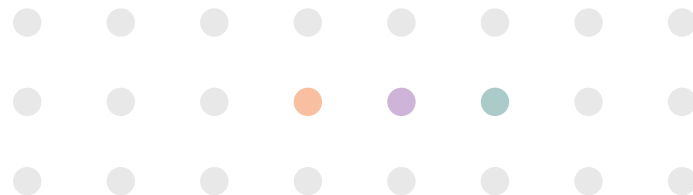


# Sensing Sand Interactive Exhibit

## DESIGN, BUILD, AND PLAY GUIDE

“Sensing Sand” is a tactile and interactive exhibit designed for children ages 2 to 7 years old, facilitating solo and group play, including scenarios with adult caretakers. This exhibit combines sensory exploration with foundational emotional intelligence development. Through manipulating kinetic and colored sands, participants engage in a journey of self-discovery and social interaction, supported by technology enhancements that translate physical play into visual and auditory experiences. “Sensing Sand” fosters an environment where children can express creativity, understand emotions, and develop empathy and cooperative skills.



# Set Up

Crafting the ideal environment for the Sensing Sand exhibit requires careful consideration of space, materials, and technology to ensure a playful, educational, and safe experience. This section outlines the steps for setting up the exhibit, focusing on the spatial layout, material safety, and technological integration to accommodate the curiosity and creativity of children and caregivers within a welcoming and inclusive setting.



## Space

- Create an environment where at least three children can interact comfortably.
- Ensure a spacious area around the sensory table for easy movement and interaction among children and caregivers. The table should be placed in a central, accessible location within the exhibit space.
- Ideally, the space is near to and visible from high-traffic areas in your broader space to welcome participants.

## Outdoor Set-up

This exhibit is well-situated to succeed both in indoor and outdoor environments. However, when considering an outdoor setup, it is crucial to include strategies for covering the sand area during inclement weather and periods of non-use to prevent contamination. Methods might include weather-resistant covers or temporary enclosures that safeguard the sand from animals and environmental debris, ensuring the exhibit remains clean, safe, and inviting for every child's interaction.



# Materials

As we dive into setting up the Sensing Sand Interactive Exhibit, our focus is on combining safety with creativity and self-expression. This section guides you through selecting and preparing materials—from choosing the right type of sand to ensuring all elements are non-toxic and suitable for participants of various needs. We will also explore adaptations for diverse settings and budgets, ensuring every child can engage meaningfully with the exhibit. More details on these items are listed on page 12.

## Sand or Clay

Choosing the right material for sensory play is pivotal in designing an engaging and educational experience. We suggest exploring kinetic sand, regular (e.g., beach) sand, modeling clay, natural clay, and other child-friendly molding materials. The choice of material depends on the educational goals of the exhibit, the expected level of cleanliness, and the desired sensory experience, with each offering distinct benefits to children's learning and play.



**Kinetic sand**, with its unique properties, sticks to itself but not to hands, allowing for a mess-free play while fostering fine motor skills development through pressing and molding activities. We suggest NATIONAL GEOGRAPHIC Play Sand. This is a special sand mixture that does not dry out and is hypoallergenic and non-toxic.

**Regular sand** is a cost-effective alternative to kinetic sand and connects children with natural textures and fosters cooperative play. Regular sand offers a classic, tactile experience, enabling children and caregivers to explore and understand textures and forms through scooping, shaping, and pouring.



**Non-drying modeling clay** is a long-lasting, mess-free clay and does not dry out when left out. It offers a depth of creative and sculptural possibilities.

**Natural clay** is a malleable material that is derived directly from the earth and offers endless sculpting possibilities. When storing the clay, it should be covered with a damp cloth and placed in a waterproof, airtight container. Proper clean-up after use is important, as it may leave some residue behind in the workspace.







## Before You Launch Your Exhibit

### Experience as a Learner

Facilitators and designers should engage with the exhibit from a child's perspective as well as from an adult caregiver's perspective, assessing the sensory experience, emotional engagement, and ease of interaction. Adjustments should be made based on these insights to enhance the exhibit's accessibility and engagement, including ways to support more co-play and co-engagement between adults and children.

For instance, through experiencing Sensing Sand firsthand, a facilitator may discover that the kinetic sand's texture could vary slightly in response to different manipulations, such as squeezing versus smoothing. This insight could lead to the introduction of a wider variety of sand textures within the exhibit to enrich the sensory exploration. Additionally, they might observe that children are particularly drawn to certain colors of sand, prompting the addition of more visually stimulating, multi-colored sand areas to encourage further emotional expression and engagement. These adjustments, informed by direct engagement, would make the exhibit more appealing and accessible to a broader range of sensory preferences and interactive styles.



# Facilitation

## Getting Started

Encourage the adults of the space to lean on their social-emotional understanding and welcome a more imaginative, sensory play. They should guide children through the exhibit, encouraging exploration of emotions and cooperative play. There is no special training needed to support a wonderful and delightful experience for participants.

## Engagement Strategies

### Cultural and Linguistic Inclusivity

Ensure all materials, prompts, and signage are bilingual and accessible to children and caregivers with sensorimotor needs. Adapt the exhibit to reflect the cultural diversity of the community, incorporating stories and materials that resonate with different backgrounds.

### Use of Storybooks

Encourage participants to express their emotions through sand manipulation and to explore the feelings of characters in storybooks. See page 9 for literature connections.

### Self-guided Exploration

The experience can be successfully self-guided. Allow the participants to freely explore the sand tray and stories at their own pace.

Although there does not need to be an educator or staff member directing the experience, children would benefit from an adult caregiver prompting them during their explorations.



# Activities

The next three pages describe a progression of activities that can be implemented during the course of the sensing sand exhibit.

## Exploring the Sand

Use signage including “sensory” vocabulary terms to encourage participants to pay particular attention to their embodied experience as they interact with the exhibit. See page 13 for signage template.



How does the sand feel?  
¿Cómo se siente la arena?

soft

hard

squishy

rough

smooth

warm

cool



suave

lisa

dura

fresca

blanda

áspera

cálida

¿Cómo se puede cambiar la arena  
con las manos?

How can you change the sand  
with your hands?

pinchar

alisar

apretar

jalar



pulling

smoothing

poking

squeezing

How does the sand make YOU feel?  
¿Cómo te hace sentir la arena?

happy

curious

peaceful

nervous

frustrated

silly



feliz

curiosa

pacífico

nerviosa

frustrado

divertida

# Emotion Storytelling



Mount an Emotion Wheel horizontally for easy child access, featuring basic emotions using vocabulary appropriate to a young audience. Display a sign prompting children to spin the wheel then use in the sand to express the emotion.

## Creating the Emotion Wheel

### Materials:

- Emotion Wheel template (see page 13)
- Emotion Wheel sign (see page 13)
- Arrow spinner
- Non-slip shelf liner
- Painter's tape
- Scissors
- Turntable

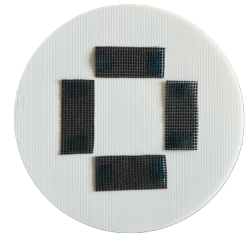
### Instructions:

#### Step 1

Print and cut the emotion wheel template (see page 13).

#### Step 2

Cut the non-slip shelf liner into thick strips then attach them to the back of the wheel with painter's tape.



#### Step 3

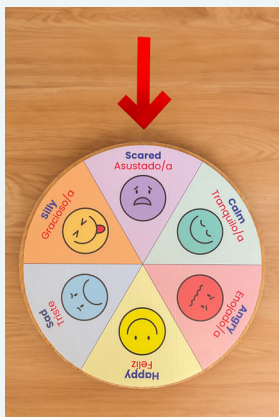
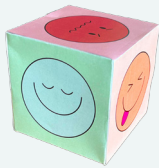
Flip the emotion wheel back over and lay the wheel on top of the turntable. If the wheel slides off the turntable, add more shelf liner.

#### Step 4

Make the emotion wheel sign easily visible by attaching it to the spinner, propping it up with a binder clip, or displaying it directly above the wheel on the wall.

## Adaptations

Other emotion selection tools are possible, such as emotion dice or simple emotion chart. (See page 14)



Create an arrow using painter's tape.



# Technology Integration

Integrating technology into the Sensing Sand exhibit opens up fascinating possibilities for augmented interactive experiences. A computer vision setup, utilizing a Kinect for depth sensing, coupled with an overhead projector, can transform the sand's surface into an augmented reality (AR) playground. This setup allows for real-time projection of vivid landscapes, educational content, or interactive games directly onto the sand, responding to the shapes and structures created by participants. Additionally, employing an overhead camera or a smartphone for sand sounding affords opportunity for a multisensory auditory dimension to the tactile experience. By using software that processes images and translates the sand's configuration into soundscapes or specific audio feedback, participants can explore the cause and effect relationship between physical manipulation and auditory outcomes. These tech-augmented versions not only enhance sensory engagement but also foster an immersive learning environment where physical play is seamlessly blended with digital innovation.

## **Computer vision setup:**

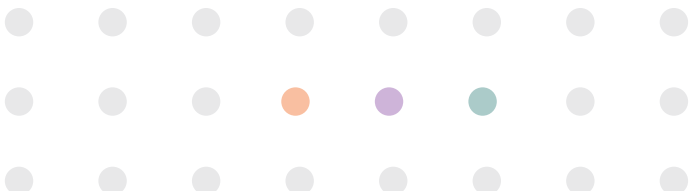
- Kinect
- Overhead projector for AR surface projection
- Overhead camera (or mobile phone) for sand sounding, computer software for image and sound processing, and speakers

This is a possible extension should you have the expertise and resources.

Set up the computer vision and audio equipment securely and out of reach of children. Calibration of the Kinect and cameras should be done in advance to ensure real-time accuracy in sand scene translation.



AR-Sandbox.eu. AR-BOX. [Photograph].  
<https://ar-sandbox.eu/augmented-reality-sandbox-gallery>



# Literature Connection

Here is a curated selection of children's books that support the exhibit's themes: senses, emotions, and personal narrative. Encourage storytelling through sand play, linking narratives to emotional exploration and expression.

Encourage readers to go back and forth between the story and exploring the sand materials. Here are some examples of prompts you could use:

- How is [name of character] moving? Show me in the sand.
- How is [name of character] feeling? Show me in the sand.
- How does the story make you feel? Show me in the sand

## Making with Your Hands

These books encourage children to think about how they can use their hands to change the materials they are working with.

- *Mud!* by Annie Bailey
- *Perfect Square* by Michael Hall
- *Many Shapes of Clay* by Kenesha Sneed

## Emotions in Stories

While reading these stories, ask children to think about different emotions that characters feel.

- *When Sophie Gets Angry, Really Really Angry* by Molly Bang\*\*
- *The Goodbye Book* by Todd Parr\*\*
- *My Heart Fills with Happiness* by Monique Gray Smith\*\*
- *The Boy with Big Big Feelings* by Britney Winn Lee
- *Anh's Anger* by Gail Silver

## Your Own Emotions

These books support children in identifying their own emotions.

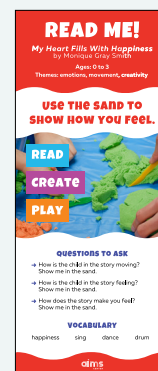
- *My Many Colored Days* by Dr. Seuss
- *The Color Monster* by Anna Llenas\*\*

\*\*Books available in English and Spanish

## Supplemental Materials

Include a series of prompts in the form of a bookmark. (see page 14 for templates).

Consider laminating the bookmark for longer use.



Keep the bookmark with the corresponding book by creating a pocket in the back of the book using cardstock and painter's tape.



# Observation & Feedback

Implement observation and feedback collection methods to gauge the exhibit's impact on emotional literacy and social interaction. Consider digital feedback stations or facilitated discussion groups post-interaction to gather insights from caretakers and children.

As you observe, you may reflect on the following questions:

- How are people engaging with the exhibit?
- What do they seem to especially enjoy about it?
- What aspects might be frustrating?
- How are adults and caregivers engaging alongside children?
- How could the exhibit encourage more co-play between children and family members?
- What materials seem to be working well?
- What are some other materials you might consider using?
- Are there any other adaptations needed based on your observations?





# Resources

All resource links can be found at  
[bit.ly/sensing-sand-exhibit](https://bit.ly/sensing-sand-exhibit)







## Materials

This list provides details about the items and materials needed for your Sensing Sand exhibit. The sample links point to possible locations where you may purchase these items. Search terms are also included that can help you find similar items sold from other online retailers. You may also find similar items in local stores.


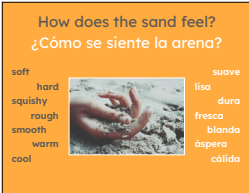

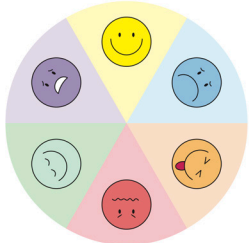
### Molding Materials


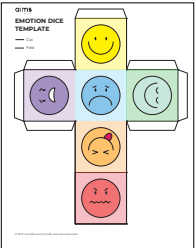
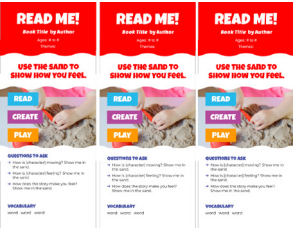
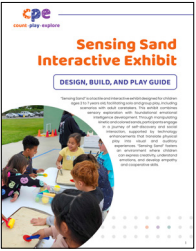
You may choose to use kinetic sand, regular sand, or clay; only one type of material is needed. See page 3.

Item	Specifications	Sample Links
<b>Kinetic sand</b>	Recommended brand: NATIONAL GEOGRAPHIC Play Sand	<b>12lbs.</b> Link: <a href="https://amzn.to/4b5cDI8">amzn.to/4b5cDI8</a> 
<b>Regular sand</b>		 Link: <a href="https://thd.co/3UAfufF">thd.co/3UAfufF</a>
<b>Non-drying modeling clay</b>	Hypoallergenic and non-toxic	Link: <a href="https://amzn.to/3QswWkZ">amzn.to/3QswWkZ</a> 
<b>Natural clay</b>	Connect with your local ceramic shop and request unused clay.	

# Prints

All prints listed can be printed on any standard printer unless otherwise noted. Other sizes may require specialty printers or can be ordered from a print shop such as Office Depot.

Print	Recommended Print Details
<p><b>General Sensory Sand Exhibit Signs</b></p>  <p>The image shows two signs for a sensory sand exhibit. The first sign is titled 'Play together' and features an illustration of two children playing with a ball. The second sign is titled 'Jugar Juntos' and features an illustration of two children playing with a ball. Both signs include text in English and Spanish about playing with others and how it can change your emotions.</p>	<p>Link: <a href="http://bit.ly/sensing-sand-exhibit-signs">bit.ly/sensing-sand-exhibit-signs</a></p>
<p><b>Sensory Vocabulary Signs</b></p>  <p>The image shows a sign titled 'How does the sand feel? ¿Cómo se siente la arena?'. It lists various sensory words in English and Spanish: soft, hard, squishy, rough, smooth, warm, cool, lisa, dura, fresca, blanda, áspera, and cálida. There is also an illustration of hands feeling sand.</p> <p>See page 7</p>	<p><b>Template</b></p> <p>Link: <a href="http://bit.ly/sensory-vocab-signs-template">bit.ly/sensory-vocab-signs-template</a></p>
<p><b>Emotion Wheel Sign</b></p>  <p>The image shows a sign titled 'What makes you feel...? SPIN THE WHEEL'. It features a large downward arrow and the text 'Show me in the sand!'.</p> <p>See page 8</p>	<p>Link: <a href="http://bit.ly/emotion-wheel-sign">bit.ly/emotion-wheel-sign</a></p>
<p><b>Emotion Wheel</b></p>  <p>The image shows a circular emotion wheel divided into six colored segments, each with a different facial expression representing an emotion: happy (yellow), sad (blue), angry (red), surprised (green), scared (purple), and neutral (orange).</p> <p>See page 8</p>	<p><b>Letter size</b></p> <p>Faces: <a href="http://bit.ly/emotion-wheel-faces-01">bit.ly/emotion-wheel-faces-01</a></p> <p>Faces and Text: <a href="http://bit.ly/emotion-wheel-text-02">bit.ly/emotion-wheel-text-02</a></p> <p><b>Adobe Illustrator (AI) File</b></p> <p>Send the zip file to a specialty print shop or online and request for it to be cut the same diameter as your turntable.</p> <p>Link: <a href="http://bit.ly/emotion-wheel-ai">bit.ly/emotion-wheel-ai</a></p>

Print	Recommended Print Details
<p><b>Emotion Wheel Arrow Pointer</b></p>  <p>See page 8</p>	<p><b>Links to print using a 3D printer:</b></p> <p><b>Body:</b> <a href="https://bit.ly/emotion-pointer-body">bit.ly/emotion-pointer-body</a>  <b>Base:</b> <a href="https://bit.ly/emotion-pointer-base">bit.ly/emotion-pointer-base</a>  <b>Connector:</b> <a href="https://bit.ly/emotion-pointer-connector">bit.ly/emotion-pointer-connector</a></p> <p>Alternative options for an arrow pointer can be found on page 8.</p>
<p><b>Emotion Dice Template</b></p>  <p>See page 8</p>	<p>Print on cardstock then cut and fold along the designated lines. Glue or tape the tabs to form a cube.</p> <p>Link: <a href="https://bit.ly/emotion-dice">bit.ly/emotion-dice</a></p>
<p><b>Bookmarks</b></p>  <p>See page 10</p>	<p>Print on cardstock and change settings to print double-sided (on short edge).</p> <p>Link: <a href="https://bit.ly/sensing-sand-bookmarks">bit.ly/sensing-sand-bookmarks</a></p> <p>Link: <a href="https://bit.ly/sensing-sand-bookmark-template">bit.ly/sensing-sand-bookmark-template</a></p>
<p><b>Sensing Sand Interactive Exhibit Guide</b></p> 	<p>This guide is made available online to print and share.</p> <p>Link: <a href="https://bit.ly/sensory-sand-exhibit-guide">bit.ly/sensory-sand-exhibit-guide</a></p>