



Introduction

As an educator and researcher, I have spent years exploring how to integrate computational thinking (CT) into early childhood education in ways that feel natural and meaningful to young children. One evening, I had a conversation with my neighbor—a computer scientist and father of two daughters, ages 4 and 5—about the idea of CT for preschoolers. His initial reaction was one of surprise, and he asked, “Really? Isn’t that a bit early?” This simple question kicked off an engaging hour-long exchange of perspectives. We discussed what CT really means—things like breaking problems into steps, spotting patterns, and figuring out how to solve challenges. I described how young children learn these concepts through play, stories, and hands-on exploration, and he shared how those same ideas show up in computer science. The longer we talked, the more we realized we were speaking the same language. By the end of our conversation, my neighbor smiled and said, “You know, I never thought of it that way, but it makes perfect sense.” That moment reminded me how universal CT skills really are—and how powerful it can be to start nurturing them in the preschool years.

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Skepticism about CT in early childhood is not uncommon. When hearing the term *computational thinking*, many people immediately associate it with computing numbers, computer science, or programming. Critics often argue that CT is too advanced, abstract, or inappropriate for young

When approaching CT for young children, the first step is to understand that, while closely interconnected, computational thinking is not the same or interchangeable with computing, computer science, or programming. CT is a cognitive framework for problem solving. It falls under the umbrella of computing and is integral to computer science and programming, which is a branch of computer science. Figure I.1 visually illustrates this relationship.

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About the Book

The contents of this book are organized into five chapters.

Chapter 1 sets the stage by defining what computational thinking is and outlining its origins. After tackling some common myths surrounding the concept of CT, it briefly overviews the four major CT skills—decomposition, pattern recognition, abstraction, and algorithmic thinking—and how they work in the problem-solving process. It also offers a glimpse into CT’s application in early childhood education. This chapter serves as your gateway to a deeper conceptual understanding of CT.

You'll dive into the heart of CT with **Chapter 2**. Following a discussion about CT's connection to children's cognitive and social and emotional development, the four major CT skills are explored more closely. The underlying key concepts for each skill are brought to life with examples familiar to the early learning setting. Additionally, you'll gain a better understanding of how these skills overlap with one another. This chapter also offers practical pedagogical strategies, including guidance on the types of questions educators can use to ignite children's curiosity and deepen their understanding.

From morning circle time to building block structures to navigating obstacle courses, the routines and play-based learning experiences that young children engage in every day inherently incorporate computational thinking. **Chapter 3** explores how teachers can intentionally foster CT learning already happening in their setting with an emphasis on technology-free, or unplugged, learning experiences. It also highlights how to integrate learning experiences that directly target CT skills and concepts. Packed with hands-on activities and illustrative vignettes, this chapter helps teachers to weave CT seamlessly into their teaching and learning.

Coding is one of the most powerful methods to develop CT in children, and stories provide the perfect framework to make its concepts both meaningful and fun. **Chapter 4** takes you step-by-step through the process, from selecting stories to navigating coding grids. In addition, the chapter highlights key terminology to integrate into your interactions with children and ideas for extending this learning experience.

Finally, **Chapter 5** is your road map for continuing your journey as a teacher who recognizes the value of CT in the early learning setting and beyond. Structured around three calls to action, it offers educators approaches and strategies to keep learning, growing, teaching, and advocating.

With this book, step into the exciting world of CT in early childhood and discover how to nurture the next generation of creative thinkers and problem solvers!