

Learning to  
SCRATCH



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# WHAT IS SCRATCH?

SCRATCH IS A COMPUTER-BASED PROGRAM TO HELP TEACH KIDS AT A YOUNG AGE HOW TO CODE.

SCRATCH HELPS KIDS THINK CREATIVELY, REASON SYSTEMATICALLY, AND WORK COLLABORATIVELY (BEING ESSENTIAL SKILLS TO HAVE IN THE 21ST CENTURY).

THE PROGRAM SCRATCH WAS CREATED AND DESIGNED AT MIT BY MITCHEL RESNICK (MRES ON SCRATCH) AND ANDRÉS MONROY-HERNÁNDEZ (ANDRESMH ON SCRATCH).

THEY WANTED TO TEACH KIDS ALL OVER THE WORLD HOW TO CODE.



# SCRATCH



# WHO USES SCRATCH?

- SCRATCH IS MADE FOR PEOPLE RANGING IN AGE FROM 8-16
  - BUT CAN BE USED BY ANYONE LEARNING TO CODE
  
- SCRATCH IS AN INTERACTIVE PLATFORM MAKING CODING FUN AND EXCITING FOR BEGINNERS



# WHY IS SCRATCH HELPFUL?

THE CREATORS OF SCRATCH CREATED CODING BLOCKS TO SHOW DIFFICULT CODE BROKEN DOWN INTO SIMPLER TERMS.





FROM LEARNING SCRATCH THESE SKILLS OF BEGINNER CODE CAN LAUNCH YOU INTO OTHER LANGUAGES. FOR EXAMPLE, DURING ARTEMIS WE WENT FROM SCRATCH, TO HTML/CSS, JAVA, PYTHON, PYTHON WITH TURTLES, AND NOW WORKING WITH MICRO BIT.

## ADVANCEMENT FROM SCRATCH

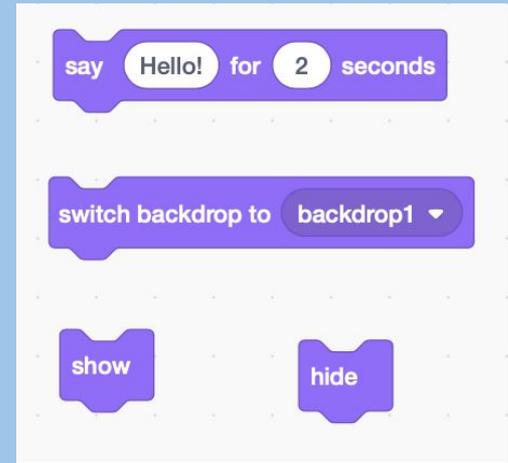
# LEARNING THE BASICS

IN SCRATCH THE BLOCKS HELP SHOW CODE IN EASIER FORMAT FOR KIDS. THERE ARE MANY SECTIONS IN SCRATCH AND IN THE SECTIONS THERE ARE BLOCKS.

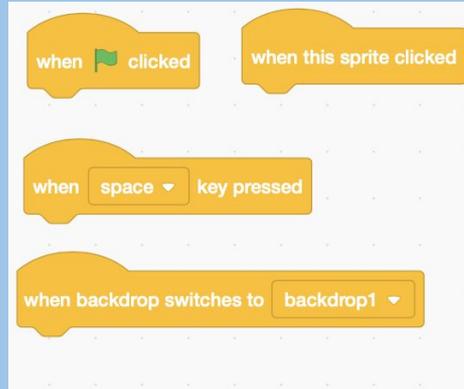
THESE SECTIONS INCLUDE: MOTION, LOOKS, SOUND, EVENTS, CONTROL, SENSING, OPERATORS, VARIABLES, AND MY BLOCKS.



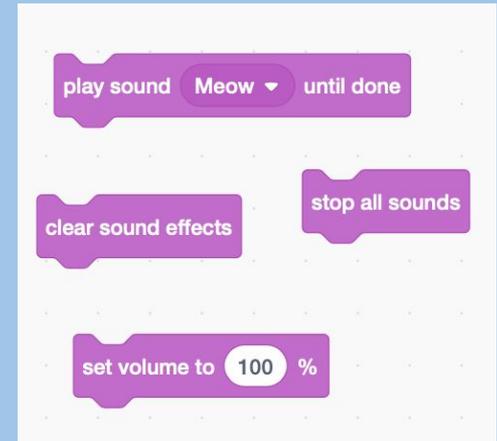
MOTION



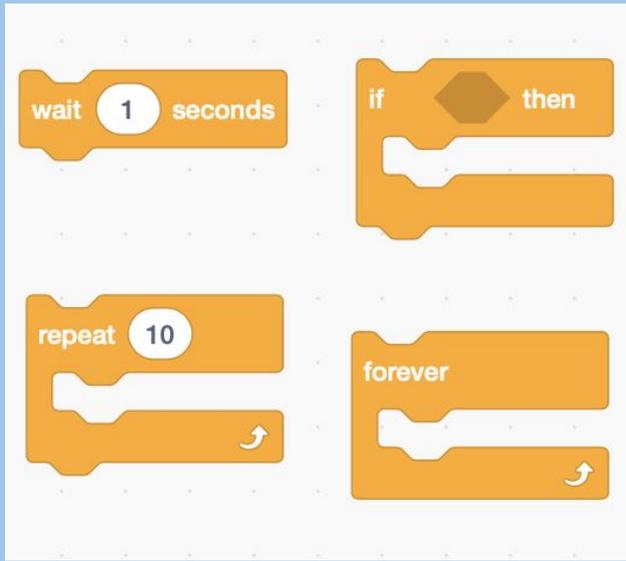
Looks



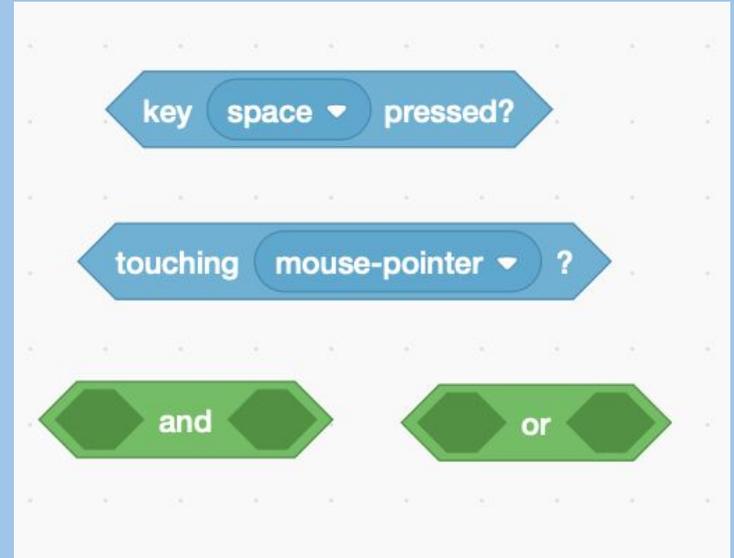
Events



Sounds



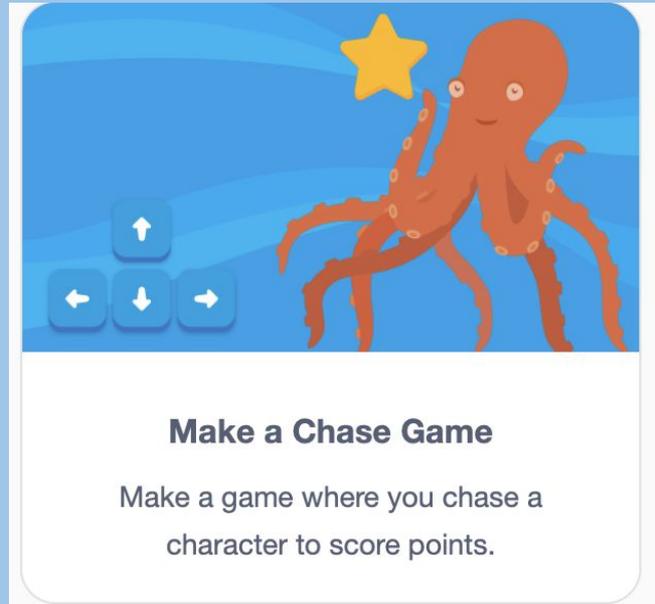
Control



Sensing and Operators

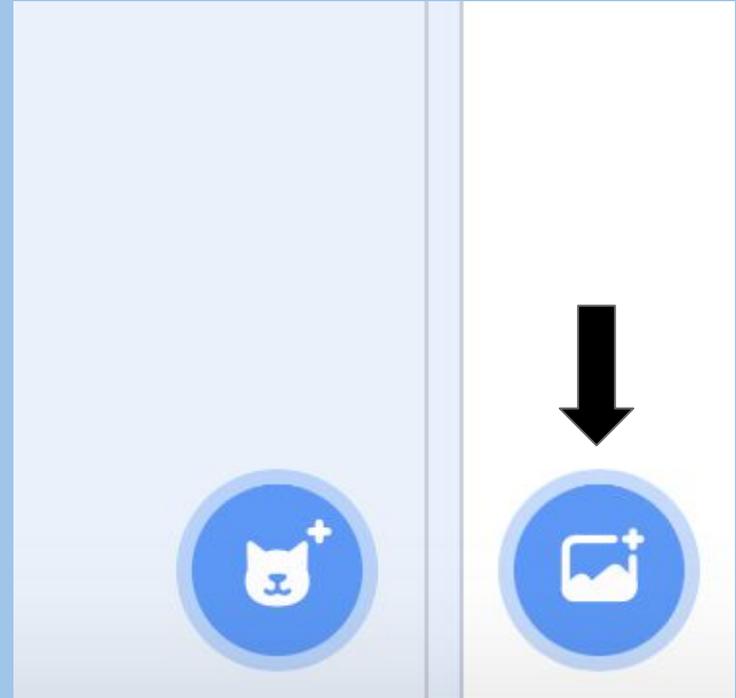
# NOW WE'RE GOING TO CODE A GAME ON SCRATCH CALLED UNDERWATER TAG!

- THIS GAME IS ABOUT MAKING A SPRITE CHASE ANOTHER SPRITE WHILE EARNING POINTS.



# ADD A NICE BACKGROUND

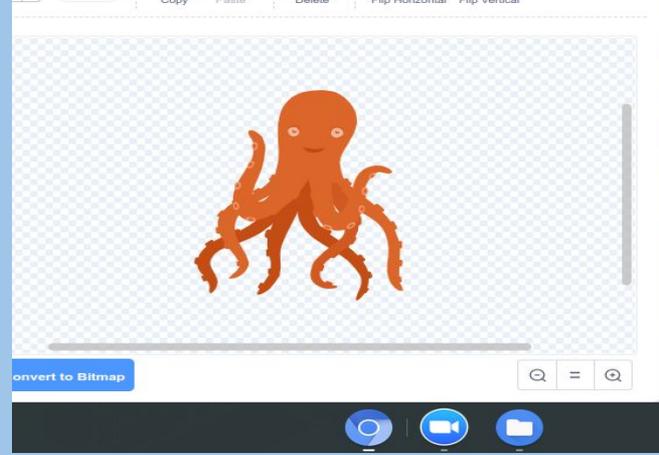
SINCE THIS IS AN UNDERWATER BASED GAME, CHOOSE A BACKGROUND THAT BEST FITS THE THEME. OR DON'T, YOU CAN ALWAYS CHOOSE SOMETHING ELSE.



# GET TWO SPRITES FOR THE GAME

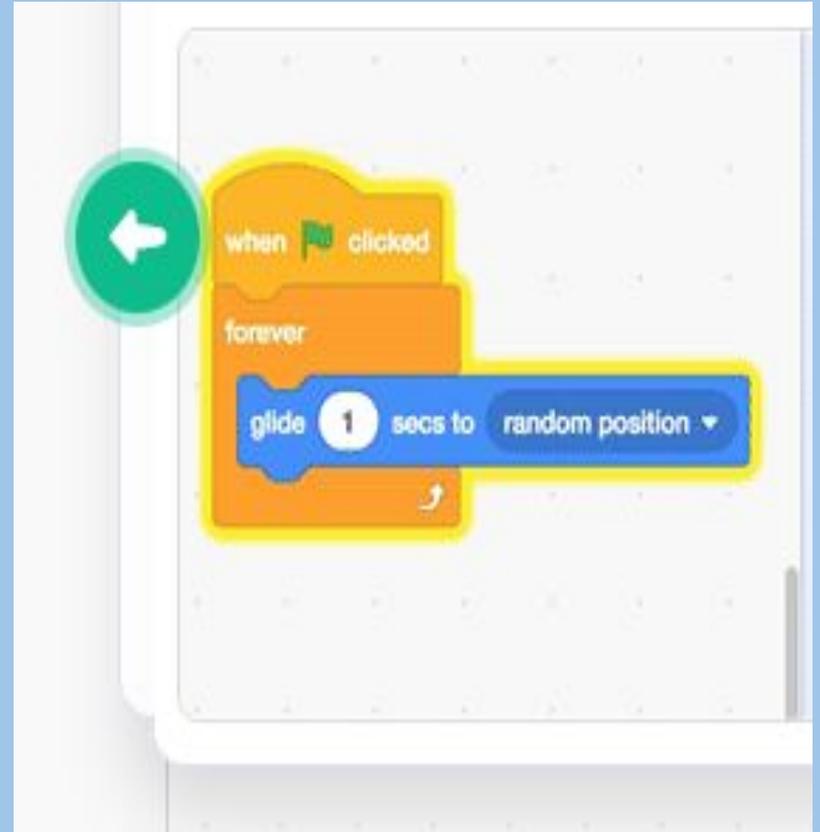
THESE ARE THE SPRITES THAT WE ARE GOING TO USE, AND THEY BOTH HAVE SPECIFIC FUNCTIONS THAT WE NEED TO CODE IN ORDER FOR THE GAME TO WORK.

SO, LET'S BEGIN.



# CODE FOR STAR SPRITE

THE OCTOPUS SPRITE NEEDS TO TOUCH THE STAR IN ORDER TO GET POINTS. SO, YOU NEED TO PROGRAM THE STAR TO MOVE RANDOMLY AROUND THE BACKDROP SO IT'S HARD FOR THE PLAYER TO GET IT. GET THE "WHEN GREEN FLAG IS CLICKED" EVENT BLOCK, AND CONNECTED IT WITH A FOREVER LOOP. THEN PUT A "GLIDE TO A RANDOM POSITION" BLOCK FROM BASICS, AND PUT IT IN THE FOREVER LOOP.

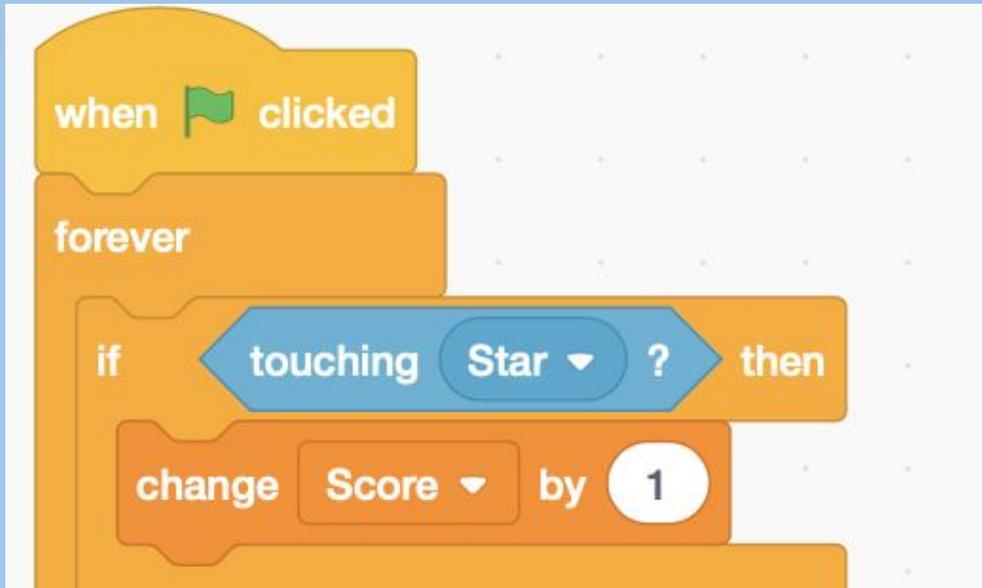


# MAKING THE SPRITE THAT WILL CHASE THE STAR



TO MAKE THE SPRITE BE ABLE TO MOVE ACROSS THE SCREEN USE THESE TWO EVENT BLOCKS SO WHEN THE RIGHT OR LEFT ARROW KEY IS PRESSED IT'LL MOVE 10 STEPS TO THE RIGHT OR LEFT.

# NEXT . . .

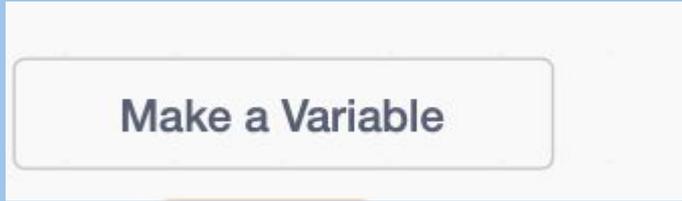


TO MAKE THE SPRITE EARN POINTS WHENEVER IT TOUCHES THE STAR, THESE BLOCKS WILL BE USED.

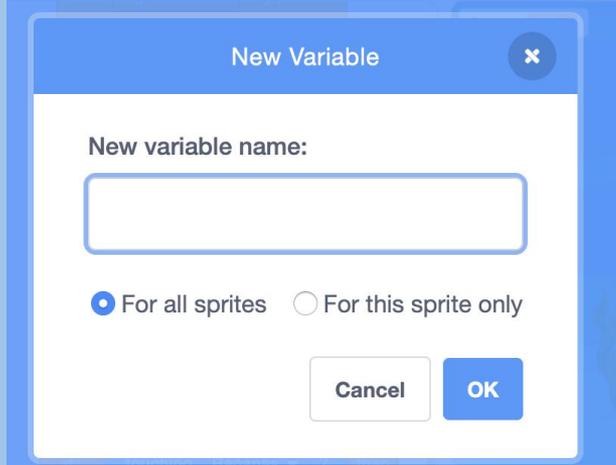
CREATE AN EVENT BLOCK SO THAT WHEN THE FLAG IS CLICKED THE FOLLOWING BLOCKS CAN CARRY OUT WHAT YOU'VE SET THEM TO DO.

HAVE AN "IF THEN" BLOCK GO INTO A FOREVER BLOCK SO THAT **IF** THE SPRITE IS TOUCHING THE STAR **THEN** CHANGE THE SCORE BY 1. THE FOREVER BLOCK MAKES THIS GOES ON FOREVER.

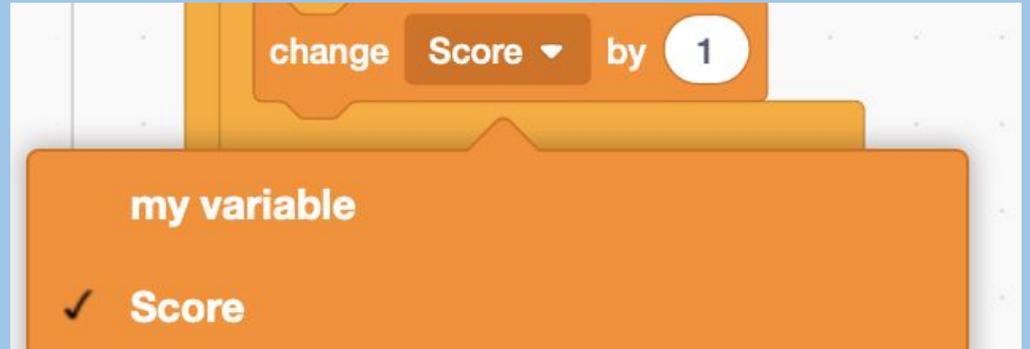
# MAKING THE SCOREBOARD:



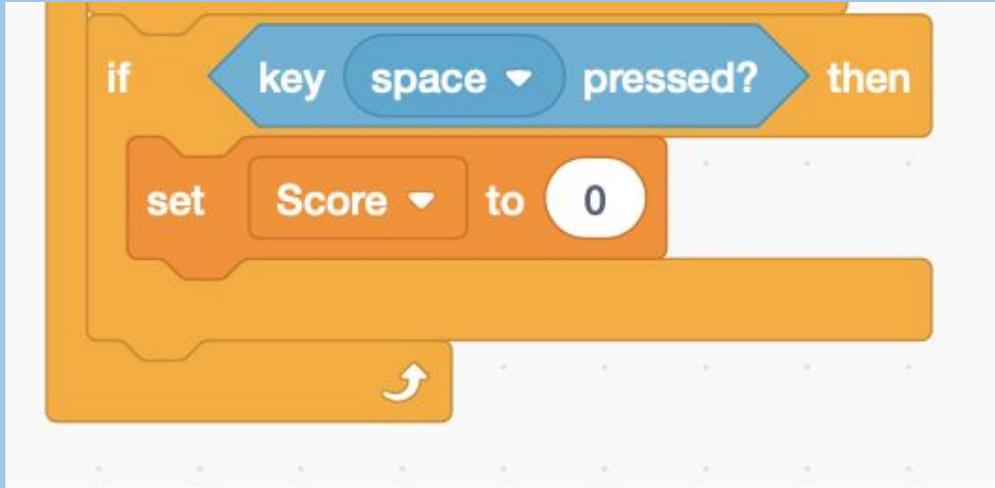
TO MAKE THE SCOREBOARD, CREATE A VARIABLE BY GOING TO THE VARIABLES SECTION AND CLICK ON "MAKE A VARIABLE". CALL THIS VARIABLE "SCORE" AND MAKE IT APPEAR FOR ALL SPRITES.



USING THE BLOCK BELOW, SELECT THE SCORE VARIABLE AND MAKE IT GO UP BY 1.



# RESET THE SCOREBOARD:



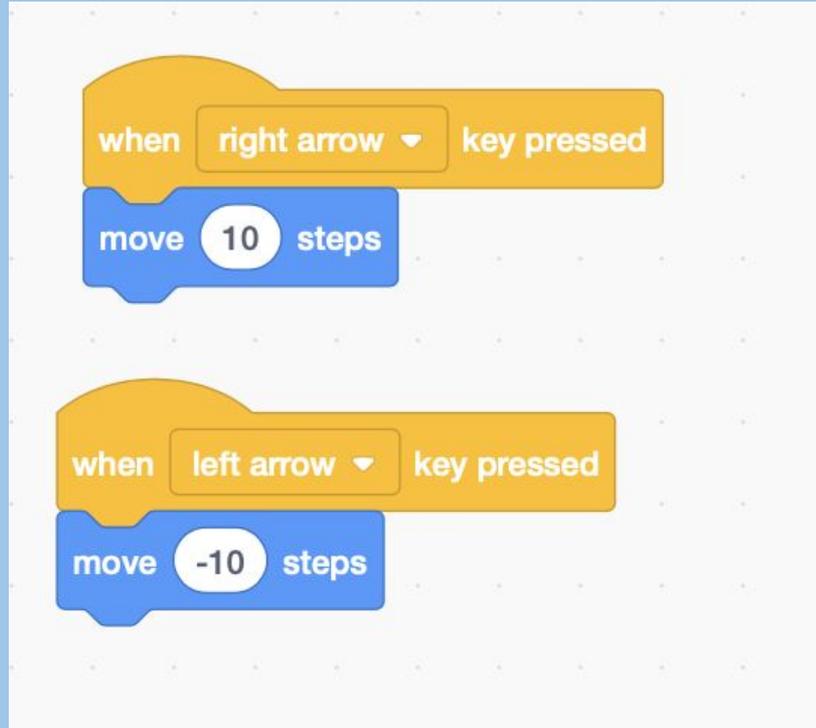
TO RESET THE SCOREBOARD, CREATE ANOTHER “IF THEN” STATEMENT THAT WILL GO UNDERNEATH THE OTHER ONE. THIS BLOCK WILL ALSO GO INTO THE FOREVER BLOCK.

USE A SENSING BLOCK SO THAT **IF** THE SPACEBAR IS PRESSED, **THEN** THE SCORE WILL RESET TO 0. (THE KEY USED TO RESET THE SCORE CAN BE ANY KEY!)

USE A VARIABLE BLOCK TO SET THE SCORE TO 0.

# THE CODE FOR THE OCTOPUS SPRITE!

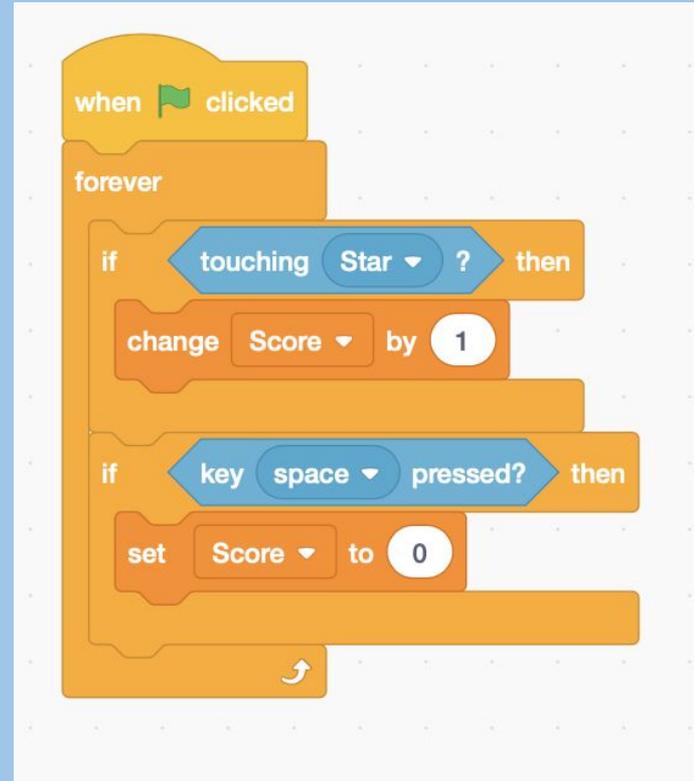
TO PLAY THE GAME, CLICK HERE! > [HTTPS://SCRATCH.MIT.EDU/PROJECTS/414448134/](https://scratch.mit.edu/projects/414448134/)



```
when right arrow key pressed
  move 10 steps

when left arrow key pressed
  move -10 steps
```

The image shows two Scratch code blocks on a white grid background. The first block is an orange 'when key pressed' block with 'right arrow' selected in the dropdown and 'key pressed' in the text. Below it is a blue 'move 10 steps' block. The second block is an orange 'when key pressed' block with 'left arrow' selected in the dropdown and 'key pressed' in the text. Below it is a blue 'move -10 steps' block.



```
when clicked
  forever
    if touching Star ? then
      change Score by 1
    if key space pressed? then
      set Score to 0
```

The image shows a Scratch code block on a white grid background. It starts with an orange 'when clicked' block. Below it is an orange 'forever' loop block. Inside the loop, there are two 'if' blocks. The first 'if' block has a blue 'touching Star ?' block in the 'if' slot and a blue 'then' block. Below the 'then' block is an orange 'change Score by 1' block. The second 'if' block has a blue 'key space pressed?' block in the 'if' slot and a blue 'then' block. Below the 'then' block is an orange 'set Score to 0' block. The 'forever' loop block has a white arrow icon at the bottom right.

# SCRATCH FOR THE FUTURE

SCRATCH OPENS UP MANY DOORS TO ADVANCED CODING AND MORE SOPHISTICATED GAMES

- [HTTPS://SCRATCH.MIT.EDU/PROJECTS/105974/](https://scratch.mit.edu/projects/105974/)

