

Sprite wants to broadcast ...

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In this lesson, we will learn ...

- * The very important feature of 'BROADCAST' in SCRATCH.
- * We will see how 'BROADCAST' can be used to synchronize actions between different sprites.
- * In this process, we will build a simple 'GHOST-BUSTER' game which will test your alertness and speed.

Ok, what is BROADCAST?

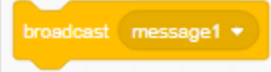
- * BROADCAST is a way for SPRITE to ‘secretly’ pass messages to each other ...
- * There are two key blocks (In the EVENTS section) ...

Most of the time we will be using this one ...

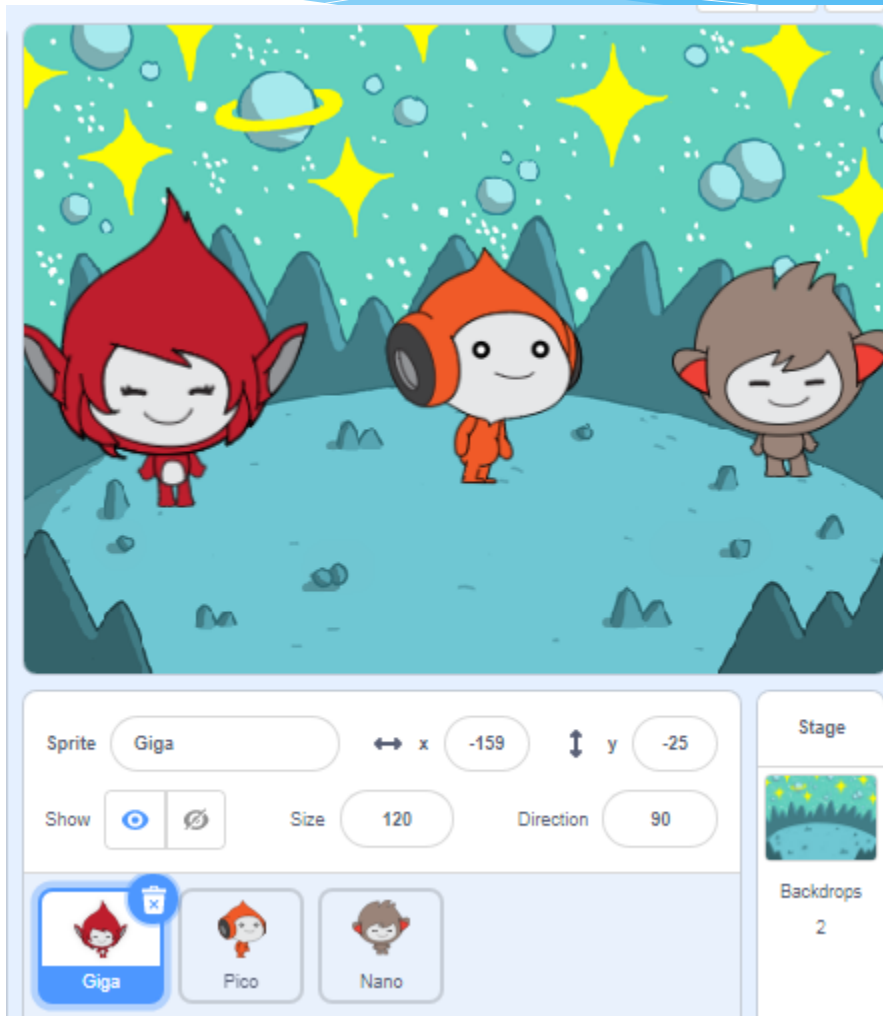


You can re-name the message by using 'Dropdown' and 'NEW Message'

Alright, what does BROADCAST do?

- * The  block 'quietly' sends a message to ALL the other participants of the code. These are
 - * Different sprites
 - * Backdrop
 - * Different pieces of code in the same sprite.
- * By 'quietly', we mean without displaying on the stage or letting us know.

Sprites and backdrop!

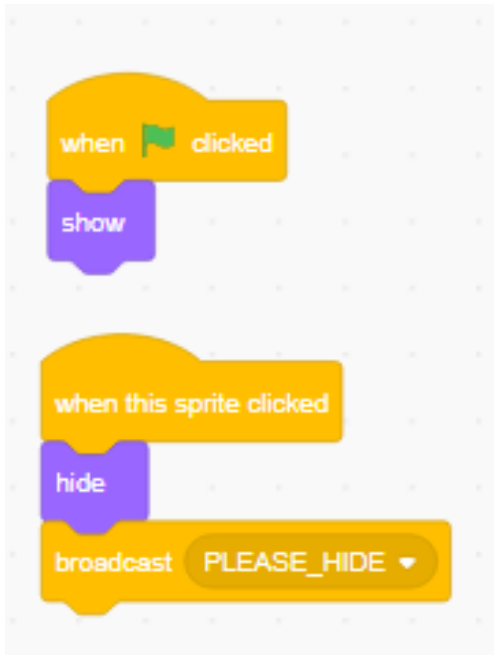


For our purpose, we add sprites GIGA, PICO and NANO.

And Change the Backdrop to SPACE.

Click GIGA to hide NANO and PICO

GIGA code



PICO code



NANO code



When GIGA is clicked, it hides and sends out a message called 'PLEASE_HIDE'.

When PICO and NANO 'receive' PLEASE_HIDE, they HIDE.

When should I use BROADCAST?

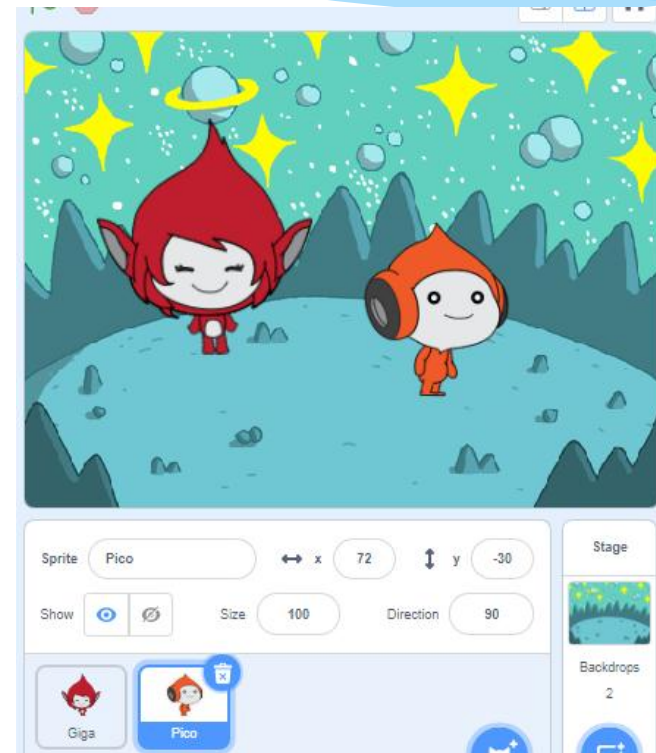
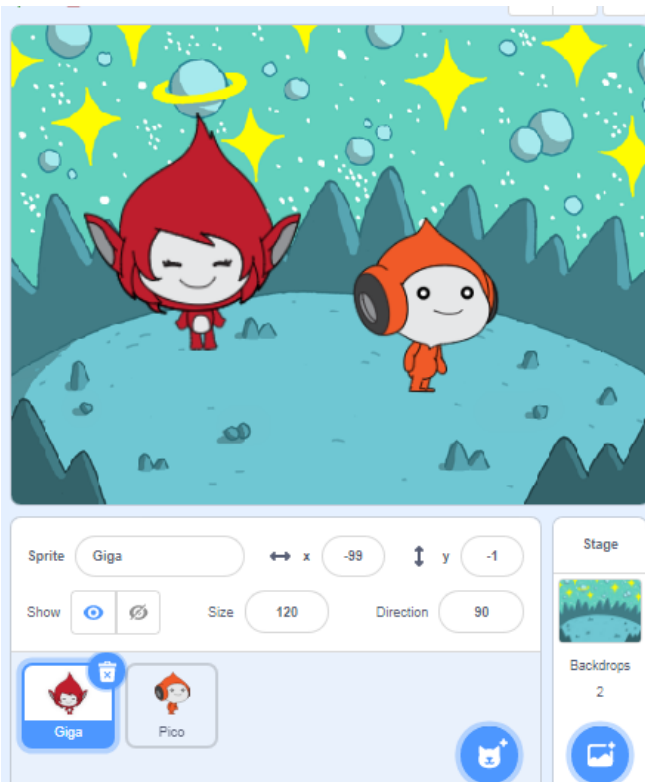
- * Three main scenarios:
 - * ACTION on one sprite causes an effect on another sprite.
 - * Multiple events lead to the same action.
 - * We want to 'CONTROL' when certain things happen and cannot predict in advance.

Our version of the Ghostbuster game

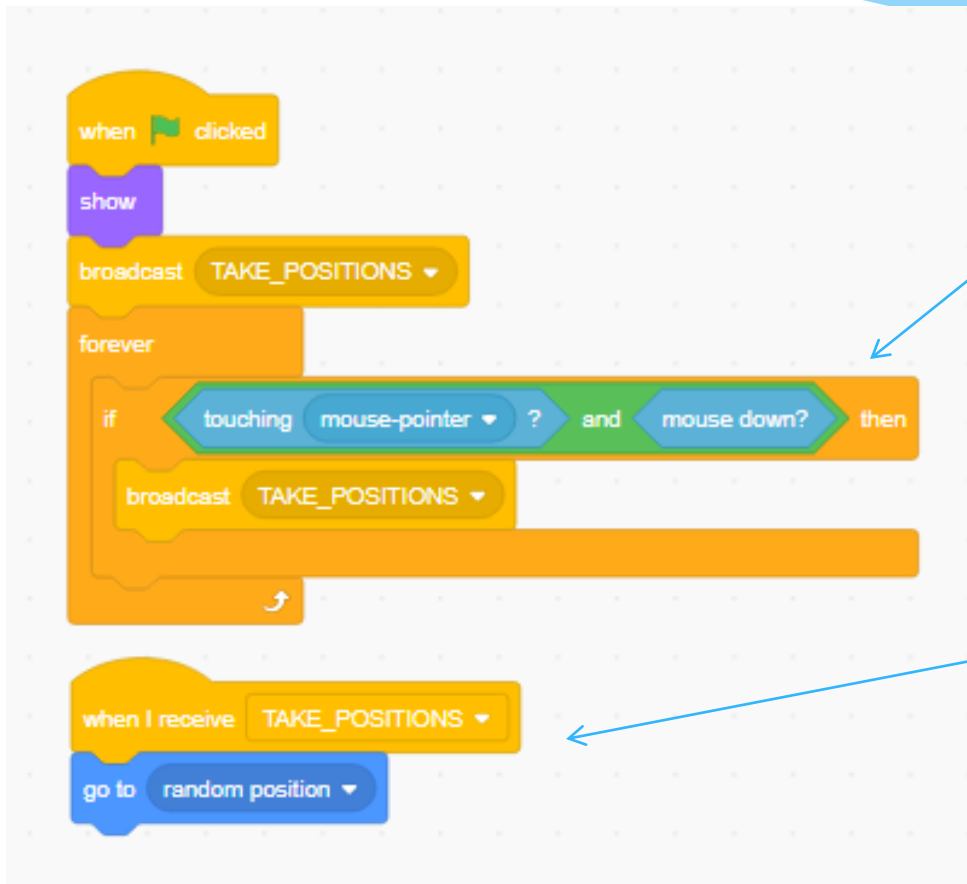
- * We have to locate and 'click' a favorite sprite – GIGA -- from a bunch of sprites.
- * Sprites appear at random positions.
- * If we 'click' our favorite sprite within a certain time, we get a point and all the sprites take on a new position.
- * If we do not click the favorite sprite in the given time, all the sprites take on a new position.
- * Game lasts for a given amount of time, after which we display the score and end the game.

As always, start small

- * Let's for now, get rid of the NANO. And make GIGA a bit bigger. (GIGA is out HERO)



GIGA Code for POSITION



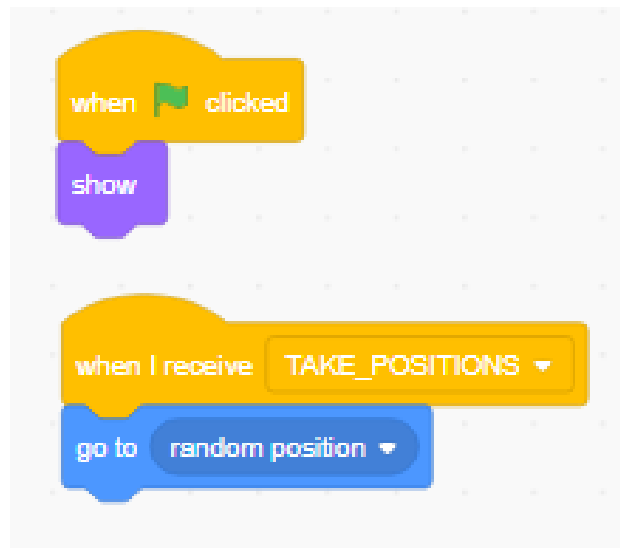
NOTICE: This will detect the event when the SPRITE has been clicked.

Why this, and not 'WHEN THIS SPRITE IS CLICKED?'. The simple answer is – This allows us to stop the game in the end.

NOTE: If there were only 1 sprite, we did not NEED to use BROADCAST, but we could still have used. But with multiple sprites, BROADCAST is (almost) a must.

PICO codes for POSITION

- * Notice how PICO ALSO take a new position when GIGA is clicked.



Creating a TIMEOUT

- * We want ALL the sprites to take on a NEW position if GIGA is NOT clicked for a certain duration.
- * For this purpose, we will use a block called TIMER (in SENSING).
- * This is like a ‘free running clock’.
 - * Just tick the box next to it to see it on the screen.

Using the timer

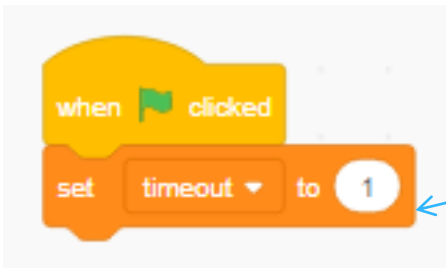
- * Scratch has a BLOCK called TIMER in the sensing portion.
- * This is like a ‘free running clock’.
- * We can use it for several purposes.
- * For example, here we will use it for creating the ‘TIMEOUT Feature’
 - * *If we do not click the favorite sprite in the given time, all the sprites take on a new position.*

Creating a TIMEOUT

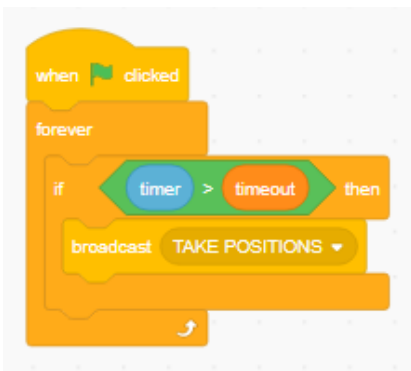
WARNING: A BIT ADVANCED



Whenever a new position is taken, RESET the timer – This is equivalent to RESTARTING the timer.



Create a variable called 'Timeout'



If timer exceeds Timeout, TAKE positions again.

Food for thought!

WARNING: SKIP IF CONFUSING

- * Why can't I do this? What is the problem with this code? Think carefully, or just try it.

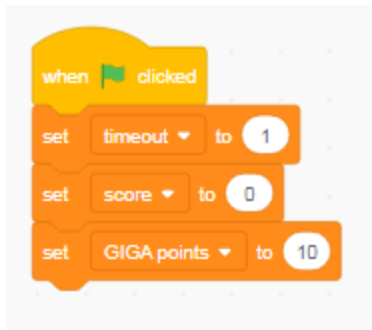


HINT:

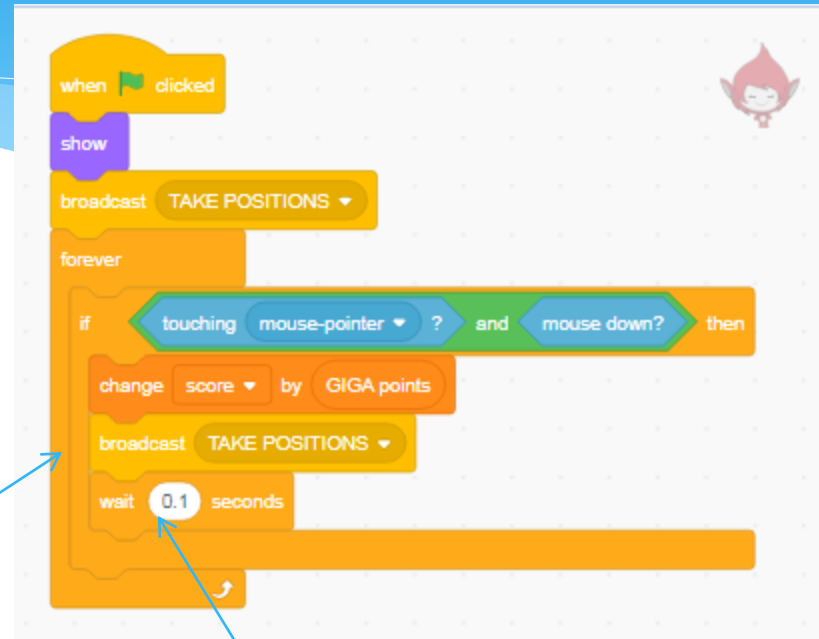
Will this code change position 'timeout' seconds *after* the sprite has been clicked? Or will it change 'every' timeout second?

Add score for GIGA ...

Add a variable
GIGA points



Add these two lines, same like
our 'CATCH' game.



A short wait to prevent
'multiple clicks from getting
registered

NOTE: These new lines of code are added to the 'earlier' loop itself. A new loop is not created. Please refer to the project page in scratch.

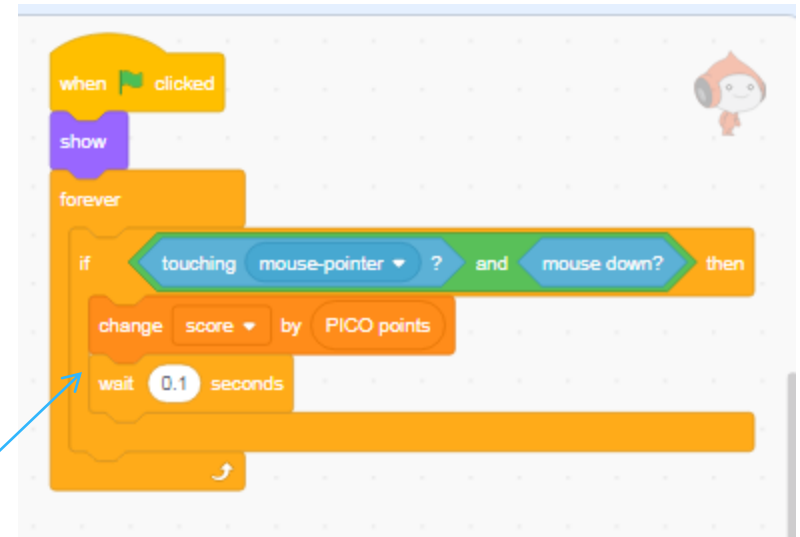
Add a (negative) score for PICO

Add a variable
PICO points

Update score when PICO is
clicked



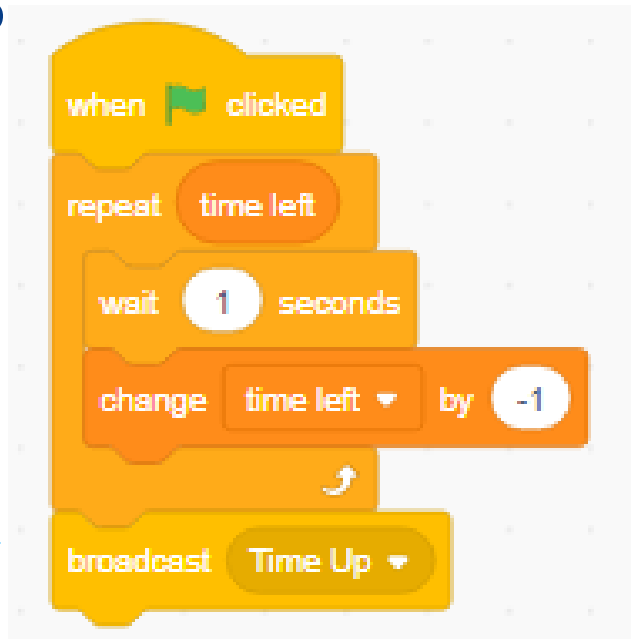
Notice, -5 for
clicking PICO



Notice: No broadcast here, only SCORE addition, since clicking PICO need not trigger search for new positions.

ADDING PLAYING DURATION

- * Same as in the CATCH game.
- * Use a variable called time left.
- * Notice, if timer was not being used elsewhere, we could have used TIMER too

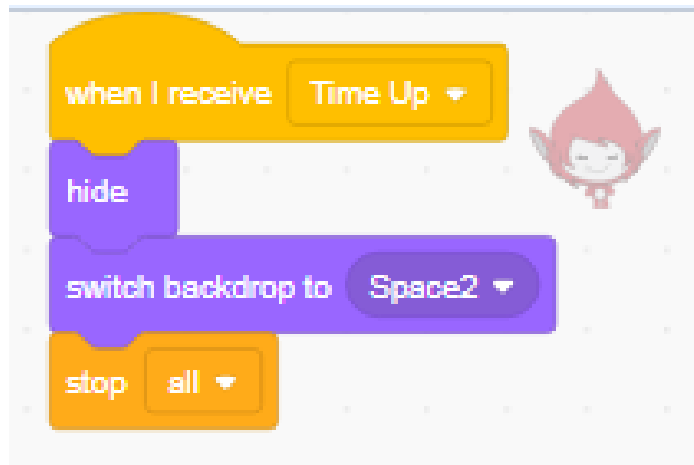


Keep reducing time left by 1 every second

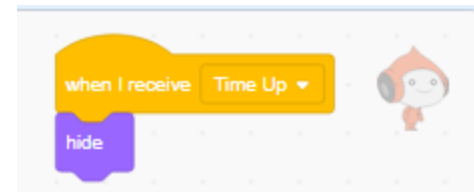
When TIME is up,
BROADCAST Time Up

And, then, on BOTH sprites

GIGA

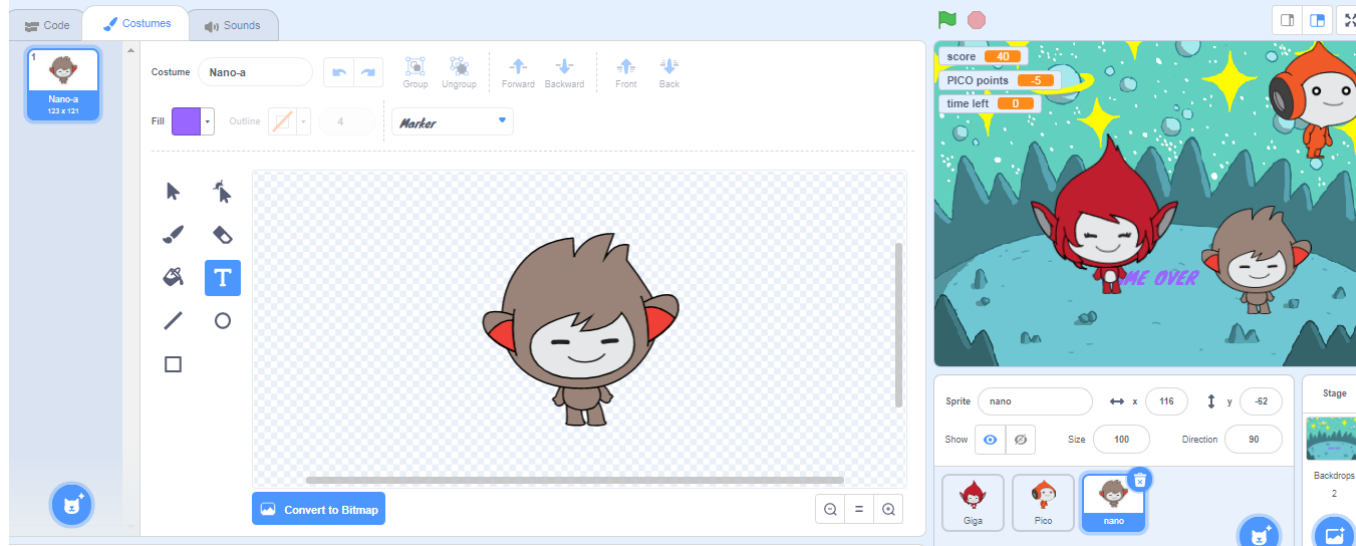


PICO



Now Add more sprites, e.g. NANO

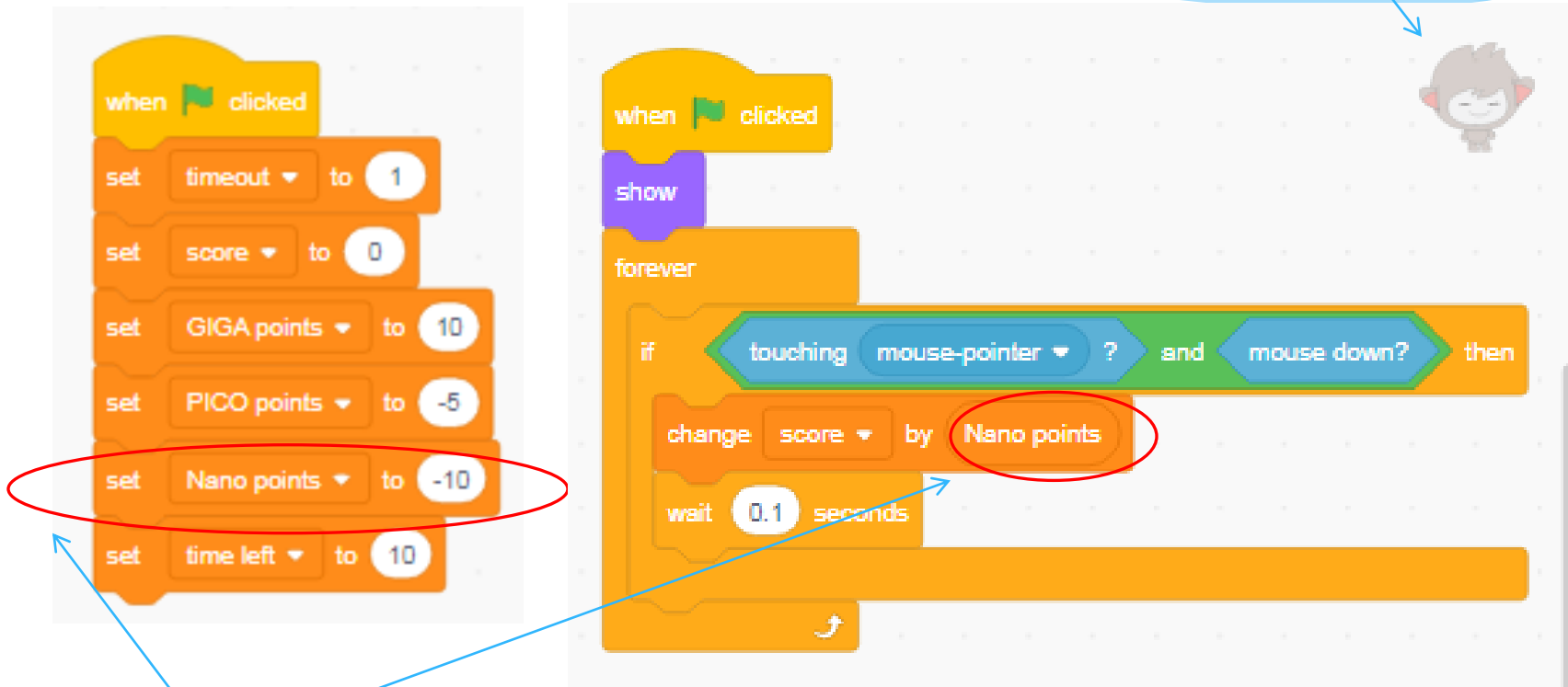
- * Right click PICO and DUPLICATE.
- * CHANGE COSTUME (Same like what we did in the CATCH Game). – and rename.



Update for scoring ...

Add a variable
NANO points

Code for NANO

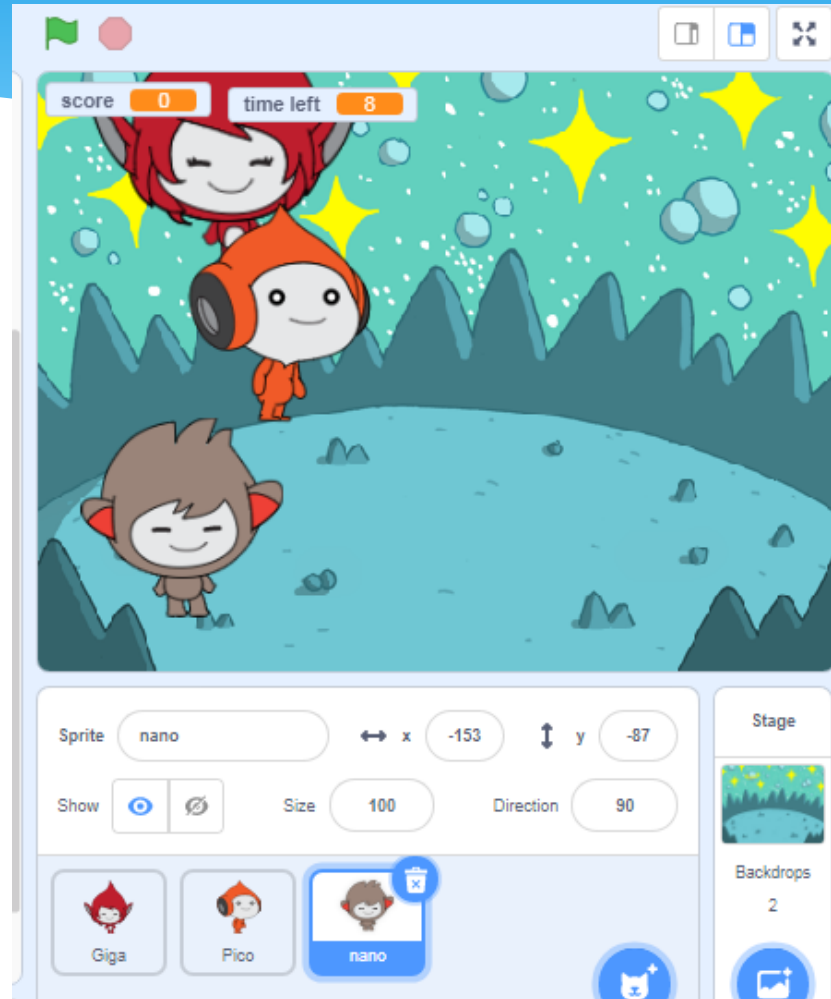


NOTICE

Food for thought?

- * Remember, we did not use the event 'WHEN this sprite is clicked'.
- * If we had done that, it will look like OUR game is still ACTIVE after the time is over. (especially if we did not HIDE).
- * STOP all will not stop the WHEN this sprite is clicked' event.

And now we have a 3 sprite game!



You are all set ...

- * BROADCAST is a very powerful and important feature in SCRATCH.
- * Use it carefully in your projects and you will see the value yourself.
- * For now, though, you are all set for your independent activity – 7: A ghost buster game.
- * Enjoy!