Introduction

Everything you need to get started leading the preschool library program on computational thinking (CT), featuring the PBS KIDS TV show *Work It Out Wombats!*™

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Welcome Libraries!

Work It Out @ Your Library builds on *Work It Out Wombats!*, a national PBS KIDS series for preschoolers that features Malik, Zadie, and Zeke, three energetic wombat siblings who live with their grandmother in the fantastical "Treeborhood" apartment complex. Through their many adventures in the Treeborhood, the Wombats solve problems, accomplish tasks, and express their creative talents—while using the computational thinking (CT) skills that are at the core of computer science.

Malik

Malik is thoughtful, considerate, and great at making plans.

Zadie

Zadie is speedy, adventurous, and a brainstormer extraordinaire, with ideas that range from silly to smart.

Zeke

Zeke is the youngest. He's a funny, curious cuddlebug who loves to play and explore. He almost always has his adorable stuffie, Snout, by his side!

What Is Computational Thinking?

Computational thinking (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.

CT doesn't teach children *what* to think but *how* to think.

Why Libraries?

Library workers make a special contribution to children's lives by supporting early learning for children from diverse backgrounds. Traditionally, this learning has been focused on literacy. But in recent years, libraries have become more intentional about offering programs that help preschoolers and their families explore STEM topics including science, math, and engineering—and increasingly, computational thinking.

Public libraries are ideal for helping children and families explore CT because they already offer free access to technology and the internet and have an established commitment to closing the digital divide. Libraries can also accommodate a range of learning needs, allowing children who are new to computational thinking to develop foundational skills, and those who are more advanced to extend their learning. And libraries are enormously creative in the ways they connect with communities, taking advantage of digital media, mobile technology, and virtual and in-library programming to extend the learning of the families they serve.

Work It Out @ Your Library is designed to leverage the unique role that libraries play in families' lives to bring CT learning to as many preschoolers as possible.

Supporting Families at the Library—and at Home

What's special about this program is that the learning takes place both in the library and in families' homes. You'll guide families during library sessions in which you'll watch videos, do activities together, or have a story time. In between the sessions, families will continue to watch videos and do activities on their own, guided by the *Work It Out Wombats!* Family App. This free App is available on the App Store and on Google Play. Once the App is downloaded, it will work anywhere—it doesn't require using data or the internet!

Program Length and Format: A Flexible Model

- This program includes four **3-week units.**
- Each three-week unit is **devoted to one CT skill:**
  - **Design Process** (or as the Wombats say, "Create, Test, Improve!")
  - **Sequencing** (or as the Wombats say, "Step It Out!")
  - **Abstraction and Representation** (or as the Wombats say, "Find What Matters!")
  - **Problem Decomposition** (or as the Wombats say, "Break It Down!")
- **Flexible length:** Choose one, several, or all four units, depending on your library's programming needs.

The format for each of the four 3-week units is the same:

	Work It Out @ Your Library	Work It Out @ Home
Week 1	**Introductory Session** **(1 hour)** Families learn about the *Wombats!* series and characters, get acquainted with CT, and practice using the *Work It Out Wombats!* Family App, which contains animated stories and songs, hands-on activities, and an interactive music video feature.	**More Activities!** **(1+ hours)** Equipped with the *Work It Out Wombats!* Family App and the *Work It Out @ Home Family Guide*, families watch *Wombats!* stories and songs and do more activities at home. They mark the activities they did on the *Wombats!* Activity Tracker.
Week 2	**Story Time Session** **(30–45 min.)** Families listen to two storybooks related to the CT skill they've been working on. They'll take a break between stories to dance with *Wombats!* puppets and for free play. They'll visit the CT Corner (which features *Wombats!* resources and take-home handouts) and check in with the librarian leading the program.	**More Activities!** **(1+ hours)** Families continue to watch *Wombats!* animated stories and songs and do more activities, preparing to share what they did at the final *Share and Celebrate* library session.
Week 3	**Share and Celebrate Session** **(1 hour)** Families return to share what they did at home and talk about their CT experiences. Then they'll do another CT activity together, receive a certificate, and finish with a celebration!	

Preschool Computational Thinking (CT)

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 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 (CT) skills all the time—and not just when we're on a computer.

- When you perfect a recipe, you probably use the three-step CT skill called the **design process**: create, test, improve.
- When you run errands, you're using the CT skill of **sequencing**—you think about the tasks you need to complete and decide on which order to do them in.
- When you have a big job to tackle, like putting together a birthday party, you use the CT skill of **problem decomposition** to break down this big job into smaller, more manageable jobs to make it easier to accomplish.

Young children are already using CT skills, too—when, for example, they build something out of blocks and test out how to make it work the way they want it to, or when they break down the big job of helping set the table for dinner into smaller 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, preschoolers can learn basic CT skills, which sets the groundwork for more complex skills later on.

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!

Here are a few examples of what it looks like when preschoolers use CT skills. Using these skills helps them:

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

Strengthening young children's CT skills helps them think more logically and effectively, fosters creative and flexible thinking, and encourages focus and perseverance—qualities that will serve them throughout their lives.

Core Computational Thinking Skills

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! emphasizes eight core CT skills. This library program focuses on four them:

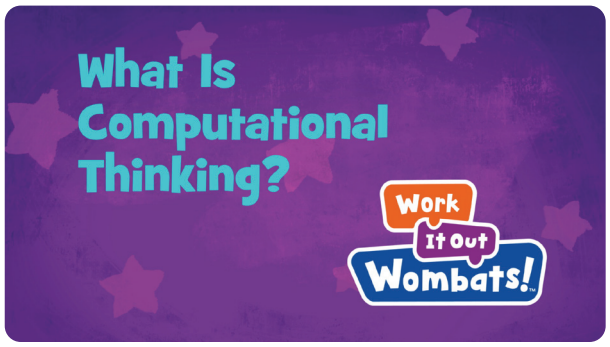
1. ***Create, Test, Improve!*** Use these three steps when designing something new, like a work of art or an invention. (computer science term: *design process*)
2. ***Step It Out!*** Follow or create a set of steps to solve a problem, accomplish a task, or make something. (computer science term: *sequences and algorithms*)
3. ***Find What Matters!*** Find important details. Use those details to categorize and sort objects or represent them with pictures or symbols. (computer science term: *representation and abstraction*)
4. ***Break It Down!*** Break down problems and tasks into smaller parts to make them easier to do. (computer science term: *problem decomposition*)

Other CT skills in the *Work It Out Wombats!* show that are not covered in this program include:

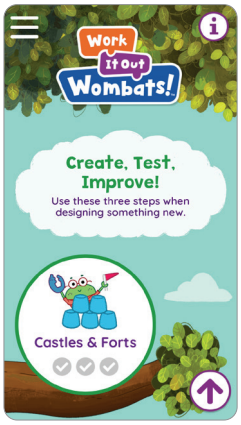
5. ***Play with Patterns!*** Identify, copy, and create patterns, which are repeating sequences of colors, sounds, shapes, or motions. (computer science term: *pattern recognition*)
6. ***Connect the Cause to the Effect!*** Explore how one action or event (cause) brings about another (effect). (computer science term: *cause and effect*)
7. ***Fix It!*** Fix or improve solutions when they're not working the way you intended. (computer science term: *debugging*)
8. ***Systems!*** Investigate computers and computer programs, and use them to accomplish tasks, solve problems, and express yourself. (computer science term: *computing systems*)

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 animated story and hands-on activity that families explore highlights just one CT skill.

Watch the video, *What Is Computational Thinking?*, by scanning the QR code.



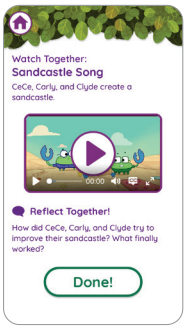
Work It Out Wombats! Family App



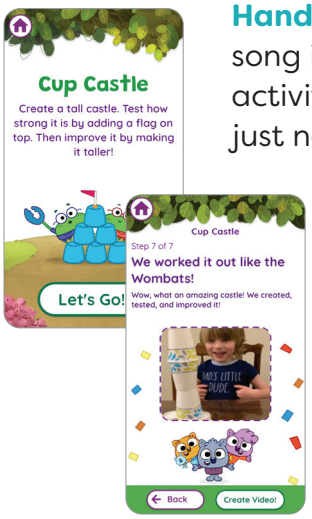
Everything families need to guide their children while they do hands-on computational thinking (CT) activities can be found in the *Work It Out Wombats!* Family App for phones. Once the App is downloaded, it will work anywhere—it doesn't require using your phone's data or the internet.

The App is designed for adults and children to use together so they can experience CT in a variety of ways: by watching, creating, listening, discussing, and playing. The more ways CT is explored, the more ways children can learn!

Here's what the App contains:



Animated Stories and Songs from the PBS KIDS show *Work It Out Wombats!* The three Wombat siblings and their friends go on adventures and use their CT skills to solve everyday problems.



Hands-On Activities. Each animated story or song in the App leads to two related hands-on activities. The activity instructions are in the App, and families just need a few simple materials that are easy to find at home.

Music Videos. As families do the activity steps, they'll be prompted to take photos of their child. When the activity is done, the App will create a music video, complete with *Wombats!* graphics and music. It's thrilling for children to see themselves starring in a video, and it's a great way to help them review and understand what they've learned about CT.

Download the free *Work It Out Wombats!* Family App. It's available on the App Store and on Google Play.

Download on the App Store

GET IT ON Google Play

Family Engagement Tips

Research shows that young children who do activities with an adult learn more than children who do activities on their own. As you introduce children to CT and the Wombats, you'll want to offer parents and caregivers tips for nurturing their children's learning.

The main message to convey to caregivers about family engagement is a simple but powerful one: to develop and grow, young children need an attentive, caring adult by their side, interacting and offering encouragement.

The *Work It Out Wombats!* Family App was designed for just this purpose: it's intended for an adult and child to use together and encourages them to collaborate and interact every step of the way. In the App, Gramma Super offers adults tips on ways to engage their child and deepen their learning.

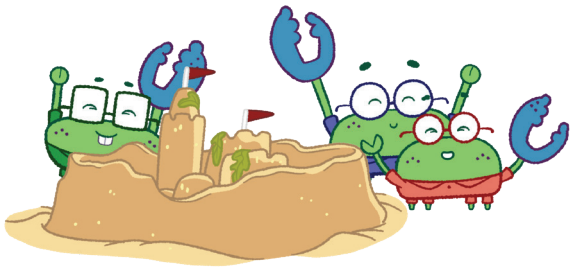
Gramma Super's tips fall into four broad categories:

1. **Let your child take the lead.** Show interest in what excites your child and guide their explorations without taking over. Putting children in charge gives them more control over their experiences and keeps them focused and having fun.

2. **Help your child share their ideas.** Ask questions to start a conversation and encourage children to talk about what they are doing. Encouraging your child to explain their thinking helps them understand that problems can be approached in an organized and creative way.

3. **Encourage your child to keep trying, even when it's hard.** Give your child time to work out a problem before offering to help. This helps them develop perseverance and confidence in their own problem-solving abilities.

4. **Reflect together on what you've done.** Give your child time and space to think and talk about what they've done when they've completed something. Looking back on their experiences helps children understand, remember, and build upon what they've learned.



Watch the video, *How Do You Support Your Children's Computational Thinking?*

Sharing the Engagement Tips with Parents and Caregivers

You can point grown-ups to these tips in a variety of places:

- ***Work It Out @ Home Family Guide*:** You'll hand caregivers a guide they'll use at home. A section on the engagement tips is included.
- ***How Do You Support Your Children's Computational Thinking?* Video:** The *Family Guide* includes a QR code for the video mentioned above.
- ***Work It Out Wombats!* Family App:** The App itself includes specific tips for each hands-on activity.

Getting Ready to Lead

Here's how to prepare to lead the program.

Organize Program Logistics in Advance

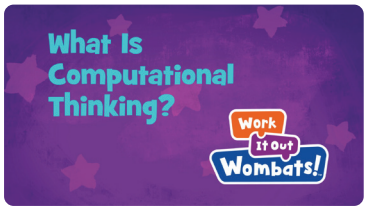
1. Schedule your program dates: Each of the four units covers a period of three weeks. You might decide to do just one unit now and others later, or you might want to do several units in a row.
2. Decide whether you need a co-leader or assistant so you can plan the program together.
3. Publicize the program. Send out information to interested families ahead of time.

Promote the Program

We've included some resources to help you promote the library program to families with preschool children. The promotional materials include a recruitment flyer, a sample email, and social media posts. All of the materials can be customized to meet your specific needs and **can be found here**.

Deepen Your Program Background

1. **Reread the Introduction** in this guide to review your role as leader and to familiarize yourself with the App and the Family Engagement Tips. Watch the two videos included in the Introduction:
   - *What Is Computational Thinking?*
   - *How Do You Support Your Children's Computational Thinking?*



2. **Read through the guide for the unit you'll be presenting.** There is a separate guide for each unit.
3. **Familiarize yourself with the *Work It Out Wombats!* Family App.** Take a look at the videos and activities for the CT skill you'll be presenting.

4. **Preview the presentation resources.** Each unit has two slideshows that you'll use for your presentations to families. There are also a few videos embedded in the slideshows. A script is provided in the unit guide so you can review the script and the slideshows together.

5. **Preview the *Work It Out @ Home Family Guide*.** Each unit has its own *Family Guide.* You'll pass these out to families during the *Introductory Session*. The guide gives families information they'll need when they use the App at home.

6. **Notice the *Wombats!* Activity Tracker** at the end of the *Family Guide.* Families will use it to keep track of the activities they do at home. It's a fun way to motivate families to complete the activities. You'll point out the tracker to families at the end of the *Introductory Session*.

7. **Plan a CT Corner.** You'll set up an area where you'll offer CT and *Wombats!* resources that families can take home. You'll set up the CT Corner for the second and third sessions within each unit. See the CT Corner Digital Toolkit, which features signs, flyers, coloring sheets, printouts, and other resources you can use.

8. **Gather the books and activity materials.** Although there's plenty of time before each session to gather the simple materials needed for the hands-on activities or the books you'll be reading or displaying, it's a good idea to get an overall sense of what you'll need in advance.

9. **Plan your space and do a tech check in advance.**

    - Find a spot in the library to arrange tables and chairs and that offers a good place to view the presentation.
    - Download the slideshows and videos to your computer. Make sure you're able to project the slideshow and video presentations using a computer and a monitor, wall, or screen. Be sure to check the video as well as the audio.

Credits

The Work It Out @ Your Library program and
the *Work It Out Wombats!* Family App were produced by:

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