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Program a Bunny, Scenario 2

In Scenario 1, you learned how to program your Bunny to hop, turn, and nibble grass. Because your bunny is a consumer, it acquired energy from its food. In this scenario, you will teach your bunny some new tricks. Follow the directions below to get started.

1. Load Scenario 2 by clicking on the **Scenario 2** button. Run the simulation for 10 "virtual days" by clicking the **STEP 10** button.

2. ✎ **If you had clicked the STEP 1 button, the bunny would have followed the Code Blocks routine one time. How many times did your bunny follow the set of rules in its routine when you clicked the STEP 10 button?**

3. ✎ **Record the Bunny's Current Energy:**

4. Click the **RESET** button, then click the **GO** button.

5. Observe the bunny's behavior. Notice that it has been programmed to turn and, if there happens to be grass underfoot, it gains 5 energy units if it hops on grass.

6. ✎ **Which direction is the bunny turning, left or right?**

7. If you haven't already stopped the simulation, your bunny is probably getting dizzy! Click the **RESET** button.

8. The bunny would probably enjoy eating the scrumptious looking carrots around the edge of the fence. Examine the arrangement of carrots. If you could program your bunny to only turn when a certain object in Bunny Land is immediately in front of it - instead of every single time it hops, do you think you could get it to land on the carrots?

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9. ✎ **Complete the following command with your best guess of the "objects" you would connect to rule blocks to cause a bunny hopping in a straight line to encounter carrots:**

   If Next Space = grass / carrot / fence (circle one)

   Then turn left / right / random (circle one)

10. Click on the **Code Blocks** button and examine the routine.

11. ✎ **If you eliminate the Turn <left> rule, the bunny will go straight until it gets stuck at the fence. If you replace the Turn <left> rule with a rule that tells the bunny to turn left when the space in front of it is occupied by "fence", what do you think will happen?**

12. Notice that the Code Blocks **palette** has some new options! The **If Next Space** rule lets you program the bunny to do something depending on what is in the space immediately in front of it. This type of rule is called "conditional" because the action depends on some conditions. **Conditional** code blocks are green and they have connectors on the right.

13. You can also now program your bunny to eat carrots using the **Eat** rule. [The difference between nibbling and eating is that nibbling just involves consuming a small bit of the plant while eating involves consuming the whole plant. When you use the **Eat** rule, the plant will disappear from the field after it is consumed.]

14. Try deleting and adding rules until you think your bunny will be programmed to walk the perimeter, eating carrots. If you don't get it right on the first try, go back to your program and see if you can figure out what needs to be changed. If you want to reset your program to the way it was before you tried changing things, just click on the **Scenario 2** button to re-load the scenario. [You might find it helpful to take and save "screen shots" of your routines to help you rebuild them and to show them to others. See the box on the next page for how to do this.]

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A Helpful Tool: Taking a picture of what's on your computer screen
Clicking the Apple (Command) Key + the Shift key and the #4 key lets you use your mouse to select a specific part of your desktop for "capture". Your mouse pointer will turn into a cross. If you hold down the mouse button, drag to select the part of the screen you want, and then release the button, the screenshot will "snap" that part of the screen and save a picture to your desktop.

15. ✎ **Write the steps of your final routine below.**