

Discussion Guide for Module 19: Early STEM Learning

Module run time: 25 minutes

Estimated time to complete the module with discussion guide: 45-60 minutes

Below are recommended stopping points and suggested questions to use in your group's discussion. Please feel free to follow your group's lead and discuss topics and questions that are of greatest value to the group!

Key points:

- It is important to build children's STEM (science, technology, engineering, and math) skills starting at an early age so they become fluent.
- Parents/teachers can provide children with a variety of STEM materials and activities, and ask questions about what children observe and expect.
- Doing STEM activities with other people can help children enjoy STEM.

Module synopsis:

Page 1: *Title Page – Early STEM Learning*

Page 2: *Acknowledgments*

Page 3: *Every Child is a Scientist*

Page 4: *What is STEM?*

Page 5: *Becoming Fluent in STEM*

⦿ Recommended stopping point

- Some adults are excited about doing STEM activities with children, while others are anxious. How do you feel about STEM?
- How do you talk about STEM with children? Do you think children can detect your own feelings about STEM from your interactions with them?
- What kinds of STEM activities do you already do with children? Would you like to do more?
- Some children are naturally drawn to STEM, while others are not. Do you think it is worthwhile to encourage all children to develop STEM skills?

Next we are going to watch a series of videos of children engaging in STEM activities. As you watch, write down your reactions and any thoughts or questions you might like to ask or share.

Page 6: *Science*

Page 7: *Science – Video*

Page 8: *Scaffolding Science*

⦿ Recommended stopping point

- Do you have any reflections or questions to share?
- What materials do you have in your home, classroom, or center that can encourage science exploration and learning? Are there other materials you would like to get?

Page 9: *Technology*

Page 10: *Technology – Video*

Page 11: *Scaffolding Technology*

⦿ Recommended stopping point

- Do you have any reflections or questions to share?
- Often, we think of phones and computers as technology, but simple tools like rolling pins are technology too! What simple tools do you already use with children everyday? How could you talk about technology with children as you are using these tools together?

Page 12: *Engineering*

Page 13: *Engineering – Video*

Page 14: *Scaffolding Engineering*

⦿ Recommended stopping point

- Do you have any reflections or questions to share?
- Building forts or block towers is a great way to explore engineering with young children – but it isn't the only way! What are some other ways to explore engineering together?

Page 15: *Math*

Page 16: *Math – Video*

Page 17: *Scaffolding Math*

⦿ Recommended stopping point

- Do you have any reflections or questions to share?
- Math is everywhere. What do you do (or could you do) to incorporate math into everyday interactions?
- Do you encourage the children you interact with to develop skills in all STEM areas equally? Are there areas that you think you should focus on more? Brainstorm some specific activities you would like to do in the future.

Page 18: *Social Connections Boost Motivation*

Page 19: *Social Connections Boost Motivation (2)*

Page 20: *Girls and STEM*

Page 21: *Charging Up*

Page 22: *Summary*

⦿ Final Discussion points

- Why do you think social connections boost children's motivation? Have you observed social connections supporting children's learning? How could you make STEM activities more social for children?
- Why do you think more young men than young women go into STEM fields like computer science and engineering? Do you think you give the same opportunities and encouragement to girls and boys in STEM? What ideas do you have for supporting more equal engagement with STEM?

To learn more about early STEM learning, take a look at these resources:

The National Association for the Education of Young Children provides many early childhood STEM education resources for teachers and families:

<http://www.naeyc.org/STEM>

Explore tips to help encourage young children's exploration of science from the National Science Teacher's Association:

<http://nstacommunities.org/blog/2010/03/01/preschool-stem/>

This toolkit from the US Department of Education has information about STEM for families with infants, toddlers and preschoolers:

<http://www2.ed.gov/about/inits/ed/earlylearning/talk-read-sing/stem-toolkit-families.pdf>

Zero to Three and Too Small to Fail created a series of videos about using STEM, and math in particular, during everyday interactions:

<http://toosmall.org/lets-talk-about-math>

The Boston Children's Museum developed a STEM Teaching Guide and Parent Tip Sheets with information and activities:

<http://www.bostonchildrensmuseum.org/stem-sprouts>

We are constantly working to improve our materials. Do you have suggestions about topics to add to this guide? Did your group discuss something we didn't suggest? We'd love to hear from you! Please email your thoughts to us at ilabsout@uw.edu.