An introduction to making sensory-rich visitor experiences

Sensory Trust

About this mini guide

This mini guide will lead you through creating sensory-rich visitor experiences as a way of broadening the ways in which visitors can engage with your place and its stories.

You will learn:

- Practical tools to help you identify and appreciate the sensory opportunities you already have.
- Ideas and techniques to create inclusive and engaging sensory-rich experiences, activities and events.
- How a sensory-rich approach can help to improve the accessibility of your visitor experience while enhancing that experience for all visitors.

The sensory-rich experiences that you can offer will depend on the resources you have available. The guide includes ideas that you can use if you don't have people available to help visitors (**Opportunities to explore independently** p13) as well as more involved, structured ways you and other staff or volunteers can enhance your visitor experience (**Guided sensory experiences** p13 and **Hands-on sensory discovery** p38).

About the Sensory Trust

Sensory Trust is a leading authority on inclusive and sensory design. We create meaningful and lasting connections between people of all ages and abilities and the natural world.

We believe that everyone should have equal physical and intellectual access to outdoor spaces and experiences. Access is about more than lifts, ramps and handrails. It means ensuring that all people feel welcome and able to enjoy experiences of equal value, in ways that are meaningful to them. It's about ensuring that families and friends of all ages can access and enjoy an experience together. We work to develop, promote and champion inclusive design because it benefits all of us.

The activities and examples included in this guide are drawn from the work of the Sensory Trust, including the projects More Than Words and Language of Nature funded by the National Lottery Heritage Fund. With thanks to our partners, their staff and volunteers, Wheal Martyn

Clay Works, Kresen Kernow - A Home For Cornwall's Archives, Geevor Tin Mine, Hayle Heritage Centre, Trees for Cities and the National Wildflower Centre.

Terms in this mini guide

Multisensory

When we talk about multisensory we are talking about making a particular effort to develop an experience which at different times prioritises or targets particular senses in a way which is notable, unusual or powerful.

Sensory-rich

A particular richness that comes from either a powerful combination of sensory stimuli or from a particularly distinctive strong or notable stimulus for example the heady scent of a jasmine bush on a summer evening, or the wild colours, shapes and scents of a tropical greenhouse.

Visitor experience

In this mini guide the term visitor experience focuses on the collection of individual experiences that combine to create the overall experience and does not include all aspects of a visitor journey, such as ticketing, cafes or shops.

A sensory-rich approach - combining accessibility with quality of experience.

Physical accessibility - such as distances, steps, paths and toilets - will determine if people can get to and around a site but the experiences on offer will determine if people want to.

We all interpret the world differently. There is no wrong or right way to move through a space, take in a view or react to something. Sensory experiences not only connect people at a deeper level with nature but also create stronger, longer-lasting memories.

Sensory experiences can be used to enrich existing opportunities and activities such as guided tours, demonstrations, talks and trails. A volunteer explaining the activities of the past can have a smell pot or two in their pocket. An interpretation sign can have a tactile object attached to it. Sensory engagement will enhance a visit and sit alongside other features such as information and interpretation,

As well as making a visit more enjoyable and memorable, designing for the senses can:

- Extend a visit.
- Encourage repeat visits.
- Create new routes and experiences for new visits, to ease pressure points and overcrowding.
- Help to plan seating and resting points.

Least Restrictive Access and equality of experience

Two important principles that underpin our work are Least Restrictive Access and equality of experience. Both these ideas are important to keep in mind when planning any visitor experience whether it is interpretation, an activity or an event.

The principle of Least Restrictive Access requires that any work that is done meets the highest possible access standards. This principle applies to physical developments – new paths,

routes, or buildings – but it also applies to activities, events, signs and interpretation. The aim is to make whatever you are planning as accessible as you can and to understand and be able to explain any decisions you have to make.

Closely related is the principle of providing an equally great experience for all your visitors. There might be situations where it is not possible to make everything accessible to everyone. In those circumstances, the ambition should be that the overall mix of individual accessible experiences add up to an equally good experience for all visitors regardless of ability. This doesn't necessarily mean the same experience for each person. The crucial aim is for the overall combination of individual experiences to add up to an equally great experience for everyone.

About the senses

Much of the modern world seems to focus on the visual but we rely on much more than sight to make sense of the world. We are essentially sensory beings; our senses are constantly working away in the background, receiving raw information from our encounters with the rest of the world. Our brains then interpret this raw information to form our understanding of and emotional connections to the world. Importantly, it is often our other senses, especially touch and smell that provide us with the most meaningful and memorable experiences, connecting us with our surroundings.

A broadly acceptable definition of a sense for neurologists would be a group of sensory cells that responds to a specific physical phenomenon, and that corresponds to a particular region of the brain where the signals are received and interpreted.

While some interpretations identify as many as 21 or 53 different senses, for the purposes of visitor experience this guide will be focussing on the widely used main five with a couple of extras.

Aristotle (384-322 BC) is credited with first numbering the senses in his work De Anima. Even if someone hadn't numbered them prior to that, the main five senses have certainly been known for thousands of years. They are known to all of us and are what most of us mean when we talk about 'The Senses'.

- Sight or vision.
- Hearing or audition.
- Smell or olfaction.
- Taste or gustation.
- Touch or tactition.

Neurologists would count, and agree on, at least nine senses, thereby adding the following,

- Thermoception - the sense of heat (there is some debate that the sense of cold may be a separate sense).
- Equilibrioception - the perception of balance.
- Proprioception - the perception of body awareness (close your eyes and touch your nose. Got it first time? That's proprioception in action).
- Nociception - the perception of pain.

For many people, sight is a dominant sense. One reason for this is that the range of our vision can be vast compared to the other senses. To taste something you have to take it inside yourself, you have to be really close to touch something and unless a smell or sound is carried

by the wind our noses and ears are limited too. Unimpaired vision on the other hand stretches beyond the horizon to the stars, the limit of our sensory experience.

People are used to using their dominant sense to explore, so any opportunity to use our other senses is a break from the norm. This mini-guide touches on sight but deliberately places more focus on our other senses as an approach that promotes wider sensory engagement. It looks at ways to engage the senses with temperature, weight and pressure included within touch and using action and movement as a way to engage balance and proprioception.

Sensory engagement can also be a great leveller. By providing activities and experiences that poke and prod all the senses you can ensure that more people take away something that is personally meaningful to them.

Sensory processing and integration

We are constantly receiving signals from multiple sources that are being received by different senses. It is difficult to think of circumstances where any experiences are single sense even if it is intended to be. Eating is the most obviously multisensory experience – the plump blackberry in between your fingers (careful not to squeeze too hard and squish it), the succulent, sun-warmed, juicy fruit bursting in your mouth, the fragrant, sweet, sharp taste, the contrasting crunchy, bitter pips sticking in your teeth.

Part of the job of our brain is to process all of these different stimuli to filter out the unnecessary, the repetitious, the mundane and to be alert for the new, sudden dangers, building threats, or fleeting opportunities.

This multisensory processing establishes pathways in our brain meaning we learn, recognise and remember. Multisensory processing is complex and as individuals we do not always process in the same way. Indeed, some brains find it difficult to process all of these signals. This is described as Sensory Integration Dysfunction, sensory processing difficulties, or Sensory Processing Disorder (SPD). People with SPD can sometimes find sensory experiences overwhelming which can make it difficult to engage in everyday activities or events. Some people may need a stronger more intense sensory experience to get an effect or response whereas others might be overwhelmed by a lighter touch. These different responses can result in different behaviours with people seeking more or less stimulation. In order to welcome all visitors and avoid overwhelming some of them ensure that the experiences you plan are optional so people can leave if they wish.

Not senses in the same sense – a sense of place and a sense of awe and wonder

The senses are so central to our experiences that the word sense is often used to describe a general feeling, an understanding or deep connection; a sense of community, a sense of belonging, a sense of responsibility.

A 'sense of place' is a widely used phrase that relates to the bonds and attachments - the emotional connections - that people have with somewhere. This can refer to a home or a town, a local park or woodland, or even a region or country. In a visitor experience context, it is used to describe the combination of stories and sensory experiences – the sound of a waterwheel turning, or water droplets falling in an old mining tunnel – that together capture the character of a site, location or destination.

When we are talking about natural heritage a sense of place can be also associated with a sense of awe and wonder that we can feel when we connect with nature. Finding a sense of awe can elicit both powerful physical and emotional responses in us. Awe can also make us think about time in a different way, how we move through it as individuals and how the natural world around us moves at a different pace, sometimes fleeting, sometimes over centuries.

We communicate and interact with our environment through our senses. We acknowledge the seasons when our senses detect the changes in temperature, we smell new plant growth, hear the birds and taste the air after the rain. By building sensory connections with the natural environment people are more likely experience awe and feel a closer bond with their natural heritage.

Multisensory experiences for the visitor

In neurological terms multisensory refers to stimuli from several sensory processing systems at once, sight, sound, smell etc. When we talk about multisensory in the context of a visitor experience, we are talking about an overall experience which is sensory-rich and which includes a variety of sensory experiences. Sometimes there will be multiple stimuli at once, sometimes they will be separate.

Multisensory experiences exploit the natural connectivity of the brain; they build layers of memories in our brains which in turn create an emotional attachment to place. The memories associated with each sense have a different location within the brain so using multiple sensory inputs means a wider degree of brain stimulation. The more sensory experiences that we expose ourselves to the stronger the connection to nature and our heritage becomes.

The important things to remember when we are using a sensory-rich and multisensory approach are:

- To not overwhelm with too many sensory stimuli at once.
- To also be aware of overwhelming with an individual experience that is too strong, too smelly, too loud, too bright.
- Enable people to choose whether to participate or not. Give people a means of escape.
- A change in a sensory experience is more notable than an ongoing experience that remains relatively constant. Difference is key, moving from light to shade for example or from a warm room to a cold space.
- Think about physical accessibility when you begin planning and throughout the process to ensure that as many people can enjoy them as possible.

Start with looking at what you have already

When looking at making visitor experiences you need to understand the opportunities that you have on offer, the stories that you are familiar with and the sensory experiences which bring them to life.

You will already be familiar with the stories that are the starting point for your visitor experience. Even if you know your place really well however there will be plenty to discover in terms of sensory experiences.

Sensory mapping helps you see in new ways

Sensory mapping is a simple, flexible technique that identifies sensory highlights with a view to creating inclusive and engaging visitor experiences. It is the best way to explore the sensory experiences you already have and to immerse yourself in the full experience of your place. Sensory mapping helps people 'see' their place in new ways and from that to identify new opportunities that had not previously been considered.

It essentially consists of individuals or small groups exploring a location and mapping where they encounter particularly strong sensory stimuli, including, but not limited to sights, sounds, smells, textures and tastes. Mapping can also make note of other things people experience in response to these sensory experiences such as emotions and memories.

Avoid trying to map too large an area at any one time, it is important to take your time and not try to rush around to cover everything.

Sensory mapping tips

- Sensory highlights will change with the seasons and the weather, so it is useful to repeat the mapping exercise at different times of the year.

Mapping and recording highlights

The most obvious way to record sensory highlights is on a map. You can use sticky dots, stars or different coloured pens to indicate the different senses and you can record as you go with pens or stickers on a map. Alternatively you can use markers or plant flags in situ to make it more immediate. Flags can include written responses to the sensory experiences discovered, comments, memories and feelings, thoughts, ideas and observations.

The results of your sensory mapping can be used to identify the ideal location for events and activities such as a sensory trail. They can help you identify where people should be given an opportunity to pause and spend time enjoying the experiences on offer. This could lead to planning for more seating or shelter. Sensory highlights are also an opportunity for new interpretation, drawing people into a location or feature.

You can then combine this knowledge with your stories to give visitors:

- **Opportunities to explore independently** (see p13).
- **Guided sensory experiences** (see p25).
- **Hands-on sensory discovery** (see p38).

Opportunities to explore independently

These ideas, tools and techniques can be used individually or combined to create self-led experiences that engage and excite the different senses.

Sensory exploration can be encouraged in various ways such as guided tours, handling collections, or hands-on activities which are included in the later sections. The starting point for independent exploration is usually touching something or picking it up. This initial interaction tells us a lot about something; texture, temperature, weight and density. Once we've got hold of something, we can bring it closer to our nose, ears and eyes for closer inspection. A mantlepiece might look like cold, hard marble but turn out to be warm, painted wood when you place your hand on it. A jar might look like it is full of fine, dark sand but when we hold it we discover that it feels heavy, like metal.

Please keep off the grass. Do not touch. We are well trained to, "Look, don't touch," but touch is one our most intimate senses, it is often how we come to truly understand something.

Essentially you need to give people permission to touch and explore. If you don't have staff or volunteers to do this, permission can be given to explore freely through leaflets maps, or signs, or in a slightly more structured way though markers and sensory trails.

An open invitation to explore

An invitation to explore can be as simple as a printed postcard or leaflet. These explorer cards at Kresen Kernow encourage visitors to find colours, textures and shapes and include cut out shapes to look through. Using these abstract ideas, the cards draw attention to the historic original features (metal columns, granite stonework) as well as the contrasting modern features of the conversion from old brewery into modern archive and library. Using a professional graphic designer or illustrator ensures that the cards are attractive and easy to read encouraging people to pick them up and take part.

Sensory trails

If you want to direct people to explore in a particular area, or indeed to not explore in certain places you can use sensory trails to guide them.

A sensory trail has a series of experiences along a route that are designed to engage the different senses and to immerse people in a multisensory journey. Sensory trails are sometimes seen as an access improvement, intended for disabled people, especially people with sensory impairments. In reality, encouraging people to use more of their senses is of benefit to everyone; they are more than just an easy access trail with low gradients and smooth surfaces.

The trails referred to in this guide are at sites in Cornwall - Geevor Tin Mine, Wheal Martyn Clay Works, Kresen Kernow (Cornwall's archive) and the Lost Gardens of Heligan - as well as Everdon Stubbs in West Northamptonshire.

Physical access

From the outset it is important to remember that your visitors have different needs. It is best practice to ensure that families and friends of all ages can access and enjoy an experience together. Challenge yourself to think of broader audiences for your trail or activity, a grandparent with limited mobility on the trail with their grandchildren or a parent with an adult child with learning difficulties. Accessibility is shared by families and friends and the ambition should always be to avoid separating people so that people can enjoy experiences together. The Outdoor Accessibility Guidance has more detail on improving physical access.

To ensure that the trail you are planning is accessible to everyone you'll need to think about the following:

Access barriers

A single barrier such as a set of steps or a short steep section can make a whole route inaccessible for some people so you should ensure trail routes are barrier free.

Distance

However long your trail is there is a possibility that it might be too far for some people. Make sure that there are good sensory opportunities near the start and where possible give people the option to cut their trail short and loop back.

Seats

Seating is one of the simplest ways of improving access and can dramatically improve the experience for many people. Not only do they allow people go further, they also let them take their time, sit and take in their surroundings and enjoy the trail.

Positioning

Any sensory experiences that are identified or installed should be accessible from paths, within easy reach for people of different heights.

The Outdoor Accessibility Guide has more detail on improving physical access.

What's on the trail?

A good starting point for a trail would be around 8-15 sensory experiences depending on your site, its size and the experiences on offer. Unless you are creating a single sense trail, such as a smelly trail, you should aim to include a good mix of sensory experiences.

A common question is how will people know if they are sniffing the right flower or stroking the right leaf? If you are using markers, careful positioning should take care of it but the most important thing to remember is that even if someone might smell the 'wrong' thing they are still using their senses and exploring the sensory experiences available.

The sensory experiences on your trail will either be features that occur naturally such as rough, knobbly bark or smooth polished stones or features you have introduced or installed such as sculptures, benches or posts.

Pre-existing features

This is going to depend entirely on what you have available and what you have discovered when you were **sensory mapping** (see p11). Don't forget to think about the good, the bad and the ugly - it's not just about sweet scents and beautiful blooms. You should also think about more immersive experiences such as a change in the level of light or a significant temperature change that creates a different feeling or sense of place.

Using natural phenomena - temperature and atmosphere

Some experiences relating to touch can be simulated or replicated but ambient temperature changes are something which can be used where they exist. Stourhead gardens has a collection of features mainly made during the Victorian era including some that share their somewhat morbid obsessions with death. A grotto was built to draw air flow through from the outside across cool water creating a cold breeze that is said to represent the cold hand of death. This change in temperature gives a full body experience which fits with its chilling meaning adding a unique experience to a sensory trail.

Seasonal change

Be aware of how things can change with the seasons. Revisit and change your trail to keep it fresh and new for repeat visitors. You may have exceptional sensory highlights that only appear at certain times of year, the autumnal changes in colour and scent in a woodland for example.

You may need different trails on offer at different times of the year, or you might have a feature that offers a highlight all year round even if the experience changes. For example at Stourhead, the Katsura tree has a wonderful smell in the early autumn (the fallen leaves smell incredibly sweet like candy floss) but also offers an opportunity to engage through the texture of the bark or exploring the shapes of the leaves.

Trails are great for telling stories

You can combine the ideas of a sensory trail with a narrative that is relevant to your place to create a sensory story trail.

How you tell the story - on boards, on a map or leaflet or by people - will depend on the nature of your site and the resources you have available. Sensory story trails can be used to

weave a story or share facts that link with your narrative and can be used to help with wayfinding and encourage people away from busy areas.

Black honey bee sensory story trail

The sensory story trail at the Lost Gardens of Heligan uses simple text accompanied by sensory trail markers and sensory experiences to tell the story of a black honey bee blown off course. As she tries to make her way back home to the hive the bee discovers the wonders of the woodland and the homes of other creatures that live there.

The trail encourages visitors to engage with the woodland environment through their senses as they follow the story of the bee. Trail markers identify sensory highlights at each stage of the story giving permission to sniff, touch or taste each experience and the arrows keep people on track without having to use paper maps. The trail includes a combination of naturally occurring experiences as well as introduced experiences guided by volunteers.

Introducing new experiences

If you have limited sensory experiences naturally you might need to introduce new ones. From a sensory perspective, the key is to think about what is missing when introducing anything. You might have limited opportunities to touch things because things are too far away or too vulnerable to damage.

The possibilities to add experiences are almost endless especially when it comes to installing sculpture or other artwork. Some of the ideas in the following section such as smell pots or making rhythms can be included in your trail but your options will be governed by what is appropriate, affordable and achievable. If you are installing them for independent exploration you will need to pay close attention to safety and security as well as durability.

Positioning is the most important thing to consider when installing any new features to make sure that visitors of different heights as well as those using wheelchairs can engage.

Information and infographics

New sensory features need to be interesting and safe but they can also be informative. Infographics are visual representations of data. They use design and graphical forms to communicate information and in particular to enable the easy comparison of data. For example, the rise and fall of tin mining in Cornwall over the 19th and 20th centuries could be presented as a series of circles, one for each decade, that get bigger or smaller depending on how much tin was mined.

Infographics present data as an image which can interpreted quickly without needing to read a lot of information and can be beneficial for a range of people who might find interpreting data tricky or simply to make it easier for people to quickly understand an idea or narrative.

Two-dimensional infographics rely on someone being able to see, compare and understand the graphical elements. Information can be made a bit more accessible by making these graphics tactile, for example using embossing or vacuum forming to create tactile infographics.

The principles of infographics can be taken a step further to create three-dimensional, tactile information. A series of models or 3D forms can be used to compare data in the same way as a series of circles resulting in an experience which is both visual and tactile.

Tactile information

Sky tips are a very common sight in mid-Cornwall. The huge tips – often referred to as the Cornish Alps - are massive piles of waste material left after extracting china clay. For every one tonne of pure china clay the extraction process creates around nine tonnes of waste. The exhibit below represents this fact in three dimensions, giving visitors a visual and tactile insight into the mining of china clay, the creation of the sky tips and the formation of the surrounding landscape. The exhibit was created as part of More Than Words with Wheal Martyn Clay Works.

The location for the model is accessible – level and free from obstructions - so that all visitors can touch and explore the models. The height of the plinth allows a person using a wheelchair to reach the model.

The expertise of a local clay artist using contrasting materials and textures contributed to the experience. A smooth, glazed pure white cone represents the extracted clay and a grainy, rough, crevassed cone glazed with dark, earthy colours and nine times the size represents the waste.

Tactile information top tips

- Make sure you get the maths right. When creating a model, you are communicating with physical volume which can lead to a bit of calculation. For example, twice the volume does not equal twice the height.
- Make sure people can reach and touch it. For exhibitions and installations, you can find diagrams of measurements for different visitors by searching online for “wheelchair reach height”.

Introducing new sounds

Sound can be one of the more challenging things to add but if you are planning a temporary trail or activity you can use a portable MP3 speaker like the one below to share stories or sounds to set the scene or add interest and atmosphere.

Waterproof speakers are available that will loop a track and can be hidden out of sight, in a tree for example. Alternatively, you could install one in a lockable wooden box on a post with holes to allow the sound to be heard.

On the black honey bee sensory story trail at the Lost Gardens of Heligan a carefully hidden speaker ensured that the sound of the woodpecker that the lost bee meets could be heard intermittently.

Trail making

Trails are essentially a framework for exploration and discovery, whether it's a route, a treasure hunt or a heritage tour. In order to enjoy a trail people needed to be guided in some way.

Maps and leaflets

Printed materials such as a map or leaflet can work if you have somewhere dry to keep them but if you don't then you will need other ways to prompt visitors. Maps and leaflets can also be made available online for visitors to print at home and bring with them.

Self-led trail booklet

Some places will have a wealth of colours and textures that together create a strong sense of place such as the post-industrial landscape at Geevor Tin Mine. This self-led trail booklet invites people to spot colours from a palette and explore textures around the site and buildings outlined on a simple map.

Trail markers

Using markers means that people aren't walking around with their noses in a map trying to work out if they are in the right place rather than enjoying and exploring. Maps can also be misinterpreted and misunderstood.

Trail markers can be long lasting and weatherproof as well as being adaptable, enabling you to change a trail as the seasons change, when a plant blooms or an orchard bursts into fruit. They can be added to existing features - natural or installed - for example by attaching them to your information and interpretation boards or benches.

Tactile sensory markers

These sensory trail markers use materials that connect with the heritage of the sites where they are installed, clay for the Wheal Martyn Clay Works and metal for Geevor Tin Mine.

While the markers were designed to be tactile they also needed to be easy to see. The markers are finished with coloured glaze for the clay and matt paint for the metal to ensure the markers have good visual contrast.

Markers - top tips

- Think about heights. Ideally the markers should be low enough for someone using a wheelchair without being so low that people need to bend down too far. As a guide, a height of between 60 cm and 110 cm from the ground is recommended.
- Maintenance is essential, be aware of any plant growth that might obscure the markers.

Trail posts

In a location where there is little that changes over time a more permanent option for prompts along a trail would be posts installed on site. Again, positioning is key, but posts can also provide an opportunity for textures and images and other interpretation to be included.

Sensory trail posts

Everdon Stubbs is an unmanned woodland site managed by the Woodland Trust. A sensory trail was designed to be durable and robust whilst also being sensitive to the natural environment. The trail is made up of a series of routed and filled oak posts that prompt visitors to explore the surroundings more closely.

Guided sensory experiences

This section looks at ways in which you, your staff and volunteers can add sensory experiences to interactions with visitors. The suggestions that follow can be used to start conversations, inspire curiosity or illuminate stories of the past.

Making your stories sensory-rich

Your options for sensory engagement increase when you have staff or volunteers available to help. The ideas that follow focus on the senses other than sight and can be used individually to help people connect with an idea or combined and added to a longer activity such as a guided tour or a storytelling session. If you can, start collecting interesting things that stimulate the senses; things that are smelly, soft, spiky, crunchy, noisy, woolly, leathery, feathery, etc. These 'sensory prompts' can then be used to add to your visitor interactions, tours or stories. Keep them on hand so there is always something for people to explore and be amazed by.

Touch

When we are talking about touch we are referring to the sensations associated with the receptors predominantly found in our skin but also some which can be found inside our bodies, in our joints and muscles, for example. The somatosensory system is responsible for the sense commonly referred to as touch (haptic) along with pain (nociception), temperature (thermoception) and the position of our bodies and our limbs (proprioception, see more below). The somasensory system is the earliest sense to develop and our skin is our biggest organ. In short touch is central to our understanding of the world around us and our close encounters with it.

As with all our senses our brains try to ensure that we don't get overwhelmed; sights, smells, textures, sounds are noticed and noted and then filtered out, dampened down or ignored. This is the same for our sense of touch, we notice the texture of our wool jumper when we first pull it on but then we don't notice it after a while. The weight of a cat sitting on our lap feels heavy at first, then barely noticeable after a while. After an even longer while we might notice it again, become overly aware of the intrusion on our personal space and force the poor creature out of its slumber and onto the floor.

There are a variety of receptors in the somatosensory system triggered by different but sometimes overlapping stimluli; light pressure, constant pressure, cold, heat, vibrations of different speeds. Some receptors are small and near the surface of the skin, others are deeper. Some receptors have a narrow area that they respond to; others can be stimulated over a larger area. Some respond quickly to the lightest touch or subtlest texture while others are slower to act and respond to movement or greater, more constant pressure.

Our sense of touch, as with all our senses, helps us to determine whether a sensation is dangerous or not. Our sense of touch is closely related to our emotional state, whether we are comfortable or uncomfortable in all senses of the words. This connection is reflected in our language, things we care about touch us deeply, a difficult situation is sticky, a person we don't get along with is prickly but a charming person is smooth.

How to use touch and tactile objects

Our sense of touch includes the ability to sense temperature or more specifically the difference in temperature between us and the things we are touching. We can tell if something is a bit colder than our hand or a lot hotter than the inside of our mouths.

This ability to sense temperature difference helps us to identify different materials and to understand whether an object is what it seems to be, whether a pot is made of cold marble or is actually warmer plastic made to look like stone.

Temperature difference can also be something we feel in the air, for example when we move to the shade of the trees out of the hot sunshine. This difference is something that can contribute to a visitor's experience and can be a significant part of a location's sense of place.

Comparison and contrast

Contrast – the extent to which two things differ – can be key to our understanding of something. It could be much bigger than something else, hotter, or heavier. Giving people the opportunity to compare two things draws attention to how they differ.

Using contrasting objects

Sometimes a story can be illustrated by emphasising a contrast or difference, for example the foundry process in Hayle Heritage Centre's sensory story. A 'pattern' is made of wood, cheap, abundant and easy to shape. The finished cast piece is made of iron, more expensive, colder, heavier, and really, really hard. These differences in the properties of the different materials are central to the process and the story of the foundry and can make for a memorable sensory experience.

Playing with scale - wildflower seeds models

Wildflower seeds are very small and vary greatly in shape and texture. This can be hard to appreciate even with a fully functioning naked eye. A poppy seed is a tiny speck in the palm of your hand; it looks, tiny, black and round. But if you make a scaled-up, palm-sized model of a poppy seed, you can begin to appreciate its shape and beauty. The models make the microscopic world more accessible and in turn create intrigue and interest in other seeds.

Smell

Our sense of smell is our treasure-seeking and early warning system. Often, we smell things before we can see them and before we can touch them and our sense of smell tells us if something is good. Smell also connects to our memories more than any other sense. A whiff of a certain aftershave takes you straight back to the school disco, the smell of the tropical greenhouse at a botanical garden back on holiday. As well as transporting us back in time smells can ground us, helping us connect with our environment and the people around us.

Smell is definitely one area where more is not necessarily better. There is often a temptation when creating a sensory garden for example to overload on scented plants. If you are using smell, consider a few key scents and focus more on scents that people activate through touch rather than plants that waft their scents over distance. Smells can also build and combine to become something new and unintended and potentially unpleasant. They can also be inescapably overwhelming, smelling something should be an invitation not an obligation.

Some smells are fleeting and can be lost before we get the chance to identify them or place them in our memories. These smells can be collected and captured in order to pin them down.

How to use scents and smells

Always make sure you offer smells as a choice, as people may get overwhelmed, have allergies and sensitivities or perhaps have no sense of smell. If the smells get too much for you or your visitors, drinking some water and sniffing the skin on your arm can help calm your smell receptors.

Capturing and controlling smells

Smell pots are a really good way to explore smells that aren't naturally available such as smells from the past. They are also essential for controlling strong or nasty smells which might fill a space and make it unpleasant for people.

You can reuse small jam or sauce jars or plastic pots with lids to hold your smells. If you are using actual objects such as flowers then they can be placed directly in the container, but you need to be mindful of people taking things out of the pots. A more powerful and safer experience can be created by using oils and perfumes. To hold the smell use cotton wool pads or watercolour paper cut to shape and size.

Essential oils are widely available and can often be used to connect with stories in unusual ways. At King Edward Mine in Cornwall for example eucalyptus oil was used to warn miners of a fire in the tunnels. The strong, distinctive smell of the eucalyptus would travel through the dark and noisy mine. Go easy on these smells, a couple of drops will last a long time, and use gloves when handling them.

You can buy specialist smells from aroma manufacturers, many of which have been designed for heritage settings and museums. In general, safety is key to using smell so choose ingredients that are as natural and safe as possible. Essential oils are powerful and need to be used sparingly and safely, avoiding contact with the skin.

An archive of historic smells

This smell archive uses a wooden box filled with smell pots to hold a selection of smells that are associated with Hayle's industrial and maritime past. The smells were purchased from an aroma manufacturer specialising in heritage and historic smells. The smells in the archive were iron smelting, coal soot, machine oil, sea, stable and horses, and kitchen smells.

A couple of drops of the aromas were added to pieces of watercolour paper cut to fit tightly into small pots to make smell pots.

You can install versions of smell pots as a self-led outdoor trail point. The smell pot will need to be set inside a suitable weatherproof vessel, with a strong mesh or grill with holes that people can smell through. Make sure the lid closes well and can't be propped open, as your smell box might get filled with rainwater. Your smells won't be trapped by a close-fitting lid so they will fade much faster, they will therefore need to be refreshed regularly.

Cheap and easy everyday smells

Sometimes you can find your sensory experiences in the supermarket. A miner at Geevor Tin Mine explained how the smell of an oranges from a miner's lunch could travel a long way through the confined spaces of the tunnels.

Smells don't have to be nice to be memorable. A powerful, unpleasant aroma can arguably evoke a stronger reaction and create a more intense experience. On the black honey bee sensory story trail at Heligan a bucket full of stinky seaweed was used to connect visitors to the seaside visible in the distance.

Hearing

Our ears are the external part of our auditory system which receives sound waves providing information about rhythm, pitch and volume. This information is processed to give information about the origins of the sound, its distance and direction. We then recognise the familiar rhythm of a friend's voice, the melody of a tune from the past, or the song of a favourite bird.

Particularly strong vibrations can also be felt by our somatosensory system (touch), such as the distinctive rhythm of a favourite song in a nightclub or the boom of a showstopping firework.

Familiar patterns and combinations draw on our memory connecting the sound to the past, enabling us to recognise and remember voices and songs or remind us of similar sounds experienced years ago.

How to use sounds

Using sound can enhance a story, whether it is a pre-recorded sound or a storyteller. Just like sound effects in a cartoon, everyday sounds can bring life to a story and connect with people's experiences and memories.

Simple sounds

Everyday objects can be used to make sounds for stories, on tours or on sensory trails. A simple desk bell can be used to demonstrate the bell signals used by the lift operators in at Geevor Tin Mine.

On the sensory story trail at Heligan, the little lost bee recognises the sounds and sights of the sea nearby and knows she is nearly home. Visitors were invited to listen to the sound of the sea by pressing a conch to their ears.

Making sounds and rhythms

Your visitors can play an active part in telling your stories. Pulling a zip and pulling apart Velcro bring to life the idea of putting on a wetsuit in a story about surfing. During the telling of 'the life of a ladybird' everyone can take part chomping loudly mimicking the sound of a ladybird larvae munching on leaves to help it grow into a ladybird.

Making rhythms

As part of the foundry story in Hayle people are invited to tap a metal hammer onto a small anvil to recreate the rhythmic beats of blacksmiths, a sound which would have echoed through the foundry all day.

Pre-recorded sound will also work well, especially if there are aspects from the site that cannot be heard all the time, for example a recording of something that happened in the past.

Simple sound tech

Noise can be overwhelming, and overlapping sounds in one space can lead to visitors being unable to focus or hear what you are trying to share. There are an increasing availability of small devices for recording and playing sound. The sound card below, for example, enables you to record (and rerecord if needed) sounds which a visitor can then play and listen to.

Action, movement and motion

Proprioception

Proprioception tells us where parts of our body are in relation to each other. The receptors that provide us with this information are spread throughout the body in our muscles and joints. The information from these receptors combine to ensure that we are moving in the intended direction, with the right amount of effort or tell us if we need to make a change. Proprioception ensures that we don't break an egg when we pick it up and that we don't overshoot when we throw a ball.

Equilibrioception

Located in the ear, but deep inside, is our vestibular system which relates to speed and direction of movement, balance and the position of our head and body in space. It is one of the most important senses as it affects our ability to get around and participate in everyday activities.

Unless you happen to have fairground rides, climbing walls or rollercoasters the vestibular is unlikely to be the focus of your activities or interpretation. Still, it is worth bearing in mind, along with proprioception and movement in general when thinking about your visitor experience and the possibilities for action, gesticulation, movement or dance.

How to use movement and motion

Getting people to physically participate in activities can break down the barrier between the visitor and the stories on offer. Participation can mean movements that mimic natural phenomena like the movement of a tree's branches or a shoot emerging from a seed. Or they can simulate industrial or mechanic processes, such as the turning of a waterwheel or the manufacture of rope.

Physical activity can make connections that are more memorable than listening alone and can appeal to people who enjoy taking part in physical activities.

Representing the engine houses of Cornish mines

Abandoned and derelict engine houses are a distinctive feature of the post-mining landscape of Cornwall. What is not easily understood from what remains is that there were three types of engine house, the pump, the winder and the stamps.

The roles of these different buildings lend themselves to physical actions that are easy to copy and which stick in people's minds.

Pump: clenched fists together lift up and down.

Winder: roll hands one over the other.

Stamps: stamp feet on the ground.

Representing a natural process

'We breathe out, trees breathe in, trees breathe out, we breathe in'. The relationship between humans and animals exchanging carbon dioxide and oxygen with trees can be shared through a simple sign showing the symbols of CO_2 and O_2. Flipping the sign back and forth as participants take deep breaths helps to demonstrate this invisible process and the movement makes it more memorable.

Taste

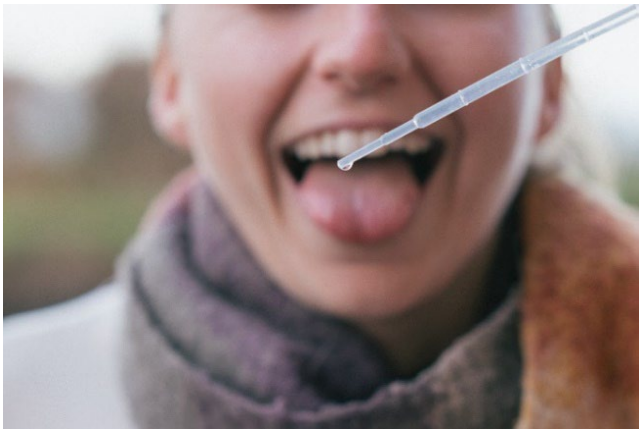
Our mouths are where taste, smell, touch and hearing come together. It's no wonder that food plays such a central place in our lives. Babies commonly use their mouths to explore the world around them. With all these different stimuli going on, there is a lot of processing to be done. Information comes from the mouth in a variety of forms; texture comes from the skin inside our mouths, sounds come in from our ears, density information (hardness or softness) comes from our teeth, taste from our tastebuds and scent from our nose. All of these sensory inputs combine and are interpreted to identify nice or nasty, safe or dangerous. This is because our mouths are also the entry point to our more vulnerable insides. Taste meaning the broader oral experience is not something that we easily include in our visitor experiences (apart from the cakes in the café or the goodies in the gift shop). When we can include it, we are generally talking about including food in a controlled way rather than licking rocks!

How to use taste and flavours

Food is the most obvious way to engage people's sense of taste and it can be used to great effect to appeal to people's tastebuds and make a strong connection. Whether it's cooking tasty treats that connect to nature or heritage or using specific tastes and flavours, make sure that you explore taste safely. Food needs to be handled properly by people with training and experience and there is always a risk of allergies so make sure you check with all visitors. If you decide to not take the risk of using taste then you can make the most of all the other sensory experiences available.

Everyday flavours

The final destination on the sensory story trail at Heligan, is a Cornish black bee hive, where a colony of bees could be viewed via a transparent screen into their hive. The final story point is a multisensory experience at the hive. A volunteer reads the final line of the story, wraps a blanket around the visitor and offers them a spoonful of Cornish Black Bee honey. They can touch beeswax and honeycomb while watching the busy bees in the hive.



In the story highlighting the many uses for china clay at Wheal Martyn, a diluted drop of peppermint accompanies the line, 'Bathroom time, I use mint toothpaste to brush my teeth, everyday. Did you know my toothpaste contains china clay'. As an alternative to the taste, an empty toothpaste box laced with a couple of drops of peppermint oil was a smelly option.

It doesn't have to be edible things. A clean metal spoon was used to evoke the tang of metal in the air of a foundry when telling the industrial story of Hayle. If you are using objects to taste, ensure they are hygienic and clean for each person to enjoy. The easiest way to do this is to have multiple objects. Using a couple of storage boxes will ensure that the clean ones are separate from those that need sanitising.

Cooking

Making and tasting treats that are connected to a feature or story is a great way to explore heritage, ingredients and recipes. These poppy seed muffins use tiny wildflower seeds to give flavour and texture. A contrast, for extra effect, can be easily made by only adding the seeds to half the mix. You can enjoy tasty treats while exploring a site or learning about nature, for example eating these muffins in a field of wildflowers, thinking about how those tiny, edible specks can grow into beautiful plants and flowers.

Top tip

Health and safety are crucial with edible activities. If taste is going to form part of your visitor experience, you should train the staff involved in food handling and hygiene.

Hands-on sensory discovery

Sometimes you will have the opportunity to go that bit further and let people get more hands-on, as part of a school visit, as an activity on an open day or during a guided tour.

When planning anything that includes physical activity make sure you consider visitors with physical disabilities. Manual dexterity might also be tricky for some people, for example, those with arthritis, so it is important to think of ways to make hands-on activities not too fiddly or to adapt when needed, using clamps to grip things for example.

Safety first

If you are going to let people touch and smell things you need to be aware of any potentially dangerous plants, materials and objects.

Relaxed sessions

You should consider having 'relaxed sessions', times of the day when the intensity of sensory stimuli can be controlled, and when people are free to move around and make as much noise as they wish. The premise of a relaxed session is to enable children with additional needs such as sensory processing disorders to experience an activity or event in a comfortable, non-threatening environment.

Originally developed in theatres and sometimes referred to as autism-friendly, these sessions are now gaining popularity in a range of venues allowing everyone to enjoy a relaxed family day out.

Activity: Texture rubbing

The original invitation to touch, this familiar activity is an easy way to explore and capture the materials, textures and features around your site.

Possible uses:

You can use this activity to take your visitors on a texture journey encouraging people to explore with their hands to find interesting textures and then capture them. This activity could be used to create a collaborative piece that collects everyone's textures into a patchwork of textures. Alternatively, you can use plain cotton tote bags so everyone can make their own texture bag as a reminder of their visit.

You will need:

- Material – squares of plain fabric or natural cotton tote bags.
- Fabric crayons (not just wax crayons which cannot be 'fixed').

How to:

1. Find an interesting texture.
2. Place the texture inside your bag or underneath your fabric.
3. Use the fabric crayon to capture the texture.
4. Find more textures and repeat.
5. To seal the texture, place greaseproof paper over the crayon and iron on a cool setting or follow the instructions for the fabric crayons you are using.

Activity: Smell hunting

Smells can trigger memories that have been buried over time and new smells are an opportunity to build a new memory. Smell hunting is an easy activity to explore and connect with a place.

Possible uses:

Smells are an opportunity to think about a place in a different way. How might the smells have changed over the years, decades or longer? Have the smells been imported, such as the perfume of an exotic flower collected by a Victorian plant hunter for example.

Smell hunting often leads to people sharing memories of their past, therefore is an excellent tool to help discover people's stories and reminisce.

You will need:

- Clear noses and a location with interesting smells.
- Pots or bags to capture and share the smells if possible.

How to go smell hunting:

1. Pick a safe location.
2. Walk around and actively hunt for smells. Try rubbing leaves between your fingers or breathing on flowers to release the scent.
3. If you can, capture the smells in your pots or bags to share with others.

Activity: Sound mapping

Sometimes an activity is about giving people a reason to stop and take their time. Sound is often in the background but this activity – a kind of I-hear rather than I-spy - places us at the centre of a soundscape that surrounds us.

Possible uses:

Sound mapping can work as a mindfulness activity, giving people the space to connect with their surroundings. It can also lead to more practical outcomes, for example identifying places for new seats to let people take their time to enjoy the soundscape. People's sound maps can also suggest notable sounds that could benefit from more information or interpretation.

You will need:

- Pieces of cardboard or paper plates, soft pencils or pens, enough for everyone taking part. Draw an X in the centre of each plate or piece of cardboard.

How to sound map:

1. Find a place outside where you can sit and be comfortable. As an introduction you could share some recorded sounds to share examples of what you might hear and help participants tune into their sense of listening.
2. Use one of your sound mapping cards. The X in the centre is you.
3. Start to listen to what is making sounds around you. What do you hear?
4. Mark on the card the sounds you can hear and where they are coming from, for example, there may be water flowing behind you, birds singing above and to your side.
5. Draw, write or colour the sounds you can hear around you.
6. Encourage people to be still and quiet so you can really focus on the sounds.

Activity: Texture hunting

A simple technique to explore textures and details around a site. If appropriate on your site people can use clay to gather textures directly.

Possible uses:

You can use small pieces of clay to create little buttons or larger pieces for bigger features. Participants can take these home as a souvenir or they can be used to create an exhibit or artwork for your site. The textures can also be used as a mould to create replicas using plaster of Paris.

You will need:

- Air drying clay or play dough.
- Plastic bags.

How to hunt for textures:

1. Identify the area where you will find interesting textures and where clay residue won't be a problem.
2. Collect textures. You can press the clay onto textured surfaces or pick up items to press into the clay.
3. Compare the different textures that are found. Can they be identified?

Activity: Texture tiles

It might not be appropriate for people to be sticking clay on things around your site but there are still ways to play with textures. Visitors can go on a texture hunt to find interesting objects that can be collected and used to create a pattern or design on a clay tile. Alternatively, you can gather a collection of interesting objects that are relevant to your site, for example, in an industrial setting, tools, nuts, bolts or grills.

Possible uses:

The tiles can be a unique memento for people to take home or can be brought together to create a collaborative artwork or feature (see the bench below).

You will need:

- Air drying clay. Pre-roll some squares of clay in case people find it difficult or run out of time.
- Pieces of calico, cardboard or wood.
- Wooden rolling pin, dining knife and pencil.
- You might also want to have some latex gloves available in case some people find the texture of the clay challenging.

How to create texture tiles:

1. Collect or find some interesting textures. Really bumpy textures work well.
2. Squish or roll out the clay into your tile shape onto calico, cardboard or wood, approximately 1cm deep.
3. Place the textures onto the clay tile and gently roll over them with a rolling pin or squish the clay directly onto the texture.
4. You can make a hole through the tile with a pencil, so when it is hard it can be hung on a wall or on string.
5. Dry your tiles in a warm dry room for about a day.

Collaborative artworks - texture tiles

If you work with real clay which can be fired in a kiln, your texture tiles can be combined to make a permanent feature that includes the texture of features on your site. This example from Wheal Martyn Clay Works uses a bench to offer visitors the opportunity to rest and take their time exploring the embedded tiles incorporating textures from around the museum.

Top tip:

For people who may struggle with fine motor skills or dislike the texture of clay, place the blank clay tile in a clear plastic bag. Pop the textures inside on top of the clay and seal the bag. Gently encourage a rolling action with a rolling pin to press the impression.

Activity: Tastes of a place

If you are lucky enough to have an abundance of edible plants, then you can explore their scents and tastes in depth.

Possible uses:

Use this activity to connect people to the plants growing in a place and create a tasty memorable connection to nature. You could compare the flavours you find with the flavours of things you can buy in the supermarket.

You will need:

- Plastic jugs with lids, drinking water, scissors, cups, table.

How to:

1. Take time beforehand to identify edible plants in the area. Remember to record the plants you find in case people have allergies.
2. Explore the place with your group to identify the edible plants.
3. Carefully collect a small amount of the edible plants and pop into a jug.
4. Clearly label the jugs with the plants you have used.
5. Top up with water and display on a table so people can see them at a suitable height.
6. Invite people to taste some of the natural flavoured water.
7. What do people think of the flavours? What could you name your drinks?

Activity: sensory mapping

Sensory mapping is something you can do on your own or with your colleagues, but it can also be turned into an activity to do with a community group or a school class.

Possible uses:

A sensory mapping session would be an ideal starting point for a co-design project, developing a sensory trail for example. It could also be the basis of an educational visit or a series of sessions exploring how an environment changes through the seasons. Sensory mapping focus groups can explore the experiences of different user groups, such as people with sensory impairments or families with children with complex needs.

You will need either:

- Maps, and pens or stickers (eg coloured dots).
- Small garden canes and pre-punched cards.

How to sensory map:

1. Give people the things they need to record the things they find – a map and pens, or cards and canes.
2. Encourage people to explore and record what they like, there are no right or wrong answers.
3. You can focus on one or two senses to start with, for example looking for just colours and textures.
4. Sensory highlights will change with the seasons and the weather, so it is useful to repeat the mapping exercise at different times of the year.

Tailored activities

While the activities above can be used in most locations with a bit of adaptation, there will be other hands-on, sensory-rich activities that you can do that relate to your site and its heritage specifically. In a heritage setting you can replicate or mimic something people used to do in the past. In a natural setting, an activity could be based around a natural process or feature.

Rope making in Hayle

Near the Hayle Heritage Centre is a collection of abandoned buildings with a long straight path running through them. This was the location of a ropewalk, now part of a pleasant, easy walk. Rope was an essential part of all industries including the mining and shipping industry that was central to the port of Hayle. A group activity, collectively twisting a giant 10 metre rope from lengths of twine brought the scale of the ropewalk to life.

Make your own clay tip

Using air drying clay and other easily accessible materials including paper plates, acrylic paint, and some clippings from local plants visitors can create their own mini dioramas. In this example at Wheal Martyn Clay Works participants can create their own china clay waste tip scenes featuring the key features of the surrounding landscape.

Thanks to our project partners at Wheal Martyn Clay Works, Kresen Kernow, Geevor Tin Mine, Hayle Heritage Centre, Trees for Cities and the National Wildflower Centre. Created by the Sensory Trust, funded by the National Lottery Heritage Fund, thanks to National Lottery players.

sensorytrust.org.uk