

# LEGO BLOCK CODING

DISCOVERY PLAY ACTIVITIES WITH YOUR YOUNG CHILD

Every child is different, and these are only suggested adaptations and activities. Do what works best for encouraging your child's independent exploration during this suggested play activity. Consult your pediatrician, physical therapist (PT), and/or occupational therapist (OT) first.



**STEM Concept(s):** Sequencing, Patterns, Counter

Help your child understand what computational thinking concepts like sequences. Lego blocks are excellent materials to target STEM activities. Help your child create, build, and imitate structures, by using Legos to create patterns and sequences.

## STEM IDEAS/WORDS

- Shapes
- Pattern/Sequence
- Numbers/Symbols
- Predict
- Colors
- Counting

## MATERIALS

- Legos or a similarly connecting block

## Key STEM Progression Steps

Science	Computational Thinking (Technology)	Engineering	Math
At the STEMIE center, technology refers to computational thinking. Technology is the introduction of underlying concepts of building or creating technology, including computational thinking, which is the basic logic underlying computer science (U.S. Department of Ed/U.S. Department of Health and Human Services, 2016).			



# LEGO BLOCK CODING ADAPTATIONS

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## ENVIRONMENT

- If possible, limit background noise & distractions
- Use modified or flexible seating
- Place Lego blocks on an anti-slip mat or in a container or tray within reach

## MATERIALS

- Have child's assistive technology ready and available, including augmentative & alternative communication (AAC) device
- Use large blocks that are easier to grasp and manipulate
- Use blocks that are bright with contrasting colors and sizes so that children can differentiate
- Use stabilizing mats or Velcro for lining up contrasting materials in patterns
- Provide blocks with different sizes, textures, and colors

## INSTRUCTION

- Use a variety of methods of communication (e.g., sign language, gestures) to meaningfully engage children
- Use pictures and/or icons to signal next steps (see following card for an example) and/or each step of the sequence
- Provide prompts and modeling to help the child create a patterned sequence and help the child imitate



*Follow your child's lead and interests. Enthusiastically ask your child questions about what they are doing and what they like.*



*Answer your child's questions. If you do not know the answer, work together with your child to discover the answer.*



*Encourage your child to participate in the activity as much as possible. Praise your child's efforts and successes.*

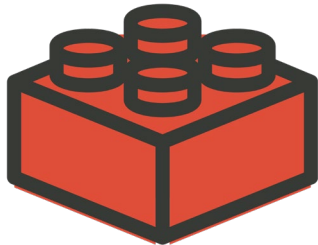


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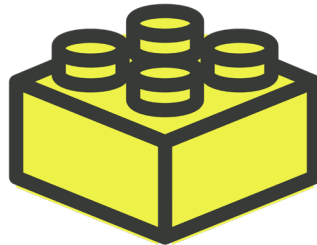
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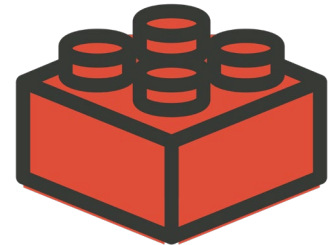
## VISUAL CUES: USE TO SIGNAL NEXT STEPS



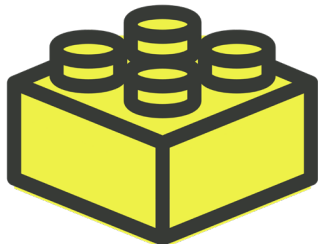
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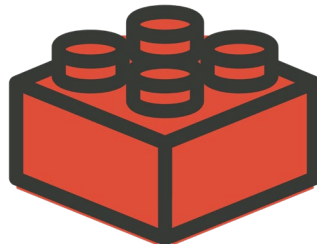
Yellow



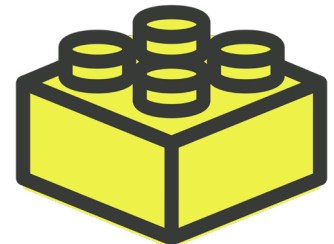
Red



Yellow



Red



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# ACTIVITY PROMPTS

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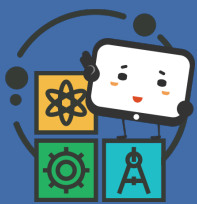
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## TECHNOLOGY

**Computational Thinking:** Repetition is doing an action over and over again. Looping is running a sequence of instructions over and over again until an end point is reached. Sequencing is doing the steps of an activity or task in a particular order. Debugging is the process of recognizing and removing errors.



Short Name	Progression Step	Cultivate Understanding (What to do, words to introduce, questions to prompt exploration)
<b>Sequence Completer</b>	Completes two-step tasks, prompted or unprompted	Play simple imitation games like Simon Says where your child can follow 1-2 steps. <i>"First wiggle, then clap."</i>
<b>Step Recognizer</b>	Recognizes that there are steps in a sequence	Encourage your child to lead imitation games like Simon Says. <i>"What should we do first, then what? Can we do them together?"</i>
<b>Simple Sequencer</b>	Creates and completes an ordered sequence of steps using simple representation (pictorial, verbal, or with physical cues) <i>Note: Depending on the culture, will need experience with reading order (left to right, right to left, vertical)</i>	Use visual cues card (see following card) to create a series of movements/steps represented by block colors. The child can also decide what each block color represents. <i>"What comes next? Then?"</i>
<b>Complex Sequencer</b>	Creates and completes an ordered sequence of steps using complex representation (i.e., language, pictures, symbols)	Encourage your child to create their own sequences of movements/activities with colors. <i>"What would your name look like (spelled out OR Lego blocks with assigned letters)?" "What is this Lego block pattern/sequence saying?" "Can you create a 'secret message' for (name)?"</i>
<b>Sequence Planner</b>	Plans steps to take to perform a sequence prior to creating or completing steps. May check steps for errors.	Help your child develop a "codebook" where they store the information about which color block means what. Then ask them to design a dance (a series of the movements). Try it out and encourage them to fix anything that doesn't work.
<b>Early Decomposer</b>	Understands that there may be more than one sequence of steps that completes a task	During a playdate with others, encourage children to create "dances" with series of movements represented by Lego blocks. Have each child perform and talk about how each team made a dance even though they may have used different blocks and/or movements.



# LEGO BLOCK CODING EXTENSIONS

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- Have the created patterns mean movements (hop, clap, stand) and act out the pattern
- Record different "codes" creating a large "codebook" (can be visuals, slides, notes, etc.) to document different dances the children have created
- Extend the idea to different play and daily activities, *"Can you tell me the steps I need to take to feed the baby? How can I remember what order they go in?"*
- Check out these great books about the patterns:
  - *Pattern Breakers* by Daniel Finkel
  - *My First Book of Patterns* by Bobby & June George
  - *Pitter Pattern* by Joyce Hesselberth

