

# Group Leader Support Guide



# SENSE

Sensory Explorations of Nature in  
School Environments

<https://www.SenseScience.org>



The Open  
University



Imperial College  
London



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Engineering and Physical Sciences  
Research Council



# Group Leader Support Guide

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## About this Guide

Thank you for participating in the SENSE project!

This Group Leader Support Guide helps teachers and other group leaders in preparing and running various elements of the SENSE project. The following sections provide:

- information about the purpose and benefits of taking part,
- a potential learning pathway making use of all the resources,
- curriculum links,
- health & safety, and
- all the activities and supporting worksheets.

These activities range in time from 10 minutes to one hour and are designed for different stages of Primary Education. They can be used standalone or integrated into your educational programme. We can also help you adapt them to suit your objectives.

All the project documents and links are accessible and/or downloadable from the SENSE website:  
<https://sensescience.org/>

**We would therefore welcome your feedback on how to make improvements for you and other teachers. Indeed the activities set out in this document are suggestions only and we invite you to adapt or create your own ideas around the themes.**



## Background information

You can find out about the SENSE project by watching our video (<https://youtu.be/1knh9A7CCaI>) or have a skim read through the summary below.

### What?

The SENSE project introduces young people to learn and understand the natural world around them - in their school grounds and nearby areas - through sensory explorations. We reimagine outdoor learning in combination with haptic technology to support pupils to experience and learn through all their senses other than just sight, with a particular focus on touch.

### Why?

The UK has lost more nature than the global average. In the decades that nature has been in decline so too has our connection with it. Today less than 10% of British children play in natural spaces. Spending time outdoors has been shown to support children's mental and physical wellbeing as well as bringing to life learning. Watching nature enables us to record what we see but this only provides part of the picture. What are we missing out on?



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The sense of touch, or haptics, is the first we experience in the womb and is central to how we begin to explore and understand the world. It enriches children's linguistic repertoire for thinking about the natural world and triggers scientific curiosity. What does the texture mean for the plant and its strategy for



survival? Observing and understanding scales, density, texture and pattern crosscut STEAM and literacy subjects.

### How?

Taking a cross-curricular approach between science, literacy and arts, we focus on sensorial awareness through touch experiences to generate participation, engagement and learning about the natural world.

The process of knowing through sensing combines cognitive, linguistic and emotional dimensions of learning, and is summarised in stages below:

- entering sensorial awareness: such as colours, forms, patterns, texture asking questions like *'what do you hear; smell; see; feel?'*
- bracketing vision: which enhances skin perception, asking questions such as *'what do you notice?'*
- manipulation and making: asking questions such as *'what does it show; how does it change; what does it do?'*
- description and imagination: asking questions such as *'how does it appear... to me; what does it feel like... to me?'*
- drawing connections: stimulating questions such as *'how does it relate with other things?'*

We take a hands-on approach by combining outdoor investigations with the use of newly emerging haptic technology to learn about the science of different textures through touch. Students can start either outdoors sensing nature through experiencing the living world directly (i.e. bodily haptics) or indoors through touching representations of 'natural' textures through our haptic technology (i.e. digital haptics). Students can be guided to cycle between the two suites of activities building their curiosity in the tactual world. This may go on to stimulate questions about why textures are the way they are and lead them to investigate their own scientific questions (as shown in this diagram ->).

### What are our senses?

'Sense' (as defined by the Oxford English Dictionary) is 'Each of the special faculties, connected with a bodily organ, by which man and other animals perceive external objects and changes in the condition of their own bodies. Usually reckoned as five—sight, hearing, smell, taste, touch'.



### What are Haptic Devices?

Haptic devices enhance the experience of touch through vibrations, so you can feel a picture of bumblebee buzz, or the texture of a plant.



The aim of including haptics is to enhance, rather than distract from or replace, experiences in nature and curiosity about nature. We expect the technology we develop to be useful for:

1. Drawing attention to nature, e.g. a child may have access to real trees but not be minded to touch them or question why they have different barks;
2. Making the untouchable tactile, e.g. through touching images of a badger;
3. Playing with scale, e.g. feeling images at microscopic (e.g. leaf veins) or macroscopic resolutions, or comparing textures of leaves over seasons; and





4. Continuing explorations of nature even when indoors, to sustain interest.

At the end of the day, arts and science both reflect the world back at us, by combining them we can build a bridge between science and its personal and societal relevance.

### Example of learning journey

Through this combined outdoor and indoor learning opportunity students could, for example:

Sit quietly in the middle of the playing field and start to notice the buzzing sound of bumblebees;



Draw the bees as they land on nearby flowers noticing their furry bodies and colour pattern;



Touch bee bodies on a haptic device to experience the feel of the buzz



Do a citizen science survey recording bumblebees in the school grounds.



Combine all these experiences students could talk about the feeling that arise from first-hand experiences with nature and be better informed in their future decision- making and problem-solving.



This may even lead to students wanting to conduct their own experiments to investigate their scientific questions.

### Our Research

The resources are designed to support you and your students on your learning journey about the natural world, however in addition, we are very interested in developing innovative pedagogical methods. Our partners at the University of Edinburgh are therefore keen to work with you to understand:

- children's awareness of the impact of the sense of touch on learning, and the extent to which this can enhance explorations of nature for young people;
- how you and your students use the resources and how they can be best adapted to suit their needs;
- how touch experiences, supported by haptic technology, can support cognitive and emotional development, for example:
  - o does it ground young people, giving them a sense of place and understanding of their senses?
  - o does it trigger a sense of care for the environment and/or support mental wellbeing?
- can linguistic and artistic approaches enhance touch experiences.
- whether haptic technology enhances or detracts from students' observation, learning and enjoyment about the natural world.
- how these digital and 'real' experiences can generate scientific questions for citizen science projects and further inquiry.



## Data Collection

The collection of baseline data will take place between January and February 2023. This will include activities focusing on children's awareness and value of touch and sensory experiences for learning. Researchers from the University of Edinburgh or the Open University will visit to conduct the research activities on a date that suits you. This will be followed by a workshop delivered by a Learning through Landscapes (LtL) development officer, on a separate date. Further research visits will be organised at certain points in the term (see timeline below for further detail). All dates and details of visits will be agreed in advance with the school. Consent will be obtained for all those participating in the project, and consent forms will be given to parents/carers of children in advance of them taking part. If you have any questions about the research, please contact: [Jonathan.Hancock@ed.ac.uk](mailto:Jonathan.Hancock@ed.ac.uk).

## Role of the teacher

We would like to work with teachers in supporting children's explorations of their school grounds through sensorial and haptic awareness, and to introduce them to make, design and create their school grounds to support biodiversity and wellbeing. Using the key features of learning through the sensorial awareness, we invite teachers to implement and adapt prototype activities and to develop curricular links to suit their students, their particular classrooms and existing spaces.

Some activities will be proposed and conducted by the team; over the course of the school year, each school and teacher will be able to introduce new materials to extend the educational experience of the students.

## Sample Timeline for Activities

Month 1 Dec 2022/ Jan 2023	Month 2 February 2023	Month 3 March 2023		Month 4 April 2023	Month 5 May 2023	Month 6 June 2023	Autumn 2023
First meeting (1 hour)	Baseline activity - exploring haptics	First workshop from LtL	Teacher led activities	First webinar (online) - provisional time	Teacher led activities	Texture map display	Second webinar (online)
Agree dates for activities - LtL and UofE	Teachers observe, followed by short meeting - UofE facilitate	Discuss ongoing support from LtL	Research visit UofE/OU	Teachers across all schools share experience - LtL facilitate	Research visit UofE/OU	Planning for summer and beyond	Wider sharing across schools - LtL facilitate
Intro to Project	Pupils start creating their texture map of school grounds	Developing touch experiences and investigations - texture map throughout seasons		Develop enquiries and questions - what do pupils see/notice about changes in textures	Planning and making changes to the school grounds - how might textures be changed? School context specific		Putting in place plans for coming term



## Example Activities Involved

The programme involves both outdoor learning and digital explorations and can be customised to your school's needs. There is not a set series of mandatory activities, but instead, you can pick and choose the elements you wish to take part in based upon what fits best with existing learning schemes and which you and students are inspired by. To give you an idea of one possible journey:

### *Explore senses outdoors*

Take your students to the playground or local park and guide your students through the outdoor activities in our worksheets

**Explore your senses outdoors:** Use your sight, smell, sound, taste and sense of touch to become more aware of your environment.

**Find textures outdoors:** Collect twigs, leaves and other natural objects with different textures

**Make marks outdoors:** Draw what students see and feel

**Describe touch outdoors:** get imaginative with language to describe what they feel

**Create a texture board:** Using all of your found and created objects assemble a 'mood board' demonstrating your outdoor explorations.

### *Explore senses on digital devices:*

Use the haptic devices we provide you with to support your students to explore touch indoors

**Explore your senses digitally:** Can your students tell the difference between birch tree bark and horse chestnut tree bark by touching/moving the mouse across the screen?

**Find textures digitally:** Go on a learning journey through our digital haptic storybook to discover what roles textures play in nature.

**Make marks:** Create artistic representations of textures on a screen and then feel this texture (This feature is under development)

**Describe touch:** Experience textures that can't be experienced easily in nature on the haptic devices. Ever wondered what bumblebees feel like? Does it spark students' curiosity to find out why bees buzz?

### *Investigate your scientific questions:*

**Mind mapping:** Hold a group session recalling all of the student questions that were generated from the outdoor and digital experiences above e.g. why do different tree barks feel different? How do pollinators pick up pollen?

**Discover the answers:** Can your students find out the answers to these questions by conducting their own research?

**Take part in experiments:** You could do a citizen science survey with your students to get them familiar with scientific surveys and collecting data e.g. take part in the X-Polli:Nation citizen science survey to identify bumblebees and see what flowers they are landing on.

**Design experiments:** Now that students have done an experiment, generated their own questions and done some research, could the students design their own experiment to find out more? E.g. do hairy bumblebees pick up more pollen than smooth hoverflies? Students could emulate the textures by wearing hairy/smooth gloves and touching flowers to see if they pick up more pollen or wrap different textured fabrics around the end of a pencil. Could you use cheese puffs to simulate pollen and design a fair test experiment?



## Learning Objectives and Curriculum Links

### *Learning Objectives*

By taking part in SENSE, participants will:

- Investigate science, language, arts and computing topics in outdoor spaces and on digital devices
- Learn about what all of our senses are and how the sense of touch can give us information about the natural world
- Start to notice, identify, describe and explain the world around them
- Create visual representations of different textures to support an understanding of how and why natural forms differ
- Articulate and communicate sensory experiences and represent through language, gestures and emotion.
- Learn about how to use novel haptic devices to reactivate experience of the outdoor world and extend the tactile, visual, artistic and creative interpretations of touch for example, experiencing textures of nature not normally possible in outdoor settings (e.g. bumblebee hairs).
- Facilitate curiosity and use this to generate their own questions about the natural world
- Learn how to collect data about the natural world through citizen science surveys
- Understand how to create their own scientific experiments
- Pay attention to how these activities make them feel about the natural world

### *Curriculum Links*

The SENSE project is designed for children aged 9-12 years. The project wishes to provide opportunities for teachers to introduce topics across the National Curriculum in a novel and engaging way by supporting students to become inquisitive citizen scientists, informed and equipped to generate their own scientific investigations and take action for the natural world.

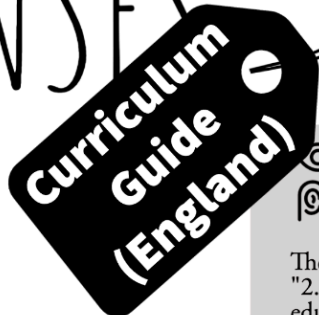
- Leading students through the three stages can support informed citizen scientists to feel confident in observing the natural world through senses other than vision, experience a sense of touch in the outdoors and on digital screens, generate questions about the natural world, understand how scientific investigations work and the opportunity to create their own investigations.
- This will build knowledge across STEAM and literacy subjects, but will be particularly relevant to the science and arts curriculum.
- This is an opportunity to carry out a scientific survey where the outcome is not known (it is not a 'fair test' style of science practical).
- It also allows pupils to carry out a safe, manageable and low-cost fieldwork activity within a timetabled lesson, and an opportunity to be part of a survey that makes a real contribution to our wider knowledge.
- The survey is designed to be repeated throughout the summer and early autumn as different pollinators emerge providing schools with their own 'big data' sets; these can run over many years and be compared to other schools or locations.

These activities are relevant for everyone across the UK, but we are currently focussing on schools in Scotland and England. Below are example Scottish and English curriculum links but these resources will be suitable for other curriculums too.





# EXPLORE OUTDOOR SPACES THROUGH YOUR SENSES



AGE:  
UPPER  
PRIMARY

Activities suggested in the SENSE programme are designed for you bring Science, Art and English lessons to life outdoors while delivering curriculum outcomes. Here's how..



## EXPLORE YOUR SENSES

The School Curriculum in England suggests:

"2.5 All schools should make provision for personal, social, health and economic education (PSHE), drawing on good practice."

*We suggest: Tapping into all the senses grounds students in the here and now and fosters a sense of connection to the world. Creating the opportunity to explore their surroundings and the feelings and thoughts that arise from this enables you to discuss many of the topics under PSHE.*



## FIND TEXTURES

The Science Curriculum suggests:  
"Pupils might work scientifically by: using their observations to compare and contrast animals ..., describing how they identify and group them...; and using their senses to compare different textures, sounds and smells."

*We suggest: Students can seek out a diverse array of living things and explore how and why they are different through their senses.*



## MAKE PATTERNS

The Art Curriculum suggests:  
Pupils should "develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form and space."

*We suggest: Using art to explore texture can not only advance artistic skills but enhance observation of nature (helpful for taxonomy) and may even lead to a desire to care for what is being drawn (e.g. taking action for the environment).*



## NAME TOUCH

The English Curriculum suggests:  
Pupils should use "expanded noun phrases to describe and specify [for example, the blue butterfly]."

*We suggest: This is an opportunity to expand upon students' repertoire of nouns in an engaging environment. Through this approach language can enhance experiences of nature and vice versa.*



## CREATE A TEXTURE BOARD

The Science Curriculum in England suggests:

"The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically"

*We suggest: Bringing together all of the students explorations through science, art and language topics will enable a discussion about what they found and why nature is the way it is. You can harness this curiosity to support students to create their own scientific questions.*



# SENSE

<https://sensescience.org/>



## Health and safety



We want people to get outside and discover the benefits of the natural environment safely. We therefore suggest that teachers/group leaders carry out a risk benefit analysis referring to their organisation's guidelines and policies. The SENSE approach to risk, and the methodology we use are evidence based and in line with official UK Government Policy, European Play and Education Policy. Further guidance can be found at [www.ltl.org.uk/spaces/ltlriskbenefit.php](http://www.ltl.org.uk/spaces/ltlriskbenefit.php). We recommend the following:

- Adhere to all Covid-19 guidance at the time of participation.
- Make a preliminary visit to the outdoor space and identify potential hazards in advance.
- Take a first-aid kit, along with a mobile phone.
- Make sure everyone taking part is familiar with safety instructions and what to do in an emergency, e.g. assembly points.
- Make sure that anyone requiring medication takes this with them.
- Children of all ages must be supervised at all times. Make sure that there are sufficient adults for the number of children in the group. The activities are not suitable for children under the age of 3.
- Make sure that people wear appropriate clothing for the weather and time of year e.g. robust sensible foot wear with good grips on the soles, sun hat and sun cream (minimum factor 15).
- Be aware of common hazards, such as roots to trip over, stinging insects and plants (for example, White Dead Nettle may be surrounded by stinging nettles) or dog mess.
- Make provision for hygiene, such as hand sanitizer and encourage participants to wash their hands after surveying.