

Lesson 3 - Sensing Blocks – the Sensors of Sprites



Need of Sensing Blocks

In real life coding for automation etc, we need to constantly monitor the environment in order to react to the changes. This monitoring is done by sensors.

Similarly in coding projects using Scratch, we need to monitor the environment & react to the changes. This is done by Sensing blocks.

Needless to say the capabilities of these blocks is very limited. They provide a good substitute to learn the fundamentals but are not an alternative.

What are Sensing Blocks

They are used to identify and measure how objects within a project are interacting with each other or to detect certain keyboard and mouse movements.

Scratch provides Sensing Blocks for four main purposes:

- **Detect things.**
- **Location of mouse pointer.**
- **Its distance from another sprite.**
- **Whether one sprite is touching another sprite.**

User Input – Making Project Codes Interactive:

Another important use of Sensing Blocks is that they allow for user input.

Ability of a user to give his inputs when required by the code, introduces interactivity in coding projects.

These user inputs can be given in three ways:

- **Click of the mouse.**
- **Use of arrow keys on the keyboard, to make a sprite move around the stage.**
- **Typing an answer into a question box.**

Sensing blocks sense when user input happens.

Thereafter, they ensure that the sprite responds to the input provided by the user.

The code will not move ahead till the input is given.

Sensing Block Statements

In mBlock 5, Statements of Sensing Blocks for Devices & sprites are different.

**For Devices such statements also fall under sensing blocks.
They are light blue in colour.**

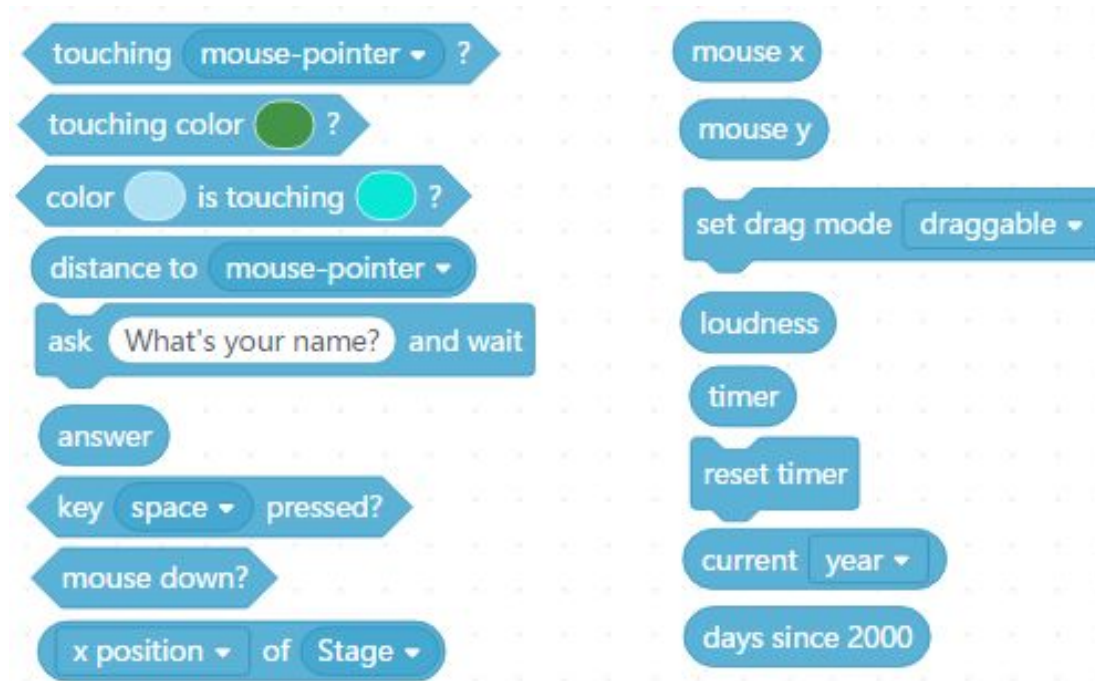
The number of statements for devices is larger than for sprites.

We shall study these later in the course.

Sensing Block Statements for Sprites

For sprites these are Cyan coloured.

These statements are:



Understanding the use of Sensing Block Statements

1. Understanding Mouse Down



This block will respond when the right mouse button is clicked.

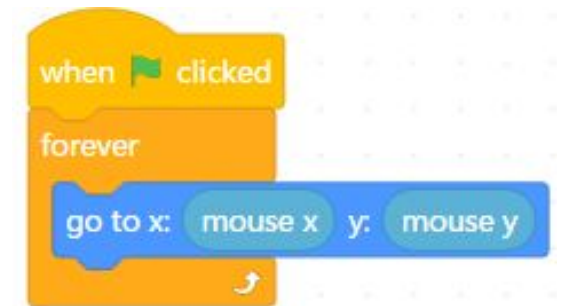
This means that **you can have a sprite, or part of your program respond to a user interacting using a mouse.**

Coding Project no 1

A typical way in which you can use sensing blocks is to build a script that will use the mouse pointer to control the movement of the sprite.

The code shown on the right will continually have the sprite go to the location of the mouses x and y coordinates.

It needs a forever loop for sprite to continually follow the mouse.



2. Understanding



This is a very useful block.

It gives us 42 options to trigger our codes.

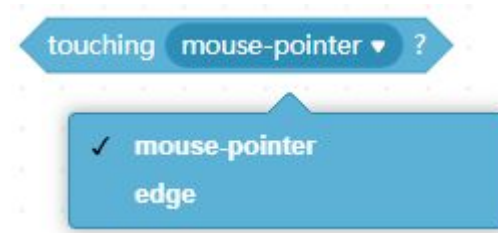
These exist in the dropdown shown.



3. Understanding



Its dropdown gives us two options.

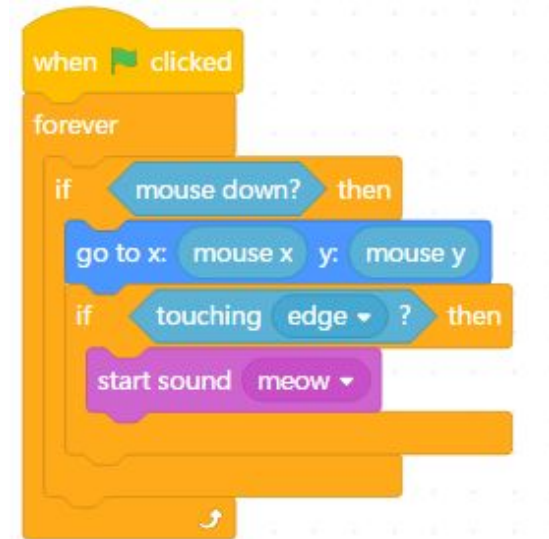


If a sprite using this block is touching any of the two options it will react with the statement placed below it.

Coding Project no 2

The script shown on the right is an example of a sprite being programmed to respond to touching the edge of the stage.

The sprite will follow the mouse pointer around the stage and when it touches the edge of the stage, it will raise an alarm by playing the sound of a cat meowing.



4. Understanding



The two are similar.

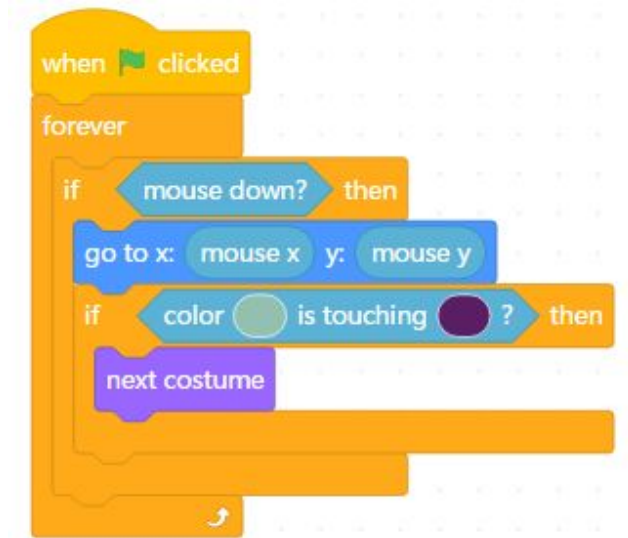
The first block is designed to **detect a collision** when any part of a sprite comes into contact with a specific colour on the stage.

The second is designed to **react** when it comes in contact with a specified colour.

Coding Project no 3

This is done by coding the sprite to do something when one colour touches another colour.

For example, the code on the right tells the sprite to change to the next costume when the colour black touches the colour grey.



5. Understanding



This block enables the code to **ask questions to a user**.
It also **stores the answer** given by the users using the keyboard.

Coding Project no 4

The question appears in a voice balloon on the screen.

When run, the program waits as the user types in a response, presses the enter key or the check mark is clicked.

Thereafter, when the answer block appears (line 4), the code picks the answer from storage & sends it out to appear as a voice bubble.



Coding Project no 5

Project with Sensing & Sound Blocks.

The story line for this project is:

For the annual day of the school, the music teacher has created an orchestra of four musical instruments.



On the final day, three out of the four are absent. So now all the four instruments have to be operated by only one student, & that too, remotely from outside the stage.

The Secret of doing this is in the trigger used to initiate the Instruments.

The trigger is:

- If mouse pointer is touching the instrument
- Then play the specified sound of that instrument.

Code for this project has been shown in the next slide.

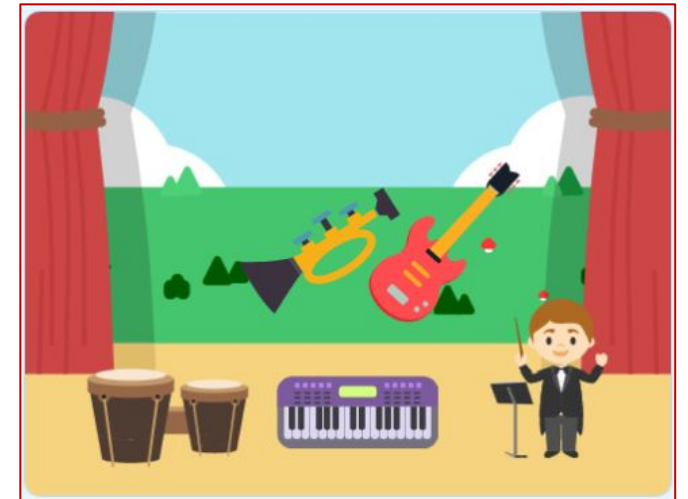
The stage is as shown here,

Code this yourself seeing the code below.

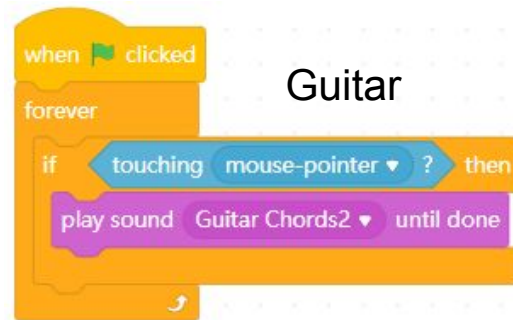
Now move the mouse pointer from one instrument to the other.

Create lovely music by moving it in different ways & speeds.

It was judged the best item of the evening.



Code For:





Code Karega India Badhega

THANK YOU Children