

Code It!

Grade Level: PreK–2

Content Areas: Music, Art, Science, Technology, and
Language Arts

Time Frame: 60 Minutes

MATERIALS

Code It! series
seeds
potting soil
cups
water
paper
markers or crayons

OBJECTIVES

Students will:

- Recognize that algorithms are a series of directions used in coding that tell computer programs how to do things
- Understand that a loop is a repeating step in an algorithm
- Know that a sequence is a set of coding steps in a certain order
- Understand that debugging is a step-by-step process used to solve problems in an algorithm
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KEY VOCABULARY

Before reading, focus on vocabulary. Read the glossary words and their definitions.

algorithm—a series of directions used in coding that tells computer programs how to do things

debug—to find and remove mistakes in an algorithm

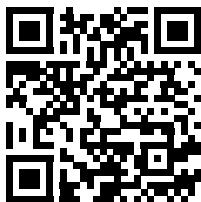
loop—steps of an algorithm that are repeated

sequence—a series of steps in a certain order in an algorithm

FREE SONG

Scan the code or [click here](#) to download or stream the Code It! songs.

Find other Cantata Learning songs and books at <https://cantatalearning.com>.



PROCEDURES/ACTIVITIES

Preparation:

Gather students somewhere where they can see you. Tell students they are going to be learning all about algorithms and their different parts today. Start the lesson by reading *Algorithms: Solve a Problem!*

Lesson Procedure:

1. Tell students that an algorithm is a series of directions. It helps solve a problem in small steps.
2. Explain that they will be making an algorithm for planting a seed in a cup. Ask students to brainstorm the first step for planting a seed (such as: *Put soil in a cup*). Write their answers on a whiteboard.
3. Get out *Sequence: Order Matters!* and read and sing along with students.
4. Explain that there are many steps in an algorithm. They need to go in a certain order. That order is called a sequence.
5. Now write out the steps to grow a plant on the whiteboard. Put them in the incorrect order. Here are suggestions for the steps:
 - Put the soil in the cup.
 - Make a hole in the soil.
 - Put a seed in the hole.
 - Cover the seed with soil.
 - Pour water over the seed.
 - Put the cup in sunlight.
6. Next read *Debugging: You Can Fix It!* and sing along with students.
7. Explain that sometimes directions can have problems. To fix the problem, you need to test the instructions step by step. Tell students that there is a problem with the instructions you wrote on the whiteboard.
8. Tell students that they will debug the instructions on the board. Ask them to work in small groups. Hand out cups, soil, and seeds. Have water available too. Ask students to complete each step to see what is out of order.
9. Ask the groups which step is out of order. Write the correct set of instructions on the board.
10. Now read *Loops: Repeat, Repeat!* and sing along with students.
11. Ask students to imagine they are planting seeds in a garden. What steps could they repeat in a loop? (*Making holes in the soil, planting seeds, etc.*)
12. Finish the lesson by asking students to think about what would happen to the seed if the instructions were wrong. Would it still grow into a plant?

Art Extension:

Tell students they will make a picture algorithm to explain how to do their favorite outdoor activity, such as biking or making a snowman. Give each student some markers or crayons and a piece of paper that has been divided into eight boxes. Tell them to write what the algorithm explains how to do in the top left box, such as: *How to Ride a Bike*. In each box students should draw one step of their algorithm. Remind them to put their steps in the correct order. They can number their boxes to help readers follow the correct order. When they are done, have students display their picture algorithms and explain each step to the class.

Technology Extension:

You can find many free coding apps for students to try in the classroom. Try [ScratchJr](#), which students can use to create stories and games. Or use [Tynker](#) to learn more about coding through online courses. Another app, [Daisy the Dinosaur](#), uses code commands to make a dinosaur move. Do a tutorial for the class using one of the apps and create a coding project together.

Each week, make a new coding project as a class. Allow students to practice their coding skills on computers or tablets in the classroom. Let them share their coding projects with the class.

Standards:

Kindergarten: CCSS.ELA-LITERACY.RL.K.10, CCSS.ELA-LITERACY.RI.K.10, CCSS.ELA-LITERACY.RF.K.1, CCSS.ELA-LITERACY.RF.K.2, CCSS.ELA-LITERACY.RF.K.3, CCSS.ELA-LITERACY.RF.K.4, CCSS.ELA-LITERACY.W.K.2, CCSS.ELA-LITERACY.W.K.3, CCSS.ELA-LITERACY.W.K.5, CCSS.ELA-LITERACY.W.K.8, CCSS.ELA-LITERACY.SL.K.1, CCSS.ELA-LITERACY.SL.K.4, CCSS.ELA-LITERACY.SL.K.5, CCSS.ELA-LITERACY.L.K.1, NGSS K-2-ETS1-1 Engineering Design

First Grade: CCSS.ELA-LITERACY.RL.1.10, CCSS.ELA-LITERACY.RI.1.1, CCSS.ELA-LITERACY.RI.1.7, CCSS.ELA-LITERACY.RI.1.10, CCSS.ELA-LITERACY.RF.1.3, CCSS.ELA-LITERACY.RF.1.4, CCSS.ELA-LITERACY.W.1.5, CCSS.ELA-LITERACY.W.1.8, CCSS.ELA-LITERACY.SL.1.1, CCSS.ELA-LITERACY.SL.1.5, CCSS.ELA-LITERACY.L.1.1, NGSS K-2-ETS1-1 Engineering Design

Second Grade: CCSS.ELA-LITERACY.RL.2.10, CCSS.ELA-LITERACY.RI.2.10, CCSS.ELA-LITERACY.RF.2.3, CCSS.ELA-LITERACY.RF.2.4, CCSS.ELA-LITERACY.W.2.8, CCSS.ELA-LITERACY.SL.2.1, CCSS.ELA-LITERACY.SL.2.5, CCSS.ELA-LITERACY.L.2.1, NGSS K-2-ETS1-1 Engineering Design

