

A GUIDE TO...

NOTICING STEM LEARNING

Cultivate and encourage ALL young children (0-5; with and without disabilities) to explore STEM concepts through activities as independently as possible with adaptations in their natural environments.

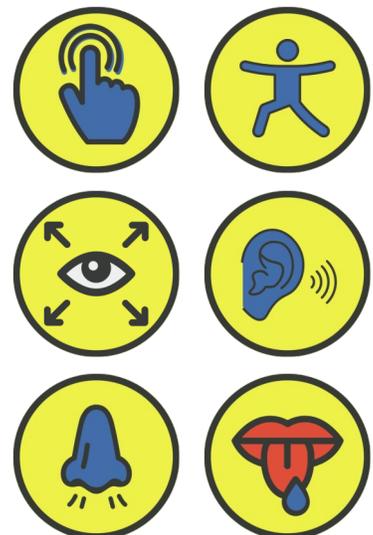
WHAT DO WE MEAN BY NOTICING?

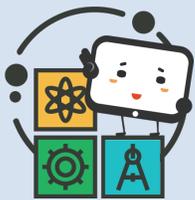
Noticing is an important foundational skill for Science, Technology, Engineering, and Math (STEM) learning and across other developmental domains of learning. While *noticing* may be interpreted as related to sight only; noticing is used to describe listening, watching, or feeling. In this document, we operationally define *noticing* and provide examples of different ways young children, including children with disabilities, may show us how they have *noticed* something/someone in their environment. Operationally defined means that a behavior may be easily, accurately, and reliably observed. For example, two or more people who observe a child picking up a toy with their hand, would be able to agree that the child picked up a toy. However, it might be harder to easily observe behavior that suggests listening, feeling, or watching – words such as *noticing* might be used to describe a variety of often subtle behavior that might not easily be observed or interpreted. (Bricker et al., 2021)

All children can develop the foundations for STEM learning from infancy. Young children are active learners who explore their environments and learn from doing, seeing, touching, and/or hearing. Through intentional and careful observation, caregivers can tap into children's natural curiosity and provide opportunities for children to develop an understanding of the world around them.

NOTICING THROUGH THE SENSES

- ▶ **Noticing Touch and Sense of Space (Proprioception)**
- ▶ **Noticing Sight**
- ▶ **Noticing Hearing**
- ▶ **Noticing Smell and Taste**





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NOTICING TOUCH AND SENSE OF SPACE (PROPRIOCEPTION)

Sense of space, or proprioception, is awareness of the position and movement of body and body parts in and through the environment. For example, the ability to touch the nose while eyes are closed or using stairs without having to stare down at each step.

See the chart below for what a child might look like when they are noticing with their sense of touch.

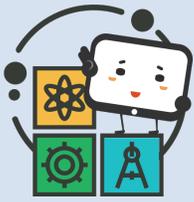


Touch is when something, including temperature, comes in contact with the skin and this information is transmitted to the brain to help make sense of the environment and is vital for social-emotional connection and physical health.



See the chart below for what a child might look like when they are noticing with their sense of touch.

CHANGES IN...	INTERESTED	DISINTERESTED
Body posture	Relaxes body (e.g., while being rocked, hugged, swaddled)	Tenses body or body becomes rigid and stiff (may also be crying)
Body position	Jumps or wiggles (e.g., excited), settles in (e.g., sits in lap for book reading), becomes still (e.g., focused on building block tower), imitates what they see someone else doing, arms out and open	Moves/leans away, turns feet away (may also be crying), crosses arms, flaps arms (e.g., may be in distress; got stung)
Hand position	Touches repeatedly or rubs (e.g., repeatedly pats a person's face, explores a sensory book with a variety of textures), maintains hold (e.g., holds onto favorite object like a blanket, stuffed animal, toy), or brings what is in their hand to their mouth (e.g., brings a fistful of sand to their mouth)	Moves away, tries to shake off or rub off sensation or substance (e.g., slimy, sticky, rough) or avoids (may also be crying), clenches fists tightly
Mouth position	Smacks lips, licks lip, holds mouth open (e.g., wants more), smiles	Holds mouth shut, spits out food, chokes, throws up (e.g., food is too hot, cold, rough, slimy, lumpy; may also turn head away), yawning



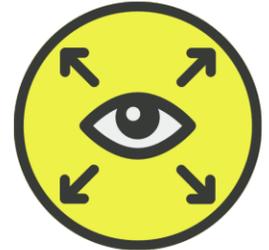
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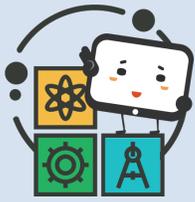
NOTICING SIGHT

Sight is when light comes in contact with the eye and this information is transmitted to the brain to help make sense of the environment.



See the chart below for what a child might look like when they are noticing, such as responding to and/or learning, through their sense of sight.

CHANGES IN...	INTERESTED	DISINTERESTED
Eye position	Brings someone's attention to the object, maintains watching, looking, or observing (e.g., watches and studies faces), widens eyes, blinks eyes rapidly, moves eyes toward, follows movement of object (e.g., looks in direction of where face disappeared behind the blanket)	Squints, covers eyes (e.g., too bright, or over stimulating), moves eyes away, closes eyes
Head position	Tilts towards, turns head towards, nodding	Jerks head backwards, turns head away
Body posture	Quiets or stills body (e.g., relaxes), freezes body in place (e.g., alerts to something)	
Body position	Moves closer (e.g., roll, slide, walk, run), shares object, extends arms/legs towards, seemingly random movements of arms/legs, adjusts to get a better angle of sight (e.g., rolls to side, stands on tippy toes)	Moves away (e.g., closes book), leans away



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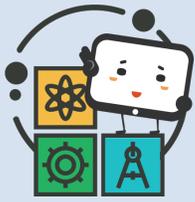
NOTICING HEARING

Hearing is when sound comes in contact with the eardrum in the ear canal and this information is transmitted to the brain to help make sense of the environment.



See the chart below for what a child might look like when they are responding to and/or learning, i.e., noticing through their sense of hearing.

CHANGES IN...	INTERESTED	DISINTERESTED
Body posture	Quiets or stills body (e.g., relaxes), freezes body in place (e.g., alerts to something)	Tenses body, body becomes rigid and stiff, startles (e.g., sound is too loud; may also be crying)
Body position	Moves closer (e.g., roll, slide, walk, run), shares object, extends arms/legs towards, seemingly random movements of arms/legs, repeats movement to make sound occur again (e.g., shakes rattle)	Moves/leans away, rubs body vigorously
Head position	Moves/tilts head toward, moves/sways head in a circular motion (e.g., hear better)	Jerks head backwards, turns head away
Eye position	Moves eyes toward source of sound, widens eyes, blinks eyes rapidly (e.g., excited, look for other changes to determine if excited)	Widens eyes, blinks eyes rapidly (e.g., frightened of sound, look for other changes to determine if frightened), or squeezes eyes closed tightly
Ear position	Ear twitches	Covers ears (e.g., too loud)



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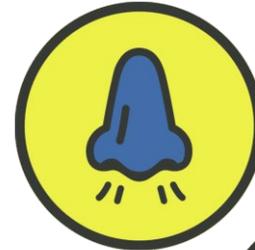
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NOTICING SMELL & TASTE

Smell is when particles invisible to the eyes pass through the nose.

Taste relies on the sense of smell to make sense of things (e.g., food) coming into contact with the tongue.

See the chart below for what a child might look like when they are noticing and learning through their sense of smell and taste.



CHANGES IN...	INTERESTED	DISINTERESTED
Body position	Moves closer	Moves/leans away
Hand position	Grabs object, claps, flaps/shakes	Blocks/swats away
Head position	Moves closer	Turns away
Eyes	Pupils dilate (e.g., get bigger)	Eyes water (e.g., smoke, harsh chemicals; may also be crying)
Nose position	Twitches	Crinkles (e.g., disgust), covers nose (e.g., smoke, harsh chemicals)
Mouth position	Smacks lips, licks lip, holds mouth open, makes 'mmm-mmm' sounds (e.g., wants more; may be drooling), smiles	Holds mouth shut, spits out food, chokes, gags, throws up (e.g., food is too sweet, salty, spicy, sour; may also turn head away), yawning

Bricker, D., Dionne, C., Grisham, J., Johnson, J. J., Macy, M., Slentz, K. L., & Waddell, M. (2021). *Assessment, Evaluation, and Programming System for Infants and Young Children, Third Edition (AEPS®-3), Beginning Curriculum (Volume 3)*. Baltimore, MD: Paul H. Brookes Publishing Co.