



STEAM PRESENTER NOTES

This guide walks you through presenting the STEAM in-service suite for American Indian/Alaska Native programs (AIAN). This in-service suite includes PowerPoint slides and supporting materials. The main PowerPoint presentation and optional slides were developed for all professional audiences (teachers, home visitors, family child care providers) working in AIAN programs or supporting AIAN children and families. Additionally, separate PowerPoint slides were developed for use with home visitors. Learning activities, tip sheets, and activity sheets are labeled for their intended audiences.

MATERIALS NEEDED

- Projector and audio equipment
- Flip chart or similar large paper and markers for writing participant ideas

BEFORE YOU BEGIN

- This presentation describes how children in AIAN programs naturally engage in inquiry, reasoning, and problem solving every day. It provides strategies that support children's STEAM skills and thinking by using cultural and language activities.
- In the presentation, you will describe the STEAM components and how they share a common approach and focus. Then discuss ways to foster STEAM skills by providing engaging environments, nurturing, responsive, effective interactions, and learning experiences/activities that integrate cultural lifeways, values, and practices.
- The presentation includes video clips that illustrate teachers fostering STEAM skills and thinking and children engaged in STEAM thinking as they play and engage in cultural/language activities. Although most of the videos are teacher examples, home visitors can watch the strategies and use them for their own professional development and to encourage families to replicate.
- Optional learning activities offer participants opportunities to understand how adults and children naturally use STEAM every day and to practice thinking about strategies to support STEAM skills and thinking in the classroom, home, and community.
- Encourage participants to view this presentation and think about how it pertains to AIAN children in their center or home-based settings.
- Adaptation boxes individualize this training for your specific training group.

LIST OF AVAILABLE CONTENT

HANDOUTS

- What is Culture?
- Multicultural Principles for Early Childhood Leaders
- STEAM Stretches Across the ELOF Domains
- Making It Work Cycle
- Learning Activity for Home Visitors: STEAM is All Around
- Activities for Families: STEAM is All Around
- Tips for Education Staff: Speak the Language of STEAM
- Tip for Families: Speak the Language of STEAM
- Tips for Home Visitors: Speak the Language of STEAM
- Tips for Families: It's OK to be Curious
- Activities for Families: Explore the Outdoors

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- Helpful Resources
 - Tools for Supervisors: Reflection and Feedback
 - Tools for Supervisors: Group Setting Observations

OPTIONAL SLIDES FOR ENTIRE PRESENTATION

- Optional Slide 1: HSPPS Supports STEAM
- Optional Slide 2: HSPPS Supports Language and Culture
- Optional Slide 3: HSPPS Supports Language and Culture
- Optional Slide 4: The Inquiry Cycle
- Optional Slide 5: Creating a Learning Environment
- Optional Slide 6: Create A Culture of Inquiry
- Optional Slide 7: Being an Expert Vs. Exploring Together
- Optional Slide 8: Turn a Question into an Experiment
- Optional Slide 9: Inquiry in Action: Blubber Experiment

OPTIONAL HANDOUTS

- Head Start Program Performance Standards Support STEAM, Culture, and Language
- Tips for Education Staff: Inquiry Cycle
- Tips for Home Visitors: Inquiry Cycle
- Tips for Families: Inquiry Cycle
- Tips for Education Staff: Culture of Inquiry
- Tips for Home Visitors: Culture of Inquiry in The Home-Based Setting
- Tips for Families: Culture of Inquiry

SLIDES FOR HOME-BASED CARE (HOME VISITORS) ONLY

- HV Optional Slide 1: Title Slide
- HV Optional Slide 2: HSPSS Support STEAM
- HV Optional Slide 3: HSPSS Support Language and Culture
- HV Optional Slide 4: HSPPS Support Language and Culture
- HV Optional Slide 5: HSPPS Support STEAM
- HV Optional Slide 6: Center-Based and Family Child Care Practices
- HV Optional Slide 7: Home Visiting Practices
- HV Optional Slide 8: What's Different for a Home Visitor?
- HV Optional Slide 9: Theory of Change for Home-Based
- HV Optional Slide 10: Support Parents in Learning About STEAM
- HV Optional Slide 11: Learning Activity: STEAM is All Around
- HV Optional Slide 12: Home Visitors Can Support Families in Building STEAM
- HV Optional Slide 13: Show Parents How to Speak the Language of STEAM
- HV Optional Slide 14: Learning Activity/Experiences



PRESENTATION OUTLINE

SLIDE	HANDOUTS NEEDED	HOME VISITOR POWERPOINT ADAPTATION	HOME VISITOR HANDOUTS	OPTIONAL SLIDES	OPTIONAL HANDOUTS
1. STEAM Introduction		- Insert HV Optional 1 if participants are all home visitors			
2. Culture	-What is Culture? - Multicultural Principles for Early Childhood Leaders				
3. STEAM Stretches Across ELOF Domains					
4. STEAM Stretches Across the ELOF Domains	-STEAM Stretches across the ELOF Domains	- Insert HV Optional Slides 2-5	-HSPPS Support STEAM, Culture, and Language	- Insert Optional Slides 1-3	-HSPPS Support STEAM, Culture, and Language
5. Red Cliff ECC					
6. House Framework for Effective Teaching Practices					
7. Parent, Family, and Community					
8. House Framework for Effective Teaching Practices- Foundation					
9. Objectives		-Insert HV Optional Slides 6-9 after Objectives			
10. Culturally and Linguistic Responsive Practices					
11. Making It Work	- Making It Work Cycle				
12. What is STEAM?					



SLIDE	HANDOUTS NEEDED	HOME VISITOR POWERPOINT ADAPTATION	HOME VISITOR HANDOUTS	OPTIONAL SLIDES	OPTIONAL HANDOUTS
13. STEAM is for Everyone		- Replace current slide with HV Optional Slide 10			
14. STEAM is All Around	- Activities for Families: STEAM is All Around (F)	-Insert HV Optional Slide 11	- Learning Activity for Home Visitors: STEAM is All Around (HV) - Activities for Families: STEAM is All Around (F)		
15. A Common Approach and Focus					
16. STEAM Mindset		- Insert HV Optional Slide 12			
17. Hoop Dancers from Red Cliff					
18. STEAM Knowledge					
19. Language of STEAM					
20. Two-Eyed Seeing					
21. Speak the Language of STEAM	- Tips for ES: Speak the Language of STEAM - Tips for Families- Speak the Language of STEAM	- Replace current slide with HV Optional Slide 13	- Tips for HV: Speak the language of STEAM (HV) - Tips for Families: Speak the Language of STEAM (F)		
22. STEAM -related Skills			- Tips for HV: The Inquiry Cycle - Tips for Families: The Inquiry Cycle	- Insert Optional Slide 4	- Tips for ES: The Inquiry Cycle - Tips for Families: The Inquiry Cycle
23. How We Can Support STEAM Learning					
24. Engaging Environments				- Insert Optional Slide 5	



SLIDE	HANDOUTS NEEDED	HOME VISITOR POWERPOINT ADAPTATION	HOME VISITOR HANDOUTS	OPTIONAL SLIDES	OPTIONAL HANDOUTS
25. Nurturing, Responsive, & Effective Interactions	- Tips for Families: It's OK to be Curious (F)		- Tips for Families: Culture of Inquiry - Tips for HV: Culture of Inquiry in the HB Setting	- Insert Optional Slide 6 - Insert Optional Slide 7	- Tips for ES: Culture of Inquiry - Tips for Families: Culture of Inquiry
26. Learning Experiences/ Activities		- Insert HV Optional Slide 14		- Insert optional Slide 8 - Insert Optional Slide 9	
27. Learning Activity: STEAM in Everyday Experiences & Activities	- Activities for Families: Explore the Outdoors Together				
28. Review	- Helpful Resources - Tools for Supervisors: Reflection and Feedback - Tools for Supervisors: Group setting observations				

ES: Education Staff

HV: Home Visitors



SLIDE 1:

INTRODUCTIONS:

Begin the training by giving participants background information on yourself. Provide an opportunity for participants to introduce themselves. Encourage them to use their tribal language.

INTRODUCE THE TOPIC:

STEAM stands for science, technology, engineering, art, and math.

Begin with an activity to get participants thinking about how their culture naturally uses STEAM. (i.e., gathering berries, harvesting, carving, fishing, preparing native foods, etc.)

DISCUSSION: HAVE PARTICIPANTS SHARE WHAT STEAM SKILLS THEY USED THAT MORNING.

This will give you an idea of what they think of when they hear the STEAM acronym.

Offer examples such as cooking breakfast, making coffee, parking your car, packing your child's lunch, checking the weather, brushing your teeth, etc. *Emphasize: You naturally use STEAM every day! The Native way of life and culture are rich with examples of STEAM.

ADAPTATION FOR HOME VISITORS:

- Insert HV Optional Slide 1



STEAM Stretches Across the ELOF Domains

--15-Minute--
In-Service Suites

	CENTRAL DOMAINS				
	APPROACHES TO LEARNING	SOCIAL AND EMOTIONAL DEVELOPMENT	LANGUAGE AND LITERACY	COGNITION	PERCEPTUAL, MOTOR, AND PHYSICAL DEVELOPMENT
▲ INFANT/TODDLER DOMAINS	Approaches to Learning	Social and Emotional Development	Language and Communication	Cognition	Perceptual, Motor, and Physical Development
● PRESCHOOLER DOMAINS	Approaches to Learning	Social and Emotional Development	Language and Communication Literacy	Mathematics Development Scientific Reasoning	Perceptual, Motor, and Physical Development

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SLIDE 3:

STORY FROM MIW

“We Inupiaq are a nation of people occupying the circumpolar Arctic from Siberia through Alaska and Canada to Greenland. We share common values, language, culture, and economic systems. Our culture has enabled us to survive and flourish for thousands of years in the Arctic where no other man or culture could. For thousands of years, our traditional method of socializing our youth was the responsibility of the family and community. From the first, visitors to the Arctic have universally commented on the warm disposition of our children. Corporal punishment was absolutely unknown. Boys and girls began their education with their parents and, by the time they reached their teenage years, they had mastered the skills necessary to survive on the land here. From that time forward, the youth—with his family and within his community—devoted his attention to his intellectual and social growth.” —Eben Hopson, North Slope Borough, Barrow, Alaska

The ELOF provides language to help teachers, family child care providers, and home visitors understand child development from a western perspective and support children’s development of skills that they will need to succeed in school. Home visitors support families’ understanding of child development and promote engaging interactions between parents and their children. It provides a guide for the implementation of effective program and teaching practices that promote strong outcomes for all children, including children with disabilities or suspected delays, children who are dual language learners, and those speaking or learning to speak and write their tribal language.

Head Start Program Performance Standards state that “A program that serves American Indian and Alaska Native children may integrate efforts to preserve, revitalize, or restore, or maintain the tribal language for these children into program services.” Our challenge as a program is incorporating cultural traditions, values, and lifeways into our day-to-day work. We need to help children develop the skills identified by the ELOF while supporting a child’s cultural identity.

STEAM is about children developing skills in multiple ELOF domains, including Approaches to Learning and Cognition. Children are born primed to explore STEAM ideas as they learn about the world. STEAM skills include using active exploration, understanding causal relationships, reasoning, and problem solving.



STEAM Stretches Across the ELOF Domains



- Cognition (Infant/Toddler)
 - Exploration and Discovery
 - Memory
 - Reasoning and Problem-Solving
- Cognition (Preschooler)
 - Mathematics Development
 - Scientific Reasoning
- Approaches to Learning
- Social and Emotional Development
- Language and Communication
- Perceptual Motor and Physical Development



SLIDE 4:

For infants/toddlers

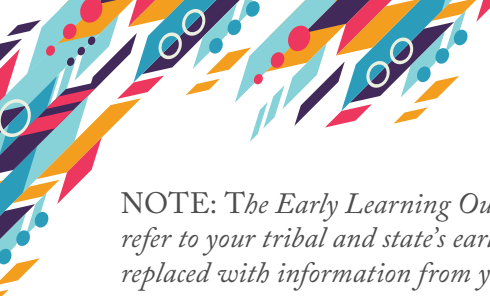
- Science knowledge, skills, and concepts that we know are attainable for young children are primarily found in the **Cognition** domain under the subdomains: Exploration and Discovery, Memory, and Reasoning and Problem-Solving.

For preschoolers

- The central domain **Cognition** is comprised of two more specific domains—Scientific Reasoning and Mathematics Development. Mathematics Development includes the subdomains Counting and Cardinality, Operations and Algebraic Thinking, Measurement and Geometry and Spatial Sense. Scientific Reasoning includes the subdomains Scientific Inquiry, and Reasoning and Problem-Solving.

Other areas of development connected to STEAM learning include the central domains **Approaches to Learning, Social and Emotional Development, Language and Literacy, and Perceptual, Motor and Physical Development.**

- For example, the **Approaches to Learning** domain is about how children learn, rather than what they learn. It includes executive function skills that are crucial to STEAM exploration like initiative and curiosity, creativity, and cognitive and behavioral self-regulation.
- When children engage in positive interactions with adults and other children while exploring their environment children are using skills found in the **Social and Emotional Development** domain. And by using both language and nonverbal communication, such as eye gaze and gestures to express interest and talk about what they observe, children are using skills found in the **Language and Communication** domain.
- Children’s exploration of the tools and materials in their environment facilitates their **Physical Development**, often requiring the use of fine and gross motor skills. For example, picking berries requires fine or small motor movements. And when teachers take children on nature walks, gross motor skills help children walk, run, or kneel down to explore what they see!
- Teaching children in their tribal language is an important part of connecting STEAM skills to their families, cultures, and developmental goals. You can further support children who speak their tribal languages or are learning their tribal languages by describing what they observe and providing key terms in both their tribal languages and in English.



NOTE: *The Early Learning Outcomes Framework is widely used in Head Start and Early Head Start programs. Please refer to your tribal and state’s early learning guidelines for this slide. If this slide is not applicable to your program, it can be replaced with information from your native and/or state’s early learning guidelines. You may want to reference your school readiness goals as well.*

MATERIALS NEEDED:

- Handout: STEAM Stretches Across the ELOF Domains

OPTIONAL FOR HS/EHS:

- Insert Optional Slides 1-3
- Handout: HSPPS Support STEAM, Culture, and Language

ADAPTATION FOR HOME VISITORS:

- Insert HV Optional Slide 2-5
- Handout: HSPPS Support STEAM, Culture, and Language



--15-Minute--
In-Service Suites

Red Cliff Early Childhood Center

We were always trying to integrate culture into the curriculum—the science domain, the math domain, etc. Then we realized that culture should be at the base, serving as the foundation, the building block for curriculum development. It was an amazing paradigm shift! We are now making huge gains in integrating language and culture into our early childhood programming.

—The Red Cliff Early Childhood Center



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SLIDE 5:

Note to presenter: Read the testimonial.

Point out how important language and culture is in everyday activities in the classroom. Keep this in mind as you talk about STEAM learning.

See page 15 of Steps and Introduction to Making It Work to learn more about Red Cliff Early Childhood Center’s experience integrating language and culture.

RESOURCE:

Making It Work <https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/no-search/making-it-work-2017.pdf>



SLIDE 6:

The framework for effective teaching practices is known as the House. The House represents five integral components of quality teaching and learning:

- The foundation: providing nurturing, responsive, and effective interactions and engaging environments for children
- The first pillar: choosing and implementing research-based curricula and teaching practices
- The second pillar: using screening and ongoing assessment of children’s skills
- The roof: individualizing teaching and learning
- The center: engaging parents and families

When connected with one another, they form a single structure—the House Framework—that surrounds the family in the center because as we implement each component of the house—in partnership with parents and families, we foster children’s learning and development.

Parent, Family, and Community Engagement

Culturally and linguistically responsive environments can only be created by engaging and partnering with families, Elders, and the community. Establishing a partnership with families and the community is crucial for children's learning and later success in life.

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SLIDE 7:

Since the beginning of time, parents, families, and communities have taught their children everything they need to know to become successful members of society.

Children are active learners and take in this kind of information, including cultural knowledge and language, through their physical and social experiences. Programs must develop teaching methods and create learning environments that reflect the cultures and languages of the children they serve.

Create culturally and linguistically responsive environments by engaging and partnering with families, Elders, and the community. Establishing a partnership with families and the community is crucial for children's learning and later success in life.

Making It Work suggests ways early childhood staff can intentionally create cultural and language activities for children, families, elders, and community members. It also helps staff align these efforts with their program's Parent, Family, and Community Engagement (PFCE) Framework. The PFCE Framework identifies seven family outcomes, all of which are listed on page 20 in Steps and Introduction to Making It Work.

RESOURCE:

Making It Work <https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/no-search/making-it-work-2017.pdf>



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SLIDE 8:

- STEAM is an essential part of the foundation of the house.
- The foundation includes nurturing, responsive, and effective interactions and engaging environments.
- Children naturally engage in STEAM skills such as inquiry, reasoning, and problem solving every day but need support from teachers and families to expand their STEAM skills and thinking through engaging environments and nurturing, stimulating interactions which can include cultural activities at home and in the community.



Objectives



- **Identify** ways infants, toddlers, and preschoolers naturally engage in inquiry, reasoning, and problem solving through everyday routines, culture, language, and learning opportunities
- **Describe** how the STEAM components share a common approach and focus
- **Provide strategies** to support children’s inquiry and STEAM skills in the early education setting, community, and at home
- **Learn** to use the *Steps and Introduction to Making it Work Guide* to integrate culture and language in lesson plans for STEAM skills



SLIDE 9:

REVIEW THE OBJECTIVES FOR THE SESSION.

- **Identify** ways young children naturally engage in inquiry, reasoning, and problem solving through every day routines, culture, language, and learning opportunities
- **Describe** how the STEAM components share a common approach and way of thinking
- **Provide strategies** to support children’s inquiry and STEAM skills in the early education setting, community, and at home
- **Learn** to use the Steps and Introduction to the Making It Work guide for support in integrating culture and language into STEAM lesson plans

ADAPTATION FOR HOME VISITORS:

- Insert HV Optional Slides 6-9 to provide a foundation for home visiting practices





--15-Minute--
In-Service Suites

Culturally and Linguistic Responsive Practices

Sources of Developmentally Appropriate Practices

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graph TD; A[Daily Program Operations/Service Delivery] --- B[Child Development Research]; A --- C[Individual Child Assessment]; A --- D[Cultural & Linguistic Contexts of the Child, Family, & Community];
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SLIDE 10:


In AIAN programs, the foundation of learning is children’s cultures and languages and the involvement of their families and communities. When staff incorporate culture and language into everyday activities and the program environment, it positively impacts children’s development.

RESOURCE:


Multicultural Principles for Early Childhood Leaders Principle 4: Addressing cultural relevance in making curriculum choices and adaptations is a necessary, developmentally appropriate practice-
<https://eclkc.obs.acf.hhs.gov/sites/default/files/pdf/principle-04-english.pdf>




Making It Work




Without language, the canoe, paddle, water, seat, the birds you hear are different than what our ancestors experienced. If you know the language, then you know what our ancestors heard, saw, felt, and experienced.
—Zalmi “Zeke” Zahir, University of Oregon



CONNECTING TRADITIONAL CULTURAL SKILLS, VALUES, BELIEFS, AND LIFEWAYS TO EARLY DEVELOPMENT AND SCHOOL READINESS GOALS





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SLIDE 11:

Note to presenter: Read the quote. Briefly introduce the Making It Work (MIW) cycle.

Making It Work is a resource you can use to connect the dots.

Tribes and native communities have always known what research now tells us—when programs integrate culture and language into the classroom’s daily activities of and engage families in those activities, children are supported in

- developing a positive sense of self;
- achieving successful child outcomes;
- learning two languages; and
- knowing their community, family, and cultural values, which promotes their resilience and well-being.

RESOURCE:

Making It Work <https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/no-search/making-it-work-2017.pdf>

MATERIALS NEEDED:

- Handout: Making It Work Cycle



What is STEAM?

--15-Minute--
In-Service Suites

Science Technology Engineering Art Math

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SLIDE 12:

INTRODUCE WHAT THE STEAM COMPONENTS ARE AND HOW THEY ARE CONNECTED.

STEAM is a research-based way of thinking that involves observing, questioning, testing ideas, and creating. It is part of many early childhood curricula. As children explore their surroundings, they naturally use STEAM as a tool to understand the world.

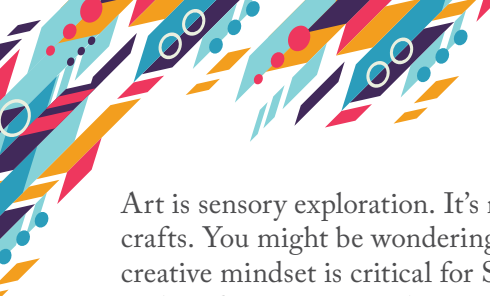
As we discussed earlier, since the beginning of time, parents, families, and communities have taught their children everything they need to know to prepare them to become successful members of society. This way of thinking begins in infancy and continues throughout early childhood. It is essential to children’s school readiness and overall success later in life.

Inquiry is the act of asking about or gathering information about a topic of interest. Science includes the use of inquiry skills such as observing, asking questions, exploring, making predictions, and analyzing information to understand how the world works (e.g., characteristics of living objects, non-living objects, and earth materials). Older infants and toddlers may spend time exploring the texture and shape of leaves in a sensory table or in their backyard by touching them, while preschoolers can discuss the differences and similarities between soft green leaves and brown leaves that are hard and crunchy.

DISCUSSION/BRIEF ACTIVITY: HOLD UP A PEN OR PENCIL AND ASK IF IT’S STEAM—IT IS!

Technology refers to any type of man-made object, not just cell phones, televisions, and computers. It’s using tools (such as pens, scissors, binoculars, fishing nets, canoes, drum frames, knives, ulus, and wheels) and creating and problem solving.

Engineering is using materials, designing, problem solving, and building structures and products. It helps us understand how and why things work. Infants and toddlers can explore stacking different-sized blocks. Preschoolers can design a fish drying rack or smoke house.



Art is sensory exploration. It's more than just drawing and painting. Art also includes pretend play, music, and crafts. You might be wondering why “Art” was added to STEM to create “STEAM.” Art was added because a creative mindset is critical for STEM subjects. For example, infants and toddlers can explore various art materials such as finger paints or bang on pots and pans to create a drum. Preschoolers can observe birds outside then draw a picture of where they live or create different patterns as they hit a drum. Making traditional regalia is a wonderful example of art and STEAM. Basket weaving is another example.

Math refers to numbers and operations, counting, sorting, measuring, using patterns, making comparisons, understanding geometry, and spatial sense. Even babies and toddlers learn early math concepts like geometry and spatial relationships when they explore new objects with their hands or mouth. Preschoolers show great interest in counting objects in their environments and sorting items by color, shape, or size.





STEAM is for Everyone



STEAM is about *how* people explore the world, not which facts they know.



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SLIDE 13:

STEAM is about how people explore and live in the world—*not* which facts they know. Children can use any old item to explore STEAM, it doesn't have to be a typical "science" material like a beaker or test tube. Open-ended and every day materials such as empty jars & lids or leaves allow for boundless exploration (and can grow with the child). You might have the children engage in subsistence activities to help them learn about the world.

And the world is your classroom—STEAM is everywhere, especially outdoors! Because STEAM is for everyone and children start using STEAM skills at such a young age, there is a great opportunity to provide STEAM learning opportunities that are culturally relevant to the children you work with. Encourage families to support STEAM learning at home and in the community.

Emphasize It's not about which facts you know—it's how you explore the world—together!

ADAPTATION FOR HOME VISITORS:

- Replace this slide with HV Optional Slide 10



STEAM is All Around



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Video is approximately 56 seconds long

SLIDE 14:

So what does STEAM look like in every day interactions and play? Let's watch two short video examples to find out! *Note: The videos shown here are teacher examples, however home-visitors can use the strategies shown for professional development and to encourage families to replicate ideas at home.* **PLAY VIDEO**

DISCUSSION: LEAD PARTICIPANTS IN A DISCUSSION ABOUT HOW EACH VIDEO SHOWED STEAM.

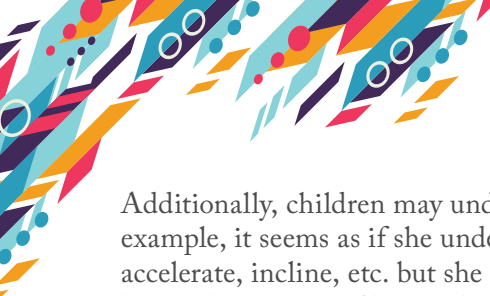
Infant Video Clip

- In the first clip, the children are exploring avocados.
- The infants are too young to talk, but the teacher still engaged them in STEAM! She asked them to make a prediction (“What do you think is inside the avocado?”). Even more verbal toddlers may not know many scientific ideas but can be encouraged to observe, think, and hypothesize—or guess.
- She talked about the children’s explorations. (“You are experimenting with rolling your avocado.”)
- She included math and science when she mentions the avocado’s round shape that enables it to roll.

Preschooler Video Clip

- In the second clip, the girl is building a ramp (That’s engineering!) to roll balls down (She’s exploring physics).
- When she tries to put a ball through one of the tunnels, it doesn’t fit. First, she experiments with the angle of the ramp. Then the ball fits through the first tunnel, but not the second. She thinks through the problem then removes the tunnel that isn’t big enough for the ball to fit.
- Then she experiments with dropping a ball down the ramp again.

These clips show examples of children demonstrating behaviors in the ELOF sub-domains such as curiosity, exploration, inquiry, reasoning, and problem solving. For example, in the infant video clip the children are showing interest in the avocados by participating in this experience. This is supported by the ELOF Approaches to Learning subdomain Initiative and Curiosity. In the preschool video clip, when the girl discovered that the ball wouldn’t fit through the second tunnel, she problem solved and removed the tunnel. This is an example of the ELOF Cognition subdomain Reasoning and Problem-Solving.



Additionally, children may understand STEAM concepts but may not have the words for the concepts. For example, it seems as if she understands the concept of the ball rolling down the ramp without knowing the words accelerate, incline, etc. but she can learn these words with support from her teacher and they will have meaning for her in the context of her exploration. These are some of the characteristics and skills that are common across the STEAM components and are some of the goals in the ELOF domains.

MATERIALS NEEDED:


- Handout: Activities for Families: STEAM is All Around





ADAPTATION FOR HOME VISITORS:


- Insert HV Optional Slide 11
- Handout: Learning Activity for Home Visitors: STEAM is All Around
- Handout: Activities for Families: STEAM is All Around



A Common Approach and Focus



 STEAM Mindset	 STEAM Knowledge
 Language of STEAM	 STEAM-Related Skills

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SLIDE 15:

INTRODUCE HOW THE STEAM COMPONENTS SHARE A COMMON APPROACH AND FOCUS.

The STEAM components share a common approach and focus—a STEAM Mindset, STEAM knowledge, the language of STEAM, and STEAM-related skills. In the next few slides, we will discuss how education staff can support and focus on these approaches with children.

NOTE: You'll describe each in more detail on the following pages.



STEAM Mindset







SLIDE 16:

A STEAM mindset includes curiosity, creativity, critical reflection, etc. From research on how children think and learn, we know that young children have a sense of wonder and natural curiosity about their world. Adults can encourage children’s STEAM mindset through both free play and supportive experiences and explorations. Here are some examples:

- Children are like scientists—they learn about how the world works through experience and exploration by finding patterns in their environment and collecting “data.” For example, when I play with snow inside of the classroom where it is warm, it melts faster than when I play with it outside where it is cold.
- Supporting STEAM skills encourages children to develop their own approaches to learning, such as the incredible curiosity that young children naturally have. For example, if an infant is crunching leaves found on the ground outside, adults can support this curiosity by bringing over more leaves (perhaps of different shapes, colors, or textures). Encourage the child’s explorations by labeling what they are doing and asking questions, “When you squeeze the leaf in your hand, what do you hear?” or “Why do you think this leaf is crunchy?”

ADAPTATION FOR HOME VISITORS:

- Insert HV Optional Slide 12



Hoop Dancers from Red Cliff Band of Lake Superior Chippewa



There is a group of teenage Hoop Dancers from the Red Cliff Band of Lake Superior Chippewa who are “stepping out” as young leaders in their community—and it all started when they were very young! In their homes and at Head Start, the girls learned the importance of their family, community, and culture. They developed social relationships while participating in the traditional, cultural music, dance, and art of their community. They learned to share, discuss, and compromise, as they developed confidence and expressed pride in their accomplishments and their culture.



SLIDE 17:

Note to presenter: Read the slide. This is an example of STEAM all around is this story from the Red Cliff Band of Lake Superior Chippewa.

The parents, families, and communities of the Red Cliff Band of Lake Superior Chippewa encourages and supports this group. Each family makes sure that their child attends drum and dance practice, that they have beautiful regalia to wear, and that family members are present to watch their child dance. The dancers practice and perform under the guidance and leadership of Gretchen Morris, a mother of one of the girls who began teaching them when they were in Head Start. Each October, the dancers share their cultural skills. They share what they know about the hoop, fancy shawl, jingle, and grass dances during the annual Apple Festival in Bayfield, Wisconsin. These young women know and take pride in their language, culture, and lifeways of the community. This knowledge is the foundation for their success in school and life. During a recent summer gathering event, the dancers returned to share their gift of dance with the young children who now attend Head Start and Early Head Start at the Red Cliff Early Childhood Center. With the guidance and support of their families and dance teacher, this group of young dancers is already contributing to their community and succeeding in school and life!

Where do you see STEAM in this story?





STEAM Knowledge



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SLIDE 18:

- Children are born primed to explore STEAM ideas as they learn about the world.
- Ask participants to think about what older babies or toddlers might understand about physics—or the movement of objects through space and time. (Pause for a few seconds.)
 - Kind of a lot already! They might have fallen, tried to walk, dropped toys, banged a cup on the table, and recognized that objects have solidity. Their experiences and play have already taught them quite a bit.
- Children build hypotheses and eventually theories as they try to make sense of the world. (A hypothesis or prediction is like a guess or possible explanation for something. A theory is the best current explanation for something that has been tested.)
 - Research shows that young children can keep track of cause-and-effect relationships and use this data to form theories about relationships that aren't always reliable (for example, pushing a button on a certain toy usually results in it making a sound, except when its battery is dead or missing).
- Adults can help children build on and expand their existing knowledge and interest in the natural world through both free play and supportive explorations. NOTE: We'll talk about supportive explorations in more detail in the strategies section.



Language of STEAM



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SLIDE 19:

- The language of STEAM is all about problem solving and the cycle of inquiry or scientific method.
- Use key vocabulary words (such as observe, predict, and compare) to encourage STEAM thinking and skills.
- Use language to describe the objects or events the child is observing and exploring. By providing words (labels) that connect the objects, concepts, and experiences, you are helping the vocabulary and concepts become meaningful to children. For example, as a child holds two different types of rocks, you could say, “Let’s compare the two rocks! This one feels smooth and this one feels bumpy.”
- You can further support children who are tribal language learners by describing what the child is observing and by providing key vocabulary words in the tribal language.





Two-Eyed Seeing

—15-Minute—
In-Service Suites



“Two-Eyed Seeing asks us to see our strengths, the best in our ways of knowing, while also asking us to respect and celebrate our differences. Two-Eyed Seeing acknowledges the necessity of formal structure yet that it must be preamble to and receptive of new understandings and opportunities, i.e., understandings associated with ‘Spirit of the East’ which brings the ‘gift of newness, of transformation.’”

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SLIDE 20:

The descriptive label Two-Eyed Seeing seeks to avoid portraying the situation as a “clash of knowledges” or as contributing to “knowledge domination or assimilation.” We recognize that in one set of circumstances we may choose to call upon the strengths within Indigenous science and Western Science in another set of circumstances. Thus, Two-Eyed Seeing will often require a “weaving back and forth” between these two perspectives.

It intentionally and respectfully brings together our different knowledges to motivate people, Aboriginal*, or non-Aboriginal alike to use all our gifts so we leave the world in a better place. This keeps the opportunities for our youth (in the sense of Seven Generations) from being compromised by our inaction.


RESOURCE:

Integrative Science/Toqwa’tu’kl Kjjitaqnn: The story of our journey in bringing together Indigenous and Western scientific knowledges <http://www.integrativescience.ca/uploads/articles/2011-Bartlett-Integrative-Science-Mikmaqwey-Debert-Chapter-17-proofs.pdf>


**The term Aboriginal is similar to the word indigenous or native—meaning originating or occurring naturally in a particular place.*

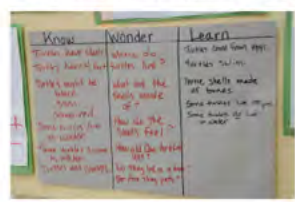



Speak The Language Of STEAM



- Observe, observation
- Measure
- Test
- Question
- Count
- Discover
- Predict, prediction
- Investigate
- Record
- Similar, different
- Explore
- Explain
- Compare, contrast
- Experiment
- Hypothesize, hypothesis, guess






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SLIDE 21:

How can adults support children as they observe, question, explore, and reflect?

One of the ways we can do this is with language. The way adults speak to children can encourage reflection and problem solving. By modeling and providing children with meaningful opportunities to hear and use scientific language, we are not only enhancing children’s STEAM learning, but we are also teaching advanced vocabulary in a meaningful context.

When using vocabulary, physically show children what a word means. By using props or engaging in the new process while we are using the vocabulary, we help young children, including children who are speaking or learning a tribal language, see the vocabulary in action.

See how science terms have been translated into the Blackfoot language in this article, *How A Cosmic Collision Sparked A Native American Translator’s Labor Of Love*: <https://www.npr.org/2019/03/31/706032203/how-a-cosmic-collision-sparked-a-native-american-translators-labor-of-love>

DESCRIBE IMAGES:

- Left image: Preschoolers comparing shapes.
- Middle image: Experimenting in a sand table.
- Right image: Know, Wonder, Learn (KNL) chart about turtles.

Discussion: How can you incorporate STEAM language into the KNL activity? How can you support families in using the KNL at home?

MATERIALS NEEDED:

- Handout: Tips for the Education Staff: Speak the Language of STEAM
- Handout: Tips for Families: Speak the Language of STEAM

ADAPTATION FOR HOME VISITORS:

- Replace current slide with HV Optional Slide 13
- Handout: Tips for Home Visitors: Speak the Language of STEAM
- Handout: Tips for Families: Speak the Language of STEAM



STEAM-Related Skills

15-Minute
In-Service Suites



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SLIDE 22:

- All STEAM components use inquiry and the scientific method (observe, question, predict, experiment, discuss) as useful thinking tools to reason out problems.
- Children start thinking about these ideas early! Even young babies are making observations and testing predictions. For instance, one-year-old children learn physical rules through observation and experimentation—and when they see something that violates typical physical rules, they are more likely to explore it. For example, researchers created an experiment where infants watched a car roll off a ledge. Some babies saw what would be expected—the car rolling off the ledge and dropping to the ground. Other babies saw a seemingly impossible trick—the car rolled off the ledge and appeared to float in midair. This violates what young children already understand about gravity. When those infants were given the same car, they were more likely to test the concept of gravity by repeatedly dropping the toy that they previously saw “float” in midair.
- Young children are using the scientific method, or inquiry cycle, to think through a problem.

NOTE: There is a 15-minute in-service suite called “Engaging Interactions: Using The Scientific Method” that goes into each step in more depth. <https://eclkc.obs.acf.hhs.gov/video/using-scientific-method>

OPTIONAL MATERIALS:

- Insert Optional Slide 4
- Handout: Tips for Education Staff: Inquiry Cycle
- Handout: Tips for Families: Inquiry Cycle

OPTIONAL HOME VISITOR MATERIALS:

- Handout: Tips for Home Visitors: Inquiry Cycle
- Handout: Tips for Families: Inquiry Cycle



How We Can Support STEAM Learning





Engaging
Environments



Nurturing, Responsive, &
Effective Interactions



Learning
Experiences/Activities



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SLIDE 23:

Up to this point, we've learned about what STEAM is, how it supports children's development in various ELOF domains, and how to support thinking and speaking STEAM.

In the upcoming section, we will make the connection back to the House Framework and discuss ways to support STEAM learning by providing the foundation of learning through

- engaging environments,
- nurturing, responsive, & effective interactions, and
- learning experiences/activities integrating culture and language.



Engaging Environments



<p>Provide open-ended materials</p>		<p>Engage the senses</p>	
<p>Use a variety of materials</p>		<p>Consider children's developmental levels</p>	
<p>Pay attention to children's interests</p>			



SLIDE 24:

Developing an engaging environment requires using our observations about what children say and do to learn about their interests and current abilities. Keep in mind the cultures and languages of children as you set up an engaging environment.

Create an engaging physical environment that is stimulating, interesting, and encourages experimentation.

In selecting and arranging materials, remember that children actively explore, investigate, and observe. They will not be taking in knowledge in a passive way. Outdoor learning is a natural and culturally appropriate way of learning.

- Provide open-ended materials. Materials that can be used in different ways and allow for creativity, investigation, and problem solving, such as cardboard and tubes, clay, or ramps.
- Work with families to ensure their home learning environments are safe for exploration.
- Work with families to ensure that the classroom environments reflect their cultural backgrounds and languages. Ask them to bring in familiar materials.
- Use a variety of materials.
- Select materials related to children's interests.
- Engage the senses with materials of different textures, smells, tastes, sounds, and sights.
- Consider the developmental level of the little scientists with whom you are working. For example, older preschoolers can verbally share what they think might happen or help record findings using post-its or drawings, whereas toddlers may respond by pointing to one of two options.
- Materials must be accessible to all children.
 - Place in a safe location so children may have independent access.
 - Tools should be of the proper size and constructed of appropriate materials for young learners.
 - When appropriate, adapt materials to ensure that children with special needs can participate as independently as possible. Some possible modifications include placing the materials in an optimal position, stabilizing materials, providing adaptations to make tools easier to grasp, and making materials larger or brighter.

OPTIONAL SLIDES:

- Insert Optional Slide 5



Nurturing, Responsive, & Effective Interactions



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SLIDE 25:

Warm, nurturing, and effective interactions lay the foundation for children’s discovery and create opportunities for them to share their findings.

Create an engaging social environment. Interactions with peers and adults facilitate the development of STEAM knowledge, while developing children’s social, language, and communication skills. It’s a collaborative inquiry process—teachers, parents, and children become scientists together. In this way, STEAM supports development in multiple ELOF domains.

How do we bring together Indigenous and Western knowledges while teaching STEAM?

Science is a way of knowing. Create opportunities in the classroom and outdoors for children to engage in cultural activities. By watching and listening children learn from their families and elders, this learning becomes “doing” as children explore and develop skills. Guiding and accompanying are important teaching strategies for AIAN programs.

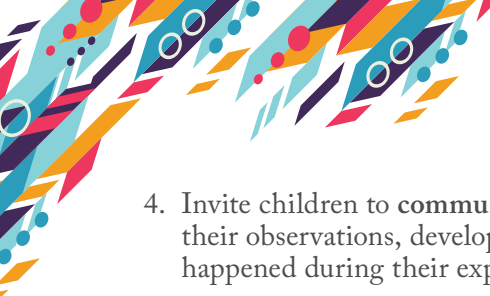
Discuss the following four specific ways to promote nurturing, responsive, and effective interactions:

1. **Use scaffolds.** (Scaffolding means offering the right support and structuring the environment to take a child’s knowledge to the next level.) Support exploration and discovery during play and cultural activities. Scaffolds can be physical (such as breaking a task into smaller steps) or verbal (such as prompting children to describe what they are observing). Scaffolding can help children engage in more complex thinking and problem solving.
2. **Introduce basic inquiry skills** to help children think about STEAM during every day play and cultural activities. This helps children become critical thinkers and problem solvers. Talk with children and ask questions to guide their observations: “Why do you think this flower hasn’t bloomed yet?” Model curiosity and a questioning mind!
3. **Speak STEAM** by incorporating problem solving and STEAM-rich language in all types of activities. Use words such as observe, investigate, compare, and predict. Listen to children’s observations and scaffold when appropriate. The use of language extends and enriches scientific experiences and reinforces the growth of STEAM content knowledge.



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- 
4. Invite children to **communicate**. Use modeling and open-ended questions to encourage children to describe their observations, develop questions, make predictions, notice similarities and differences, explain what happened during their explorations, etc.
- Infants and toddlers can respond with eye gaze, gestures, and some vocalizations.
 - Older toddlers and preschoolers are still learning language but are better able to respond verbally as they put words and experiences together. NOTE: Important for all children, including children who are learning their tribal language.
 - Many of these strategies are used throughout the day in literacy and social and emotional contexts. For example, when you ask a question “Why do you think the boy in the book feels that way?” This strategy is the same for STEAM interactions, when we ask children questions to foster inquiry skills and use STEAM language to strengthen children’s vocabulary.
 - See page 28 in the Handbook for Culturally Responsive Science Curriculum by Sidney Stephens (2000) to look at the differences and compatible strategies for traditional teaching and inquiry teaching.
<http://ankn.uaf.edu/publications/handbook/handbook.pdf>

MATERIALS NEEDED:

- Handout: Tips for Families: It’s OK to be Curious!

OPTIONAL SLIDES:

- Insert Optional Slides 6-7

OPTIONAL HANDOUTS:

- Handout: Tips for Education Staff: Culture of Inquiry
- Handout: Tips for Families: A Culture of Inquiry

OPTIONAL HOME VISITOR HANDOUTS:

- Handout: Tips for Home Visitors: Creating a Culture of Inquiry in the Home-Base Setting
- Handout: Tips for Families: A Culture of Inquiry



Learning Experiences/Activities



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Video is approximately 1 minute long.

SLIDE 26:

An important way to support STEAM learning and skills is through the experiences and activities you plan in the early education setting and encourage families to do at home.

In this video, a teacher talks about how she created an activity with pill bugs (or roly polys) after children showed interest in them outside. As you watch, think about all the ways the teacher supports STEAM learning through this activity. Please note that the video shown here is a classroom example, but home visitors can use the strategies for professional development and to encourage families to replicate at home or use during socializations. A home visiting adaptation has also been developed (see adaptation box below). **Play video.**

DISCUSSION: ASK PARTICIPANTS TO SHARE WHAT THEY OBSERVED.

Highlight the following STEAM skills and supports:

- The teacher followed children’s natural explorations and curiosity to create an activity that brought nature inside.
- The teacher asked children to make predictions (e.g., Why did it curl up in a ball?).
- The children used magnifying glasses to closely observe the pill bugs.
- The teacher planned a hands-on activity, rather than having the children watch her talk about roly polys.
- The children explored the pill bugs with their eyes and hands.
- They did an art activity based on their explorations (briefly shown in clip).
- The teacher invited children to ask more questions about the roly polys and other things they want to learn. This led to more explorations. (Note: It wasn’t shown on video but mention that they next investigated what roly polys like to eat based on children’s predictions.)
- The teacher didn’t always act like the expert—she made it an activity to explore together with the children.

OPTIONAL SLIDES:

- Insert Optional Slides 8-9

ADAPTATION FOR HOME VISITORS:

- Insert HV Optional Slide 14



Learning Activity: STEAM in Everyday Experiences & Activities



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SLIDE 27:

Small group discussion about how to incorporate STEAM into 3 different learning experiences: book reading, outside activities and finger play/music. Also have participants consider how children naturally engage in STEAM outside.

DISCUSSION PROMPTS FOR EACH IMAGE:

- Left image: A boy uses tweezers to sort plastic shapes. How can this activity promote STEAM skills?
- Middle image: A child and adult are playing in the mud. What type of STEAM skills can children learn while playing outside?
- Right image: A boy is beating on a drum. How can you use music and songs to foster STEAM learning?


DISCUSSION: LEAD PARTICIPANTS IN A DISCUSSION ABOUT HOW THE LEARNING EXPERIENCE OR ACTIVITY IN EACH OF THE PHOTOS IS FOSTERING STEAM SKILLS.

BOOKS

- Books provide a great springboard for STEAM discussion and activities.
- How can “The Very Hungry Caterpillar” promote STEAM skills?
 - Topics could include math (numbers, counting, size), engineering (making a cocoon), science (e.g., Why did the caterpillar have a tummy ache after eating so much? or How did the caterpillar transform into a butterfly?), and art (have children create their own caterpillar out of different materials: balloons, beads, paper plates, sponge paint, etc.).

OUTSIDE

- What type of STEAM skills can children learn while playing on a climbing structure?
- Examples:
 - physics (hanging from monkey bars or sliding down slides)
 - math (counting rungs on a ladder or seeing who can swing higher)

- 
- science (balancing on a beam or going up and down on a see-saw)
 - sand play can include engineering and art (building sand structures), technology (digging with tools), science (where does the water go when you pour it on the sand?), problem solving, investigations, imagination, gravity, and cause and effect


FINGER PLAY/SONGS


- How can you use music and songs to foster STEAM learning?
- Examples:
 - counting aloud
 - pattern recognition
 - include STEAM language and ideas to expand thinking and vocabulary
- **Note:** Research shows that the brain is learning about music as children listen to it in their environment. Four-month-olds show stronger brain responses to music they've heard more often. Reference: Trainor, L. J., Lee, K., & Bosnyak, D. J. (2011). Cortical plasticity in 4-month-old infants: specific effects of experience with musical timbres. *Brain Topography*, 24 (3-4), 192-203.



Review

--15-Minute--
In-Service Suites



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SLIDE 28:

REVIEW THE MAIN POINTS OF THE PRESENTATION

- Inquiry is a great tool for learning about the world: adults and children do it naturally!
- Culture and language are at the base of this learning.
- Children—like scientists—explore their world using observation, logic and experimentation.
- STEAM is about *how* people explore the world—not which facts they know. Activities should encourage exploration and curiosity rather than facts. And it doesn't matter where you are—at school or at home—all adults can explore the world with children.
- Making it Work can assist with the development of culturally appropriate activities while engaging the parents, community, and elders in the child's learning.
- We discussed activities to foster STEAM skills and early child development goals from the ELOF and your curriculum.
- There are many ways we can support children's natural inclinations to explore, build, and question. Some ways to set the stage and foster STEAM learning include creating engaging environments and learning experiences/activities and providing nurturing, responsive, and effective interactions that are grounded in culture and language.
- Design hands-on STEAM activities based on children's questions and observing what they show interest in throughout the day.
- Work with families in both center- and home-based settings to encourage STEAM learning at home and in the community.
- Making It Work is a resource to assist with STEAM learning through the integration of tribal languages and cultures.
- STEAM is all around us, ready to be discovered by our willing young explorers!

MATERIALS NEEDED:

- Handout: Helpful Resources
- Handout: Tools for Supervisors: Reflection and Feedback
- Handout: Tools for Supervisors: Group Setting Observations