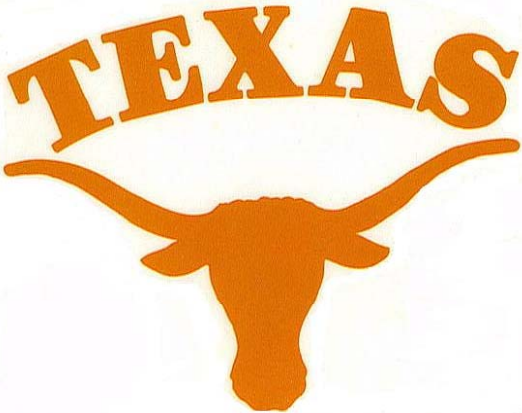


Game Making with Alice

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What is Alice?

- Alice is a visual programming language.
- Alice is designed to teach you how to program
- The output of Alice programs are movies.
- The movies can be interactive



Alice and Visual Programming

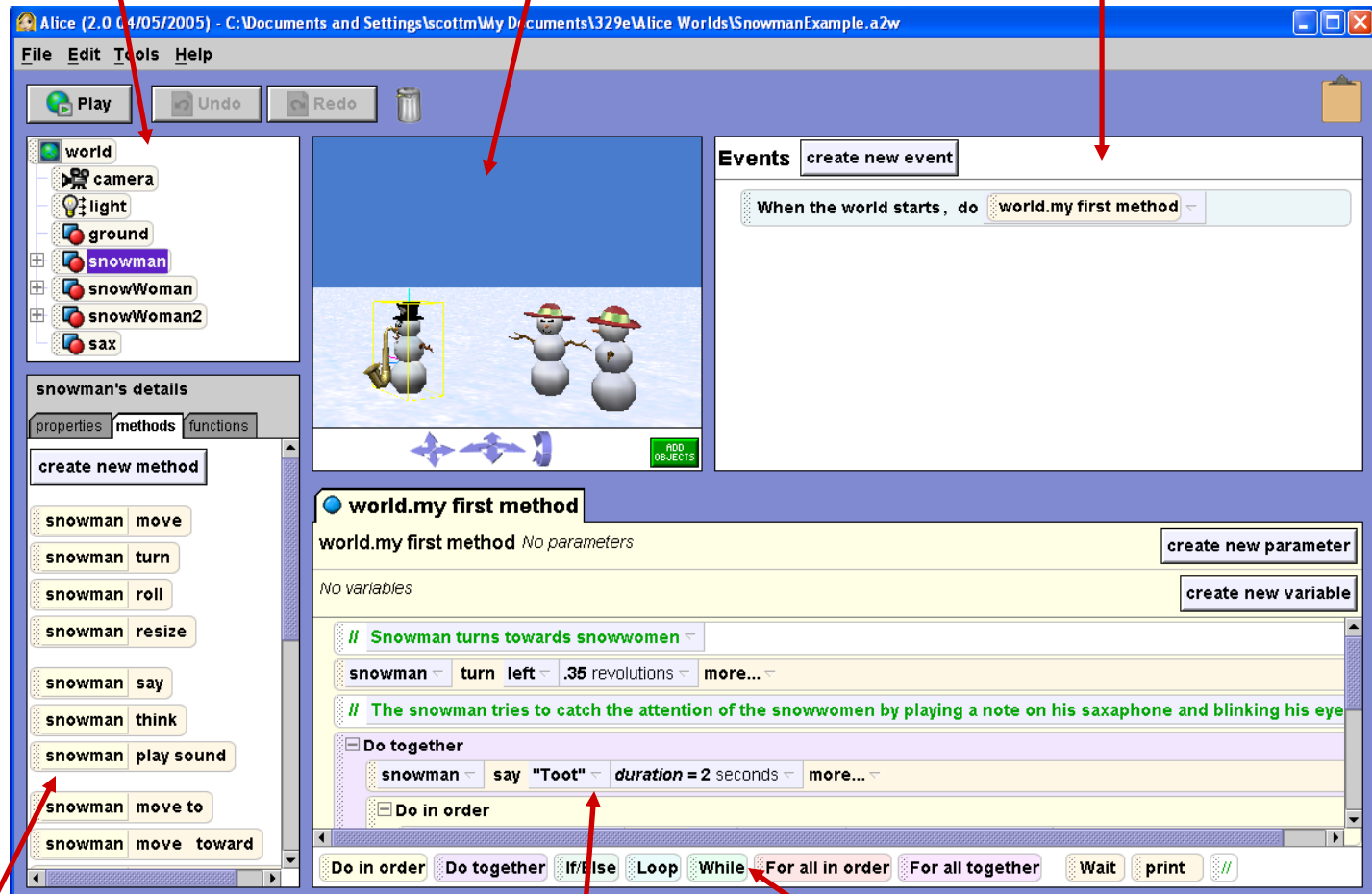
- Programming is done by pointing and clicking, dragging and dropping, selecting from menus, and some typing
- Download Alice for free:
- www.alice.org



Object Tree

World View

Event Editor



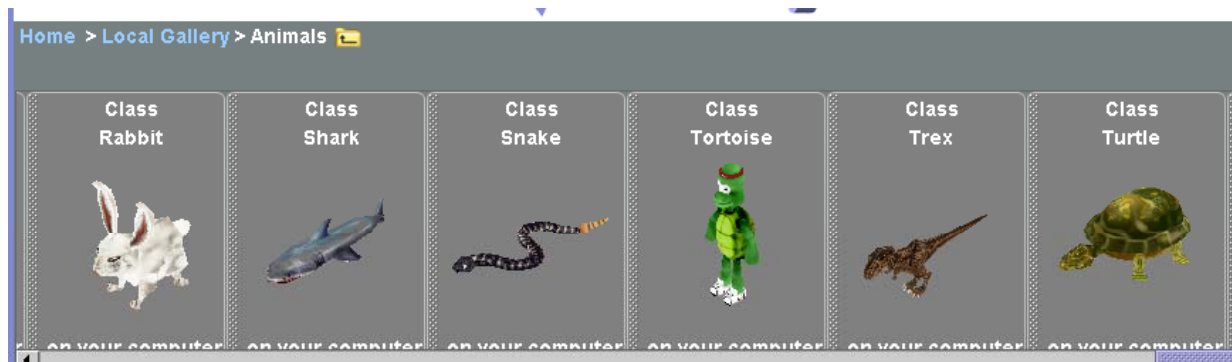
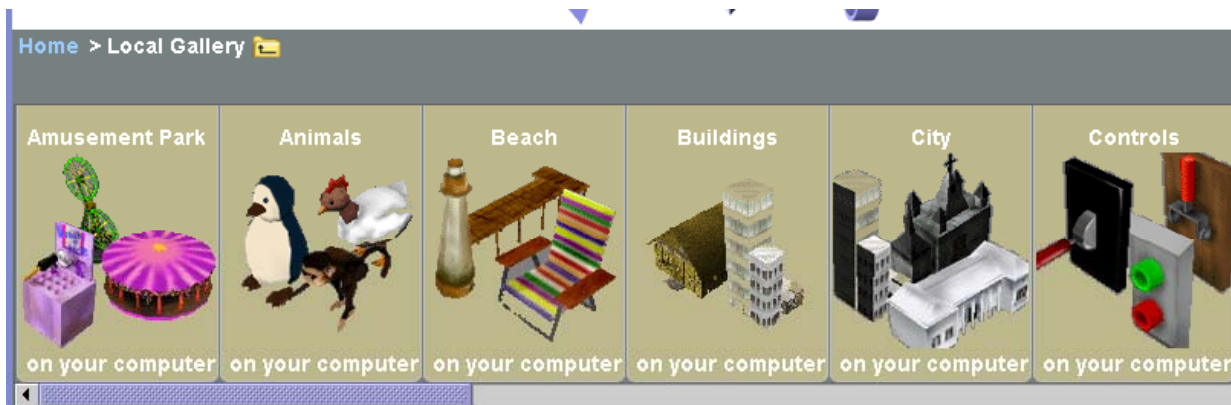
Details Panel

Code Editor

Control Primitives

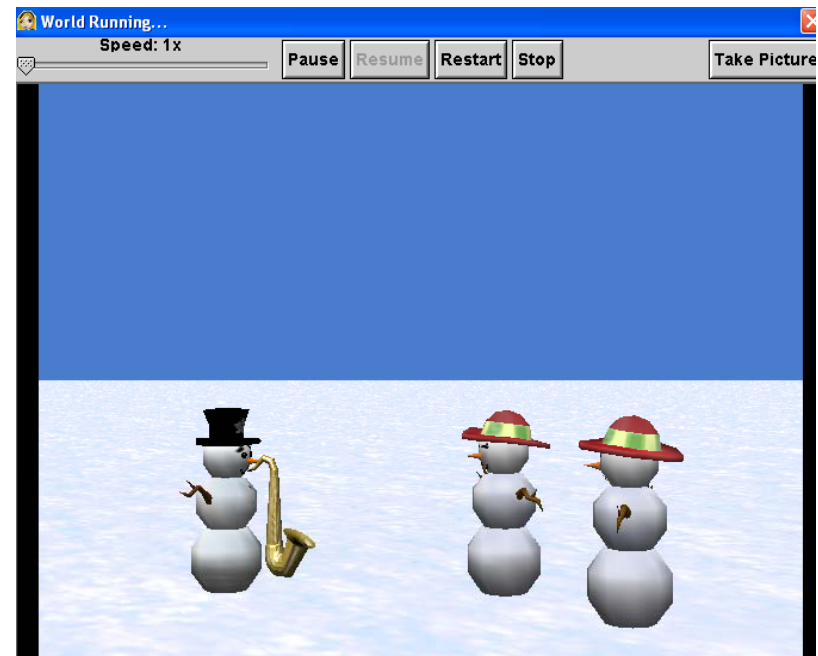
Alice Models

- Main programming data are 3d models
- Many built in and more on web



Output

- Output are 3d movies
 - run the program, play a movie
 - can also add sound to programs
- A lot easier to recognize logic errors
 - "Why do my ninja's arms keep flying away?"



Sample Program - Bunny and Broccoli



Click the Cow



Eat the Hay

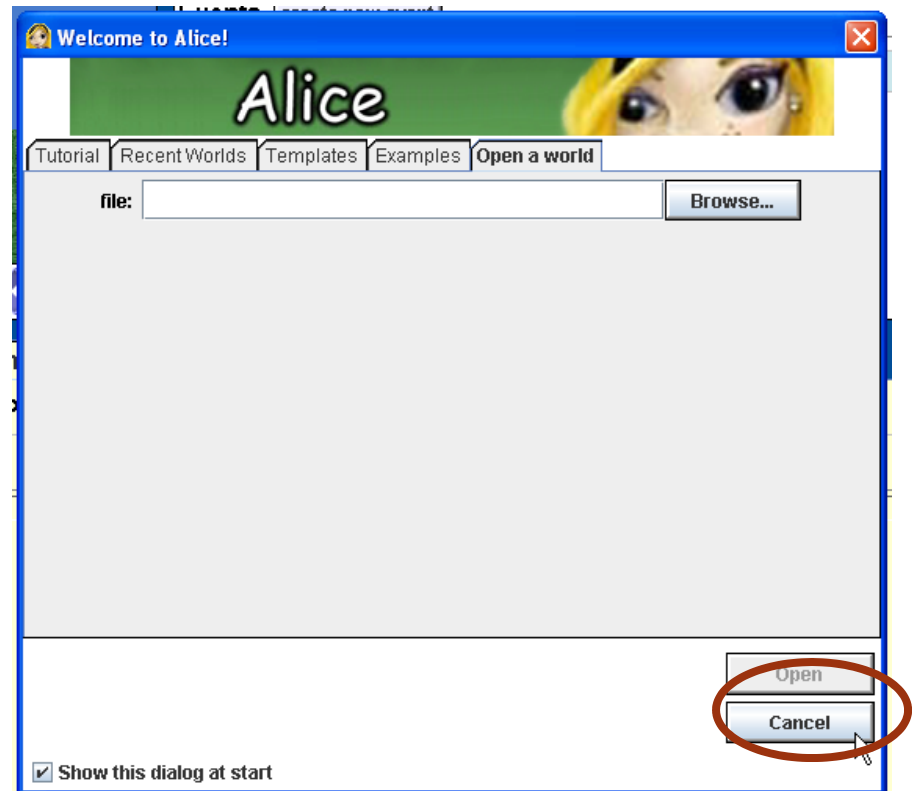


Start Alice

- Double click on the Alice icon to start Alice
 - It may take a minute to start up

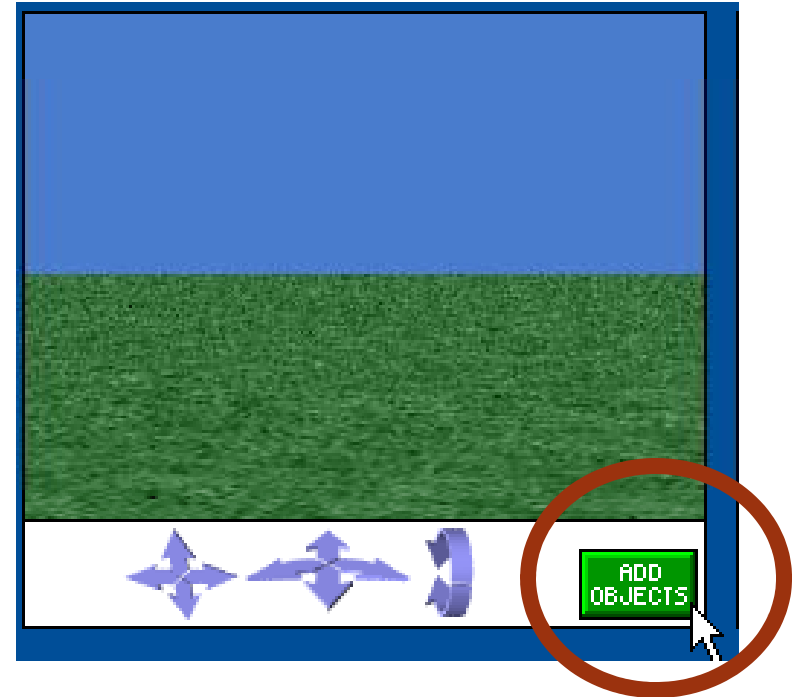


- Cancel the opening dialog screen



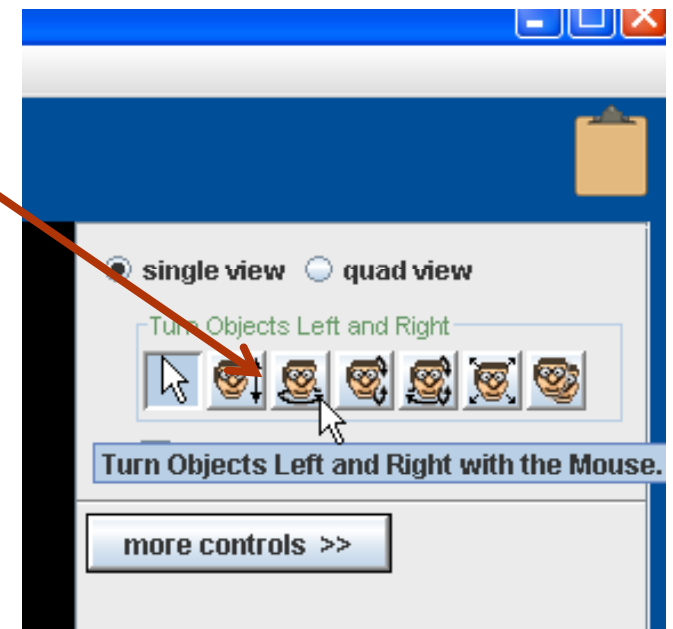
Build the Scene

- Click on the add objects button at the bottom right of the scene
- Scroll to the Farm category and click on Farm



Add Objects to Scene

- Click and Drag some objects into the scene
- Once in the scene objects can be positioned with the mouse
- Object can be rotated by selecting the proper option from the menu in the upper right
- If you want to get rid of an object right click it and select delete



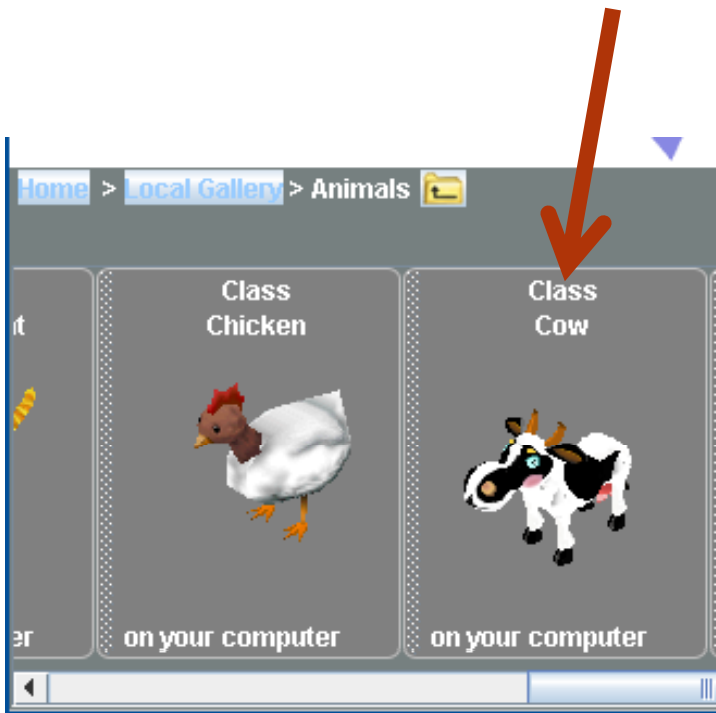
A Farm Background

- Yours can be different.



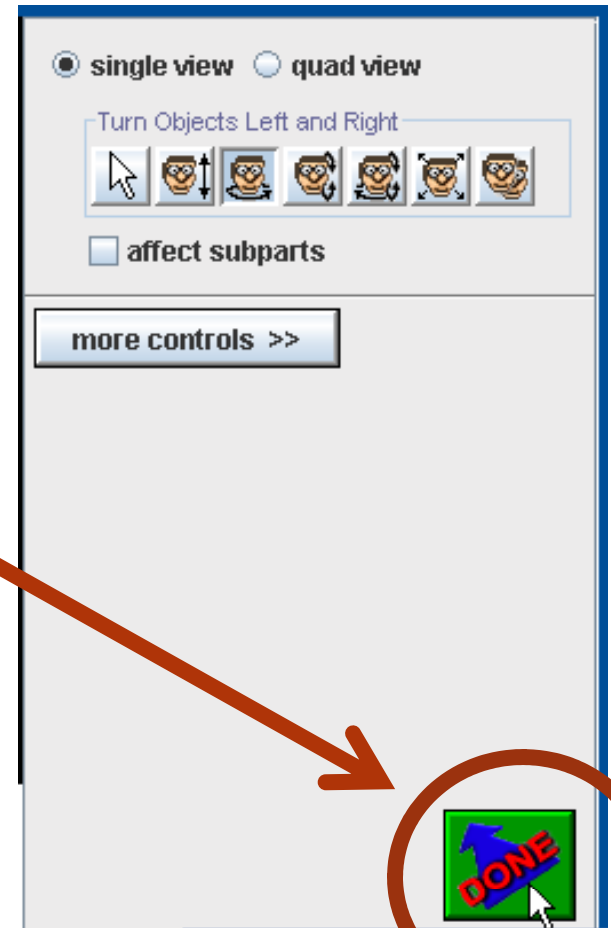
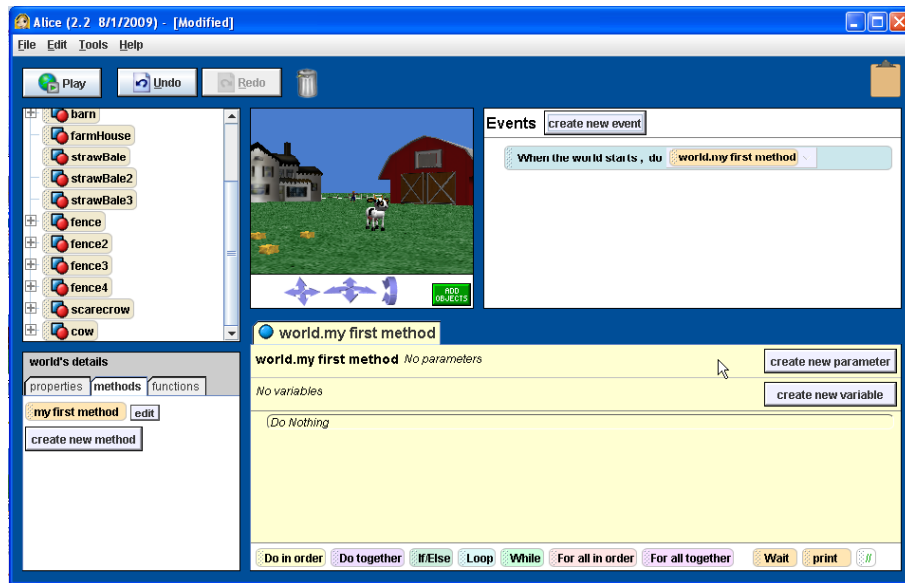
Add The Cow

- Click on the Local Gallery to get back to the list of categories
- Open the Animals Category
- Scroll over to the Cow and add one to the world



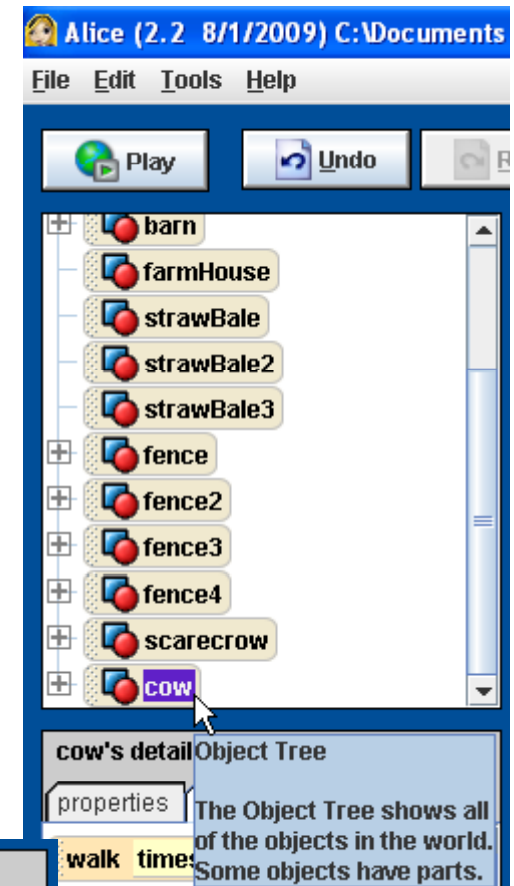
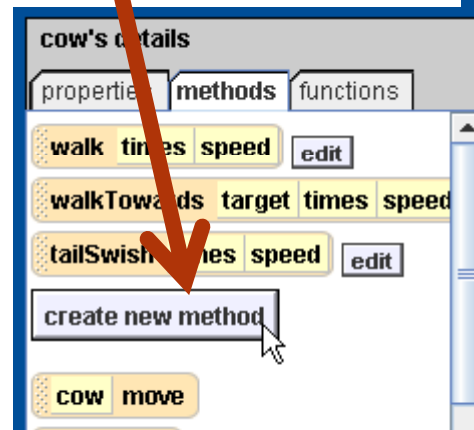
Back to Programming

- Exit the scene editor by clicking the done button



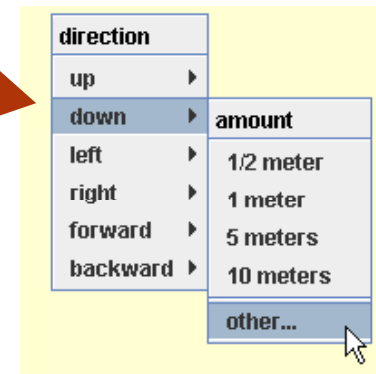
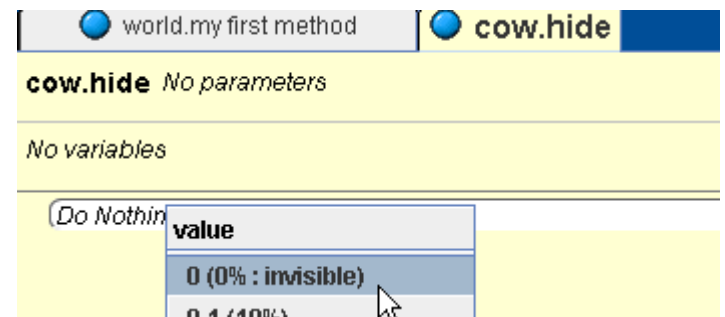
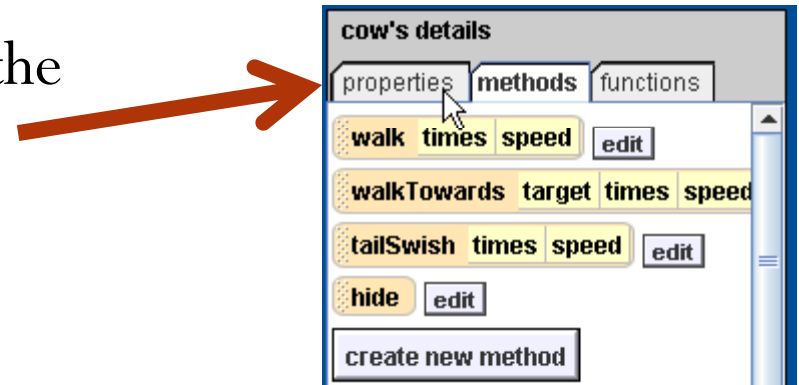
Make a method to hide the cow

- Click on the cow in the object tree.
- Click on the methods in the details window
- Click on the create new method button
- Name the method hide



Add commands to the hide method

- Click on the properties tab in the detail window
- Drag the opacity = 1(100%) icon into the window for hide
- Change the opacity to 0(0%)
- Click on the methods tab in the details window
- Drag over the cow move command
- Select down for the direction and other for the amount.
 - Set to 2



The completed hide method

The screenshot shows the Alice software interface. At the top, there are two tabs: 'world.my first method' and 'cow.hide'. The 'cow.hide' tab is selected. Below the tabs, the text 'cow.hide No parameters' is displayed. Underneath, it says 'No variables'. At the bottom, there are two event-driven actions. The first action is triggered by a 'cow' object and performs the action 'set opacity to 0 (0%)'. The second action is also triggered by a 'cow' object and performs the action 'move down 2 meters'. Both actions have a 'more...' dropdown menu next to them.

world.my first method **cow.hide**

cow.hide *No parameters*

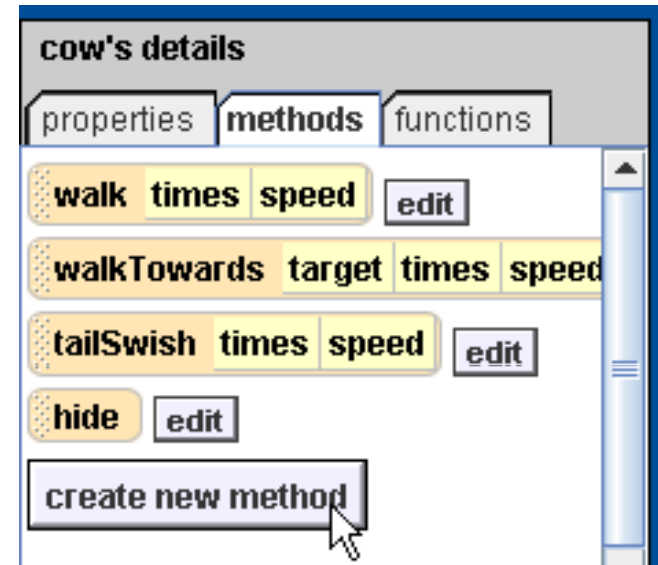
No variables

cow ▾ set opacity to 0 (0%) ▾ more... ▾

cow ▾ move down ▾ 2 meters ▾ more... ▾

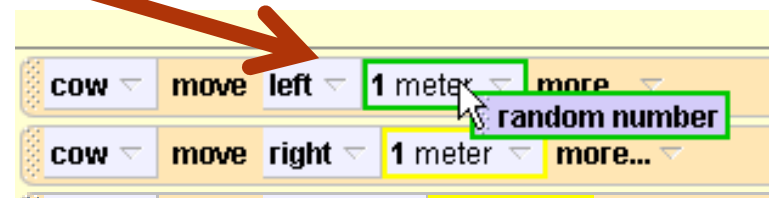
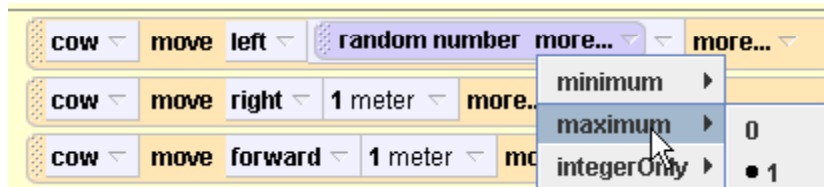
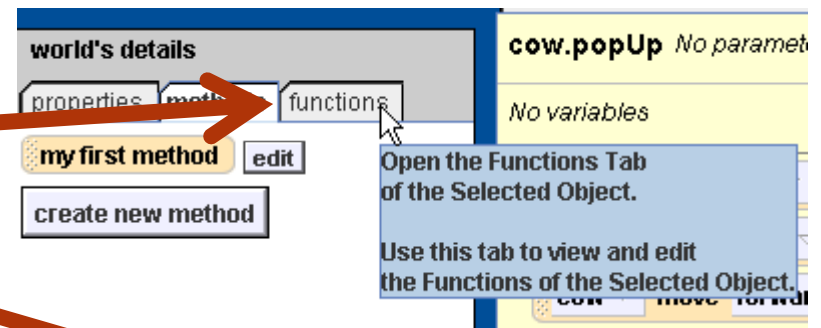
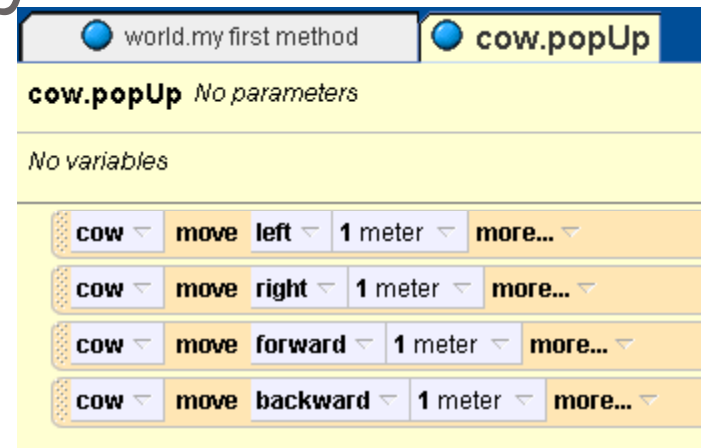
Create the pop up method

- Click the cow in the object tree
- Click on methods
- Click the create new method button
- name the method popUp



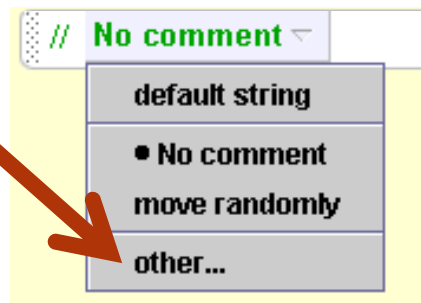
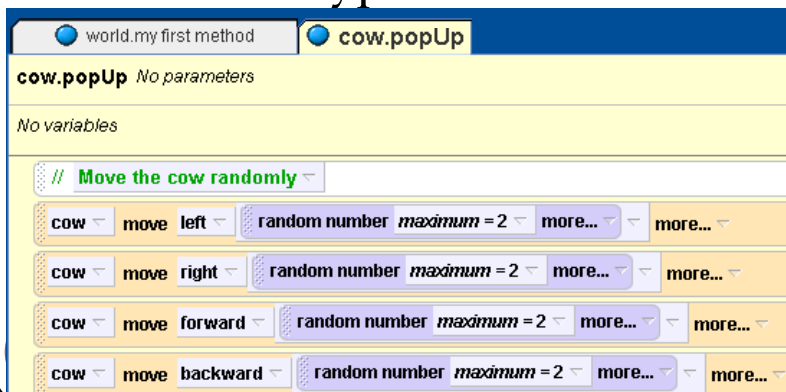
Move the cow randomly

- Start by dragging out cow move tiles
 - one for each of left, right, forward, and backward
- Click on world in the object tree to select it
- Click on functions in the details window
- Drag out random number and drop it on the 1 meter
 - select more and change max to 2



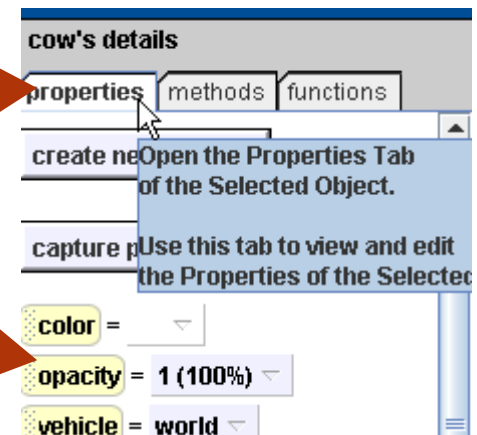
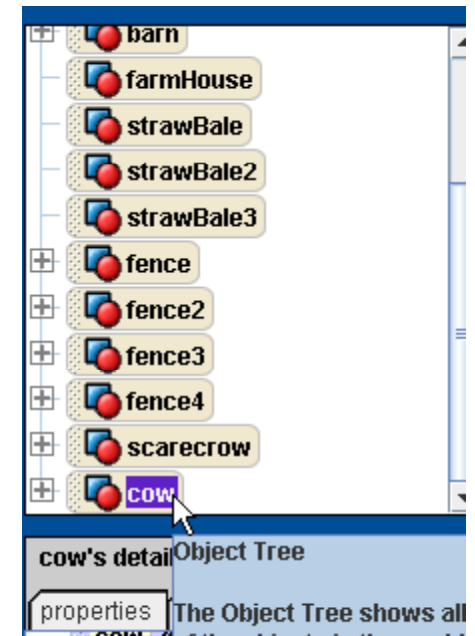
Add a comment

- You can add a comment to explain what you are doing in English
- Drag a // tile from the bottom of the method editing window to where you wish to place the comment
 - Click on the down arrow
 - Select other
- Type in the comment

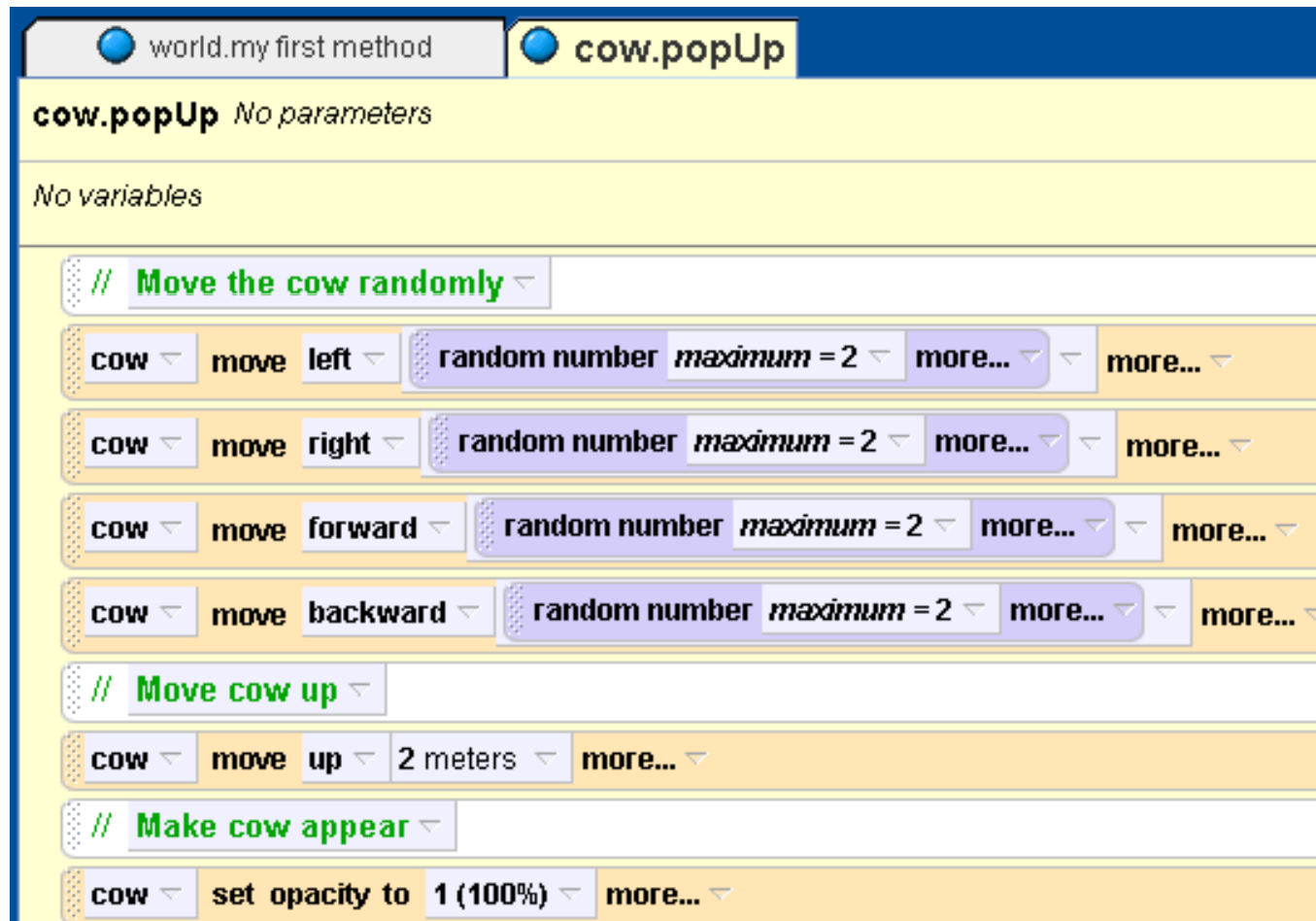


Showing the cow

- Click on cow in the object tree to select it
- Click on methods in the details window
- Drag out a cow move tile
 - select up 2 meters
- Click on properties in the details window
- Drag out opacity = 0
 - change to 1 (100%)



Completed popUp method



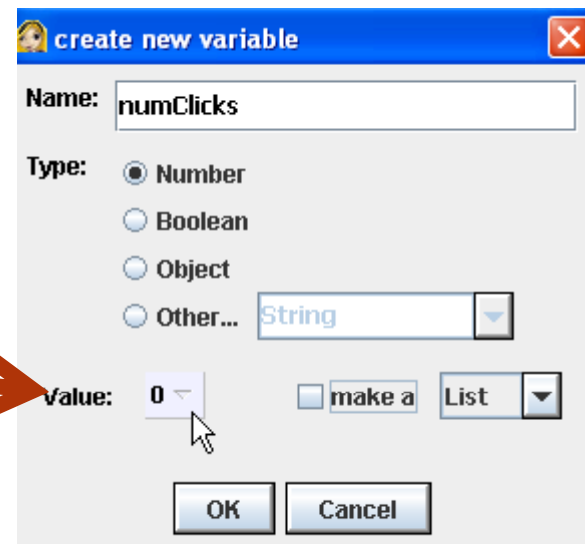
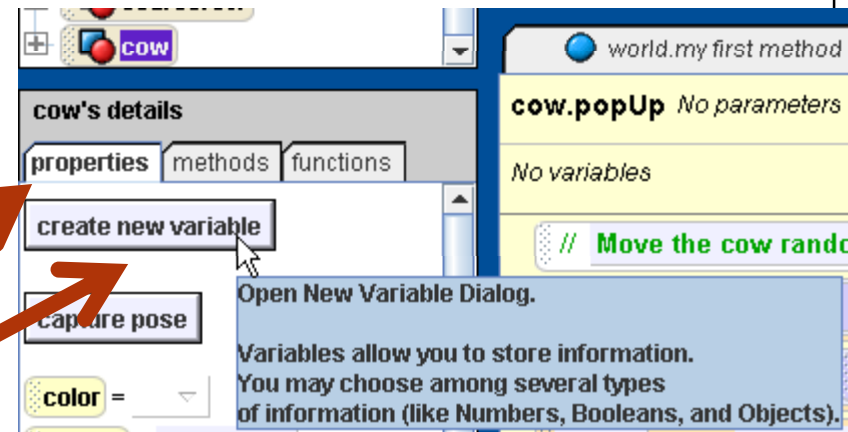
The image shows a Scratch script titled "cow.popUp" with no parameters. The script is organized into three sections: "Move the cow randomly", "Move cow up", and "Make cow appear". Each section contains a series of blocks that perform specific actions on the cow object.

Script Details:

- Section 1: Move the cow randomly**
 - Block 1: cow → move left → random number maximum = 2 → more... → more...
 - Block 2: cow → move right → random number maximum = 2 → more... → more...
 - Block 3: cow → move forward → random number maximum = 2 → more... → more...
 - Block 4: cow → move backward → random number maximum = 2 → more... → more...
- Section 2: Move cow up**
 - Block 5: cow → move up → 2 meters → more...
- Section 3: Make cow appear**
 - Block 6: cow → set opacity to 1 (100%) → more...

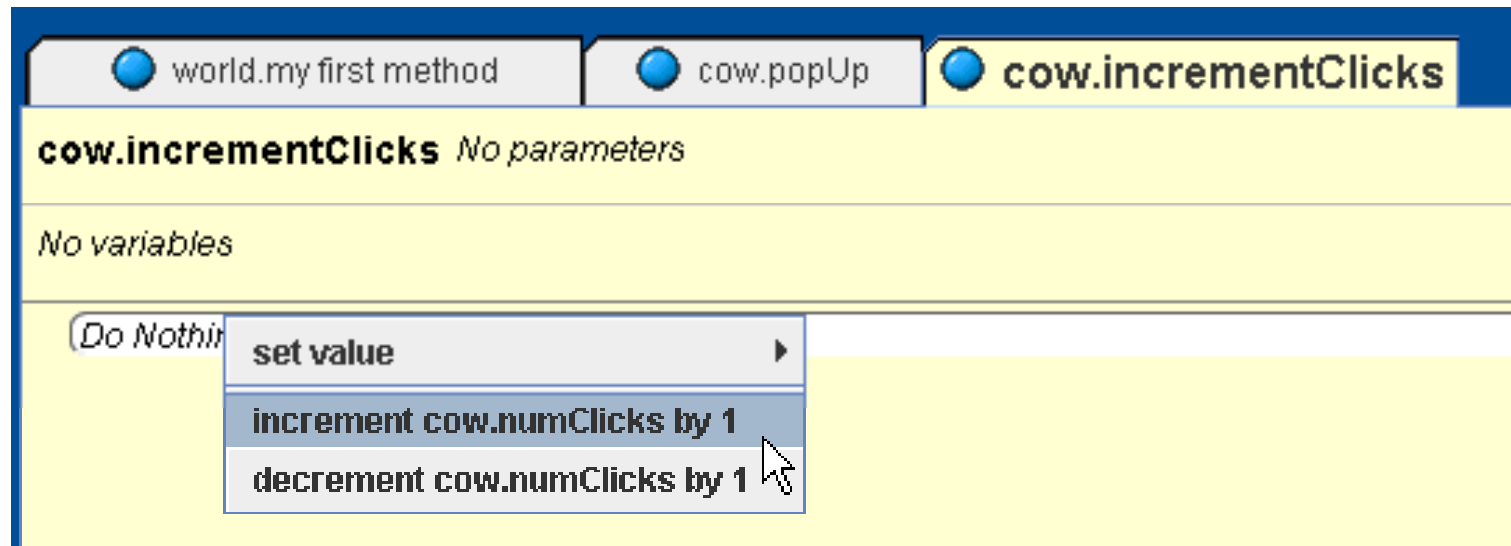
Adding a property (field)

- We need to store the number of time the cow has been clicked
- Click the cow in the object tree
- Click on the properties tab
- Click the create new variable button
- name the variable numClicks
 - set the value to 0



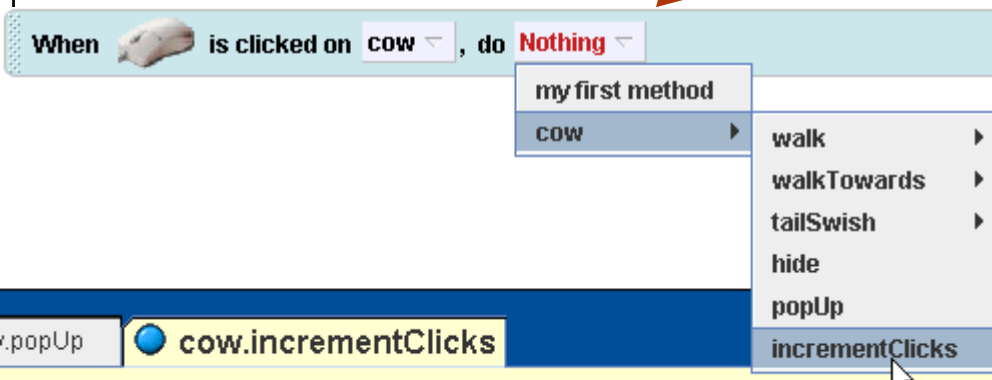
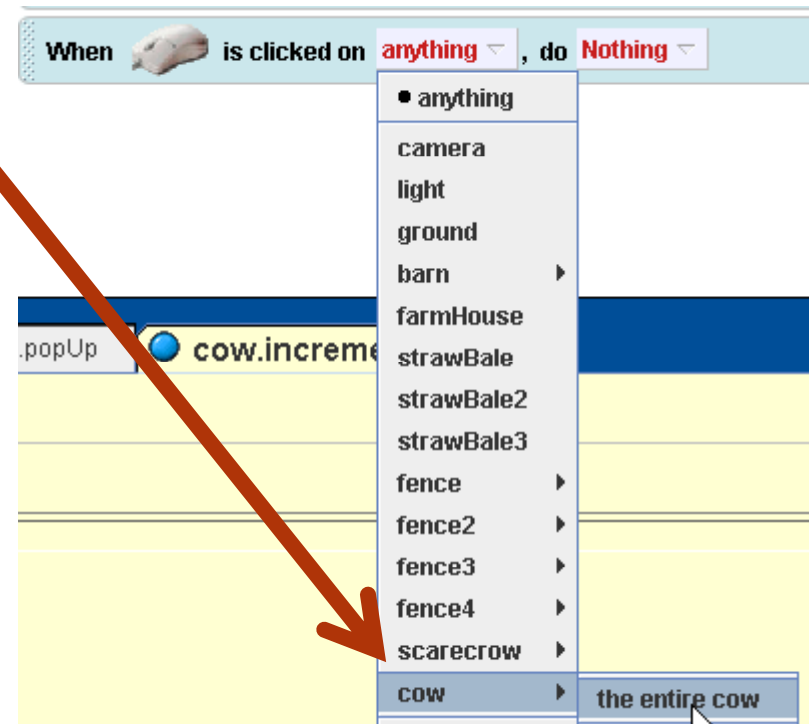
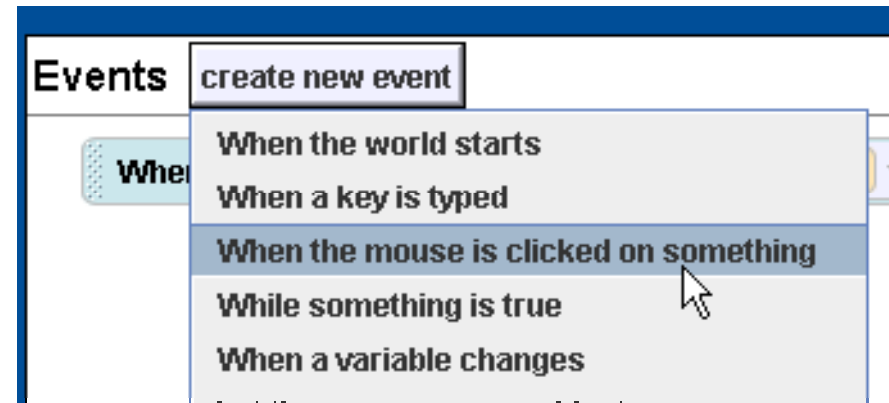
Increment the number of hits

- If the user clicks on the cow we want to add 1 to the number of clicks so far
- Create a method that does this
 - It should be a new cow method (cow selected in object tree)
- Drag numClicks variable into method and select the increment cow.numClicks by 1 option



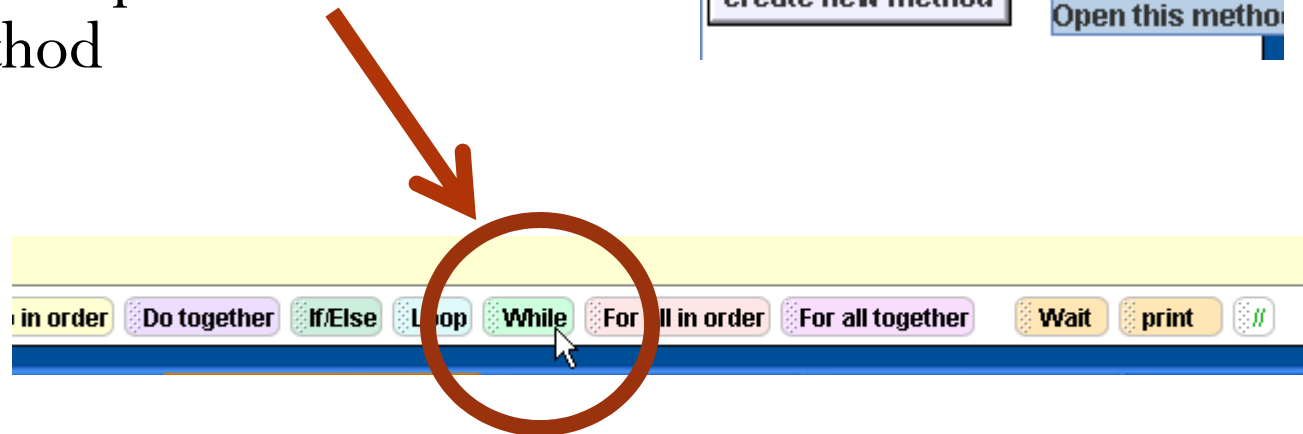
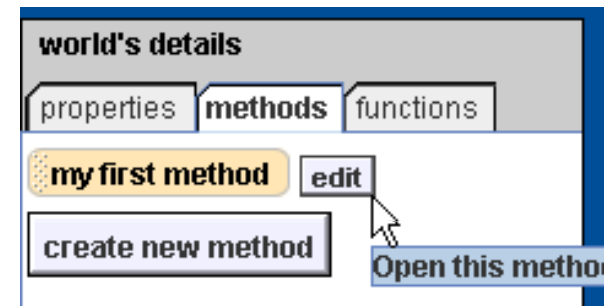
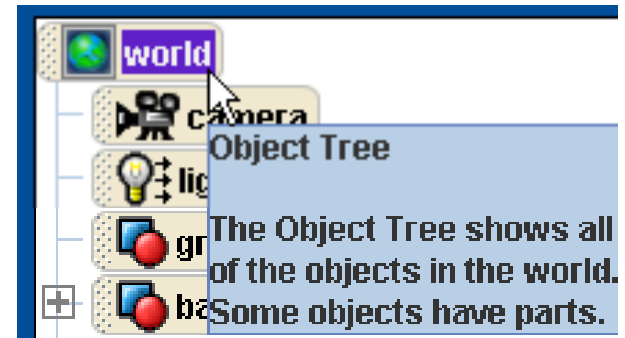
Respond to mouse click on cow

- In the events window click the create new event button
 - select When the mouse is clicked on something
- Change the anything to the cow (the entire cow)
- Change the nothing to cow incrementClicks



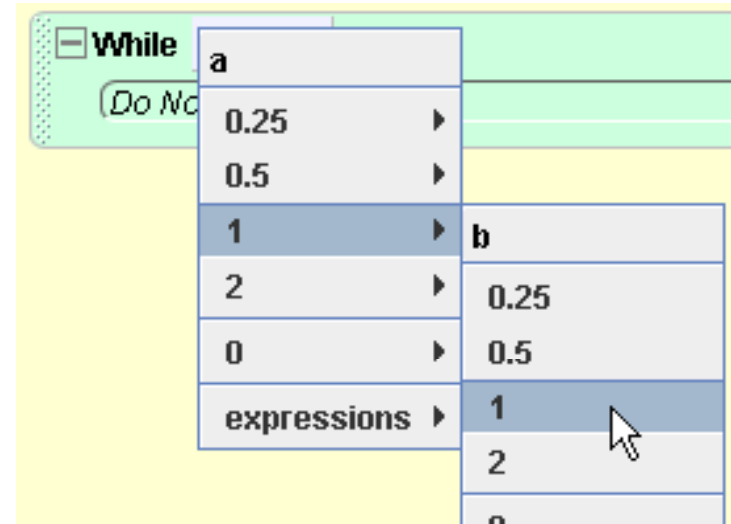
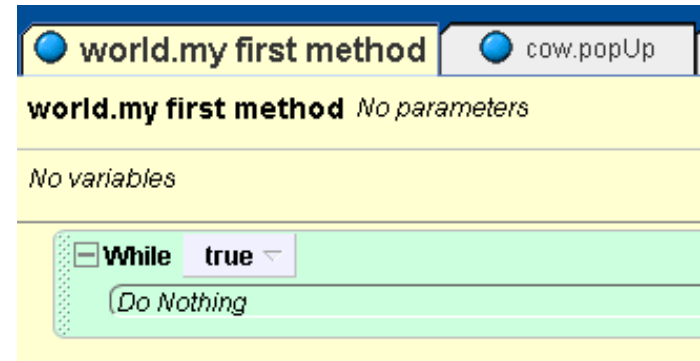
Method to run the game

- Click on world in the object tree
- Select methods and edit the my first method
- Pull up a while tile from the bottom of the editor window and drop into the my first method
 - select true



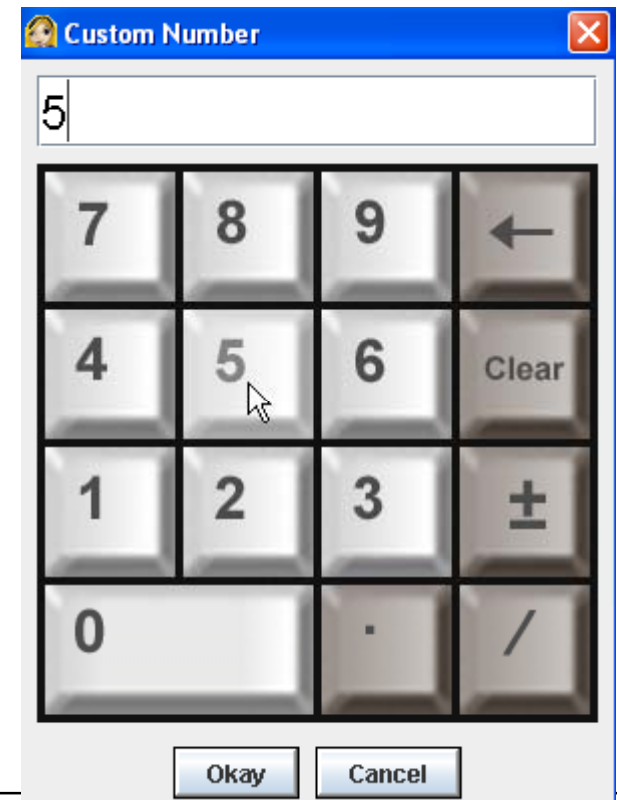
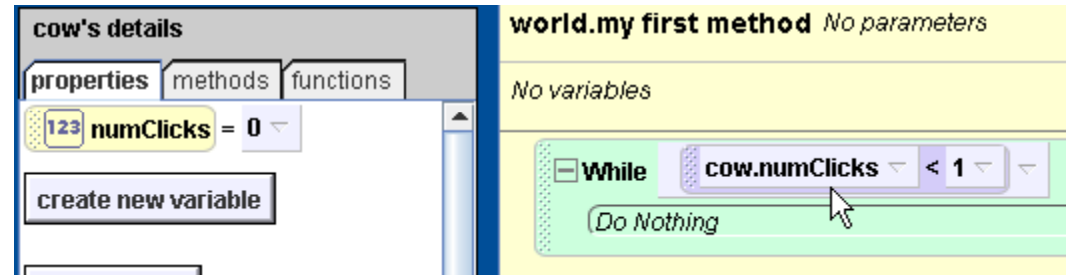
Change while loop

- Click on functions tab
 - drag out $a < b$ and drop it on true
 - select 1 and 1



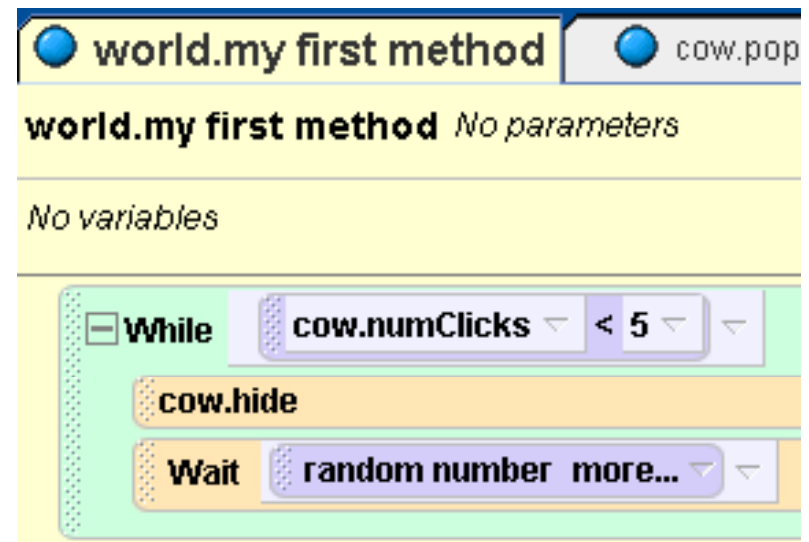
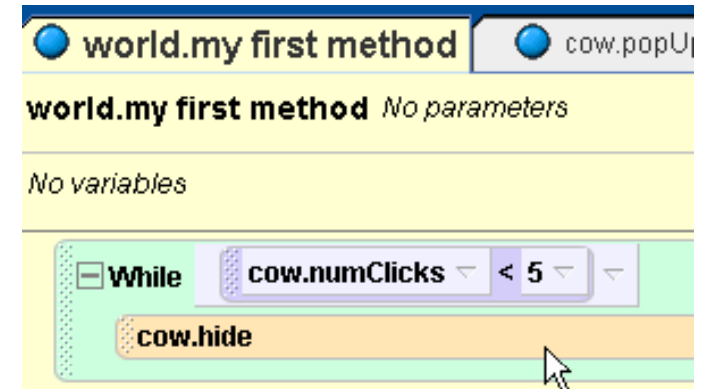
While number of hits < 5

- Click on cow in the object tree
- Click on properties
 - drag out numClicks = 0 and drop on the first 1
- Change the second 1 to 5
 - click on other and enter 5



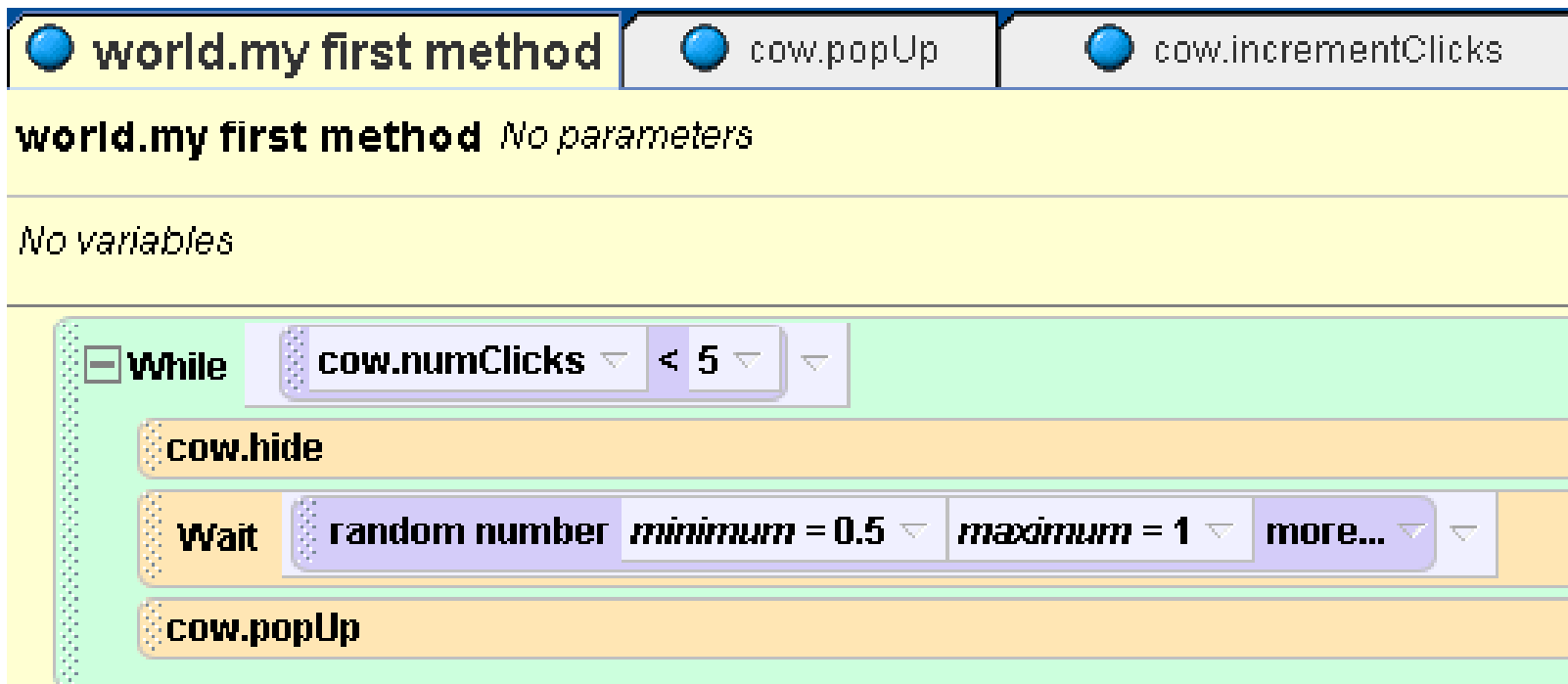
Hide and wait a random amount of time

- Click on cow and then the methods
- Drag out hide
- Drag up a wait tile from the bottom of the editor window
 - select 1 second
- Click on world in the object tree
 - click on functions
 - drag out random number and drop on the 1 second



pop up and wait for 1 second

- Change random number on wait to a min of 0.5 seconds
- Drag out a cow popUp
- Try it out!
 - What happens after you click on the cow 5 times?

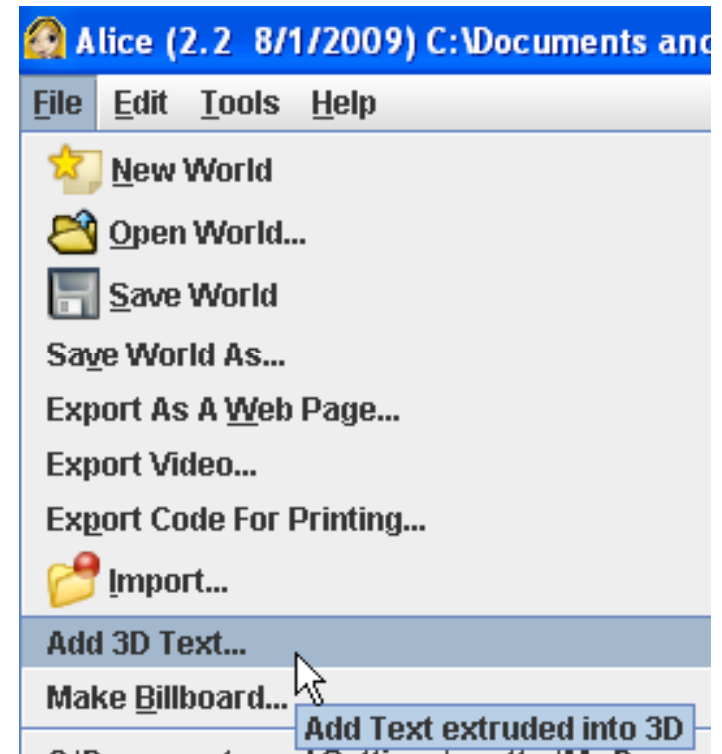


The image shows a Scratch script editor with three tabs at the top: **world.my first method**, **cow.popUp**, and **cow.incrementClicks**. The **world.my first method** tab is selected, showing a script with the following blocks:

- world.my first method** *No parameters*
- No variables*
- While** loop with condition **cow.numClicks < 5**
 - cow.hide**
 - Wait** block with **random number**, **minimum = 0.5**, **maximum = 1**, and **more...**
 - cow.popUp**

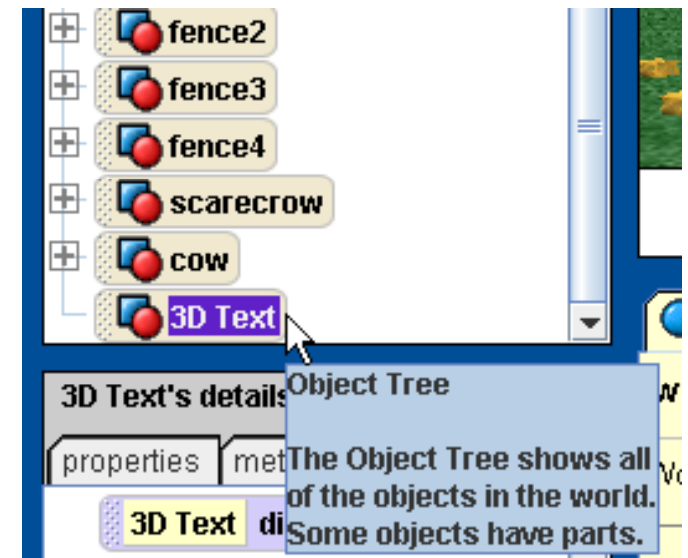
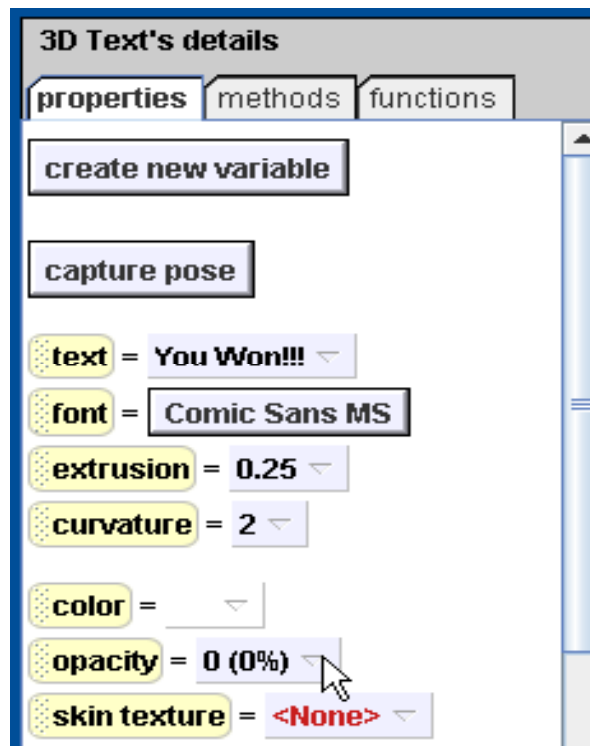
Tell the user they won

- Add some 3D text that tells the user she or he won
 - Click on File and then on Add 3D Text
 - Type in the text
 - you can change the font
- Place it where you want it to appear
 - Click on add objects to get to the mouse controls
 - Click on done when done



Make the text invisible to start

- Click on the text in the object tree
- Click on properties
 - Modify opacity to 0 (0%)



When the user wins show the text

- Drag out opacity = 0 to the my first method
 - change to 1 (100%)
- Play the game!

The image shows a Scratch script editor window. At the top, a blue header bar contains a blue circle icon and the text "world.my first method". Below this, a yellow bar displays "world.my first method" followed by "No parameters". A second yellow bar shows "No variables". The main script area has a light green background. It begins with a "While" loop block, which is expanded to show its contents. The loop condition is "cow.numClicks < 5". Inside the loop, there are three blocks: "cow.hide", a "Wait" block set to "random number" with "minimum = 0.5" and "maximum = 1", and "cow.popUp". Below the loop, there is a "3D Text" block with the text "set opacity to 1 (100%)".

world.my first method

world.my first method *No parameters*

No variables

While **cow.numClicks** < **5**

- cow.hide**
- Wait** **random number** *minimum = 0.5* *maximum = 1* **more...**
- cow.popUp**

3D Text **set opacity to** **1 (100%)** **more...**

Speeding things up in hide method

- All animation commands takes 1 second by default
 - you can change this using the more...
- Drag a Do together block from the bottom and then drag both commands into it

The screenshot shows the Alice software interface. At the top, there are three tabs: 'world.my first method', 'cow.popUp', and 'cow.hide'. The 'cow.hide' tab is selected. Below the tabs, the text 'cow.hide No parameters' is displayed. Underneath, it says 'No variables'. A 'Do together' block is visible, containing two commands: 'cow move down 2 meters duration = 0.5 seconds more...' and 'cow set opacity to 0 (0%) duration = 0.5 seconds more...'.

Speeding things up in popUp method

- Remove the random move left and forward
 - Right click commands and select delete
- Change minimum on random move right and back to -2
- Set duration on random moves to 0
- Put move up and set opacity to 1 commands to a do together block and change duration to 0.5 seconds

Finished popUp method

world.my first method cow.popUp

cow.popUp *No parameters*

No variables

// Move the cow randomly

cow move right random number maximum = 2 minimum = -2 more... duration = 0 seconds more...

cow move backward random number maximum = 2 minimum = -2 more... duration = 0 seconds more...

☐ Do together

// Move cow up

cow move up 2 meters duration = 0.5 seconds more...

// Make cow appear

cow set opacity to 1 (100%) more...

Add instructions

- Create 3D text that tells the user what to do in the game
- When the game starts wait for 1 second
 - then make the text invisible
 - can set opacity to 0



world.my first method cow.popUp

world.my first method No parameters

No variables

Wait 1 second

3D Text2 set opacity to 0 (0%) more...

While cow.numClicks < 5

cow.hide

Wait random number minimum = 0.5 maximum = 1 more...

cow.popUp

3D Text set opacity to 1 (100%) more...

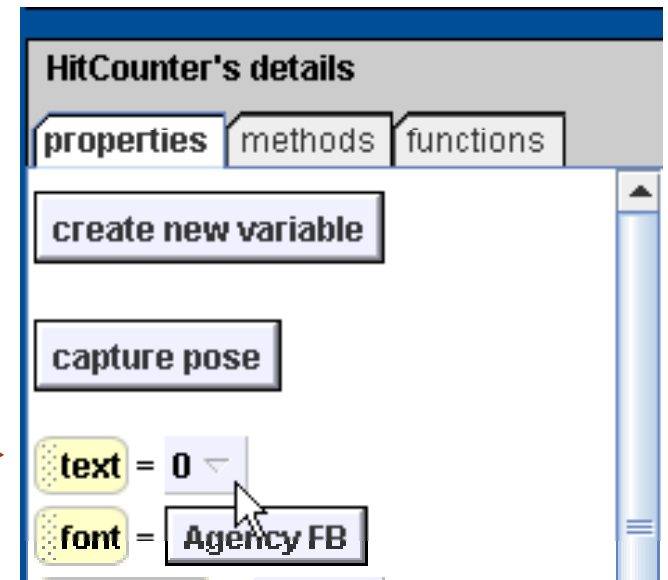
Show the number of hits

- Create 3D text that says Hits and one that says 0
- Use the mouse controls to position the text
 - Click on Add Objects to see the mouse controls
 - when done click on done






Create World incrementClicks method

- Add an incrementClicks method to the world
 - call the cow incrementClicks method
 - click on the 0 3dText object then properties
 - drag out text = 0
 - select default string
 - replace the default string with the what as string function in the world to convert the number to a string
 - choose expressions and pick cow numClicks as what to convert



Change when mouse clicked

 world.my first method |  cow.popUp |  world.incrementClicks

world.incrementClicks *No parameters*

variables


cow.incrementClicks

HitCounter ▾ set text to default string ▾ more... ▾

- Modify then when mouse is clicked on the cow to call the world's incrementClicks method
- Try it!

Events

When the world starts , do world.my first method ▾

When  is clicked on cow ▾ , do cow.incrementClicks ▾

my first method
cow
incrementClicks

Other Ideas

- Have the cow play a sound when hit
 - modify cow incrementClicks method
 - use play sound in methods
 - you can also record your own sounds
 - click on properties for the cow
 - click on the + next to Sounds
 - and record a sound and name it
- Count the number of times the cow has appeared
- Add a way to lose
 - maybe it will only run till it appears 10 times
 - maybe add a timer and a time limit
 - maybe add other cows that if you click on these you lose, change color of target cow to something like orange
- Make the amount of time you give the user to click on the cow a random amount from 0.5 to 1 second

Summary

- Alice can be used to create simple 3D games
- Concepts covered
 - creating methods
 - creating a property (field)
 - creating a variable
 - using a while loop
 - creating a comment