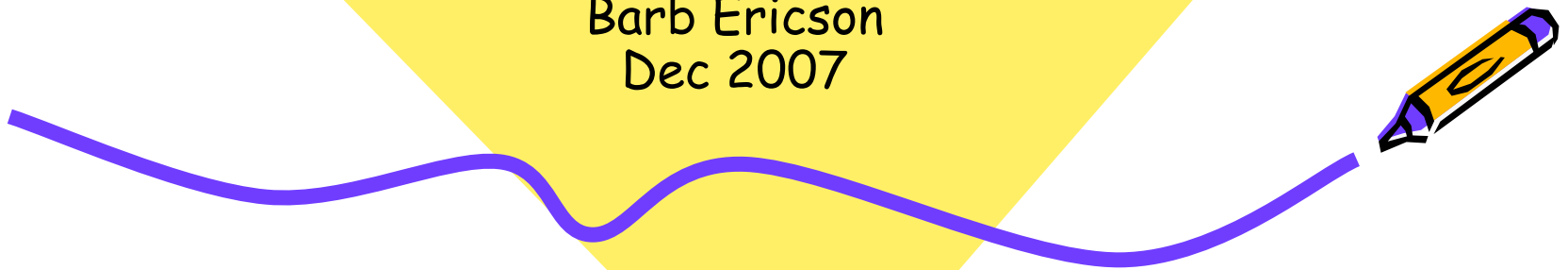




Introduction to Scratch!

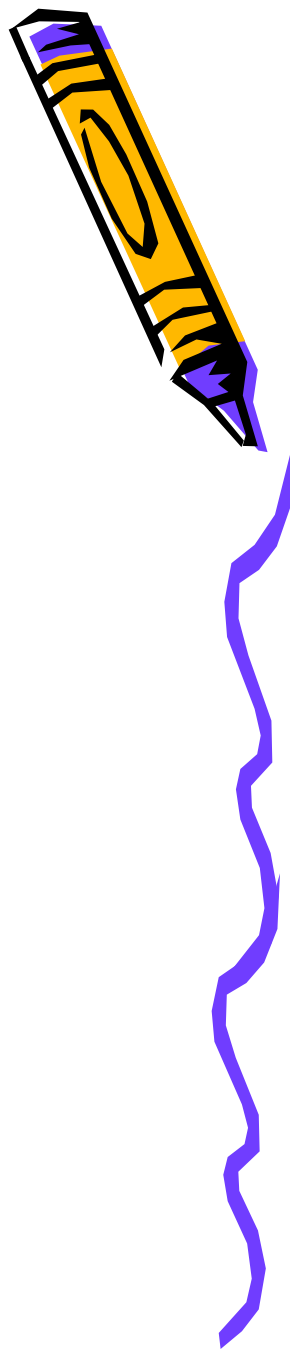
Michelle Venable-Foster
Barb Ericson
Dec 2007



Adventures in Animation

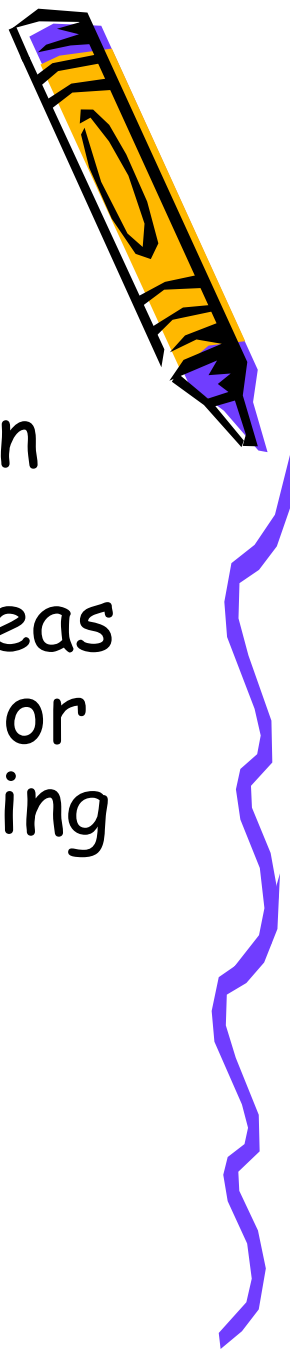
What is Scratch?

- Scratch is a free programmable toolkit that enables kids to create their own games, animated stories, and interactive art
- and share their creations with one another over the Internet.



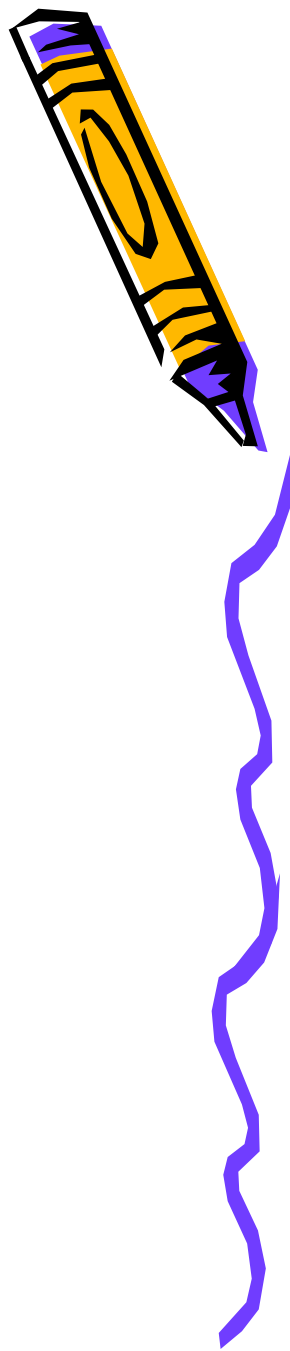
What is Scratch?

- Scratch builds on the long tradition of Logo and LEGO/Logo, but takes advantage of new computational ideas and capabilities to make it easier for kids to get started with programming (lowering the floor) and to extend the range of what kids can create and learn (raising the ceiling).



What is Scratch?

- The ultimate goal is to help kids become fluent with digital media, empowering them to express themselves creatively and make connections to powerful ideas.



What is Scratch?

- Scratch is built on top of the Squeak environment developed by Alan Kay and colleagues.



What is Scratch?



- Scratch is being developed by the Lifelong Kindergarten Scratch is being developed by the Lifelong Kindergarten research group at the MIT Media Lab Scratch is being developed by the Lifelong Kindergarten research group at the MIT Media Lab, in collaboration with KIDS research group at the UCLA Graduate School of Education & Information Studies



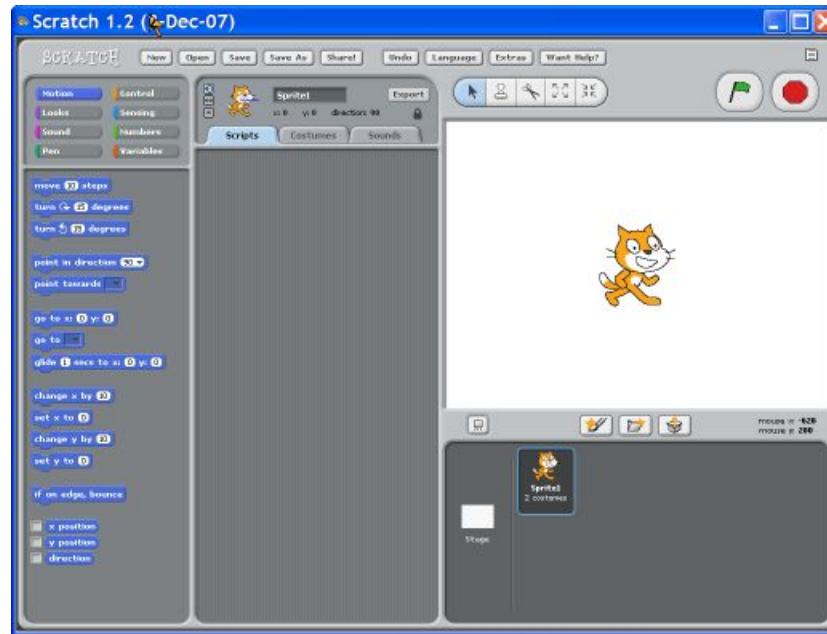
Let's Get Started!

- To Open Scratch, double-click on the Scratch (cat) icon or click on Scratch.exe



Getting Started With Scratch

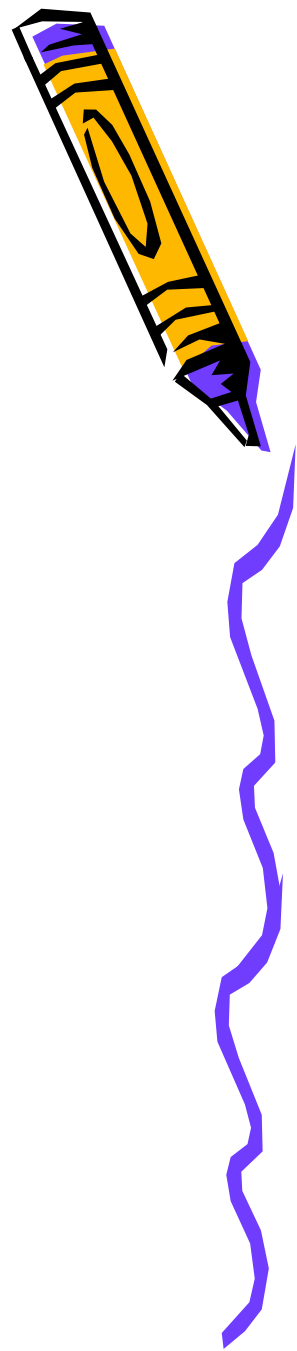
Once you've opened Scratch, you should see this default screen:



Watch a Quick Introduction to Scratch!



Adventures in Animation



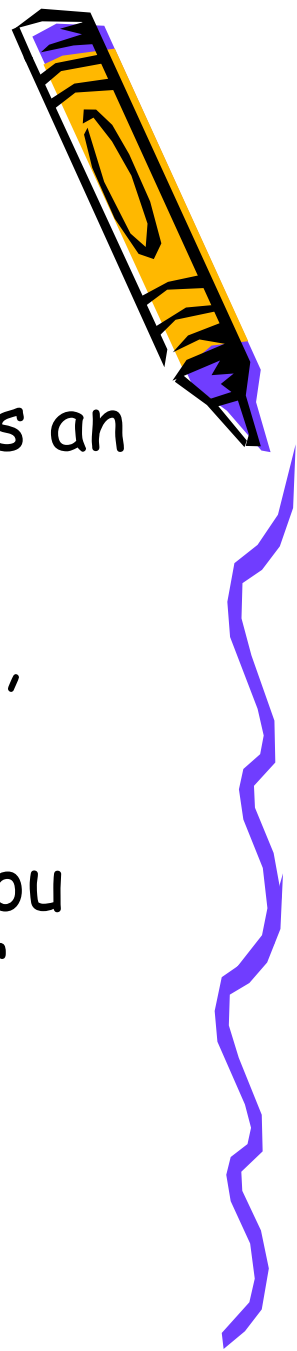
Let's Look At Some Scratch Examples



- Go to Open > Projects and choose the category Animation
- Look through them and see what you will be able to do in Scratch!
- (Some of these have sound. Please be considerate of your neighbors and turn the sound down on your computers! Ask your teacher to help you if you don't know how.)



Choose Your Sprite!

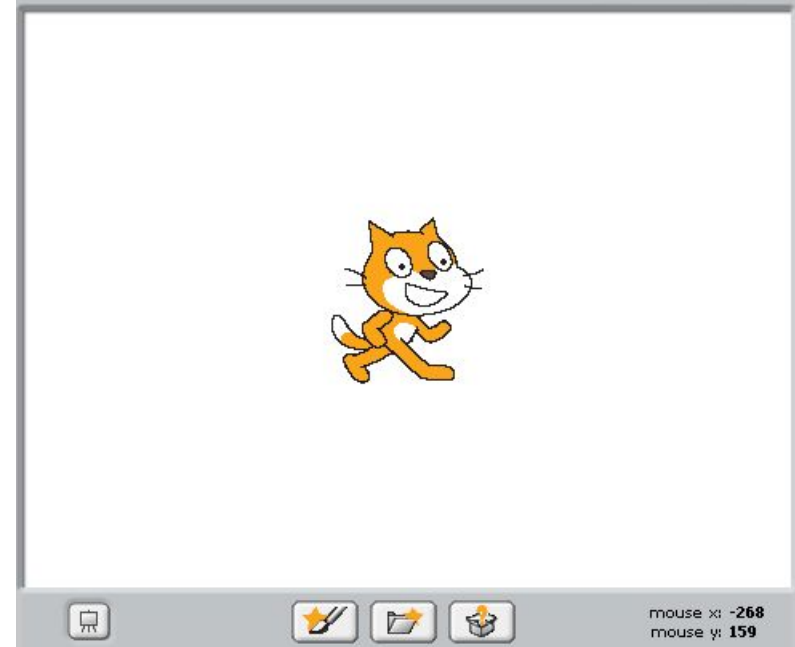


- You will notice that the default **sprite** is an orange cat.
(A **sprite** is a small graphic that can be moved independently around the screen, producing animated effects.)
- You can choose a different sprite to program from a library in Scratch, or you can draw your own! You will create your own sprite later.



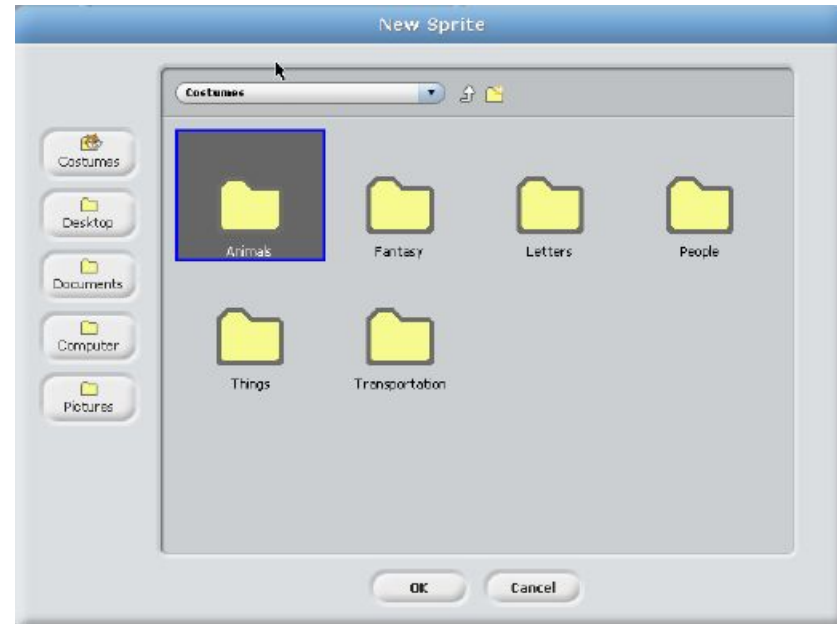
Choose Your Sprite!

- To choose a sprite from the Scratch library, click on the Folder with a Star icon. When you hover your mouse over it, it will say "Choose new sprite from file".



Choose Your Sprite!

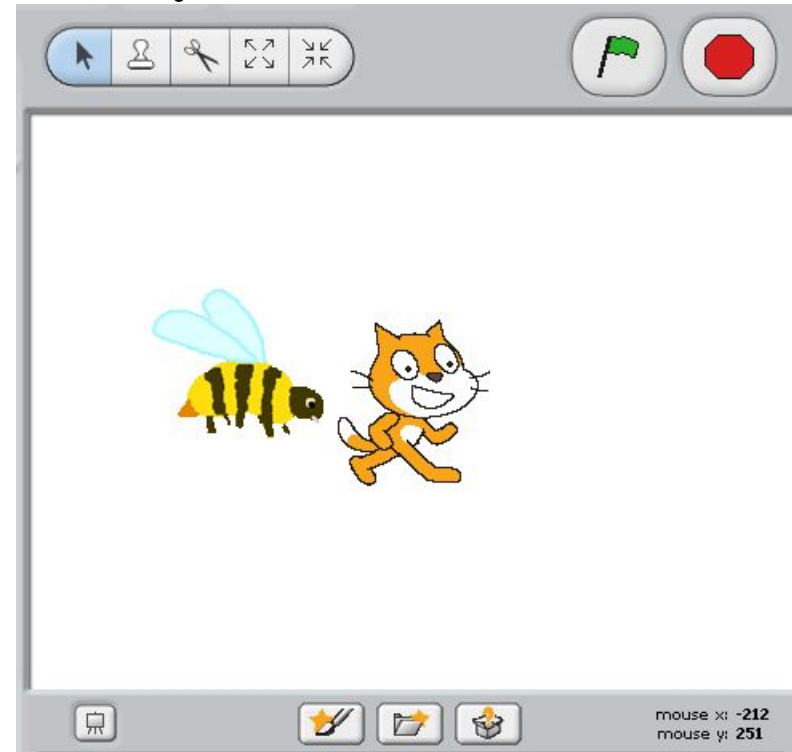
Open the folders of the different categories of sprites. Choose one that you'd like to experiment with by double clicking on it. You can have more than one sprite in your animation!



Choose Your Sprite!



- Once you have a sprite that you'd like to program, you can delete the orange cat sprite by clicking the scissor icon and clicking on the cat!
- Make sure that you click on the arrow icon before you do anything else - otherwise, you'll delete something that you really wanted!
- You can also right click on the icon to delete that sprite

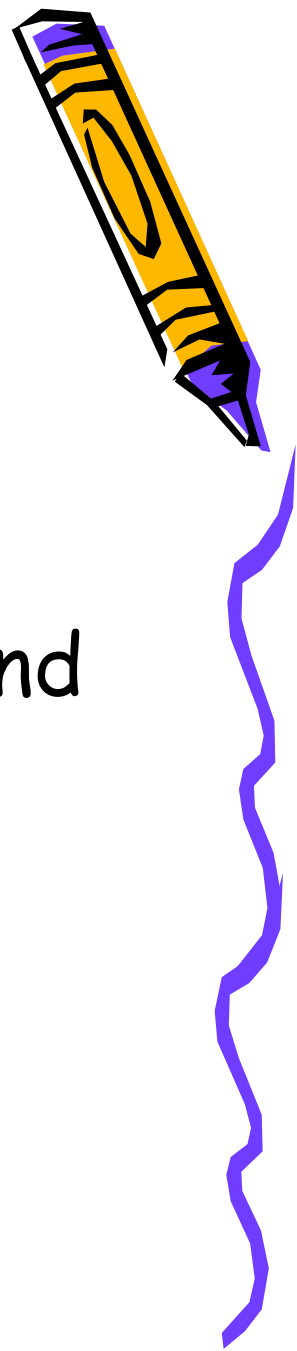


Resize Your Sprite!



- You can make your sprite larger or smaller by using the "grow sprite" or "shrink sprite" icons.
- You click on one of these icons, then click on your sprite until it is the size you'd like.





Choose Your Background!

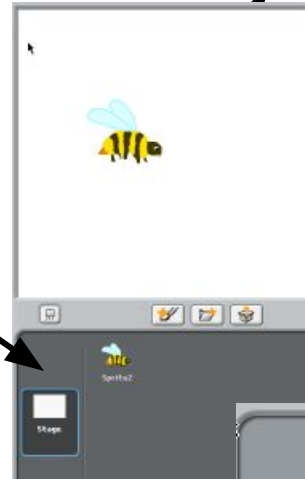
- Right now, you have a plain, white background - boring!
- You can also change your background by choosing one from the Scratch library or creating your own!

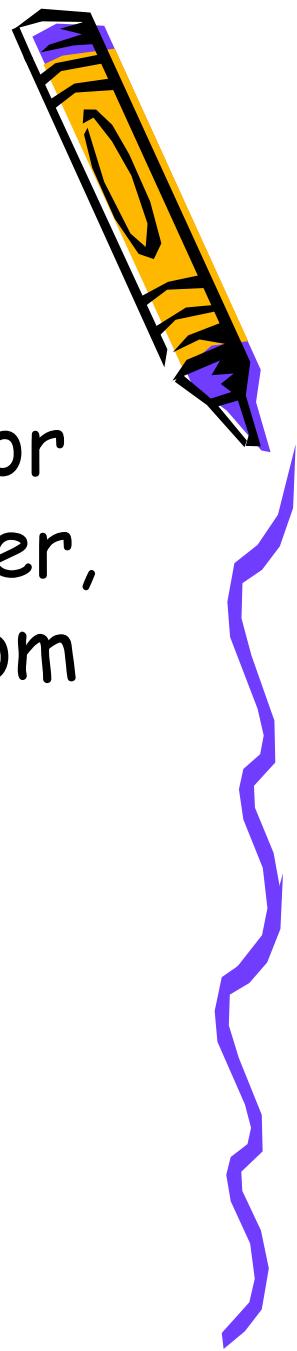




Choose Your Background!

- Click on the Stage:
- Now, select the "Backgrounds" tab!





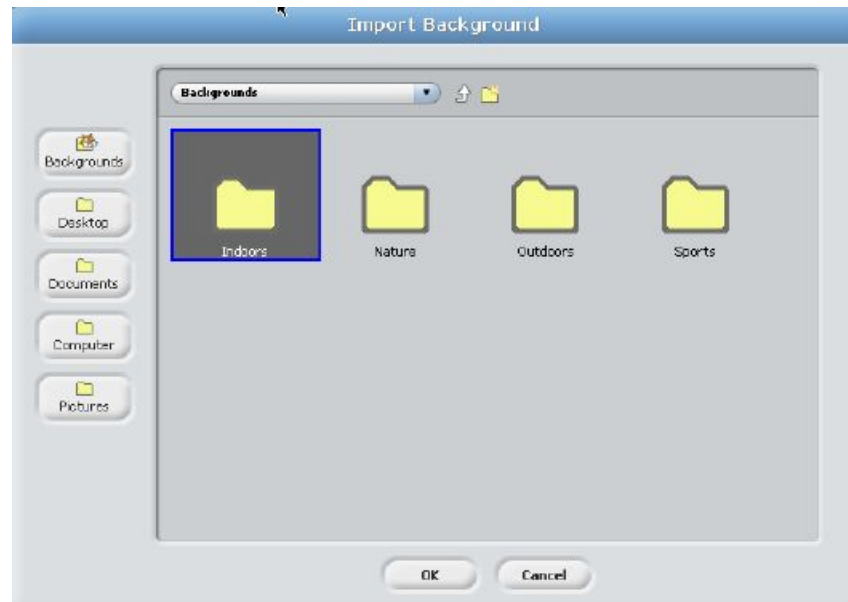
Change Your Background!

- You can experiment with creating or importing your own background later, but, for right now - choose one from the library by selecting **Import**.

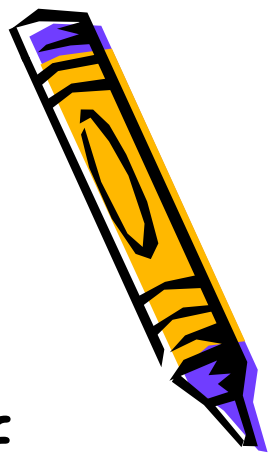


Change The Background!

From this screen, you can choose one of the category folders, and select a background that you like by double clicking on it!



Adventures in Animation

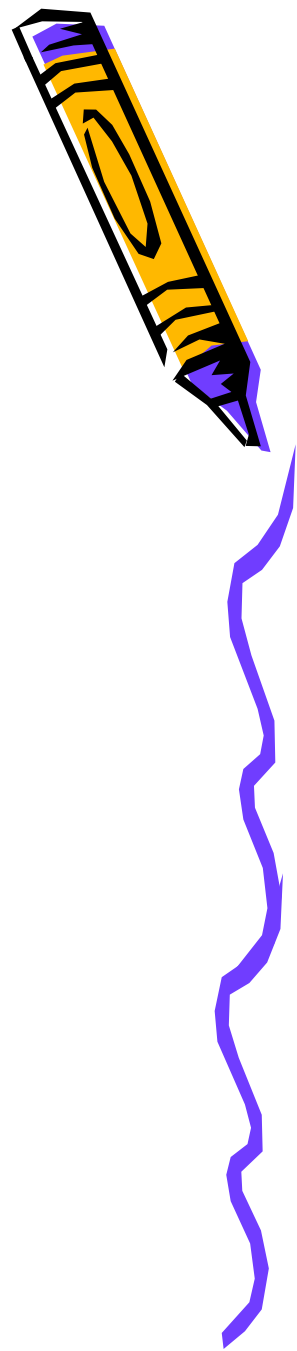


Now, We're Ready to Program!

Now, you should have a sprite and a background that you'd like to work with!



Adventures in Animation





Programming In Scratch!

- The first thing you need to do is to click on the sprite you want to program, and select the "Scripts" tab.
- Since your sprite is the only thing that can be animated, make sure you have it selected.
- The Scripts area is where you "build" your program by using the programming blocks.



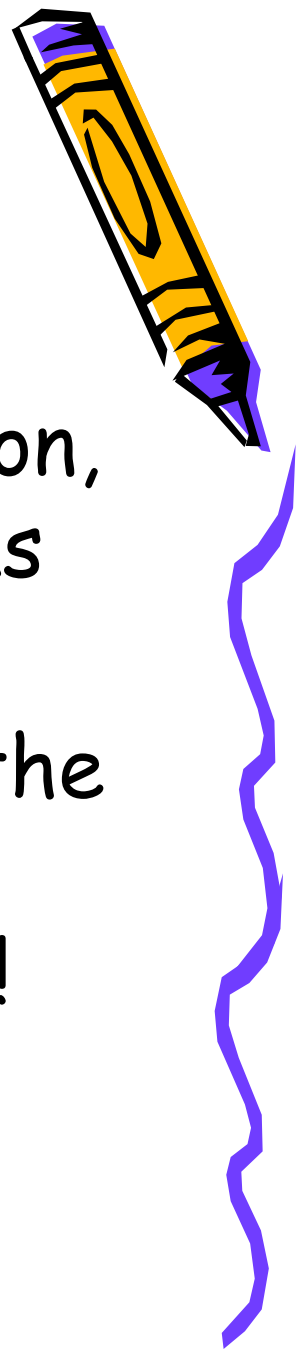


Programming In Scratch!

- In the upper, left-hand corner of your Scratch window, you will see 8 buttons .
- Each of these buttons have programming blocks in those particular areas.
- We will first experiment with the Motion blocks.



Motion!



- When you click on the motion button, you will see the programming blocks that can be used with your sprite.
- Let's all program our sprites with the same code first, and then you'll be allowed to experiment on your own!



Motion!

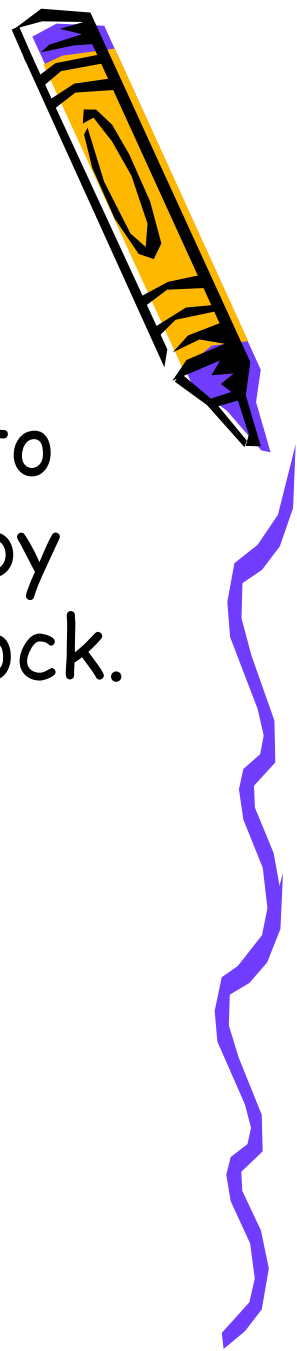
- Drag out the "move 10 steps" block.



- Change the "10" to "50" by clicking in the block and typing in 50.
- To see your sprite move 50 pixels to the right, double click on the block in the Script area. Cool, isn't it?!



Motion



- You can also set the motion block to move a negative number of pixels by typing a negative number in the block.
- This will move your sprite that number of pixels in the opposite direction.



What Is A Pixel?

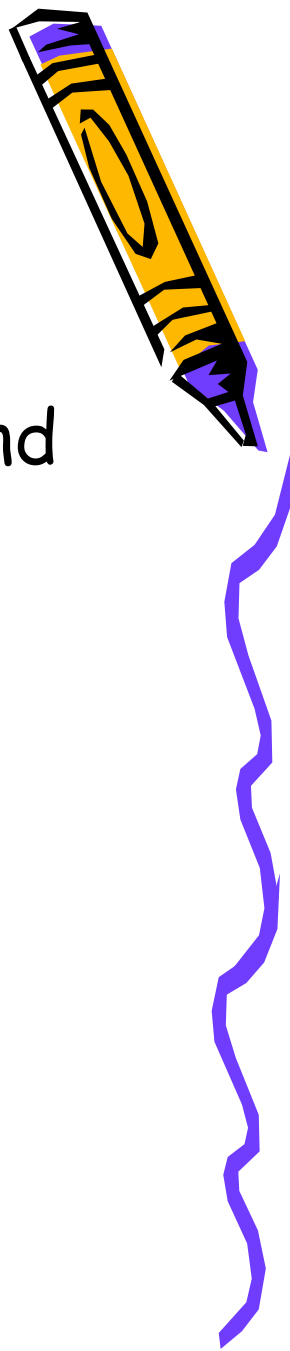
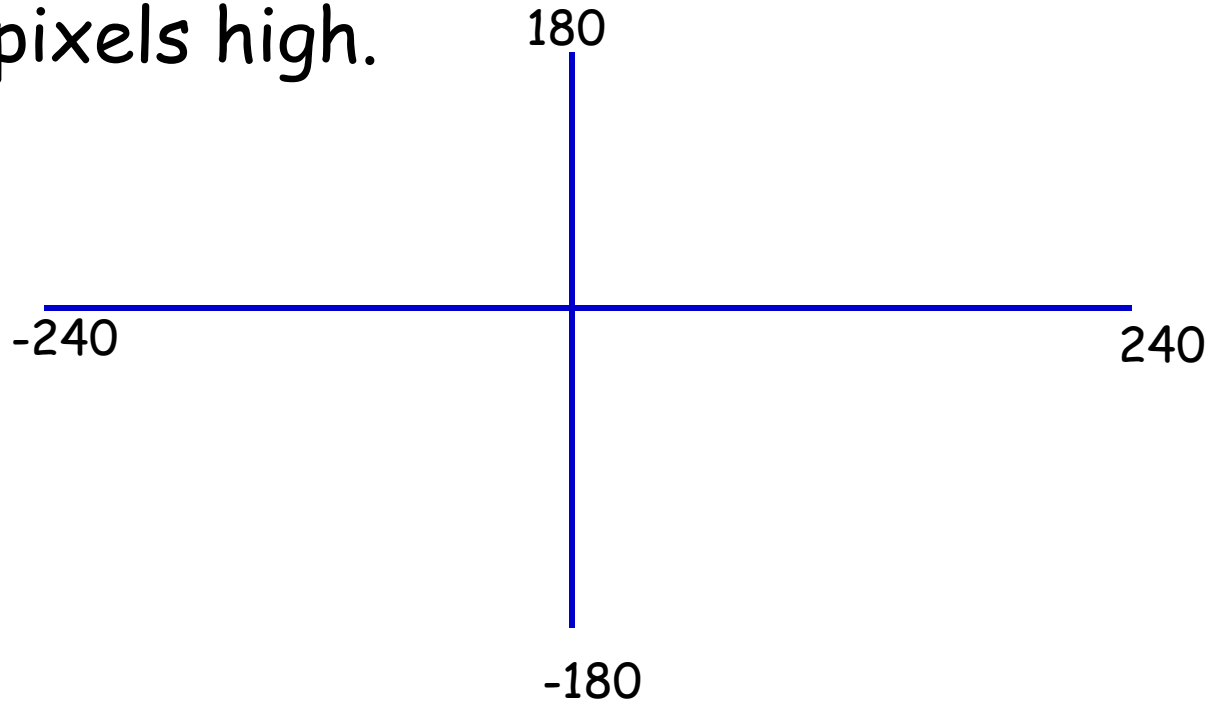


- We've been talking about **pixels** - what is a **pixel**?
- A pixel is one of the small units that make up an image on a computer or television screen.
- It is derived from the words **picture** and **element** to make pixel!



The Scratch Stage

- The Scratch stage is 480 pixels wide and 360 pixels high.



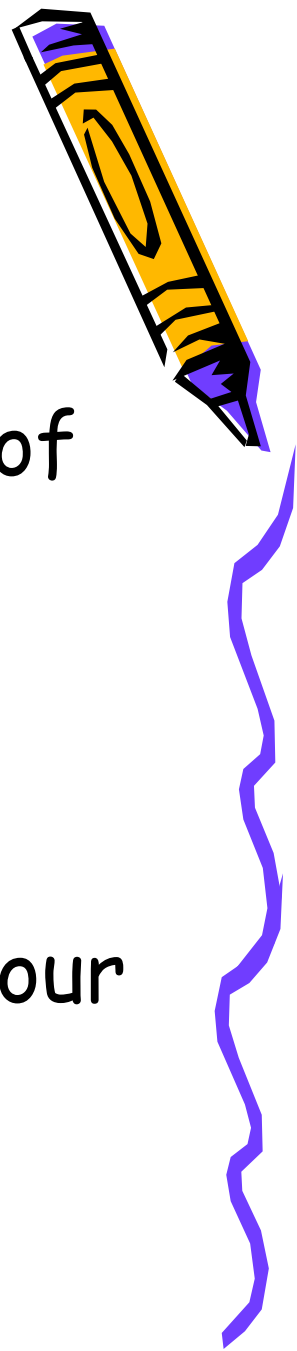
More Motion!



- Now, add the "turn 15 degrees" block to the other block of code.
- When you see the white bar between the 2 blocks of code, you can release your mouse. That white bar means that the 2 blocks will "snap" onto the other block.



More Motion!



- Again, you can change the number of degrees by double clicking in that area and typing in the number of degrees you'd like your sprite to rotate.
- Double click on the blocks to see your sprite move and rotate!



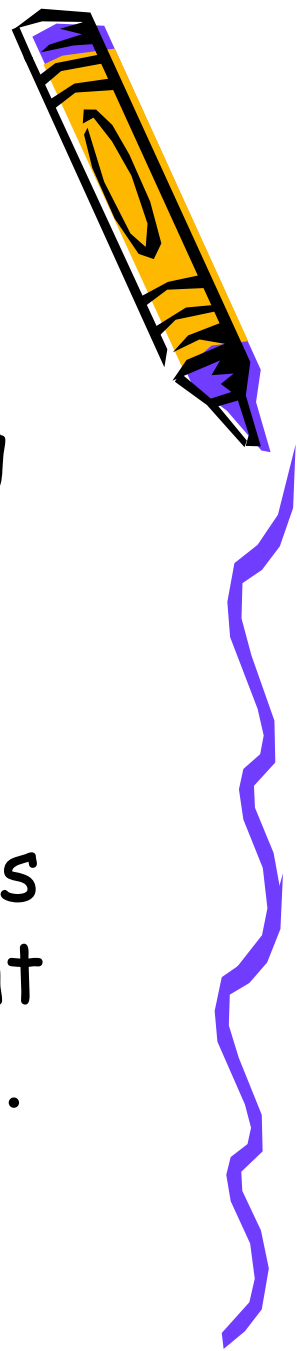
Experiment With Motion!



- We've only used 2 of the blocks in the Motion category.
- For the next few minutes, I want you to experiment with all of the other blocks in the Motion category.
- If you'd like to see what a block does, right click on the block and then click on help.
- You can delete code easily by just dragging it from the Script area!
- Have fun!



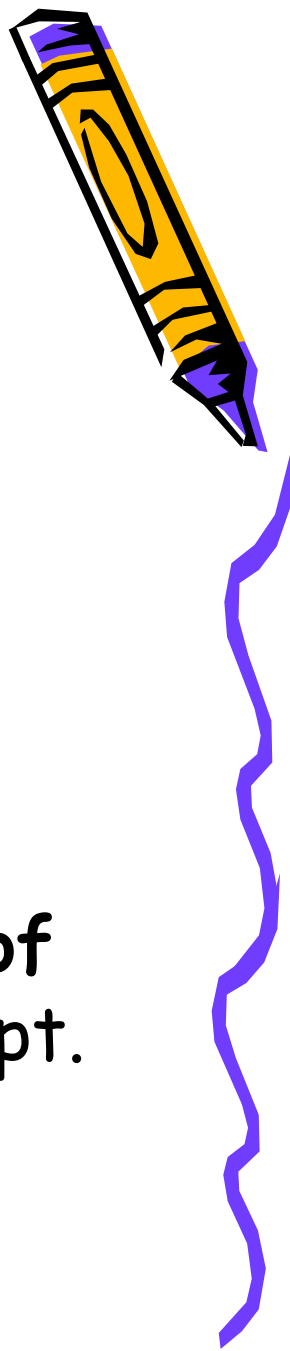
Control!



- The next category of programming buttons we will experiment with is the **Control** category.
- This is a very important category because it **controls** how many times an event happens, how long an event happens, or when an event happens.



Control!



- The first block I'd like us to use is the "when flag clicked" block:



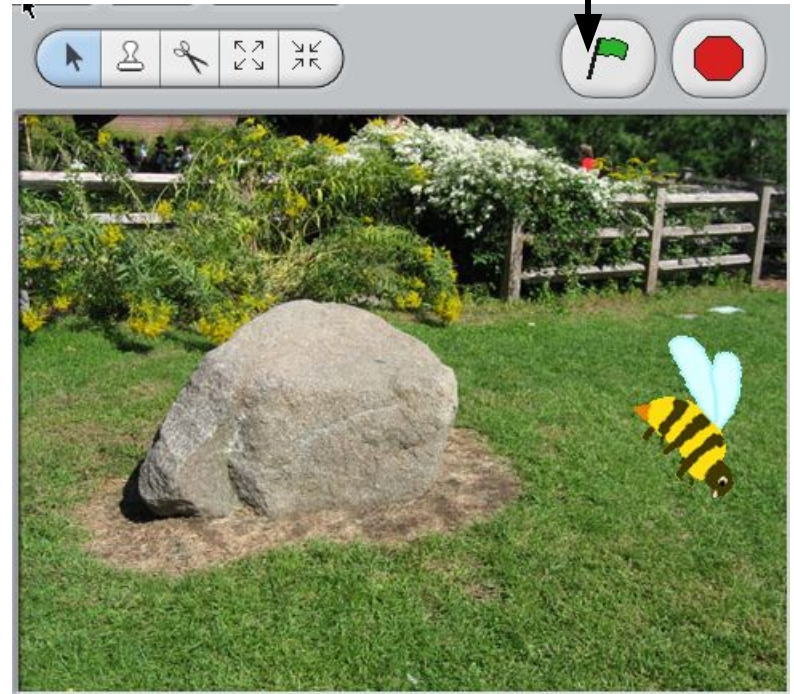
- Drag this block out, and snap it on **top of** the blocks you already have in your script.



Control!

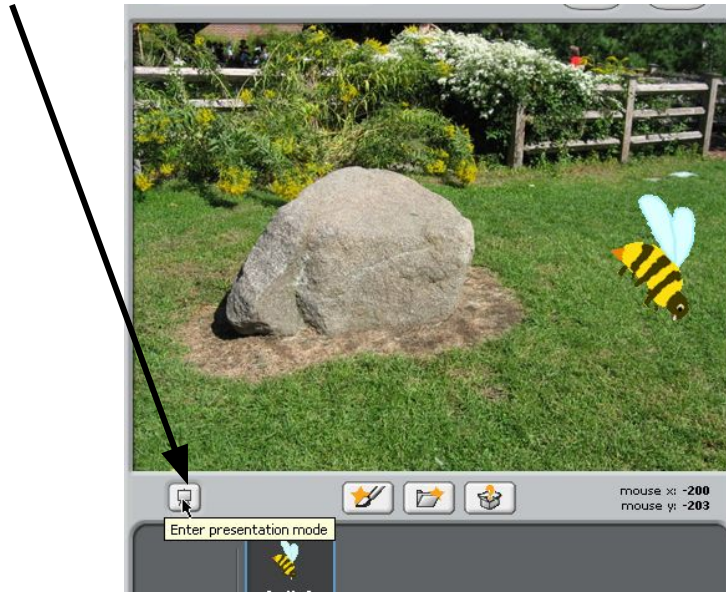
- Now, instead of having to double click on your block of code, you can just click on the flag icon to play your animation!

Click here to start



Presentation Mode

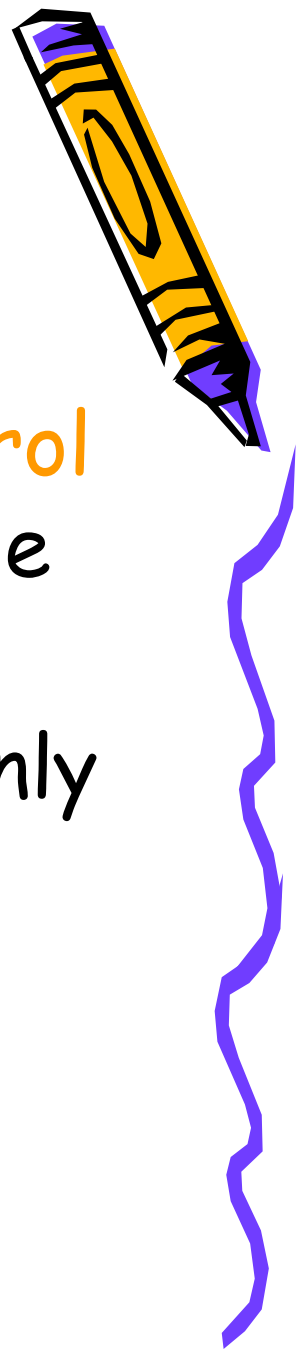
- When you click on the presentation mode button, your animation will fill the whole screen!



- To exit presentation mode, click the arrow in the top left of the screen, or just press the Esc key.



Back to Control!



- Other powerful blocks in the **Control** category are the blocks that handle **conditional statements**.
- Conditional statements are commonly called "if statements" or "if-else statements".



Conditional Statements

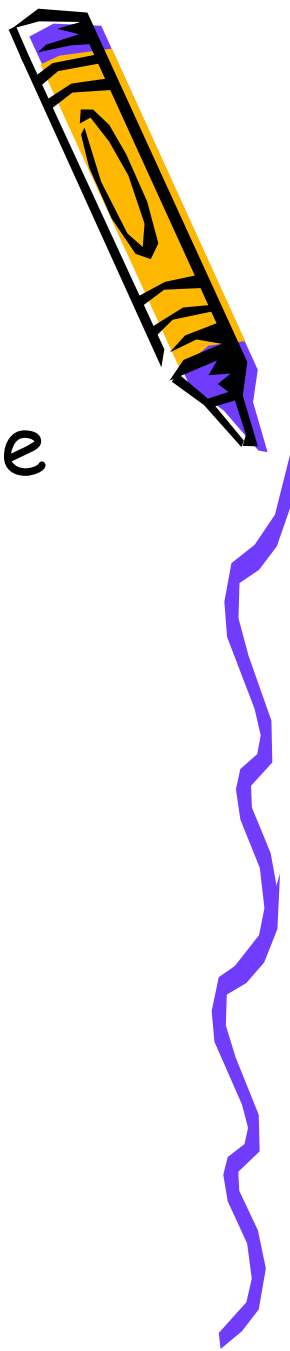


This code means that if the user presses the Space key on the keyboard, the sprite will move 10 steps.

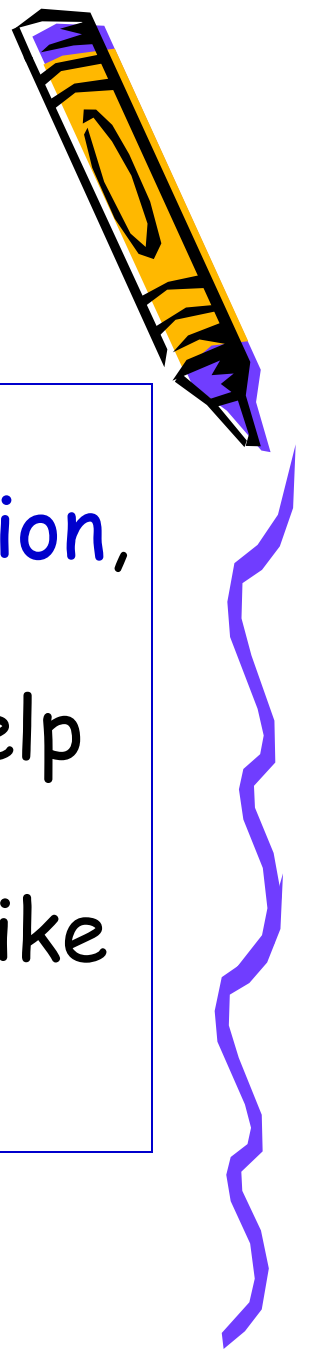


Sensing!

- The conditional statements must be used along with the sensing blocks. (Notice the shape of some of the sensing blocks. They are the ones that will fit inside the "condition" since they have 6 sides)



Back to Control!

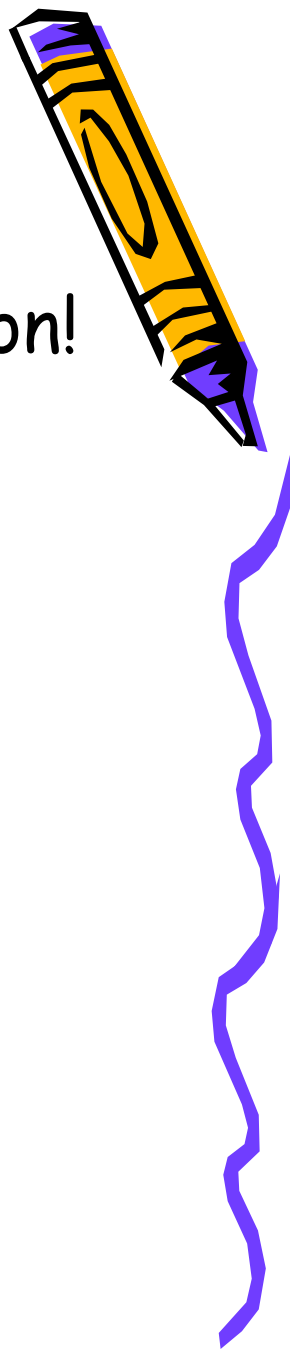


- For the next few minutes, experiment with the blocks in **Motion**, **Control**, and **Sensing**.
- Right click on a block and select help to get information about a block.
- When you get something cool, I'd like to see it!

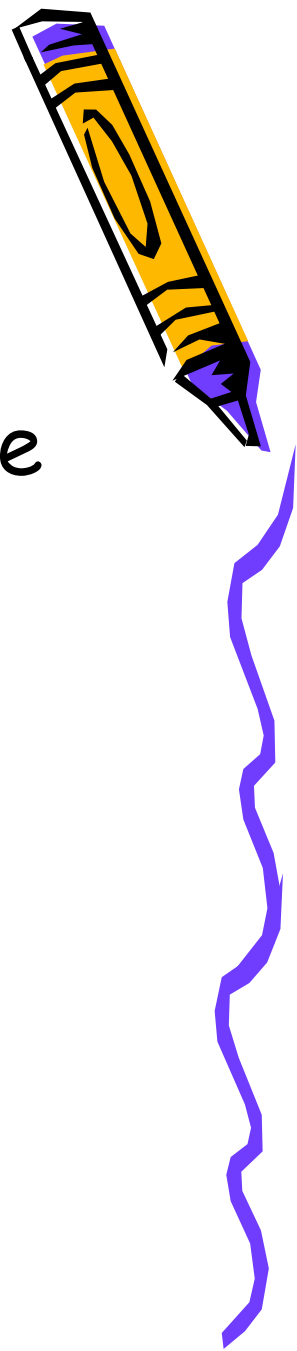


Sound!

- Now, let's add some sound to our animation!
- There are many different ways to get sound in your animation.
- The first way we're going to experiment with is by importing a sound from the Scratch sound library.



Importing Sound From The Scratch Sound Library



- Click on the sprite you want to have sound.
- Click on the Sounds tab and select Import.

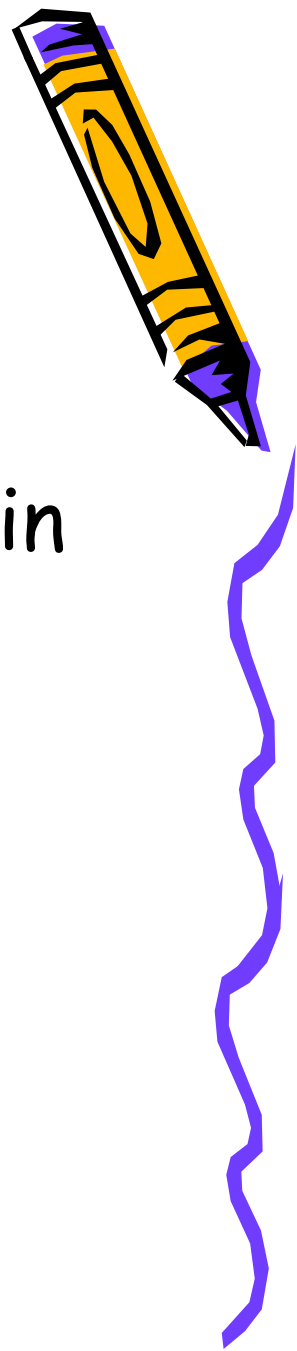


Scratch Sound Library

- You will see different categories of sounds that you can use in your animation that are available for you in the Scratch library.



Adventures in Animation



Inserting Sound

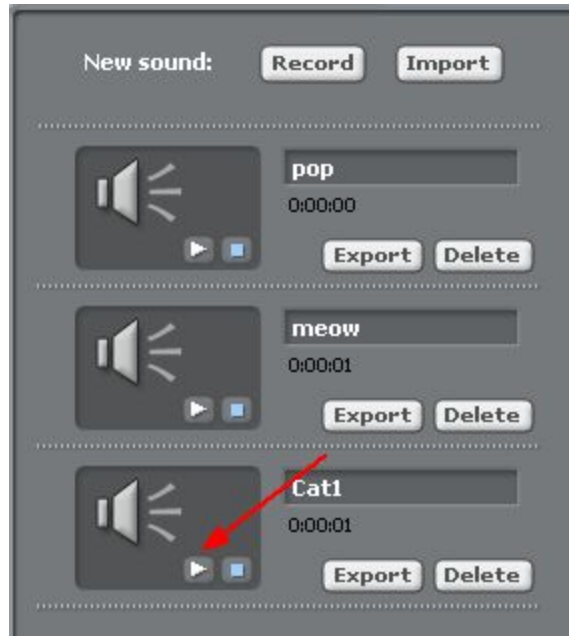


- Once you find a sound that you like, select it and click on OK.
- You will see the sound you just selected show up under "New Sound".

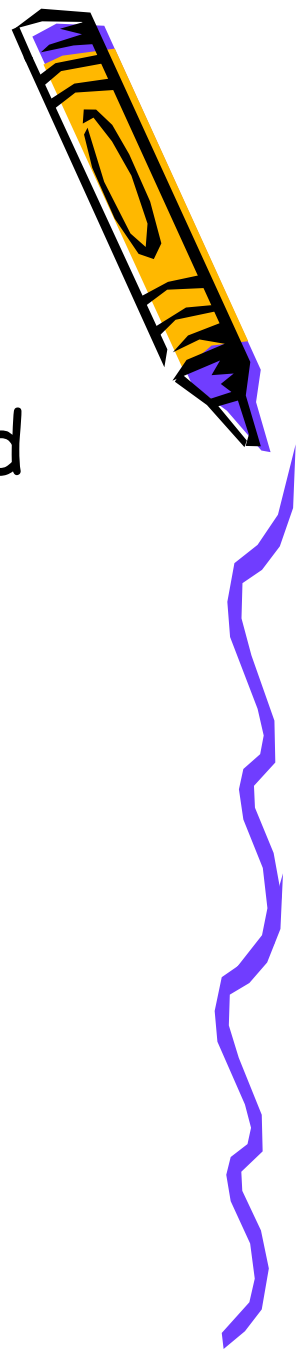


Play Your Sound

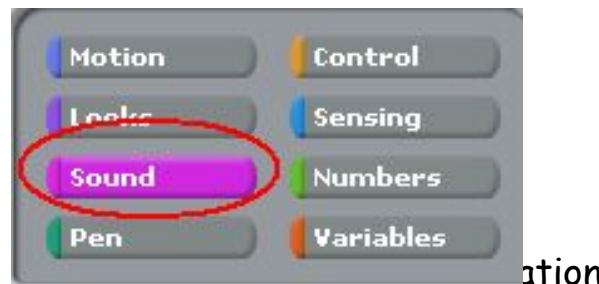
- If you click on the "Play" button, you can preview your sound.



Adding The Sound To Your Animation

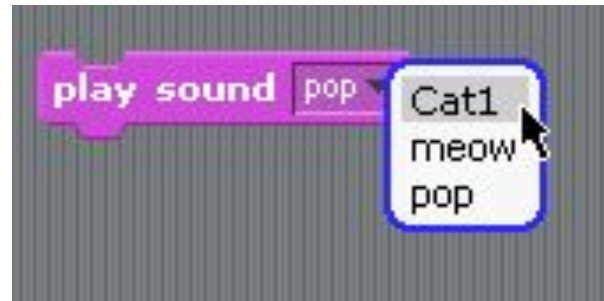


- Now, you're ready to add the sound to your animation!
- Click on the Script tab.
- Select the sprite you want to have sound.
- Now select the Sound button.

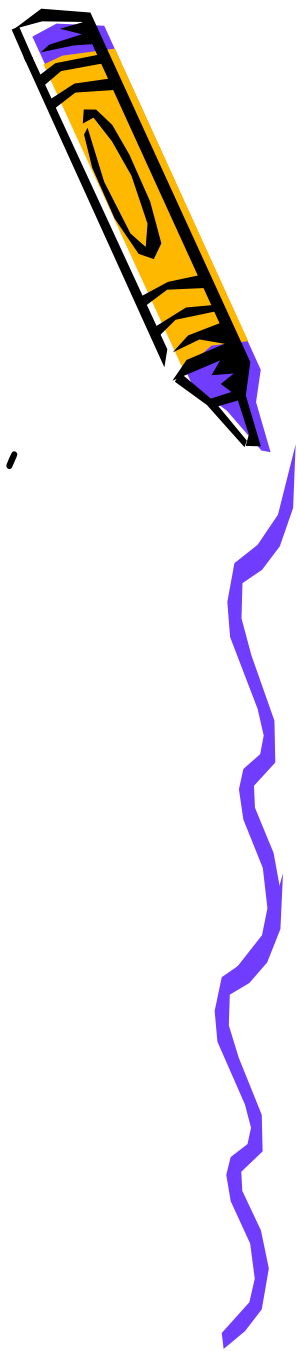


Adding Sound

- Now, select one of the blocks that says, "play sound..."

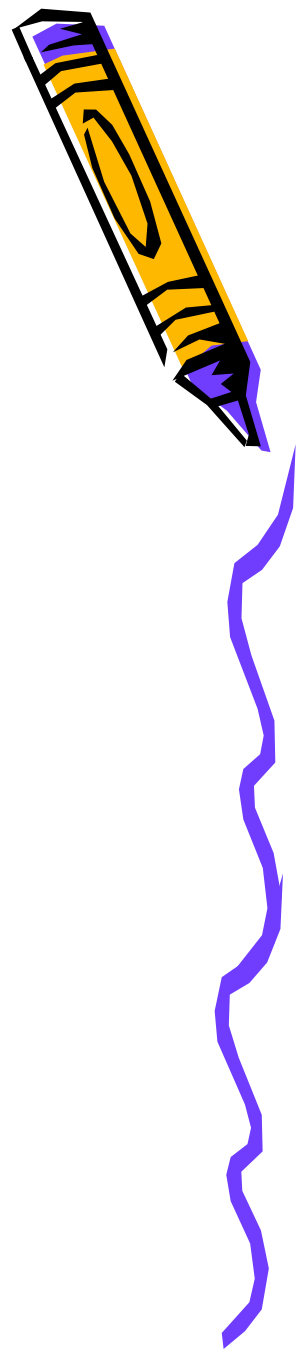


- Select your sound from the drop-down menu by clicking on the triangle next to "pop".



Recording a Sound

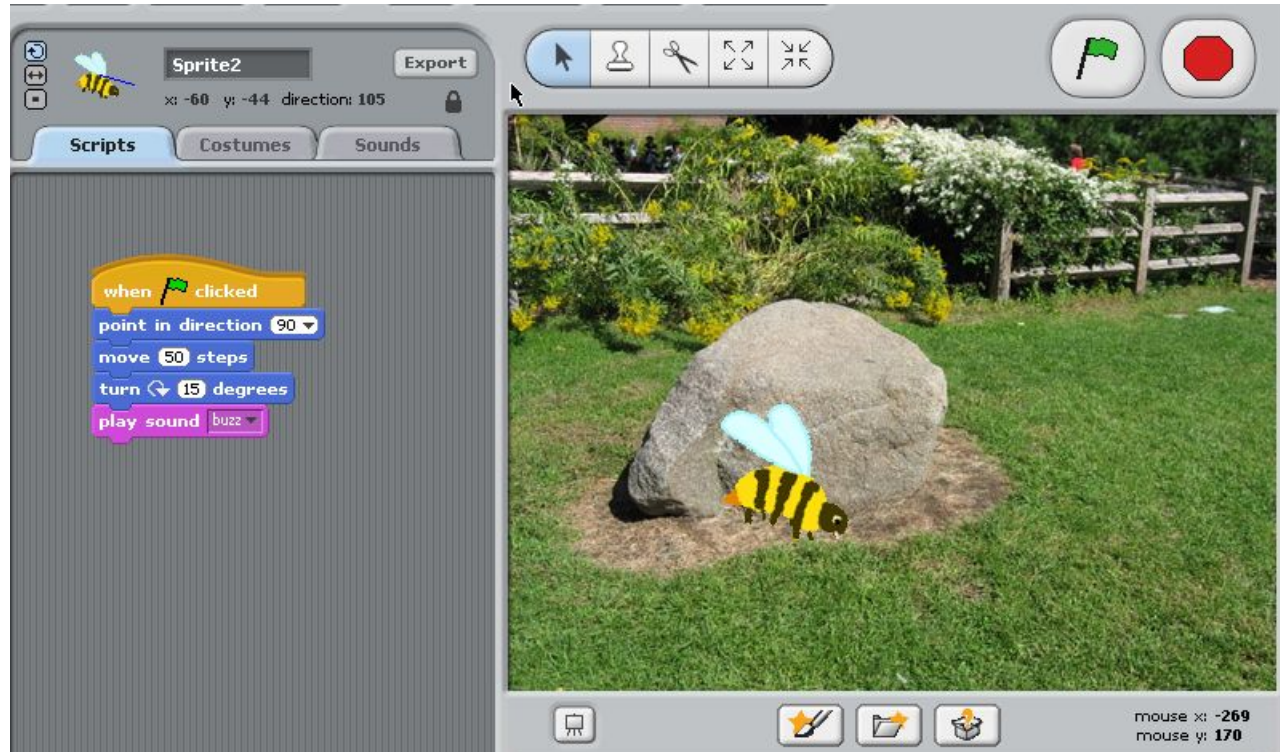
- Click on the record button to record a sound
- Click on the red button to start recording
- Click on the square to stop
- You can rename the sound by typing over the name



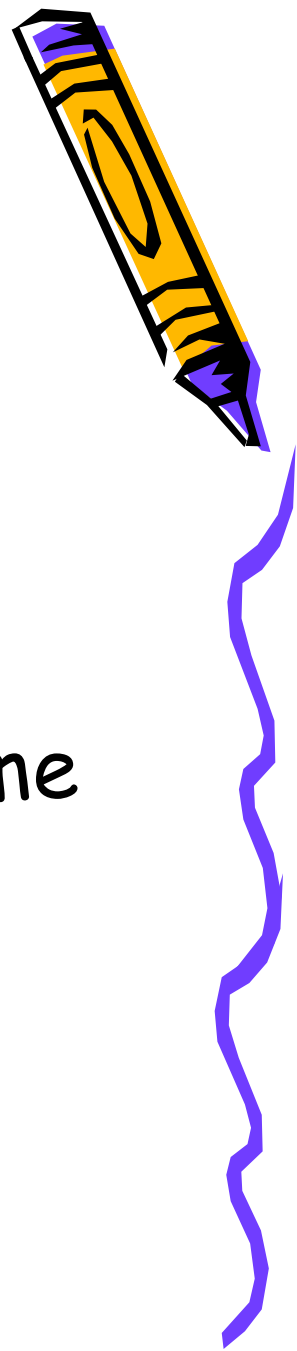
Incorporate Sound Into Your Animation!



When I click the flag, my bee will move and buzz.



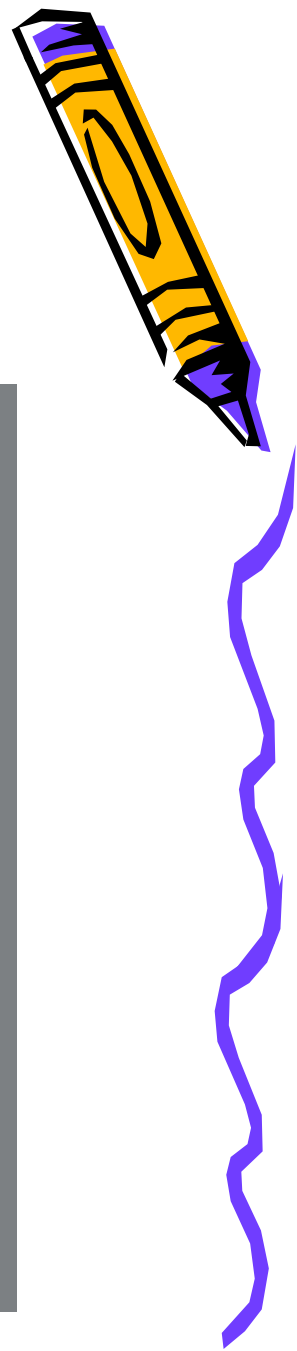
Time To Play!



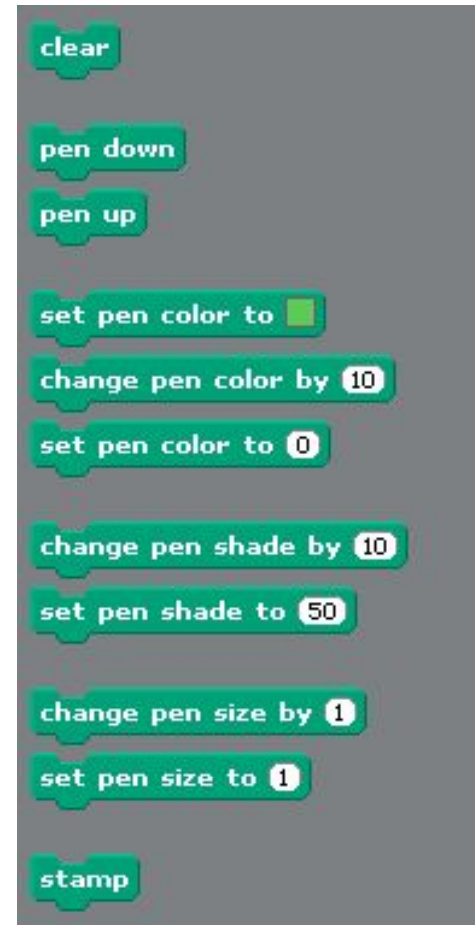
- For the next few minutes, experiment with **Motion**, **Control**, **Sensing**, and **Sound**!
- When you get something cool, let me see it!



Using The Pen!



- When using the Pen tools, your sprite actually becomes your writing instrument!
- You can change the Pen's color, its shade, and its size.



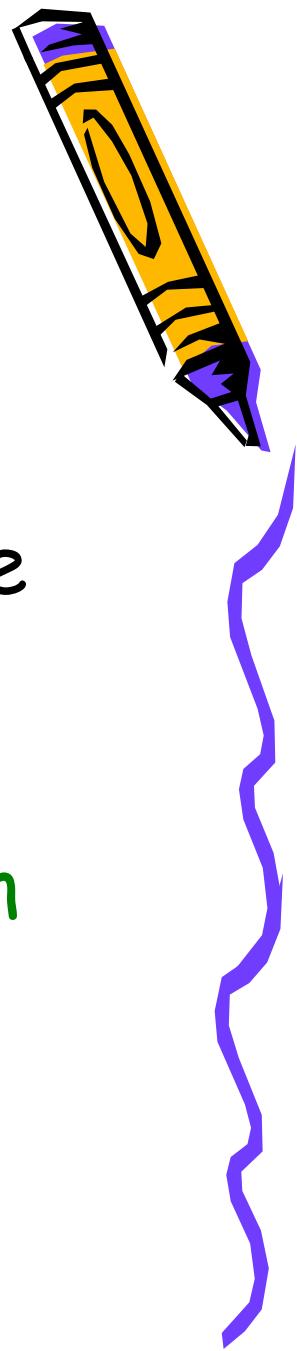
Using the Pen!



- Your first Pen challenge is to write your initials using the Pen tools.
- It may sound easy, but, you have to remember to lift your pen when necessary and also to put it back down!



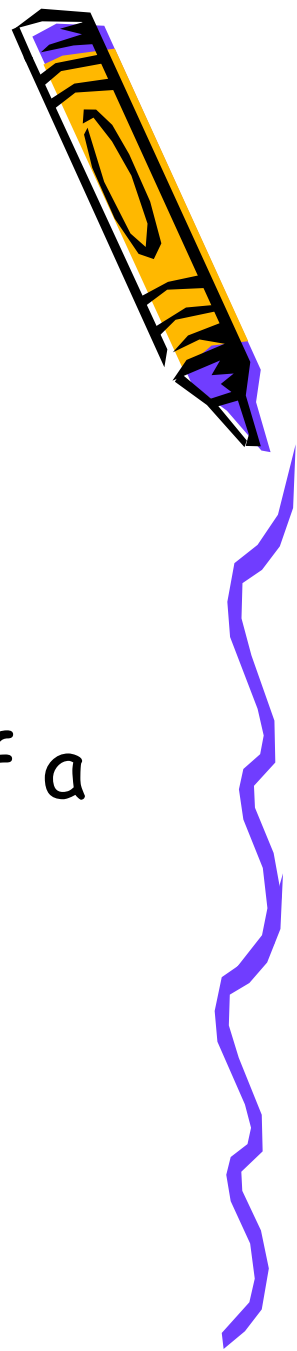
Pen Challenge #2



- Great job with Pen Challenge #1!
- Your second **Pen** Challenge is to use the tools to create an interesting design.
- Remember that you can change **Pen** color and shade!



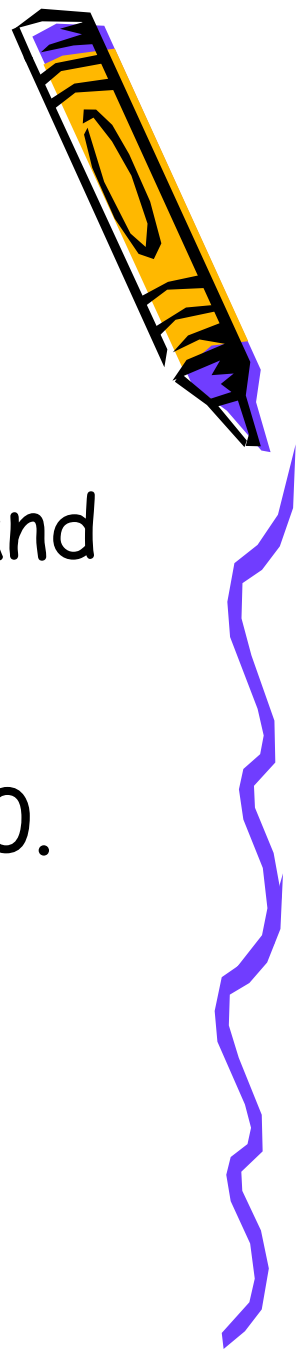
Numbers!



- There are many animation effects you can create using **Numbers** in Scratch.
- One effect is random movement of a sprite!



Random Movement



- Remember that the Scratch animation area is 480 pixels wide and 360 pixels high.
- That means that the range on the horizontal axis is from -240 to 240.
- The range on the vertical axis is -180 to 180.



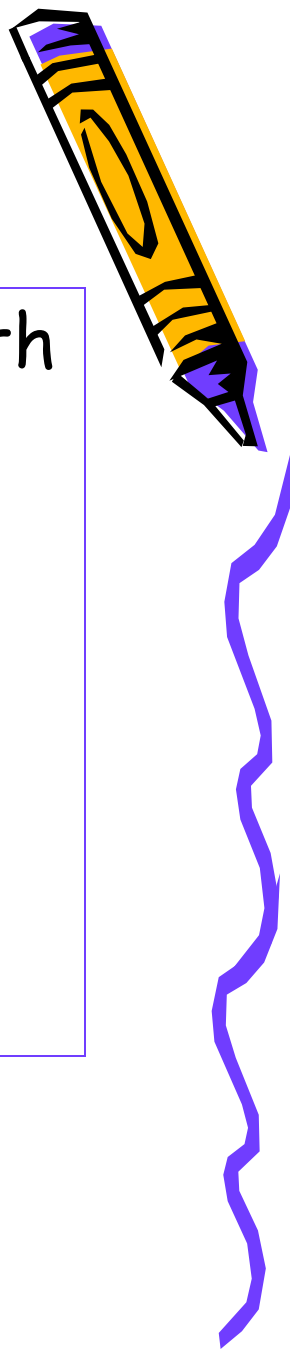
Random Movement

- This is the block of code I would use if I wanted my sprite to randomly glide the entire horizontal and vertical distance of my Scratch animation area:



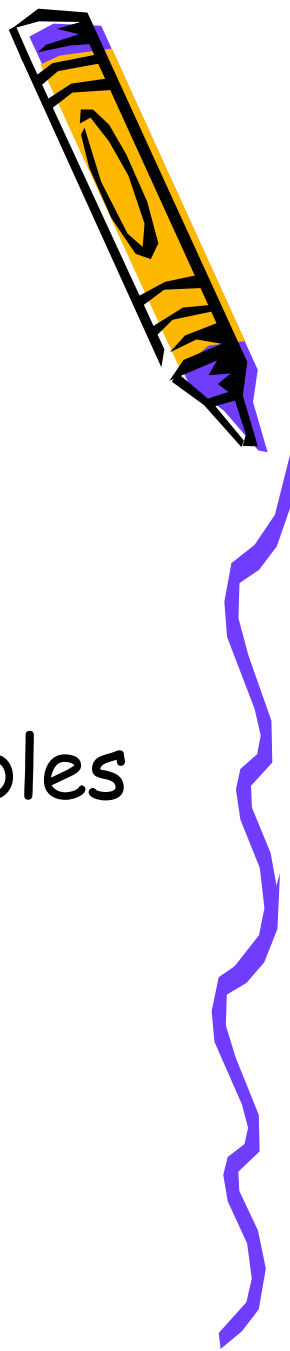
Numbers!

- For the next few minutes, experiment with the tools in **Motion**, **Control**, **Sensing**, **Sound**, and **Numbers**.
- Click right on a block and select help to see what it does.
- When you get something cool, let me see it!



Variables!

- Variables are used mainly in the development of games.
- Open some of the examples in Projects > Games to see how variables are used to keep score in a game.



Time To Have Fun!

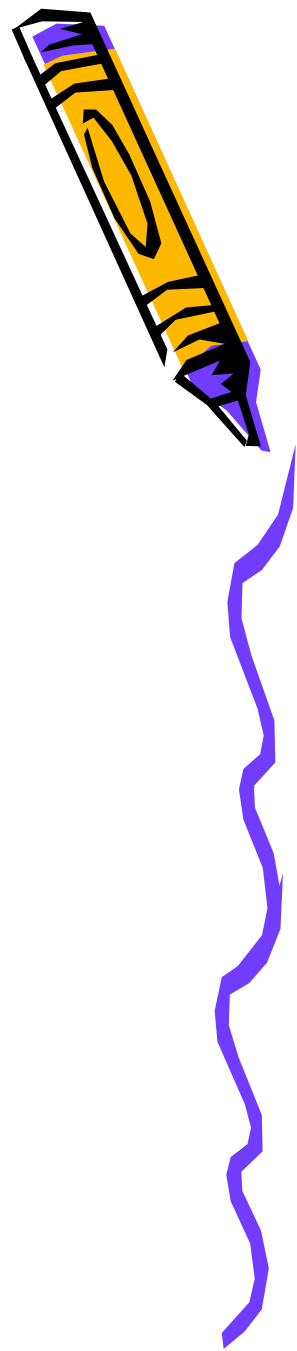


- Now it's time for you to create your own original animations or games!
- Each table has a set of 12 laminated cards with different projects that you can try, to give you ideas for your own animation.

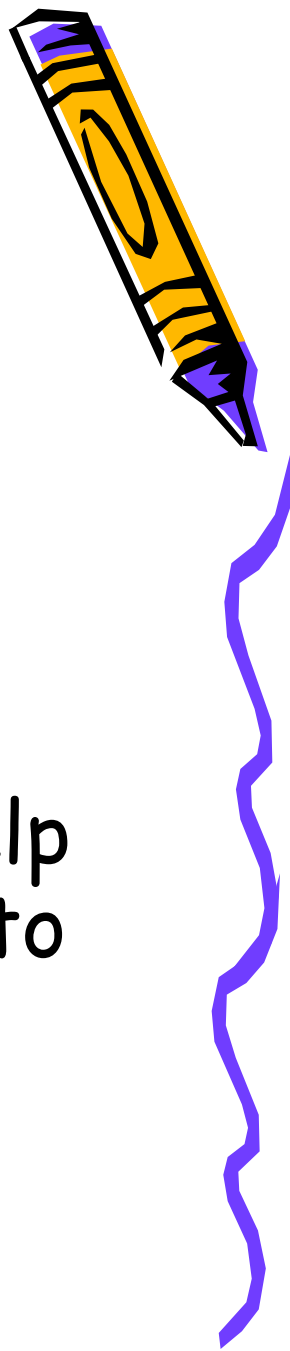


Learn How To:

- While you're creating your own Scratch animation, I want you to discover how to:
 - Create your own sprite;
 - Create your own background;



Last Slide!



- Remember to:
 - Be **appropriate**;
 - Be creative;
 - Have fun!
- You will also be given a Scratch Help Guide, complete with screenshots to help you get started.

