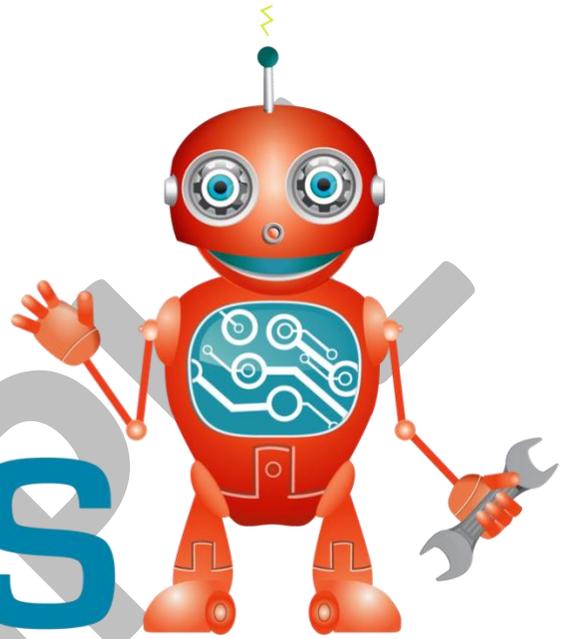


STEM MINDS



Science Technology Engineering Math

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STEM MINDS “VIDEO GAMES WITH SCRATCH” UNIT COPYRIGHT

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DAY 2: MAIN CHARACTER MOVEMENT

Required Materials

- Student accounts for Scratch
- Laptops/tablets (1 per student)
- Game planner (see Appendix B) for student reference

Learning Goals

We are learning to code with Scratch

- I can program basic movements for my main character sprite
- I can use loops and conditionals to control my main character's movements
- I can use the concept of sequence to control the flow of my code

Minds On (10 Minutes)

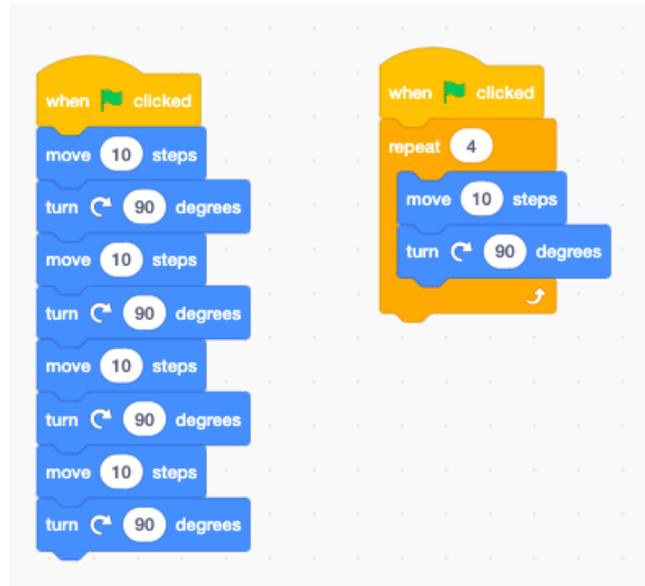
Where possible, have all students join the teacher in community circle. When all students are seated, ask students to quickly summarize what they remember about coding from yesterday. Ensure that students are making connections with the idea that “coding is the language that computers speak”, that we need to learn to code if we want to “speak” with computers, and that coding requires us to make sure that our instructions are very clear.

Next, tell students that there are three key terms we need to learn before we can start working today. ***You can use the slides for this lesson to support you if needed.***

[CONCEPT 1 REDACTED FROM SAMPLE]

Concept 2: Loops/Repeating Events

Show students the following image and ask them which line of code will move their sprite in a square.



Students should be able to identify that both lines of code do the exact same thing. Ask students to identify which line of code was probably easier/faster to write. Most students will also be able to identify that the code on the right is much more efficient.

Tell students that the example on the right is an example of a loop being used. A loop is, very simply, a section of our code that repeats until a certain condition is met. This could be a number of times to repeat, until a certain button is pressed, or even looping forever! This makes our code much easier to work with and more efficient.

Tell students that they will regularly be using “forever” loops in their code for this project because this is what allows their computer to constantly be checking for the player’s input through the keyboard. We’ll cover this in more detail in the video lesson.

[CONCEPT 3 REDACTED FOR SAMPLE]

Now that students have a good understanding of the key concepts they need to get started, we can begin coding our games in earnest!

Working On It (40 Minutes)

In today’s lesson, remind students that they will only be working on programming the movements of their main character. Code for enemies, collectibles, and even creating additional levels will be covered in later lessons.

This video lesson will walk students through the basics they need to program basic movements for their character. Students have the flexibility to add additional movements to their characters on their own. For example, students may explore further block categories to add sounds while their character moves, make their character spin as they move, etc.

You may wish to have students follow along with the video independently on their own devices or to follow along as a class, periodically pausing where necessary.



When students are done watching the video, they can get started on their project.

Be sure to circulate throughout the class while students are working in order to provide guidance. You may wish to give students access to the video link so they can go back and re-watch a section if they are stuck.

Important Notes:

- One of the most common mistakes that students will make is forgetting to put their “if..then..” blocks INSIDE of the forever loop. The forever loop is what causes the game to constantly be checking if the condition is true. Without it, the computer will only check once and then move on, which means your keyboard controls won’t work.
- Be sure to give students a 5 minute and 1 minute warning before their time to work on their project is wrapping up so students can manage their time effectively.

Consolidation (5 - 10 Minutes)

Depending on your group of students, you may want to provide 3-5 minutes for students to get cleaned up, devices put away, and to rejoin you in community circle or to return to their seats.

When students have gathered, have students use Think, Pair, Share or another strategy to analyze the following image. Tell students that the coder wants their sprite to move left when the left key is pressed and right when the right key is pressed.

You can find a copy of this image in the slides for this lesson.

[IMAGE REDACTED FROM SAMPLE]

Ask students to determine:

- What, exactly, will this code do in its current form? Is it what the coder wants?
- If changes need to be made to this code in order for it to work, what changes should we make?

There are two main changes that need to be made to this code:

1. The conditionals are not inside of a forever loop, so they will only be checked once. This would make your game essentially unplayable!
2. Both the left and right keys are moving the sprite 10 steps to the right. In order to move to the left, 10 would need to be changed to -10

Remind students that subtle changes and even small mistakes can have big impacts on your code. As we move forward, this will get more complex, so keep in mind some of the strategies for troubleshooting we discussed in the first lesson as we continue to work on our projects.