



Programming with Alice and Garfield



Part II Coding the Animation

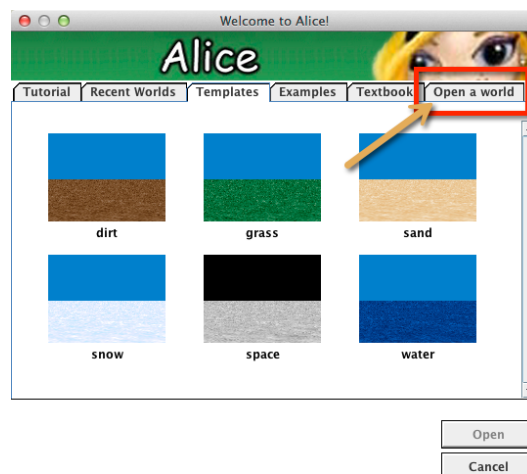
Welcome to Part 2 of a tutorial on programming with Alice and Garfield using the Alice 2 application software. In Part I of this tutorial, you created a scene containing characters and props. In this part, you will create program code to animate characters in a scene. An animation can be used to tell a story (similar to a video or short film), create a simulation, or play a game. In this tutorial, we will tell a story in which Garfield the cat decides it is time for his friend Odie to take a bath.

If you have completed the Part I of this tutorial, Alice is still running, and your scene is still open, you may skip ahead and begin with step 5 on page 3. Otherwise, please begin by completing steps 1-4 to open the world you previously created and saved in Part I:

1. Find the Alice application on your computer, and start Alice. You should see the following splash screen as Alice starts.



2. After Alice has started, you will see the following dialog box. Click on the **Open a World** tab.



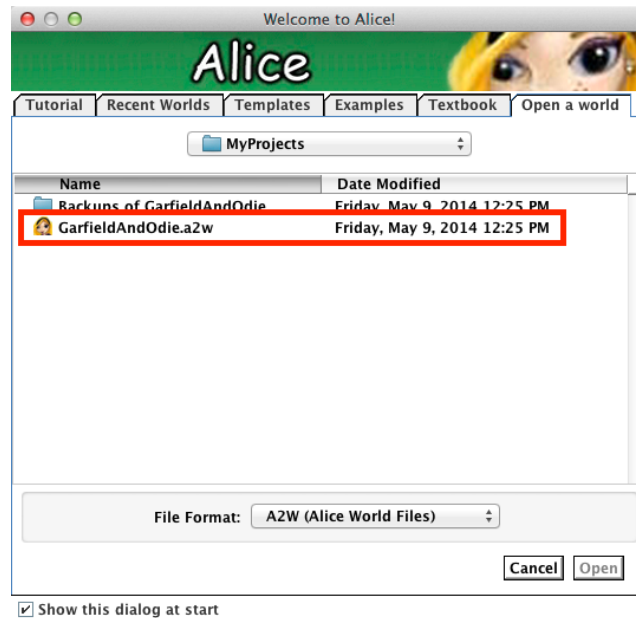
☒ Show this dialog at start



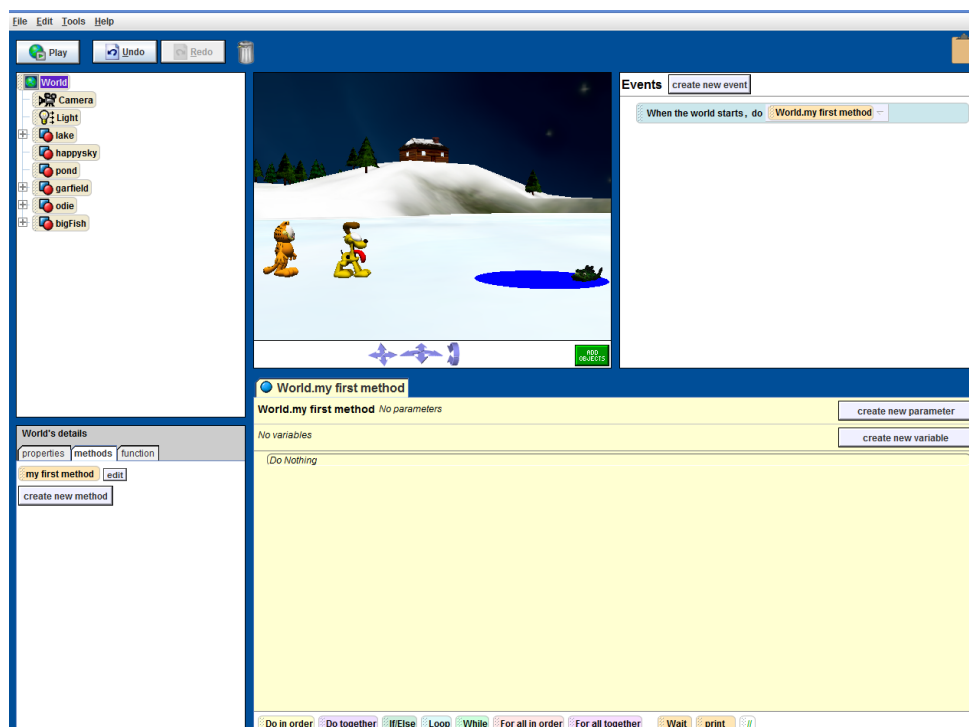
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3. Navigate to the location on your computer where your world has been saved. Then, select the world and click the **Open** button.



4. After the world has loaded, you should see Garfield the cat standing behind Odie and both are facing the pond, as shown here:



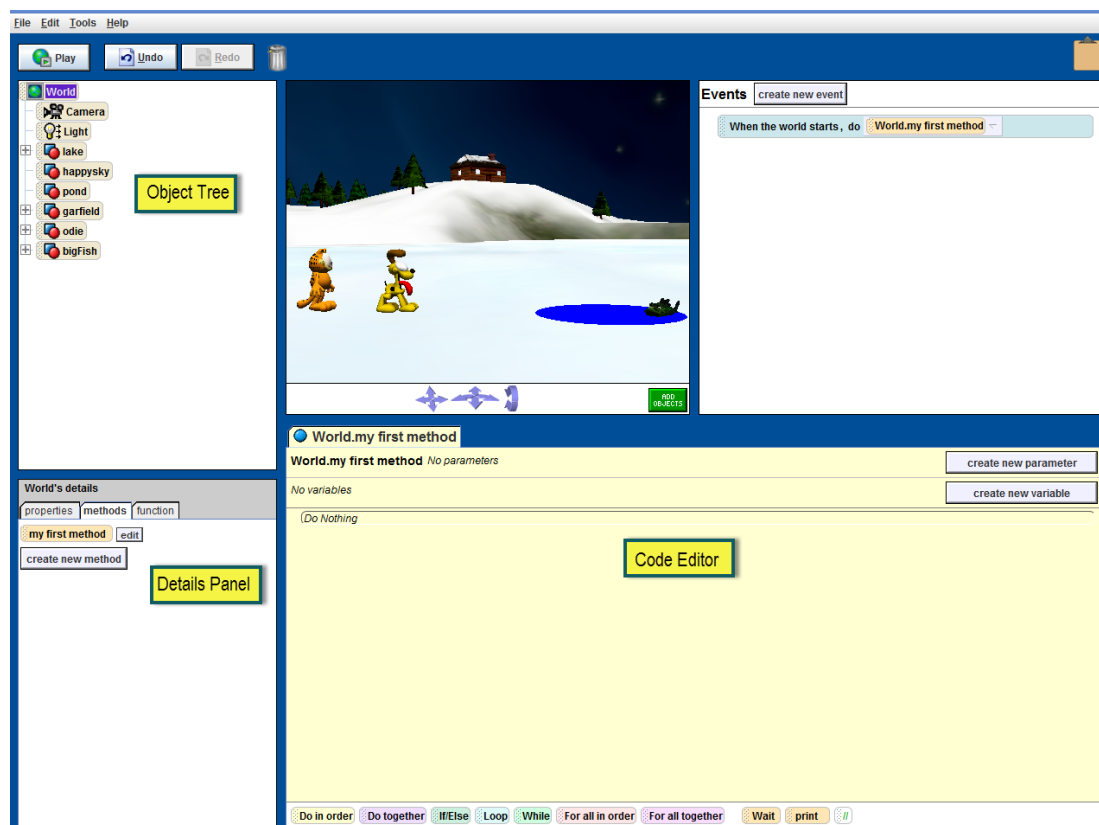


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5. In our story, Garfield and Odie have been sliding around on a slippery ice-covered lake. The lake surface isn't completely frozen. A pond-like area with open water can be seen in the middle of the lake. Odie has been playing with a fish and his fur smells bad. Garfield decides that Odie needs a bath. Our animation will begin with Garfield giving Odie a push into the pond. Our design (plan of action) is the following:
- Garfield moves forward to bump into (collide with) Odie
 - Odie moves forward to the pond
 - Odie moves down into the water and (at the same time) a splash sound plays
 - Garfield turns to look at the camera
 - Garfield says "Bath time!"
 - Odie jumps out of the water
 - Odie turns to look at the camera
 - Odie says, "The water is too cold!"

To create the animation, each action in the above design will be coded as a statement in Alice's Code editor, as shown here:



On the left side of the window are two panels: the object tree at the top and the details panel at the bottom left. At the lower right is a yellow tabbed area, labeled **World.my first method**. The yellow tab is where the code statements will be created.



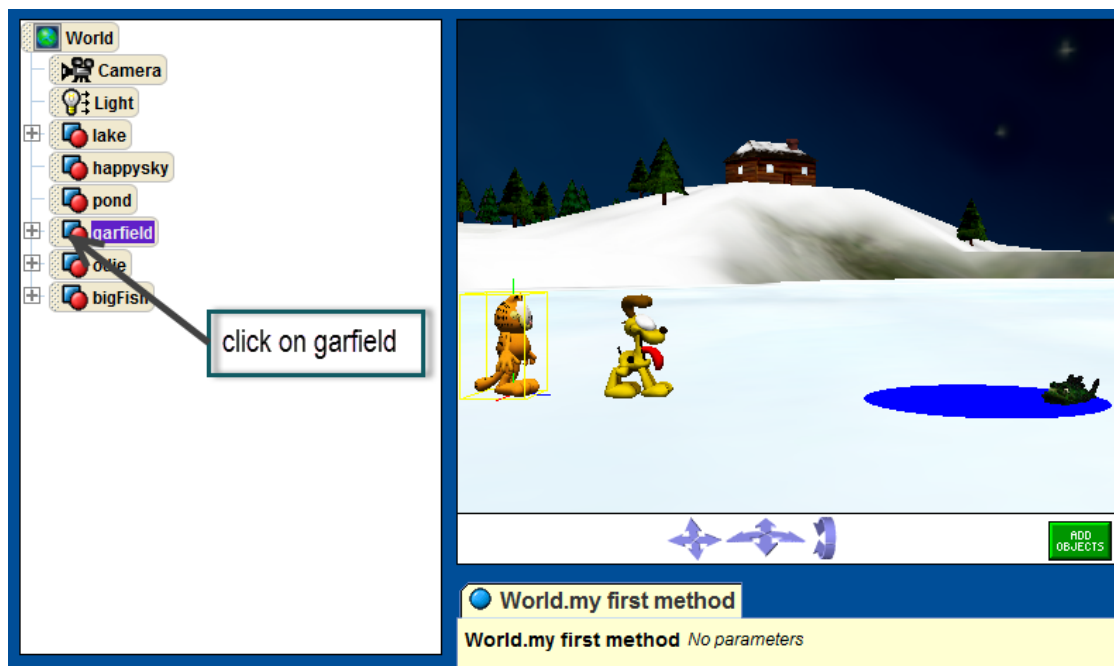
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The first action is “Garfield moves forward to bump into (collide with) Odie.” As you may remember, Garfield is standing 1.5 meters behind Odie. This distance is measured center to center, as shown here:



To move Garfield forward just enough to bump into Odie, we will create a code statement that tells Garfield to move forward less than the total distance (1.5 m) – say, 1 meter. This will have Garfield just bump into (not slide through) Odie. In Alice, a code statement is created by first selecting the object that will perform the intended action. To select Garfield as the object, click on Garfield’s name in the object tree, as shown here:

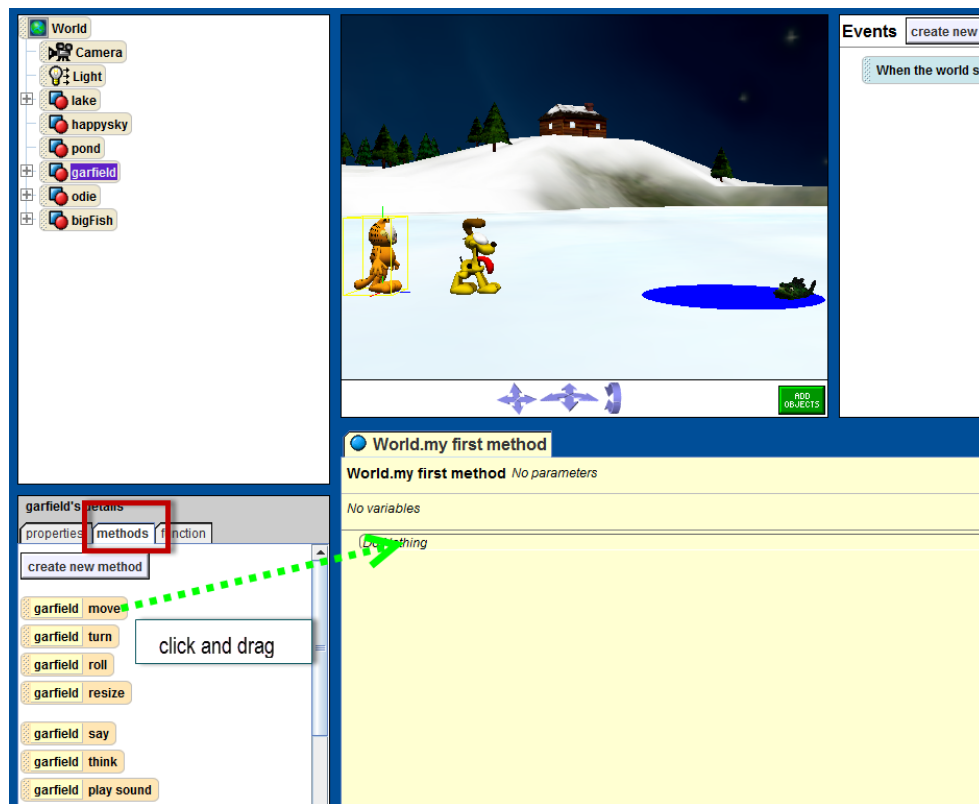




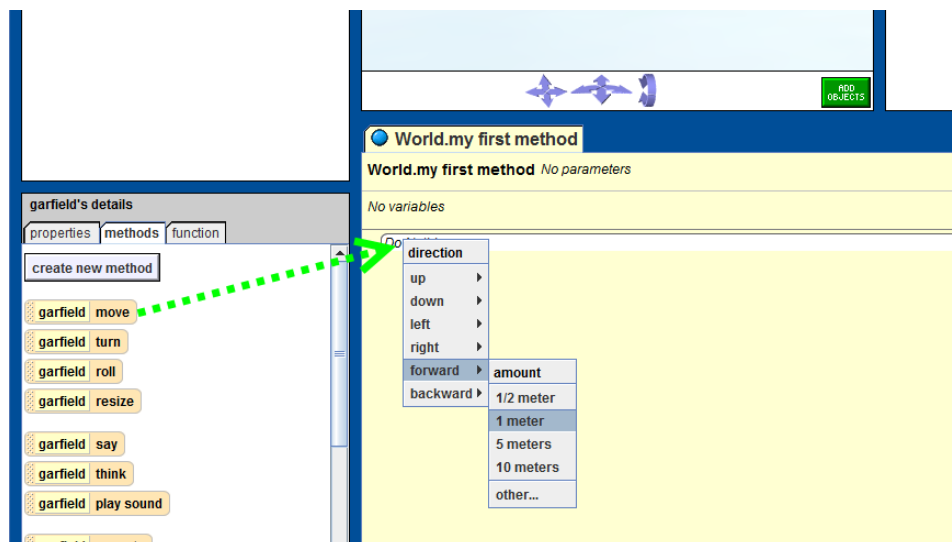
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- Next, select the action tile in the **methods** tab of the **details** panel. Use the mouse to click and drag the **move** tile from the details panel into the Code Editor.



- Popup menus prompt you for the **direction** (select **forward**) and the **distance** (select **1 meter**).

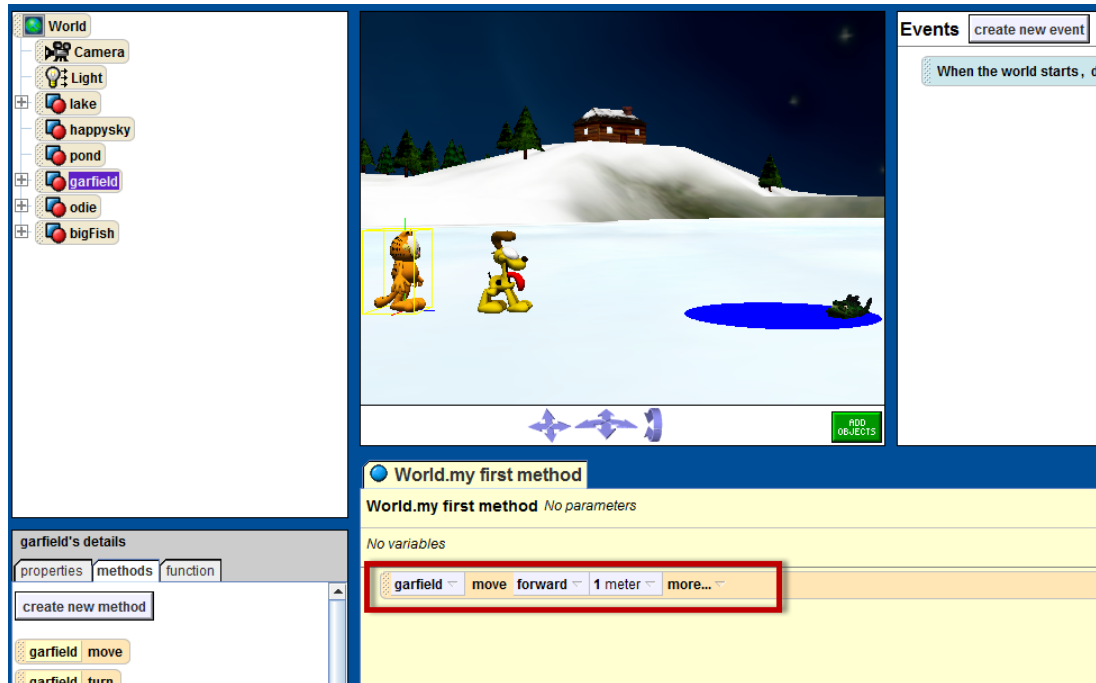




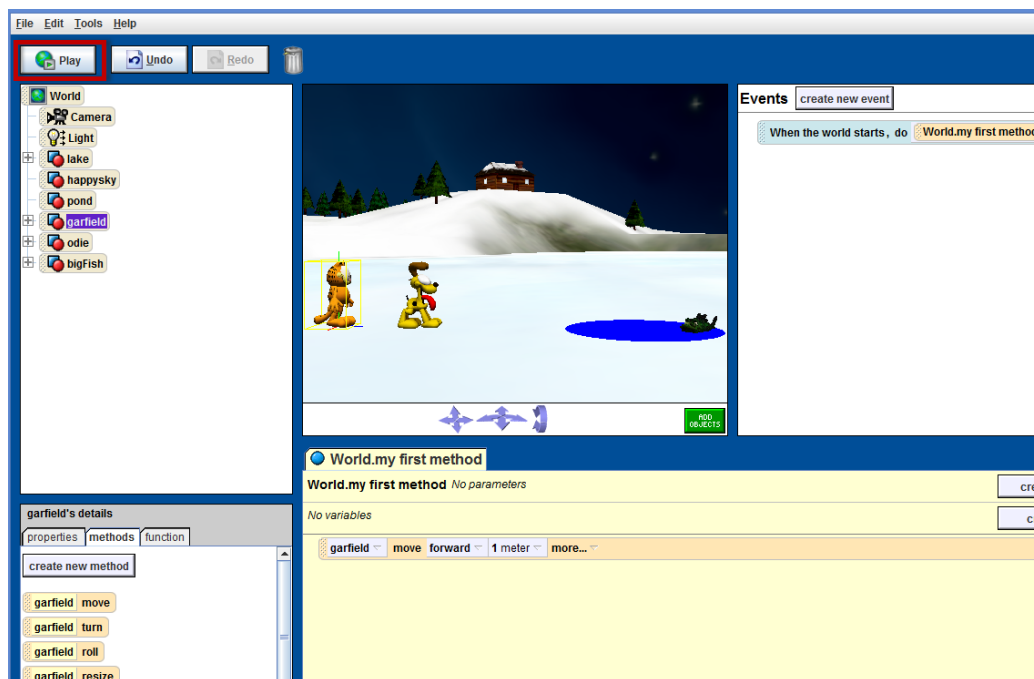
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8. A code statement “*garfield move forward 1 meter*” should now be seen in *World.my first method*.



9. To test your code, click on the Play button in the upper left corner.

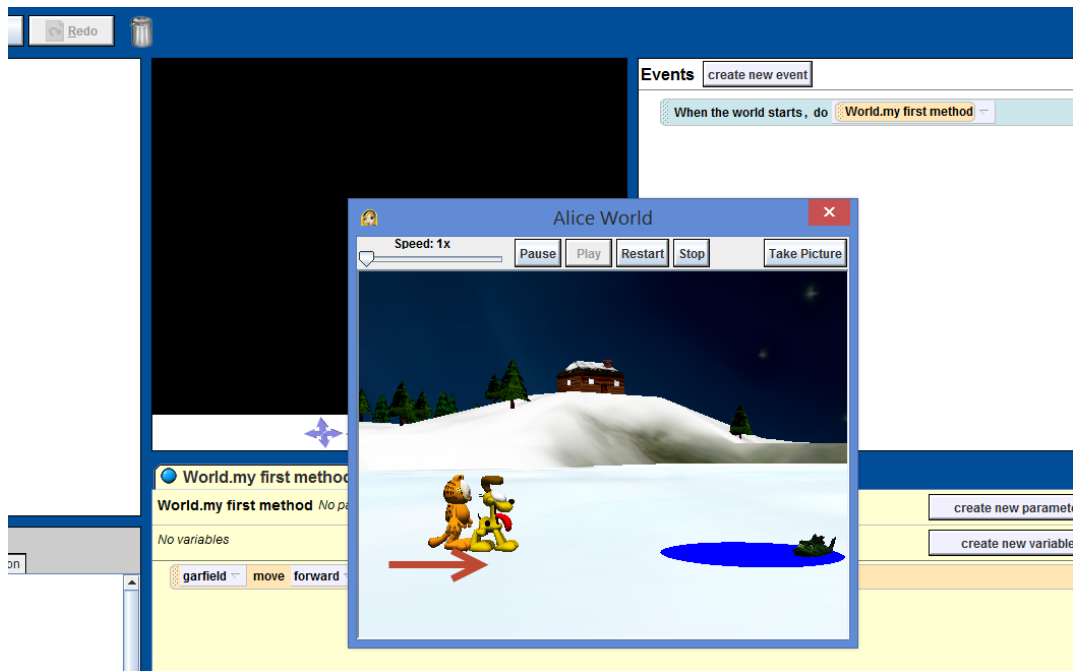




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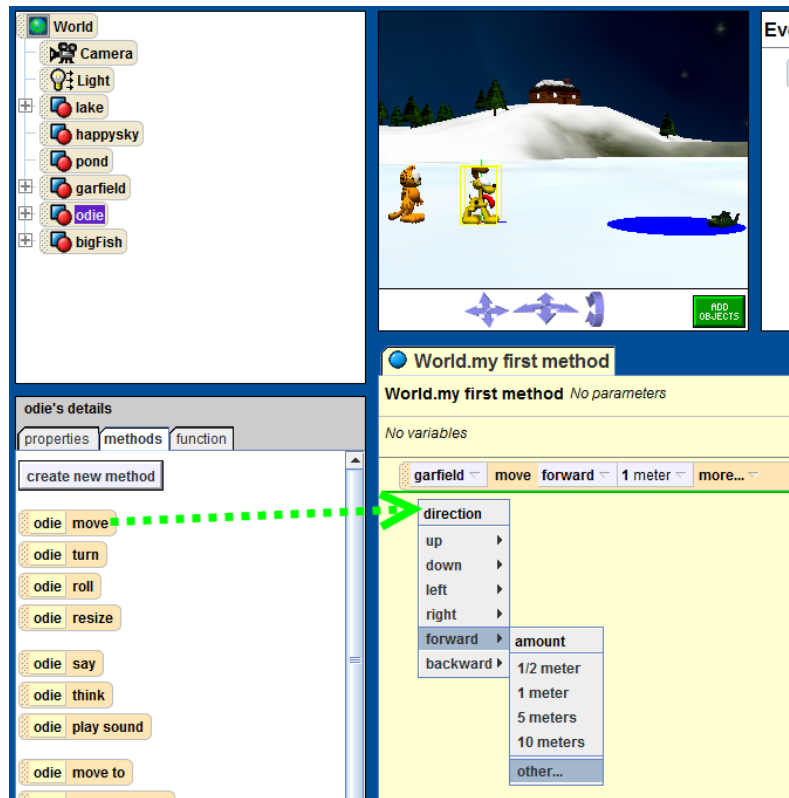
10. When the Play button is clicked, a run-time window pops up, where you can view the animation as the code runs (**executes**). You should see Garfield move forward to collide with Odie. You can push the Restart button in the runtime window to view the animation several times. When you have finished viewing the animation, close the runtime window to return to the Code editor.



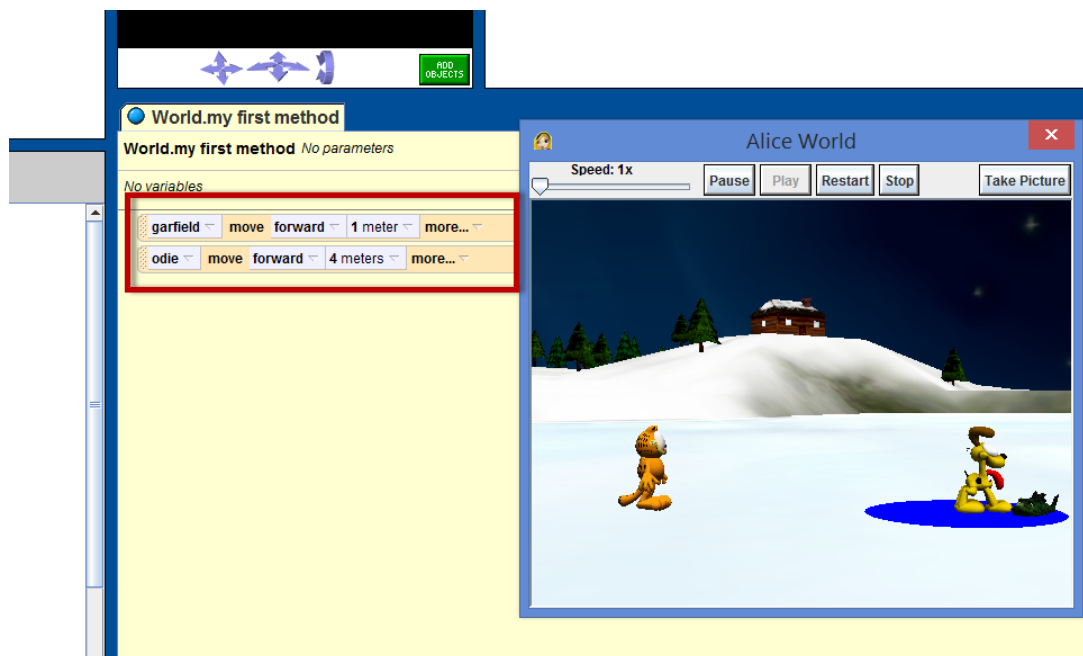
11. The next step in our animation design is “*Odie moves forward to the pond.*” Create a statement in which Odie will move forward. We don’t really know exactly how far Odie is from the pond, so we will take a good guess and try 4 meters as the distance. Select Odie in the object tree, click and drag the **move** tile into the code editor, selecting **forward** and **other...** from the popup menus. A number pad should be displayed. Enter **4.0** as the distance, and click **Okay**.



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12. Click on the **Play** button to test your code. Odie should now be on the pond, as shown here:



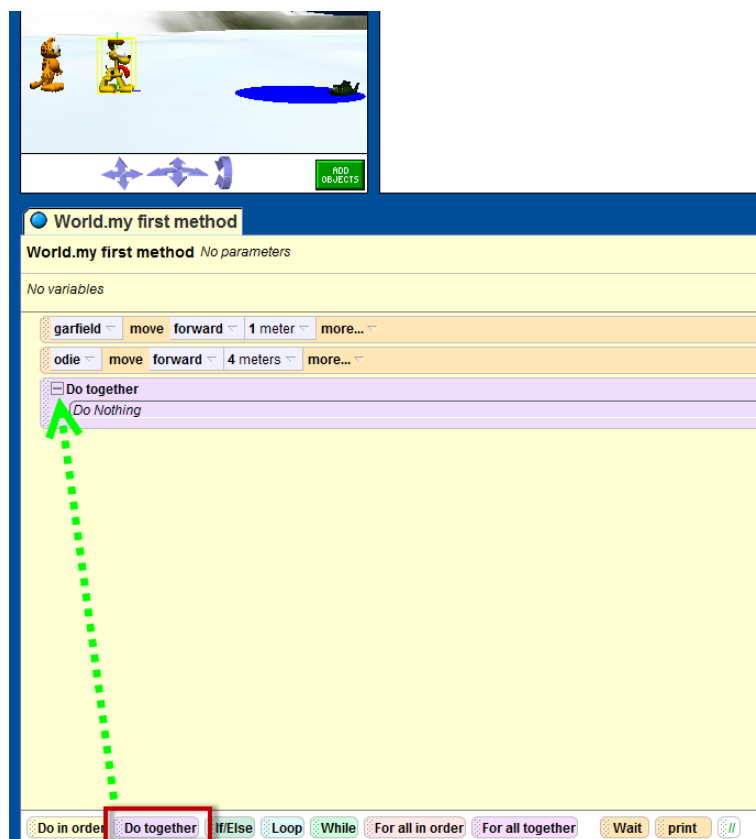


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Debug: If Odie does not end up in the pond, you will need to adjust the distance that Odie moves forward. If so, click on the number **4** in the *odie moves...* code statement, and select **other...** to return to the keypad to enter a better value (for example, you might enter 3.8 or 4.25).

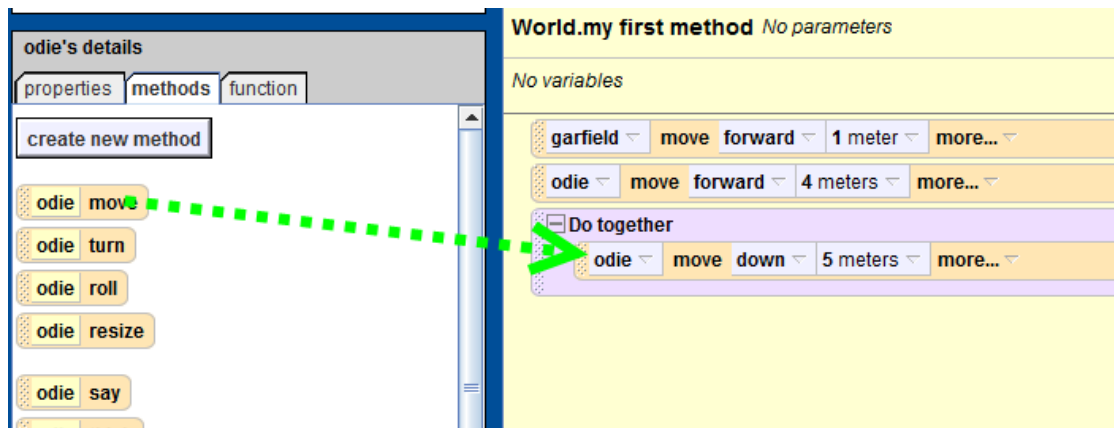
13. No doubt, you have noticed that the two code statements you created were executed in order, one after the other. First Garfield moves forward and then Odie moves forward. But, now we want to create code to have Odie move down into the water and make a splash sound **at the same time**. Alice has a **Do together** control statement that will execute code statements at the same time. The **Do together control tile** is found at the bottom of the code editor. To use **Do together**, click on the **Do together** control tile and drag it into the code editor.



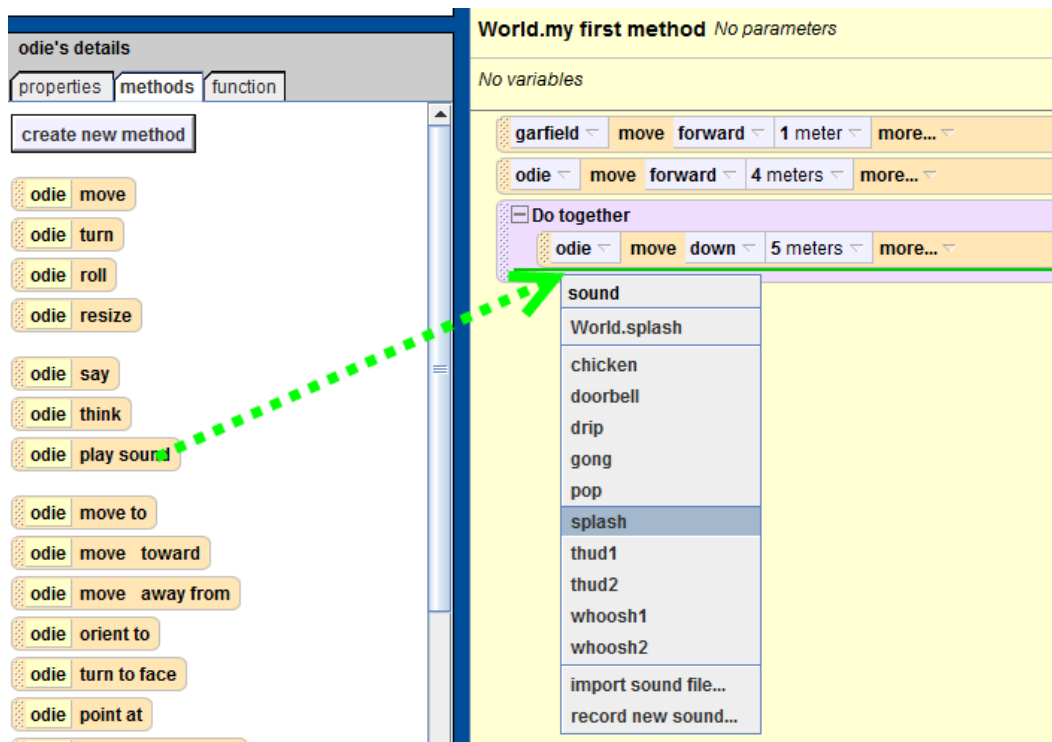
14. Create a code statement within the **Do together** code block that will have **Odie move down 5 meters**. (We chose 5 meters so that Odie will go completely down into the water. You may choose a smaller value if you want to see his head still above water.)



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15. Find the **play sound** tile in the Details Panel. Click and drag it into the same **Do together** block. Select **splash** from the menu of sound choices.



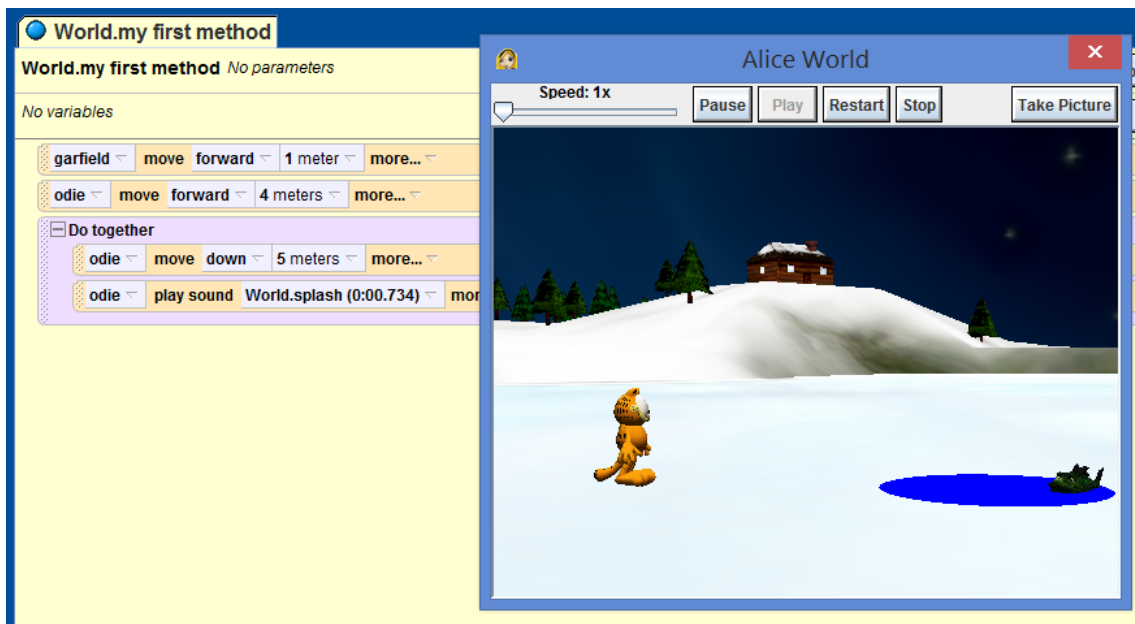


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16. You should now have two code statements in the same **Do together** code block. Click on the **Play** button to test your code. When these statements are executed, Odie should fall down into the water, and you should hear a splash sound.

Debug: If you do not hear a splash sound, check that your computer's sound is turned on and is loud enough to hear. In some school computer labs, you may need to attach earphones to the computer.



17. The next design step is to have Garfield turn to face the camera. Select **Garfield** in the object tree. Click and drag the **turn to face** tile into the Code Editor, and select **camera** from the dropdown menu of objects that Garfield can turn to face.



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The screenshot shows the Alice programming environment. On the left, the 'World' object is expanded, showing a hierarchy of objects: Camera, Light, lake, happysky, pond, **garfield** (highlighted with a red box), odie, and bigFish. In the center, a 3D scene shows Garfield and Odie in a snowy landscape with a lake and a house. On the right, the 'Events' panel shows a single event: 'When the world starts, do World.my first method'. Below this, the 'World.my first method' code editor is open, showing a sequence of actions: 'garfield move forward 1 meter', 'odie move forward 4 meters', a 'Do together' block containing 'odie move down 5 meters' and 'odie play sound World.splash (0:00.734)', and finally 'garfield turn to face Camera' (the 'Camera' target is highlighted with a red box). A green dashed arrow points from the 'garfield say' tile in the 'garfield's details' methods list to the 'turn to face' action in the code editor.

18. The next step is to have Garfield say "Bath time!" Click and drag the **say** tile into the Code Editor. Select **other...** from the menu of choices that appears. Type in **Bath time!** in the textbox.

This screenshot shows the same code editor as before, but with the 'garfield say' tile from the 'garfield's details' methods list being dragged into the code editor. A green dashed arrow indicates the drag action. The 'say' tile now appears in the code editor with a dropdown menu open, showing options: 'what', 'Hello', 'Goodbye', and **other...** (highlighted with a red box).

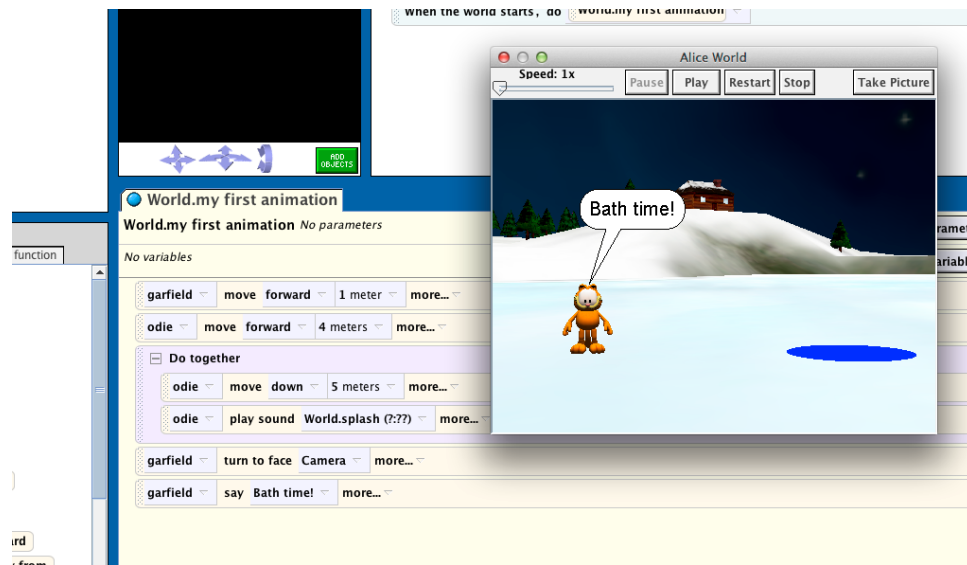
A dialog box titled 'Enter a string' is shown. It contains a text input field with the text 'Bath time!' entered. Below the input field are two buttons: 'Cancel' and 'OK'.



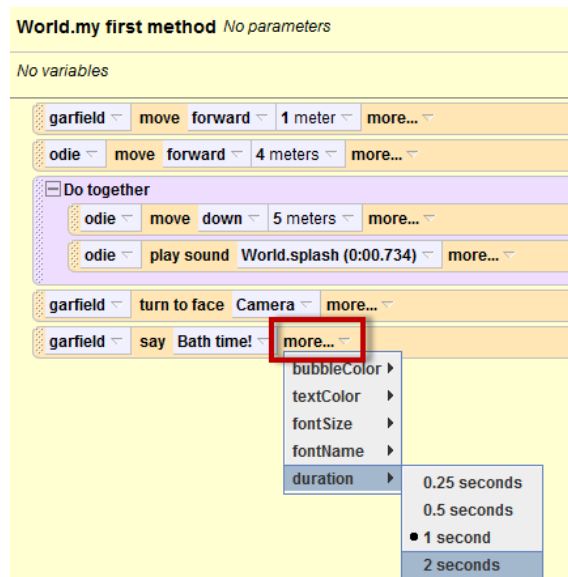
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19. Click on the **Play** button to test your code. When these two code statements are executed, Garfield should turn to face the camera and tell us it is Odie's bath time.



Debug: You may wish to have the text bubble displayed on the screen a little longer (to give the user time to read the text). If so, click on the *more...* options item on the **say** statement, select duration from the drop-down menu, and then select the amount of time (in seconds) we want the duration to last.





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Your Turn

We have completed this much of the original design for this animation:

- **Garfield moves forward to bump into (collide with) Odie**
- **Odie moves forward to the pond**
- **Odie moves down into the water and (at the same time) a splash sound plays**
- **Garfield turns to look at the camera**
- **Garfield says “Bath time!”**

It is now your task to complete the project by creating the code for these actions:

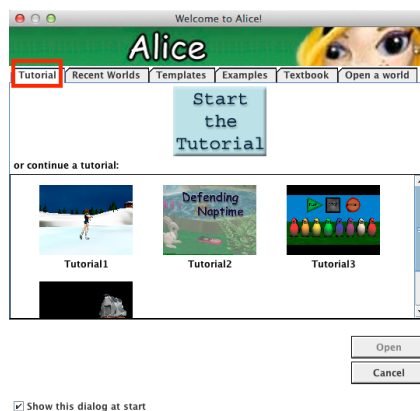
- **Odie jumps out of the water**
- **Odie turns to look at the camera**
- **Odie says, “The water is too cold!”**

All of the methods needed to complete these steps have been illustrated above. You may, however, wish to explore other methods in Alice to finish this story, or even to add a different ending.

You may also want to experiment with the ***Do together...*** statement. For example, when you are having Odie jump out of the water, what happens if Odie moves up and moves forward at the same time in a ***Do together...*** code block?

Be sure to save your Alice world when you are done.

To learn about Alice and how to use it, you may want to try the tutorials that are built into the software. To view the Tutorials, go to the **File** menu and select **New World....** Then, click on the **Tutorial** tab in dialog box that pops up.



Also, explore the Alice website, <http://www.alice.org> to find other resources for learning about Alice.