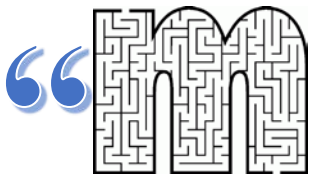
Creating "Maze Craze"



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It was created using ideas from and portions of prior work completed by
Fred Gluck.

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Vocabulary/Definitions

Action .....the requested behavior of an agent if the conditions are true

Agent .....a character in the game

Array .....a rectangular arrangement of agents

Collision .....the situation when two agents physically collide.

Condition .....the situation that must be 'true' for an action to occur

Depiction.....an image of the agent.

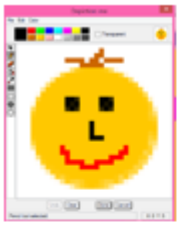
Student Handout 1B:

Basic Game

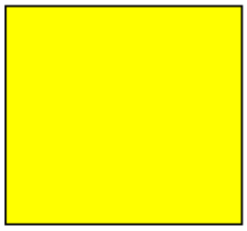
Initial Story: *The traveler will walk around on the ground surrounded by walls. The object of the game is to move next to the goal without moving next to one of the Chaser agents. If you reach the goal, the game ends happily. If you move next to an Chaser agent or vice versa before reaching the goal, the game ends unhappily.*

Create these Agents:

Me



Floor

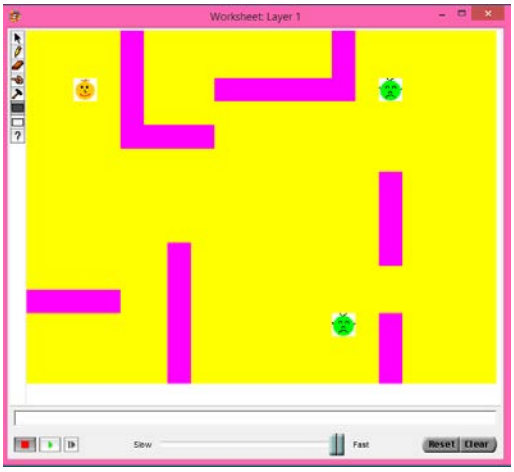


Wall

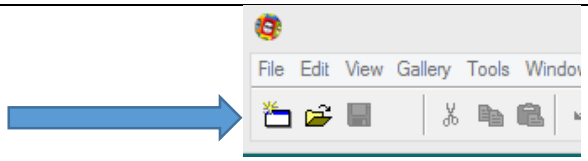
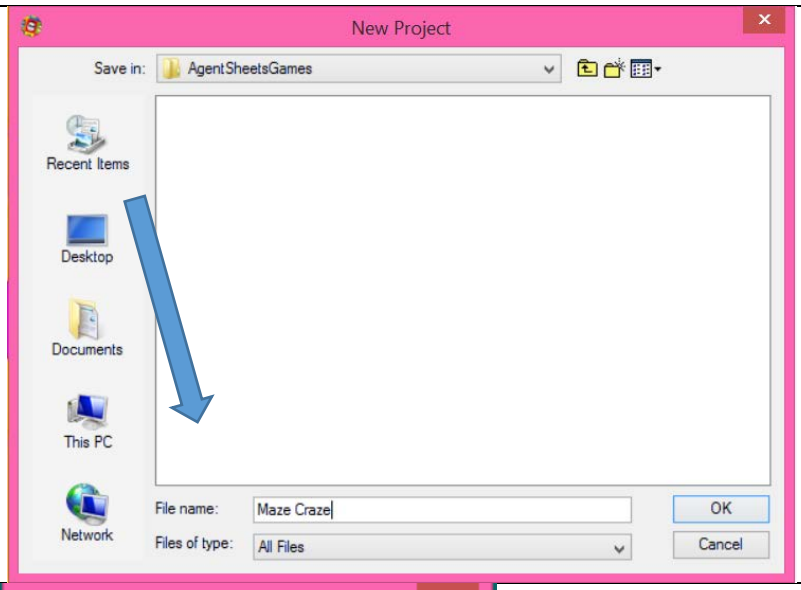
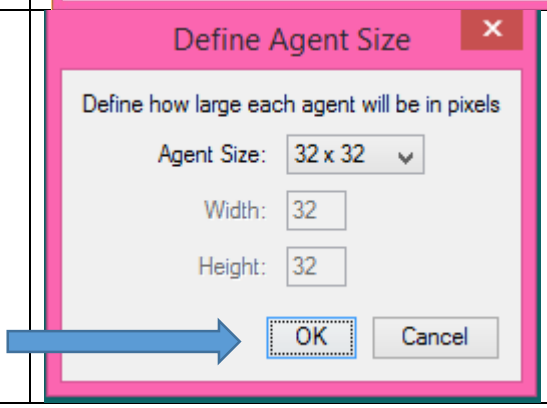
Goal

Attacker

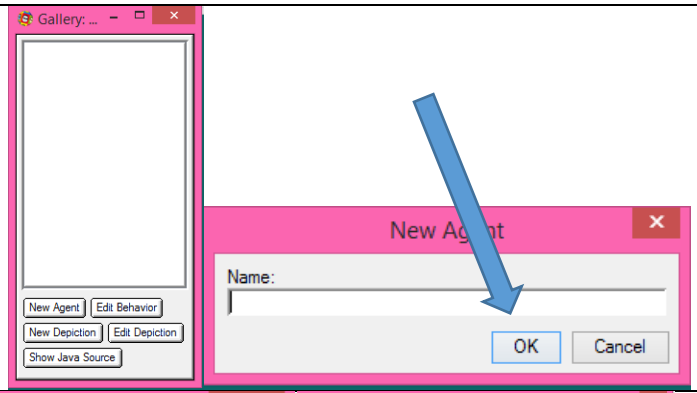
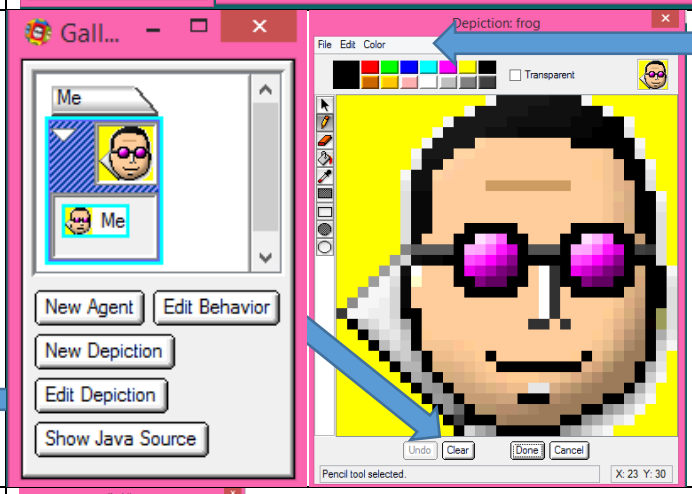
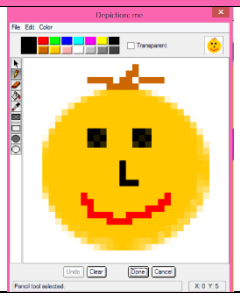
Create this initial Worksheet:



Student Handout 1B: Create a game

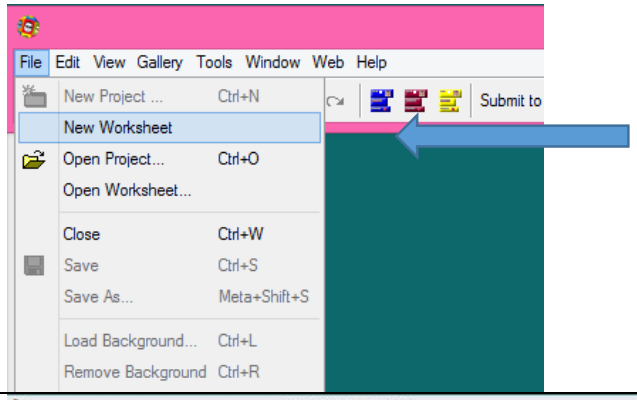
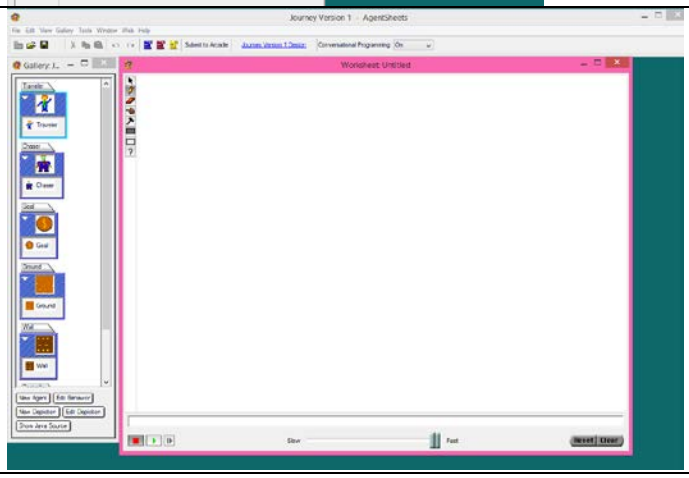
Step 1	**Create Game** **Click on the new game icon (far left)**	
Step 2	**Name the Game** **Name it Maze Craze and click OK**	
Step 3	**Define Agent Size** **Do not change - Click OK**	

Student Handout 1B: Create agents

Step 4	**Create Agent** **Click on New Agent** **Name it Me** **Click ok**	
Step 5	**Edit Agent** **Click Edit Depiction** **Click Clear to erase the current image.**	 *Click on Color> Mask Color>> White to make the white background sections see-through*
Step 6	**Draw Me** **Click Done**	 Here is an example of one way to draw the Me. You can be creative. If you make a mistake, use the eraser or click CLEAR to clear the whole area. Click COLOR>>MASK COLOR>>WHITE to eliminate the white background.
Step 7	**Draw remaining agents**	Floor (yellow box) Wall (Pink box) Goal (Blue Box) Chaser (Green face)

The worksheet is the game space –

it is where the agents will perform their actions.

Step 8	**Make the worksheet** **Click File>>New Worksheet**	
Step 9	**Make the worksheet bigger** **Notice it is big, but not so big that it fills up the whole space.**	

Select Tool

Pencil Tool – places a single agent on the worksheet

Eraser – erases agents from the worksheet

Will be defined later

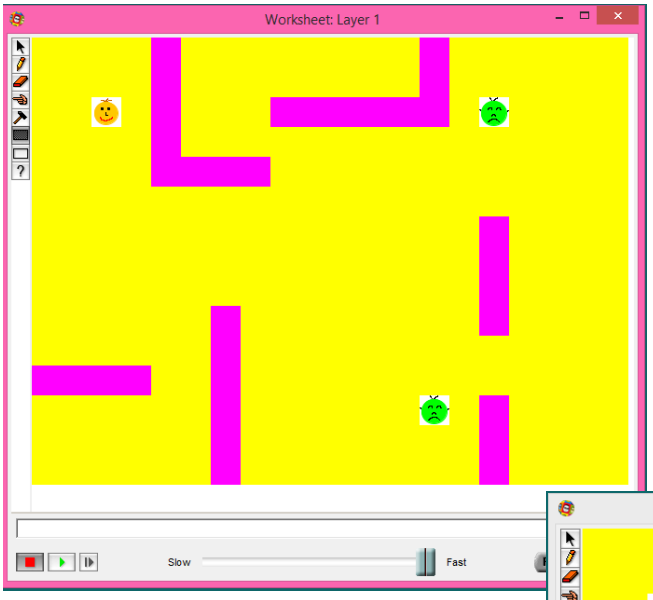
Will be defined later

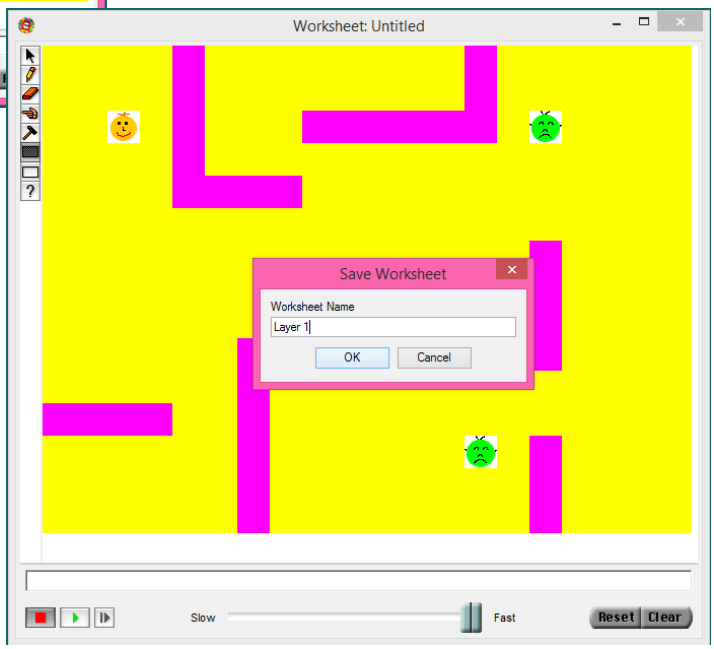
Draw Rectangle – places agents in an array (rectangle)

Erase Rectangle – erases agents in an array

Will be defined later

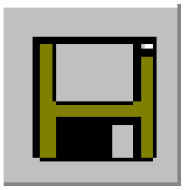
Step 10	**Use the tools to place items on the worksheet.** **Pencil: places agents one at a time** **Filled in Rectangle: Places agents in an array.**	 **Placing one agent on top of another stacks them; however, you can only see the top agent in a stack. Therefore, it is important to use the worksheet construction tools carefully. To use the shaded rectangle tool, click in the upper left corner of the worksheet, click, then drag the cursor to the lower right corner of the worksheet and release. This will produce a single uniform layer of "Background" agents. You can click on the lower right boundary of the worksheet window and stretch it to leave a little "white" space on the right and bottom edges of the "Background" agents, so that you can see where the simulation area ends..**

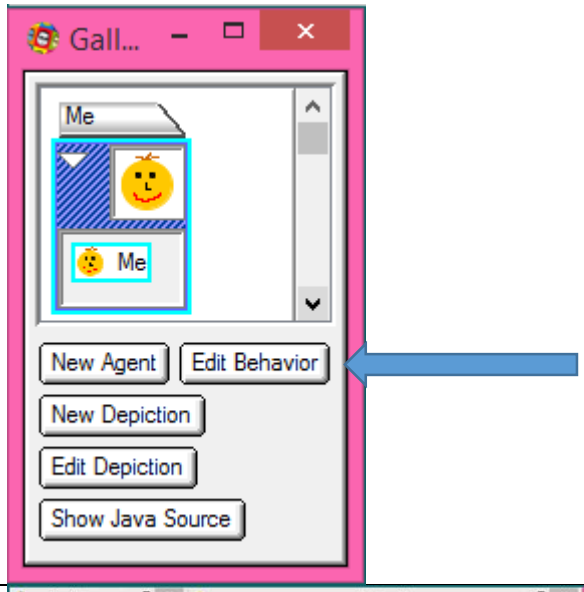
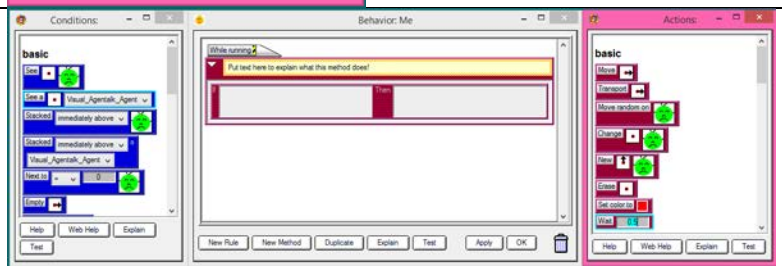


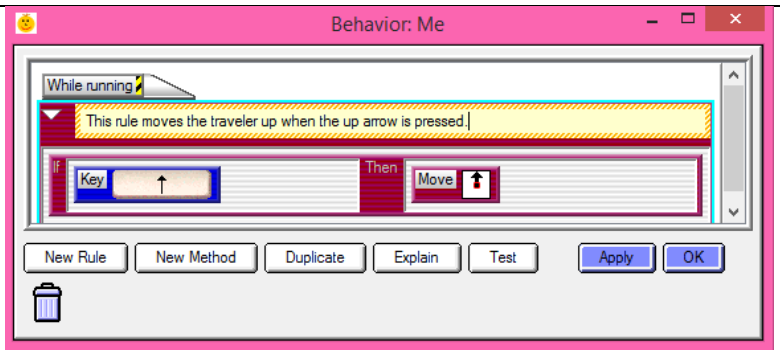
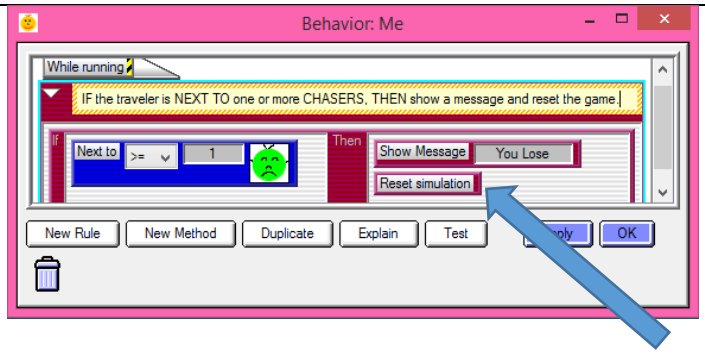
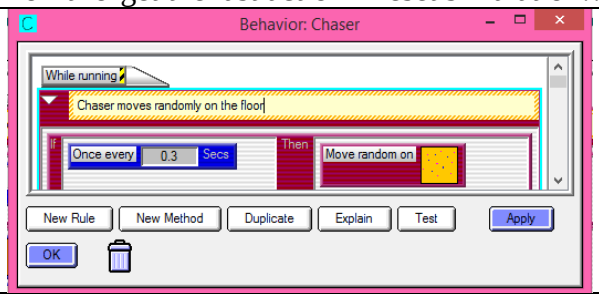


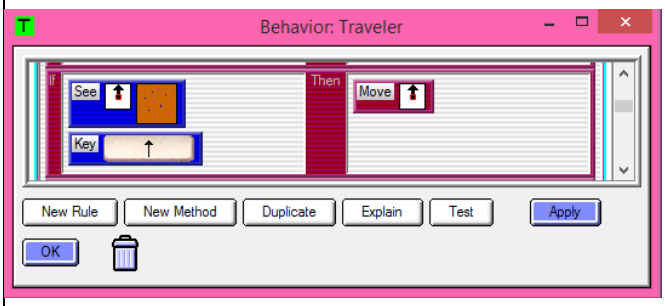
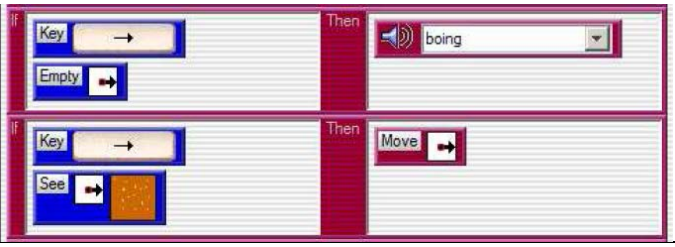
This is a good time to save the worksheet!

File>>Save



Step 11	**Create behaviors for your agents** **Read the explanation** **and then** **Click Edit Behavior**	The kind of behaviors that we will give to our Agents are called rules. Rules are made up of an IF-THEN statement. For controlling the Traveler using the cursor keys, one of the rules we need should be that "IF the Up key is hit, THEN the Traveler will move up." Overall we should have 4 rules, one for each direction (Up, Down, Left, Right). 
Step 12	**Set up your workspace** **When you first open EDIT BEHAVIOR, it will be blank. It is helpful to set up your space in this manner, with conditions (blue) on the left, and actions (red) on the right.**	 **You are going to drag and drop the conditions (on the left) and the actions (on the right) to create the rules.** **To drag and drop the conditions, move the cursor to the solid color so that a hand appears. Then pull it into the empty space of the IF or THEN portion of the rule.**

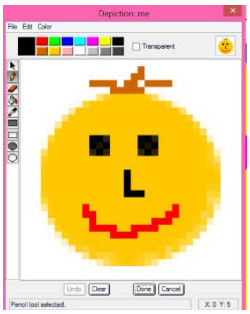
Step 13	**Create a behavior (rules) to make the Traveler (called Me) move using the arrow keys**	 **Take a look at this rule…it says,** **IF I <u>click on the up arrow</u>, THEN <u>my traveler will move UP</u>** **Create the rules to have the traveler move up, right, left and down.** **NOTE: Each rule has to be separate…use NEW RULE to create each new rule.**
Step 14	**Create rule to end the game when the traveler is next to the Chaser** **Click on Traveler and Edit Behavior** **Add these rules**	 Don’t forget the last action – reset simulation!!!
Step 15	**Create rule to end the game when the traveler is next to the Goal**	No hints here – your turn to figure it out. Use step 13 as a hint. Don’t forget the last action – reset simulation!!!
Step 16	**Program the ***<u>Chaser</u>*** to move randomly**	 ***Click on the agent to add behaviors to that agent***

Step 17	**Prevent your Traveler from walking through walls** **Part a)** **Add the code shown** **Part b)** **Add code for the remaining directions**	Work with the person next to you to figure out how to prevent the Traveler from walking into a wall. Here is one way to think about it… Challenge yourselves to find a different way.  ***Click on the agent to add behaviors to that agent*** **Note an important programming point**: The two conditions are in the same box…this is an AND statement. It reads like this: *IF <u>the up arrow is pressed</u> AND <u>the traveller sees ground above him</u>* *THEN <u>he moves up</u>*
Step 18	**Determine where the traveler can cheat**	Traveler can cheat by moving off the game ground. Talk with the person next to you about where this can happen on your worksheet.
Step 19	**Stop the traveler from cheating**	Add rules that make a sound for attempted movement off the ground. Note the importance of rule order for the new rules. Here is an example to prevent the Traveler from moving right off the worksheet. What other direction limit will you need?  ***Click on the agent to add behaviors to that agent***

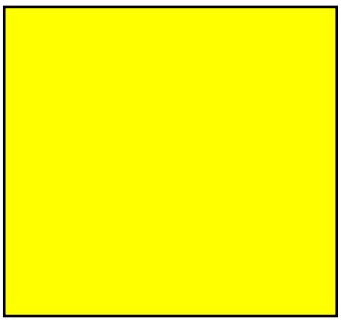
Student Handout 1C:
Agent Creation Models

Use these as quick starting points for your own agent. They don't have to look exactly like the model!

Me



Floor



Wall

Goal

Chaser