



SCRIPT-NC Webinar: STEM learning for each and every child
Presented by staff from the STEM Innovation for Inclusion in Early Education
November 10, 2020
References and Resources

General activities/assignments

Resources

1. SCRIPT-NC Website Resource search - Annotated collection of free, downloadable resources is searchable by topic, resource type, type of diversity, etc. (Note: you may select “STEM” to filter the STEM-related resources): <https://scriptnc.fpg.unc.edu/resource-search>
2. **Personas** are short snapshots of individual children, which provide information about the configuration of the child’s family, offer insights about the child’s likes or interests, and share information about the child as a learner. There are three sets of personas available: infant/ toddler, preschool, and K-Grade 3. The children reflect different learning needs: children who are dual language learners, have identified disabilities, live in challenging conditions, have experienced trauma, and are racially/ethnically/culturally diverse: <https://scriptnc.fpg.unc.edu/shifting-blackboards>

From STEMIE:

3. **STEMIE Mythbuster** series: <https://stem4ec.ning.com/blog/Mythbuster>
4. **STEMIEFest Media Cubbies** includes some great resources related to STEM developed by some of our amazing partners:
<https://stemie.fpg.unc.edu/stemiefest> Resources that you might be interested in include:
 - a. **Joan Ganz Cooney Center’s** STEMIEFest Media Cubbie includes blog posts and reports that advocate for, and make recommendations for early STEM learning for young children: <https://stemie.fpg.unc.edu/stemiefest/the-joan-ganz-cooney-center-at-sesame-workshop>
 - b. **Early EduAlliance and Cultivate Learning at the U of Washington** shared several resources on how educators can incorporate STEM in their daily plans and how to modify activities to increase children’s engagement and learning: <https://stemie.fpg.unc.edu/stemiefest/early-edu-alliance>
 - c. **National Center for Early Childhood Teaching and Learning:** <https://stemie.fpg.unc.edu/stemiefest/ncecdtl>

d. **Maker and home activities from our museum and community partners at Boston Children’s museum, Bay Area Discovery Museum, Kidzu, and the Little Orchestra.**

5. Curated list of resources to support practitioners and families during COVID-19: <https://stemie.fpg.unc.edu/covid-19-resources-families-supporting-childrens-stem-learning-during-routines-and-activities>

Topic	Description of Assignment/Activity/Notes for Instructor
<p>Myths</p>	<p>Use the myths from our mythbuster series (see link above) to create quick trivias. Use the following site to tools to generate trivia-style or jeopardy-style classroom quiz review games that you can play from computer, table, or phone.</p> <p>Poll everywhere: https://www.polleverywhere.com/ Factile (Jeopardy style): http://www.playfactile.com Kahoot: https://kahoot.com/business-u/ Typeform: https://www.typeform.com/ Plickers: https://help.plickers.com/hc/en-us/articles/360009089693-Scanning-Your-Student-Answers</p>
<p>STEM trivia and fun facts</p>	<p>The following questions can be used as a trivia for students to learn some ‘fun’ facts about early STEM learning and beyond.</p> <p><u>Questions</u></p> <p>1. Observational studies of a 6-hour day preschool program (Farran, Lipsey, Watson, & Hurley, 2007). showed that math instruction took up the following amount of the day:</p> <p><1 minute 6 minutes 31 minutes 94 minutes >2 hours</p> <p>2. The percentage of faculty in early childhood Bachelor’s degree programs in Florida who did not include teaching strategies for STEM (science, technology, engineering, math) in the courses they taught.</p> <p>5% 50% 90% 10%</p> <p>3. Of students with disabilities enrolled in high school, what percentage of students are enrolled in Chemistry?</p>

1%
3%
6%
13%

4. According to NSF (National Science Foundation), what percentage of scientists and engineers report some form of disability?

50%
30%
20%
10%

5. Teaching science in early years is associated with gains in
Mathematics
Early Literacy
Reading
All of the above

Use the following site to tools to generate trivia-style or jeopardy-style classroom quiz review games that you can play from computer, table, or phone.

Poll everywhere: <https://www.polleverywhere.com/>

Factile: <http://www.playfactile.com>

Kahoot: <https://kahoot.com/business-u/>

Typeform:

<https://www.typeform.com/>

Plickers: <https://help.plickers.com/hc/en-us/articles/360009089693-Scanning-Your-Student-Answers>

Child Development

Resources		
<p>From STEMIE: Information on learning trajectories: https://stemie.fpg.unc.edu/our-work/learning-trajectories</p> <p>Math learning trajectories: https://learningtrajectories.org</p>		
Topic	Description of Assignment/Activity	Notes for Instructor
Using the math learning trajectories	<ol style="list-style-type: none"> Review the information on learning trajectories (see link above) and Understanding STEAM and how children use it: https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/steam-ipdf.pdf Review information about Ms. Amy's class and Shawntell: <p><i>Ms. Amy's preschool class is a group of children from diverse backgrounds with varied interests. Many of the children are currently interested in Duplos and splashing about at the water table. Almost all the children love storytime. Shawntell, a little girl with Down's syndrome enjoys playing with her brother, Ty at home, and the other children in the class. She can count up to five and knows the words related to quantity such as 'more, less, big, small'. She loves baby dolls and enjoys putting her baby dolls in the houses that her brother, Ty builds. She also enjoys splashing at the water table with other children, and at home, she enjoys taking baths, and 'helping' with washing up dishes. She does not speak in sentences and uses a communication board/visual cues to communicate and is working on turning pages in a board book and grasping objects.</i></p> Register for a free account https://learningtrajectories.org. Once you are in, select 'Explore Learning Trajectories'. If desired, you may select Alignment tool (on left side of screen, in green) to review the trajectories by age. Use the learning trajectories to identify Shawntell's current thinking level on counting and measurement (volume). Compare that to what some of Shawntell's 3-year old peers may be at. Identify and describe one classroom experience/activity that might be used to support Ms. Amy's class in STEM learning. Include in the description specific STEM vocabulary Ms. Amy might use. 	<p>If learners have not learned about adaptations and individualization for children with disabilities, some knowledge acquisition materials that could be used include: https://eclkc.ohs.acf.hhs.gov/children-disabilities/article/highly-individualized-teaching-learning</p> <p>Connect modules 1, 5, 7: https://connectmodules.dec-sped.org</p> <p>STEM-specific: 15-minute mini lectures on strategies to support young children with disabilities in STEM learning:</p> <p>STEM Instructional strategies for young children with disabilities (Presenters: Jessica Hardy, PhD (University of Illinois at Urbana-Champaign) and Bonnie Ingelin, PhD (University of St. Thomas): https://stemie.fpg.unc.edu/stemiefest/stem-instructional-strategies-young-children-disabilities</p> <p>STEM for Children with Autism and Online Learning Resources (Presenters: Ann Sam, Jessica Dysktra Steinbrenner,</p>

	<p>6. How would you adapt the activity to support Shawntell’s learning? And, how might these activities be used in your own work setting? Consider the environment, materials, and instruction.</p> <p>7. How can Ms. Amy work with Shawntell’s parents to implement or extend the activity at home during everyday routines and activities? And how might you encourage parents of your own students to incorporate such activities at home?</p>	<p>Kara Hume, FPG Child Development Institute, School of Education, UNC-Chapel Hill): https://stemie.fpg.unc.edu/stemiefest/stem-children-autism-and-online-learning-resources</p> <p>You may also want to consider using other personas (see above for link)</p>
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Language and Literacy

Resources		
<p>From STEMIE:</p> <ol style="list-style-type: none"> STEMIE storybook conversation blog posts https://stem4ec.ning.com/blog/Storybook+Conversation STEMIE storybook conversation tip sheets and activities https://stemie.fpg.unc.edu/resources?f%5B0%5D=field_routines_everyday_activity%3A64&f%5B1%5D=field_resource_type%3A21 <p>From ECLKC:</p> <p>Understanding STEAM and how children use it: https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/steam-ipdf.pdf</p> <p>From Recommended Practices Modules (RPM) Videos:</p> <p>Parent-child washing up at the sink: https://rpm.fpg.unc.edu/resources/video-1-14-parent-child-interaction</p> <p>Exploring water: https://rpm.fpg.unc.edu/resources/video-1-3-preschoolers (Video that is shown during webinar)</p>		
Topic	Description of Assignment/Activity	Notes for Instructor
<p>Common misconception in STEM and literacy/language</p>	<p>Read the statement and answer with true or false</p> <ul style="list-style-type: none"> Language and literacy skills are more important than STEM knowledge and skills 	<p>Ask a true/false question:</p> <ul style="list-style-type: none"> Language and literacy skills are more important than STEM knowledge and skills

		Encourage students to respond using interactive methods, such as poll, thumb up/down Encourage students to read STEMIE’s Mythbuster series: https://stem4ec.ning.com/blog/mythbuster-series-2-language-and-literacy-skills-are-more-importa?context=category-Mythbuster
Choose a STEM book	Ask students to discuss the following questions and take turns sharing their idea. <ul style="list-style-type: none"> • Do you have a favorite children’s book that is STEM related? • Why is it a favorite? • What STEM topics/concepts are included in the book? For example: The Very Hungry Caterpillar: number, counting, size Encourage students to listen to each other, and further discuss or expand on the ideas. 5-10 minutes	Use STEMIE curated STEM book list as an example. Divide students into small groups and discuss the following questions (NCECDTL, 2018) <ul style="list-style-type: none"> • Do you have a favorite children’s book that is STEM related? • Why is it a favorite? • What STEM topics/concepts are included in the book? For example: The Very Hungry Caterpillar: number, counting, size
Plan dialogic reading using STEM-related storybooks and personas	Read the information about Joseph and Winston and identify a book that matches child’s developmental level and interests and discuss <i>What STEM topics/concepts are included in the book?</i> Use the Connect CROWD strategy planning sheet to plan dialogic reading strategies. Record yourself practicing CROWD strategy using the chosen books and upload the video to FlipGrid. Joseph <i>Not Joe, Joseph, he will tell you, as he is the third Joseph in his family, and using his full name is a tradition. With a younger sister coming behind him, he is continuing a family tradition of learning and education. Joseph’s mother and father both completed advanced degrees and are eager to</i>	Note: You may be already teaching about dialogic reading, so this could be an activity that comes after the students have learned about the practice. If you are interested, use CONNECT Module 6 (see link above to provide the knowledge acquisition for learners) Use STEMIE’s storybook conversation series as examples Divide students into small groups. Use Jamboard, Padlet, or Google doc to write down their discussion. <ul style="list-style-type: none"> • Select storybooks match child’s developmental level and interests and list STEM concepts • Plan dialogical reading strategies using Connect CROW strategy planning sheet Ask students to create a presentation using FlipGrid

understand how they can support him in achieving his full potential.

Joseph's family can trace their roots in North Carolina back several generations to the era of slavery. They take pride in sharing the stories of both their roots and their aspirations. In fact, carrying the stories of the past forward is a commitment Joseph's family shares both at home and in their place of worship.

In his Kindergarten classroom, Joseph is quick to raise his hand when he knows the answer. He is fascinated with any aspect of science – animals, planets, dinosaurs, etc. But reading is not Joseph's favorite thing. When it's time to focus on reading, Joseph tunes out. When his family has asked him about this, his response has been that reading is "boring" and doesn't relate to him. Joseph's teacher is very concerned about his lack of interest in the reading curriculum.

Winston *is a three year old oftentimes referred to as "Sir". He lives with his parents who are of Native American and African American descent. He is an only child in the household. The family dynamics are richly based in culture consistent to morals and being authentic.*

Winston's obsession with dinosaurs has evolved over the past two years. He is very strong in learning about dinosaurs and incorporating "his favorite" T-Rex in his learning and social environment. He loves to share his adventures with family and friends through literacy and play. Another strong emphasis Winston has is science.

His mother is a strong advocate for literacy by which books are read to him daily. Winston has evolved in his reading by identifying objects, some words, and talking about the images he sees in the books. The concern his parents have is finding images in books that look like him.

	<i>Winston's parents are concerned that he does not speak as clearly about other concepts outside of dinosaurs and nature. He is ready to learn new concepts introduced to him formally or informally. He is well versed in the alphabets, numbers to twenty, colors, shapes, opposites and some aspects of the earth such as differences in night and day, cold and hot.</i>	
STEM talk	<p>Review Pages 14-17, 22 of Understanding STEAM and how children use it: https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/steam-ipdf.pdf</p> <p>Watch the video and share additional questions you might ask to initiate STEM talk with children on Padlet. Consider questions related to help support children in observing, making predictions, discussing, exploring and experimenting.</p>	<p>Select an RPM video from the above link:</p> <p>After watching the video, ask students: What are additional questions you might ask to initiate STEM talk with children and support their thinking? Ask students to use Jamboard, Padlet, or Google Docs to write down their response</p>
Learning STEM through different literacy/language opportunities	<p>Discuss the following questions in small groups and record your group responses on a Google Docs.</p> <ol style="list-style-type: none"> 1. Identify a learning opportunity in daily life (e.g., grocery shopping) 2. What adult can do to support literacy, language, and learning? 3. Share three adaptation ideas 	<p>Divide students into small groups. If in Zoom, use breakout rooms, and have students use Google Docs for small group discussion. If used as an out of class assignment, each group can record a presentation using FlipGrid or Google Slides.</p>

Children with Disabilities

Resources

From STEMIE:

STEMIE website includes a growing number of resources related to STEM for children with and without disabilities. Find tipsheets on having storybook conversations with young children and making adaptations for children with disabilities (as referenced in the language and literacy section above), blog posts, and much more: <https://stemie.fpg.unc.edu/> Some highlighted resources include the following:

15-minute mini lectures on strategies to support young children with disabilities in STEM learning:

STEM Instructional strategies for young children with disabilities (Presenters: Jessica Hardy, PhD (University of Illinois at Urbana-Champaign) and Bonnie Ingelin, PhD (University of St. Thomas): <https://stemie.fpg.unc.edu/stemiefest/stem-instructional-strategies-young-children-disabilities>)

STEM for Children with Autism and Online Learning Resources (Presenters: Ann Sam, Jessica Dysktra Steinbrenner, Kara Hume, FPG Child Development Institute, School of Education, UNC-Chapel Hill): <https://stemie.fpg.unc.edu/stemiefest/stem-children-autism-and-online-learning-resources>)

Changing attitudes and beliefs:

From Zero to Hero video: Meet Alex, a fifth-grader, who found math challenging when he was younger. He is now acing Math classes with a little help from a calculator and lots of encouragement and support from people who believe in what he can do: <https://stemie.fpg.unc.edu/zero-hero-calculator-and-supports>

STEM Talkable podcast: In this first episode of STEM talkABLE podcast, Lily and Robyn share their stories and struggles in STEM learning. Robyn shares her fears of Lily failing, while Lily shares how she doesn't want to be treated differently because of her disability. <https://stemie.fpg.unc.edu/stem-talkable-podcast>

Just the facts:

Harradine, C. & Lim, C.-I. (2020). *What do we know about STEM learning for young children (ages birth to five years) with disabilities?* Chapel Hill, NC: STEM Innovation for Inclusion in Early Education. Retrieved from: <https://stemie.fpg.unc.edu/what-do-we-know-about-stem-learning-young-children-ages-birth-five-years-disabilities>

From Recommended Practices Modules videos

Child who is blind and teacher using a tactile book to count: <https://rpm.fpg.unc.edu/resources/video-3-5-shared-storybook-reading>

Playing with blocks: <https://rpm.fpg.unc.edu/resources/video-1-9-block-play>

Mealtime: <https://rpm.fpg.unc.edu/resources/video-6-6-practicing-target-skill-pizza>

Child with visual impairment in a ballpool: <https://rpm.fpg.unc.edu/resources/video-1-8-ball-pool>

Water and trucks play: <https://rpm.fpg.unc.edu/resources/video-1-7-water-and-dirt-play>

From CONNECT Modules videos

Blocks (toddlers): <https://connectmodules.dec-sped.org/connect-modules/resources/videos/video-1-7/>

Block play: <https://connectmodules.dec-sped.org/connect-modules/resources/videos/video-1-9/> (shown during webinar)

Water play: <https://connectmodules.dec-sped.org/connect-modules/resources/videos/video-1-10/>

Topic	Description of Assignment/Activity	Notes for Instructor
<p>Reframing attitudes and beliefs</p>	<ol style="list-style-type: none"> Review the “From Zero to Hero” video (see link above) and also review mythbusters 1 and 2: https://stem4ec.ning.com/blog/Mythbuster. Review the information below about Ms. Amy and Shawntell, then (i) pick three of Ms. Amy’s perspectives to reframe, (ii) post your reframed perspectives on the discussion board, (iii) reflect on your own perspectives on STEM, and (iv) respond to one peer’s reflection and/or reframed perspectives. <p><i>Ms. Amy is a preschool teacher in a community childcare program. She works hard at ensuring children have school readiness skills by the time they leave her program. She offers a lot of opportunity for free play but also provides some teacher-directed activities such as storybook reading. She provides free play activities such as housekeeping, blocks, and a water table. Her director wants her to incorporate STEM into the curriculum but Ms. Amy doesn’t know how.</i></p>	<p>You may also use the activity as a pre/post course to understand if learners’ attitudes and beliefs may have shifted about STEM learning.</p> <p>You may also have learners consider Ms. Amy’s ability to incorporate STEM and also the children’s and Shawntell’s ability to learn STEM at the beginning of the course and at the end of the course. Learners could enter their responses to Jamboard or Padlet, and as a class, you could discuss and contrast the differences in responses pre/post.</p>

	<p><i>She and her assistant teacher, Ms. Li have a class of twenty children, including three-year old Shawntell, a joyful and curious child who has Down syndrome. Shawntell's parents, and older brother Ty are always eager to learn how they can support her to achieve her full potential. Her older brother Ty for example loves science and building, and the family told Ms. Amy that Shawntell is always interested in what he is doing.</i></p> <p><i>Shawntell attends Ms. Amy's class each day, where she receives her services. Delays have been identified in all domains of development. Her speech-language pathologist is working with Ms. Amy, and family to support Shawntell's early speech and language development. Help Ms. Amy reframe her perspectives about STEM learning.</i></p> <table border="1" data-bbox="430 600 1379 966"> <thead> <tr> <th data-bbox="430 600 919 641">Ms. Amy's Perspectives</th> <th data-bbox="919 600 1379 641">Reframe</th> </tr> </thead> <tbody> <tr> <td data-bbox="430 641 919 711">1. I can't teach STEM because I was really bad at math.</td> <td data-bbox="919 641 1379 711"></td> </tr> <tr> <td data-bbox="430 711 919 781">2. Shawntell and her classmates are too young to learn STEM.</td> <td data-bbox="919 711 1379 781"></td> </tr> <tr> <td data-bbox="430 781 919 850">3. Given Shawntell's delays, she would not be able to do STEM.</td> <td data-bbox="919 781 1379 850"></td> </tr> <tr> <td data-bbox="430 850 919 920">4. We should only focus on Shawntell's language.</td> <td data-bbox="919 850 1379 920"></td> </tr> <tr> <td data-bbox="430 920 919 966">5. Girls do not like STEM.</td> <td data-bbox="919 920 1379 966"></td> </tr> </tbody> </table>	Ms. Amy's Perspectives	Reframe	1. I can't teach STEM because I was really bad at math.		2. Shawntell and her classmates are too young to learn STEM.		3. Given Shawntell's delays, she would not be able to do STEM.		4. We should only focus on Shawntell's language.		5. Girls do not like STEM.		
Ms. Amy's Perspectives	Reframe													
1. I can't teach STEM because I was really bad at math.														
2. Shawntell and her classmates are too young to learn STEM.														
3. Given Shawntell's delays, she would not be able to do STEM.														
4. We should only focus on Shawntell's language.														
5. Girls do not like STEM.														
<p>Considering adaptations and modifications</p>	<ol style="list-style-type: none"> 1. Review mini-lecture, STEM Instructional strategies for young children with disabilities and/or STEM for Children with Autism and Online Learning Resources (see link above). 2. Select a persona of a child with disabilities (see link above), develop a plan (including adaptations and modifications) for how to engage in STEM during classroom and home routines. Use a child activity matrix, e.g., Handout 1.12: Child Activity Matrix (blank) https://www.connectmodules.dec-sped.org/wp-content/uploads/2019/04/DECHandout-1.12-Blank-child-activity-matrix.pdf 	<p>Emerson, Josiah, Marcus, or Jake are possibilities for preschoolers</p> <p>Razae, Shawntell, and Kingston are possibilities for infants/toddlers</p>												

Using video clips for reflection and discussion	<p>Select and review a video from RPMs/Connect (see links above), then</p> <p>(i) reflect on how the adult could take further advantage of children’s interest?</p> <p>(ii) What might be some talk to engage children’s STEM thinking and extend their learning? Think about <i>additional activities/experiences to</i>:</p> <ul style="list-style-type: none"> • <i>Deepen their understanding</i> • <i>Extend their understanding to other relevant and related concepts</i> • <i>Connect it to their everyday lives</i> <p>(iii) Consider any adaptations/modifications needed: e.g., environment, materials and instruction</p> <p>(iv) Share your ideas on Jamboard</p>	You may assign groups of learners to review a different video and set up a Jamboard for each video. Don’t forget to set the ‘Share’ to public and edit rights so that learners can access and add to the Jamboards. You may also use this as part of an online discussion.
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Infants and Toddlers

Resources
<p>From STEMIE:</p> <ul style="list-style-type: none"> • Tip sheets that include specific question prompts, related activities, and adaptations that you can use for storybooks related to STEM to use with infants and toddlers: https://stemie.fpg.unc.edu/resources?f%5B0%5D=field_developmental_stage%3A1 • Blog post on supporting young children in STEM learning within routines and activities at home: https://stem4ec.ning.com/blog/enhance-stem-learning-and-participation-for-young-children-with-d <p>Infants and Toddlers Block Play: STEM in the Blocks Center Iowa Regents Center for Early Developmental Education https://regentsctr.uni.edu/sites/default/files/activity_sheets/Infants_and_Toddlers_Block_Play_Activity_Sheet_Final.pdf</p> <p>From Too Small Too Fail:</p> <ul style="list-style-type: none"> • Let’s Talk, Read and Sing about STEM! Tips for Infant/Toddler Teachers & Providers https://www2.ed.gov/about/inits/ed/earlylearning/talk-read-sing/stem-toolkit-infant-toddler-teachers.pdf • STEM Moments: Everyday Fun With Science http://toosmall.org/resources/Everyday-Fun-With-Science.pdf • STEM Moments: Everyday Fun With Engineering and Technology

<http://toosmall.org/resources/Everyday-Fun-With-Engineering.pdf>

- **Video: Everyday Fun with Science**
<https://talkingisteaching.org/resources/lets-talk-about-stem-video-science>
- **Let's Talk About Math**
<http://toosmall.org/lets-talk-about-math>
- Additional videos (in collaboration with Zero to three): <https://www.zerotothree.org/resources/series/let-s-talk-about-stem-video-series>

From ECLKC:

- **News you can use: Early Science learning for infants and toddlers:** <https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/nycu-early-science.pdf>
- **Infant/Toddler STEAM Series:** <https://eclkc.ohs.acf.hhs.gov/school-readiness/teacher-time-series/infanttoddler-steam-series>

From Recommended Practices Modules videos:

- <https://rpm.fpg.unc.edu/resources/video-1-1-infants-and-toddlers>
- <https://rpm.fpg.unc.edu/resources/video-1-2-infants-and-toddlers-2>
- <https://rpm.fpg.unc.edu/resources/video-1-4-child-mother-and-toy>
- <https://rpm.fpg.unc.edu/resources/video-6-5-instructional-supports-blocks>
- <https://rpm.fpg.unc.edu/resources/video-6-7-everyday-activities-ducks>
- <https://rpm.fpg.unc.edu/resources/video-1-6-water-play> (Video shown during webinar)

Assignment Ideas			
Topic	Description of Assignment/Activity		Notes for Instructor
Embedding STEM into the daily routine	<ol style="list-style-type: none"> 1. Students review handouts and videos from Too Small To Fail (see above) 2. Students are assigned or choose an age group (e.g., B-12 month, 12-24 months, 24-36 months). 3. Using an activity matrix (see sample below), students develop a STEM activity appropriate for their age group for each part of the routine. 4. Criteria could include: <ol style="list-style-type: none"> a. The activity only uses materials that are generally available in homes or classrooms. b. Activities are developmentally appropriate c. Adaptations are provided for a child with a disability (see instructor note) 		<p>Students would complete the review of resources and matrix as a homework assignment. They could then be asked to share their activities in-class or online so that all students would end up with a repertoire of STEM activities for the B-3 age range.</p> <p>Students could use a persona of an infant or toddler with a disability and include adaptations appropriate for that child for each activity.</p>
	Routine	Activity & Materials	

	Breakfast			
	Playtime			
	Outdoors			
	Bathroom/diapering			
Outdoor Challenge	Have students imagine they are taking a small group of toddlers on a nature walk on a beautiful sunny day. Give them five minutes to write down the STEM concepts they could teach using only the naturally occurring materials they find on the walk (e.g., big and little with stones, alike and different with leaves, shade/sun/shadows), then have each of them share back an idea.			This activity can be used in class to catalyze discussion or as an online discussion board activity. An alternative would be to ask the same question but instead of an outdoor activity, they could focus on how many concepts they could teach using the sand or water table in the classroom.
Using video clips for reflection and discussion	Select and review a video from RPMs (see links above), then <ul style="list-style-type: none"> (v) reflect on how the adult could take further advantage of children’s interest? (vi) What might be some talk to engage children’s STEM thinking and extend their learning? Think about <i>additional activities/experiences to:</i> <ul style="list-style-type: none"> • <i>Deepen their understanding</i> • <i>Extend their understanding to other relevant and related concepts</i> • <i>Connect it to their everyday lives</i> (vii) Consider any adaptations/modifications needed: e.g., environment, materials and instruction (viii) Share your ideas on Jamboard 			You may assign groups of learners to review a different video and set up a Jamboard for each video. Don’t forget to set the ‘Share’ to public and edit rights so that learners can access and add to the Jamboards. You may also use this as part of an online discussion.

Educational Technology

Resources to help young children use and apply foundational concepts of computational thinking

From WGBH Kids and Jam Media:

- AHA Island: Computational Thinking Resources for Families and Educators (website with hands-on activities to share with your students). Includes two educator guides – one for libraries and one for leading parent-child playgroups
 - <https://ahaisland.org/>

From WGBH Kids:

- WGBH Kids: Supports to share with your students for preschool educators to teach computational thinking
 - <https://wgbhkids.com/>
- Story Emporium (Apps designed for helping children understand story sequences) Includes app for educators:
 - <https://demo.wgbhdigital.org/ahaisland/storyemporium/v20/?app=teacher>

From WGBH Kids and 9 Story Entertainment in association with TV Ontario:

- Peep and the Big Wide World: Website to help teach young children about STEM; includes specific activities for educators:
 - <http://peepandthebigwideworld.com/en/educators/>

Topic	Description of Assignment/Activity	Notes for Instructor
Sequence/Algorithms in Daily Activities	<p>Consider introducing this activity with a discussion of everyday “algorithms”. You could ask students to describe a simple step-by-step task such as making a peanut butter and jelly sandwich to help illustrate the importance of each step and the order each step is completed.</p> <p>Use the persona below and ask students to design an activity to target the completion of a set of steps in the accurate order. Encourage them to consider expanding on the activity by developing a plan to help the child develop her own “algorithm”.</p> <p><i>Alaina is a 4-year-old girl who lives with her mom, dad, and little brother. Alaina was born with bilateral, sensorineural, severe-profound hearing loss. This means she is deaf in both ears. At the age of 10 months, Alaina received cochlear implants which enable her to hear. Alaina and her parents were enrolled in their state’s Early Intervention program from the time she was born to the age of three. Now Alaina receives early childhood special education services in an inclusive classroom with her peers. Her inclusion is supported through</i></p>	<p>Help students learn the everyday application of step-by-step sequences or “algorithms”.</p>

	<p><i>services she and her teacher receive from a Teacher of the Deaf/Hard of Hearing (TOD) and a Speech-Language Pathologist (SLP).</i></p> <p><i>Alaina loves to play and is very social with her peers. She plays with all the children in her classes but also has special friends who she prefers. Her interests include play-doh, baby dolls, playing chase games outside, and anything pink! Alaina is interested in books and has the attention to listen to long stories but sometimes has a hard time remembering all the details.</i></p> <p><i>Often, because Alaina is very socially competent, it can be difficult to notice when Alaina is struggling in the daily classroom routines. She is able to follow other children's lead when she doesn't hear the directions or can't understand what is being said. Sometimes Alaina struggles to follow step by step instructions. She doesn't always know what comes first, next, and last. Alaina's expressive language is very good but she sometimes is missing the beginnings or ends of words – especially softer sounds.</i></p>	
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STEM-related Personas Referred to During Webinar

Winston



Winston is a three year old oftentimes referred to as “Sir”. He lives with his parents who are of Native American and African American descent. He is an only child in the household. The family dynamics are richly based in culture consistent to morals and being authentic. Winston’s obsession with dinosaurs has evolved over the past two years. He is very strong in learning about dinosaurs and incorporating “his favorite” T-Rex in his learning and social environment. He loves to share his adventures with family and friends through literacy and play. Another strong emphasis Winston has is science. His mother is a strong advocate for literacy by which books are read to him daily. Winston has evolved in his reading by identifying objects, some words, and talking about the images he sees in the books. The concern his parents have is finding images in books that look like him. Winston’s parents are concerned that he does not speak as clearly about other concepts outside of dinosaurs and nature. He is ready to learn new concepts introduced to him formally or informally. He is well versed in the alphabets, numbers to twenty, colors, shapes, opposites and some aspects of the earth such as differences in night and day, cold and hot.

Possible discussion questions:

What might be evidence-based strategies for expanding Winston’s interests?

How would you support Winston’s language and literacy using materials that are both mirrors (reflect who he is and his interests in STEM) and windows (offer insights to other perspectives, topics, and vocabulary)?

How would you partner with Winston’s family to support his language and literacy development?



Joseph

Not Joe, Joseph, he will tell you, as he is the third Joseph in his family, and using his full name is a tradition. With a younger sister coming behind him, he is continuing a family tradition of learning and education. Joseph's mother and father both completed advanced degrees and are eager to understand how they can support him in achieving his full potential.

Joseph's family can trace their roots in North Carolina back several generations to the era of slavery. They take pride in sharing the stories of both their roots and their aspirations. In fact, carrying the stories of the past forward is a commitment Joseph's family shares both at home and in their place of worship.

In his Kindergarten classroom, Joseph is quick to raise his hand when he knows the answer. He is fascinated with any aspect of science – animals, planets, dinosaurs, etc. But reading is not Joseph's favorite thing. When it's time to focus on reading, Joseph tunes out. When his family has asked him about this, his response has been that reading is "boring" and doesn't relate to him. Joseph's teacher is very concerned about his lack of interest in the reading curriculum.

Alaina



Alaina is a 4-year-old girl who lives with her mom, dad, and little brother. Alaina was born with bilateral, sensorineural, severe-profound hearing loss. This means she is deaf in both

ears. At the age of 10 months, Alaina received cochlear implants which enable her to hear. Alaina and her parents were enrolled in their state's Early Intervention program from the time she was born to the age of three. Now Alaina receives early childhood special education services in an inclusive classroom with her peers. Her inclusion is supported through services she and her teacher receive from a Teacher of the Deaf/Hard of Hearing (TOD) and a Speech-Language Pathologist (SLP).

Alaina loves to play and is very social with her peers. She plays with all the children in her classes but also has special friends who she prefers. Her interests include play-doh, baby dolls, playing chase games outside, and anything pink! Alaina

is interested in books and has the attention to listen to long stories but sometimes has a hard time remembering all the details.

Often, because Alaina is very socially competent, it can be difficult to notice when Alaina is struggling in the daily classroom routines. She is able to follow other children's lead when she doesn't hear the directions or can't understand what is being said. Sometimes Alaina struggles to follow step by step instructions. She doesn't always know what comes first, next, and last. Alaina's expressive language is very good but she sometimes is missing the beginnings or ends of words – especially softer sounds. In addition, it is difficult for Alaina to learn new words quickly.

Alaina is getting ready to transition to Kindergarten next year. Her mother and father are concerned about Alaina keeping up academically especially as things become more difficult. Alaina is not confident in asking for help and she can get lost in the shuffle. How can Alaina's teachers develop an IEP that will give Alaina the necessary supports to be successful in Kindergarten? What goals and strategies are important for Alaina?

Possible Discussion Questions

- If you were Alaina's teacher, what would you identify as important goals for her IEP to guarantee her continued success as a learner? For example, what evidence-based practices might support Alaina in learning to ask for help? What suggestions do you have for incorporating those goals in daily routines and activities in a kindergarten classroom? What practices or strategies might support those goals (e.g., peer supports)?
- When the goals, practices, and strategies you identified are implemented in Alaina's classroom, what might the possible benefits be for the other children in the class