Objectives

- Learn what computational thinking is, especially in early childhood.
- Be able to make connections between early literacy and computational thinking skills.
- Learn how computational thinking can be introduced in library programs for young children using unplugged and digital activities.
Exercise

Grab a piece of paper and writing instrument.

Draw a “house”. (60 seconds on the clock!)
What is Computational Thinking?

A process that can be used to develop and implement solutions to big, complex problems.
“Computational thinking allows us to take a complex problem, understand what the problem is and develop possible solutions. We can then present these solutions in a way that a computer, a human, or both, can understand.” --Jeannette Wing (2006)
Why Young Children?
“A computational thinker sees computation as more than something to consume; computation is something they can use for design and self expression. A computational thinker sees computation as a medium and thinks, ‘I can create and I can express my ideas through this new medium.”

-Karen Brennan & Mitchel Resnick
## Early Literacy

“what children know about communication, language (verbal and nonverbal), reading and writing before they can actually read or write.”

-Katie Campana, Liz Mills & Saroj Ghoting

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### The Ready Readers

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<th>Skills</th>
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Thinking Sideways

- Early Literacy Skills
  - Phonological Awareness
  - Print Awareness
  - Print Motivation
  - Vocabulary
  - Background Knowledge
  - Letter Knowledge

- Computational Thinking Skills
  - Decomposition
  - Pattern Recognition
  - Abstraction
  - Algorithm Design
Breakdown of CT for Young Children

Image: https://www.bbc.com/education-guides/zxxbgk7/revision/1
**Skill:** Identifying and classifying similarities.

**Practice:** “Simon Says.”
**PR... in the library**

**Share:** *Lost. Found.* by Marsha Diane Arnold and Matthew Cordell

**Design:** Quiet Blocks Building Challenge

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**Hints:**
- How many layers does it have?
- How many blocks are in each layer?
- Do you see a pattern?
- Which shape of blocks are used in each layer?

**Grown-ups:** Help your child grow their computational thinking skills by asking them problem solving questions as they try to build a similar tower.
PR... at home

Share: Round is a Mooncake by Roseanne Thong and Grace Lin

Explore: Go on a color or shape scavenger hunt! Look for a specific color or shape, red or triangles for example, in different places you visit around town.
CT: Decomposition

Skill: Breaking larger actions into smaller, easily completed steps.

Practice: Singing and clapping words to break them down into syllables.

Twinkle, Twinkle, Little Star

Twinkle, twinkle, little star
How I wonder what you are
Up above the world so high
Like a diamond in the sky
Twinkle, twinkle, little star
How I wonder what you are
Decomposition... *in the library*

**Share:** *I Got the Rhythm* by Connie Schofield-Morrison and Frank Morrison

**Tinker:** Make music with playdough and a Makey Makey

Image: Homer Public Library
Decomposition... at home!

Share: *The Red Hen* by Rebecca Emberley and Ed Emberley

Make: Put a lunch together! Talk about the different parts of the meal you want to share. For example, will you include a sandwich, soup, fruit or a specific drink?

Image: Macmillan
**CT: Algorithm Design**

**Skill**: Following a specific order of actions to complete a task.

**Practice**: Share sequential stories like *Go Away Big Green Monster*, *Tickle Monster*, *Dog’s Colorful Day*, or *Lola at the Library* with props.
AD... in the library

Share: Tap the Magic Tree by Christie Matheson

Design: Pick your favorite song and create a dance to match the rhythm. Teach the order of the steps to others. Think about when you want to start moving and if you want to repeat steps.
AD... at home!

Share: *Fort-Building Time* by Megan Wagner Lloyd and Abigail Halpin

Build: Build a fort at home, inside or outside, and talk about what steps need to happen in what order. Is some part of the design not working? Debug and fix it! Or explore seasons with Scratch Jr.

https://www.scratchjr.org/images/slide1.png
CT: Abstraction

Skill: Simplifying ideas to what is essential or important.

Practice: Retell stories like *The Three Little Pigs*, *Lion Lessons*, *Little Red and the Very Hungry Lion* with movement and props.

Image: Homer Public Library
Abstraction... *in the library*

**Share:** *Dreaming Up: a celebration of building* by Christie Hale or *Fire! Fuego! Brave Bomberos* by Susan Middleton Elya and Dan Santat

**Designing:** Choose a favorite story and share it through different medium: act it out with movement; write reader’s theatre scripts, retell it with your own words and pictures.
Abstraction... at home!

Share: How Raven Got His Crooked Nose: An Alaskan Dena’ina Tale by Barbara Atwater, Ethan Atwater and Mindy Dwyer

Create: Re-purpose household or found materials to make a raven mask. Talk about what a beak does, what characteristics it needs and what it should look like.
**CT Mindset**

“Yes!” Izzy said. “The right shape, perfect weight . . .”

“I’VE HAD IT!” yelled Izzy, heading straight for a bin. But the crow blocked her path. He just wouldn’t give in.

But ONE wing flapped madly.

The crow couldn’t fly straight.

Image: http://www.playingbythebook.net/2017/08/31/izzy-gizmo/
Art

Image: https://www.bbc.com/education/guides/zxxbgk7/revision/1

#thinkingsidewaysala
CT with families in Washington D.C.

Take Home Packet
Everyday materials ready for family engagement

Decomposition
Algorithm Design
Abstraction
Pattern Recognition
CT with families in Homer, Alaska

Images: Homer Public Library
Talking with Families about CT

Ready, Set, Think!

Unite early literacy and Computational Thinking concepts to gain early coding skills.

 libraries / ready to code

Pamphlet link: https://drive.google.com/file/d/19usKlQo_puzAcwMOG1Y_PQRbJx6X0ii/view?usp=sharing

Pamphlet link: https://drive.google.com/file/d/0B77T8RDGgL8e8YndhVlhEbkJRZmJyU2RBX3RmcVdyLWJwb09J/view?usp=sharing
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