Unplugged:
A Hands-On Drawing Activity

INSTRUCTIONS

Introduction

Have you ever tried to follow directions to make a recipe or assemble a new toy? Did you know that you were thinking like a computer? Computational thinking doesn't just happen in math class or when learning how to use a computer. You use computational thinking skills every day. It's a problem-solving skill that helps you better understand problems and learn systematic ways to uncover solutions.

There are four important elements of computational thinking. Each one of these elements gives you a different way to approach a problem and find a solution. Read below to find out more about what makes up computational thinking:

☐ **Decomposition**: Sometimes a problem can feel overwhelming, and it can be hard to get started identifying solutions. When you decompose, you break a problem down into smaller parts that are easier to handle.

☐ **Pattern Recognition**: When faced with a problem, you can look for similarities and differences between that problem and things you already know. When you can recognize patterns, you can make predictions about what might happen next.

☐ **Abstraction**: Some problems come with a lot of information. When you use abstraction, you are determining what information is important to identify a solution and what you can put aside. When you can focus on the important information, it's easier to come up with the right solutions.

☐ **Algorithm Design**: An algorithm is a set of rules or instructions for problem solving. When you design an algorithm, you are identifying the steps to solving a problem and putting them in the correct order so they can be followed.

Once you understand and know how to use these skills, you will notice that you use them in many areas of your life!

Practice Activity

As you learned in the video, computer programs are written in code. There are many different coding languages, and programmers know which one to use when they write a program. But luckily, you don't need to understand a coding language to do this activity. You just need to put on your computer hat and follow instructions.

You can practice your computational thinking skills by completing the following drawing activity from the video. You will need a blank piece of paper and a pen, pencil, or marker. You will also need a partner to help read the directions to you. Close your eyes or put on a blindfold. Pay close attention to the directions as they are read and have fun!

- ☐ First, draw a circle about the size of an orange in the middle of your paper.

- ☐ Next, using the top of the circle as the bottom of each triangle, draw two triangles the size of a grape at the top of your circle. One triangle should be on top of the left side of your circle and the other triangle should be on top of the right side of your circle.

- ☐ Now, draw three dots in the shape of an upside-down triangle right in the middle of your circle.

- ☐ Draw a straight line down from the bottom dot and stop about halfway between the dot and the bottom of the circle. At the bottom of the line, draw a smile.

- ☐ On each side of your circle, draw three straight lines. Each line should be half in the circle and half out of the circle.

Take a look...what did you draw? Does it look like a cat? Maybe! Or...maybe not. Think about how you could improve the instructions, or the code, to make them even clearer.

Extension Activities

For more practice building your computational thinking skills, try these ideas.

- ☐ Try writing your own program for a new blindfolded drawing activity. Can you improve the directions?

- ☐ Make up your own game and create written directions for your friends or family to follow.

- ☐ Play "Chore Charades" and act out or draw simple directions to complete everyday tasks. How well can you act out or explain how to complete an activity?

- ☐ Follow a recipe to make something to eat, or write your own recipe.

Parent Tips

Your child is learning how to build computational thinking skills. Computational thinking is a way of thinking about problem solving that helps you better understand problems and learn systematic ways to uncover solutions. Support your child by asking her to share the activity with you, and try one or more of the ideas below:

☐ Practice another drawing activity with your child. Have her close her eyes or put on a blindfold as you read the instructions below:

- Draw a small square in the middle of the page.

- Draw six smaller circles in a straight line under the square.

- Draw a short, straight line from the top left corner of the square.

- Draw a short, straight line from the top right corner of the square.

- Make two small dots at the end of each line.

- On the left-hand side of the circles, draw an oval that connects on its right side to the first three circles under the square.

- Draw an oval the same way on the right-hand side of the circles.

- Next, draw a slightly smaller oval underneath the first one, connecting it to the bottom three circles.

- Repeat on the other side.

Let her reveal the drawing. Does it resemble a butterfly?

☐ Model the four elements of computational thinking by "thinking aloud" when you complete a task at home. What steps do you follow? What information is important to know, and what is not important? How can you break a task apart into smaller, more manageable actions?

☐ Research careers that require computational thinking skills. What jobs or careers need to develop systems to solve problems?

☐ Ask your child to tell you about ways she's using computational thinking skills in school.