



INCLUSIVE NATURE

SENSORY DEVELOPMENT IN NATURE FOR
SPECIAL NEEDS CHILDREN

TOOLBOX





TABLE OF CONTENTS

2

Introduction

3

What is Sensory Integration?

5

**What is the Inclusive
Nature Approach ?**

6

**What is Nature Based Learning for
Special Needs ?**

8

**Nature as an Environment
for Sensory Integration**

9

Twelve Inclusive Activities

24

**Example Sensorial
Experiment Tour in Nature**

28

**What is SPA (Sensory Play Area)
Design ?**

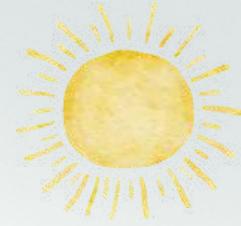
32

**Tips for parents and
educators**

33-34-35

Conclusion, Credits and References





INTRODUCTION

This Toolbox has been developed within the scope of the Erasmus+ project titled **"Nature-Based Sensory Development for Special Needs Children"** (Project Code: 2024-1-FI01-KA210-SCH-000250643), coordinated by Learning in Nature Ltd from Finland, in partnership with Oba Ütopya Eğitim Sanat ve Medya from Türkiye, Vammaisperheyhdistys Jaatinen from Finland, and Vrtec Martin Krpan Cerknica from Slovenia. Katia Hueso from Spain, an expert on nature education for special needs children also provided valuable support to the project. The project aims to empower teachers to take children with special needs outdoors more frequently by equipping them with practical resources and training. Through nature-based approaches, the project supports sensory development, enhances emotional and physical well-being, and contributes to more inclusive and holistic special education practices.

This Toolbox serves as a practical guide and inspiration for educators, providing them with tools, activity ideas, and theoretical background to effectively integrate nature into their daily work with special needs children.



INCLUSIVE NATURE



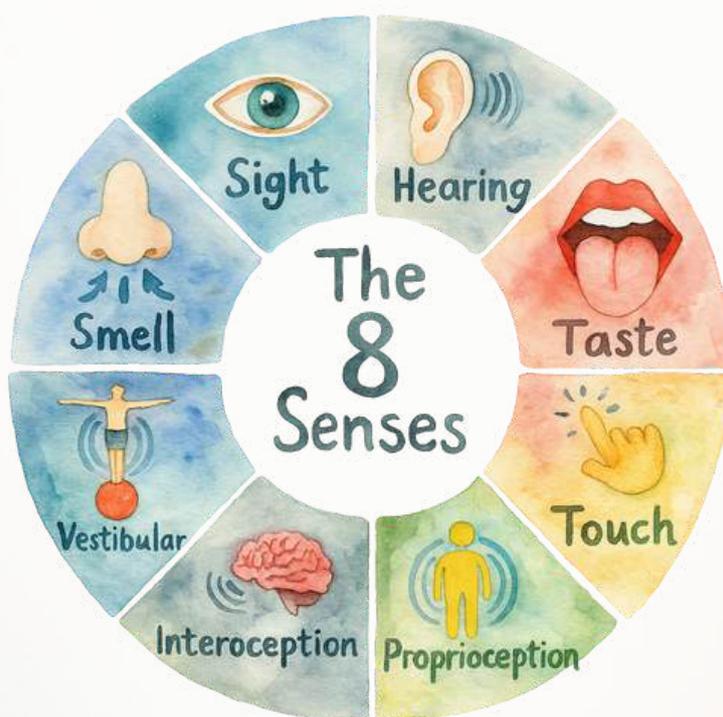
WHAT IS SENSORY INTEGRATION?

Sensory integration is a neurological process that enables individuals to receive, organize, and respond appropriately to sensory inputs from both external and internal environments. This process involves various sensory systems including vision, hearing, touch, balance, body awareness, taste, smell, and internal bodily sensations (Bundy, Lane, & Murray, 2002; Miller et al., 2007). The brain structures responsible for sensory processing such as the brainstem, thalamus, cerebellum, cortex, and limbic system—work together to filter, integrate, and interpret incoming sensory data (Lane & Schaaf, 2010).

Jean Ayres' foundational research (Ayres, 1972) highlighted how difficulties in sensory integration can negatively affect children's learning, attention, behavior, and motor coordination. These sensory processes develop rapidly in early childhood, and disruptions at this stage may cause long-term developmental challenges (Parham & Mailloux, 2015).

Sensory integration is deeply rooted in neurobiology and is closely linked to the efficiency of the nervous system in managing stimuli (Schaaf & Mailloux, 2015). Consequently, successful sensory integration is fundamental for the development of social, cognitive, and motor functions.

To better understand sensory integration, it is essential to examine the eight sensory systems, each of which has distinct functions, examples, and potential challenges (Kranowitz, 2005; Nicholson, 1971; Baranek, 2002):



Resource: University Hospitals of Morecambe Bay NHS Foundation Trust (2024)



THE EIGHT SENSES



VISUAL

- **Visual (Sight)** : Interprets light, color, shape, and spatial awareness. For instance, recognizing faces or catching a ball. Challenges include difficulty copying from the board or locating objects (Bundy et al., 2002).



AUDITORY

- **Auditory (Hearing)**: Processes environmental sounds and spoken language. Examples include listening to instructions or enjoying music. Over- or under-sensitivity can affect communication and attention (Baranek, 2002)



OLFACTORY

- **Olfactory (Smell)**: Detects scents, contributing to taste and danger recognition. Over-sensitivity can cause nausea; under-sensitivity may prevent awareness of hazardous odors like smoke (Kranowitz, 2005)



GUSTATORY

- **Gustatory (Taste)**: Involves flavor recognition, essential for food preferences. Difficulties can lead to picky eating or excessive seeking of certain tastes (Wilbarger & Wilbarger, 1991).



TACTILE

- **Tactile (Touch)**: Detects pressure, texture, and temperature. Sensory defensiveness may result in discomfort with certain fabrics or touch; under-responsiveness may cause messiness or pain unawareness (Ayes, 1972).



VESTIBULAR

- **Vestibular (Balance & Movement)**: Senses head position and movement, crucial for posture and coordination. Children may crave spinning or avoid movement entirely (Lane & Schaaf, 2010).



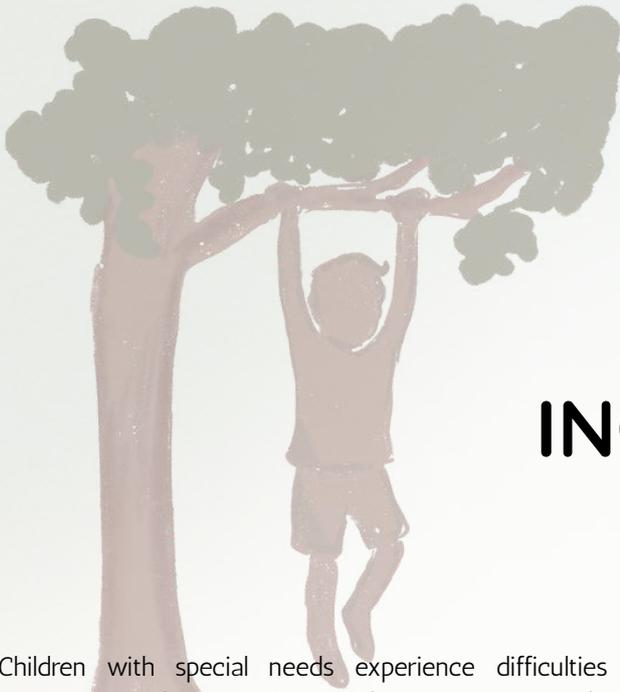
PROPRIOCEPTION

- **Proprioceptive (Body Awareness)**: Provides feedback about muscle and joint position. A child may appear clumsy, seek deep pressure, or crash into things for regulation (Miller et al., 2007).



INTEROCEPTION

- **Interoceptive (Internal Body Signals)**: Involves awareness of internal states such as hunger or the need to use the bathroom. Poor interoception can affect toileting, emotional awareness, or recognizing thirst (Schaaf & Mailloux, 2015).



WHAT IS THE INCLUSIVE NATURE APPROACH?

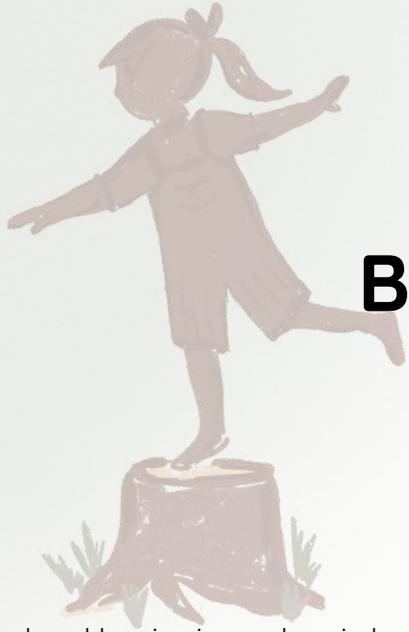
Children with special needs experience difficulties accessing and connecting with nature, not only because of physical burdens, but also because of their impairments (motoric, sensitive, cognitive or multiple), as well as a structural lack of time and opportunity. Their added commitments to academic support activities as well as medical and therapeutic procedures and frequent additional procedures in daily life (hygiene, getting dressed, eating) consume energy and free time from them and their caretakers. Being out in nature is seen as a leisure activity and is easily dismissed from the agenda, whenever these difficulties arise. However, spending time in nature has multiple benefits for the psychomotor, cognitive, emotional and spiritual development as well as for the physical and mental health of people. It improves the intra- and interpersonal competencies, provides lifelong autonomy skills and enhances the outcomes from learning and therapeutic efforts elsewhere. Above all, being in nature and connecting with it provides joy and contributes to a general and lasting feeling of happiness and overall wellbeing.

Among the main advantages of nature is that it is free, ubiquitous, inclusive, universally accessible and a non-judgmental setting. Nature is found everywhere: from pristine protected areas to a nearby park or garden and is usually free of access. Connecting with nature is as simple as noticing it. Frequency of contact with nature will have a heavier impact than any degree of naturalness or remoteness, if unnoticed. Being aware of nature increases the depth and lasting outcome of this connection. Children feel at ease in nature because it provides myriads of play opportunities in a broad range of settings (forests, mountains, meadows, beaches, wetlands...) and plentiful materials

(sticks, leaves, stones, seeds, sand) and opportunities to connect to more-than-human beings. When free play is encouraged, nature lets them be: a tree can be climbed on, hugged, hidden behind or sat under. The tree will not judge the child's capacity to climb it or lack thereof; it will not admonish a child that idly lies under it or hits it with a stick. This is a very powerful feeling for children, especially those with disabilities, who are used to being assessed, instructed and stimulated every minute of their waking hours. Children also have a strong capacity to live in the present moment, a skill that makes connection with nature not only possible, but also engaging, profound and lasting.

The Inclusive Nature Approach acknowledges the power of nature to include children with all levels of capacities and needs, of all ages, anywhere in the world. It highlights the idea that nature is found everywhere, it simply needs to be noticed. While nature contributes to the development, health and wellbeing of all, it is especially well indicated for children with disabilities and their families, for all the benefits it offers, which are especially well suited for them. The Inclusive Nature Approach is a synergistic, dynamic dual pathway where both nature and children with disabilities encounter and offer the best of each other, it empowers children and encourages them to take care of nature that has accepted and embraced them. By caring for each other, both nature and children with disabilities win.





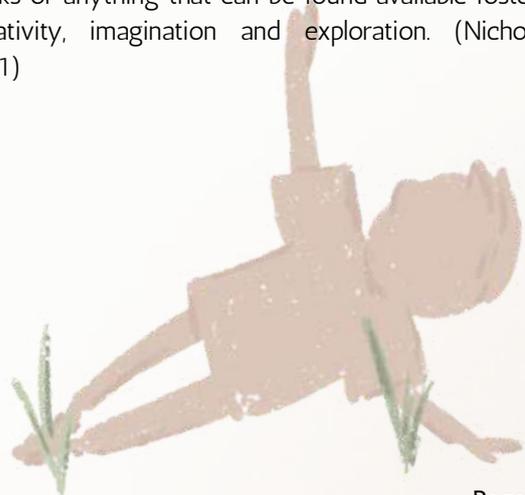
WHAT IS NATURE BASED LEARNING FOR SPECIAL NEEDS?

Nature-based learning is a pedagogical approach that is gaining momentum across the world, as seen with the growth of forest kindergartens and nurseries, nature playgroups, forest school sessions, outdoor education in schoolyards and nearby environments and other initiatives with similar names. Learning in nature is a hands-on experience with lasting emotional and cognitive outcomes for all engaged. The higher efficiency of regular outdoor learning has been proven in multiple studies among children and students of all ages (from nursery to higher education) in a broad range of landscapes and cultures.

The term learning is well placed here, as the focus lies on the acquisition of skills rather than their transferal through formal teaching. Learning in nature often takes place as a self-directed process, following the interests, capacities and needs of the child, rather than uniformizing sessions to meet the goals of an adult-led programme. Teaching is then transformed into facilitating and accompanying, becoming a more horizontal, peer-to-peer and inclusive activity. Learning through free play is a slow but deep way to ensure learning outcomes, as the internal motivation and flow are maximum. Free play in nature offers plenty of settings and materials, a broad diversity of situations from which to learn. Children playing free in nature continuously practice the scientific method, as they go through all the stages of learning without the shortcuts usually provided by adults: they observe a phenomenon, ask themselves a question, formulate a hypothesis, design an experiment and try it out in different conditions, after which, they draw conclusions.

An example of this is a child throwing stones in the water. She may watch others doing it, unconsciously ask herself what would happen if she also tried it. She then decides to throw a stone and repeats the process several times. She may also do it elsewhere, later in time. At some point, also unconsciously, she concludes that stones sink in water and moves on to the next "project". Maybe later she develops a new set of experiments by trying to throw a stick, which then floats, or a stone on a frozen pond, which slides on the ice. New levels of knowledge will then be built. This is the model of autonomous learning, typically applied by children who engage in free play in nature; science and conscience in the making.

In nature there are many "loose parts". The Loose Parts Theory was coined by architect Simon Nicholson in 1971. According to this theory, loose parts are materials that can be moved, carried, combined, redesigned, lined up, and taken apart and put back together in multiple ways. In nature loose parts can be stones, seeds, fallen leaves, mud, shells, feathers, barks, sticks or anything that can be found available fostering creativity, imagination and exploration. (Nicholson, 1971)



When considering the economical challenges parents, foster parents, families or teachers might face when supporting children with special needs through therapeutic procedures or devices, these loose parts are found freely in nature and can also be ways for sensory integration. Bearing in mind that some plants can be endemic, it is good to know a little about the flora and fauna when visiting a natural environment. Also to leave the loose parts in the same area will provide opportunities for play to other children, making it a sustainable practice.

When free play cannot be applied for any reason (e.g. low adult to children ratio, unknown setting, children not used to free play), games can be proposed. Care should be taken to choose inclusive, engaging and cooperative games that provide positive emotional experiences. Competitive games tend to leave sweet-sour feelings that may jeopardize the learning outcome. Non-inclusive games will exclude children with certain disabilities, further deepening their exclusion. Inclusive learning is about designing games and learning processes with diversity in mind, it's about empowering children in their consolidated capacities and inviting them to challenge their boundaries, to explore new avenues of learning and doing.



"We must teach our children to smell the earth, to taste the rain, to touch the wind, to see things grow, to hear the sun rise and night fall - to care."

John Cleal



Nature is the perfect place for this to happen. Nature is diverse, fragile and sensitive to change. But it is also welcoming, patient and resilient. Nature teaches children to keep trying, to offer the best of themselves, to digest and enjoy the outcomes of crossing the boundaries of their comfort zone at their own pace; to highlight their skills, as limited as they may be. Nature encourages us to be who we are, accept ourselves and others, and do it at the best of our capacities. It is perhaps time to rephrase the term children with special needs into children with additional needs. In essence, we are all special and some of us might have additional needs.





NATURE AS AN ENVIRONMENT FOR SENSORY INTEGRATION

A person walking in nature encounters an immense variety of sensory stimuli: colors and shapes, sounds, scents, the feel of wind on the skin, and cones and roots underfoot. The sensory experiences provided by being in nature form a harmonious whole, where the environment and its events naturally align in meaningful ways, with no single stimulus demanding all the attention. However, nature is teeming with countless things happening at any given moment, offering endless opportunities to draw focus and engage in activities that support sensory integration

Nature offers an endless supply of stimuli for the five basic senses, requiring a refined ability to discern and differentiate them. The forest holds countless shades of green, each plant has its own subtle scent, and each berry its unique delicate taste. Two types of moss feel different under the hand, and one could spend a lifetime learning to identify the songs of birds. In contrast, environments and objects created for children often feature garish colors, intrusive and overwhelming sounds, and monotonous materials. A developing child's nervous system and sensory system can become exhausted by the constant flood of strong stimuli, while simultaneously missing the opportunity to practice the subtle and focused sensory perception that a natural environment encourages.

In addition to the five basic senses, balance (vestibular sense), proprioception, and interoception are strongly present in the experiences of moving in nature. As we navigate varied terrains and uneven surfaces, every step is different, requiring the brain and body to constantly observe and react to changing conditions. In doing so, both the sense of balance and proprioception—the sense of body position and movement—are actively engaged and constantly improving.

Even a person using a wheelchair can experience diverse bodily sensations and activation from the vibration and tilting of the chair on a forest path, which are absent on flat, constructed surfaces. Encouraging a child to balance on rocks, climb trees, crawl under fallen logs, or carry sticks for a campfire supports the development of balance and proprioception.

Interoception is the ability to sense and regulate one's internal state, such as hunger, fatigue, cold, emotions, and alertness. A hike in the woods offers a child a holistic experience that may include exploring exciting or even slightly scary places, feeling breathless after climbing a steep hill, experiencing joy and relaxation, feeling hungry before a snack break, and enjoying a pleasant tiredness at the end of the day. All these experiences require and develop functional interoception. Adults can support children in observing their bodily sensations and emotions by asking them to describe or show where they feel sensations and what they feel like. Since emotions can be challenging to verbalize, comparisons to elements found in nature can help: "My legs feel as heavy as that rock," "There's a butterfly fluttering in my stomach just like that one," or "I feel as calm as that water."

Playing, exploring, and moving in a natural environment demands and simultaneously develops the ability to observe the surroundings with all senses, adapt one's movements to changing conditions, and notice and regulate one's internal state. Nature offers the eight human senses rich and impactful experiences, creating a level of holistic stimulation that is difficult or impossible to replicate in constructed environments. Nature is an excellent setting for working on sensory integration, as it touches and engages humans comprehensively as physical, psychological, and social beings



TWELVE ✨ INCLUSIVE ACTIVITIES

During our project we had the opportunity to visit an ergotherapy centre in Turkey. Ergotherapy also known as an occupational therapy (OT), provides rehabilitation services to help individuals develop, maintain, or recover the ability to perform daily tasks and activities. At the centre we had the opportunity to familiarize with tools and materials that support sensory integration for children. As it is the experts who can make the assessment and establish what kind of support the child needs to ensure their development, we believe it is again the therapists, ie professionals who can thoroughly give necessary exercises and instructions to parents or recommend occupational therapy rehabilitation for the child. Followed by this visit and a seminar by a professional ergotherapist Sümeyye Sevgili we got inspiration on what can be done in nature with children.



This section offers twelve practical nature-based activities designed to support children with special needs through sensory development. Each activity encourages exploration, stimulates multiple senses, and fosters connection with the natural world. Adaptable to different ages and contexts, these activities provide educators with simple, engaging ways to make learning in nature inclusive, joyful, and empowering.

SHARING AN OUTDOOR MEAL

 Jenny Turunen  0,5- 3 hours

 2-10 Children



Materials: Food ingredients or a pre-prepared meal, a camping cooker or fire, kettles, plates and utensils based on need. Picture cards

Learning Outcomes: Practicing fine motor skills, communication skills, planning and making decisions in a group, risk management, telling one's opinion, listening to others, cooking skills, table manners, taking others into consideration.

Description: Include an activity of eating in a forest trip. Set the level of challenge and tasks according to the age, skills, and special needs of the group. The point of the activity is to encourage the individuals and the group to communicate, make decisions and cooperate, take care of tasks, practice fine motor skills and cooking skills. The instructor supports the individuals and the group in decision making, communication and the practical tasks, at the same time giving them the space to be active and independent participants.

To be considered: Due to possible fire sparks, it would be important to make sure there is enough space between the fire and where the child is sitting. Other points to consider: making common agreements on how to be around the fire, having a first aid kit and water nearby, sharp utensils, allergies, seating arrangement ensuring that smoke doesn't come to the face; general risk analysis and precautions in the forest, such as for wasps, falling branches.

Variations: In its simplest form this can mean e.g. tasking a piece of fruit, supporting the child to choose from two options, e.g. a banana or an apple. With a group with more skills and capacity the activity can include the whole process from deciding on the menu and shopping for the ingredients, to making a fire, preparing the food, sharing a meal and taking care of the dishes. In the end the group functions independently with only slight support from adults.



WHAT IS MISSING? >>



Chantal Romi



30 minutes



7 children



VESTIBULAR



PROPRIOCEPTION



HEARING

Materials

Different kind of loose parts like a stone, a stick, a cone, a leaf or other natural materials and a cloth bag

Learning Outcomes

Concentration, remembering by touching and seeing, sensory awareness, fine motor skills, problem solving, self-confidence

Description

Show the materials and loose parts to the children and ask them to name each material. Then put them into the cloth bag. Ask the children to close their eyes and then take one material out of the bag. Ask who wants to guess what is missing. They have to guess it by touching the materials in the bag. If the task is too hard, you can give some hints like "it is hard, it is grey..."

To be considered

A child with tactile sensitivity may at first be afraid to touch different materials. In this case, the task is progressed on the child's terms, and touching must not be forced. The child can be guided to touch the different materials first outside the bag with eyes open and then only after that inside the bag or by trying with eyes closed.

Variations

You can change materials and children can find new materials as well.

The game can be played the same without a cloth bag. Put loose parts on the ground and then ask children to close their eyes. Then you take one material away and ask what is missing.



RALLY/ FORMULA RACES



Miina Weckroth



15 minutes



A child and a guardian (or 2+ children and guardians as needed)



Materials

The child needs a vehicle that is suitable for the terrain where the race takes place. This activity is primarily designed for a child who requires significant assistance and uses a wheelchair for mobility. An excellent choice for a vehicle would be a rehabilitation buggy pushed by the guardian, ideally one that is suitable for jogging. While a wheelchair may not be the best option, it can be used if the track is appropriate for it.

Variations

A child may also use a wheelchair that they can maneuver independently. Additionally, children who are capable of riding a bike can opt for a bicycle instead.

Learning Outcomes

Sensory Awareness, Spatial Awareness, Joy of moving fast!

Description

Let's turn this into a live-action role play! The child will take on the role of the rally driver and can choose a name for their character. They can create a name of their own or borrow one from a famous rally driver, such as Kalle Rovander. If they are more familiar with Formula drivers, they may select a name from that realm, like Mika Häkkinen. The guardian pushing the buggy will act as the co-driver, serving as both a navigator and a radio or TV commentator.

For additional participants, please refer to the variations. Find a suitable track for the rally, and let the adventure begin! The length of the rally can be either short or long. The guardian should adjust the speed according to the terrain, while also ensuring to create an exciting rally atmosphere by embellishing speed, turns and curves.

The atmosphere is further enhanced by the guardian's commentary on the progress of the rally. *For example:*

"Here comes Kalle Rovander, the greatest rally driver of all time! Kalle launches into the rally, and the speed skyrockets... He approaches the first bend, a sharp right turn, and Kalle floors the accelerator! But caution is essential – even the slightest mistake could lead to a spin! Ahead lies a steep uphill, and Kalle presses on the gas... Now he enters the left-hand bend, and the car begins to slide perilously. What's this! Kalle nearly loses control!! He almost skids into a ditch – but thankfully, he quickly regains his grip on the road! What a relief! What an adventure!! And the journey continues..."

To be considered

Ensure that all vehicles are in good condition. Select a racetrack that is appropriate for the vehicles being used and suitable for the skill level of the drivers, while also providing ample space. Always maintain a safe speed.

Variations

If more than one child is participating, you can organize a fun rally competition. In addition to the roles of rally drivers, map readers, and TV commentators, other roles can be included, such as a judge, a mechanic, or a spectator. All participants can choose a role name. Children can use vehicles that match their skills and the terrain; for instance, a child who can maneuver a wheelchair independently may use that, while those capable of riding a bike can opt for a bicycle instead.





SNOW SCULPTURES



Hanna Vesamo



Preparation 15 min.- 2h
(depending on the size or number of boxes) cooling preferably overnight. Sculpture 0.5-1 hour



1-3 for one sculpture



VESTIBULAR



PROPRIOCEPTION

Materials

A cardboard box or large plastic container, shovels and various tools for making the sculpture. The sculpture can be worked with spoons, chisels, sticks and knives (does not have to be sharp).

Sensory Development Area

Visual and interoception

Learning Outcomes: Persistence, planning, Visual perception. Getting to know different tools. Possibly teamwork and cooperation.

Description

Fill a cardboard box or plastic container with snow by pressing it tightly into the container at different stages of filling.

Turn the container over to the place where the sculpture will be made and leave it in the mold, preferably overnight. If using a cardboard box, you can fill it from the top, which means you don't have to turn the box over, but the walls of the cardboard box act as a mold. The next day, remove the mold and you can start working on the snow cube. You can shape the cube into whatever you want by sculpting and engraving.

To be considered (Including Possible Risks)

Each participating child has a tool that they are familiar with and are able to use. Check if the child recognizes that they are feeling cold and they are attuned to their body's sensations when outdoors.



A CONCERT FOR FOREST ANIMALS



 Erna Zabukovec, Bernarda Okoliš, Saša Pivka

 1 - 10 children

 20 minutes



Materials

Natural materials (stones, sticks, cones,...), basket

Learning Outcomes

To develop hearing attention, distinguishing sounds, to encourage creativity

Description

In the forest, invite children to collect natural materials and to put them into the basket. Take two sticks out of the basket and start making sounds by hitting the sticks to each other. Then invite children to choose any material out of the basket. Each child tries to make sounds by rubbing, hitting, tearing... You can start to sing a simple rhythmic children song whilst hitting the sticks. Children can follow you.

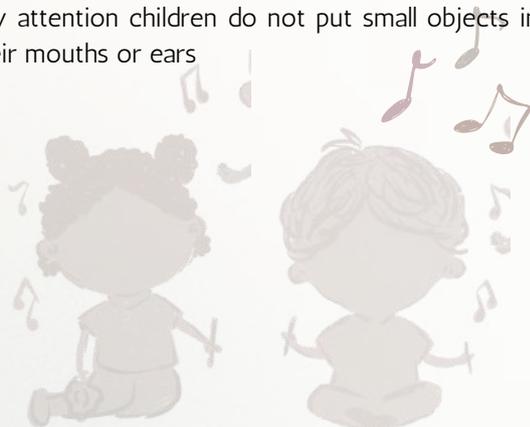
To be considered

Depending on the childrens' age or special needs, pay attention that they do not throw stones to each other. If that happens you may guide them to an area where there aren't any other children and they can throw the stone/cones/sticks there since the act of throwing in childhood is crucial for development.

Pay attention children do not put small objects into their mouths or ears

Variations

- Guessing version: A child is playing a natural instrument. Other children are listening but not watching. Their task is to guess which material is being used for playing.
- Rhythm Repetition Version: A child or a teacher is playing a rhythm with a natural instrument. Other children try to repeat the rhythm.
- Singing Version: Children sing or hum a song and play a rhythm with the natural instrument.



BE A CONSTRUCTOR

 Erna Zabukovec, Bernarda Okoliš, Saša Pivka

 1 - 10 children  30 minutes or more



Materials

Mud, natural materials (sticks, cones, pebbles, twigs, bark...)

Later you can give them the possibility of free play. You can initiate the mud play as a guided activity however if you have children that are able to create play themselves, the best approach is to just let them!

Learning Outcomes

To be familiar with mud, its varying textures, temperatures, and consistencies which provide rich tactile experiences for children, stimulating their brains and developing fine and gross motor skills through activities like digging, mixing, and shaping, to increase the tolerance of being dirty, to improve eye-hand coordination.

To be considered

depending on the season children may need proper clothes and boots for playing in the mud. If it is the summer or warm weather they needn't wear boots or waterproofs and they can play barefoot.

Variations

You can also make small mud balls and roll them along the pathways that have hills or holes creating new games.

Description

You can start building paths and channels in the mud and use different materials such as sticks or pebbles to do this. By using pebbles or you can flatten the pathways and demonstrate how to use materials differently. If you have children with special needs most of the time you may need to show how to play and continue to play along them.

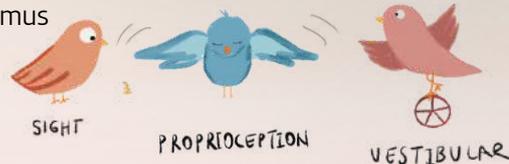


SWINGING TREE ✨

 Erna Zabukovec, Bernarda Okoliš, Saša Pivka, Gaye Amus

 1 - 10 children

 15 minutes



Materials:

A fallen tree / log and thick branch

Learning Outcomes

To practice balance, develops gross motor skills, muscle strength (legs, core), and coordination, improves balance and body awareness, enhanced sensory integration, spatial awareness, focus and emotional regulation.

Description

On the forest walk children look for a fallen tree. They sit on a trunk one after another. They push themselves with their legs up from the ground and the trunk starts to swing. This becomes a natural bouncing swing for them. The calming, repetitive motion can reduce stress, promote relaxation, and help children regulate emotions, making it a soothing activity for those who are anxious or overstimulated.

Variations

In the case where there is no fallen tree, we can make a seesaw by using a log and placing a thick branch over it.

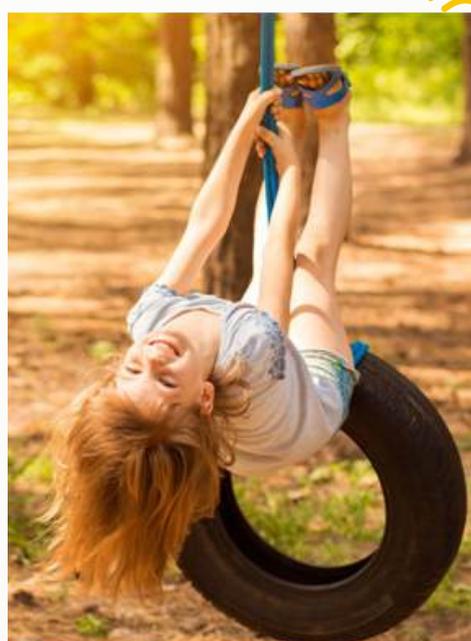
A rope tied above on a strong branch with a piece of wood at the end for sitting or a tire can be used to make a swing. A hammock can also be used and placed between two trees to support swinging which is good for the vestibular and proprioceptive senses.

For children with motor or visual impairment: The assistant/parent can sit with a child in their lap and swing.

To be considered: Remember to ensure that the tree's branch or bark is not damaged by ropes. Use a sock or two, a tree-saver strap or padding to protect trees from rope marks.

To be considered

Make sure the fallen tree is stable.



ROLLING LOGS

Ahmet Öncel

10 - 15 minutes

1-2 children (can be implemented individually or with peer support)



TOUCH



PROPRIOCEPTION



VESTIBULAR

Materials

Rounded wooden logs in different sizes (smooth surface, no splinters). Colorful ribbons or flags (for target/goal marking)

Learning Outcomes

Develop gross motor coordination through whole-body movement, improve spatial orientation and balance, strengthen muscle awareness and control, practice sensory integration through tactile and movement/proprioceptive feedback, foster social cooperation when playing in pairs, enhance problem-solving by navigating toward a goal, experience emotional satisfaction and support deep press stimulation.

Description

As pre-preparation place a few thin logs on a soft, safe surface. Children are invited to lie down lengthwise, belly-down or back-down depending on their preference,

on safely prepared rounded wooden logs. Encourage the child to move their body and roll forward toward a visual target. In case there is space between the logs the child can be asked to stretch the arms out like a bird as they roll on the logs or touch the ground like a turtle. The aim is to roll themselves forward using body coordination (head to toe movement), or with peer assistance. The path leads to a target marked with a flag or ribbon – this can be a pretend "island," "castle," or "color zone" depending on the theme of the session. Celebrate reaching the goal and allow time to rest and reflect.

Reaching the target by rolling themselves forward can encourage children to tackle other challenges confidently. Let children observe each other and, if in pairs, take turns. For children with limited mobility, a second child or an adult can gently assist in rolling or guiding the log, enabling shared joy and cooperation.

This activity can be done in nature (e.g., forest, garden, park) where uneven terrain adds natural challenge and multisensory input.

To be considered

Logs should be checked for stability and smoothness. Make sure the area is free from sharp objects and has soft landing zones. Children should wear comfortable clothes, preferably with elbow and knee pads if needed.

Adult supervision is necessary throughout the activity as logs may be heavy and might need to check the fingers don't get caught between two logs. The difficulty level can be adjusted depending on the child's motor and sensory profile.

Variations

- Obstacle Version: Place natural obstacles (e.g., leaves, cones) to navigate through.
- Team Version: One child rolls, the other gives directions (left/right), developing social-communication.
- Texture Focused: Use different materials (bark, mat, grass) under the log path to stimulate tactile feedback.
- Thematic Play: Turn the activity into a story (rolling to save an animal, reaching a hidden treasure).



FRUIT NINJA



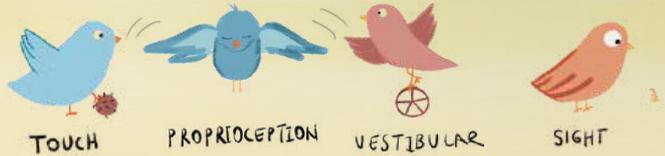
Ahmet UYAR



40 Minutes (may make it shorter depending on the childrens' age, motor and sensory profile)



1-5 children (If there are more children for eg. 10 consider making two parkours so as not to make children queue/ wait too long for their turns)



Materials Branches, pebbles, dry leaves, water, log, apple, orange, soil, 2 baskets, rope, portable water container.

Learning Outcomes

Improving children's focus, body balance skills and matching abilities, while also providing an opportunity to explore through touch and sight. Developing fine motor skills, hand eye coordination, matching skills, bilateral coordination and sensory awareness.

Description

This game is an obstacle parkour completion game. The stages in the parkour are designed to activate and stimulate the player's different senses. The activity parkour is generally arranged before the children arrive at the area. Once the children arrive, the parkour is completed together with them. Involving the children actively in preparing the parkour will contribute to their sensory and physical development.

The parkour consists of several stages. In the first stage which is the parkour set up phase, there are squares bordered with branches, each containing sensory elements (you can see the arrangement of these squares in the image below). This phase is carried out by the instructors. Before the activity begins, the squares made of branches, the log, the mud pit, and the baskets hanging from the trees should all be placed and ready.

Next is the Parkour Creation Phase where the child arrives at the area and collaborates with the instructor to collect and place the elements inside the squares (such as pebbles, water, dry leaves whatever they find around) and to prepare the mud for the mud pit. The demonstration phase while the children watch, the instructor completes the parkour and explains each step aloud. As the instructor jumps in the single squares, they say "juuump!" With both hands and feet, they move through the double squares, saying "waalk!" When they reach the squares with the apple and orange, they pick up the fruits and stand up. They step onto the log holding the fruits and walk while saying "baalance!" After stepping down, they crawl through the mud pit still holding the fruits, chanting "craaww!" When they reach the end of the mud, they stand up and aim to throw the fruits into the correct baskets hanging from the tree— one marked with an orange, the other with an apple. Once the fruits are thrown into the baskets, the parkour is complete. Now it is the child's turn. The child jumps with both feet in the single-square sections and steps into the squares with both hands and feet in the double-square sections. While the child is jumping, the words "jump, jump, jump" are said; when moving using hands and feet, the phrase "walk, walk, walk" is used. At the end of the squares, the child picks up two fruits placed there and says, "I got them!"



In the second stage, the child holds the fruits and walks across a log while maintaining balance. The log should be safe to walk on and free of splinters. When stepping onto the log, the phrase "balance,balance,balace" is said. In the third stage, the child crawls through a mud pit while instructors chant, "crawl, crawl, crawl."

The fourth stage requires the child to throw the fruits into baskets. At the end of the parkour, there are two baskets hanging from a tree by ropes, marked with pictures of an apple and an orange. The child is expected to match the fruit in their hands with the correct basket and throw it in accordingly.

Once all children complete the parkour, the fruits in the baskets are given back to them. If there's a stream, the fruits are washed there; if not, the instructors use the water they brought in a portable water container to wash them. With the help of the instructors, the children then eat the fruits.

The child is expected to complete the parkour independently. Verbal and physical cues are provided for support, verbal encouragement and reinforcement can also be offered after each successfully completed stage. Completing the parkour with minimal help supports the child's sense of confidence and achievement.

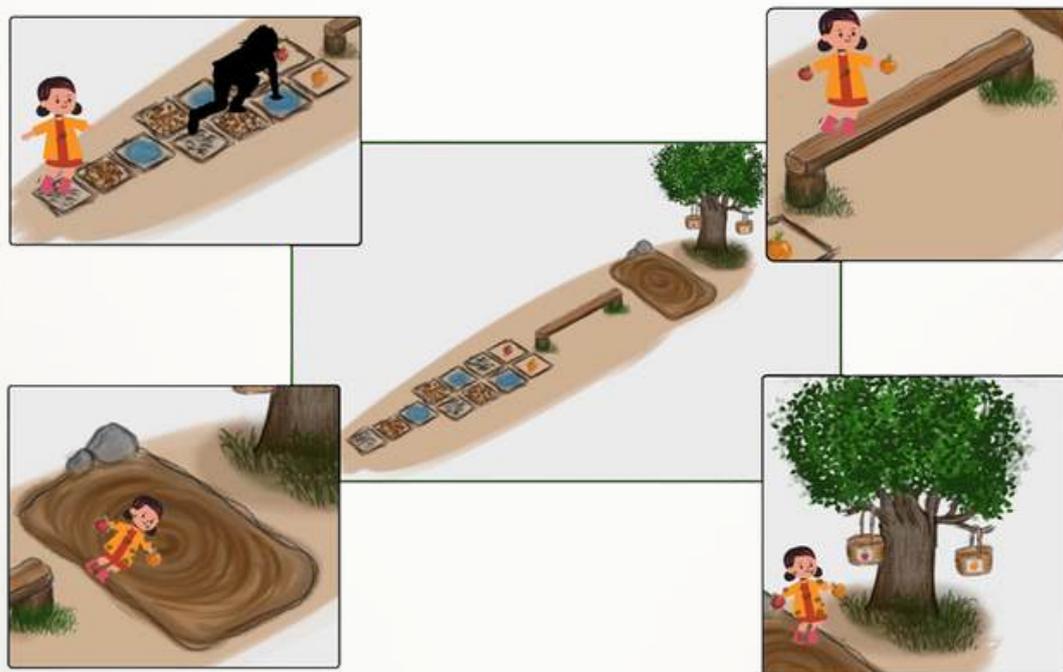
To be considered

Since the child will be in close contact with nature during the parkour, they should wear clothes that are suitable for getting dirty. It is important that the pebbles used in the parkour are smooth and that the log is free of splinters. The mud pit should be free of any foreign objects in it, other than mud itself. Before washing fruit in the stream make sure that the water is clean, if you are unsure,bring water in a portable container. Ensure the child doesn't have any allergies to the fruit you have in the activity. If you are in the woods or other natural environment and are creating a temporary parkour, be mindful to put all the material back from where you got them after you are finished with the activity.

Variations

Fruit-free Version : Instead of fruit, different items that might capture the child's interest can be used. For example, their favorite toy, colorful stones or colorful balls.

Different Natural Materials Version: The items inside the squares can be changed to provide different sensory inputs.





BLOW THE LEAVES TO MAKE THEM MEET



Ayşen Şahin, Ayşe Kan



Played in pairs.



15-20 Minutes



PROPRIOCEPTION



VESTIBULAR

Materials

Leaves

Learning Outcomes

Children learn to regulate their breath, experience working cooperatively, they learn the blowing motion by engaging head, neck, and chest muscles which increases their proprioceptive awareness, their visual and motor coordination skills are improved.

Description

Each child chooses a leaf and the activity is carried out in pairs. The children sit close to each other on the ground (either squatting, kneeling, lying down, however they feel comfortable) They place their leaves on the ground and try to blow them at the same time to make the leaves touch in the middle. This activity supports breath control, visual-motor coordination, and proprioceptive awareness.

To be considered

The distance between children should be appropriate (not too close).

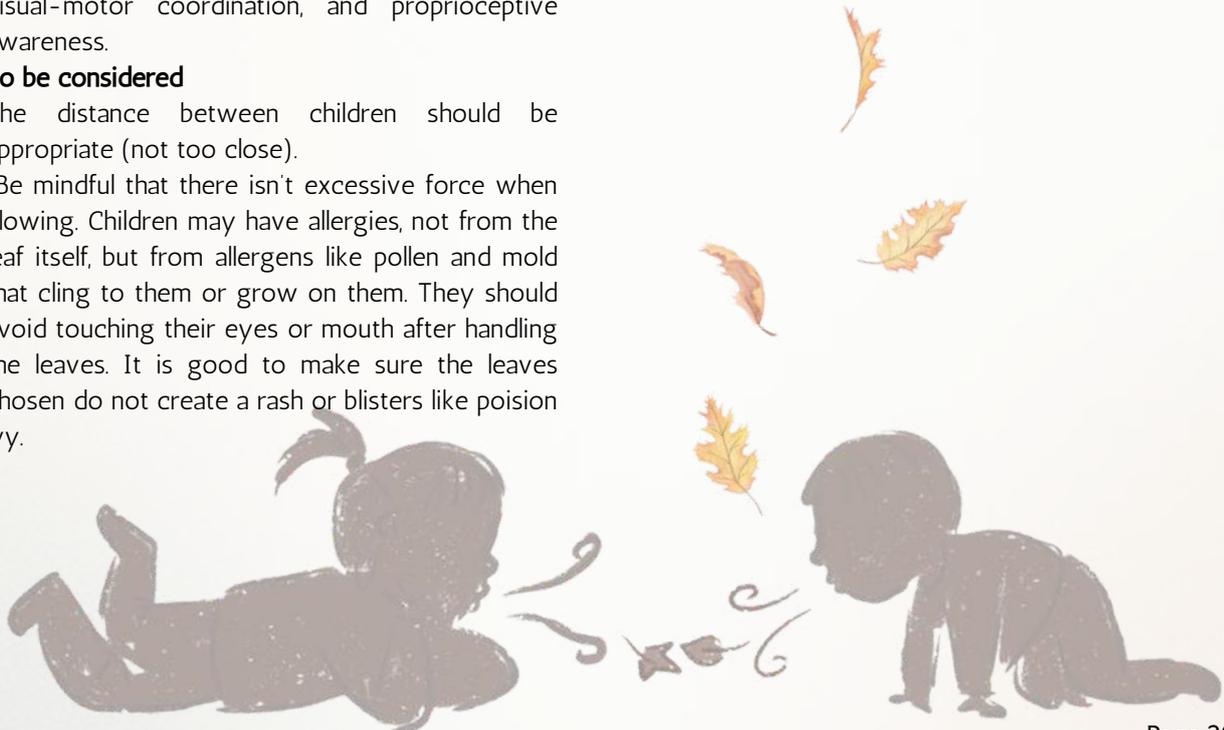
Be mindful that there isn't excessive force when blowing. Children may have allergies, not from the leaf itself, but from allergens like pollen and mold that cling to them or grow on them. They should avoid touching their eyes or mouth after handling the leaves. It is good to make sure the leaves chosen do not create a rash or blisters like poison ivy.

Also while finding a leaf on the ground make sure there isn't an insect or worm on it before playing with it to not disturb their habitat.

Since the activity is performed while squatting or kneeling, maintaining balance is important, however children who have limited mobility or prefer to lie down may.

Variations

- One-Leg Balance Blowing Version: Children can try blowing while standing on one foot, which enhances vestibular skills.
- Different Distances Version: The distance between pairs can be adjusted. Starting from a close distance and gradually increasing helps children develop breath control.
- Different Body Positions Version: Children can be asked to blow the leaves while lying down or lying on their side.



SENSORY TRACK

Mehmet Ali CAMGÖZ

1-4 children



40 minutes (15 minutes for preparation and introducing the track, 25 minutes for each child to complete the track)



PROPRIOCEPTION



VESTIBULAR



TOUCH

Materials

A long log or a wide lengthy wooden plank, mud, dry leaves, natural materials like sticks and stones

Learning Outcomes

Improving fine motor skills, enhancing focus, attention and motor skills. Walking barefoot in mud strengthens foot and leg muscles, providing proprioceptive input through resistance.

Description

The activity consists of two phases:

In the first phase, the sensory track is carefully introduced to the children. Each section of the track is explained and demonstrated. A warm-up activity to help the children get to know each other can be included. The parent or therapist completes the track first to model the activity. During the demonstration, the instructor times each stage and observes to assess the child's sensory responses.

In the second phase, the children take turns completing the track. The track begins with the Log Walking Stage, where the child balances while walking across the log bare foot. This is followed by the Mud Object Finding Stage, where they walk through mud and search for smooth stones previously hidden by the instructor. Once the stones are found, they proceed to the Dry Leaves Stage, where they locate sticks or cones hidden among the leaves.

The activity concludes with the Target Practice Stage, where the child throws the collected stones and sticks or cones into a designated target area.

To be considered

Hidden objects in the mud might feel uncomfortable for some children. Round pebbles that are smooth can be chosen as objects in the mud. Check beforehand if the log is slippery due to moss or rain, if possible try it out first before the children. If the log/fallen tree has too many splinters or the child is reluctant to try barefoot, they can walk with shoes first and then remove shoes and socks to go into the mud. If using wellies make sure the log/tree is dry. Keep water and towels available for cleaning if needed.

Variations

This outdoor activity can be adapted for indoor settings or in the backyard under parental supervision.

For example:

Replace mud with wet sand and stones with walnuts or hazelnuts in the Mud Object Finding Stage.

Replace the log with cushions or pillows in the Log Walking Stage.

Replace leaves with newspaper and sticks with pencils in the Dry Leaves Stage.

Adjustments can be made to suit individual differences and sensitivities of the children. Alternative materials providing similar sensory input can be used.





SHADOW PLAY IN THE WOODS



 Gaye Amus



20 min (depending on the interest of the children) including 5 minutes of preparation.

 2-6 children, 2 adults



Materials

2 ropes, a thin white cloth/ bedsheet (max 1m x 2m, the size can be smaller) wooden clothes pegs, 2 tree paddings

Learning Outcomes

Developing physical skills like balance, coordination, spatial awareness and flexibility, while also enhancing creativity. Improving children's focus while also providing an opportunity to explore through movement and sight. Socially, it fosters teamwork, provides a healthy outlet for self-expression and helps manage stress and anxiety. These outcomes are achieved by encouraging children to move their bodies and express themselves through movement or dancing.

Description

The best time to have shadow play in the woods is when there is morning sunlight. The low angle of the rising sun creates long, distinct shadows that are ideal for observation and shadows seen clearly from the other side of the cloth. Make sure to hang the sheet so that the sun is behind it.

The adult prepares the space by tying two ropes between two trees, one close to the ground and the other about 1m above. Placing paddings between the bark and the ropes are a good way to protect the tree from marks. The fastest way to prepare the 'shadow play theatre' is to put a thin white bedsheet and use pegs from the top to hold it in place and tie the two corners of the cloth to the bottom rope if it is a windy day.

Ideally you can pre-prepare one by sewing the white sheet by length on the upper and lower ropes if you do not want to use pegs.

The adults and children sit in a circle in front of the white sheet. The adult will start chanting a song which can be about the season, it can be fast or slow or one based on the children's favourite. As the children join and continue to sing one of the adults goes behind the white sheet and moves freely creating shadows.





Depending on the group size, there can be a child joining the adult in the beginning while the others watch. The adult then joins the children back in the circle and asks if two children would like to move to a song while they sing. Behind the sheet the children move as they wish to the music they hear, they can dance, lie down and move only their arms, crouch or jump. It is their 'hidden' space to explore and have fun. Here they also experience how to move together in a shared space. After singing if the children would like to explore shadows by themselves, the white sheet can be there to hang also during free play.

To be considered

The shadows are not so visible when there is not enough sunlight. For children with motor or visual impairment: The assistant/parent/adult can sit with a child in their lap and do slow movements together behind the white sheet.

Variations

- Explanatory Version: Depending on the children in the group, the flow can advance with more explanations for those who need to know what is happening in advance. In the circle at the very beginning, the adult can give space to any curious questions that come up when they see the white sheet. They can tell them there will be a shadow play and share that they will start to dance behind the white sheet. While some are moving the others can watch the shadows that appear. The adult will share that they would like to have music to move and invite the children to choose a song.
- Free Play Version: The shadow play can be provided without it being a guided activity by just hanging the white sheet between two trees. It can be a means of exploration and enhance child-led, unstructured, creative play.





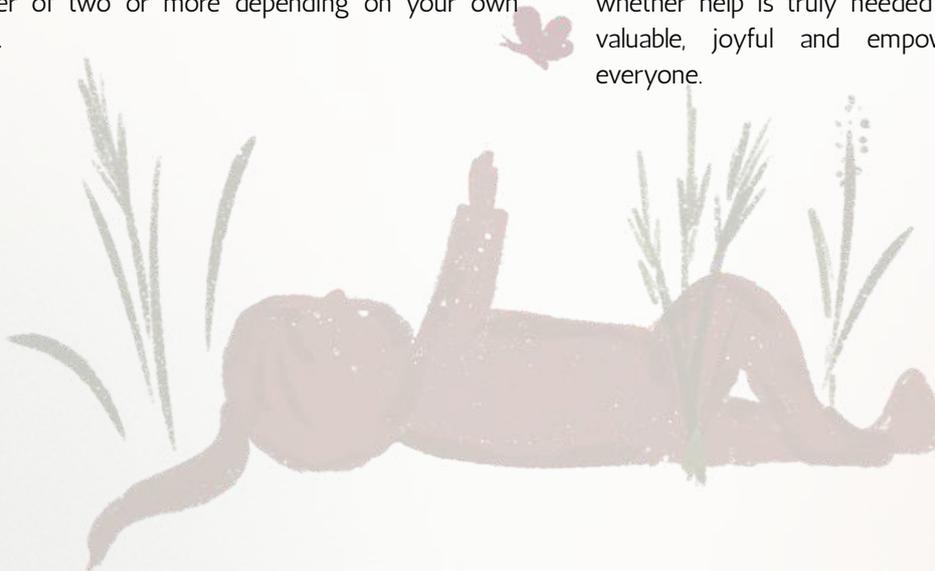
EXAMPLE OF A SENSORY EXPERIENCE TOUR IN NATURE

Our project partner, Utopia, works with individuals with disabilities at the local level in Turkey. In Antalya, Utopia collaborates with the Adalya Foundation, which specifically carries out activities with young people with disabilities. Together, they organize activities that encourage these young people to connect with nature.

During our main project activity, which was a 5-day training course in Antalya, an experiential workshop was conducted. As course participants and educators we worked together to host the participation of 16 young people aged 13–30 from the Adalya Foundation. This workshop was called "Egg of the Sun" (Auringonmuna) which is the name of a Finnish children's book and was chosen as a symbolic title with the orange fruit as its core. The name was particularly meaningful because Utopia is located in an area surrounded by orange groves, and it was the orange season at the time.

To ensure a local and authentic experience, a nature-based sensory trail with an orange theme was organized. The trail included multiple activities because the participating youth group was highly experienced and had long been engaged in similar activities, making them ready and well-prepared. These activities were designed and implemented by the educators attending the training course. The following sensory experience tour serves as an example where activities can range from even a number of two or more depending on your own group.

You can design and organize a similar experience tailored to the personal developmental levels and needs of individuals with additional needs. Furthermore, pedagogical sensitivity plays an important role for the adult who is accompanying and guiding the experience, where you may stop/pause doing the activities or not continue at all if you notice that it is becoming overwhelming, tiring for the participant or if they need a more peaceful space. You may notice that the participant is reacting to the number of people around them or showing extreme discomfort or distress caused by certain sounds. Therefore being mindful of providing comfortable spaces where individuals can retreat when feeling overwhelmed is also something that can be considered before a tour. Based on Nina Wallenstjerna-Heiskanen's experience with art work with special needs, her thoughts can also shine a light to all other activities as well. She shares "Tasks can be completed independently, but help is often needed. The need for help can be very diverse. The level of demands of the tasks and the time required for them vary. Applying and modifying the instructions to suit the situation is permitted and desirable. Individual differences in working methods also determine the time spent on a task; while someone can complete it in ten minutes, someone else wants to spend hours on the task. (Wallenstjerna-Heiskanen, 2022) Observing, giving full presence and knowing when to guide the participant or deciding whether help is truly needed is useful for it to be a valuable, joyful and empowering experience for everyone.



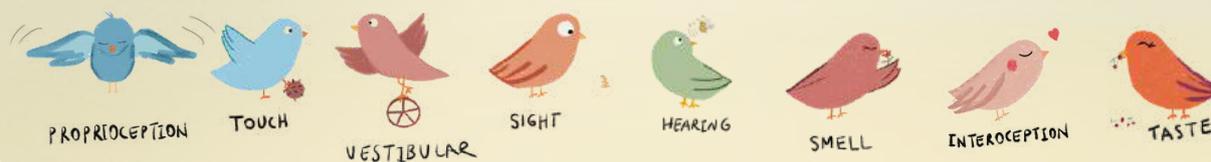
EGG OF THE SUN



 3 - 10 participants (Depends on the number of the educators accompanying them)



60 – 90 minutes (Time can vary according to the group and their interactions)



Materials

A plate of sliced and peeled oranges, sticks, leaves, a plank, logs, a white cloth 1m x1m or depending on the group size a bigger one 2m x 2m (for land art), strings (to tie the oranges) and a pair of scissors. For each participant: a basket, a scavenger hunt sheet and pencil.

Description

The participant group is welcomed in a greeting circle, where a welcome song is sung. Participants are then asked to close their eyes, and orange slices are presented for them to smell and guess what it is. Afterward, they are given a slice of orange to taste. Before heading into the forest, the day's plan is explained, and participants are briefed on what they might encounter in the forest. Each participant is paired with an educator as a partner. Each pair is given a basket, a pencil, and a sheet with a written and visual list of items needed for the scavenger hunt.

As they follow the forest trail, participants are tasked with finding the listed items and navigating the rugged track. Once the treasure hunt is completed, the pairs leave their baskets aside and are asked to find two sticks in the forest that can be used to create rhythm. Using these sticks, the group comes together to create rhythm and sing songs in a rhythm activity.

After the rhythm activity, a white cloth is spread on the forest floor, and participants are asked to collaboratively create a picture on it using the items they collected during the treasure hunt. Once the artwork is complete, the group shares their thoughts on what the creation resembles.

On the way back, a pre-prepared orange game is played. Two oranges are tied to the branches of each tree using string and hung at a high point. Participants are asked to hold the oranges opposite one another and swing them to collide.

After the forest journey is completed, a farewell circle is held where participants share their feelings about the activity, their favourite moments, and the parts they found challenging. The activity concludes with farewell songs and dances.

To be considered

When going to the forest, always carry a first aid kit and ice in your backpack and if any, have the participant's personal medication with you.

Allergic Reactions: Participants might have allergies to oranges or other natural elements (e.g., plants). It is good to know the personal allergies or dietary requirements beforehand through parental permission slips.

Insect Bites or Stings: Possible encounters with insects like bees, ants, or mosquitoes.

Stick-Related Injuries: Improper handling of sticks during the rhythm activity could cause accidental injuries.

Variation

Instead of having a guide leading the whole group, you may want to have pre-prepared stations where you can choose to go with in pairs (the educator and the participant) and complete the trail in your own time and in smaller groups.

LEARNING OUTCOMES OF EACH ACTIVITY



1. Blindfolded Guessing the Taste and Smell of an Orange

- **Sensory Development:** Enhances sensory awareness by focusing on taste and smell.
- **Concentration and Focus:** Encourages participants to concentrate on specific sensory inputs without visual distractions.
- **Critical Thinking:** Promotes hypothesis-making and reasoning as they guess based on sensory clues.
- **Confidence:** Builds self-assurance when their guesses are correct.
- **Social Interaction:** Engages participants in discussion and sharing observations.

2. Scavenger Hunt

- **Problem-Solving Skills:** Develops critical thinking and logical reasoning to interpret clues.
- **Picture Reading and Navigation:** Improves spatial awareness, navigating through different environments and helps develop executive functioning skills such as sequencing or matching.
- **Teamwork and Communication:** Encourages collaboration and effective communication among participants.
- **Physical Activity:** Promotes movement, improving physical health and coordination.
- **Imagination and Creativity:** Stimulates creative thinking through role-playing and storytelling.

3. Walking on a Rugged Track

- **Balance and Coordination:** Enhances the ability to maintain stability on uneven ground.
- **Strength and Endurance:** Builds physical strength and stamina as participants navigate challenging terrain.
- **Risk Assessment:** Encourages critical thinking and careful decision-making to move safely.
- **Resilience and Confidence:** Instills perseverance and self-assurance as participants successfully navigate obstacles.
- **Environmental Awareness:** Promotes observation and connection to the natural surroundings.
- **Problem-Solving Skills:** Encourages participants to find efficient ways to traverse the terrain.
- **Gross Motor Development:** Strengthens leg muscles and overall body coordination.

4. Playing Rhythms with Sticks and Singing Song

- **Rhythmic and Musical Skills:** Develops a sense of rhythm, timing, and basic musicality.
- **Motor Skills:** Enhances fine motor coordination through stick movements.
- **Memory and Cognitive Development:** Strengthens memory by learning song lyrics and rhythms.
- **Collaboration:** Fosters teamwork and a sense of community through group singing and playing.
- **Emotional Expression:** Provides a creative outlet for self-expression and joy.





5. Land Art

Outcomes:

- Creativity and Aesthetic Sense: Encourages imaginative thinking and artistic expression.
- Environmental Awareness: Fosters a connection to and appreciation for natural elements.
- Teamwork: Promotes collaboration if done in groups, as participants discuss and agree on a design.
- Fine Motor Skills: Develops precision in placing and arranging objects.
- Problem-Solving: Encourages thinking about how to use found elements to create a cohesive design.



6. Two Oranges Hanging on the Tree: Participants try to make the oranges collide

Outcomes:

- Hand-Eye Coordination: Improves motor skills and spatial accuracy in targeting.
- Physical Strength and Agility: Enhances physical activity and body control.
- Focus and Precision: Develops concentration and accuracy in aiming.
- Fun and Engagement: Provides an enjoyable challenge, fostering enthusiasm and excitement.
- Sportspersonship: Encourages healthy competition and resilience in case of unsuccessful attempts.





WHAT IS SPA?

Creating a **Sensory Play Area (SPA)** using natural elements can significantly support the sensory integration needs of children with additional needs. Nature provides a rich, multi-sensory environment that stimulates the eight sensory systems, including vestibular, proprioceptive, and interoceptive senses through varied textures, sounds, movements, and smells. Establishing such a space in a school playground or forest area offers both structured and unstructured sensory experiences, promoting self-regulation, attention, emotional stability and motor development. The Inclusive Nature Project aims to offer more practical, accessible and economically sustainable nature-based practices for families and teachers of children with additional needs. By designing and sharing easy-to-implement and replicable tools, the project promotes inclusive education through natural sensory stimulation.

The SPA concept is envisioned as a mobile or permanent area, created with natural materials and stimuli, allowing both teachers and parents to actively support children's development while enriching their own sensory well-being. As part of the project, several example workshops and activities have been developed to demonstrate how nature can provide an effective and inclusive sensory integration space. The following section presents sample SPA (Sensory Play Area) practices developed by our project partners from Turkiye, Slovenia and Finland.

”
Nature is open to all if
the paths are made
feelable and accessible
for everyone.



TÜRKİYE



Utopia is a nature-based learning center located in Antalya, Türkiye and has been organizing nature-based activities for many years to support the sensory development of children with additional needs. Through this project, the center aims to further develop its sensory play activities from a more professional perspective. As part of this effort, a specific area within the camp has been redesigned as a SPA (sensory play area). This area includes various pathways and activity zones that children can explore either independently or with the support of a parent or guardian. The activities are especially focused on balance, body awareness, deep pressure stimulation and reducing hypersensitivity. One key feature is a sensory walking path that allows barefoot exploration of different natural materials, such as sand pits, grass and surfaces with varying textures and firmness.

. This path is generally used with the guidance of a caregiver or educator. Additionally, a balance trail, multi-directional swings, climbing boards and loose parts like tires are available for free play or structured activities. These elements are designed to enhance sensory integration, support physical development, encourage imaginative and nature-based play. Next to the SPA-inspired area, there is also a herbal garden featuring plants such as lavender, sage and thyme. Children are encouraged to visit this garden and engage in sensory experiences through smelling various natural scents, which further supports their sensory development and emotional regulation.



SLOVENIA

Kindergarten Vrtec Martin Krpan Cerknica in Slovenia is a public kindergarten with children from the age of 11 months to school age with 18 playrooms. The youngest children are also invited to keep moving in a large gym and beautiful playground which provides space for all children to enjoy. The kindergarten has a special programme for children with additional needs and they are included in the groups. One playroom has an integrated group with 6 children who have additional needs and work in this group is mainly based on supporting sensory development of children.

For several years now, the kindergarten Vrtec Martin Krpan Cerknica has had a SPA on the playground for many years, made of natural materials (stones, sticks, logs, mud...). Children love to play in it and form a variety of creative games. Play in the SPA supports the sensorimotor development of children in the tactile area (touching, grasping, shifting...), in the proprioceptive area (squeezing, throwing, pulling...) and in the vestibular area (balance).

As part of the project, the kindergarten has therefore designed a garden that will support the development of children in other sensory areas as well. So four corners were set up.

1st Corner: Plants with fragrances were planted in it: lavender, sage, rosemary, lemon balm, mint. Children touch the plants, smell them and they can also taste them. By doing so, they primarily develop their olfactory sensory system.

2nd Corner: Strawberries were planted in it. Children observe the growth of plants, water and care for them. When the berries are ripe, they are tasted. By doing so, they primarily develop their taste sensory system.

3rd Corner: The children planted peas in it. They also take care of this corner by watering and caring for the soil. They also observe the growth of the plant. When the fruits are ripe, they are tasted. This space is dedicated to developing a sensory system for taste as well.

4th Corner: Mud. In this corner, children have endless possibilities for play and thus it supports the development of their tactile sensory system.



FINLAND

Vammaisperheyhdistys Jaatinen ry is an association founded in 1997 by families with disabled children in Helsinki Finland. Jaatinen has an accessible, activity centre for disabled children and their families called "Jaatisen Maja", which is provided free of charge for play and to meet other families. The staff is present at Maja to help and guide users with any issues related to the activities there. Jaatinen also organizes plenty of supervised activities, clubs and groups for disabled children and adolescents, their siblings and parents as well as family events and celebrations. You can rent mobility aids and games suitable for disabled children and adolescents from Maja. "Malike Rental" at Maja allows you to rent e.g. bicycles, kayaks, downhill skiing equipment and all-terrain wheelchairs for severely disabled children and adolescents. Games have been adapted for the whole family to enjoy together.

The Mobile Spa: The Nature Explorer's Backpack was developed for this project. The Nature Explorer's Backpack is a portable, mini sensory play space that invites children and adults to discover nature together. The backpack contains multisensory and accessible tools that make it possible to explore and observe nature wherever the child and family may go - to the backyard, park, nearby forest, or even more distant destinations.

The backpack offers families an inclusive, engaging, and inspiring way to explore the natural world like a traditional sensory play space, but without the limitations of a fixed structure or location. The backpack is designed for all children and includes tools that make nature exploration accessible and enjoyable for children with disabilities as well. The tools included allow the children to practice sensory processing and environmental awareness, which can enhance positive nature experiences. The goal is to boost the child's self-esteem, nurture curiosity, and provide a safe and exciting way for everyone to engage with nature, free from barriers and pressure, but full of joy and discovery. Conveniently packed with a variety of tools (such as a magnifying glass, tongs, invisibility cloak, identification cards, small fish net, a white tray and more), the backpack enables children to see, hear, smell, and touch their surroundings in ways that suit their individual abilities. Families can embark on their own kind of research expedition, for example spotting species, examining textures, recording discoveries, and sharing experiences together.

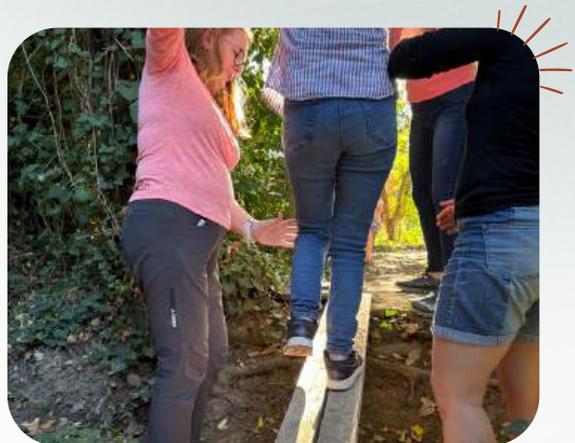
The backpack is based on the principles of sensory play. In sensory play, the senses – touch, hearing, sight, smell, taste, balance, body awareness, and proprioception – can develop and strengthen in a natural and enjoyable way. The tools inside the backpack make environmental exploration more accessible, inclusive, and, above all, fun for all the children.



TIPS FOR PARENTS AND EDUCATORS



Nature can constantly present a variety of challenges and unpredictable conditions. At the same time, the needs and emotional states of children with additional needs can also vary. For this reason, it is advisable not to venture too far from the main base or station, and to always be prepared with backup plans (Plan A, B, and C) to adapt to changing circumstances.



TOP TIPS

No such thing as bad weather only proper clothing and right gear.

Wear the right clothes, waterproof if possible when raining. Take a tarp with you big enough to encompass wheelchairs or strollers if there isn't any shelter. Bear in mind that if a child is immobile/in a wheelchair they might need more layers or even a blanket/sleeping bag to keep warm in winter as they are not moving.

...

Let child's clothes get worn off not their joy for play.

Clothes can be scraped or become dirty, therefore use those that you are willing to let get worn off.

...

Don't be chased by time, adapt to the child's pace.

Daily routines may take longer so be open to the possibility that what you expect to take 5 minutes may require more time. Patience and understanding is key.

...

You don't have to plan, overthink or have a structured activity.

Let children use their creativity and innovation by encouraging unstructured play outdoors. Rather than trying to entertain children, be present and observe their cues.



Challenge yourself and your children to experience nature with their senses.

...

Create a routine that incorporates a little bit of nature at least once a week.

As Richard Louv states, "Put nature on the calendar" This way the family can ensure to get their weekly or daily dose of Vitamin N (N for nature). (Louv,2016)

...

Ask local authorities/associations to organise regular weekly visits to the outdoors for families with special needs children.

This can be great opportunity for families who feel overwhelmed with the daily responsibilities and yet would like to get together with other families.

Making life easier for families by supporting them to make nature more accessible will in essence enhance everyone's wellbeing.

Let nature support your wellbeing as well as the child's.

CONCLUSION

As part of the **Sensory Development in Nature For Special Needs Children** project, also called "Inclusive Nature", people from different sectors with diverse professional experiences and backgrounds came together to collaborate. The project focused on supporting the sensory development of individuals with special needs and encouraging their deeper connection with nature. Throughout the process, organizations working in the fields of nature-based learning, special education, and sensory integration got the opportunity to share, discuss and apply their expertise.

Over the course of 12 months, members of the project partners received training from experts in sensory integration and were inspired by educators specializing in nature-based learning. Practical, nature-based solutions for families and educators working with children with special needs were formed. These experiences were compiled into a toolbox, making the outcomes of the project accessible and applicable for professionals in the field. Throughout the journey, a great deal was learned from one another, wisdom was drawn from nature, the benefits for parents and children were experienced and accessibility to nature for all became a purpose and mission.

The project was concluded with a spirit of innovation and inclusivity. What this project taught was clear: true inclusion is not only about recognizing individual differences, but also about creating meaningful, sensory-rich environments by reconnecting learning spaces with nature.

So, do take a step into nature. Recognize the incredible opportunities it offers us and let it remind us how inclusive it is and that we are not separate from nature. Try making it a conscious decision to spend more time outdoors, and allow yourself and the children you support to build a deeper connection with the natural world. Whilst you do, pay close attention to the rich variety of sensory stimuli nature provides, and discover how essential these experiences are for sensory development, especially in the context of special education. Let nature strengthen and nurture you. Are you ready to grow with what both you and nature so generously can offer?



"There is a way that nature speaks, that land speaks. Most of the time we are simply not patient enough, quiet enough, to pay attention to the story."

Linda Hogan

CREDITS

This booklet has been developed as part of a Small Scale Partnership in School Education funded by the Erasmus+ Programme of the European Union and coordinated by Finnish National Agency. The project brings together educational organizations from different countries to exchange knowledge, share experiences, and develop innovative approaches to teaching and learning.

The following organizations actively contributed to this project:

Finland



Türkiye



Slovenia



TEAM

Gaye Amus
Jenny Turunen
Chantal Romi
Miina Weckroth
Hanna Vesamo

Ahmet Öncel
Cansu Üzümcü
Ahmet Uyar
Mehmet Ali Camgöz
Sümeyye Sevgili
Hilal Nur Sezgin
Ayşe Kan
Ayşen Şahin

Erna Zabukovec
Saša Pivka
Pavlina Zrimšek
Urška Juvančič
Bernarda Okoliš

Spain
Katia Hueso

Special thanks to Utopia Ergotherapy Center and Adalya Foundation.

For more information about the project the website is here: <https://www.inclusivenature.com/>

Erasmus+ is the European Union's flagship programme for education, training, youth, and sport. For the 2021–2027 period, Erasmus+ promotes inclusion and diversity, digital transformation, environmental sustainability, and active participation in democratic life. More info about Erasmus Plus: <https://erasmus-plus.ec.europa.eu/>



Editor

Ahmet Öncel
Gaye Amus

Proofreading & Quality Assurance

Gaye Amus

Designer

Ayşe Köksal Yildiz

Photos

Ahmet Öncel
Gaye Amus
Erna Zabukovec
Saša Pivka

Hanna Vesamo

REFERENCES



1. Ayres, A. J. (1972). *Sensory Integration and Learning Disorders*. Los Angeles, CA: Western Psychological Services.
2. Baranek, G. T. (2002). Efficacy of sensory and motor interventions for children with autism. *Journal of Autism and Developmental Disorders*, 32(5), 397–422.
3. Bundy, A. C., Lane, S. J., & Murray, E. A. (2002). *Sensory Integration: Theory and Practice*. F.A. Davis Company.
4. Kranowitz, C. S. (2005). *The Out-of-Sync Child: Recognizing and Coping with Sensory Processing Disorder*. Perigee Trade.
5. Lane, S. J., & Schaaf, R. C. (2010). Examining the neuroscience evidence for sensory-driven neuroplasticity: Implications for sensory-based occupational therapy for children and adolescents. *American Journal of Occupational Therapy*, 64(3), 375–390.
6. Louv, Richard (2016) *Vitamin N: The Essential Guide to a Nature-Rich Life*. Chapel Hill.
7. Miller, L. J., Anzalone, M. E., Lane, S. J., Cermak, S. A., & Osten, E. T. (2007). Concept evolution in sensory integration: A proposed nosology for diagnosis. *American Journal of Occupational Therapy*, 61(2), 135–140.
8. Nicholson, S. (1971), "How Not To Cheat Children: The Theory of Loose Parts", *Landscape Architecture*, v62, p30-35.
9. Parham, L. D., & Mailloux, Z. (2015). *Sensory Integration*. In J. Case-Smith & J. C. O'Brien (Eds.), *Occupational Therapy for Children and Adolescents* (7th ed., pp. 258–303). Elsevier.
10. Roley, S. S., Mailloux, Z., Miller-Kuhaneck, H., & Glennon, T. J. (2007). Understanding Ayres Sensory Integration®. *OT Practice*, 12(17), CE-1–CE-8.
11. Schaaf, R. C., & Mailloux, Z. (2015). Clinician's guide for implementing Ayres Sensory Integration: Promoting participation for children with autism. *American Journal of Occupational Therapy*, 69(5), 6905185010p1–6905185010 p10.
12. University Hospitals of Morecambe Bay NHS Foundation Trust (2024). <https://www.uhmb.nhs.uk/our-services/patient-information-leaflets/children-young-people-sensory-guide-children>
13. Wallenstjerna-Heiskanen, Nina (2022) *Erytyistä kuvataidetta-ideoita ja tehtäviä kuvataidetyöskentelyyn, Riikka Herlinin säatiö*. (P 8-9)
14. Wilbarger, P., & Wilbarger, J. (1991). *Sensory defensiveness in children aged 2–12: An intervention guide for parents and other caretakers*. Avanti Educational Programs.

