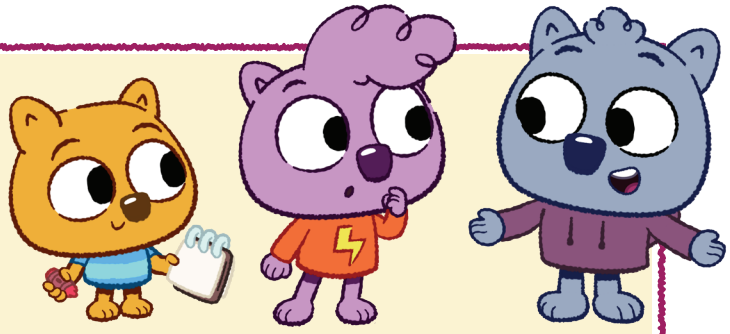
About Computational Thinking (CT) in Preschool and Kindergarten

Computational thinking, or CT for short, doesn't teach children *what* to think but *how* to think.

CT is a creative way of thinking that helps children solve problems and complete tasks in more organized ways, using a toolkit of skills from computer science.



All of us use CT every day!

We may not realize it, but we use computational thinking skills all the time—and not just when we're on a computer.

- When you try making a recipe better, you are using the CT skill called the ***design process***—you are creating, testing, and improving.
- When you replace the batteries in your TV remote because it isn't working, you are using the CT skill ***debugging***—you are thinking about how to fix the problem in a systematic way and coming up with a solution.
- When you run errands, you are using the CT skill of ***sequencing***—you are thinking about the tasks you need to do and are deciding which order to do them in.

Young children are already using CT skills too—when, for example, they try to debug a mechanical toy that isn't working, or when they break down the big job of helping set the table into smaller, more manageable tasks.

How CT benefits young children

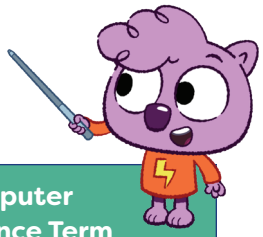
CT is something that can be nurtured at a young age, and it can be practiced without a computer. Just as children learn to sing the alphabet before they learn to read, they can learn basic CT skills.

CT is important for math, science, and literacy, and it can help children learn coding or computer programming when they are older. It also prepares young children for school success right from the start! Strengthening young children's CT skills helps them think more logically and effectively, fosters creative and flexible thinking, and encourages focus and perseverance. Here are a few examples of what it looks like when preschoolers and kindergartners use CT skills in the classroom. Using these skills helps them:

- **understand and follow directions**
- **take a step-by-step approach when completing tasks**
- **make plans and stick with them**
- **change those plans if there's a better approach**

While CT is an essential building block for STEM and literacy fields, few early childhood programs include it, particularly in under-resourced communities. *Work It Out Wombats!* aims to meet this need, bringing animated stories and engaging, hands-on experiences to young children that will help prepare them for the classroom and careers of the future.

Work It Out Wombats! introduces children to seven CT skills



CT Skill (name used in *Wombats!*)	Definition	Computer Science Term
Step It Out	Follow or create a set of steps in order to solve a problem, accomplish a task, or make something new.	Sequencing and Algorithmic Thinking
Break It Down	Break down problems and tasks into smaller parts to make them easier to do.	Problem Decomposition
Find or Make Patterns	Explore how objects, events, or steps can repeat in a predictable way (a pattern).	Pattern Recognition
Connect the Cause to the Effect	Explore how one action or event (cause) brings about another (effect).	Cause and Effect
Identify Important Details	Pick out important details of objects and use those details to categorize and sort the objects. Use symbols, pictures, or models (like a map or a street sign) to represent the important details.	Abstraction and Representation
Create, Test, Improve	Use a three-step process (create, test, improve) when you want to make something, like a work of art or an invention.	Design Process
Fix It!	Fix or improve solutions when they're not working the way you intended.	Debugging

When children solve problems, they often use more than one of these skills. But because it's easier for children to focus on one idea at a time, each *Wombats!* animated story and related hands-on activity highlights just one CT skill.

Work It Out Wombats! is produced by GBH Kids and Pipeline Studios.

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