for the school kitchen and the wider community.



4. Fruit Trees Orchard

Support is also offered (from Outdoor Classrooms) for orchard establishment. Help is available via technical knowledge and the sourcing of suitable trees and later with pruning protocols. A school orchard would be ideal to provide organic fruit for the whole school.



5. Cooking

The produce the children have grown themselves will provide low cost organic food. Larger amounts can be used to provide the school kitchen with produce, or be available for parents to take home. Smaller amounts can be used for class cooking. Dishes like minty potatoes, vegetable soup or humus (made with field beans) are all easy recipes. A great opportunity to bring practical aspects to lessons, tying into curriculum frameworks.





What are the implications for SEND?



.....and all children who may be exposed to timber treatments, plastics, rubber crumb and weedkillers in education gardens?

Our human form is more than just our obvious physical structure. We host a whole eco system of life on the micro level. Scientists now estimate that our microbial cells exceed the number of our human cells [24][38]. *“More than 100 trillion symbiotic microorganisms live on and within human beings and play an important role in human health and disease. The human microbiota, especially the gut microbiota, has even been considered to be an “essential organ”, ... [essential for] ... modulating the metabolic phenotype, regulating epithelial development, and influencing innate immunity” Wang, Baohong; Yao, Mingfei; Et al (Vol. 3, Issue 1, 2017) The Human Microbiota in Health and Disease; [76]*

Many of our body's microbiota can be very sensitive to damage from antibiotic chemicals, whether, in weedkillers, cleaning products, fragrances, or medical antibiotics. Many chemicals in plastics have also been shown to be detrimental to health. We need to consider the health implication of the materials being brought into the learning environment. Scrap store projects encourage the collection of what, at first sight, may seem of benefit to use in a school setting. Things like plastic packaging, old tyres, off cuts of decking timber, etc. However, these very same items may be wholly inappropriate- having never been originally designed with children's play in mind. *Tyres fare an example, which are now considered as 'toxic waste', if you need to depose of them.* Weedkiller and artificial surfaces also bring in a cocktail of synthetic man made chemical compounds.

Reducing the amount of synthetic and man-made chemicals which may be present in the children's environment will positively benefit their general health and development. This is because their bodies don't need to work as hard on clearing such unnatural chemicals. In place of trying to cope with these additional chemical burdens, a child's body and brain is more free to focus upon healing, growth, repair, learning, development and social interaction. Often children with SEND are more sensitive to stresses caused from many of the modern day synthetic chemicals that surround us. We have several levels of defence in our immune system to protect against unwanted invaders. However, it seems that our bodies struggle to defend against many of these synthetic chemicals. Our liver has the main job of clearing any toxins that get past the body's first barriers, of our gut, skin and lungs. Unfortunately, consumption of modern day processed foods is already heavily taxing the liver. There may also be a genetic component to our ability to deal with these toxins. Some children's bodies seem to find it difficult to process sulphur, found in foods such as eggs, garlic and onions. Sulphur (as sulphate) is critical in allowing the body to expel toxins, through, for example, urine, defecation and sweating. Our bodies haven't evolved to deal with the many hundreds of modern chemicals, this can cause inflammation in the body. Inflammation is widely believed to be the starting point for many health problems. Reducing environmental exposure to toxins is the first step to supporting the body to heal and to reduce inflammation. For more information please see [Lustig, Dr Robert; Constant, Charles; et al \(2021\) Metabolical: \[39\]](#) and [Seneff, Stephanie; \(2023\); Sulfur Sensitivity; \[62B\]](#)

We agree with [Booker; et al \[12\]](#) ... **“Why are chemicals that are banned from children's toys allowed in artificial turf and rubber playground surfaces? [As noted in their article], “numerous studies indicate that the hormone-disrupting chemicals found in rubber and plastic cause serious health problems. That is why the Consumer Product Safety Commission has banned several endocrine-disrupting chemicals from toys and products used by young children.”**

Examples of some areas for improvement (and replacing with something more 'natural') are; artificial light, processed foods, artificial fragrances in everyday products, cleaning supplies, treated timber, flexible and rigid plastics, PVC's, tyres, weedkillers and artificial surfaces. The list could go on! [\[5\]\[7\]\[8\]\[10\]\[11\]](#)





So, What Can Be Done?



The SENCO's Natural Initiative promotes the #play-natural-initiative message. It aims for a 'return to basics' and to keeping everything as simple and as straightforward as possible. Much of the following is already built into the school day and practised by educational professionals and informed parents. The following *'Best Practice'*, can be built upon and shared with others.

1/ Schools strive to create and promote a loving and tolerant environment – which focuses on the celebration of individual and shared achievements. This type of caring support reinforces the body's microbial inner health by reducing the release of stress hormones. This allows for a more balanced hormonal production – notably dopamine, serotonin and oxytocin. The presence of these hormones promotes a child's inner sense of well-being and self-regulation. This, in turn, encourages expressive speech and language (or sign language) development - again reducing a sense of inner frustration.

2/ Many schools now have continuous outdoor provision in Foundation and Year One, as well as access to outdoor learning for all age groups. Many practitioners see the benefits of spending as much time as possible in *real, natural* green spaces. It's helpful to make a point of watching the sunrise every morning – or at least to open a window at dawn to let the natural light frequencies and fresh air in. This 'resets' the hormonal body clock each day and our micro biology really pays attention to this! Walking to school may have more benefits than one might think. Make the most of natural, as apposed to artificial light.[6][47]

3/ Many schools are encouraging healthier diet choices and a reduction in processed foods, Organic food growing in the school garden, in natural un-treated timber planters, has much more nutritional value than shelf stable packaged foods. Doing this will help supply the school kitchen as well as being an enjoyable and useful learning tool in itself. Harvesting home-grown produce, preparing and cooking healthy meals with the children encourages them to taste and try out new foods. Also, it helps reduce the intake of sugary and high carbohydrate snacks between meals - so allowing the gut time to heal. (Further research can be found in; [Professor Robert Lustig's 'Eat Real' project](#)) [9][19][39][64][66]

4/ School settings are increasingly replacing plastic and other *unnatural* resources, in both the indoor and outdoor provision, for natural alternatives. Resources made from nontoxic natural materials, like untreated wood, stainless steel, natural fibres, and other non (or at least lower) toxicity materials are being chosen. The gold standard is to use natural untreated UK timber. Schools are turning to natural timber (instead of treated timber) for planters, and natural timber for moveable or static dividers (for zoning playground areas), in place of tyres. Opt for real grass, trees and plants, instead of artificial grass surfaces. Natural untreated woodchip is good to use as an appropriate 'fall surface'.

Thank you for reading to the end. Please share this information with your SLT, EYFS, Curriculum Leads, Forest School Practitioners and any other support staff. Thank you!

Hope you enjoy developing your education gardens! May they blossom into a rich and wonderful bio-friendly learning environments.





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Maths resources



Signs



Mini-Maths Set

Can You Find? Boards

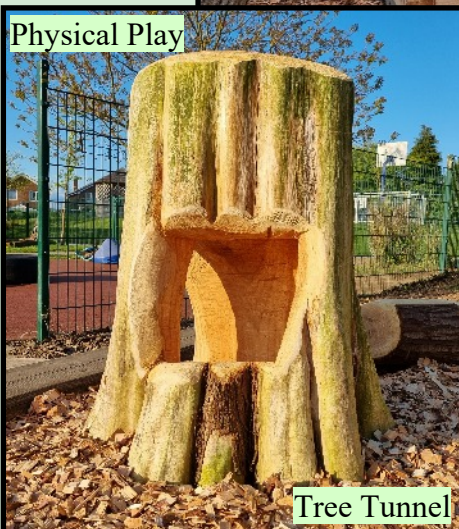
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Timber Framed Buildings



Physical Play



Tree Tunnel

Care Cabins

Language & Literacy Resources



Pre-writing Boards

Spiral Climber



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We have a huge range of products—here is a small sample:



Physical Play Area



Climbing Stumps



Outdoor Classroom

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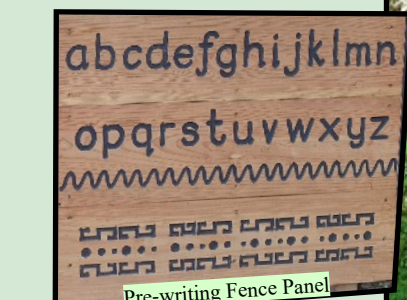


Outdoor Classroom

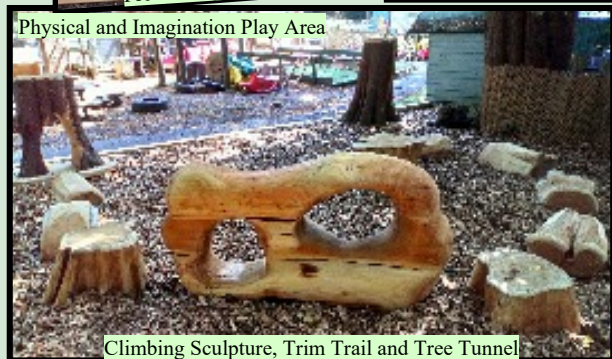
Rustic Shelter



Physical & Imagination Play Area



Pre-writing Fence Panel



Climbing Sculpture, Trim Trail and Tree Tunnel



Tree Tunnels, Shaped Balancers, Climbing Sculpture, Log Edging and Woodchip

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