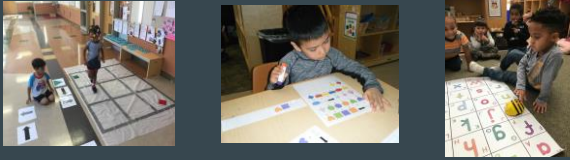# Coding in Preschool

Ritenour School For Early Childhood Education
Michelle Miller and Stephanie Phillips
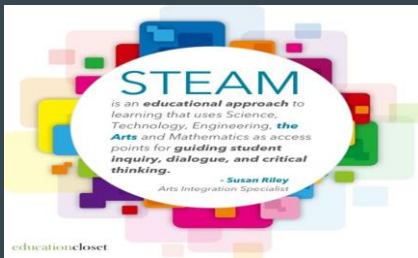
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Today's Agenda

- STEAM
- What is Coding
- Interactive Coding without Technology
- Technology Based Coding
- Time to Explore
- Q & A and Giveaway

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What is STEAM?

STEAM is an *educational approach* to learning that uses Science, Technology, Engineering, *the Arts* and Mathematics as access points for *guiding student inquiry, dialogue, and critical thinking.*

- Susan Riley
*Arts Integration Specialist*

educationcloset

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Why STEAM?

- "Research shows that the earlier we guide and support children's wonder about the world--and thereby identify opportunities for children to acquire foundational STEM skills--the more successful they are in all areas of learning later on in life."- NAEYC
- The National Science Board (NSB; 2010): U.S. economic Although 28% of college students begin as STEM majors, about half will either switch majors or drop out of school before graduating (Chen & Soldner, 2013).
- Half of all current jobs will be done by a computer or robot by 2030, although there are now 500,000 open jobs in computer science. There are only 40,000 new CS majors graduating nationwide (Washington Post, December 16, 2016).
- Early exposure to STEM supports children's overall academic growth, develops early critical thinking and reasoning skills
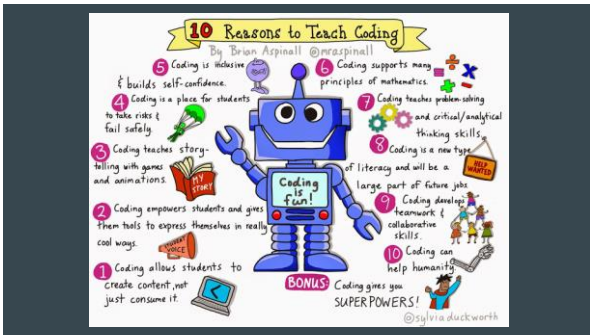
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Design Thinking Process
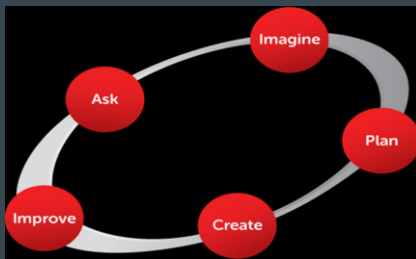
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4 Parts of STEAM

- Novel Engineering
- Architecture
- Life Science
- Coding

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Benefits of Coding

- Coding activities give students the opportunity to practice numbers, language, critical thinking, and positions.

- Vocabulary: **coding, programming, programmer, input/output, play,** loop/repeat, computational thinking, algorithm

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Missouri Early Learning Standards

Number operations
- Solves problems using numbers
- Uses numerical representation

Speaking - Expressive Language
- Uses expanded vocabulary

Physical Science
of   - Solving problems involving physical properties

objects

Geometry Spatial Sense
- Investigates positions and locations

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What does Coding look like?

1. Students write a code to get the robot/character from one space to another to reach a final destination or to complete certain actions.
2. Students input the code into the computer (if programming a computer).
3. Students test the code.
4. Students revise the code if needed.

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Interactive Coding without Technology

- Grid Coding
- Action Coding
- Earthworm Coding
- Name Coding
- Family Coding
- Partner Coding

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Grid Coding -graphing activity

- Learning Target:
    I can create a code using left, right, up, and down positions.

- Materials needed:
        Book: This Book is Out of Control! By Richard Byrne
    3x3 Graph
        Green and red bean bag
        8x11 prints of up/down, left/right arrows, and start/stop button

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Grid Coding, cont'd

1. Read the book and discuss.

2. Group discussion of games the students play to relate to real life and how the games are played.

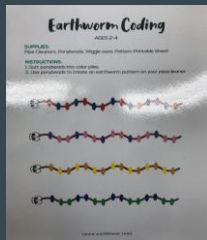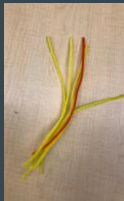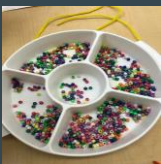3. Introduce graph, bean bags, 8x11 prints

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Action Coding

Students use movements to create a code using action cards.

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Earthworm Coding Materials

A color code is created using pony beads and pipe cleaners.

Created by
www.sixthbloom.com

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Earthworm Coding

Created by
www.sixthbloom.com

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Name Coding Materials

Students use a key of shapes
to code their name.

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Name Coding

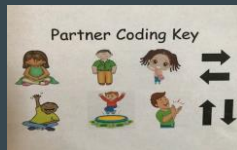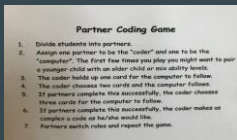Students use a key of shapes
to code their name.

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Family Coding

Students use their family members to create a code.

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Partner Coding Materials

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Partner Coding

Collaborating with a partner to create and act out a sequence of codes.
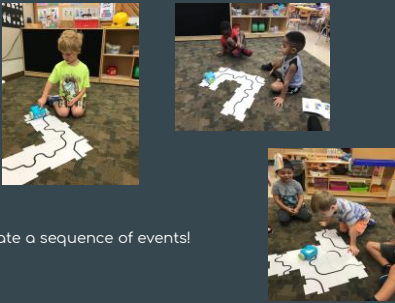
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Technology Based Coding

- Botley the Robot
- Code-a-Pillar
- Bee Bot
- Osmo Coding with Awbie
- Osmo Coding Jam

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Botley

Robot used to create a sequence of events!

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Code-a-pillar

Develops important skills such as problem solving, planning, sequencing and critical thinking.
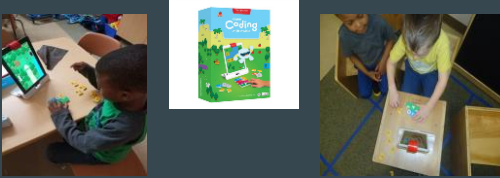
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Bee Bot

Teachies sequencing, estimating, and problem solving while learning pre-academics.

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Osmo Coding with Awbie

An iPad game created to teach children how to code.

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Osmo Coding Jam

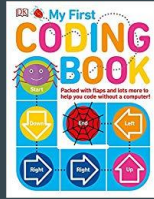An iPad game created to teach children how to create music through coding.

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Books to Use with Coding

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Contact Information

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