AMERICAN HORTICULTURAL SOCIETY

YOUTH SENSORY GARDENING MANUAL

PREPARED BY
AMY WAGENFELD, PhD, OTR/L, SCEM, FAOTA

The generosity of Charlotte S. Bingham and the Anna I. Snyder Trust made this project possible.

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PREPARED BY
AMY WAGENFELD, PhD, OTR/L, SCEM, FAOTA

DESIGNED BY
KATE WOLLENSAK FREEBORN

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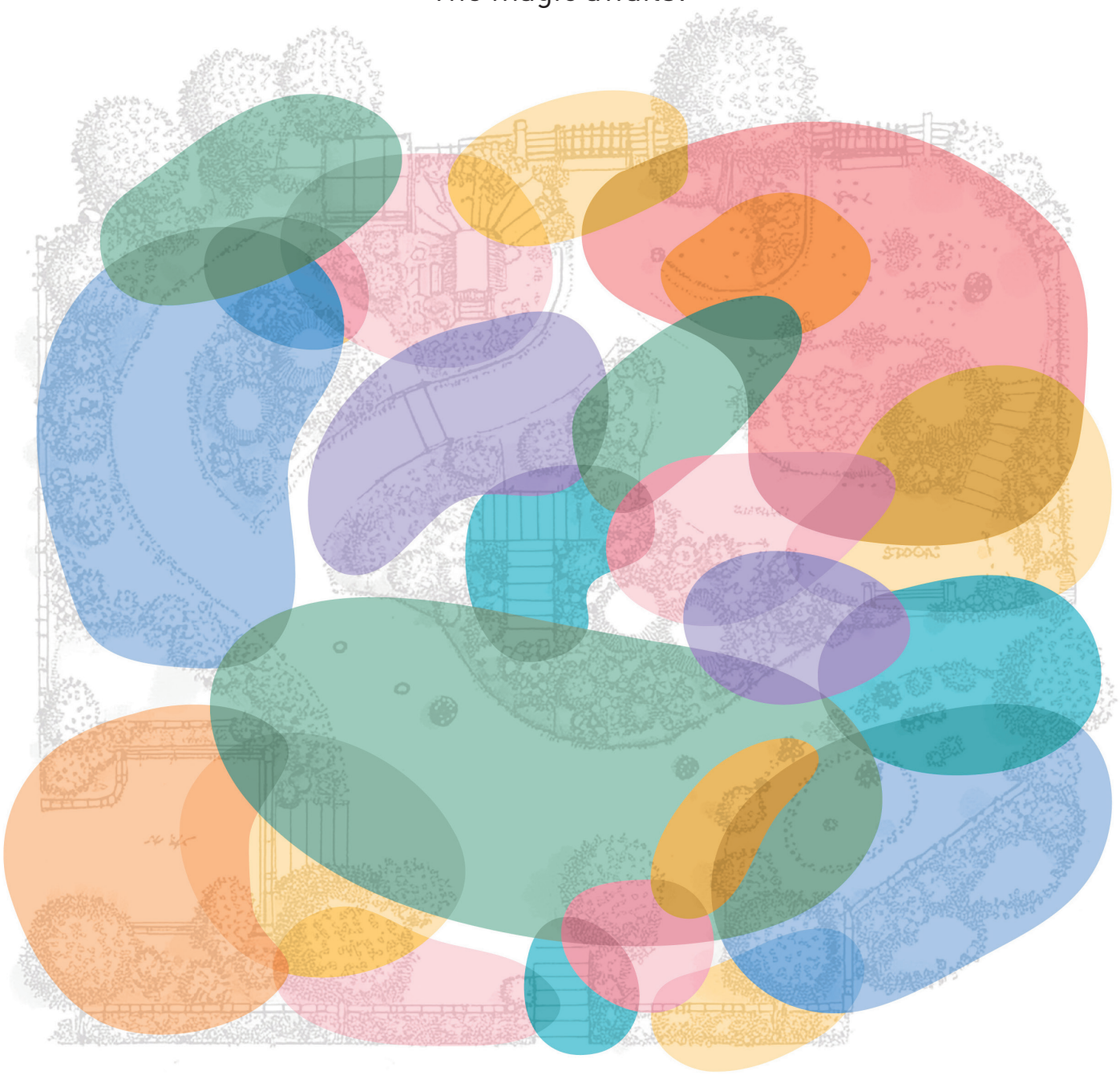
MAY
2025

Founded in 1922, the nonprofit American Horticultural Society (AHS) is one of the most respected and longstanding member-based national gardening organizations in North America. The Society's membership includes more than 22,000 aspiring, new, and experienced gardeners, plant enthusiasts, and horticultural professionals, as well as numerous regional and national partner organizations. Through its educational programs, awards, and publications, the AHS inspires a culture of gardening and horticultural practices that creates and sustains healthy, beautiful communities and a livable planet. AHS is headquartered at River Farm, 27-acre site overlooking the Potomac River that is part of George Washington's original farmlands in Alexandria, Virginia. **ahsgardening.org**

OUR EIGHT INCREDIBLE SENSES PROVIDE THE ROOTS to guide us through everything that happens in our daily lives. Children can experience sensory nourishment and find joy in the garden as they explore it through creative approaches that encourages them to...

- **LOOK**
- **TOUCH**
- **SMELL**
- **BALANCE**
- **LISTEN**
- **TASTE**
- **MOVE**
- **SELF REGULATE**

The magic awaits!



CHAPTER 1

Introduction

Our daily lives are shaped by multi-sensory experiences that help us to move our bodies, to organize our emotions and behaviors, to learn, and to interact with the world. Nature is the ultimate sensory experience and indeed, with all the benefits nature offers, it seems plausible because we experience it so many ways.

In fact, all eight of our sensory systems can be nourished through a thoughtful sensory gardening approach. In this manual, we look at what sets a sensory garden apart from other gardens, discuss sensation and the eight senses, and explore some strategies to design an inclusive sensory garden for the special children in your lives. While medical professionals who work with children will find this manual especially useful, the manual is accessible for anyone who works with children or is seeking a resource on sensory gardening. Similarly, while adults with neurodivergent children in their lives will find this manual especially relevant, the manual provides material addressing children of all sensory experiences. First let's establish some roots and begin this journey by talking about health and how nature connections can and do make us healthier.

WHAT IS HEALTH

THE WORLD HEALTH ORGANIZATION'S (WHO) definition of health "is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." The connections we make with nature support the WHO's definition of health because abundant research finds that people of all ages' health and wellness benefit from connecting and interacting with nature. These benefits extend to indoor and outdoor connections, like tending indoor plants, viewing nature scenes on devices and through photos, listening to recorded nature sounds, and gazing out the window at green and blue nature (water), mountains, and the sky. In fact, the first research study on the topic of nature and health found that patients recovering from gall bladder surgeries whose hospital rooms looked out onto a view of treetops required less pain medication and attention from nursing staff, and they were discharged sooner than patients whose rooms faced a brick wall (Ulrich, 1984). Outside, we reap the health benefits of nature though activities like tending gardens, outdoor exercise, quiet time contemplating, and even dining outdoors.

Connecting with nature improves physical health, mental health, and cognition.

Connecting with nature improves physical health, mental health, and cognition. **Physical health** refers to how our internal and external body systems are working and how we move about in our environment (Virginia Wesleyan University, 2024). Physical functions include joint mobility, strength, coordination, blood pressure, and heart rate. **Mental health** includes emotional and psychological well-being and impacts how we feel and behave within ourselves and with others (WHO, n.d.). Social-emotional health is an integral component of mental health. Social health is having the desire, knowledge, and skills to participate in communities like families, school, work, and recreational activities (Kirk & Jay 2018, p. 474). Social development andhealth rely on emotional health, which is the ability to recognize, understand, and regulate our emotions (Kirk & Jay, 2018). Mental health enables us to cope with the stressors we encounter in life (WHO, 2022). There is a clear relationship between social skills needed for building relationships and emotional skills necessary to maintain those relationships. **Cognition** encompasses thinking and reasoning. It involves acquiring, organizing, and using knowledge to solve problems (Gelman, 1978).

NATURE AND HEALTH

WITHIN THE FRAMEWORK of the WHO definition of health, one way we can achieve better health is through exposure to nature. For children and youth, nature-based experiences help to support overall positive physical, mental, and cognitive development, thus underscoring why we need to provide them with a range of opportunities to engage with nature in ways that they find fun and enjoyable (Bowers et al., 2021).

Let's look at some of these benefits in the chart below.

The Benefits of Nature-Based Experiences

Physical Benefits	Mental Health Benefits	Cognitive Benefits
Increased physical activity	Improved social interactions	Improved test scores
Improved balance	Improved communication and problem solving skills	Better attention, concentration, and focus
Improved strength and coordination	Reduced levels of stress, aggression, anxiety, and depression	Increased sense of curiosity and interest
Improved play skills	Fewer incidences of behavioral problems	Better chance of being a steward of the environment
Reduced BMI and obesity	Improved resilience and sense of mastery	Reduced symptoms of ADHD
Improved healthy eating habits	Increased rates of creativity	Improved engagement in learning
Reduced rates of nearsightedness	Improved family connectedness	Increased desire to learn

WHAT IS A GARDEN

HAVING ESTABLISHED THE CONCEPTS of health and the value of nature in nourishing health and wellbeing for children, let's explore sensory gardens. A garden is an intentional space where we plan, lay out, and tend to plants. There are many kinds of gardens like herb, vegetable, flower, native, and succulent. Gardens can be in ground, in containers and raised beds, and vertically oriented. All gardens contain sensory elements and all gardens play an important role in supporting health and wellbeing. But not all gardens are sensory gardens.

WHAT MAKES A SENSORY GARDEN, SENSATIONAL

WHILE EVERY GARDEN has sensory qualities, a sensory garden is more than a pleasing place to be. In its optimal form a sensory garden intentionally incorporates all eight sensory systems, rather than only the commonly known five basic senses, which can also be thought of as the five external senses. We will examine external and internal senses in the next chapter. Not only does a comprehensive sensory garden incorporate all eight senses, but it also has a range of experiences to meet the needs of people who seek out and avoid sensation.

WHY WE NEED SENSORY GARDENS

WE NEED THOUGHTFUL SENSORY gardens because everything we do in our lives is predicated on our sensory systems. As you will learn in the next chapter, everyone has a different sensory profile and tolerances for sensation. The best kind of sensory garden accommodates for a range of sensory needs. Some sensory gardens are elaborate and costly. Others are simpler. No matter the budget, what it all comes down to is careful design.

ROAD MAP AND FEATURES

THERE ARE SEVERAL REOCCURRING features in the upcoming chapters that will enhance the quality of your sensory garden. They include ***Sensory Stories, Sensory Spotlights***, and ***Test Your Sensory Knowledge*** activities for adults and children. These features are intended to elevate the value of sensory gardening and inspire you to start or enhance your sensory gardening program, no matter where it is located or the size of the garden.

• *Sensory Stories*

Social stories are increasingly used as a tool to describe a social situation, skill, event, activity, or concept for children in a clear, simple, concise, and structured way. Sensory stories, a type of social story, focus specifically on sensory experiences and can help children learn how to navigate through new situations that might evoke feeling of fear, uncertainty, and anxiety. All social and sensory stories describe what to do in any situation and can be a guide to help children learn how to react to new situations. The structure of a sensory story comes from breaking down the topic (sensory skill, event, activity, etc.) into clear, sequential, and understandable steps, like a well-written recipe. Each step of the sensory-focused activity should only include a simple descriptive sentence or two of text. They are intended to be individualized to meet a child's needs and are written from a child's perspective and in first-person language. Sensory stories should always be written in a positive tone. We want our little ones to experience success!

Oftentimes the best sensory stories are supported with illustrations or photos to support the text and help explain a particular topic in detail. Sensory stories can be used as a helpful tool to guide a child through a new or unfamiliar situation like gardening! Every sensory system section in Chapters 3 and 4 will include a sample sensory story, and in the Appendix, you will find a sensory story template to use and modify to meet your young gardener's needs.

• *Sensory Spotlights*

Sensory Spotlights are included in the sensory system chapters with the intention to expand the capacity of your sensory gardening program twofold. Some of the Sensory Spotlights are tidbits of interesting information about sensation and nature. Other Sensory Spotlights are sensory-focused activities and design tips to use and adapt to your best sensory gardening advantage.

• *Test Your Sensory Knowledge*

Sensory gardening school is in session! Each chapter will contain an optional check-in quiz to help you reflect on the information shared. There is also a child's template version of the quiz in the Appendix for you to use and modify to suit your needs. Note that the child's version is very simple and involves a quick reflection of what they did in the garden and how it made them feel. An emoticon scale is used to capture children's feelings. For those of you who are data driven, children's responses to the garden sessions could be collected and analyzed for research purposes if they do not put their names on the 'quiz.' An important note: always check with your institutional research board to determine whether it is appropriate for you to collect and analyze the data.

SUMMARY

NATURE HELPS TO SUPPORT HEALTH, wellbeing, and childhood development in amazing ways, including enriching the senses. In the next chapter we will talk about sensation and the eight senses and how they can be nourished in a sensory garden. And remember, no matter your budget or space, you can successfully develop and carry out a sensory gardening program. For the sake of their health, make sensory gardening a happy priority for children and for YOU!

We need thoughtful sensory gardens because everything we do in our lives is predicated on our sensory systems.

CHAPTER 2

Sensational Sensory Systems

Everything we do in life—move, feel, interact with others, and think is influenced by our eight senses.

The content of this chapter is intended to provide a base understanding of the importance of a well-integrated sensory system; a good fit between a person's sensory preferences and their sensory environment is linked with mental health, physical health, emotional regulation, learning, and their capacity to perform tasks and activities. Understanding the science behind creating a sensory garden for children in your life will help you feel more confident with your decision-making.

SENSATION

SENSATION IS "INPUT ABOUT THE PHYSICAL [and internal] world obtained by our sensory receptors" (University of Central Florida, n.d.). The first step in a complex feedback loop is that sensation is *perceived* from external and internal environments through our eight sensory systems. After perceiving sensation, the information travels to the brain via neural pathways and is *processed* and readied for action. The action that occurs is the brain's *response* to the sensory information it has processed. A garden-related example of the perceive, process, respond feedback loop is that when we accidently touch a rose thorn, we perceive it is sharp and our brain processes that it is painful and responds by guiding us to quickly remove our finger(s) from the thorn. For most people this feedback loop is a smooth and ongoing process that hums along, quickly and efficiently without us being hyperaware of it as it occurs throughout our daily lives. This feedback loop is called sensory integration and is illustrated below (FIGURE 1).

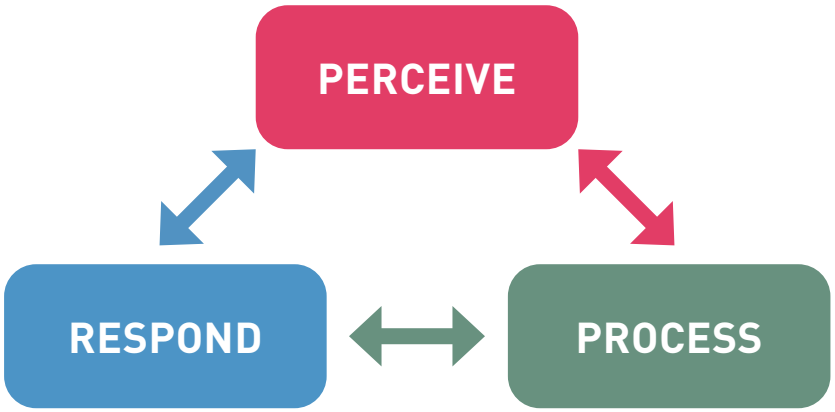


FIGURE 1. Sensory integration feedback loop.

SENSORY INTEGRATION

THE SENSORY INTEGRATION THEORY was developed by occupational therapist Dr. A. Jean Ayres. It is the "process of organizing sensory inputs so that the brain produces a useful body response and also useful perceptions, emotions, and thoughts" (Ayres, 1979, p. 28). Everyone has a unique way of processing sensory information as we all have differing sensory needs.

This includes

- our response to varying types of input at different times
- differing tolerances for all types of sensation
- our unique preferences, likes, and dislikes.

As discussed above, sensory information is taken in from the external and internal environments, processed in the brain, which then elicits an act or response. This process happens constantly and is oftentimes relatively seamless with sensory systems that are in sync or integrated. We are regulated and at best able to manage emotions and behavioral responses to life's circumstances when the senses are integrated. For example, things such as not liking the smell of jasmine, preferring one kind of gloves over another, or being drawn to the sound of wind chimes or not have little impact on time spent in the garden. The sweet smell of jasmine, garden gloves that might feel a bit tight, or clanging wind chimes may be annoying and not to your preferences, but not enough to hang up your garden hat and retreat inside. Everyone has unique sensory preferences that for the most part do not impede with engaging in life's daily activities. But there are children whose sensory responses are more extreme.

We are regulated and at best able to manage emotions and behavioral responses to life's circumstances when the senses are integrated.

Children with sensory processing disorder crave/seek or avoid sensory stimuli to help them get through their days. For them, the examples above become elevated to the point of being too much or not enough sensory stimulation and associatively, make the garden experience sub-optimal. Their response may be to retreat from or seek out additional sensory feedback to help them feel a sense of control over their bodies.

Other terms you may hear that are associated with sensory processing challenges are hyper- and hyposensitivity or hyper- and hypo-responsivity. Hyposensitivity, represented by an empty glass, is when a child craves sensory input and cannot get enough of it to be able to focus and engage. Hypersensitivity, represented by the overflowing glass, is when a child cannot tolerate much sensory input because it is overwhelming and tends to withdraw in an effort to self-regulate. A half full glass is optimal (FIGURE 2).

FIGURE 2. Common sensory avoiding and seeking behaviors.

Sensory Spotlight

SENSORY PROFILES

For a child to be out of sync, to have a cup that is overflowing or empty, is extraordinarily challenging and makes it very difficult for them to socialize, learn, work, play, and take care of themselves. At the extreme end of craving or avoiding, *sensory processing disorder* occurs when the nervous system is unable to effectively take in, process, and respond to internal and environmental stimuli. See the graphic below to learn more about conditions that are associated with sensory processing disorder (FIGURE 3).

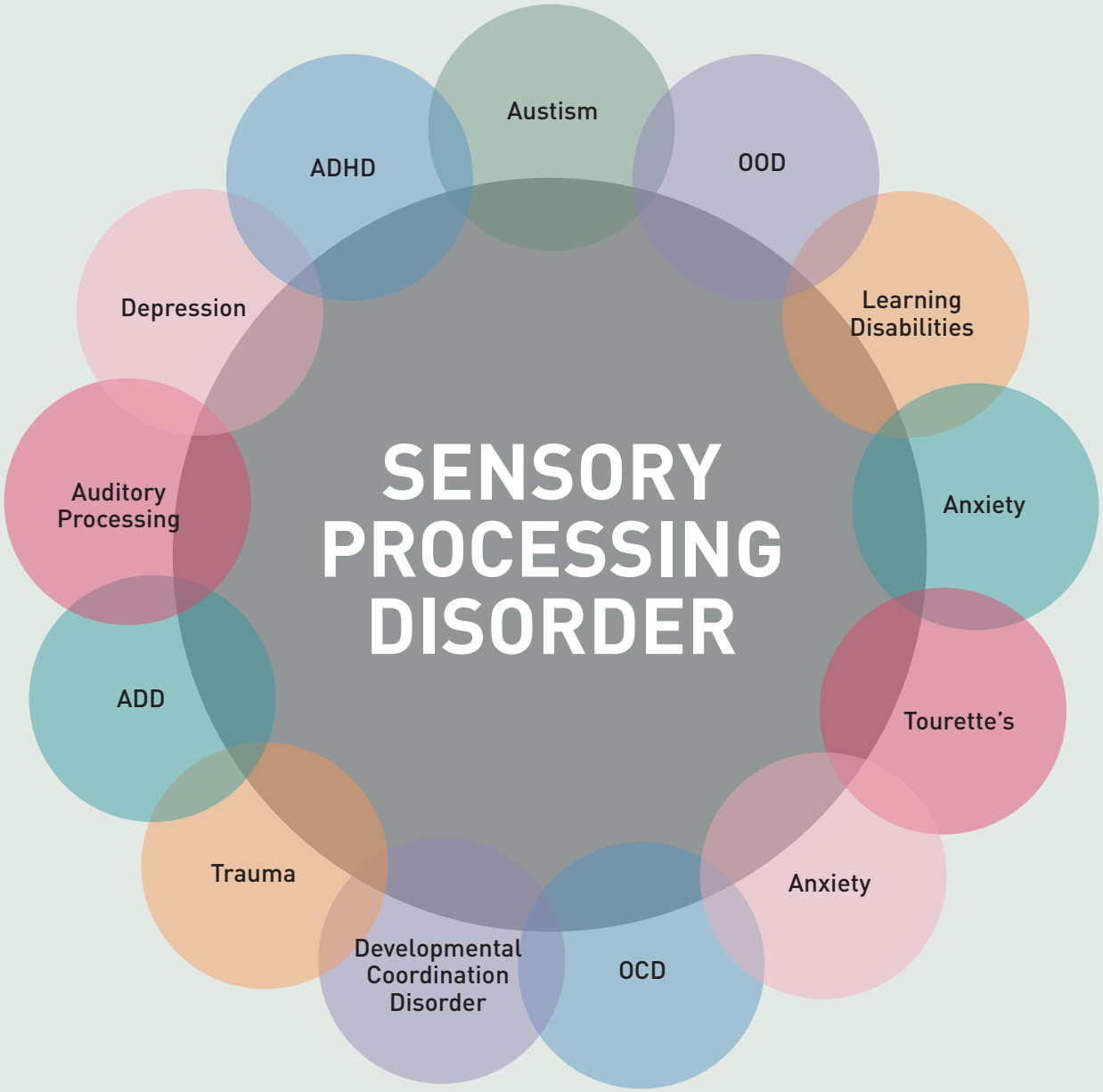


FIGURE 3. Conditions associated with sensory processing disorder.

Sensory Spotlight

For a child with sensory processing disorder, it is very hard to filter and tune out irrelevant information from the environment. Their cup is seemingly always empty or overflowing. A child may be challenged with one or more senses and respond differently to each, perhaps craving tactile stimuli and avoiding smells. The scratchy sensation of an annoying shirt label can become the only thing that a child who is hypersensitive or sensory avoiding to touch can think about. They may act out and become angry and aggressive towards themselves or others because of the sensation of the label rubbing on their neck. No work, learning, or play can happen because this label is all they can focus on. For a child who is hyposensitive or sensory craving, no amount of swinging is enough to satisfy their vestibular system (more on this internal sense to follow).

When a child's sensory systems are working in sync, they are best able to move in and through the environment, to feel safe, manage emotions, and to do everything that shapes their daily lives (Williams & Shellenberger, 1996). On the other hand, sensory underload/hyposensitivity, (the empty cup) or overload/hypersensitivity (the overflowing cup) impacts how children interact with their internal and external environments and can amplify stress and anxiety, regardless of whether someone experiences sensory processing issues (Martin et al., 2019). The key to sensory garden design is to create the just-right balance of experiences—reducing or increasing sensory input from the environment for the empty and overflowing cups.

WE HAVE EIGHT SENSORY SYSTEMS

LIKELY YOU KNOW THE FIVE BASIC SENSES: **1. hearing, 2. seeing, 3. touch, 4. smell, and 5. taste.** They are also called the external senses, because they gather information from the environment around us (Biel & Peske, 2009). There are also three other sensory systems, **6. vestibular, 7. proprioception, and 8. interoception**, which are the internal senses. They provide information about what is going on inside our body like helping to understand where and how our body is moving in space and our physical and emotional state. Please see below (FIGURE 4).

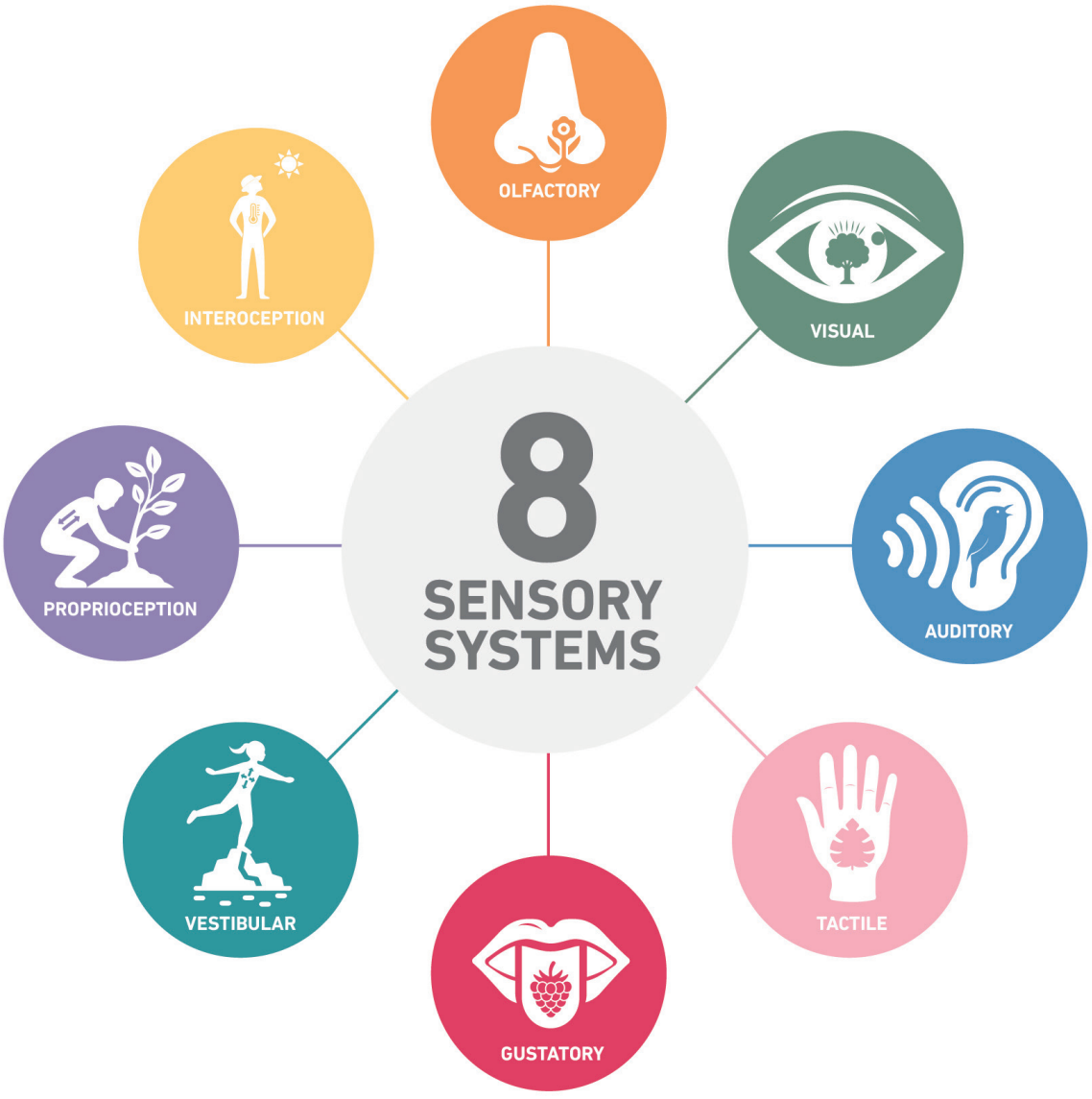


FIGURE 4. Eight sensory systems.

The following chapters will discuss each sense in detail. It is all but impossible for one sense to work in isolation. When working in sync, the eight sensory systems operate as connected information units. Take for instance smelling rosemary.

Sensory Spotlight

NO SENSE IS AN ISLAND

To smell rosemary, you first notice it by seeing and/or touching the leaves and stems. You need to use your balance to reach and bend or stretch to access the stalk of rosemary whether it is in ground, in a pot, or raised bed. Perhaps, as you touch the rosemary with your fingers or hand, you might hear a sound as the stem is bent to bring it closer to your nose or the leaves rustle a bit by your touching it, especially if the leaves and stems are slightly dry. Maybe after rubbing your fingers along the leaves to activate the scent, you take a little taste of a leaf because you are hungry. An encounter with rosemary is an unexpectedly complex process, far more than simply its scent.

PLANNING

After you select your sensory garden location but before you start designing, make notes or take photos of what the space already affords for children to see, hear, smell, taste (optional), touch, move, and self-regulate. Knowing what you already have available is a positive first step in sensory garden design.

SUMMARY

IN THIS CHAPTER THE FOCUS was sensation and sensory integration. The eight senses need to, as best as possible, work together and be in sync to help us do what we want and need to do in our daily lives. For children struggling with sensory systems that are out of sync, life is hard. An inclusive sensory garden can become a welcome oasis to meet the needs of children who struggle with synchronizing their sensory systems.

TEST YOUR *Sensory Knowledge*

1. Which of the following are examples of a hypersensitive sensory profile

a. Withdrawal
b. Refusal to participate
c. Covers ears to block out sound
d. All of the above

2. What best describes the sensory feedback loop

a. perceive, process, respond
b. experience, respond, reflect
c. respond, repeat, recreate
d. respond, withdraw, return

3. The five external senses take in information from

a. Inside our body
b. Inside and outside our body
c. The environment outside our body

4. The following are examples of the internal senses

a. Proprioception, tactile, olfactory
b. Vestibular, interoception, proprioception
c. Tactile, olfactory, auditory
d. Visual, vestibular, proprioception

5. Which of the following is an example of a hyposensitive sensory profile

a. Swings for hours without stopping
b. Refuses to try new foods
c. Covers ears to block out sound
d. All of the above

The answer key is on page 48.

CHAPTER 3

A Welcome Place

A key feature of any garden is to be inclusive and welcoming for all. An inclusive garden has no barriers that limit access and interaction. They are safe and easily understood, no matter a child's abilities, conditions, cultural backgrounds, or preferences.

We want children to desire to be in the garden and the adults who care for them to feel that they too belong. Plants have one goal, to grow and thrive. Like plants, all children should be given the opportunity to bloom in all aspects of their physical, emotional, and cognitive development. No matter its size, budget, or theme, a sensory garden can be the place to grow and thrive.

An inclusive sensory garden considers how the space you select provides equitable access for all and meets your budget. Inclusion means that walkways are flat, smooth, and wide enough to accommodate at least one wheelchair (if not two), and are ergonomically designed so seated gardeners can face forward to any type of raised growing beds. Even the most shoestring budget sensory garden can shine if you also create inclusive sensory zones. These are fully accessible

spaces that provide either alerting or calming elements so that children who crave or avoid sensory input can find their best places to be in the garden. Equally as important as the alerting and calming spaces are what is in between. These transition spaces are intentionally designed to have limited sensory experiences. They contain flexible spaces to sit so a child can move the seating to meet their needs, some shade protection, and the capacity to view the garden expanse to see where to go next or whether to just stay put. This in-between space is where a child can feel safe and not stigmatized to pause, collect themselves, and decide what they want to do next.

Wayfinding also matters. If signage is necessary to tell children where they are in the garden, keep it simple, using sensory icons and, as needed, Braille or auditory cues. An added inclusionary feature is to create a sensory map with bubble diagraming. This map is a drawing of the garden and notation of what senses are the primary focus of a space and whether it is an alerting or calming space. Keep in mind that while you may have a designated balance (vestibular) space/element like a swing, other senses such as vision and tactile are also at work, so think strategically when labeling the map (FIGURE 5).

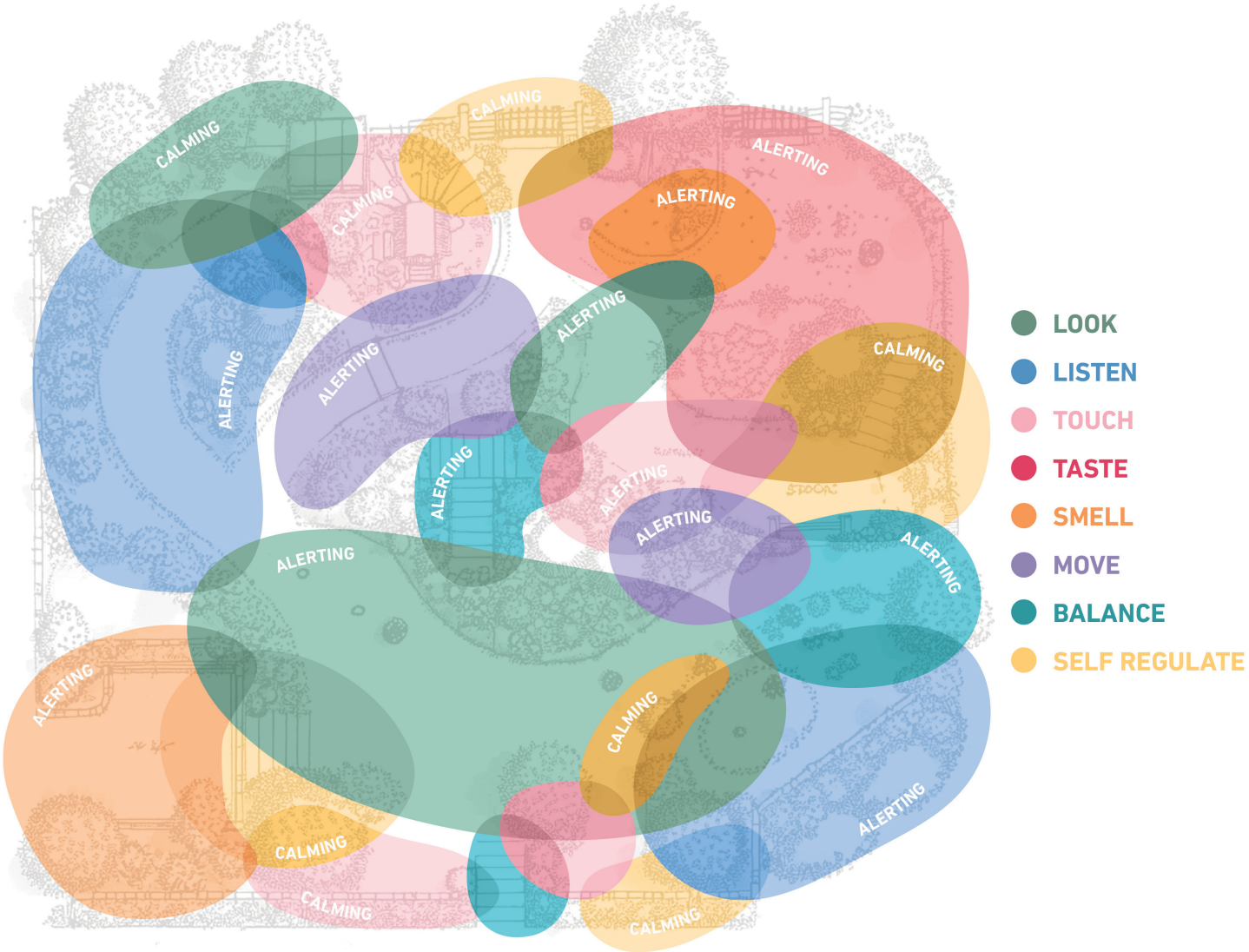


FIGURE 5. Sensory Garden

Sensory Spotlight

SELECTING SENSORY GARDEN ELEMENTS

Refer to the **Eight Senses Hardscape Considerations** planning spreadsheet template in the Appendix to help determine the sensory qualities of the hardscape you are considering for the garden.

AN INCLUSIVE GARDEN IS A SAFE PLACE

- Store all sharp tools, as well as chemicals, far away from children.
- Must have soil that is free of lead and other chemicals if planting edible plants. Get a soil test!
- Organic fertilizers such as kelp and fish emulsion, while organic, are still not things children should play with or have access to at any time. Better still, do not use harmful chemicals at all!
- Adequate staffing supports the success of a youth sensory gardening program.
- Have a supply of child sized garden tools available.
- Do not plant plants that are poisonous (i.e. fox glove) or have prickers or thorns.
- If mouthing plants is an issue, plant only those that can be safely consumed.
- If gardening outdoors, make sure the garden is in a safe spot, either fenced in or well away from traffic or the potential for a child to walk off.
- Keep a phone and first aid kit handy.
- Keep water available for children to drink.
- Slip, slap, slop – slip on a shirt, slap on a hat, and slop on sunscreen.

SUMMARY

THE FOCUS OF THIS CHAPTER was to provide strategies to design a sensory garden that welcomes all children regardless of their abilities, cultural backgrounds, or preferences. An inclusive garden ensures that all children can thrive and feel that they belong.

CHAPTER 4

The External Senses

The five external senses are gustatory (taste), olfactory (smell), tactile (touch), auditory (hearing), and visual (seeing). They provide information to the brain about what is happening outside of the body. The brain then processes and responds to the sensory information with some type of action.

While each sensory system will be introduced separately, they work as a team and our responses to sensory input varies. The essence of sensory garden design is to embrace this variability and create spaces or elements within the garden that provide alerting and calming multi-sensory experiences and spaces in between to take a pause. As you design a sensory garden this process might be helpful to you (FIGURE 6).

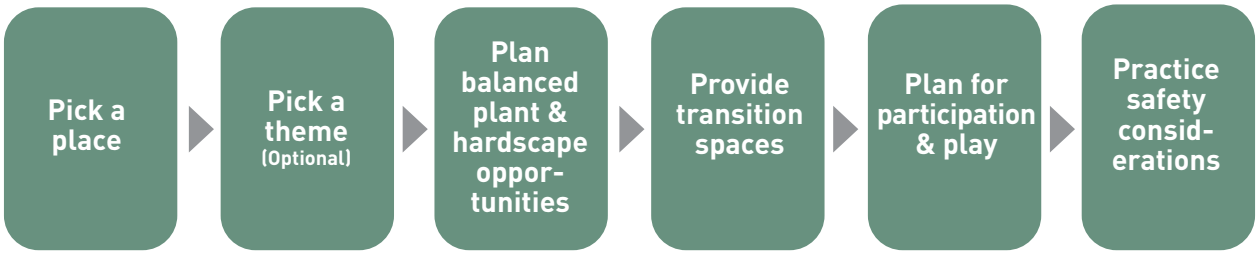


FIGURE 6. Sensory garden design process.

Additionally, the **Eight Senses Plant Considerations** template in the Appendix guides you through determining the sensory qualities of plants you should be considering for the garden.

TASTE

LOCATED IN THE MOUTH, TONGUE, and esophagus, taste, also called the gustatory system has specialized cells that send messages to the brain to decode five kinds of tastes: sweet, salty, sour, bitter, and umami. Sometimes bitter is linked with being poisonous, so it is protective. Umami is the savory or delicious taste. Mushrooms, beef, soy sauce, and tomatoes are examples of umami rich foods. Many little raised bumps called taste buds help to discriminate the five taste sensations. Humans have about 10,000 taste buds that regenerate every couple of weeks (kidshealth.org, 2024). There is a very strong connection between taste and smell.

Try this.

Pinch your nose and take a bite of your favorite chocolate. You may be able to tell if the bite of chocolate is sweet or bitter, or maybe even salty, but can you taste the "chocolate-ness?"

Sensory Spotlight

TASTY TASTES IN THE SENSORY GARDEN SUGGESTIONS

- If there is an edible theme to the garden, invite children to share what they would like to grow. A sense of ownership is empowering!
- Grow herbs such as chives, basil, parsley, lemon verbena, and mints for alerting experiences.
- Vegetables, including peas, beans (varied colored varieties add a visual element), sweet peppers, cucumbers, pumpkins, and tomatoes can appeal to a range of taste preferences.
- Fruit such as strawberries and blueberries are a good choice if they grow in your region.

Children who participate in growing their produce are more likely to eat it (Savoie-Roskos et al., 2017). For children who are sensory avoidant in environments outside the garden, this trend may also apply. The key is to grow a variety of edibles to appeal to the range of taste preferences; sweet, salty, sour, bitter, and umami.

For safety's sake, carefully select plants that have no toxicity so children who are sensory-seeking will not harm themselves if they ingest anything that is planted, regardless of whether it is an intended edible. As well, be cautious about trees and shrubs that produce and drop seed pods and the like, as children who are sensory seekers may try to eat them, and the results could be catastrophic. *Check with your local cooperative extension service for lists of toxic plants.*

Sensory Story: Tasting Tomatoes

STEP 1
Today we are going outside to taste tomatoes. Some children like tomatoes and some do not- it is okay either way.

STEP 2
After we sit down at the table, everyone will get a paper plate with 3 pieces of tomatoes on it. You can decide if you would like to taste, 1, 2, 3, or none of the tomatoes.

STEP 3
Our teacher will collect the plates and leftover tomatoes and put them in the compost bin.

STEP 4
Next, we will draw a picture that shows how we feel about tasting the tomatoes. My picture can look like anything I want it to.

STEP 5
After we give the drawings to our teacher, we will go back inside.

SMELL

THE OLFACTORY SYSTEM (SMELL) is the first sensory system to fully develop. Smell helps people recognize danger like fire and rotten food. Smell is also involved in identifying pleasant situations. There is a strong connection between smell and emotions and memories. For example, what memories and emotions do smelling damp leaves elicit for you?

For children undergoing cancer treatment and children with autism, smells may be extremely aversive. When designing any sensory garden be aware of this and plan carefully. Keep the pungent plants well away from the low- or no-odor plants so children can choose if they want to be near them and to smell them. Another option is to have high odor plants installed in rolling containers that can be pushed to the perimeter of the garden and away from the main action. Alternatively, create a scent-free zone in the garden that is positioned well away from any types of high odor plantings. *Do not include any plants in the transition space in your sensory garden.*

Sensory Spotlight

WHAT CAN I SMELL IN THE SENSORY GARDEN? CONSIDERATIONS

- Wet soil and untended free standing water each have unique smells to be aware of.
- High odor flowering shrubs like jasmine and honeysuckle may overwhelm some children,
- Decaying leaves and other plant materials may be a deterrent for children who are sensory avoiding.
- Unintended animal waste has a distinct and pungent odor.
- Chemical (not recommended) and organic fertilizers can smell noxious and must be kept safely stored away so children have no access to them.
- Plastics (seating, etc.) can emit odors, so be aware of this if it is your hardscape choice.

Sensory Story

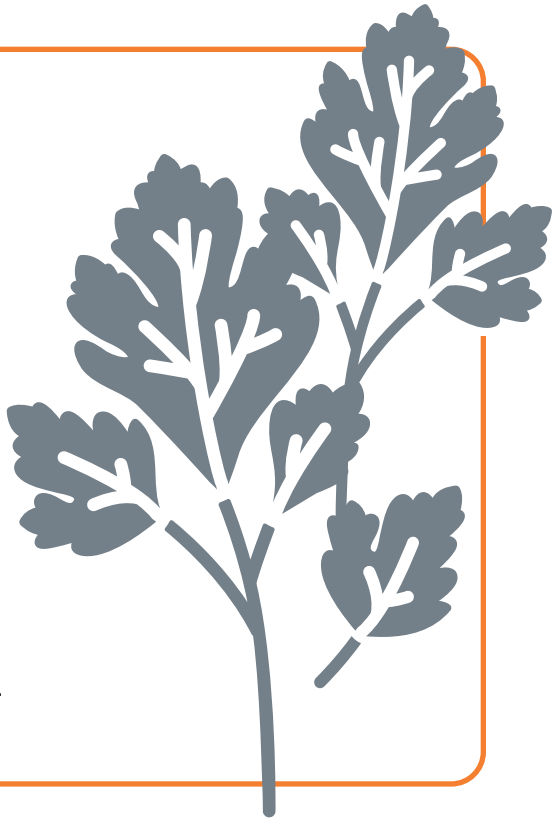
STEP 1
There are many herbs growing in our garden.
They each have different smells.

STEP 2
Some of the smells are strong, like basil and mint.

STEP 3
I can rub my fingers on the herbs and smell them if I want to.

STEP 4
I can also stand near a friend and when they rub the herbs
I can lean over and smell them without touching them.

STEP 5
Or I can move to a different place in the garden without plants.
No matter what I choose, I have made the best decision for me.



TOUCH

THE FIRST SENSORY SYSTEM that develops in the womb is the *tactile*, which is the sense of *touch*. It is also the largest sensory system because there are tactile receptors located all over our outer and inner bodies (Biel & Peske, 2009). Different types of touch receptors send information to the brain about light and deep pressure: touch, pain, temperature, and vibration. We always experience touch information, even as you are sitting or standing and reading this information.

Children undergoing cancer treatments may experience peripheral neuropathy that can lead to pain, numbness, and tingling in their hands and feet. They may also have lowered immune systems, which is also associated with other chronic childhood conditions like juvenile rheumatoid arthritis and diabetes. Safety considerations are critical. Gloves that fit well but do not compress are a must. Shoes and socks should always be worn. Provide ample seating options, shade, and as needed, handrails. Be careful and deliberate with your planning and never hesitate to reach out to a healthcare provider for further information to make sure you are on track with your garden design and programming.

Sensory Spotlight

TOUCHY, TOUCHY IN THE SENSORY GARDEN – PLANTS AND HARDSCAPE CONSIDERATIONS

- Planters and pots with smooth and bumpy surfaces to appeal to a range of children who are sensory seeking and avoiding.
- Wooden and plastic seating options provide different tactile experiences.
- Plant qualities – smooth, soft, bristly, sticky leaves and stems, round and square stems.
- Two bucket or bin systems – fill one with a rotating mixture of highly varied and textured nature objects like seed pods, pinecones, and stones for children who seek sensory input and another bin with single sensation nature objects like smooth stones or flower petals for children who tend towards being more sensory avoiding.
- Avoid any hardscape that will burn children like polished steel or use of splinter-prone wooden raised beds or seating.

When thinking about plants, consider their textures. Select a balance of textures and strive to keep the smooth and softer leafed plants separate from the more sticky and scratchier plants. Accomplish this through separate pots or in different parts of the garden beds. If all the plants are in a single garden or raised bed, create a transition zone by placing a smooth piece of art or river rocks in between the texture levels.

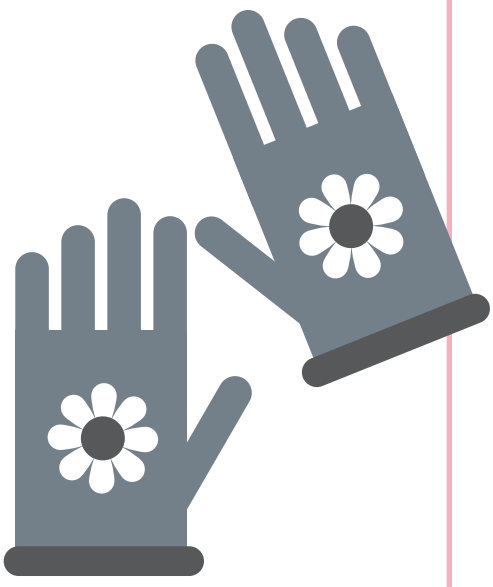
Sensory Story

STEP 1
Today, when I am in the garden, there are many things I can touch if I want to.

STEP 2
I can touch the soil with my fingers or wear gloves or not touch it at all. Whatever I choose is okay.

STEP 3
Some plant leaves feel smooth, and some are scratchy. If I only want to touch the smooth leaves that is great.

STEP 4
If I want to help fill watering cans and water the plants, that is my choice. I can also watch if that feels best to me.



HEARING

THE AUDITORY SYSTEM IS THE SENSE OF HEARING. There are four dimensions of sound: 1. intensity, 2. frequency or pitch, 3. duration, and 4. localization. Intensity describes loudness and is measured in decibels. The sound of rain is about 50 decibels, and the sound of thunder is about 120 decibels (noiseawareness.org). Frequency or pitch is measured in hertz (hz), the number of sound waves per second. The average frequency range for humans is 20–20,000 hz. Duration is the length of time a sound persists, and localization is identifying where sounds are coming from (Biel & Peske, 2009, p. 41).

Sensory Spotlight

I HEAR YOU IN THE SENSORY GARDEN IDEAS

- Ornamental grasses and bamboo will make noise when the wind rustles through them.
- Bird feeders bring birds and bird song. Determine whether this is an asset for your garden.
- Musical instruments – if free standing, place them on the edge of the garden as a destination for children who seek them out.
- Wind chimes may be controversial as the tones can be unpleasant for some children who are hypersensitive to sound.

Children who are sound aversive need access to spaces that buffer noise. While it is challenging to block sound without noise cancelling headphones, quiet spaces on the periphery of a sensory garden that are womb- and nest-like will provide a level of calming. Another strategy to help buffer sounds from outside the garden is to heavily plant the borders with dense shrubs.

Sensory Story

STEP 1
There are many kinds of sounds that you can hear outside.

STEP 2
I might like some sounds that I hear. Think about what you do like.

STEP 3
Some sounds may feel loud and hurt your ears and scare you. There are ways to help you.

STEP 4
I can tell my teacher that the outside sounds are bothering me.

STEP 5
I can put on headphones to block out sounds.

STEP 6
I can move to a different place in the garden to avoid sounds that I do not like.

STEP 7
Whatever I decide to do is the right solution for me.

VISION

THE TWO MAJOR FUNCTIONS of the visual system are seeing and understanding what is seen. Taking in information from the environment through the eye as light (seeing) is vision. Visual perception is analyzing, interpreting, and making sense of the information coming through the eye (Price & Remington, 2012). Like all the sensory systems, vision is complex and is strongly connected with the vestibular system, one of the three internal senses. More on this relationship follows in the next chapter.

Sensory Spotlight

I SEE YOU IN THE SENSORY GARDEN IDEAS

- Flowers and ornamental plants- provide a range of alerting and calming colors.
- Fruits and vegetables- mix up the color palette with a range of unusual varieties.
- Trees – various leaf shapes and colors, different types of bark.
- Seat coverings – simple or complex or a variety.
- Shade sails – ideally select calm colors like blue, green, or cream.
- Play equipment.
- Paving – avoid bright and glaring pavement as it can be blinding for children who are photosensitive.

For children who are sensory avoidant, a garden awash in bright colors, differently shaped and sized plants, and other hardscape can be overwhelming, so keep this in mind when planning your sensory garden. A wide variety of brightly colored and textured plantings and hardscape can denote a more active and vibrant area. A more muted color palette with limited variability can denote quieter spaces for children who are sensory avoiding or need a more calming experience. Children will find what they need in the sensory garden if varied ranges of opportunities are made available to them.

Sensory Story

STEP 1
Today we are going to look at leaves in the garden. Leaves grow on plants, shrubs, and trees and have different shapes and colors.

STEP 2
We will identify 5 different shaped leaves and draw a picture of each using crayons and paper the teacher gives. I will do my best.

STEP 3
After we are done looking and coloring, we will share what we found. I am proud of my work.

SUMMARY

BEFORE MOVING TO THE NEXT chapter on the three internal senses, take a few moments to reflect on the information provided about the five external systems and how you can incorporate them into sensory garden design.

TEST YOUR *Sensory Knowledge*

1. Which of the following is highly umami?

a. Lemons b. Peanuts
c. Soy sauce d. Potato chips

2. What must be avoided when selecting plants for a sensory garden (or any children's garden)

a. Herbs b. Toxic plants like foxglove
c. Lettuce d. Green beans

3. There is a strong relationship between taste and smell.

True
False

4. The first sensory system to fully develop is

a. Taste b. Smell
c. Touch d. Hearing

5. There is no connection between smell and memory

True
False

6. Smell is a protective sense as it alerts us to danger like fire or spoiled food.

True
False

7. Which sensory system is first to develop in the womb

a. Auditory b. Tactile
c. Visual d. Gustatory

8. Which of the following is not a tactile sensation?

a. Pain b. Pressure
c. Temperature d. Noise

9. Which best describes a tactile experience

a. Eating a cookie
b. Rubbing fingers along a tree trunk
c. Listening to bird song
d. Looking at a butterfly in flight

TEST YOUR *Sensory Knowledge*

10. The four dimensions of sound are

a. intensity, interoception, duration, localization
b. intensity, frequency or pitch, duration, localization
c. intensity, frequency or pitch, duration, lamination
d. intonation frequency or pitch, duration, localization

11. Duration is

a. Loudness
b. Knowing where sound is coming from
c. Pitch
d. How long a sound persists

12. Pitch or frequency is

a. Knowing where sound is coming from
b. Loudness
c. How long a sound persists
d. Number of sound waves per second

13. Vision is

a. Understanding what you see
b. Seeing
c. Not understood
d. None of the above

14. Visual perception is

a. Understanding what you see
b. Seeing
c. Similar to the vestibular system
d. None of the above

15. An example of vision and visual perception working together is

a. We see a flower and recognize it has 6 yellow petals
b. We can identify a white flower growing amongst a patch of red flowers
c. We recognize that a tomato is round and red (for the most part!)
d. All of the above

The answer key is on page 48.

CHAPTER 5

The Internal Senses

The three internal senses provide information about what is happening inside the body to help keep us aware and oriented. They are the vestibular (balance), proprioception (body awareness and movement), and interoceptive (internal regulation).

While they may be somewhat unfamiliar, the roles they play in daily life are critically important to understand and incorporate into sensory gardens. The Eight Senses Hardscape Considerations template in the Appendix guides you through determining the sensory qualities of hardscape you should be considering for the garden.

VESTIBULAR

THE SENSE OF BALANCE IS BASED ON THE VESTIBULAR SYSTEM, which is made up of the structures in the middle ear. The vestibular system sends information to the brain about movement, head position (up/down, side to side). It helps to keep the body in a stable and upright position, and contributes to identifying the body's position in space, which is proprioception. Anytime our head position changes as it moves, up and down, side to side, the vestibular system is working hard to keep the body balanced. Some examples of vestibular experiences are boating, spinning, rolling, rocking, jumping, running, dancing, swaying, hanging upside down, and going from sitting to standing and back.

Sensory Spotlight

PUTTING BALANCED MOVEMENT INTO A SENSORY GARDEN (SEE ALSO PROPRIOCEPTION) IDEAS

- Vertical gardens that invite children to bend and reach and move side to side.
- Swings and hammocks- some should be more stable than others to appeal to a range of sensory needs.
- Mounds to climb and slide, roll, or walk down.
- Obstacle courses can be varied to meet children's vestibular needs.
- Curved paths offer a subtle balance challenge to walk along.

There is a strong connection between vision and the vestibular system because seeing plays a role in understanding how the body is moving and where in space it is located. This connection makes movement smoother.

Sensory Story

STEP 1

When we do warm-up exercises in the garden to get our bodies ready to move, I can twist my body, twirl around, and touch my toes if it feels good. Otherwise, I can stand quietly.

STEP 2

There is a swing in the sensory garden. Some children like to swing and feel their bodies move high into the sky and back down again. Some children do not like how it makes their body feel. Either way is okay.

STEP 3

I can roll down the garden hill or go down on my bottom or not go on the hill at all. It is my choice.

PROPRIOCEPTION

THE PROPRIOCEPTIVE OR BODY AWARENESS SYSTEM controls movement and posture through proprioceptors (specialized sense organs) located in muscles, joints, tendons, and ligaments. Proprioception keeps us aware of where our body parts are without needing to look at them and to understand whether we are moving or still (Biel & Peske, 2009). Proprioceptive input comes through deep pressure and heavy work like pushing, pulling, lifting, jumping, climbing, and squeezing into tight spaces. Many people find proprioceptive input calming, like a baby who usually quiets when swaddled. There is a strong connection between the proprioceptive and vestibular systems because being aware of where the body is in space and how it is moving depends on the sense of balance, which is the purpose of the vestibular system.

Sensory Spotlight

PUTTING PROPRIOCEPTION INTO A SENSORY GARDEN IDEAS

- Vertical gardens that encourage reaching up/down and side to side to tend.
- Mud bin or trough to play in.
- Tunnels to squeeze in and crawl through.
- Dirt piles to dig in and scoop up and transport.
- Trees to hug.
- Rake leaves into piles and have a jump.
- Carry rocks and other heavy items.
- Load a child-sized cart with rocks or soil to bring to the garden beds or simply push.
- Logs to balance on and walk across.
- Obstacle courses.
- Mounds to climb on and roll down.

Find out more at mortonarb.org/app/uploads/2022/06/Outdoor-Proprioceptive-Activities.pdf

Sensory Spotlight

DOWN THE SENSORY PATH

Located in a level part of the garden, a nature-friendly sensory path contains different multi-sensory experiences for children to explore while going from its start to end. Can you think of all the sensory systems that are being nourished? Depending on space and budget, the path can be linear and have a clear start and stop point or be a loop. Be inclusive and design based on your population and how they will most comfortably and safely navigate the path.

Here are the steps.

1. Decide on a location. A sensory path should never be the main thoroughfare in the garden as it is an optional activity.
2. Size matters- determine how long and wide the path should be based on your children's needs. Typically, it is about 3–4 feet wide and however long you want it to be.
3. Remove the grass and any roots and stones from the future sensory path.
4. Level off the remaining soil, adding more topsoil or sand as needed.
5. Consider putting down a weed barrier (cloth).
6. Edge the path with bricks or another material that will hold the contents of the sensory path in place. Be aware of how you lay the edging to avoid any tripping hazards.
7. Using string and stakes, grid off your path into 3-4 ft wide x 5-6 ft long sections.
8. Fill each section with a different material such as mulch, smooth pebbles, tree cookies (thinly 'sliced' sections of tree trunks), grass, and coarse sand. Be creative!
9. Tamp down the materials and add more so they are as level and even as possible, planning that you will need to do this many times to keep it level throughout its 'life.'
10. Install handrails as needed – on one side of the path or both.
11. Observe whether children's behaviors change after spending time on the path. Are they calmer and more focused?

Sensory Story

STEP 1
When I am outside in the garden I like to move my body. There are lots of things I can do.

STEP 2
I like to carry things like rocks and buckets of soil and watering cans full of water. It makes me feel strong and happy.

STEP 3
Sometimes I like to rake the leaves that fall on the ground into a big pile. I pretend I am making a giant nest. I don't like to jump in the leaves. I just like to rake.

STEP 4
When I am done with my work, my favorite thing to do is curl up like a tiny mouse in the tunnel in the garden. It makes me feel calm and quiet.

INTEROCEPTION

THINK OF INTEROCEPTION AS WHAT DO I FEEL rather than HOW do I feel. Interoception is the brain's ability to perceive the internal state of the body (Feldman et al., 2024) in two ways. One is for homeostasis, the process of maintaining internal stability through awareness of your physical state like hunger or thirst, needing to use the bathroom, being hot or cold, pain, and heart rate (Mahler et al., 2022). Awareness of and prompt reaction to homeostatic cues can lead to better self-regulation and ability to manage behaviors and emotions. For example, if you are aware of being thirsty, take a drink of water! Interoception's other role is providing affective cues, prompting awareness of your emotional state. Like homeostatic cues, good affective awareness can lead to correctly interpreting emotional responses and then tending to them. For children, well-functioning interoception makes them better able to learn, work, play, and tend to their bodies, kindly and positively.

Sensory Spotlight

SELF-REGULATION MUST-HAVES IN THE SENSORY GARDEN

- Shade, under the canopy of a leafed out tree, a shade sail, or other installed shade structure.
- Spaces to sit and rest, nest-like spaces to take a break.
- Hydration stations where children can take a drink of water or fill a water bottle.
- Misting fans as needed.
- Restroom with a changing table located in or nearby the garden.

Children taking mental health medications, children with autism and other neurodevelopmental conditions, and children being treated for cancer have a higher tendency to be photosensitive and easily overheat. It is imperative that every sensory garden, no matter who it is being used by, provide ample shade and hydration stations.

Sensory Story

STEP 1
If I feel hot and sweaty when I am in the garden, I can take care of my body and cool down under the blue shade sail. I can sit on a bench or lay down on the soft grass beneath the sail.

STEP 2
Sometimes I forget that I am thirsty when I am in the garden. The water fountain reminds me to take a drink. I am glad it is there.

STEP 3
If I need to use the bathroom, there is one right near the garden entrance. It makes me feel safe to know it is there and that I can use it when I need to.

REFLECTING ON A JOB WELL DONE

THIS MANUAL FREQUENTLY REFERENCES the **Eight Senses Hardscape and Plant Considerations** templates located in the Appendix. Once you have planned and created your garden, you can use the grid below to reflect on what you have created and how you addressed the needs of children with hypo- and hypersensitive needs.

Sensory Reflection	Hyposensitive Considerations	Hypersensitive Considerations
VISION Things to see		
AUDITORY Things to hear		
TACTILE Things to touch		
GUSTATORY Things to taste (optional)		
OLFACTORY Things to smell		
PROPRIOCEPTION AND VESTIBULAR Ways a child can move their body and do heavy work		
INTEROCEPTION Opportunities for self-regulation		

SUMMARY

IN THIS CHAPTER, information about the three internal senses; vestibular, proprioception, and interoception was provided. Including vestibular, proprioceptive, and interoceptive features in a sensory garden is important as these three sensory systems play a vital role in helping children manage their behaviors and emotions.

TEST YOUR *Sensory Knowledge*

1. There is a strong relationship between the visual and vestibular systems.
   - True
   - False

2. Because movement depends on balance, the _____ system and vestibular system work closely together
   - a. Tactile
   - b. Auditory
   - c. Proprioceptive
   - d. Visual

3. Examples of vestibular motions are
   - a. Spinning and rolling
   - b. Turning
   - c. Swinging
   - d. All of the above

4. Example/s of proprioceptive input include
   - a. Singing
   - b. Pushing a wheelbarrow
   - c. Carrying a box of books
   - d. B & C

5. If a child struggles with proprioceptive awareness they may appear
   - a. Tired
   - b. Lazy
   - c. Clumsy
   - d. Coordinated

6. Pressure to the joints, muscles, tendons, and ligaments may feel
   - a. Calming and regulating
   - b. Like nothing
   - c. Hunger inducing
   - d. None of the above

TEST YOUR *Sensory Knowledge*

7. Interoception is strongly linked to

a. Taste
b. Touch
c. Self-regulation
d. Hearing

8. Homeostasis is how the body maintains internal stability

True
False

9. Examples of interoception are awareness of

a. Hunger and thirst
b. Pain
c. Heat or cold
d. All of the above

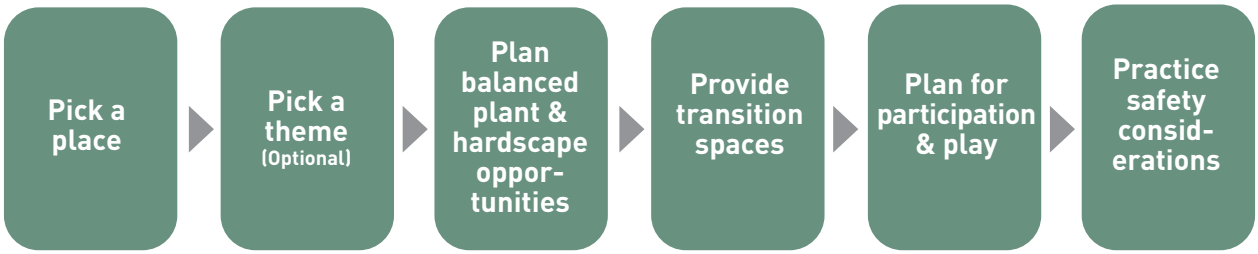
The answer key is on page 48.

CHAPTER 6

Final Thoughts

With the information about inclusion and the five external and three internal senses and their important role in everything that happens in daily life provided in this handbook, you are ready to design a sensory garden!

Remember that the eight senses work as a team and everyone responds to sensation differently. Some children require a great deal of one or more sensory inputs to do what they want and need to do in their day. If you recall, words to describe this need for lots of sensory input are hyposensitive/hyporesponsive or sensory seeking or craving. On the other end of the sensory spectrum, some children cannot tolerate some types of sensory input and may need to retreat to find their center. Words to describe this are hypersensitive/hyperresponsive or sensory avoiding. The best sensory gardens provide a range of alerting and calming sensory experiences for children who are seeking or avoiding. Equally important are the spaces in between these active and quiet areas to pause and compose. When you plan with these techniques in mind and follow the design process explained in Chapter 4 (FIGURE 6),



you are well on the way to creating an inclusive garden where every child feels welcome and wanted. No matter if your sensory garden is large or small, you can successfully meet the sensory needs of the children in your life.

Happy sensory garden designing!

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TEST YOUR SENSORY KNOWLEDGE ANSWER KEY

CHAPTER 2 ANSWERS

1. d. All of the above
2. a. Perceive, process, respond
3. c. The environment outside our body
4. b. Vestibular, interoception, proprioception
5. a. Swings for hours without stopping

CHAPTER 4 ANSWERS

1. c. Soy sauce
2. b. Toxic plants like foxglove
3. True
4. b. Smell
5. False
6. True
7. b. Tactile
8. d. Noise
9. b. Rubbing fingers along a tree trunk
10. b. Intensity, frequency or pitch, duration, localization
11. d. How long a sound persists
12. d. Number of sound waves per second
13. b. Seeing
14. a. Understanding what you see
15. d. All of the above

CHAPTER 5 ANSWERS

1. True
2. c. Proprioceptive
3. d. All of the above
4. d. B & C
5. c. Clumsy
6. a. Calming and regulating
7. c. Self-regulation
8. True
9. d. All of the above

APPENDIX

BASIC INDOOR SUPPLIES TO LAUNCH A SENSORY GARDENING PROGRAM

- Windowsill or shelf near a window to grow indoor plants
- Pots – lightweight plastic ones work well for young children
- Trays drip pans, or plastic container lids to set pots on top of
- Soil – stored in an airtight container- a potting mix containing organic matter and perlite is good
- Plastic basins to place soil in for projects
- Scoops or small trowels- ice cream scoops with chunky handles also work nicely
- Water
- Watering cans – small cans with long spouts work well, as do small water bottles with sports caps
- Spray bottles or turkey basters are a good alternative for children who may not be able to handle a watering can or bottle
- Plant labels – tongue depressors are a good alternative
- Permanent markers for labeling plant labels
- Table covers
- Chopsticks – to poke holes in soil for planting seeds or seedlings and to use as small plant stakes
- Plants and seeds
- Scissors
- Magnifying glasses
- Child and adult sized gloves – those with rubberized palms are best. Be mindful of any latex allergies or sensitivities.
- Safety supplies such as band aids, antibiotic creams, and cleansing wipes
- Light cart – can make one by hanging florescent lights about 3 inches above plants placed on shelves
- Children's gardening books – challenge yourself to create a library!

If your program is intended to provide more in-depth sensory gardening projects, you will need additional materials, based on the supply needs of each project.

BASIC OUTSIDE GARDEN TOOLS AND SUPPLIES

- Trowels*
- Rake*
- Stakes
- Spades*
- Hose/Watering Can*
- Markers
- Gloves*
- String to mark rows
- Buckets/pails/baskets
- Worktables
- Shed or watertight storage containers
- Wheelbarrows/garden carts (child sized)
- Raised bed frames (as needed)
- Soil (potting soil for raised beds and topsoil for in ground beds)
- Composting system
- Trash can

**Child and adult sized*

COMFORT AND SAFETY ITEMS

- Drinking water and cups
- Sunscreen
- First aid kit
- Hats or umbrellas on moveable stands
- Portable seating

Sensory Story
TEMPLATE

See sample sensory garden stories in each sensory chapter

SENSORY SYSTEM AND ICON:_____

PLANNED ACTIVITY:

- In no more than 2 simple sentences explain
  - Steps to do the activity
  - How it might feel to do the step

- It is helpful to insert a simple image to illustrate each step.

STEP 1
Sentence 1: the first step to do the activity
Sentence 2: how it might feel

STEP 2
Sentence 1: the first step to do the activity
Sentence 2: how it might feel

STEP 3
Sentence 1: the first step to do the activity
Sentence 2: how it might feel

STEP 4
Sentence 1: the first step to do the activity
Sentence 2: how it might feel

STEP 5
Sentence 1: the first step to do the activity
Sentence 2: how it might feel

Add additional steps and images as needed

Children's Sensory Quiz
TEMPLATE

8 sensory reflection quizzes – to be completed right after sensory gardening session ends

SENSORY SYSTEM AND ICON: _____

Today in the garden I _____

Ex. Today in the garden I touched the petals of a yellow flower.

Touching the flower made me feel:

HELPFUL ONLINE RESOURCES

American Horticultural Society
ahsgardening.org
MISSION: To inspire a culture of gardening and horticultural practices that creates and sustains healthy, beautiful communities and a livable planet.

Children & Nature Network
childrenandnature.org
MISSION: To increase equitable access to nature so that children – and the natural world – can thrive.

Kids Gardening
kidsgardening.org
Mission: To create opportunities for kids to play, learn, and grow through gardening, engaging their natural curiosity and wonder.

Star Institute
sensoryhealth.org
MISSION: To impact quality of life by developing and promoting best practices for sensory health and wellness through treatment, education, and research.

OTA The Koomar Center
otawatertown.com
MISSION: To provide care that empowers individuals to navigate life's challenges while nurturing growth.

A SHORT LIST OF READING AND OTHER RESOURCE RECOMMENDATIONS

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Mottola, A. (2017). *What do you sense in the garden?* The New York Botanical Garden Press.

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WORKSHEET 1: Eight Senses Hardscape Considerations








HARDSCAPE ELEMENT	GARDEN LIGHT CONDITIONS Sun, part-sun, shade	TACTILE (TOUCH) QUALITIES Smooth, rough, slippery, bumpy, sticky, etc.	OLFACTORY (SMELL) QUALITIES High odor, low odor, no odor	GUSTORY (TASTE) QUALITIES N/A	AUDITORY (HEARING) QUALITIES Loud, medium, quiet	VISUAL (SEEING) QUALITIES Color, shape, size, width, height	PROPRIOCEPTION (MOVEMENT, BODY AWARENESS) QUALITIES Push, pull, lift, squeeze, climb, jump	VESTIBULAR (BALANCE) QUALITIES Spin, roll, turn, rotate, twist	INTEROCEPTION (INTERNAL REGULATION) QUALITIES Shade/no shade, seating, hydration, elimination, retreat & refuge

WORKSHEET 2: Eight Senses Plant Selection Considerations








ANNUAL OR PERENNIAL PLANT	GARDEN LIGHT CONDITIONS Sun, part-sun, shade	TACTILE (TOUCH) QUALITIES Smooth, rough, slippery, bumpy, sticky, etc.	OLFACTORY (SMELL) QUALITIES High odor, low odor, no odor	GUSTORY (TASTE) QUALITIES N/A	AUDITORY (HEARING) QUALITIES Loud, medium, quiet	VISUAL (SEEING) QUALITIES Color, shape, size, width, height	PROPRIOCEPTION (MOVEMENT, BODY AWARENESS) QUALITIES Push, pull, lift, squeeze, climb, jump	VESTIBULAR (BALANCE) QUALITIES Spin, roll, turn, rotate, twist	INTEROCEPTION (INTERNAL REGULATION) QUALITIES Shade/no shade, seating, hydration, elimination, retreat & refuge

ABOUT AMY WAGENFELD, PHD, OTR/L, SCEM, FAOTA

For over twenty years, Amy has dedicated herself to the field of inclusive and therapeutic landscape design, driven by a fervent passion for projects that significantly enhance the lives of children and their families. With her background as an occupational therapist, Amy appreciates the importance of an in¬terdisciplinary approach in designing and programming innovative outdoor and indoor spaces. These spaces are carefully crafted to foster physical and sensory development, support mental health, and facilitate learning. Amy is Principal of Amy Wagenfeld | Design, Co-Director of the Learning Network of the Nature and Health Alliance and holds a faculty position in the Department of Landscape Architecture at the University of Washington, where she actively contributes to the academic and professional discourse through widespread publi¬cation and presentations on the intersection of nature, health, and well-being throughout all stages of life. She is the lead author of Nature-Based Allied Health Practice and The Nature of Inclusive Play.

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