

Early Learning STEM Lessons

Unit 1: Using Our Senses to Observe

This unit was developed by the Bremerton School District in partnership with the Office of Superintendent of Public Instruction and funded through grants from the Boeing Company and EPA Region 10 to support Early Learning STEM Education. The Early Learning STEM units are designed for educators, teachers, and childcare providers to use with children between the ages of 3-5.



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Unit Objectives

- Children will identify the five senses (sight, touch, hearing, taste, and smell).
- Children will use their senses to make observations about materials and the environment; and compare/contrast.
- Children will explore items using scientific tools (e.g.: magnifiers, tape measure, etc.).

Common Misconceptions

- *There is only one scientific process to follow.* In reality, the scientific process is fluid, complex, and unpredictable. There are often many different people involved, engaged in many different activities, and following many different orders and thought processes.
- *Science cannot be done without an experiment.* In reality, there are many different ways to test various scientific ideas, experimentation is only one.

Target Books

Fiction:

- My Five Senses by Aliko
 - Follow a young boy as he explores the world around him using his five senses. Each sense is individually discovered, followed by explanations of multiple senses being used at once.

Nonfiction (Informational Text):

- Our Senses by Adrienne Betz
 - Real-life pictures illustrate the five senses used by different children in their day. Senses are explored individually and then scenarios where multiple senses are used follow.

Key Vocabulary

- **Senses** - ways we can experience our world; we learn about our world by seeing, touching, hearing, smelling, and tasting things.
- **Aware** - to know about something.
- **Record** - to draw or write about what you see, touch, smell, hear, and taste.
- **Observation** - to pay attention to something, you sometimes record your observations.

Pre/Post Assessment Ideas

- Use provided worksheet to assess what your child knows about the senses.
 - Children can state something that can be explored using each sense or point to a picture of an item that would be explored with a requested sense (you can touch fur, taste milk, see toys, etc.).
 - Children could also cut, sort, and glue pictures onto the body part that is used (this is also a way to assess fine motor skills).
- Give children a picture and ask them to “Tell me about the picture”. After they have described it, ask them what they might see, hear, taste, feel, and smell if they were there. Listen for descriptive words and how their senses would help them to explore if they were there.

Before Reading

- Introduce key vocabulary.
- Take a 'picture walk'-look through the pages and talk about what they see and think the story may be about; when appropriate, have children make predictions about what they think may be happening on a page.
- Record predictions that children make during their picture walk.
- Record what children already know about the topic, a circle map can be an excellent recording tool - examples are at the end of the unit.

During Reading

- Make comments about personal connections, either between you and the story or the children and the story.
- Ask questions that are:
 - "On the page"- basic level questions that have yes/no answers or can be answered by looking at the page.
 - "Between the lines" - a higher level of questioning that requires children to recall information they have already heard or information they are hearing right now in order to answer.
 - "Beyond the book" - an even higher level of questioning that requires children to take information they have previously heard and make reasonable predictions based on that known information.
- A single page of key vocabulary and a variety of types of questions specific to each book is included with the unit. It is recommended that you print this page and keep it with your book copy to serve as a reference guide when engaging with the book with young children.

After Reading

- Review children's predictions on what they thought the book was about.
- Review what children said they knew about the topic, see if there is any new information they would like to add.

Book Extension

- Have a basket of items children can explore using their senses. Initially focus on one sense and expand to include the others. Ideas include:
 - **Touch:** include objects that are soft, fluffy, scratchy, smooth, moist, and dry such as different fabric scraps, shells, tiles, rocks, sandpaper, feathers, cotton balls, tree bark, moss, craft fur; trays or small containers can contain 'messy' things like shaving cream, flour, salt, or shampoo.
 - **Hearing:** initially use a container children can see through to place objects, add in containers that cannot be seen through and have pictures for children to listen and match the sound; have objects that rattle, clink, have different noises when in different containers, pop, and are loud/quiet such as coins, pebbles, cotton balls, bells, baby rattles, bits of paper, or bubble wrap.
 - **Smell:** initially use a container children can see through with holes punched through, add in containers that cannot be seen through (again

with small holes punched through) and have pictures for children to smell the object and match the smell; include things that smell fruity, sour, minty, along with strong and subtle scents such as shampoos or lotions, candles, gum, spices, cotton balls sprayed with perfumes or air fresheners.

- **Taste:** before introducing taste as a way to observe the world, emphasize that they may ONLY taste items that adults say are safe; include items that are sweet, salty, sour, bitter, or fruity such as chocolate, cocoa powder, salt, cereal such as fruit loops or fruit cheerios, lemons or dried lemon powder, Jell-O powder, or baby food fruits and vegetables.
- **Sight:** any of the above items, include magnifying glasses or other magnification tools for further exploration.
- Sort and graph a set of items:
 - **Senses:** Sort objects/pictures by the primary sense used to explore the item.
 - **Number of senses:** Determine the number of senses that are used to explore an item, for example watermelon would be graphed as four senses (sight, taste, touch, and smell), a rock might be graphed as two (sight and touch). Remember to be flexible in your thinking. Some children might raise points about whether an object is explored with a sense or not—someone might include hearing as a way to explore rocks because they make a sound when you hit them together.
 - **Descriptions:** Sort objects/pictures by properties such as soft, hard, smooth, heavy, sour or sweet.

Discussion Points

- When engaging with children in the sensory basket, make comments and ask questions that allow them to: describe what they see, hear, smell, touch, and taste; compare and contrast the materials and their senses; along with encouraging further exploration. Examples include:
 - “The fur is soft and fluffy; does the sandpaper feel the same?”
 - “The paper makes a scratching sound when I shake the container, what sound do the pennies make?”
 - “The cinnamon sticks smell the same as the cinnamon powder, but they feel different.”
 - “What happens when you look at the leaf under the magnifying glass?”

Additional Activities

Small/Large Group Activities:

- Play a “What is it? game:
 - Have familiar objects that children can touch, taste, smell, and hear.
 - Blindfold children or have them close their eyes.
 - Let them explore an object using their senses and predict what it could be and why.
 - Check their prediction – remove the blindfold and see if they were right.

- **Make a classroom book:**
 - Use pictures or icons to represent each sense.
 - Take pictures of the children exploring the items at the sensory table, and recording comments they make.
 - Sort the pictures by sense and include recordings of child comments next to appropriate pictures.
 - Place in page protectors/laminate, and bind book as desired (three hole rings, yarn, binder, etc.).
 - Display in library area.
- **Taste test match-up:**
 - Have different food items that are pureed or powdered (Jell-O packets or baby food fruits and vegetables) and have children taste a little bit of the food and try to match it to a picture of the item.
- **Picture/object sort:**
 - Sort objects or pictures of objects by properties.
 - Giving children the categories (sort by things that are soft, scratchy, and smooth) is easier than having children create the categories themselves. Once they are familiar with the concept of sorting the same set of objects by different properties (sorting things by size, then sorting the same items by color) have the children sort the objects then tell you how they sorted them. A progression of skills would look like:
 - The child is able to sort a set of pictures or objects when told the categories (things we eat and things we hear).
 - The child is able to sort a set of pictures or objects when given the categories, then can take those same pictures or objects and sort them by different categories (first sorting by things we eat/things we hear, then sorting by things that are found inside/things that are found outside).
 - The child is given a set of pictures or objects and asked to sort them, when they have finished sorting they are able to tell you how they chose to sort them (these are all animals and these are things that are wet).
 - The child is able to take a set of pictures or objects, sorts them by categories they create, then can take those same pictures or objects and sort them a different way (first sorting by animals/things that are wet and then sorting the same set by color).
- **Magnifying glass hunt:**
 - Use magnifying glasses to have a treasure hunt around the room. Each child can hunt for a different type of item and then bring it back to share with the group.
- **Sensory bottles:**
 - Create different sensory bottles out of plastic water bottles. You can make bottles that have liquids (oil, water, corn syrup), solids (rice, beans, flour) and place different small objects in them (beads, cotton balls, shells,

confetti, marbles). Have children compare how different objects move through the liquids or solids. Ask questions like “Why do you think the beads zoom to the bottom in the bottle with water, but move slower in the bottle with corn syrup?”

- **Scent match-up:**
 - Use film canisters or colored containers with holes punched in the lids and place items that have different strong scents (e.g., onions, perfume, cinnamon, coffee, etc.) in them. Have children try to guess the scent, and match it to a picture of the item or have two of each item and match the scents.
- **Sound match-up:**
 - Use film canisters, colored containers, or water bottles hidden in a sock and place items that have different sounds when shaken (beans, pennies, rice, paper, cotton balls) in them. Have children compare the different noises. Order them from quietest to loudest, or sort by the types of sounds. Have two of each item and see if children can match the two that sound the same. The ability to listen and hear differences in sound is a critical component in phonological awareness, and can help form a solid foundation for future literacy success.
- **Grab bag “Match the Object”:**
 - Have two of each item, one set that will go in a bag and one that children will try to match to. Have children reach into the bag and try to find the requested item. You can vary the number and type of items in the bag to make it easier or harder.
- **Grab bag “Guess the Object”:**
 - Use objects that are very familiar to children (e.g., fork, paintbrush, feather, rock, toy car) and place one in a bag. Have children reach in and try to guess what the object is. You can vary the number and type of items in the bag to make it easier or harder.
- **What’s missing game:**
 - Place between 3-6 objects on a tray. Let children look at the tray for about 30 seconds, then cover it up. Remove an object, and then uncover the tray. Have children tell you which object is missing. To change the difficulty level, change the number of items on the tray, the type of objects (things that look similar or very different). You can also remove more than one item at a time. For very young children, give them a picture list of the items that were on the tray, and have them compare the list to the tray after an object has been removed.
- **What’s different pictures:**
 - Take pictures of different scenes (e.g., a doll house with people sitting at the table, a block tower) and then change a component and take another picture (replace the people with animals, use different colored blocks). Have children look at the pictures and find what is different between the two. Ask them to tell you how they were able to find the differences.
- **How does it make you feel?:**
 - Collect multiple items with strong smells (e.g., flower, onion, cookie, perfume, and orange) and have children smell the object. How does it

make them feel? Have children show you using their face or body how the smell makes them feel.

- Collect multiple items with distinct flavors (e.g., lemonade or lemon slice, pickle, peanut butter, chocolate) and have children taste the object. How does it make them feel? Have children show you using their face or body how the taste makes them feel.
- **Water glasses:**
 - Have a set of glasses with differing amounts of water in them. Have the children put the glasses in order based on amount of water. Tap the glasses with a pencil and listen to the sound. Do the glasses sound the same or different?
 - Have children close their eyes or turn around. Tap the glasses and see if they can be ordered by sound.

Art Activities and Writing Area

- Collect items when on a nature walk and use them to make a collage.
- Create a picture using different objects such as beans, colored cereal, or noodles.
- Make rubbings of different objects (types of leaves, bark, feathers, or shells).
- Mix primary colors to make secondary colors-use paint, colored ice cubes, colored water.
- Texture Paint – use things with different textures to ‘paint’ with-shaving cream, flour, salt, finger paints. Talk with children about what happens when mixing the different textures, ask, “Can the salt be used by itself?” “What happens when you mix the flour with the shaving cream?” “With the finger paint?”
- Use different objects to paint – foam brushes with designs cut into the tip, wire cleaning brush, and popsicle sticks. Ask, “What types of designs do the different objects make?”
- Have different writing implements and paper available for children to record observations.
- Let children make a scientific journal, an individual book where they can record all of their observations.
- Have different tools (rulers, stencils, scissors) available to help children in recording their observations.

Meal/Snack Conversations

- Describe how items taste, look, feel, or smell. Do different foods make different sounds when you chew them? Compare favorite foods or foods that you do and do not like (for example: “I like carrots because they are sweet and crunchy, but I don’t like how squishy peas are when I bite them.”)

Outdoor Component/Active Movement

- **Hula hoop sort** – have children sort objects they find outside or pictures/objects you have placed in a location into hula hoops. Some examples of ways to sort include:
 - By sense (touch, feel, see, hear)
 - By texture (rough, soft, bumpy, etc.)

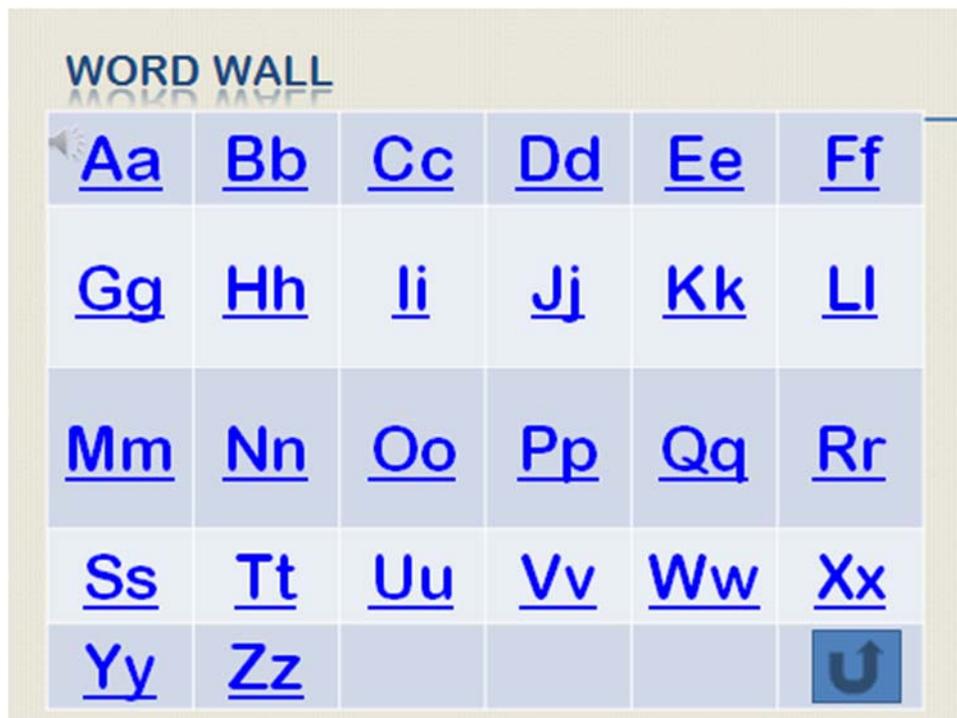
- By sound (loud sounds, soft sounds, outdoor sounds, indoor sounds, etc.)
- **Head, Shoulders, Knees, and Toes** – go at a normal pace, fast, or slow. Use a silly voice, a loud voice, a quiet voice, etc.
- **Play Simon Says** – “Simon Says touch something rough”, “Simon says jump up and down two times”, this will encourage development of listening skills, and can also allow for large motor movements if running to touch/find something you have described.
- **I Spy** – use descriptive words that relate to the senses, “I spy something that smells sweet, is red, and grows in the ground.”
- **Make outdoor music** – using rhythm sticks or sturdy sticks, have children make music by tapping on different objects outside. Have them compare differences in sounds, that tapping on a fence makes a clinking sound, where tapping on a big tree makes a “thunking” sound.
- **Jingle Bells** – give each child a bell (cow bell, jingle bells, hand bell, etc.) and have them move around the room exploring the sounds they are making. Explore different types of movements-can they move without making the bell ring? If they move in different ways does the volume of the bell or type of noise from the bell change? Another variation would be to have children listen for the pitch of the bells, for high sounds they can stretch up high, low sounds the scrunch down to the ground. Children can then order the bell sounds from high to low or low to high, once familiar with listening for the differences in pitch.
- **Make That Sound** – explore making different sounds using parts of their bodies (clapping hands, clicking tongue, etc.). The teacher starts by making a sound and having all the children imitate them; then take turns having the children make different sounds using their body.
- **Listening/hearing/feeling/smelling hunt** – have children take observation notebooks outside and have them explore their environment using different senses. Children record what they see, hear, feel, or smell; dependent upon the focus of the walk. Everyone can then share their observations after the walk.
- **Scarf/beanbag toss** – start with scarves and have children practice throwing and catching. What senses do they use (sight and touch)? See if they can catch the scarves with different body parts (on their head, with one finger, etc.). Introduce the beanbags and practice throwing and catching. How is it the same? How is it different?
- **Mirror Game** – explore mirrors and talk about how they reflect what is in front of them. Tell children you are going to pretend to be mirrors. Demonstrate with a child, strike a pose (something simple!) and have the child imitate your pose. Switch and let the child create a pose for you to imitate. Partner children up and have them imitate each other.

Assistive Technology

Assistive Technology is the use of strategies, adaptations, and/or materials which are created or commercially available products to enable participation in activities that otherwise would not be accessible. While these strategies are designed to assist those with disabilities and/or other barriers to learning, they can be implemented with all children, including those who are not native English speakers, and provide additional visual and technological support.

For this Unit:

- Add visual/picture supports for each of the block types you are using
 - Clip art available as sticky notes for some children to choose rather than drawing or writing their observations
 - Clip art or objects for each shape you are searching for, the shapes can be matched to photos of the actual objects that are observed.
 - Clip art or other symbols or objects for each building type to answers to questions about which sense was being used
- A communication device programmed with key words, vocabulary as well as words that could answer questions about the senses or observations. This could be used to participate in discussions, answer questions, and request items
- If any digital stories were created, use a switch connected to a switch interface which is connected to the computer for any child to view the story.
- If using content material, a child could watch it multiple times to gain content and or background information
- Create a spinner attached to a switch so a child can participate in selecting items for others to explore or categorize. The items on the spinner could include items previously used or it could include which sense to use. This same type of spinner can be used for the math games that are included.
- Create an electronic interactive word wall: This is created using PowerPoint. Each letter in the first slide is a hyperlink to the corresponding alphabet page. At the bottom of each alphabet page are links to return to the main screen or go forward to backward a page. Children can assist with the creation by choosing pictures and suggesting words to be added.



e	Eye		I see with my eye.
e	Ear		I can hear with my ear.
e			

Other Resources

- **Teacher Resources:**

- Discovery Education – www.discoveryled.com is an online resource that offers a wide variety of digital media content into classrooms. This allows for increased engagement of children and gives them the opportunity to explore and experience fascinating people, places, and events. All content is aligned to state standards, can be aligned to custom curriculum, and supports classroom instruction.
 - Under the Teacher Resources there are tutorials on creating stories using Photo Story which comes with Microsoft. There are multiple tutorials plus completed projects.
 - 15 minute video on Sorting and Grouping, each full video is divided into smaller segments.
 - Multiple videos on senses. Each video clip is subdivided into segments of 2-5 minutes, search for senses and filter by K-2.
 - Additional resources on senses and sorting in the Teacher or Professional Development section of Discovery Education
- BookFlix – <http://bkflix.grolier.com> is an online literacy resource that can be purchased through Scholastic and is geared for children up to approximately third grade. Over 100 pairs of fiction and nonfiction books are included, with the fiction book being animated and the nonfiction in a read-a-long format. BookFlix includes games or puzzlers, a meet the author section, web resources, and teacher lesson plans.
 - BookFlix Lesson Plan: Discovering Nature in Science-Observation
 - Fiction/Nonfiction pair: Inch By Inch and How Long Is It?
 - Fiction/Nonfiction pair: That New Animal and Let's Explore the Five Senses with City Dog and Country Dog

- **Children's Books:**

- Hand, Hand, Fingers, Thumb by Al Perkins
- No Mirrors in my Nana's House by Ysayse Barnwell
- Two Eyes, a Nose, and a Mouth by Roberta Grobel
- Scrubba Dub by Nancy Van Laan
- Do Pirates Take Baths? by Kathy Tucker
- I Spy by Jean Marzollo and Walter Wick (can be adapted by outlining hidden items with a fine-tipped marker to make a little easier for preschoolers)
- The Listening Walk by Paul Showers
- The Five Senses by Keith Faulkner
- Listen, Listen by Phillis Gershator
- The Eye Book! by Dr. Seuss
- Sounds All Around by Wendy Pfeffer
- Touch and Feel books by DK Publishing
- What's That Awful Smell? by Heather Tekavec
- Here Are My Hands by Bill Martin Jr and John Archambault

Sample Circle Map

