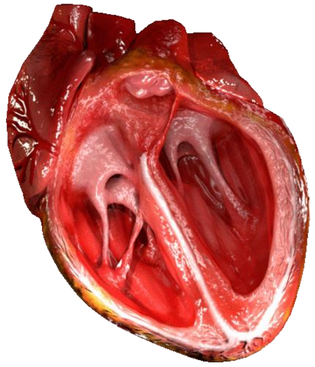
ATL Game Development Platform

Day 03

Programming Blocks in Scratch



By Mr. Neeraj &
Ms. Chithra from
Learning Links Foundation

NITI Aayog

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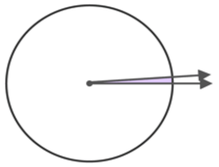
Agenda of the day

01 **Reflections of Day - 2**



02 **Introduction to programming blocks in scratch**

03 **Brief on Block Shapes in Scratch, Role of Motion, Looks, Sound, Event, Control, Sensing, Operators and variable blocks**

04 **Home Assignment, Q&A**

Reflections of Day - 2

- Brief on Sprites
- Different ways to add sprites
- Different ways to modify the existing sprites
- Costumes
- Different ways to add backgrounds
- Role of coordinates in Scratch
- Different ways to add sounds

What are programming blocks ?

Programming blocks help add action and animation to your sprites

Motion: Code blocks that control sprite placement, direction, rotation, and movement .

Looks: Code blocks that affect sprite and background appearance and to display text.

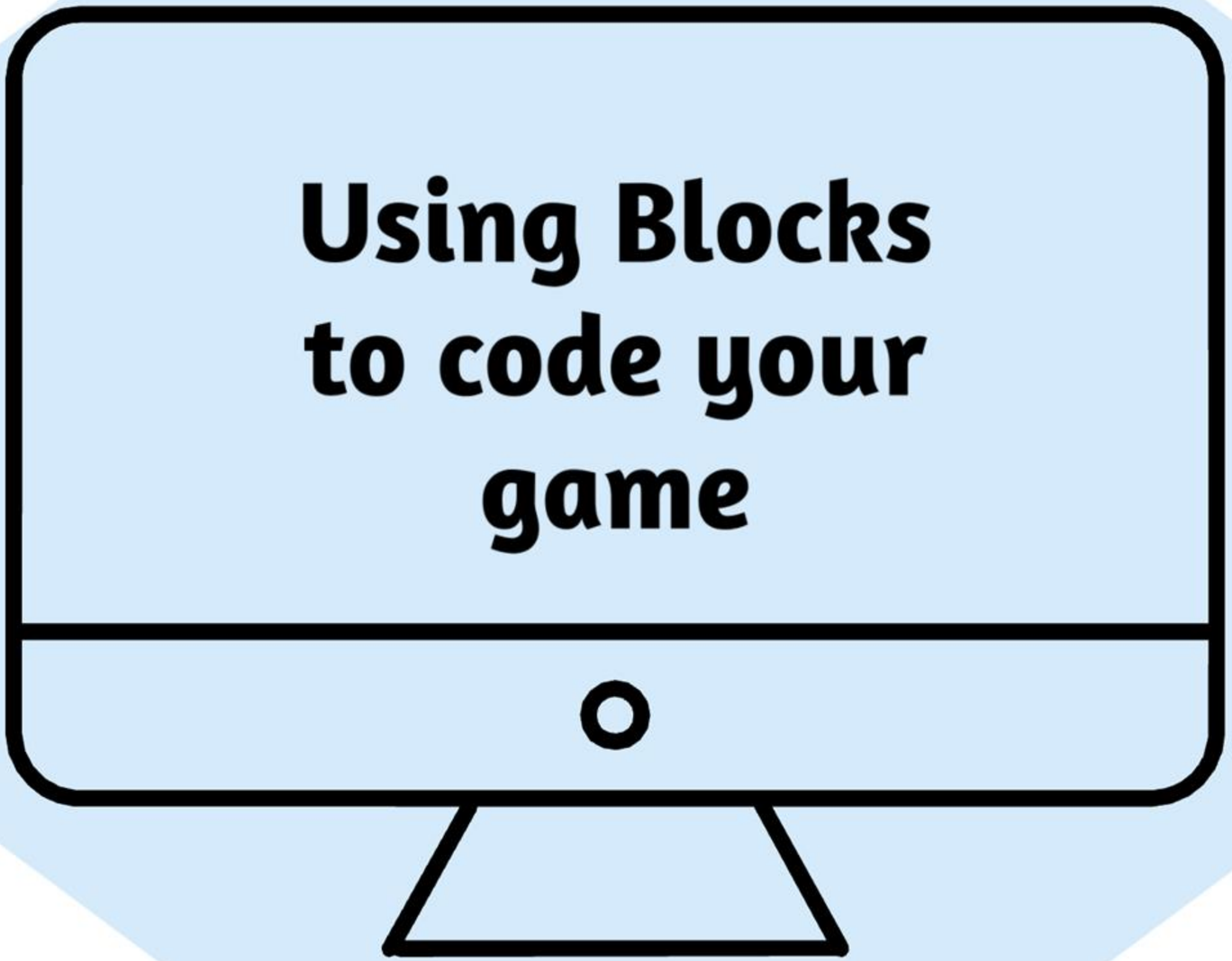
Sound: Code blocks that control the playback and volume of musical notes and audio files.

Control: Code blocks that trigger script execution based on predefined events, repeated and conditional logic.

Sensing : Code blocks that can be used to determine the location of the mouse-pointer, distance from other sprites, and whether a sprite is touching another sprite.

Operators: Code blocks that perform logical comparisons, rounding, and other arithmetic operations.

Variables: Code blocks that can be used to store data used by applications when they execute.


Using Blocks
to code your
game

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What do different block shapes mean in Scratch?

"Hat Blocks" are the blocks that start every script

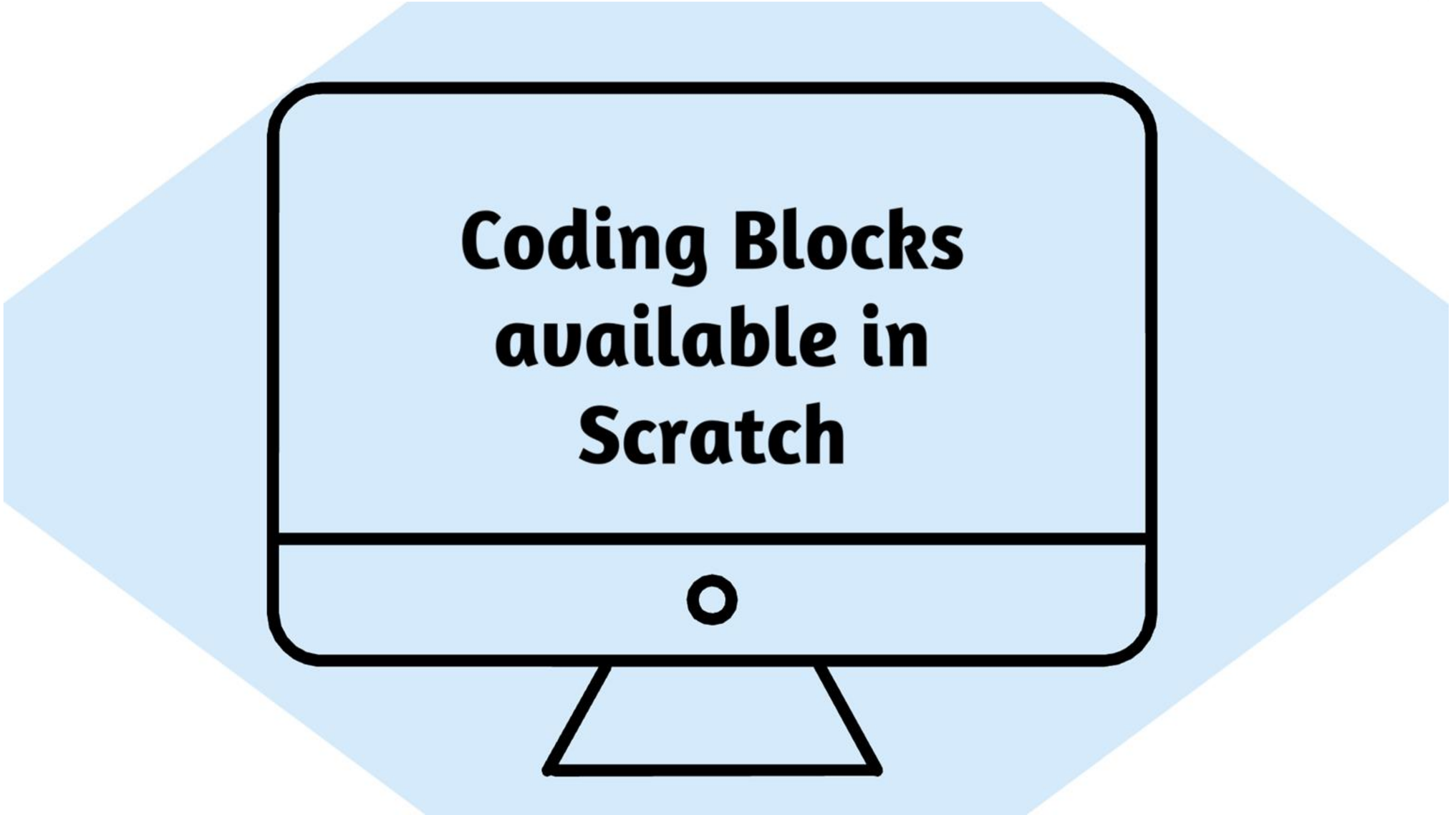
"C-blocks" loop the blocks within the Cs or check if a condition is true

"Stack blocks" are the blocks that perform the main commands

"Reporter blocks" stores the values. They can hold numbers and strings

"Cap blocks" are the ones that end scripts. They are shaped with a notch at the top and a flat bottom

"Boolean blocks" are the conditional blocks. They are either true or false


Coding Blocks
available in
Scratch

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Blocks in Scratch

Motion Blocks

Motion blocks are the blocks that control a sprite's movement.

- move (steps) — Moves the sprite forward the number of steps in the direction the sprite is facing.
- turn (degrees) — Turns the sprite (clockwise) the specified amount.
- turn (degrees) — Turns the sprite (counter-clockwise) the specified amount.
- point in direction — Points the sprite in the direction.
- point towards — Points the sprite towards the mouse-pointer or another sprite.
- go to x: y: — Moves the sprite to the specified X and Y position.
- go to — Moves the sprite to the mouse-pointer, a random position, or another sprite.
- glide (secs) to x: y: — Glides the sprite to the location, taking as long as the specified amount of time.
- glide (secs) to — Glides the sprite to the mouse-pointer, a random position, or another sprite, taking as long as the specified amount of time
- change x by — Changes the sprite's X position by the amount.
- set x to — Sets the sprite's X position to the specified amount.
- change y by — Changes the sprite's Y position by the specified amount.
- set y to — Sets the sprite's Y position to the amount.
- if on edge, bounce — If touching the edge of the screen, the sprite's direction flips over
- set rotation style — This sets the rotation style of a sprite.

- say (for) (secs) — A speech bubble appears over the sprite and stays for the specified amount of time.
- say — A speech bubble appears over the sprite and will not go away over time.
- think (for) (secs) — A thought bubble appears over the sprite and stays for the specified amount of time.
- think — A thought bubble appears over the sprite and will not go away over time.
- show — Shows the sprite.
- hide — Hides the sprite.
- switch costume to and switch backdrop to — Changes the sprite's/Stage's costume/backdrop to the specified one.
- switch backdrop to (and wait) — Like the Switch to Backdrop () block, though it waits until all of the hat blocks triggered by this have completed. (Stage only)
- next costume and next backdrop — Changes the sprite's/Stage's costume/backdrop to the next one in the costume list.
- change (effect) by — Changes the specified effect by the amount.
- set (effect) to — Sets the specified effect to the amount.
- clear graphic effects — Clears all graphic effects on the sprite.
- change size by — Changes the sprite's size by the amount.
- set size to (%) — Sets the sprite's size to the amount.
- go to (front/back) layer — Puts a sprite in the front or back.
- go (forward/backward) (layers) — Changes the sprite's layer value by the amount.

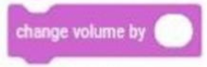
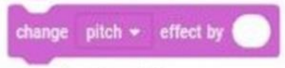
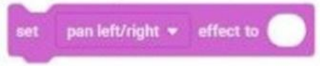
Looks Blocks

These are the blocks that control how a sprite looks.

Blocks in Scratch

Sounds Blocks

These are those blocks that controls sound.

-  — Plays a sound without pausing the script.
-  — Plays a sound and pauses the script until it finishes.
-  — Stops all playing sounds.
-  — Changes the volume by the amount.
-  — Sets the volume to the amount.
-  — Change the pan left/right or pitch by the amount.
-  — Set the pan left/right or pitch to the amount.
-  — Clears any sound effects currently in place.

Event Blocks

These are those blocks that controls events and triggering of scripts.

-  — When the flag is clicked, the script activates.
-  — When the specified key is pressed, the script activates. The event will only be triggered again after the event is released.
-  — When the sprite is clicked, the script activates.
-  — When the backdrop switches to the one chosen, the script activates.
-  — When the first value is greater than the second value, the script activates.
-  — When the broadcast is received, the script activates.

Scratch 3.0 has the following two Event Stack blocks:

-  — Sends a broadcast throughout the Scratch program, activating When I Receive () blocks that are set to that broadcast.
-  — Like the Broadcast () block, but pauses the script until all scripts activated by the broadcast are completed.

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Blocks in Scratch

Control Blocks

These are those blocks that controls scripts.

-  (sprites only) — This hat block is triggered whenever a clone is created, and will only be run by that clone.

Scratch 3.0 has the following three Control Stack blocks:

-  — Pauses the script for the amount of time.
-  — Pauses the script until the condition is true.
-  — Creates the specified clone.

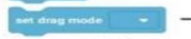
Scratch 3.0 has the following five Control C blocks:

-  — A loop that repeats the specified amount of times.
-  — A loop that will never end unless the Stop Sign is pressed.
-  — Checks the condition so that if the condition is true, the blocks inside it will activate.
- 
  └— Checks the condition so that if the condition is true, the blocks inside the first C will activate and if the condition is false, the blocks inside the second C will activate.
-  — A loop that will stop once the condition is true.

Scratch 3.0 has the following two Control Cap blocks:

-  — Stops the scripts chosen through the drop-down menu. Can also be a stack block when "other scripts in this sprite" is chosen.
-  (sprites only) — Deletes a clone.

Scratch 3.0 has the following three Sensing Stack blocks:

-  — An input box appears — you type the value in and it stores the value in the  variable.
-  — Resets the timer.
-  — Sets the sprite to draggable or not draggable.

Scratch 3.0 has the following five Sensing Boolean blocks:

-  — The condition for checking if the sprite is touching the mouse-pointer or another sprite.
-  — The condition for checking if the sprite is touching a specific color.
-  — The condition for checking if a color on the sprite is touching a specific color.
-  — The condition for checking if the specified key is being pressed.
-  — The condition for checking if the mouse is down.

Scratch 3.0 has the following ten Sensing Reporter blocks:

-  — The distance from the sprite to the mouse-pointer or another sprite.
-  — The most recent input with the Ask () And Wait block.
-  — The mouse-pointer's X position.
-  — The mouse-pointer's Y position.
-  — How loud the noise is that the microphone is sensing.
-  — How much time has passed since the Scratch program was opened or the timer reset.
-  — The X position, Y position, direction, costume, size or volume of the Stage or a sprite.
-  — The specified time unit selected.
-  — The number of days since 2000.
-  — The username of a user.

Sensing Blocks

These are those blocks that detects things.

Let’s Practice - Homework of the day

Complete the STEM Animation Shared (Half baked game can be downloaded from https://rb.gy/b7mkf6)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&
A

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Thank You!

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