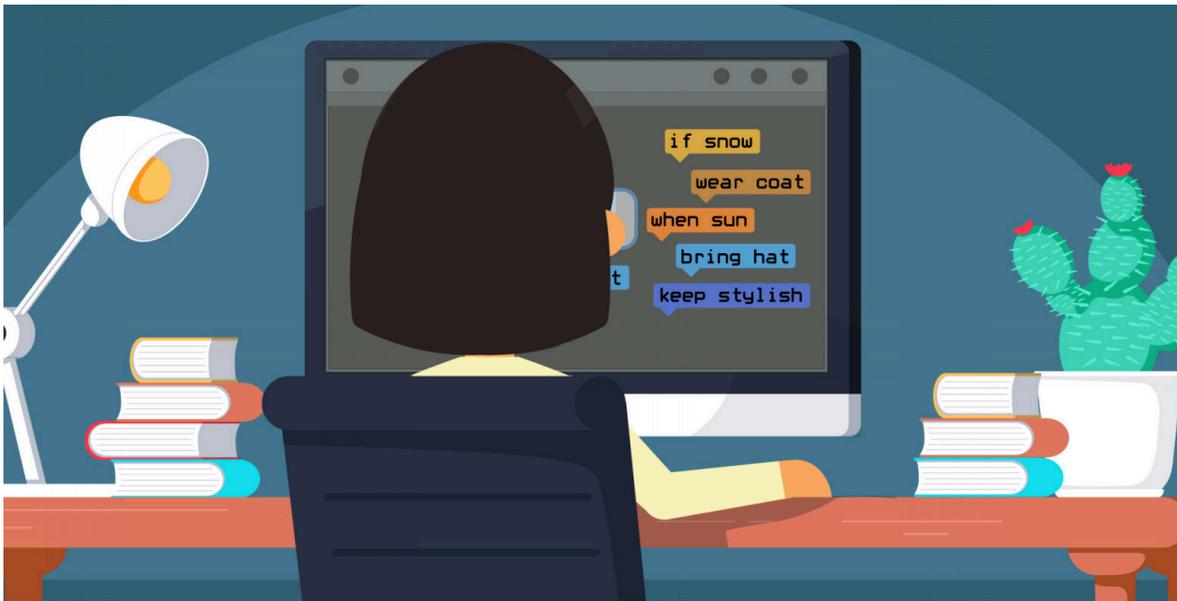


Robotics Activity: Scratch Fashion Show



INSTRUCTIONS



Introduction

Look around at any group of young people and you will see smartphones in their hands. In fact, smartphone use has been steadily increasing since they were first invented. Apps, games, email, and texting are important methods for communication. These tools keep us entertained, informed, and most importantly, connected.

But have you ever wondered what is behind those apps and computer games? Computers, games, and apps are programmed in code. Code is a set of instructions that tells the computer what to do to run the program or app. Computer programmers study different languages so they can write programs for even the most complicated tasks. There are many different languages that computer programmers use to write code, including JavaScript, Python, SQL, C++, and more! Programmers need to know how to write using coding language, and they also need to be careful to write each line of code exactly. One small coding error can prevent the program from running correctly.

To help prevent errors in coding design, some programmers write code using block-based programming. With block-based programming, the computer programmer strings together blocks of pre-written code to create a program. The programmer can choose the right block to complete the action. Block-based programming is a great way to learn and practice coding because it can prevent programmers from making mistakes. Even experienced computer programmers use block-based programming.

Practice Activity

Practice a coding activity using Scratch, a free computer program developed by the Massachusetts Institute of Technology (MIT) that uses block-based programming. Follow the steps below to take a tour of Scratch and then start programming.

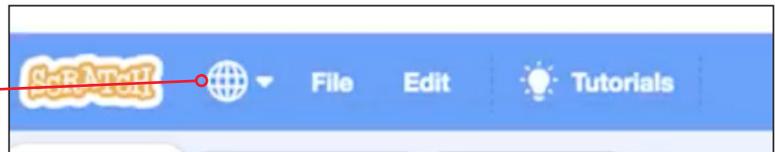
- 1 Let's begin our demo by visiting the URL for our Tech Fashionista Scratch project at scratch.mit.edu/projects/432025784/.



- 2 By the way, a fashionista is someone who LOVES fashion. I'm all about that wearable tech right now.
Create an account by clicking **Join Scratch** in the top right corner (or **Sign In** if you already have one).

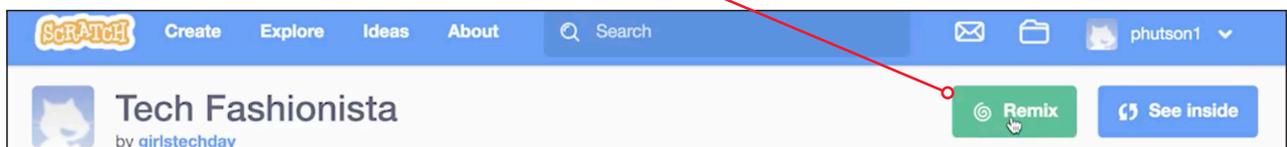


- 3 You can work in Scratch in several languages. Select the one you want from this menu.

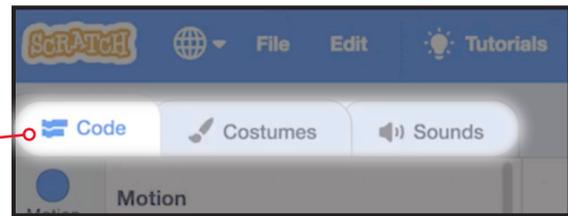


- 4 Once you are logged in, click on **Remix** to make your own copy of this Tech Fashionista Scratch project. When you make a remix, you are making a copy of the original Scratch project so that you can program it yourself and make it your own!

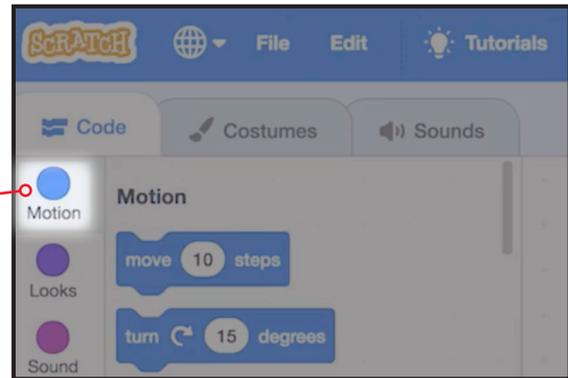
Once your Remix opens, you are inside the Editor window of the Scratch program. It's like seeing how a computer program operates from the inside out!



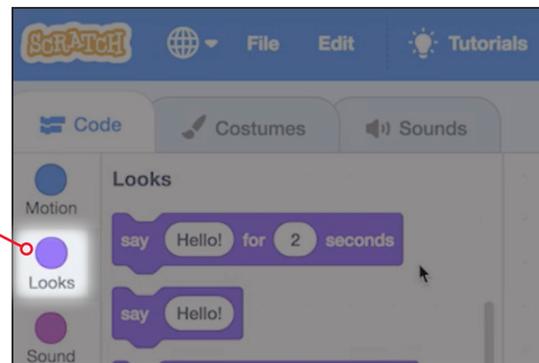
5 Now, let's take a tour of the Scratch interface so you know how to get started. On the left-hand side of your screen, you can see three tabs: **Code**, **Costumes**, and **Sounds**.



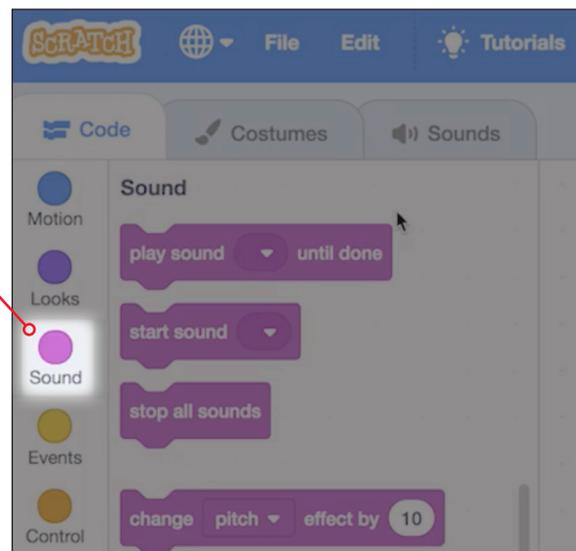
6 If you look closely at the **Code** tab, you can see a column of colored dots. Each of these dots represents a different category of code. What does the blue dot category let you code? That's right. **Motion**. You will use these blue blocks to program your Tech "Fashionista" move on the runway stage.



7 Let's click on the purple, which contains **Looks** blocks. These blocks let you code some of what you see on the screen. This is where you can add a popup message by using the say block.

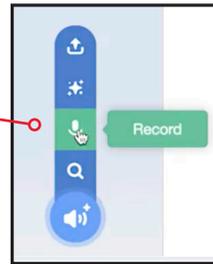


8 Now take a look at the pink blocks for **Sound**. There are lots of options here. You can search the Sound library by hovering over **Choose a Sound**. You can upload a sound from your computer. You can even record your own sound! Now take a look at the pink blocks for **Sound**. There are lots of options here. You can add one sound by clicking the down arrow next to play sound.



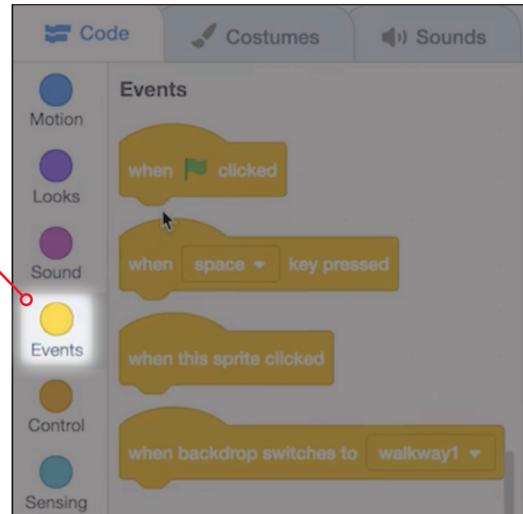
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Or, you can go to the **Sounds** tab and find a new sound to add to any Sprite. You can even record your own sound!



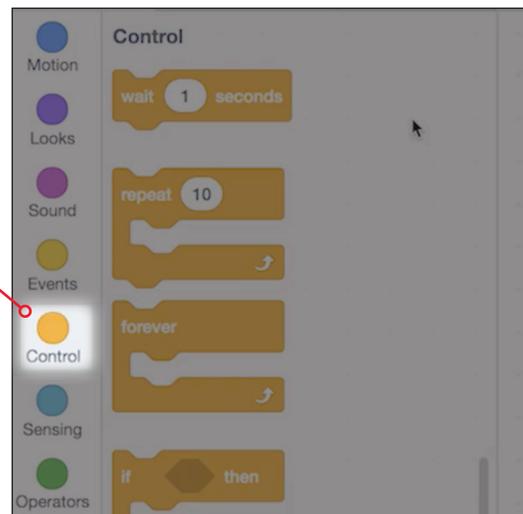
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But how do you make stuff happen? That's when you use the yellow **Events** blocks. See the first one, with the green flag? This block tells the computer to perform an event when the green flag is clicked.



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Let's check out the orange **Control** codes. These blocks control the flow of your program. Keep these control codes in mind because they are an important concept in all computer programming languages! Maybe you want to have your program wait for a few seconds, or you want to write code that repeats. The control codes help you do that.



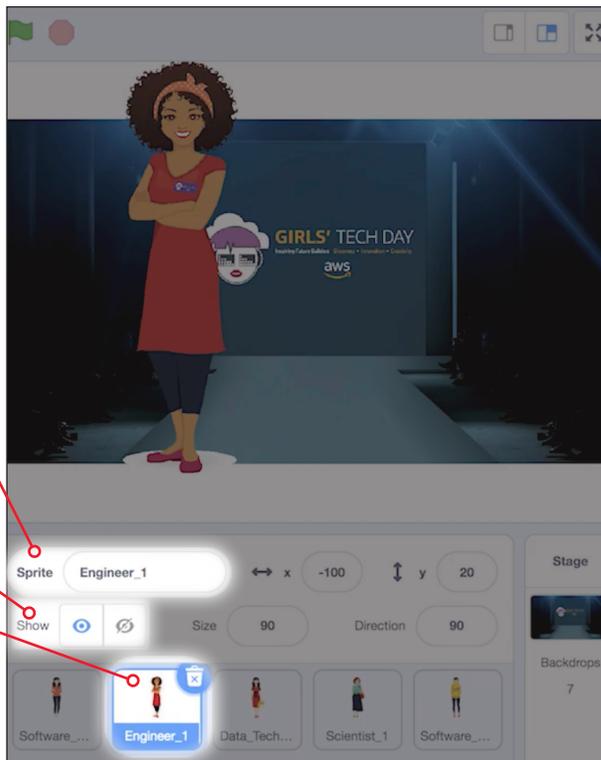
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Remember your Remix? Now let's practice by writing a program for the Fashionista scene. First, look at the **Sprite** section. See that there are several Sprites named with different jobs such as Software Developer, Engineer, Data Technician, and more?

Notice when you click a Sprite, it's highlighted in this bottom portion of the screen. This is very important. You always have to make sure you are adding the code to the correct Sprite.

To check out a Sprite more closely, click on each one and then click on the **Show** button.

When you click **Show**, the Sprite appears on the stage. Now select the model you want to write a program for:

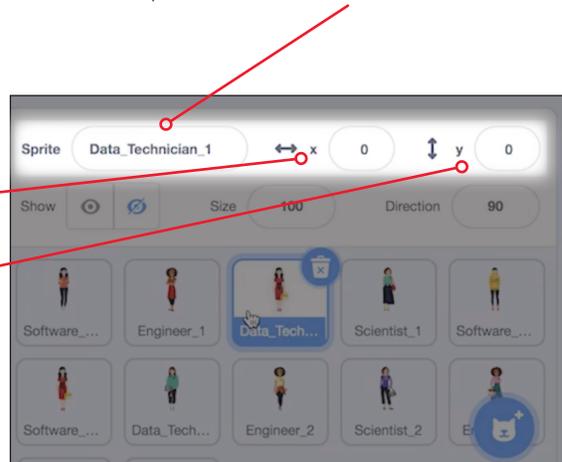


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Let me show you something else about Sprites. For example, click on the Sprite named **Data_Technician_1** or any other Sprite you choose.

Then click the **Show** button so you can see her on the screen. You can see the name for that Sprite.

You can show and hide the Sprite, change the size, and change the direction. But can you see the X and Y coordinates? These coordinates show exactly where your Sprite is on the stage. When $x = 0$ and $y = 0$, the Sprite is in the middle!



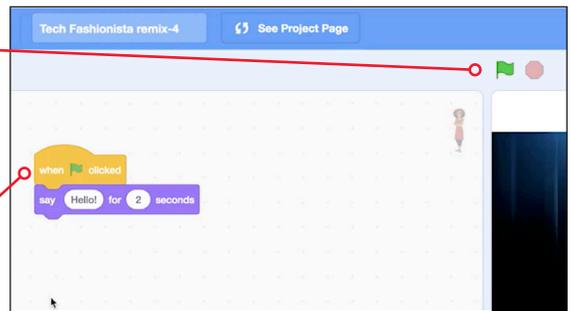
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Now, choose the Sprite you want to program. Click **Show**, and be sure to hide the rest of the Sprites by clicking the hide button.

I want to start by adding an Event block to start the program.

Go to the yellow **Events** section. Drag the when green flag clicked block on to the middle. Then click on the purple **Looks** category and add a say block. Notice how the blocks fit together like puzzle pieces?

Now, let's click the **green flag** to test the program. You can see how your program works on the right-hand side of the screen.



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Now, try separating the blocks. Let's click the Say block and disconnect it. The first way to delete a block is to right-click on it, and then choose **Delete Block** from the options. Notice when you select it, it's highlighted with yellow.

The other way to delete is by clicking the block and just drag to the left until it disappears.

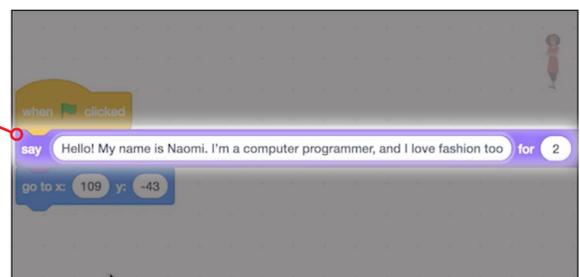
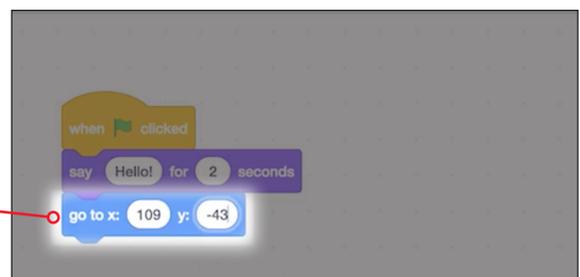


Now, that you know a little about Scratch, do you think you can make your Sprite move? I bet you can! I'll walk you through it.

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Continue to build your program by adding a **Motion** block to program your Sprite to go to a certain location on the stage. Try x = 109 and y = 43, for example, or any other coordinate you want your Sprite to move to!

Then, edit the **Say** command from the **Looks** category. Change **Hello** to "Hello! My name is Naomi. I'm a computer programmer, and I love fashion too" Change the time to a "5" seconds.

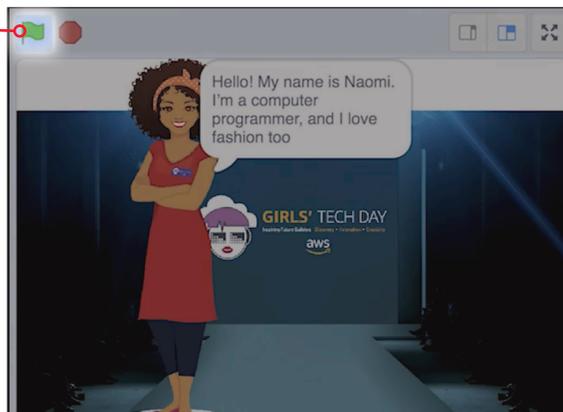


17 Now click the **green flag** to run your program. Pay close attention to the right-hand side of the screen and watch what happens.

Did the Sprite move to the exact location you programmed it to with the **Go To** block?

You can stop the program by clicking the **red stop sign**.

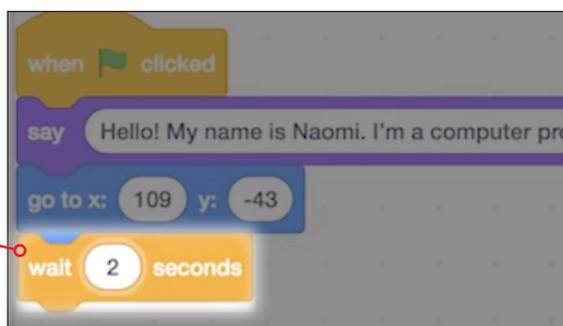
Congratulations. You've written your first computer program!



Ready to add more? It's not really a Tech Fashion show without that runway walk.

18 First let's click on the orange **Control** category.

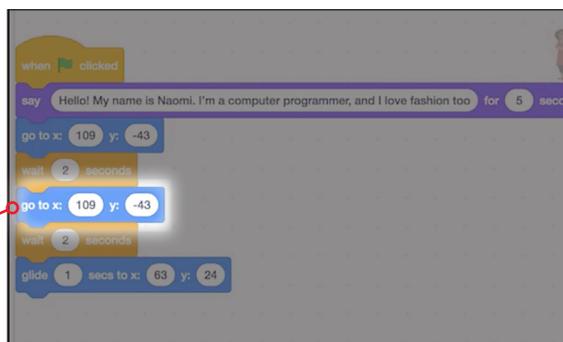
Drag the wait 1 second block and drop it below the go to block. Change the time from 1 to 2. That will add a 2 second pause in your program.



19 Next, let's make sure you know where you want your model Sprite to move.

Click and drag your Sprite to the location on stage you want to program her to move to so you can see what the exact x-y coordinates are. Remember that the coordinates show in the Sprite window. This is a good way to plan out your runway walk!

Drag another blue **go to x y** block from the blue Motion section and drop it at the bottom of your stack of blocks. Change the x value and y value in this block to the numbers you decide to use! In this example, the Sprite will be programmed to go to 109 and -43. Add another wait block too!



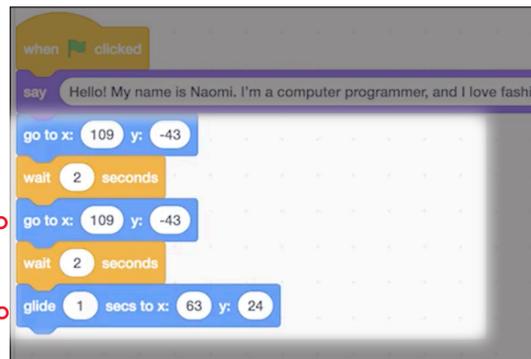
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Program your model to move to a couple more locations on the stage. Figure out the exact x and y coordinates that you want her to move to by clicking and dragging the Sprite around the Stage runway with your mouse, and then looking at the coordinates that show in the Sprite window.

Then add these numbers to your next go to block. You decide where your Sprite moves in your individual program!

Add another wait block.

Then try experimenting with the glide motion block next.



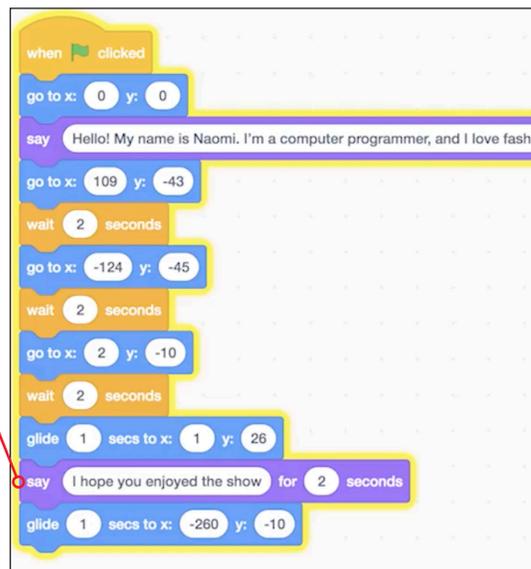
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Add a final say block to conclude your show!

Can you figure out how to program the Sprite to slide off the stage?

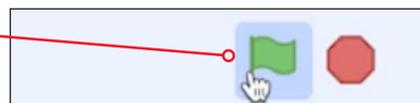
Can you figure out how to have the Sprite start at the center of your stage every time you run your program?

See my example program for hints!



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Test your program by clicking the **green run flag** and watch your Tech Fashionista move around the runway!



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There are so many different ways you can code a program in Scratch. See what else you can do on your own!

Before you finish, be sure to name your program and click **Share** so other "Scratchers" can see your program too!



Extension Activities

For more practice coding, try these ideas.

- Click **Explore** and choose someone else's project to remix. How can you build on another Scratcher's ideas?
- Extend your scene by adding another model, adding your own recording, or even adding a new background to create a second scene.
- Try adding Operators or Sensing codes to your program. How can you use these codes to extend your program?
- Research additional coding languages. Find one that interests you and explore programs written in that coding language. Look for patterns or similarities to block-based programming.

Parent Tips

Your child is learning how to use block-based programming to create her own computer program in Scratch, a computer program developed by the Massachusetts Institute of Technology (MIT). Scratch helps students learn and practice valuable programming skills. Block-based programming is a great way for new coders to get started learning how to write simple programs and to spark their interest in different careers. It's especially important to encourage girls to explore the possibilities of computer programming; one day all careers will require some programming skills! Support your child by asking her to share her project with you, and try one or more of the ideas below:

- Explore local careers that require programming skills or knowledge. Try to find a job or career that you wouldn't expect to involve programming skills. Ask your child to identify how programming skills can help her in any career.
- Practice programming by asking your child to write instructions for you to follow. Start with a simple task (making a bed) and move on to more complicated tasks (cooking a meal). Follow the directions exactly. How well did the program work?
- Talk about how computer programs impact your daily life. What role do computer programs play in making your routines easier?