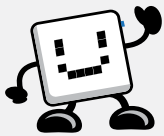


# CHANGING LIGHTS

HELLO, IT'S CODEY, BACK FOR MORE CODING FUN! BEFORE YOU BEGIN, MAKE SURE YOUR CODE CUBE IS CONNECTED TO AND PAIRED WITH YOUR COMPUTER. IN CASE YOU FORGOT HOW TO DO THIS:

1. OPEN THE CODE CUBE APPLICATION IN A CHROME BROWSER.
2. ATTACH, OR TETHER, THE CODE CUBE TO YOUR COMPUTER WITH THE CABLE.
3. CLICK **CONNECT CUBE** IN THE TOP-LEFT CORNER OF THE APPLICATION AND SELECT YOUR CODE CUBE FROM THE LIST. THEN, CLICK **CONNECT**.



**HINT:**

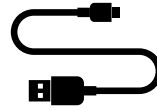
YOU CAN RIGHT-CLICK THE IMAGE BLOCK AND SELECT **DUPLICATE** TO MAKE A COPY OF THE HAPPY HEART. THEN, ADJUST THE COLORS OF THE PIXELS TO MAKE THE SAD HEART. YOU CAN DUPLICATE ANY BLOCKS BY RIGHT-CLICKING THEM!

In this activity, we will learn how to make your Code Cube display multiple images. Gather the materials listed, and we will get started.

## MATERIALS NEEDED



Code Cube



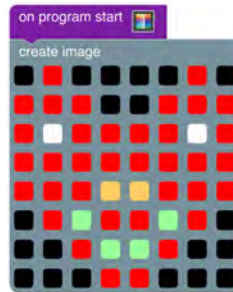
Micro USB cable



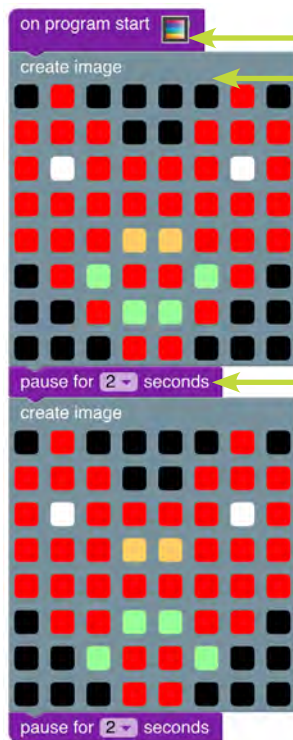
Computer with Code Cube application open

## CODING TIME

If you saved your program from Activity 1, you can open it by clicking **Open Blocks** on the top row of buttons. If you did not save it, you can write a new one as you follow along in this activity. We will start with the program from Activity 1 that displays a happy heart.



Add the following code blocks into the programming area of your application and arrange them as shown.



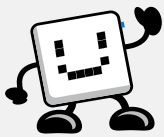
**On program start** tells the Code Cube to run the program when uploaded (**Send Code**). It automatically runs when tethered or, when it is not tethered, when the start button is pressed.

**Create image** tells the Code Cube what image to display when the program is running.

**Pause for – seconds** tells the Code Cube how long to wait before going to the next block. In this example, it tells the Code Cube to display the image and wait 2 seconds before showing the next image. You can change how long the image is displayed by adjusting the number of seconds for the pause.

Notice that we are showing two images for 2 seconds each. The program should keep running this loop until we stop it or load a new program. We can add up to eight different images by adding **create image** blocks to our program loop before the memory is filled.

CONGRATULATIONS! YOU HAVE JUST FINISHED YOUR SECOND PROGRAM WITH YOUR CODE CUBE. USE THIS CODE TO COMPLETE ANY OF THE FOLLOWING ACTIVITIES. DON'T FORGET THAT YOU CAN ADD MORE IMAGE AND PAUSE BLOCKS (UP TO EIGHT) IF YOU NEED THEM! I CAN'T WAIT TO SEE WHAT YOU CREATE! I WILL BE BACK WHEN YOU ARE READY FOR ACTIVITY 3.



Now, recolor your pixels in the second **create image** block to make the second shape in your program.

To display these images on your Code Cube, click **Send Code** in the upper left of your application. It should automatically appear on the display if it is tethered to your computer.

**Note:** When you create a code or display, you might want to use it again. Save it by:

1. Clicking **Save Blocks**.
2. Giving it a descriptive name (such as Activity 2).
3. Choosing the location where you want it saved.

## GO FURTHER



### ELA – Multiple Characteristics

This is your chance to dream up a different character than in Activity 1 or extend the same character that you would like to meet or maybe never meet. It could be a monster (good or bad), a pet, a person, a superhero, or anything you can think of that would have certain characteristics. Use a program like the one you used in Activity 2 to create at least five different images of your character and display them on your Code Cube. Write down the characteristics of your character captured in each image so you can share them with others.

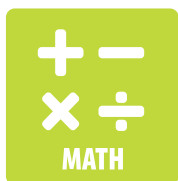
Use the Code Cube Planner to sketch your ideas and write your responses.



### SEL – Many Moods

How are you feeling right now or today, in general? Create five images that communicate how you are feeling or have felt during the week. Use a program like the one you used in Activity 2 to create the images and display it on your Code Cube. Write down things that make you feel like your images so you can share them with others.

Use the Code Cube Planner to sketch your ideas and write your responses



### Math – Symmetry

When one half of an image looks like a mirror image of the other half, it is said to have reflectional symmetry. A plus sign and a square have symmetry. There are different kinds of symmetry, but you will create five images that have reflectional symmetry. Use a program like the one you used in Activity 2 to create the images and display them on your Code Cube. Write down at least three places where you might see an example of your images in your classroom or community.

Use the Code Cube Planner to sketch your ideas and write your responses.



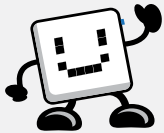
### Science – Multiple Stages

Think about the stages in a life cycle of an animal such as a frog or butterfly. Create at least three images or icons that represent the stages. Use a program like the one you used in Activity 2 to create the images and display them on your Code Cube. Write down the stages in the life cycle of the animal that include your images and explain when your images would happen.

Use the Code Cube Planner to sketch your ideas and write your responses.

# TURN THAT FROWN UPSIDE DOWN

HELLO, IT'S CODEY, BACK FOR MORE CODING FUN! BEFORE YOU BEGIN, MAKE SURE YOUR CODE CUBE IS CONNECTED TO AND PAIRED WITH YOUR COMPUTER.

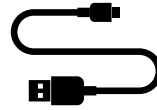


In this activity, we will make your Code Cube display different images based on the position it's facing. Gather the materials listed, and we will get started.

## MATERIALS NEEDED



Code Cube



Micro USB cable



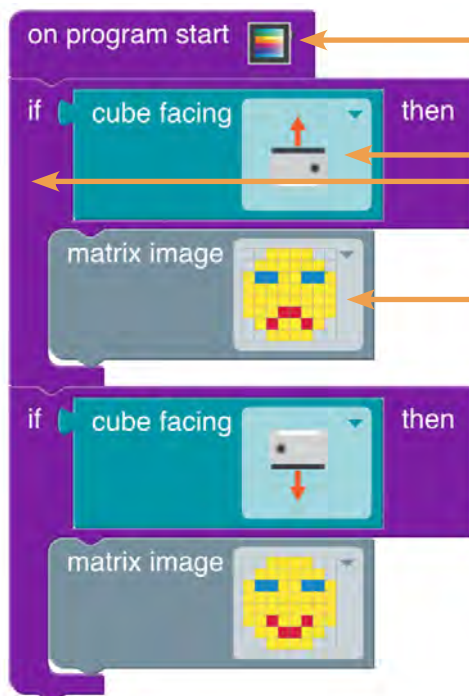
Computer with Code Cube application open

## CODING TIME

When you write code, there are usually different ways to get the same result. This activity will give you two ways to write a program that makes the Code Cube do the same thing. Usually, you want to write a code with the least number of blocks since it will use the least amount of memory.

Add the following code blocks into the programming area of your application and arrange them as shown.

**HINT:** AFTER YOU CREATE THE FROWNY FACE, YOU CAN RIGHT-CLICK THE IMAGE BLOCK AND SELECT **DUPLICATE** TO MAKE A COPY OF THE FROWNY FACE. THEN, ADJUST THE COLORS OF THE PIXELS TO MAKE THE SMILEY FACE. YOU CAN DUPLICATE ANY BLOCKS BY RIGHT-CLICKING THEM!

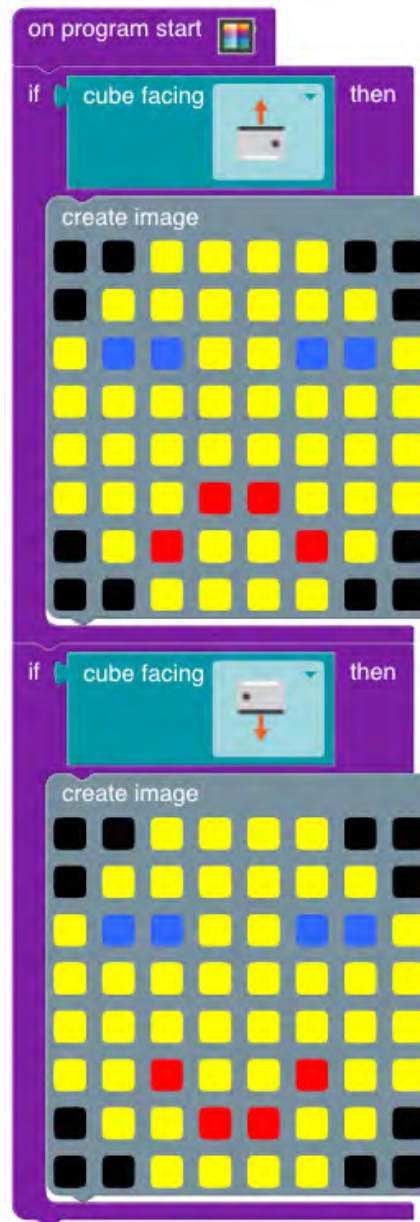


**On program start** tells the Code Cube to run the program when uploaded (**Send Code**). It automatically runs when tethered or, when it is not tethered, when the start button is pressed.

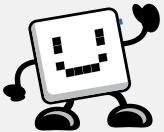
**Cube facing (up)** tells the Code Cube what to do when the program is running and the display is facing up. The *up* can be changed to *down* (see the second **cube facing** block).

The **if - then** block tells the Code Cube what to do when certain conditions are met. This example tells it to display a frowny face when the display is facing up. What do you think it will do in the second **cube facing** block?

The **matrix image (frowny face)** block tells the Code Cube to display a preprogrammed image. In this example, it tells it to display the frowny face image. The second **matrix image** block tells it to show the smiley face image.



WHEN YOU DO YOUR ACTIVITIES, USE **CREATE IMAGE** BLOCKS. THE PROGRAM WOULD LOOK LIKE THE SECOND EXAMPLE IF YOU HAD CREATED YOUR OWN IMAGES. PREPROGRAMMED IMAGES USE A LOT LESS MEMORY THAN CREATED IMAGES, SO YOU CAN USE MORE OF THEM IN LONG PROGRAMS.



CONGRATULATIONS! YOU HAVE JUST FINISHED YOUR FIRST PROGRAM THAT DETECTS THE CODE CUBE'S POSITION. USE EITHER CODE TO COMPLETE ANY OF THE FOLLOWING ACTIVITIES. DON'T FORGET THAT YOU CAN DUPLICATE BLOCKS IF YOU WANT TO CHANGE ONLY A SMALL PART OF AN IMAGE! WE WILL KEEP MOVING IN ACTIVITY 4.

To run this program with your Code Cube, click **Send Code** in the upper left of your application. When you turn your display from face up to down, the image should change. It might be easier to see if you disconnect the Code Cube from the computer and hold it above you.

**Note:** If you want to use this program again, click **Save Blocks** to save this as Activity 3.

## GO FURTHER

**ELA – Antonym Action**

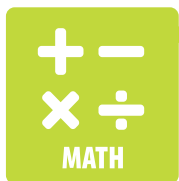
*Stop and go. Good and bad.* These words mean the opposite of each other, and we use them almost every day. Create two images that represent a pair of antonyms. Use a program like the one in Activity 3 to display them on your Code Cube when it is in opposite positions (faceup and facedown). Explain what each image represents. Then, give an example of how they could be used while you wear your Code Cube.

Use the Code Cube Planner to sketch your ideas and write your responses.

**SEL – Red Light, Green Light**

In the game of Red Light, Green Light, someone calls out “green light” when players are allowed to move and “red light” when they must stop. Sometimes, we need to tell or signal others to start or stop doing something. Think of a time when it would be useful for you to be able to tell someone to start or stop doing something without talking. Create two images that would be useful in that situation. Use a program like the one in Activity 3 to display them on your Code Cube when it is in opposite positions (faceup and facedown). Write down what each image represents and explain how each would be useful.

Use the Code Cube Planner to sketch your ideas and write your responses.

**Math – True North**

If we wanted to point someone in one direction using a Code Cube (such as north, straight ahead, right, and so on), we would need the image to always point in the same direction whether it is facing up or down. Create two images that would point someone in the same direction when the display is facing up or down. Use a program like the one in Activity 3 to create the images and display them on your Code Cube. Write down what you had to do to make the images look the same regardless of which way the Code Cube was facing.

Use the Code Cube Planner to sketch your ideas and write your responses.

**Science – Weathered**

Think about two weather conditions that you would consider opposite of each other. Create one image or icon that represents each condition (two total images). Use a program like the one in Activity 3 to create the images and display them on your Code Cube. Write down the conditions represented by your images and explain why you consider them to be opposites.

Use the Code Cube Planner to sketch your ideas and write your responses.