

# Epidemiology Simulation

[Click to Start](#)

This simulation might be triggering to those feeling sensitive to people becoming sick and/or passing away.

How this tutorial will work: Every slide you will be given an **instruction** and up to 3 choices to choose

[Instructor? Click here for the cheat sheet](#)



**OK:** I Understood the instruction, finished the task and am ready to move on

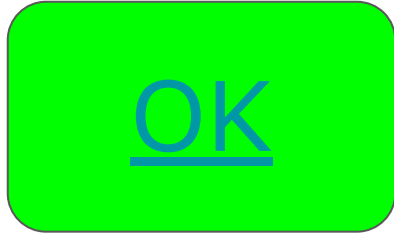
**How:** Give me a more in-depth explanation

**Show:** Take me to a project that has this code

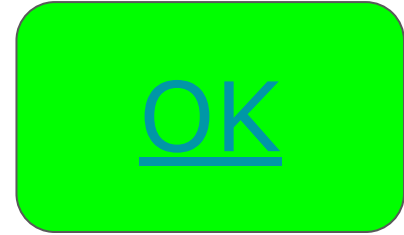


Takes you back to the previous slide

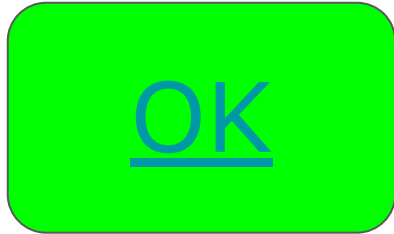
Setup Instruction 1: In the Google chrome browser,  
Go to [agentsheets.com](https://agentsheets.com) and make an account by  
clicking [sign up](#). **Click OK when done or How for  
more help.**



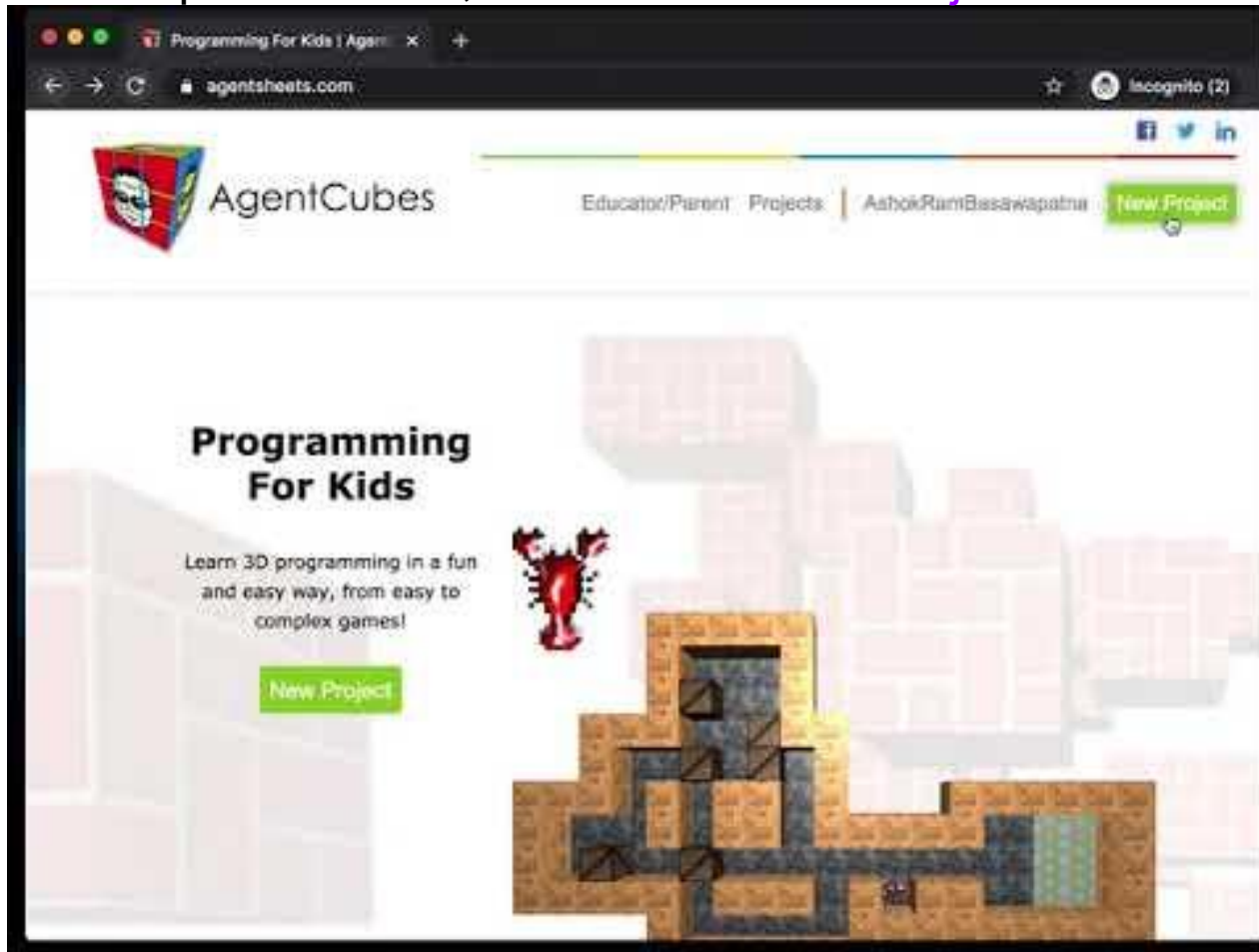
Click on the video to learn how to make an AgentSheets account



Instruction 2 & 3: Click on **New Project Button** at the top right of the agentsheets webpage, **name the project** something Disease Spread related, and click the **New Project Button**. **Click OK when done or How for more help.**



Instruction 2 & 3: Click on **New Project Button** at the top right, name the project something Disease Spread related, and click the **New Project Button**.



OK

# Introduction to the disease spread simulation

OK





# Summary

-We Will

1. Create a background
2. Create a 3D person: Healthy, Sick and Recovered
3. Move Randomly
4. If a healthy student is next to a sick person, they will get sick with some %
5. A sick person will become healthy with some % chance
6. A sick person will disappear with some % chance



OK

# Instruction 4: Create a background agent

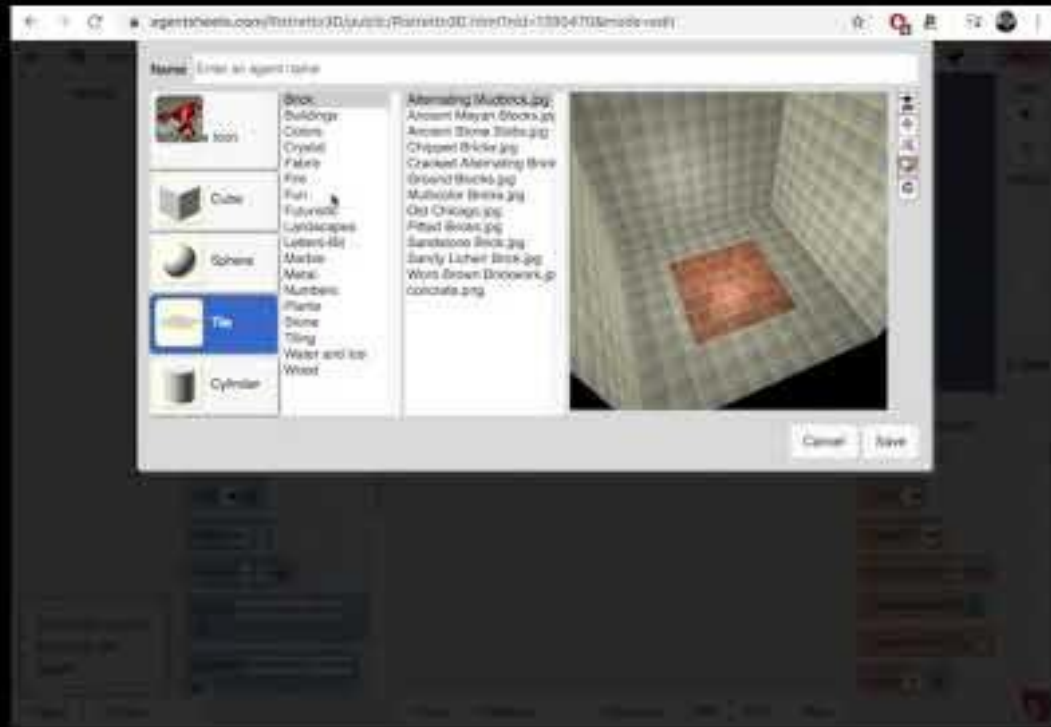
In bottom left

The screenshot shows a software interface for creating a background agent. The interface includes a 'Name' field containing 'background', a list of material categories, a list of material names with corresponding image thumbnails, a 3D preview window, and 'Cancel' and 'Save' buttons. Numbered callouts (1-6) indicate specific steps: 1 points to the '+ Agent' button in the bottom left; 2 points to the 'Tile' category in the material list; 3 points to the 'Name' field; 4 points to the 'Colors' category; 5 points to the 'gray-4.png' material thumbnail; and 6 points to the 'Save' button.

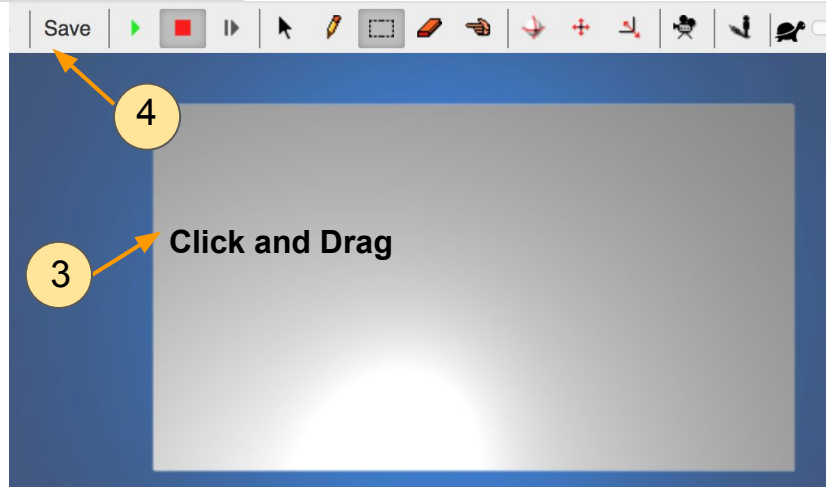
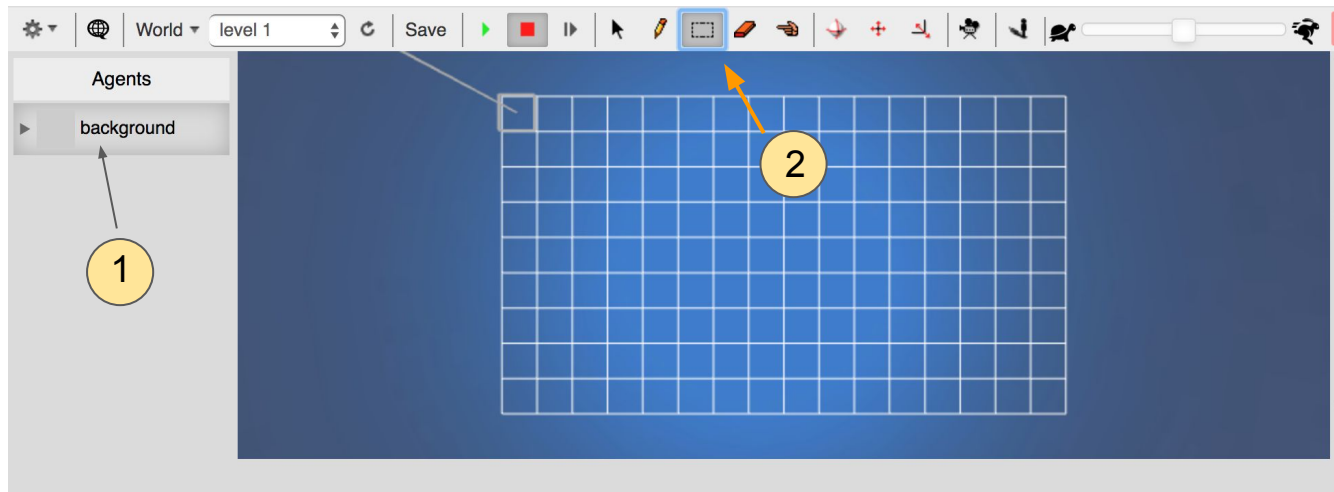
Inflatable Icon	Brick	blue-baby.png
Cube	Buildings	blue-sky.png
Sphere	Colors	gray-0 (black).png
Tile	Crystal	gray-1.png
Cylinder	Fabric	gray-2.png
	Fire	gray-3.png
	Fun	gray-4.png
	Futuristic	gray-5 (white).png
	Landscapes	green-dim.png
	Letters-Bit	green-olive.png
	Marble	orange-peel.png
	Metal	orange-plain.png
	Numbers	pink-pig.png
	Plants	purple-plain.png
	Stone	purple-velvet.png
	Tiling	red-plain.png
	Water and Ice	red-rich.png
	Wood	teal-plain.png
		teal-rich.png
		yellow-sun.png



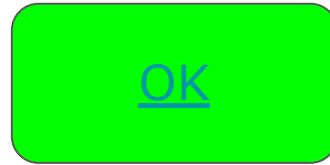
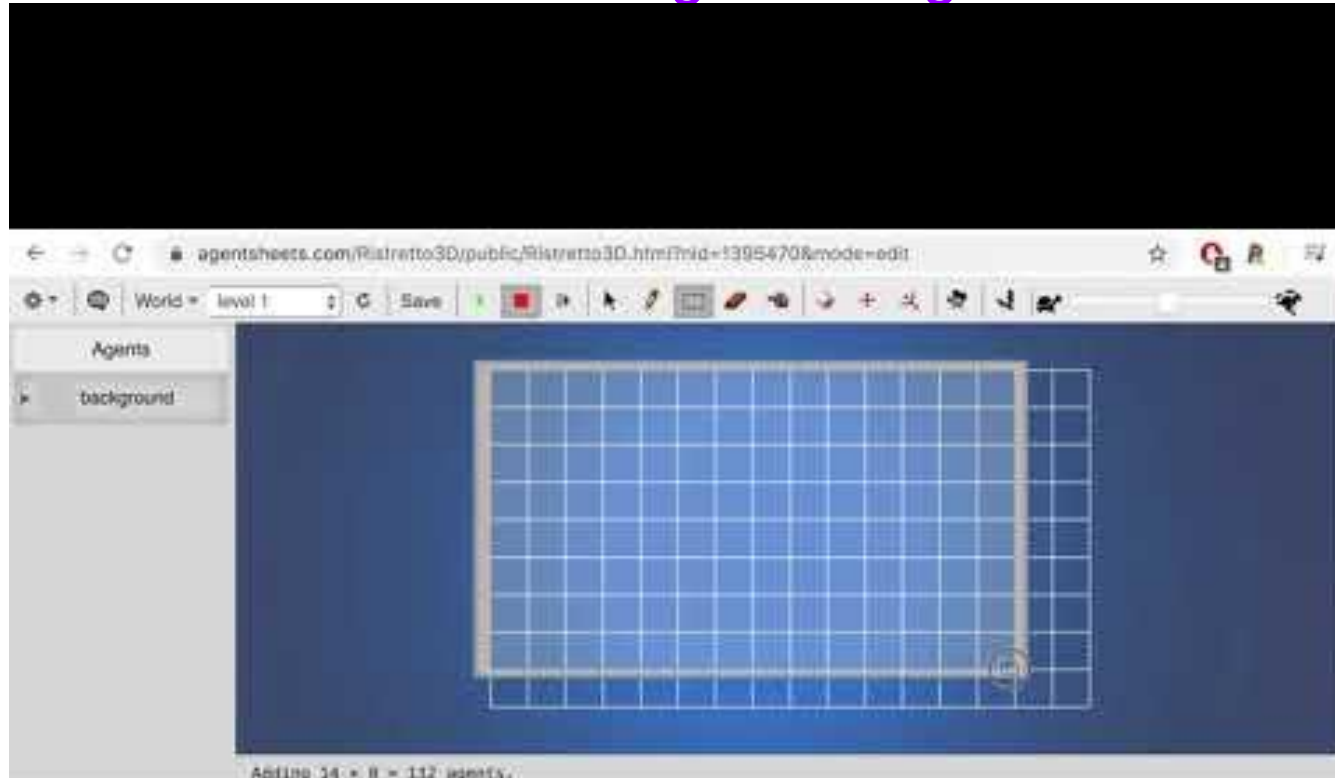
# Instruction 4: Create a background agent



# Instruction 5: Place the background agent in the world and save



# Instruction 5: Place the background agent in the world and save



# Instruction 6: Add a Human Agent

The interface shows a workflow for adding a human agent. It includes a '+ Agent' button (1), a category list (2) with 'Inflatable Icon' selected, a sub-category list (3) with 'People' selected, a character list (4) with 'girl' selected, a 3D preview window (6) showing a character, and a 'Name' field (5) containing 'human'. 'Cancel' and 'Save' buttons are at the bottom right.

1: + Agent

2: Inflatable Icon

3: People

4: Pick one

5: Name human

6: 3D Preview

Cancel Save

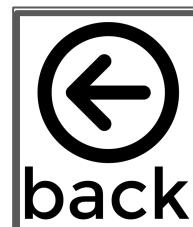
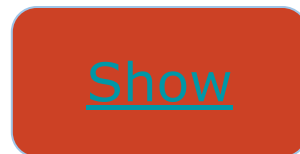
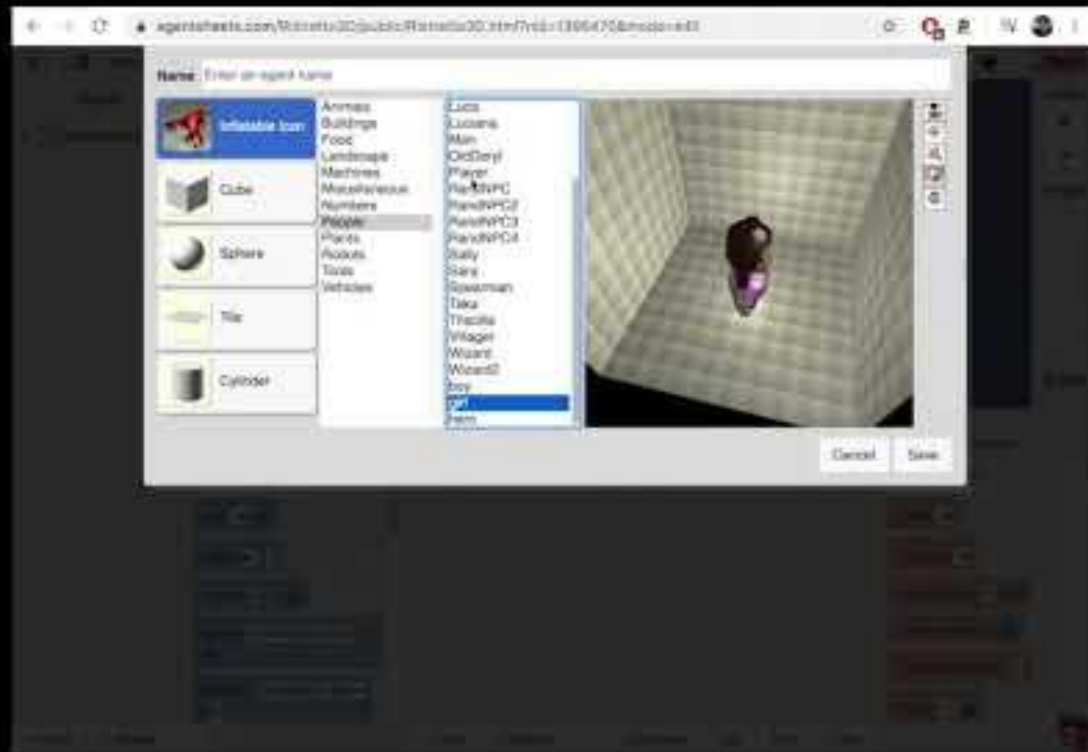
OK

How

Show

  
back

# Instruction 6: Add a Human Agent

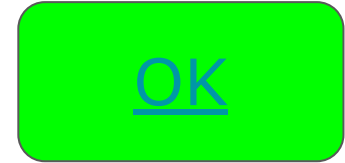
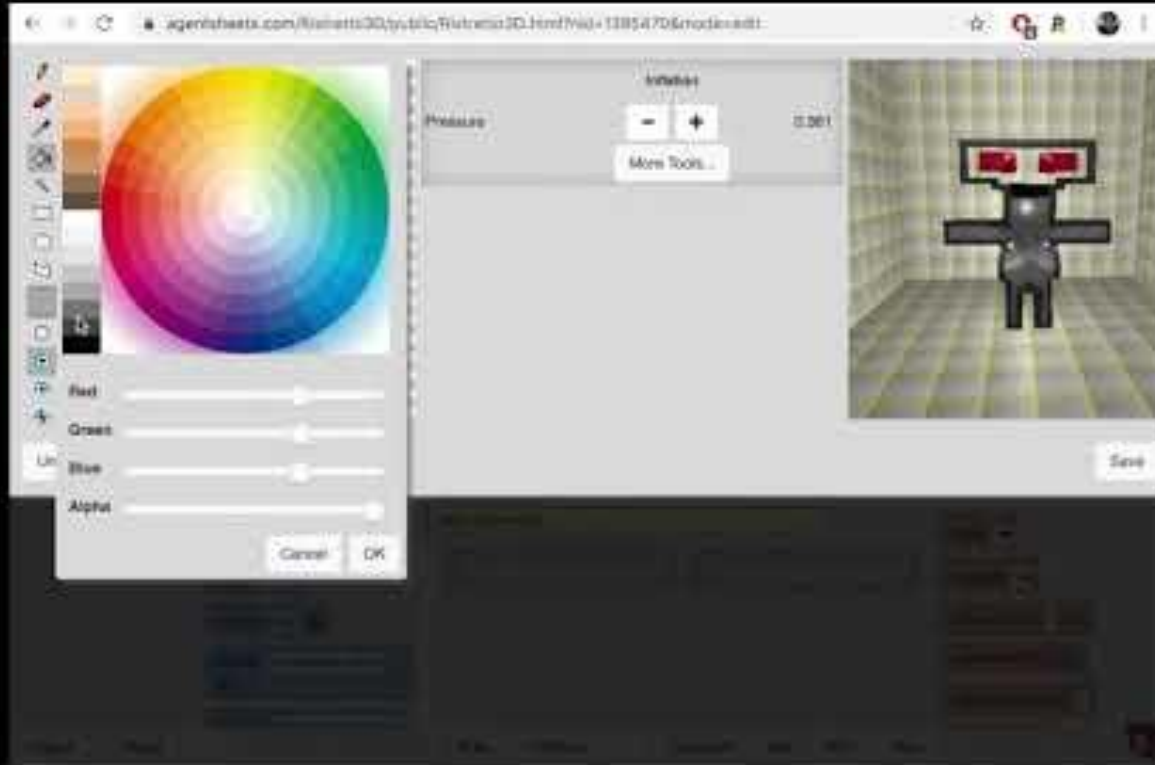


# Instruction 7: **Optional-** draw your own 3D human agent

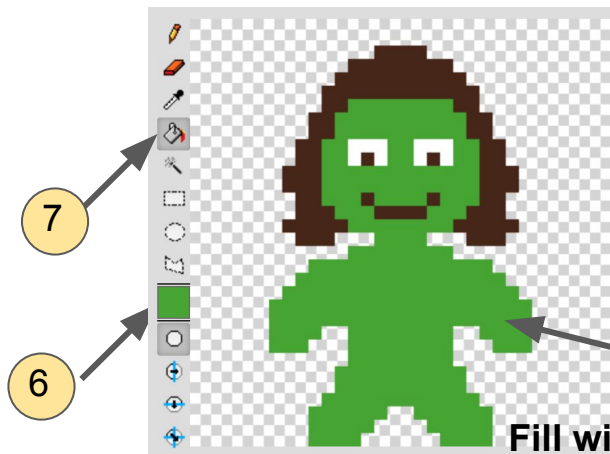
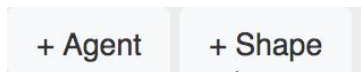
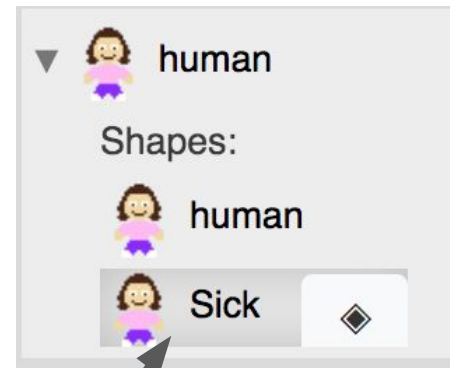
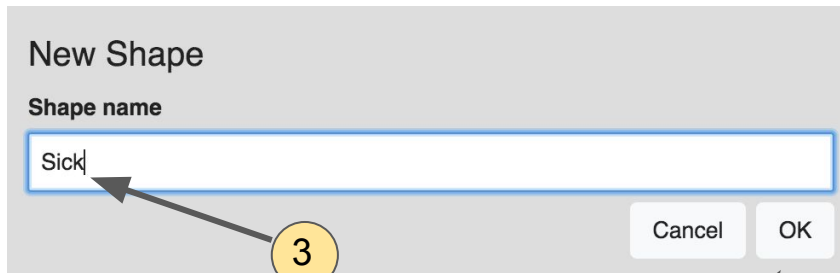
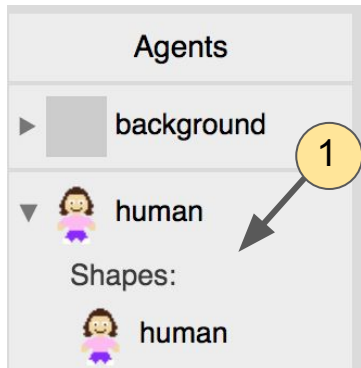
The image displays a software interface for creating a 3D human agent. On the left, a panel titled "Agents" contains two entries: "background" and "human". An arrow labeled "Double Click" points to the "human" entry. Below this, a 2D drawing of a human agent is shown on a transparent background. A toolbar on the left side of the drawing area includes various tools: Erase, Fill, Selection tools, and Mirror Tools. An arrow labeled "Pencil" points to the Pencil tool in the toolbar. To the right of the drawing area, a control panel shows "Inflation" settings with "Pressure" set to 0.361 and buttons for "-" and "+", along with a "More Tools..." button. On the far right, a 3D rendered view of the agent is shown in a wireframe environment. Above the 3D view, there are two buttons: a green "OK" button and an orange "How" button. To the right of these buttons is a "back" button with a circular arrow icon.



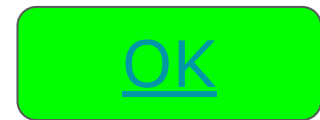
# Instruction 7: Optional- draw your own 3D human agent



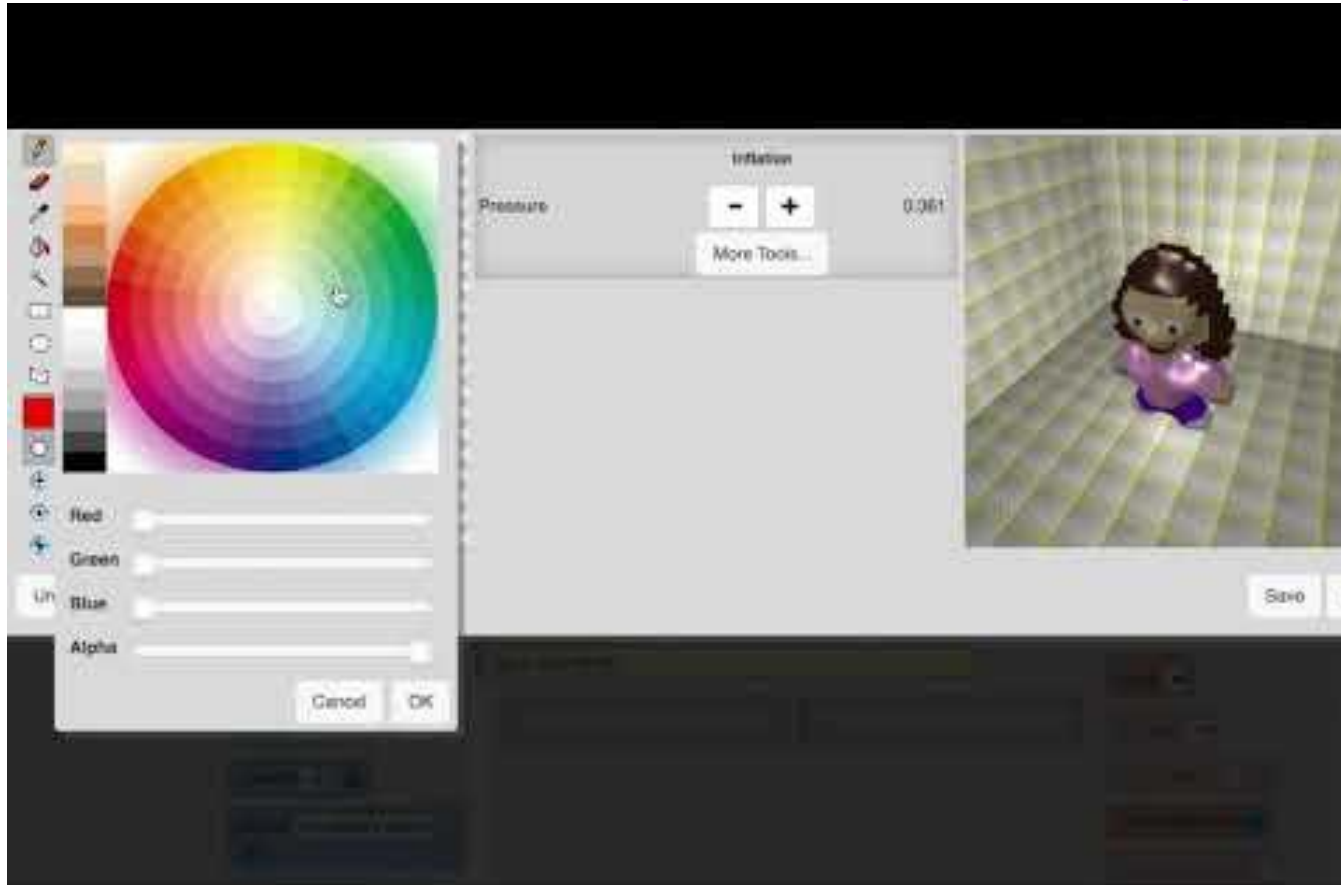
# Instruction 8: Create a sick human Shape



Double click



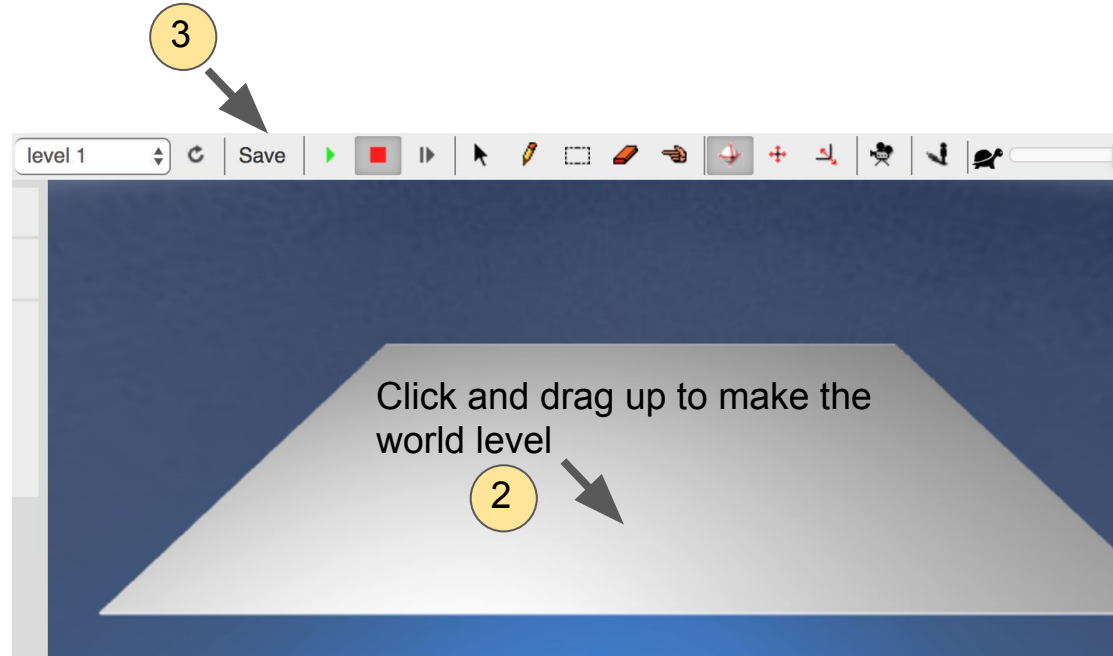
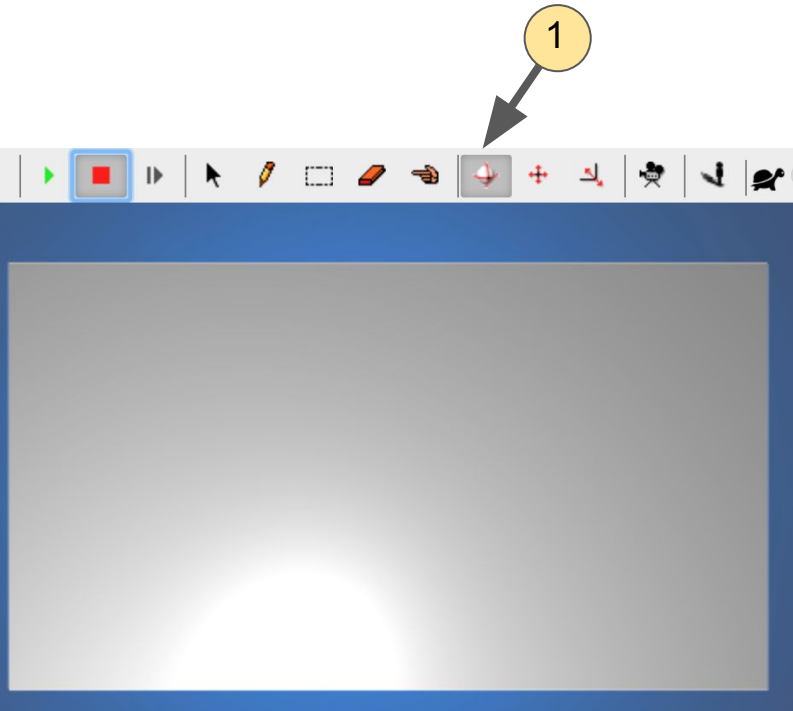
# Instruction 8: Create a sick human Shape



OK

Show

# Instruction 9: Rotate the world and save

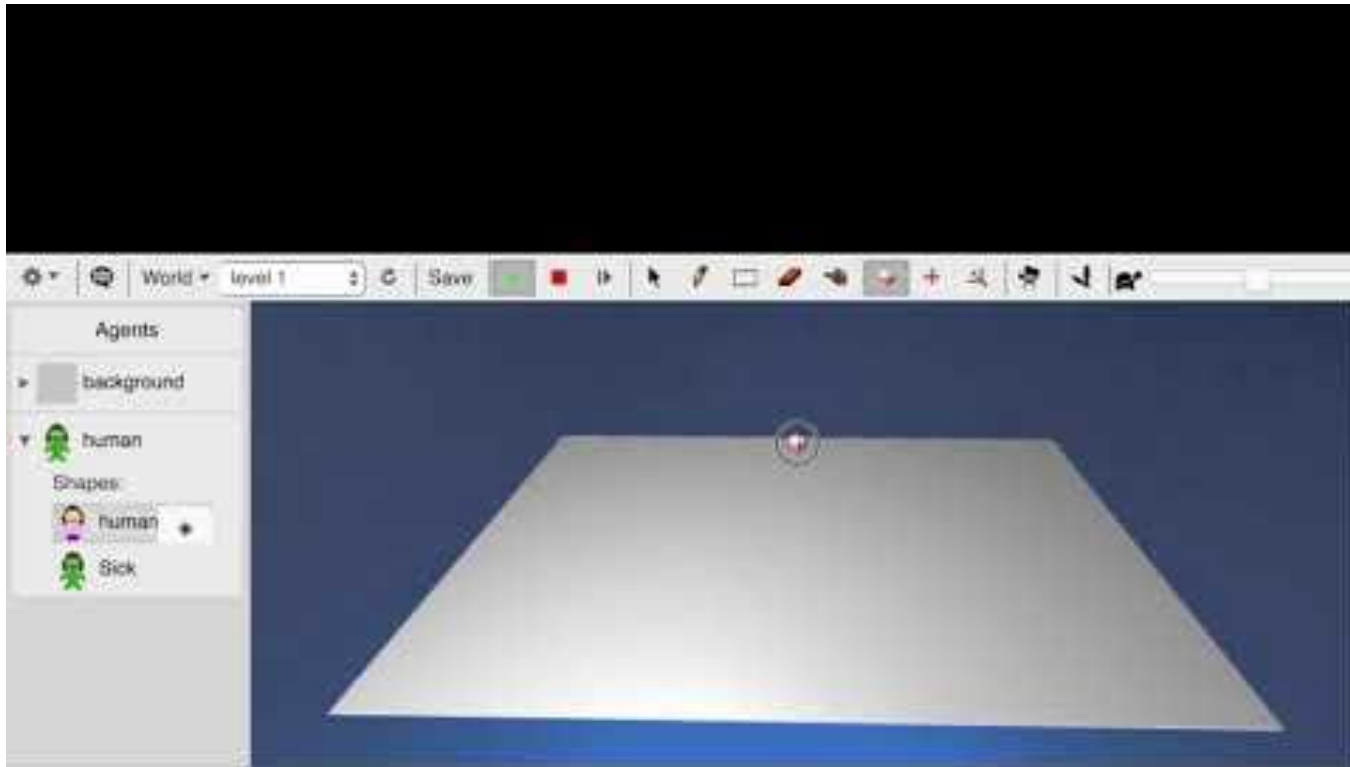


[OK](#)

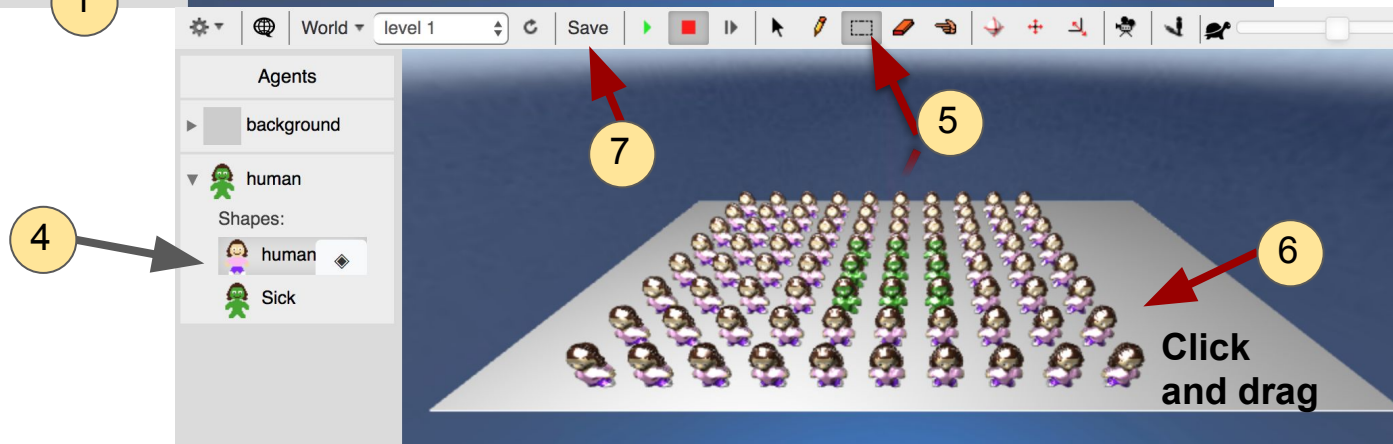
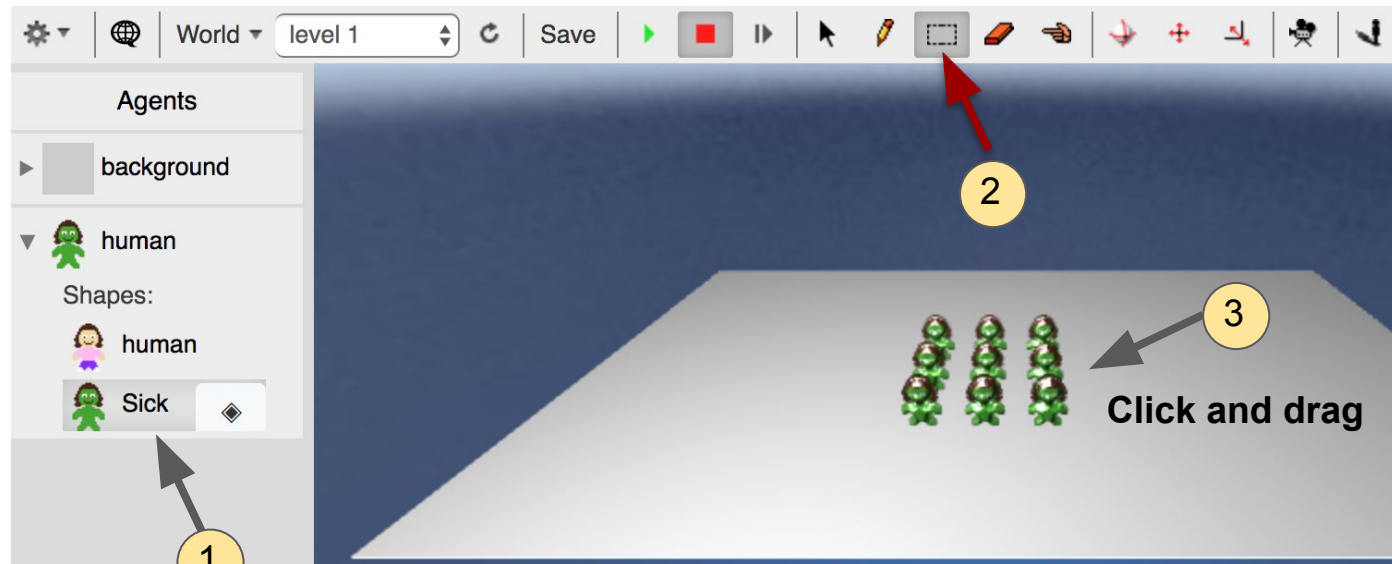
[How](#)



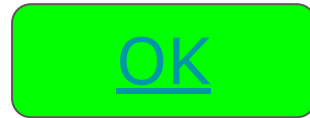
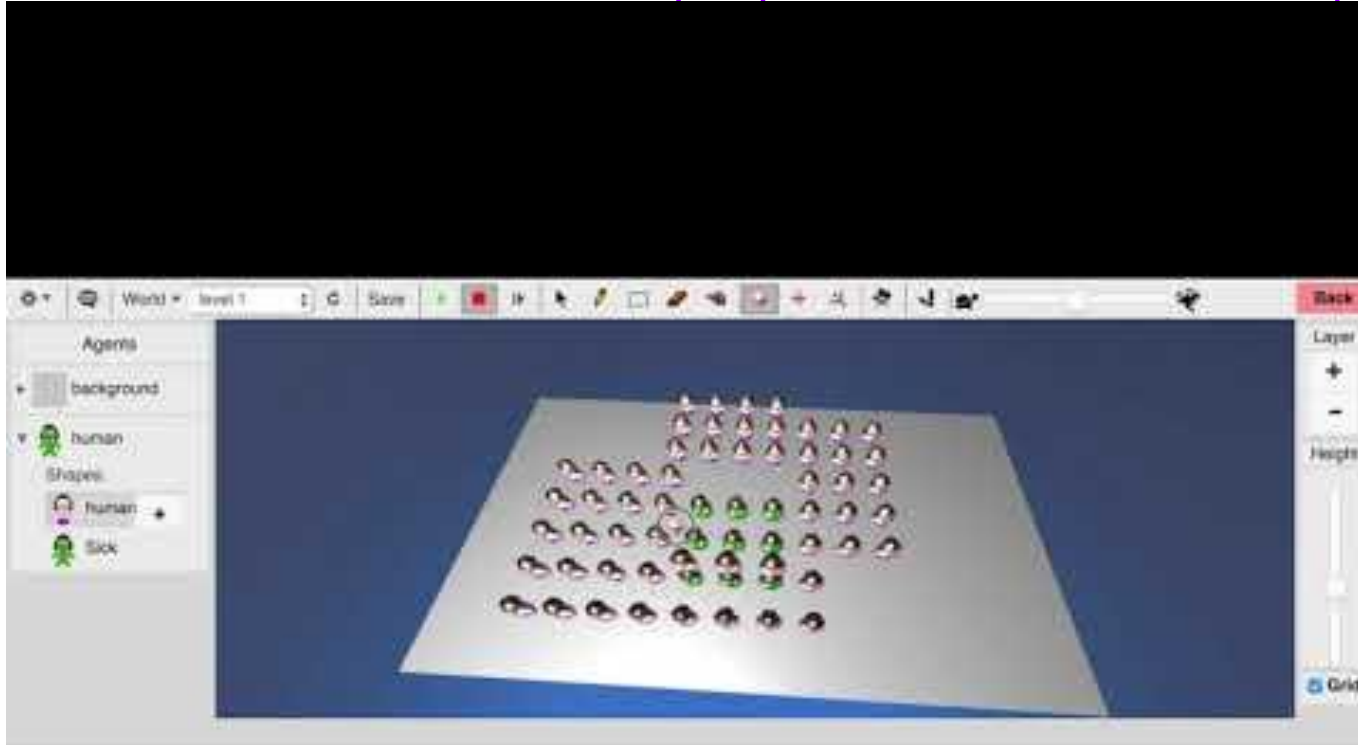
# Instruction 9: Rotate the world and save



# Instruction 10: Add a few sick people and a bunch of healthy people to the level



Instruction 10: Add a few sick people and a bunch of healthy people to the level



# How we program our agents in agentcubes

The screenshot displays the AgentCubes software interface. At the top, a toolbar includes icons for file operations (Save, Print, Undo, Redo) and a 'Back' button. Below the toolbar is a 3D environment window showing a grey ground plane and a dark blue sky. A small human agent is visible on the ground. To the left of the 3D view is a panel titled 'Agents' containing 'background' and 'human' entries. To the right is a 'Height' slider and a 'Grid' checkbox.

The bottom half of the interface is a behavior programming workspace. It features three main sections: 'Conditions', 'Behavior human', and 'Actions'.  
- The 'Conditions' section on the left contains several blue blocks: 'stacked > immediately above', 'empty', 'once every 0.5 sec', 'is selected', and 'power change 50'.  
- The 'Behavior human' section in the center contains a 'while running' block, a yellow 'your comments' block, and a 'once every 0.5 sec' block. A green arrow points from the 'once every 0.5 sec' block to the 'your comments' block.  
- The 'Actions' section on the right contains a 'basic actions' category with several orange blocks: 'move', 'stop', 'stop random', 'move random', 'move random', and 'move random'. A green arrow points from the 'your comments' block to the 'move' block.

At the bottom of the workspace, there is a toolbar with buttons for '+ Agent', '+ Shape', '+ Rule', '+ Method', 'Duplicate', 'Text', 'NOT', and 'Help with move (action)'. A small red shield icon is visible in the bottom right corner.



# Instruction 11: Programming the human agent to move random on the background every 0.5 seconds

OK

How

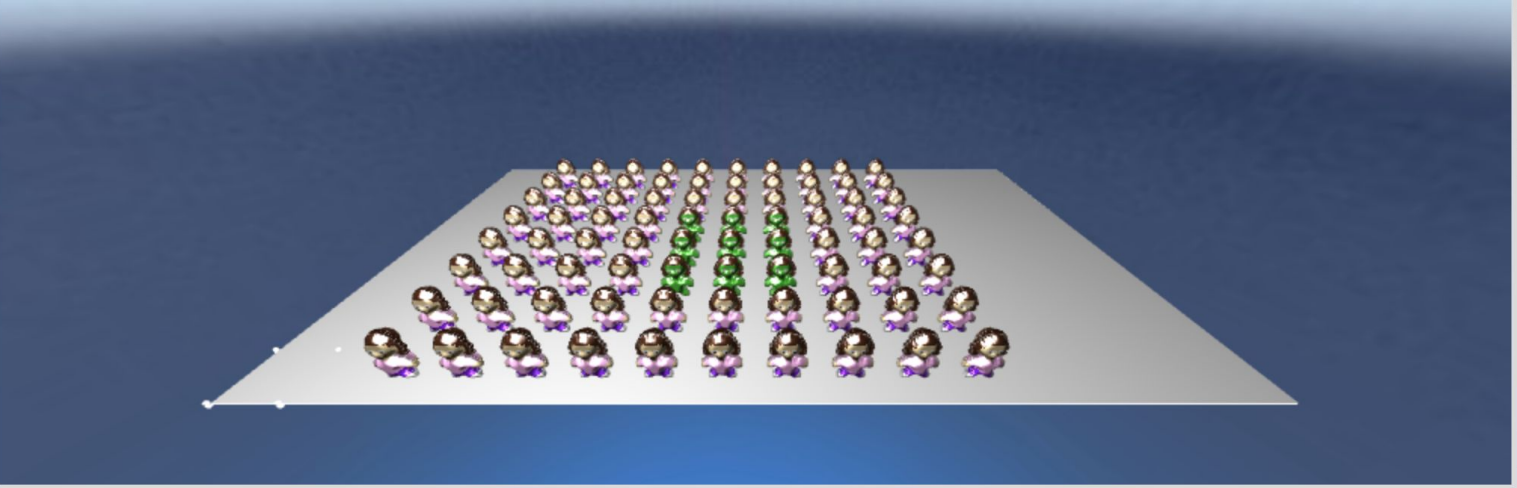
Show



Agents

- background
- human

1



Layer

+  
-

Height

Grid

Conditions

- stacked immediately above
- stacked-a immediately above
- empty
- once-every 0.5 sec

Behavior: human

while-running

your comments

if once-every 0.5 sec

then

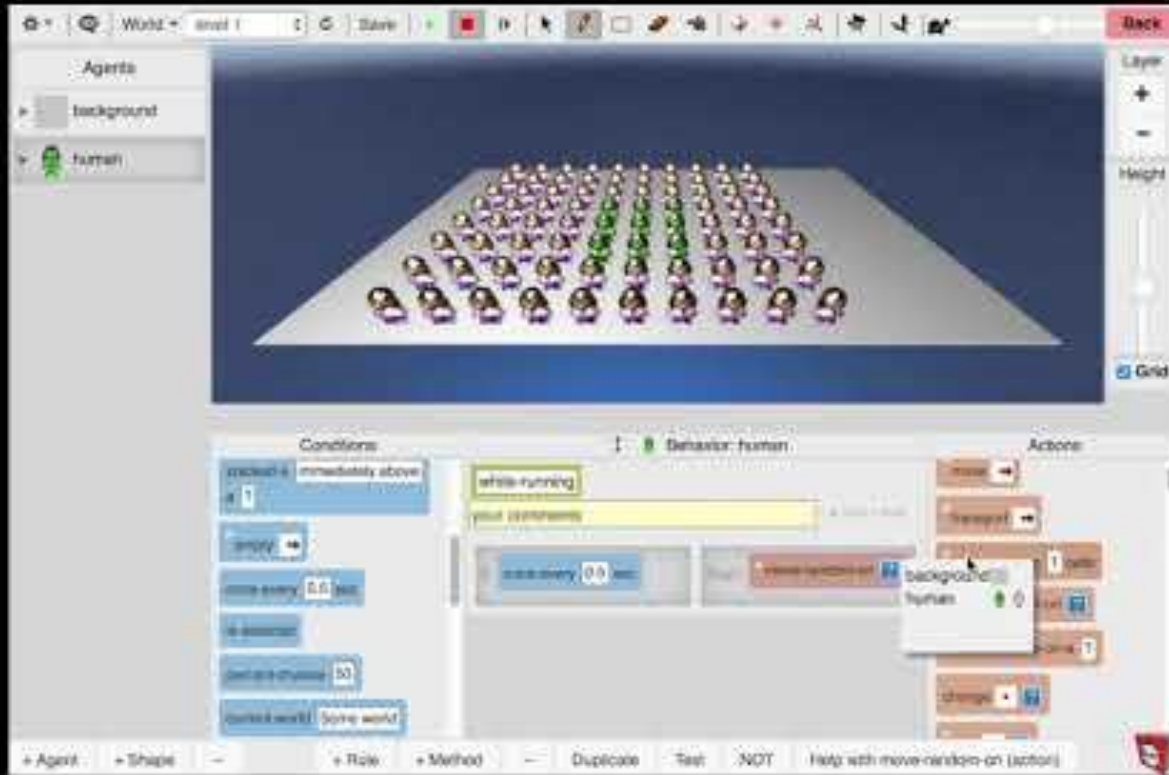
- move-random-on background human background

Actions

- move
- transport
- move-random 1 cells
- move-random-on
- move-random-on-a

2

3



Instruction 11:  
Programming the  
human agent to move  
random on the  
background every 0.5  
seconds

OK

Show



# Methods in AgentCubes

Methods (also called functions) allow us to organize a rule or group of rules in one place

We will add the following methods to our person agent

A Method Called **Get Sick**



PEOPLE GET SiCK

A Method Called **Recover**

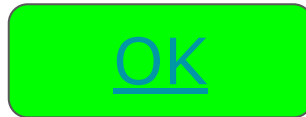


SiCK PEOPLE RECOVER

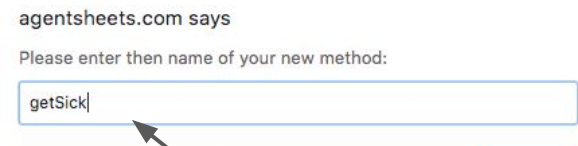
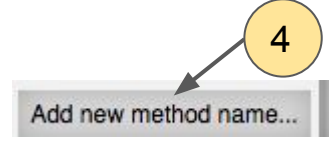
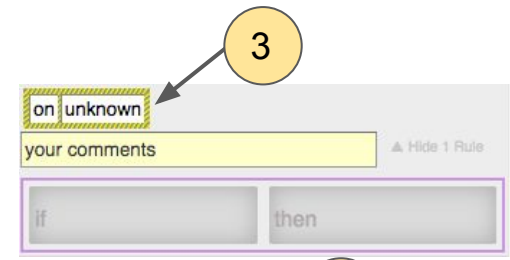
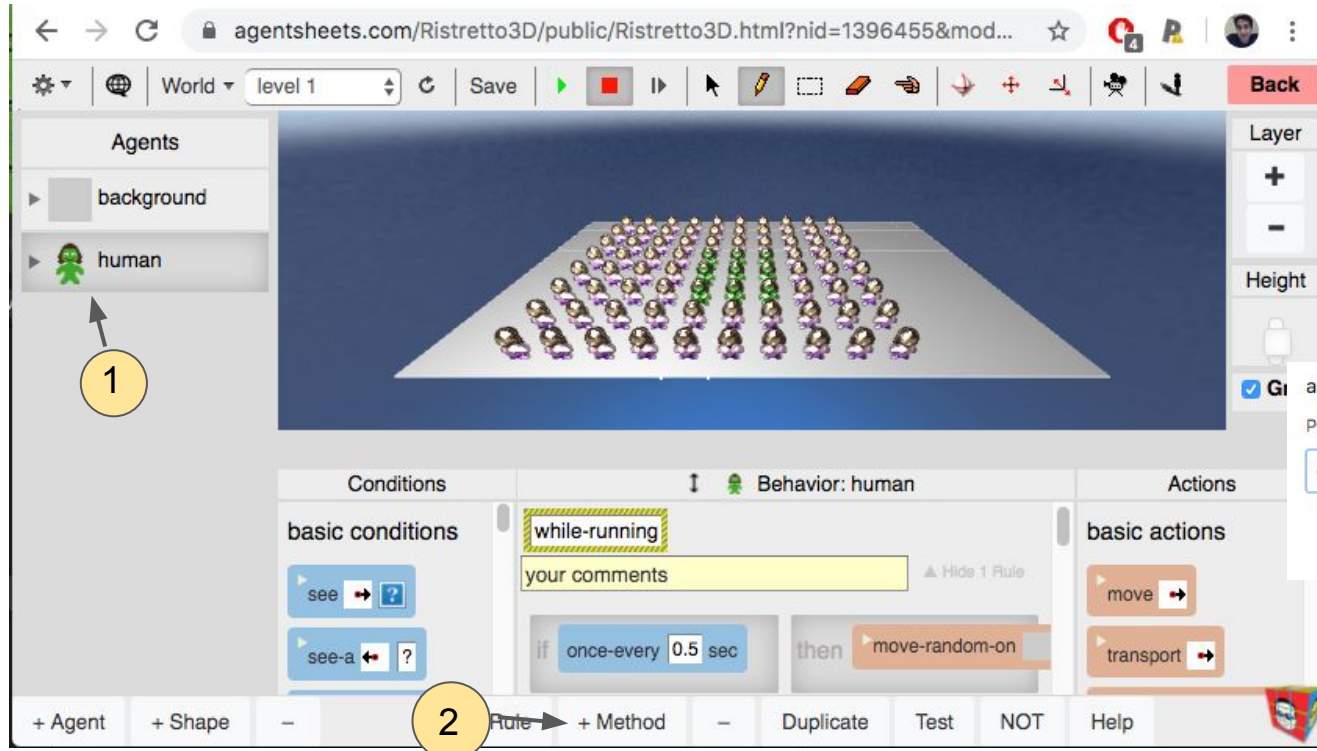
A Method Called **Erase**



SiCK PEOPLE DiSAPPEAR



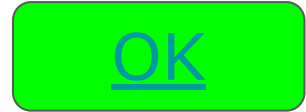
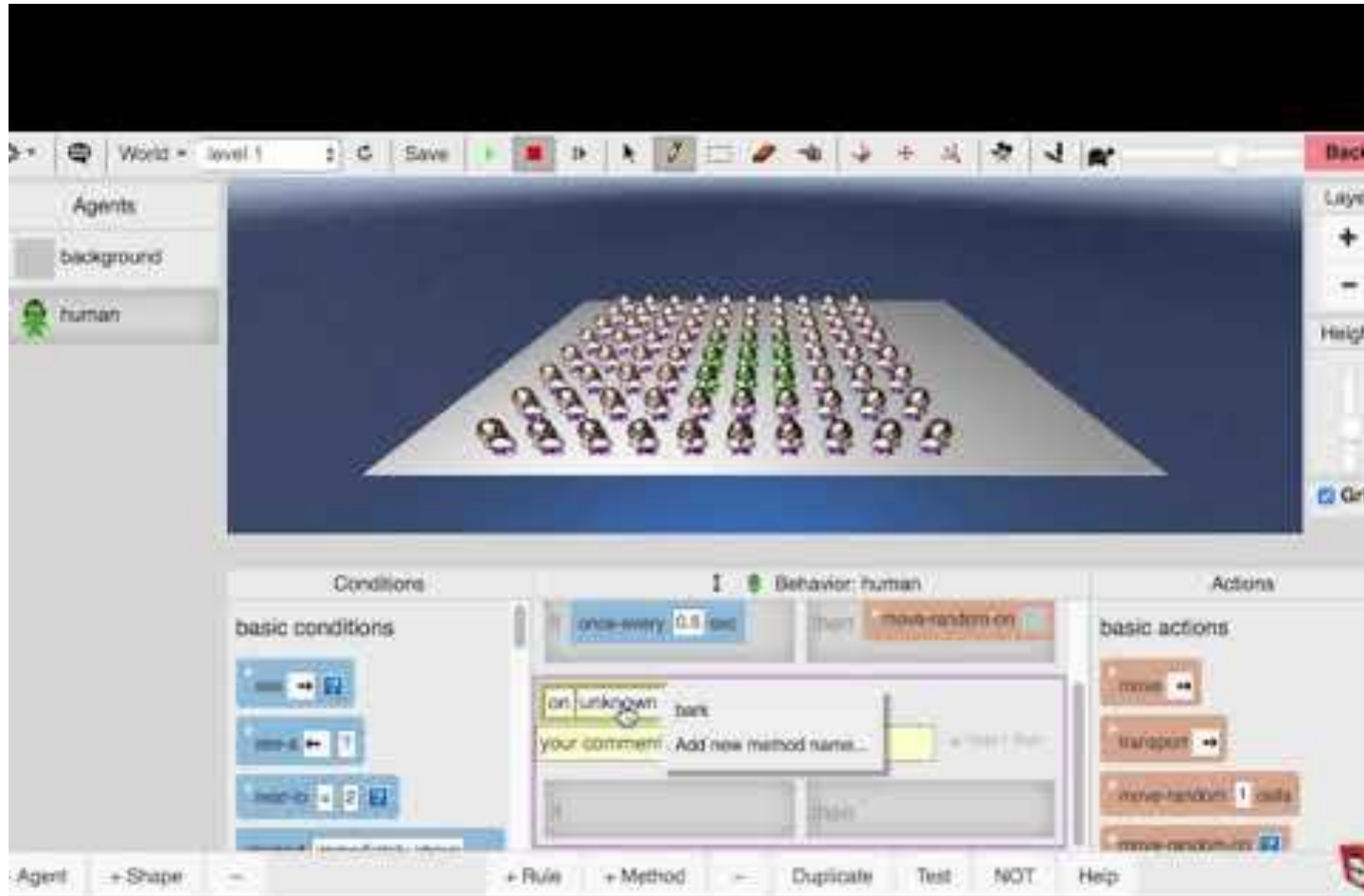
# Instruction 12: Add a 3 methods to your project: 1 named “getSick” one named “recover” and one named “erase”



7 Repeat 1-6 for recover and erase



Instruction 12: Add a 3 methods to your project: 1 named “getSick” one named “recover” and one named “erase”



Instruction 13: Program the following rule in the getsick method: *If I see myself as healthy and am next to at least 1 sick person, with some % chance I get sick*

IF I see myself as healthy

In the getsick method

your comments ▲ Hide 1 Rule

if

- see [red dot] [person icon]
- next-to [>=] [1] [green person icon]
- percent-chance [50]

then

- change [red dot] [green person icon]

AND I'm next to one or more sick person

Then I change into a sick person

AND with a 50% chance



Instruction 13: Program the following rule in the getSick method: *If I see myself as healthy and am next to at least 1 sick person, with some % chance I get sick*





# Instruction 14: Invoke the getSick method from the **while running** method

Methods must be *invoked* for their code to run.

The **while-running method** is a special method that runs many times a second after you hit the play button. Currently it has a rule that moves the person agent randomly every .5 seconds

while-running

your comments

if once-every 0.5 sec then move-random-on

We can update the while-running method as follows to invoke the getSick method

while-running

your comments

if once-every 0.5 sec then move-random-on message getSick

[OK](#)

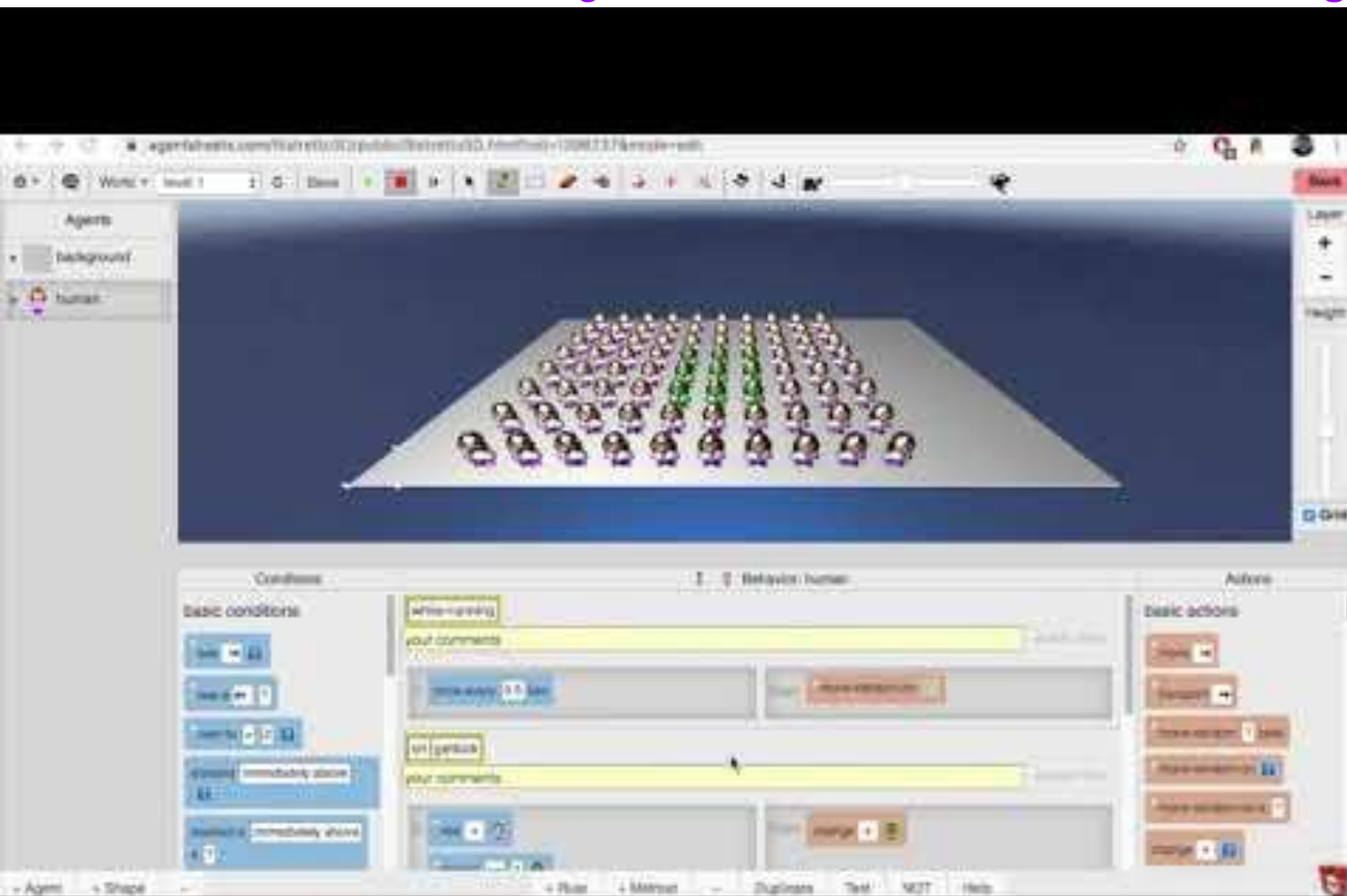
[How](#)

[Show](#)

[←](#)  
back



## Instruction 14: Invoke the getSick method from the **while running** method



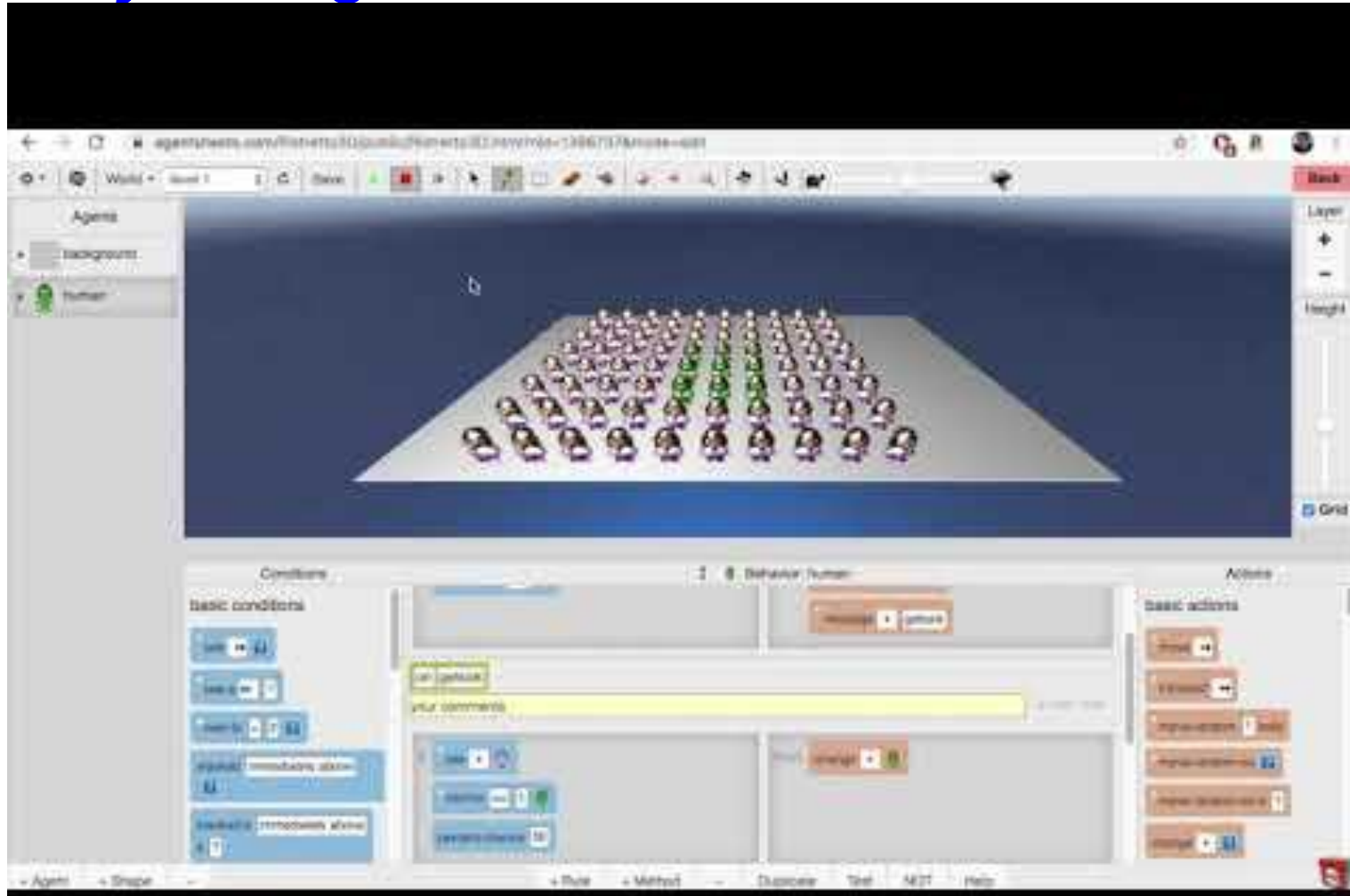
The screenshot displays the NetLogo environment. At the top, a browser address bar shows the URL: `agenfabrics.com/files/retro02/public/retro02.00.html?city=(206,137)&mode=edit`. The main window shows a 3D perspective view of a large number of human agents arranged in a grid on a flat surface. The agents are represented by small 3D models with heads and bodies. The interface includes a top toolbar with various icons for navigation and editing. On the left, there is an 'Agents' panel with a 'human' agent selected. Below the 3D view, there is a 'Behavior Editor' for the 'human' breed. The editor is divided into three sections: 'Basic conditions', 'Behavior', and 'Basic actions'. The 'Behavior' section is currently active, showing a sequence of methods: 'when green flag clicked', 'your comments', 'while running', 'getSick', 'your comments', and 'when green flag clicked'. The 'while running' block is highlighted in yellow, and the 'getSick' block is also highlighted in yellow. The 'Basic actions' section on the right contains several blocks, including 'show', 'show agent', 'show environment', and 'change'. The bottom of the screen shows the standard Mac OS X menu bar with 'Apple', 'Shape', 'File', 'Edit', 'Display', 'Text', 'NET', and 'Help' menus.

OK

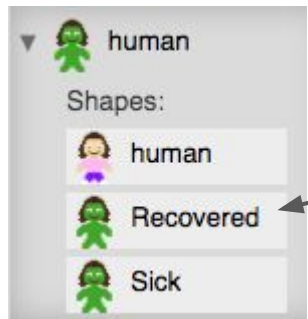
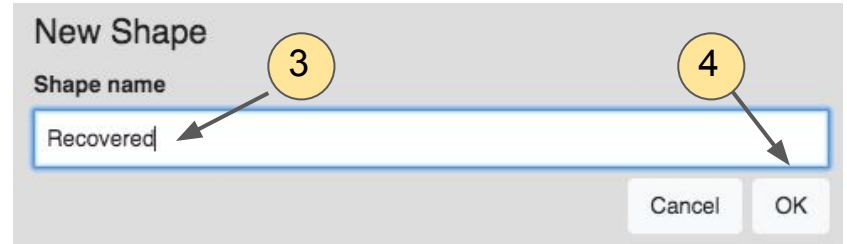
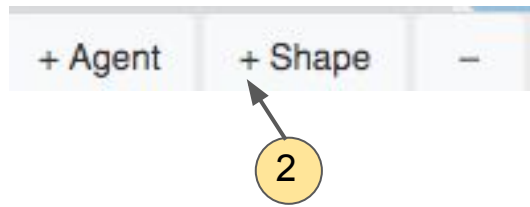
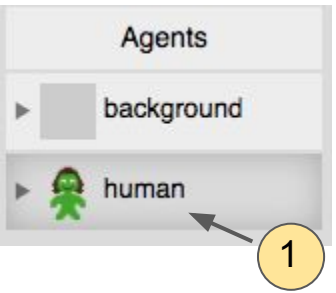
Show

  
back

# Playtesting

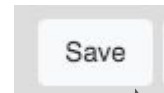
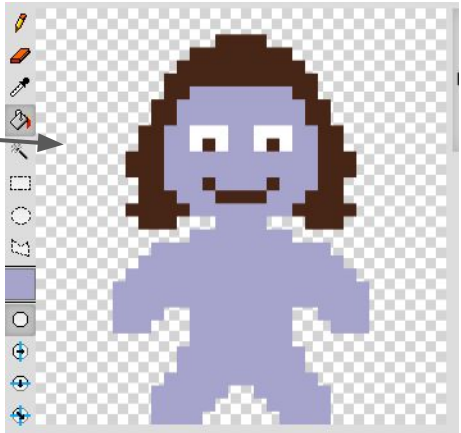


# Instruction 15: Create a recovered human shape that looks different from the other shapes



Double click


Make it unique





Instruction 16: Program a rule in the recover method that says *If I see myself as sick, with a 50% percent chance, I change to recovered*, and invoke the recover method in the while-running method

In the **recover** method



IF I see myself as sick

AND with a 50% chance

Then change myself to recovered

In the **while-running** method



Invoke the Recover method



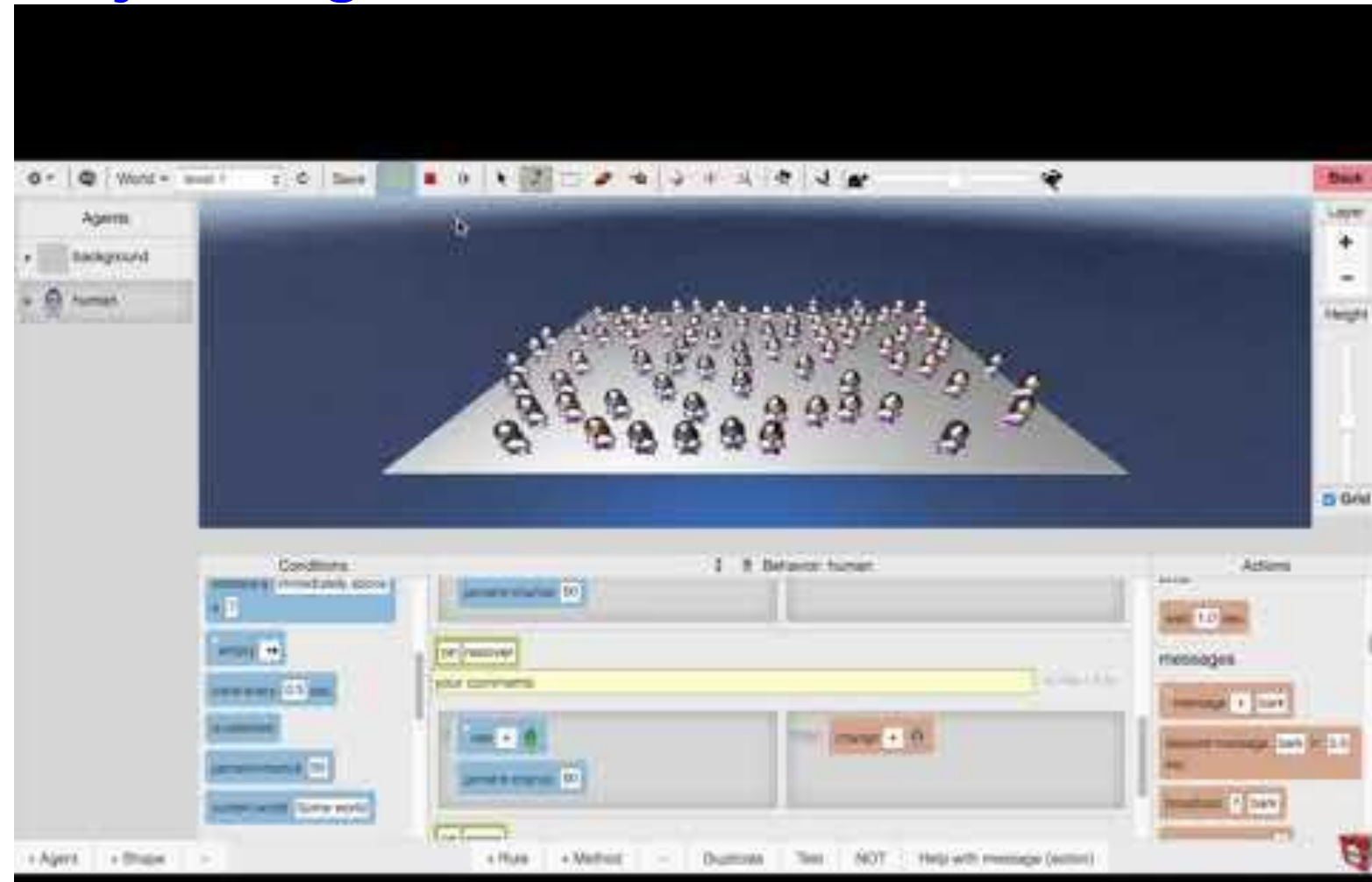
Instruction 16: Program a rule in the recover method that says: *If I see myself as sick, with a 50% percent chance, I change to recovered*



The screenshot shows the NetLogo interface. At the top, the browser address bar displays 'agents4eas.com/NetLogo3D/club90/NetLogo3D.html?uid=139075&mode=edit'. The main window shows a 3D perspective view of a large group of small human-like agents on a flat grey ground. A central column of agents is highlighted in green. On the left, a panel lists 'Agents' with 'background' and 'human' selected. Below the 3D view is the 'Behavior editor' for the 'human' agent. It features a 'Conditions' column on the left with a blue block 'is-sick?' and a '50%' probability slider. The main workspace contains a yellow 'when clicked' block followed by a 'comment' block. Below the comment block, there are two columns: the left column contains 'ask self', 'ask self', and 'set self health'; the right column contains an 'change' block with a green arrow icon. On the right side of the editor, an 'Actions' column contains several orange blocks, including 'show message', 'show message', 'show message', 'show', 'show', and 'show'. At the bottom, a status bar shows 'x: 75.6', 'y: 84.6', and other interface elements.



# Playtesting



OK





Instruction 17: Program a rule in the erase method that says *If I see myself as sick, with a 50% percent chance, I erases myself, and invoke the erase method in the while-running method*

IF I see myself as sick

And with a 50% chance

**on erase** ← In the erase method

your comments ▲ Hide 1 Rule

if see [self] sick percent-chance 50

then erase [self] ← Then erase myself



**while-running**

your comments ▲ Hide 1 Rule

if once-every 0.5 sec

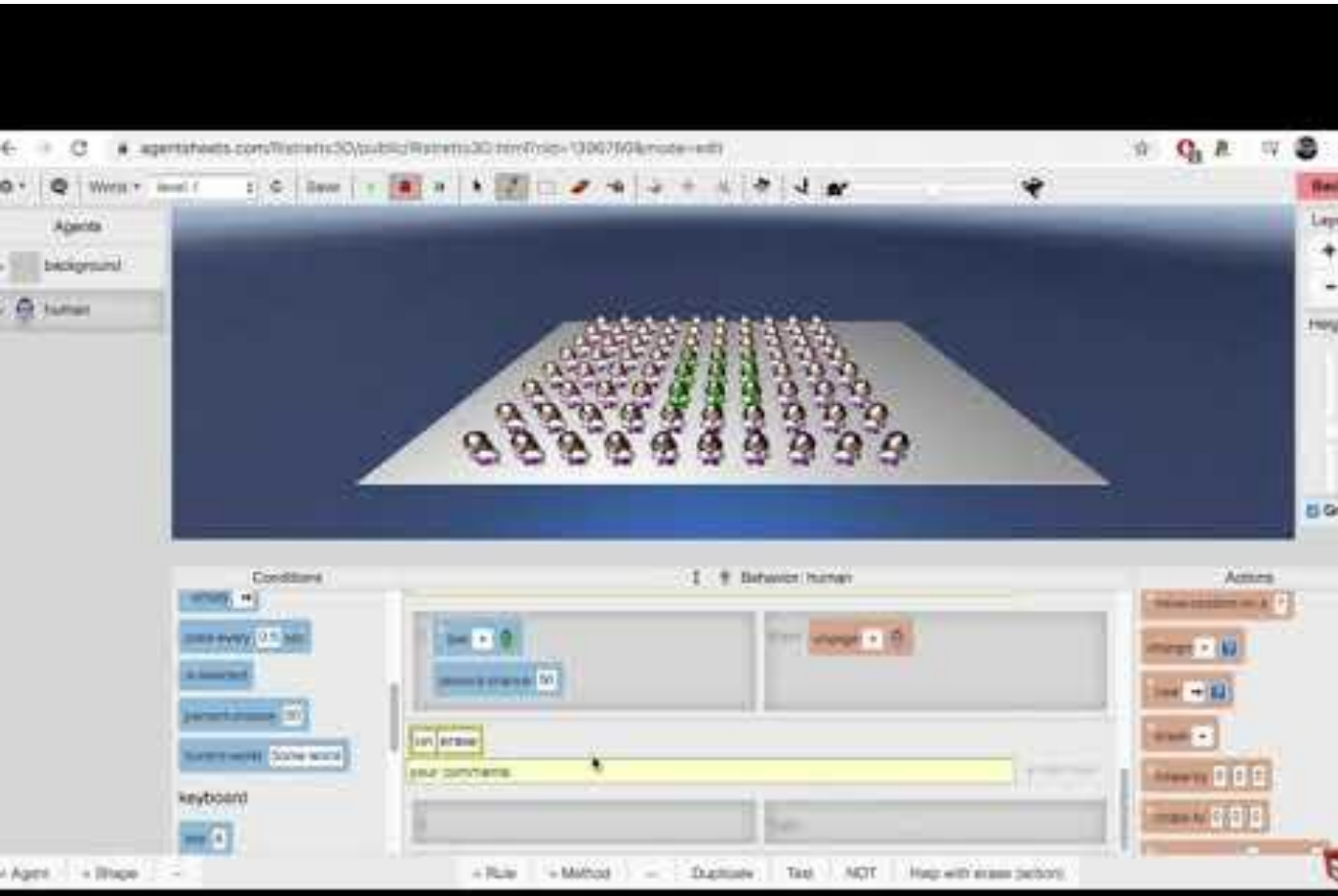
then move-random-on message [self] getsick message [self] recover message [self] erase

Invoke the erase method

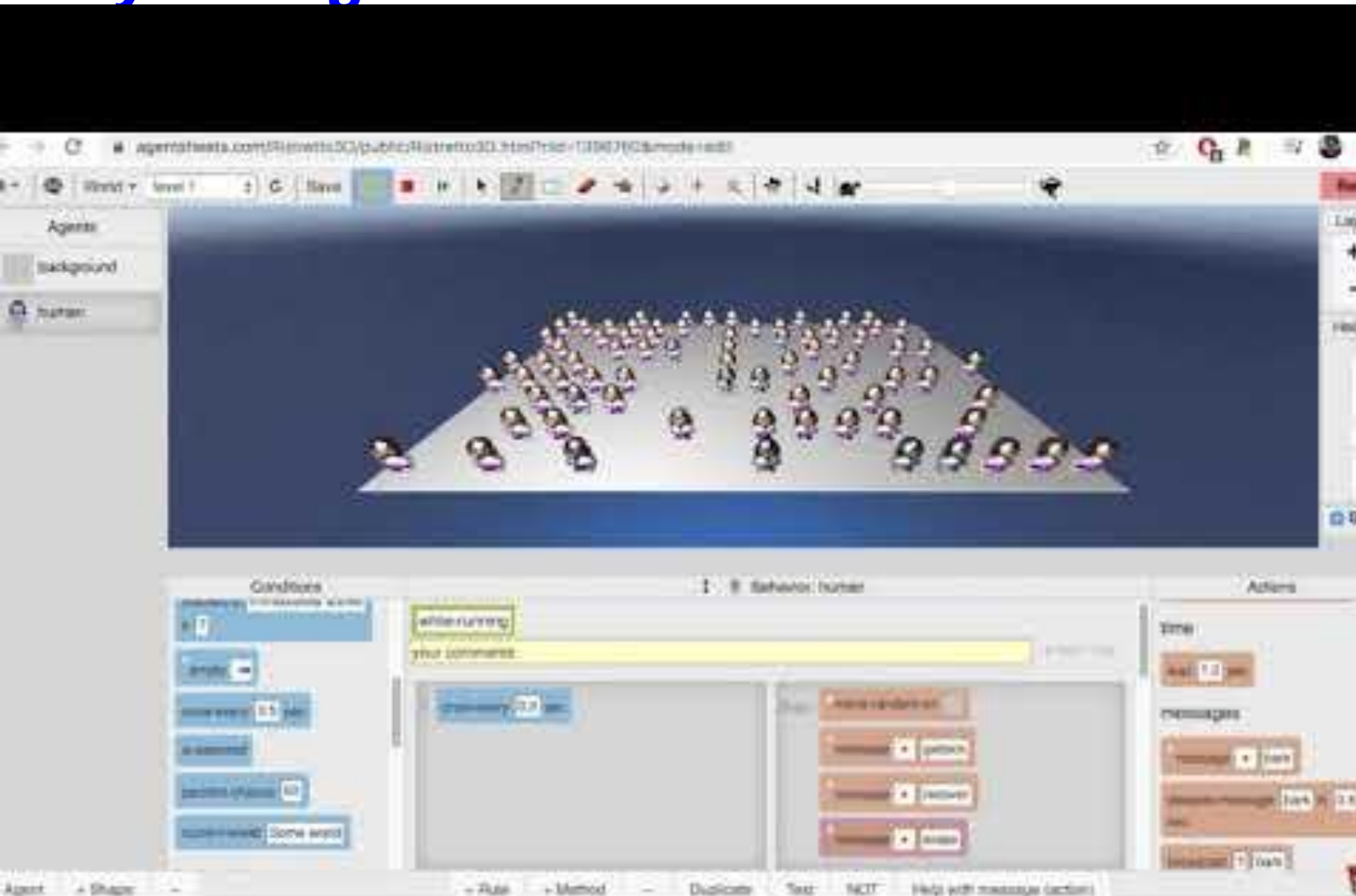




Instruction 17: Program a rule in the erase method that says *If I see myself as sick, with a 50% percent chance, I erases myself, and invoke the erase method in the while-running method*



# Playtesting



OK

# Instruction 18:FINAL STEP: Follow the video to Create an Agent to plot the populations of sick, healthy and recovered

The screenshot displays the NetLogo interface for a simulation. At the top, a red error message box reads: "The Counter agent's behavior patch is not completed. Click on the window to see changes." Below this, a large number of human-shaped agents are arranged in a grid on a light gray floor. The agents are color-coded: most are grey (Human), some are green (Recovered), and a few are red (Sick). The interface includes a left sidebar with an "Agents" panel showing "12 Counter" and "Human" agents, and a "Shapes" panel with icons for "Human", "Recovered", and "Sick". The main workspace is divided into three sections: "Conditions" on the left, "Behavior: Counter" in the center, and "Actions" on the right. The "Behavior: Counter" patch contains several blocks: "when green flag clicked" followed by "set counter 0.0", "clear all", "ask agents of type Human" followed by "set plot", "ask everyone" followed by "set plot", "ask everyone" followed by "set plot", and "ask everyone" followed by "set plot". The "Actions" panel contains several blocks: "ask counter" followed by "set plot", "ask counter" followed by "set plot", "ask counter" followed by "set plot", "ask counter" followed by "set plot", and "ask counter" followed by "set plot".

OK

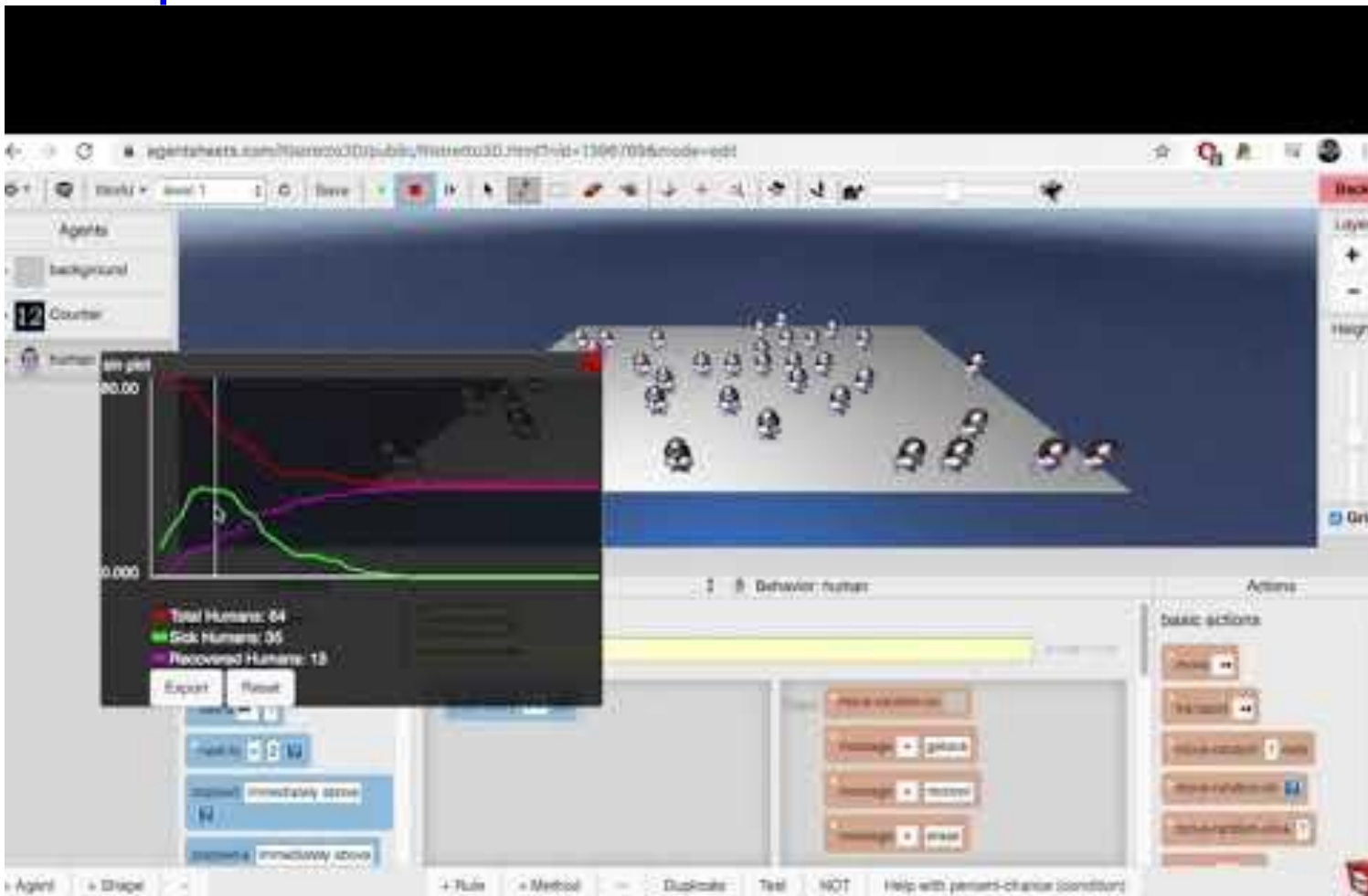
Show

Experiment 1: What do you think would happen if you decrease recover percent and decrease erase percent to 10% and run the simulation? Was your prediction correct?

OK



# Experiment 1:



OK

back

Experiment 2: What if we increase the erase percent to 90%, what would you think would happen as compared to experiment 1?

OK





# Experiment 3: A Quarantine Experiment

The screenshot displays a NetLogo simulation environment. The main window shows a 3D perspective view of a virtual world with a grey floor and blue walls. A large group of small, stylized human figures is arranged in a grid. Some figures are colored green, while others are purple or pink. A blue path or lane is visible on the right side of the grid.

On the left side, there is a panel titled "Agents" with a list of objects: "background", "Counter" (with a value of 12), and "human".

At the bottom left, a data panel displays the following statistics:

- Total Humans: 79
- Sick Humans: 4
- Recovered Humans: 0

Below the data panel are "Export" and "Reset" buttons.

The bottom right area shows a "Behavior: human" block with a yellow progress bar and a "basic actions" panel containing several buttons: "move", "change", "spread", "recover", and "die".

The browser address bar at the top shows the URL: `agentstests.com/files/netlogo3D/public/files/netlogo.html?view=1386760&mode=edit`