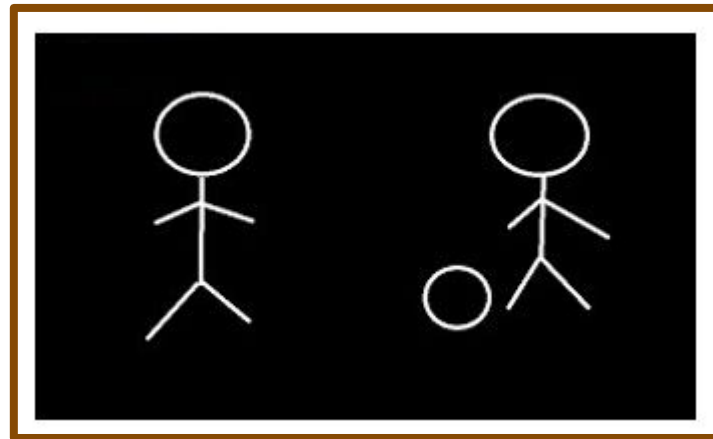# Lesson 4 – Animation & Effects

Introduction to Animation

Animations help us

- Tell stories and communicate emotions and ideas in a unique, easy-to-perceive way that both small children and adults can understand.

- They connect people throughout the world in a way that sometimes writing and live-action films cannot.

- Animation adds life to story telling, educational games and quizzes.

- Animation is a tool to boost a childs imagination and expression.

- They are the crown jewel in a **schools wall magazine**.

What is Animation

Animation enables story tellers to tell stories in unique ways. So if you're a storyteller, or want to be, then animation is a great place to start.

In its very simple definition, Animation is the simulation of movement & activities, created by a series of pictures placed in a sequence, that is dependant on the effect you desire to create.

How does Animation Work

Our eyes can retain an image for approximately 1/10 of a second.

when multiple images appear in quick succession, the brain sees the first image, but before it finishes with that, it sees the second, & so on.

This blends these static images into a single moving image.

This single moving image has many names including Movies & Animation.

Traditional vs Modern Animation

In traditional animation, pictures are drawn or painted on transparent celluloid sheets to be photographed.

Early cartoons are examples of this.

However, today, most animated movies are made using computer-generated imagery or CGI.
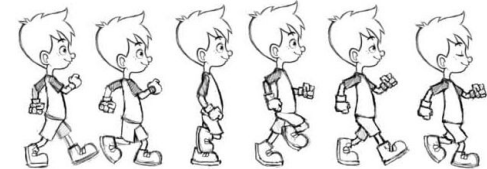
Frames & Frame Rates

Individual drawn, painted, or computer-generated images are called Frames.

To give the frames the appearance of movement we need to consider a thing called frame rate, or the number of consecutive images that are displayed per second.

The minimum required for giving a cartoon type output is six frames. Lower then six will give a jerky appearance.

The Concept of Two's

Moving characters are usually shot "on twos" which just means one image is shown for two frames.

This changes the frame rate to 12 drawings or images being shown per second.

12 frames per second allows for motion but may look choppy.

In films, a frame rate of 24 frames per second is often used for smooth motion.

2D Animation

In order to create the animated sequence, the animator must draw every frame.

In the earlier years, the animator would draw on a table that had a light inside it.

This then enable the creator to put the frames together in the desired sequence called 2D Animation.

In this course we shall focus on coding for 2 D animation.

2D Animation & Coding

The procedure for 2D animation using code (scratch) is same as that for the traditional procedure.

In order to create an animated sequence,
the animator must draw or generate every frame.

These frames are then used by the programmer to code.

Options for Making Animation Frames

We have the following options for making the animation frames:

- Drawing these ourselves.
- Downloading from animation frame libraries available on the web.

Freepix, Colour box & Shutter Stock are great sites for such clips.
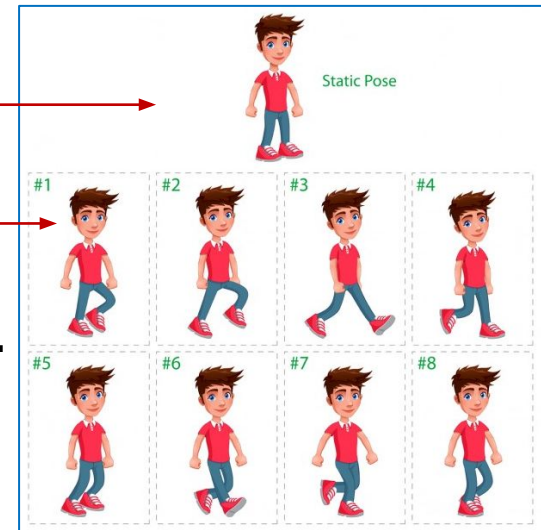
There are more.

Sprite Costumes

Typical animated sprite collage is as shown.

Available as paid clips, and free clips, it consist of:
- **One Static Pose.**

- **A few animated poses.**

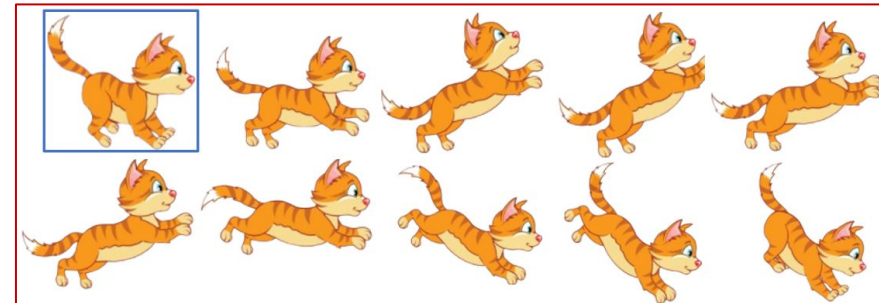**Animated poses are then added in the code as Costumes.**

Number of costumes depends on how smooth or jerky, the animation has to be made.

Animation Collage

In this Collage:
- The cat in the first frame is **sprite.**

- Cats in remaining 9 frames
  are called **Costumes.**

- They have to be given a **name.**
  Example - Cat 1 to cat 10.

- **They all** have then to be coded **individually.**

Introduction to Effects

Effects are changes that can be introduced to **structure of objects**.

They are an integral part of animation.

They are a tool in the hands of programmers to help children develop interest in **creativity through imagination and coding.**

**Effects can be implemented** on Any sprite.

Basic effects include:
- **Increasing and decreasing Size.**

- **Creating Mosaics of sprites.**

- **Increasing and decreasing the Number of sprites in a mosaic.**

- **Manipulation between the three using effects like positioning on the stage, disappearing, etc to create Visual Shows with & without music.**

Increasing & Decreasing Size of a Sprite

To Increase:

- **The code for increasing size is as shown.**

- **On pressing up key the size increases.**

- **Press again. It increases further.**

- **This process can continue.**
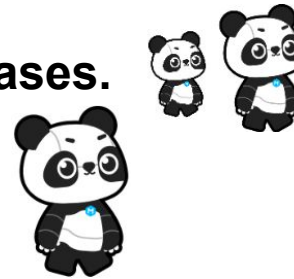
To Decrease:

- **The code is similar & as shown.**

- **On pressing down key. The size will reduce.**

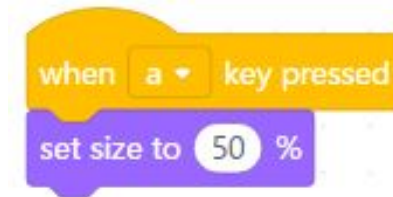- **On press again it reduces further.**

Manipulate between up & down keys and observe the effect.

Reverting to Original Size in one Step

- **Select a new trigger – when (a) key pressed.**

- **Select the looks block – set size to 100 %.**

- **Here 100 % means its original size.**

- **Press and observe.**

- **However, if you now set 100% to 50 %**


```
when  a ▾  key pressed
set size to  50  %
```

- **The size will reduce to half (of 2nd sprite).**

Making a Mosaic

To do so:

- Select Sprite.

- Select blocks as shown.

- In the drop down select Mosaic.

- Change 25 to 4 & click on right arrow. You get a **mosaic of 4.**

Click again. You get a **mosaic of 9.**
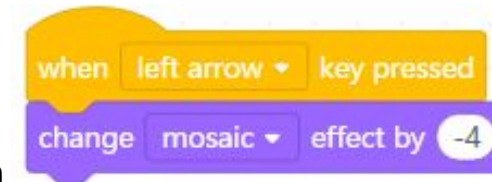
Then **16.**

Then 25 & so on.

Reducing a Mosaic

Say your final mosaic is:

To reduce:

- Select and configure blocks as shown.

- Click left arrow. A new mosaic of **16 appears.**

- Now click left arrow again.
- Mosaic of **9, 4 and then 1 appea**

```
when  left arrow ▾  key pressed
change  mosaic ▾  effect by  -4
```

One click return to original

Say your final mosaic is:

To reduce:
o **Select and configure blocks as shown.**

o **Moment you click on green flag.**

o **Just one sprite appears in the stage.**
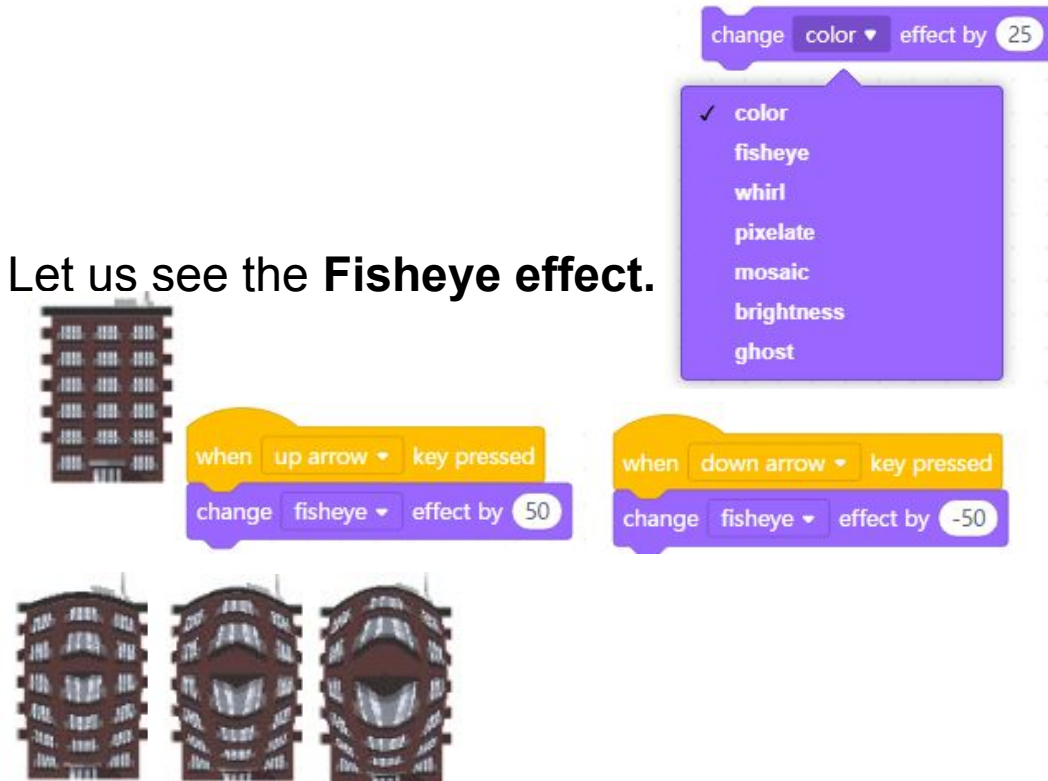
when ⚑ clicked
clear graphic effects

More Effects

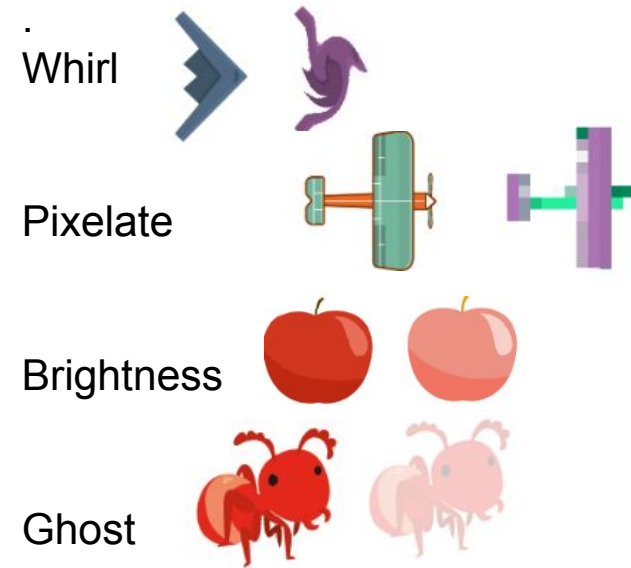Dropdown has many more effects. Let us see the **Fisheye effect.**

Change sprite to **apartment** block.

- Configure blocks as shown.
- Click on up arrow sequentially.

- You will see the fisheye effect.

- Use the second code for reverse or use the clear graphic effects block.

change color ▾ effect by 25

✓ color
  fisheye
  whirl
  pixelate
  mosaic
  brightness
  ghost

when up arrow ▾ key pressed
change fisheye ▾ effect by 50

when down arrow ▾ key pressed
change fisheye ▾ effect by -50

Some More Effects. Open the dropdown to execute the following effects:

.
Whirl

Pixelate

Brightness

Ghost

Coding procedures are same as Mosaic and Fisheye.

**To understand the true applications of these effects
in animation and other projects
You need to play with them with an open mind
Exploring options and seeing the result**

Code Karega India Badhega