

CODING (UNPLUGGED)

"Cups" Algorithm

Lesson Overview:

Students will explore key computational thinking concepts through a hands-on cup song activity. They follow and create a sequence of actions, learning how complex tasks can be broken down into smaller steps (decomposition), ordered (sequence), repeated (loops), and changed based on decisions (branching).

Learning Outcomes:

By the end of this lesson, students will be able to:

- follow a sequence of instructions to complete a task
- explain how a complex task can be broken into smaller steps (decomposition)
- describe what an algorithm is using simple language
- identify patterns and repetition in a sequence (loops)
- recognise that instructions can change based on conditions (branching)

Key Words:

algorithm, sequence, decomposition, loop, branching, instructions

Lesson Resources:

[Lesson Slides](#), [Cup Tutorial Video](#), [Scratch Code Printable \(With Branching\)](#), [Scratch Code Printable \(Without Branching\)](#), Cups

LESSON SLIDES

Introduce:

- Watch Karly's Cup Song tutorial and observe the cup sequence (without cups)
- Ask students: *What did you notice?*
Was it easy or tricky to follow?
- Tell students: *"We're going to learn this step by step, just like coders do."*

Explore:

- Students (and teacher) attempt the sequence together, following the video on slide 3
- Discuss what made the sequence tricky to learn
- introduce **decomposition**:
 - breaking the problem into smaller parts.
- Watch the video on slide 5 and follow the sequence
- Notice how the video matches the scratch code blocks
- Highlight that the order of steps (sequence) matters
- Explain that a **sequence** is the correct order of instructions
- Students spend time practicing this sequence.
- Explain that the full set of step-by-step instructions that they've just been following is called an **algorithm**
- Watch the video on slide 7 and follow the new algorithm
 - *"How did the loops change it?"* - They made the algorithm shorter
- Watch the video on slide 8 and follow the new algorithm
 - *"How did the new loop change it?"* - It made the algorithm repeat until the song finished
- Introduce **branching** - when the computer asks a question to decide which path to take next.
- Watch the video on slide 9 and follow the new algorithm
 - *"How would you explain what happened here?"*
- Rewatch Karly's Cup Song tutorial and allow students time to practice
- When confident, students can watch and join Karly in performing the Cup Song at full speed.

Reflect:

Students...

- engage in a Turn & Talk, sharing an 'I can' statement and supporting it with an example from the activity.

Curriculum Links

Digital Technologies

- Define problems with given or co-developed design criteria and describe sequences of steps and decisions needed to solve them (AC9TDI6P01)
- Implement and modify digital solutions using algorithms involving branching and iteration (AC9TDI6P02)

English

- Use interaction skills to contribute to discussions, clarify and build on ideas, and use appropriate language and features (AC9E5LA01 / AC9E6LA01)

Health and Physical Education

- Practise and refine movement skills and apply them in different movement situations (AC9HP6M02)