Content Type

Scratch Mix and Match Challenge Bonus: Levels

Level: Grade 7–12 • **Topic:** Game Design, Digital Storytelling

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About the Author

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Mary is an educator, writer and media artist who loves to collaborate. She creates poetry films and Augmented Reality art installations. Mary gets really excited about participatory media digital arts projects and believes in the potential for creative technologies to inspire individuals and connect communities. Mary's next adventures include creating sound compositions of letters from WWI. Mary has a B. Ed, specializing in Special Education and Language Literacy and is currently finishing off her Master's of Educational Technology degree through UBC. She has taught in Canada and at international schools in Africa and in Asia. Mary loves traveling to meet new people, learn about different ways of being, and experiencing new landscapes.

Overview

Welcome to the Scratch Mix and Match Cards Challenge. This is a Bonus Bonanza week. This week you get seven cards from the Mix and Match Challenge deck! I'll feature the Levels #1 and Levels #2 cards, and show you how to add levels to your Scratch game. Adding levels to your game makes the fun last longer, and adds to the challenge. We'll take a look at the code blocks involved in this algorithm, the code blocks on the Levels #1 card, and pull them apart to figure out how to put them back together and make a level for your game.

> *Hey, do you know this word?* **Decomposition** is one of the ways of computational thinking. It means to take a bigger problem and break it down into smaller pieces to make it easier to solve. Notice how we use this approach to figure out how to set up levels in a game!

Part 1 • Video Link: https://youtu.be/zvtbsL0uqpl

Thanks so much to The Mini Vandals for sharing their track, High Life (link: https://www.youtube.com/channel/UCTdSDPjB1kIe7puRKAuHP_g)

Steps to Setting Up Levels
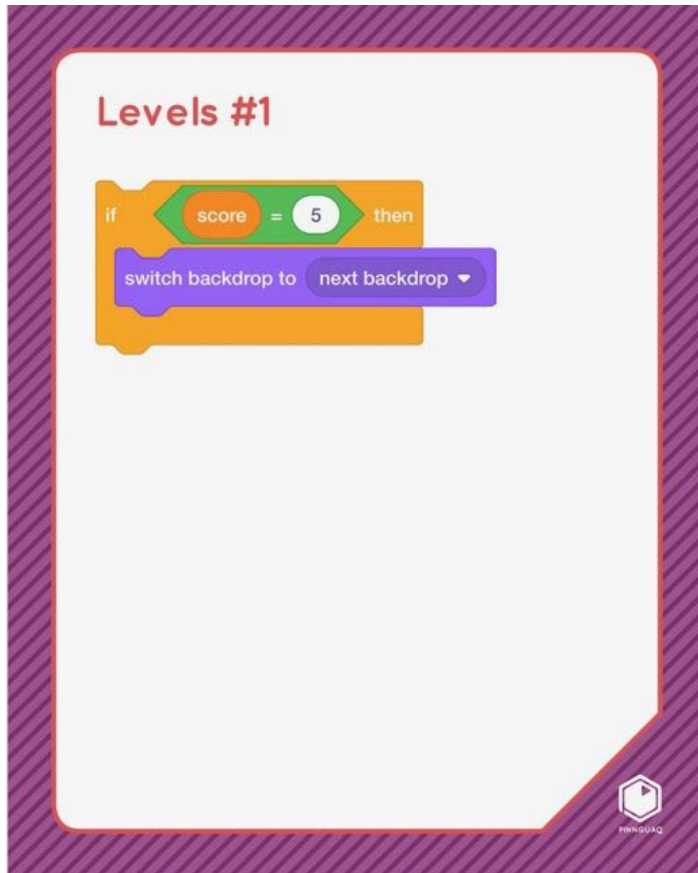
Let's start by looking at all the pieces in this algorithm, these blocks of code which tell the computer that *if* the score in the game equals 5, ***then*** switch to the next backdrop.

● Here I have set up the code to change to a new level in this Critter Chorus game.
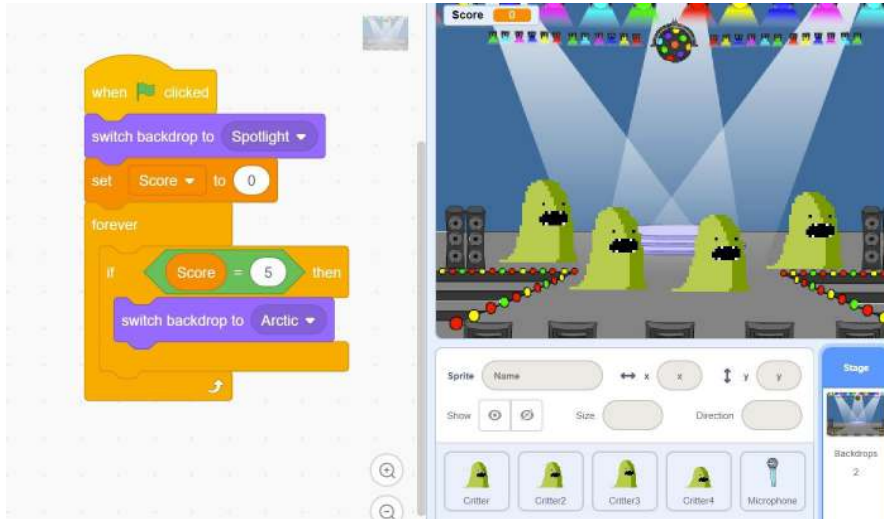
● If the Score = 5, then switch backdrop to the Arctic backdrop. Let's pull these code blocks apart to figure out how to put it together.
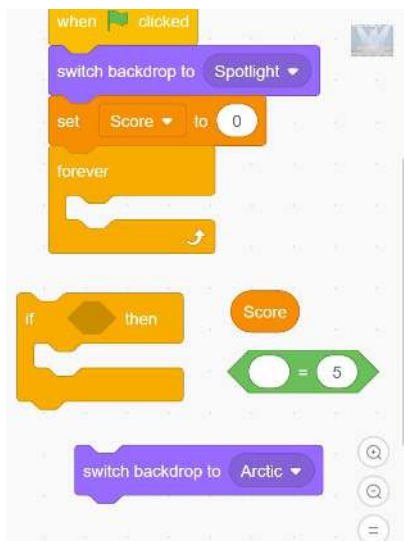
● Now you can see all the different pieces and how they fit together:
   a. The orange **Control If…then** block fits into the **Forever** loop.
   b.   The green **Operators** block fits inside the hole in the orange **Control If…then** block.
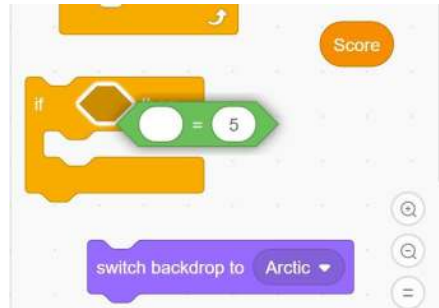
c. The deep orange **Variable** Score block fits into the rounded hole inside the green **Operators** block.

d. The purple **Looks** block that tells which backdrop to switch to fits inside the middle of the **If…then** orange **Control** block.
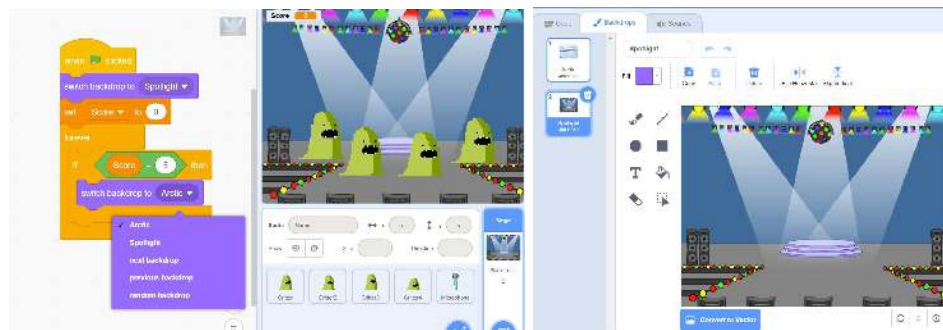

Now let's think about what each of these blocks does:

Remember that **Variables** are a way to keep track of information in a game or story that can vary or change.

Green Operators blocks are a way to use Math equations in the code. For this game, I am using the Operator block to compare if two things are equal.

- The **Forever** loop tells the computer to keep running the code inside it (forever!).
- The orange **Control** **If…then** block tells the computer that **if** something is happening (we say "is true") **then** something should happen.
- The green **Operators** block tells the computer that "something equals something."
- I can place the deep orange **Variable** that I created to track the Score right into the hole in the green **Operators** block. I have set it up to trigger the backdrop to switch if the Score = 5.
- To make all of this work, I would first need a Score **Variable**.
- To make a **Variable**, you go to the deep orange **Variables** blocks.
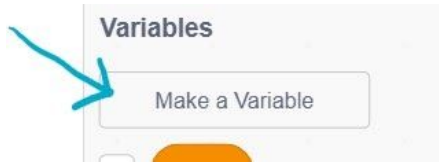
a. Click on "Make a Variable."
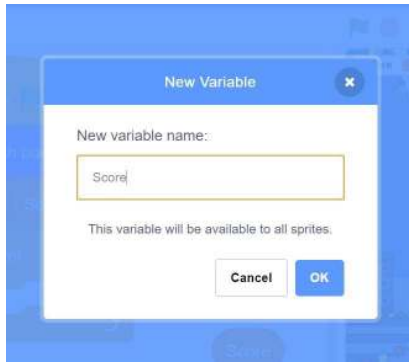
b. Give your Variable a Name

As I am in the **Backdrops** and **Stage** code area, any **Variables** that I make here will be for all sprites.

c. Check the box beside the **Variables** that you want to show on the screen during the game. I want the Score to show, so I have checked the box beside it.

● Because there is a **Forever** loop orange **Control** block wrapped around the **If...then** block, the computer is continually checking to see if the score is 5. When the score is 5, the computer will make the **Backdrop** switch.

● When the **Backdrop** switches, you are at a new level in your game. You can change your game in many different ways to make the next level different. Maybe your game gets

harder because the actions happen more quickly. In the Critter Chorus game, the action happens more quickly, and the critters start moving around. Maybe your game has a more difficult maze to navigate, or trickier track to drive on when the backdrop switches. Watch the next video and continue on with the tutorial to see how I changed the Critter Chorus game into the Level Up Critter Chorus game with a second, more challenging level.

Part 2 • Video Link: https://youtu.be/7L_TI-_LhvI

Thanks so much to The Mini Vandals for sharing their track, High Life (link: https://www.youtube.com/channel/UCTdSDPjB1kIe7puRKAuHP_g)

Let's take a quick look at the way I've changed the Critter Chorus game to be a bit harder for the second level:

- When the backdrop switches to the Arctic, the next level begins.
- Let's pull these pieces apart to see what is happening.
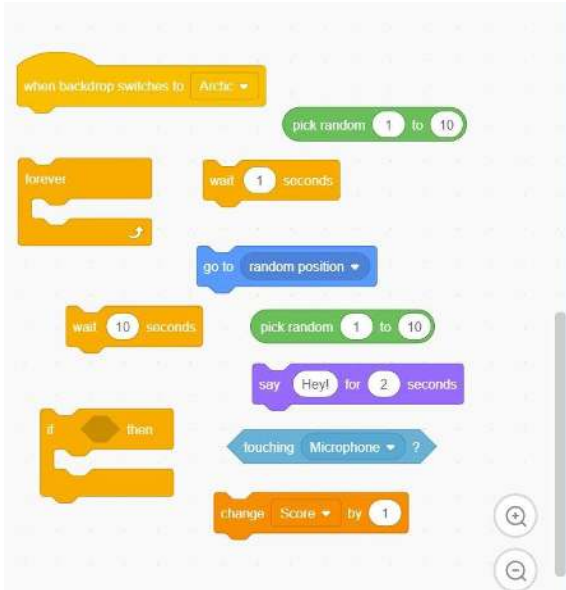
- The **Forever** loop wraps around all the other code blocks and will keep running the code that is inside its loop (forever!)
- Each critter will wait for a random number of seconds -- the computer will choose a random number between 1 and 10 for that critter to wait.
- The blue **Motion** block tells the critter where to go and I've chosen **"random position"** from the drop down menu. This means the critter can move to anywhere on the stage.
- Another orange **Control** wait block will make sure the critters don't all say "Hey" at the same time, they have been instructed to wait a random number of seconds --the computer will choose a random number between 1 and 10.
- The critter will **say "Hey" for 2 seconds.**
- The orange **If...then Control** block tells the computer if something happens (is true), then something else should happen.
- The light blue **Sensing** block will tell the computer *If* the critter is **touching the microphone** when it says "Hey" *then...*
- Change the **Variable**, Score by 1 and gain a point!
- You can change your game in so many different ways for the next Level.
- Use the code blocks shown on the Levels #2 card to make more than two levels in your game!
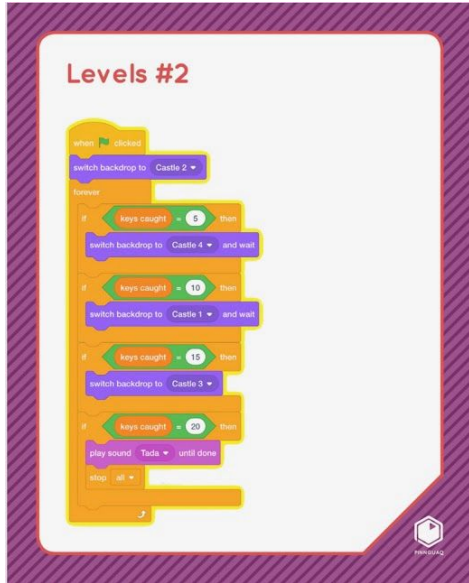
A Bonus Challenge

Take a look at some of the other **Operator** blocks and see if you can think of ways you could use them in a game.
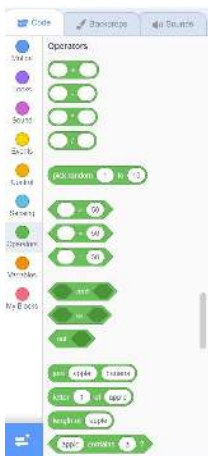
Conclusion

We want to see the awesome things you're creating! Take a photo or video and share your work with us by emailing media@pinnguaq.com or tagging **@pinnguaq** on Facebook, Twitter, or Instagram. Don't forget to include the hashtag *#LearnWithPinnguaq!* You can also upload your project to the Pinnguaq Studio (https://scratch.mit.edu/studios/26567463/).