Lesson 3: Running Around In Loops

Goals

- Learn how to use loops to do the same thing over and over again.

In the last lesson, you learned about making objects do things at the same time. This lesson, you'll learn how to tell a character to do something over, and over, and over again! In Alice, we do this using something called a **loop**.

1. Click on **File** at the top left corner of the screen and click on **Open World**, shown in Figure 1.
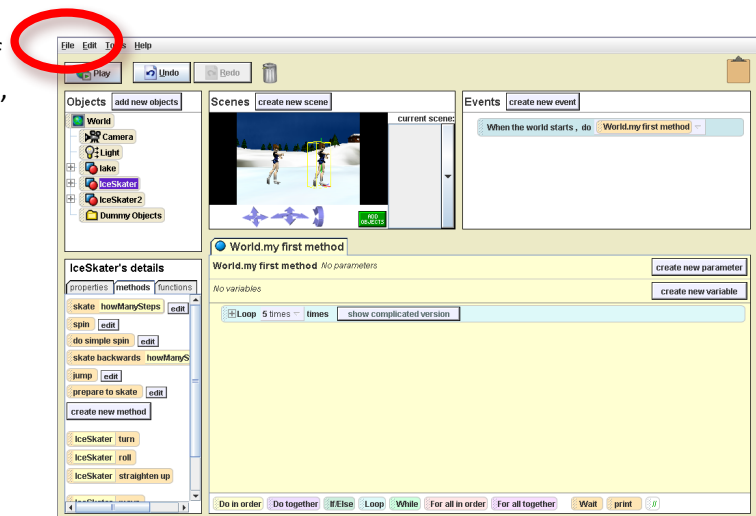

Figure 1. Opening a Previous World.

2. Click on the **Open a World** tab and click on **Race_Lesson2.a2w**, shown in Figure 2.

By doing this, you're opening the world you made in Lesson2 so that you can continue your work rather than having to start all over.
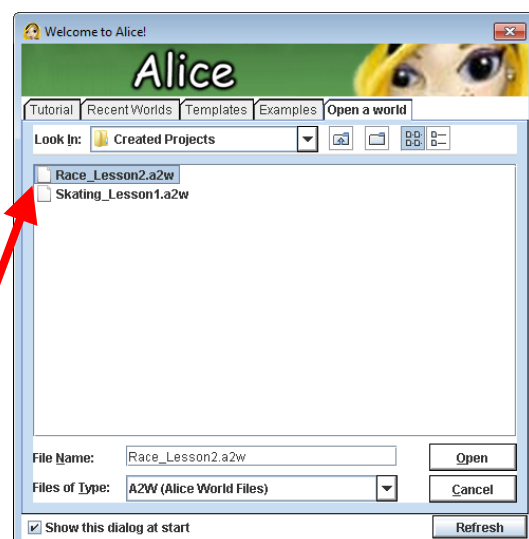

Figure 2. Opening Race_Lesson2.a2w.

3. Click **Open**.

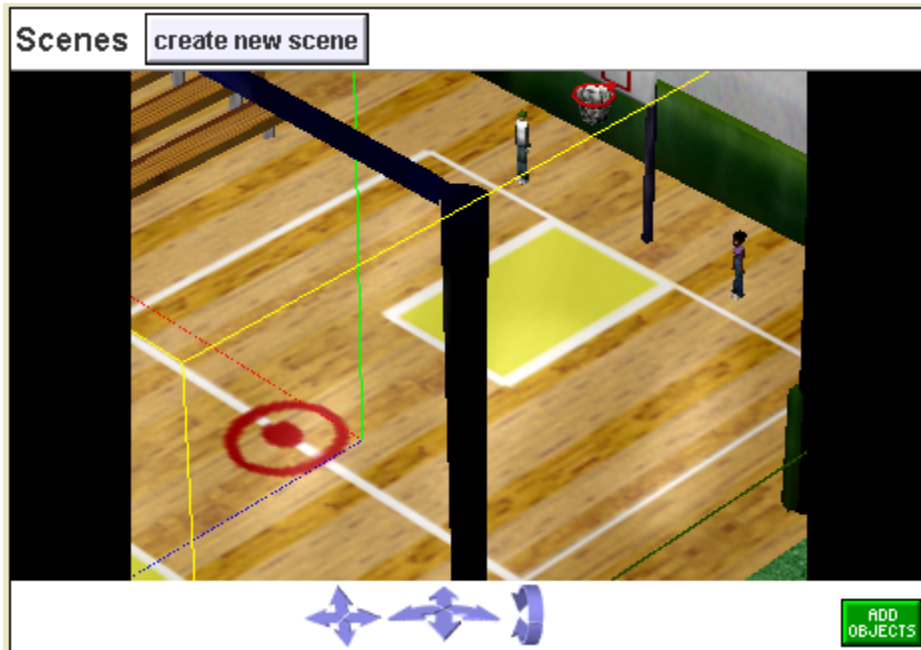4. Double check to make sure you have the following scene open in Figure 3:

Figure 3. Viewing the Race Scene.

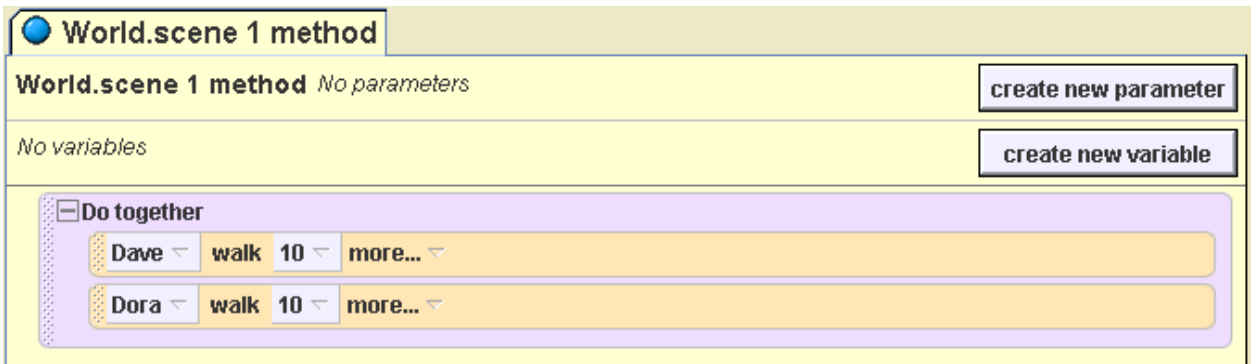With the following script in Figure 4:

Figure 4. Viewing the Race Method.

Let's Turn Things Around

The overall goal in this lesson is to get Dave and Dora to run back and forth across the gym multiple times. In this first section, we're going to tell Dave and Dora to run forward, turn around, and then run back to where they started from. We can tell objects to turn using the **turn** block that most objects have. Now that Dave and Dora are able to walk across the gym, we need to help them really get in shape

for the big race! The first thing we need to do is tell Dave and Dora to turn around when they reach the other side of the gym using the turn block.

5. First, drag a new Do together block into the *Editor Area*.

6. Next, we'll have Dave turn **1/2 revolutions** (one "revolution" is an entire spin). To do this, first put a Dave turn block inside the new Do together block.

7. Next, select **left**, followed by **1/2 revolution** shown in Figure 5.

Figure 5. Selecting a Half Revolution Turn.
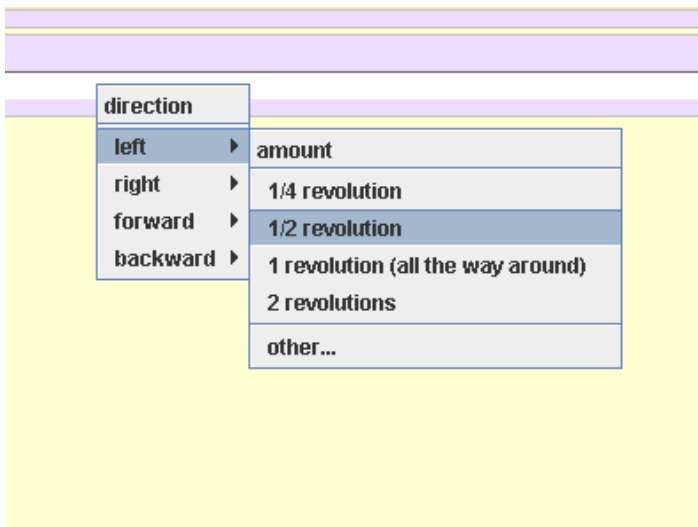
> The direction we pick here doesn't really matter, as long as you choose **left** or **right**. If we picked "right" instead of "left" would it change the direction the objects end up facing?

8. Now we need to do the same thing for Dora! Drag a Dora turn block into the same Do together we have Dave turn in.

9. Select **left**, followed by **1/2 revolution** (i.e. half a spin) just like before. Now, your *Editor Area* should look like Figure 6.
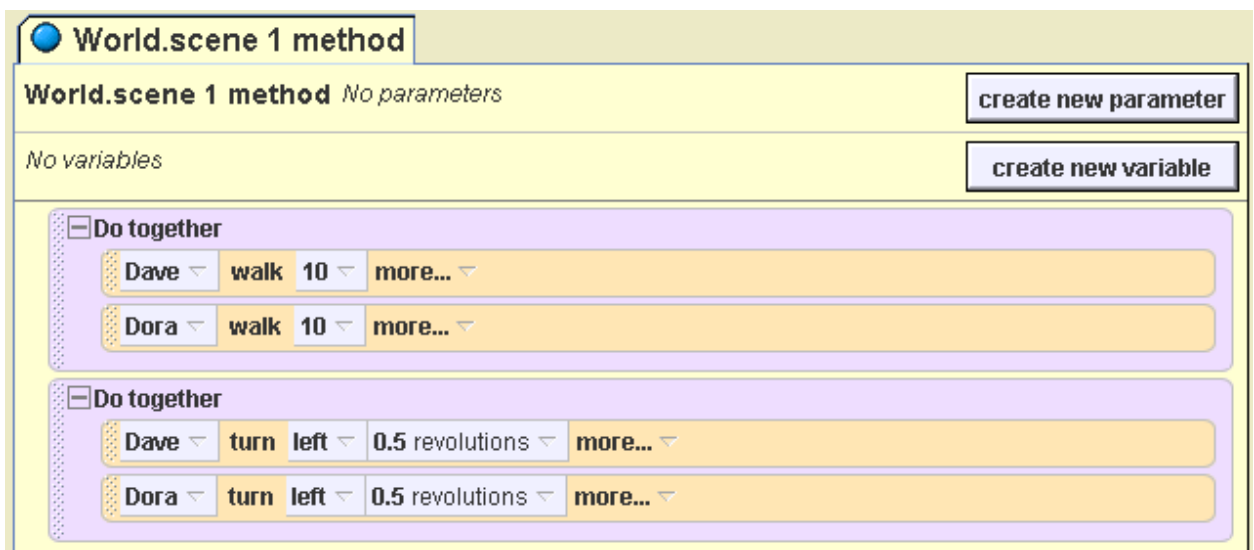

Figure 6. Adding Do Together Block.

10. Now that Dave and Dora have turned around, we need them to walk back in the direction they came from. To do this easily, **right click** on the first `Do together` block (where we tell Dave and Dora to each walk 10 steps) and select **make copy.**

11. Now that we have a copy of the walking block, move this new copy *after* Dave and Dora turn around. When you're done, the *Editor Area* should look like Figure 7.
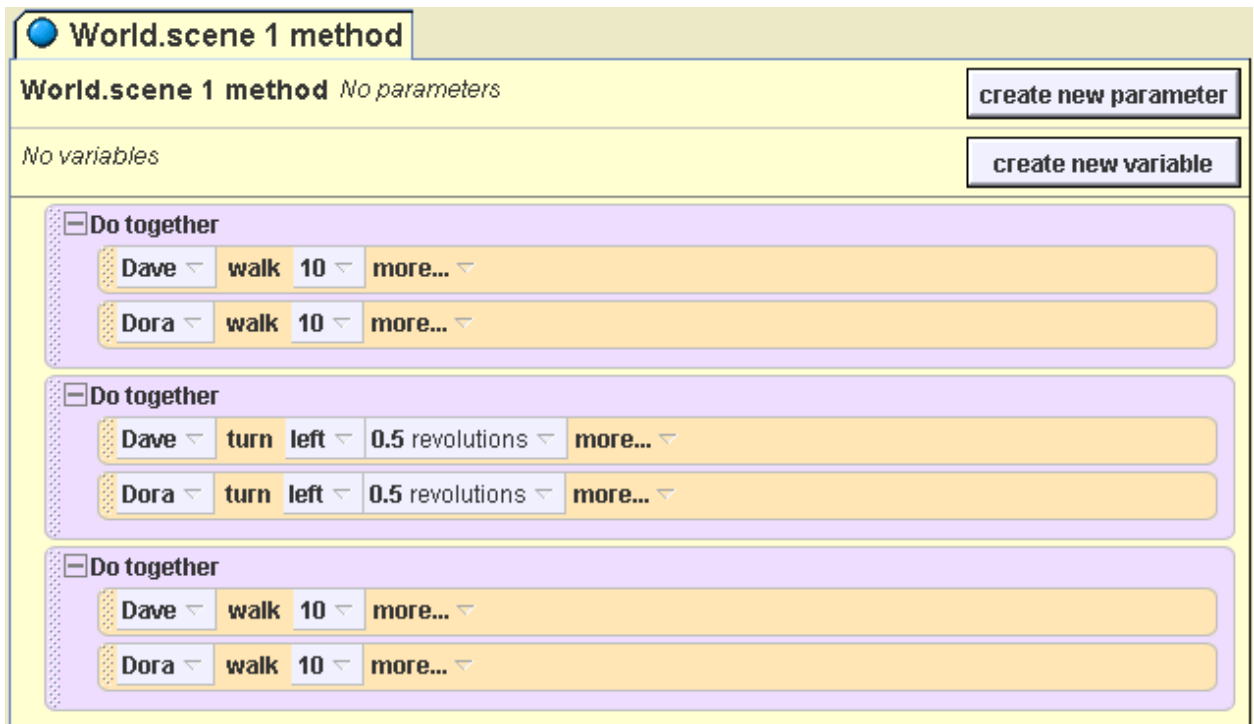

Figure 7. Copying the First Do Together Block.

12. Press `Play` to see what happens!

Running Around in Loops

Training for the biggest race of the year is going to be tough, and just running back and forth a single time isn't going to cut it. In order to help Dave and Dora really get fast, we're going to have then run back and forth a lot of times! One way we could do this would be to just copy what we've already done over and over again, but that takes up a lot of space and work. A much easier way to do this is to use a `Loop`.

13. **Drag** a new `Loop` block into the *Editor Area*.

14. Select that you want this to happen **5 times**.

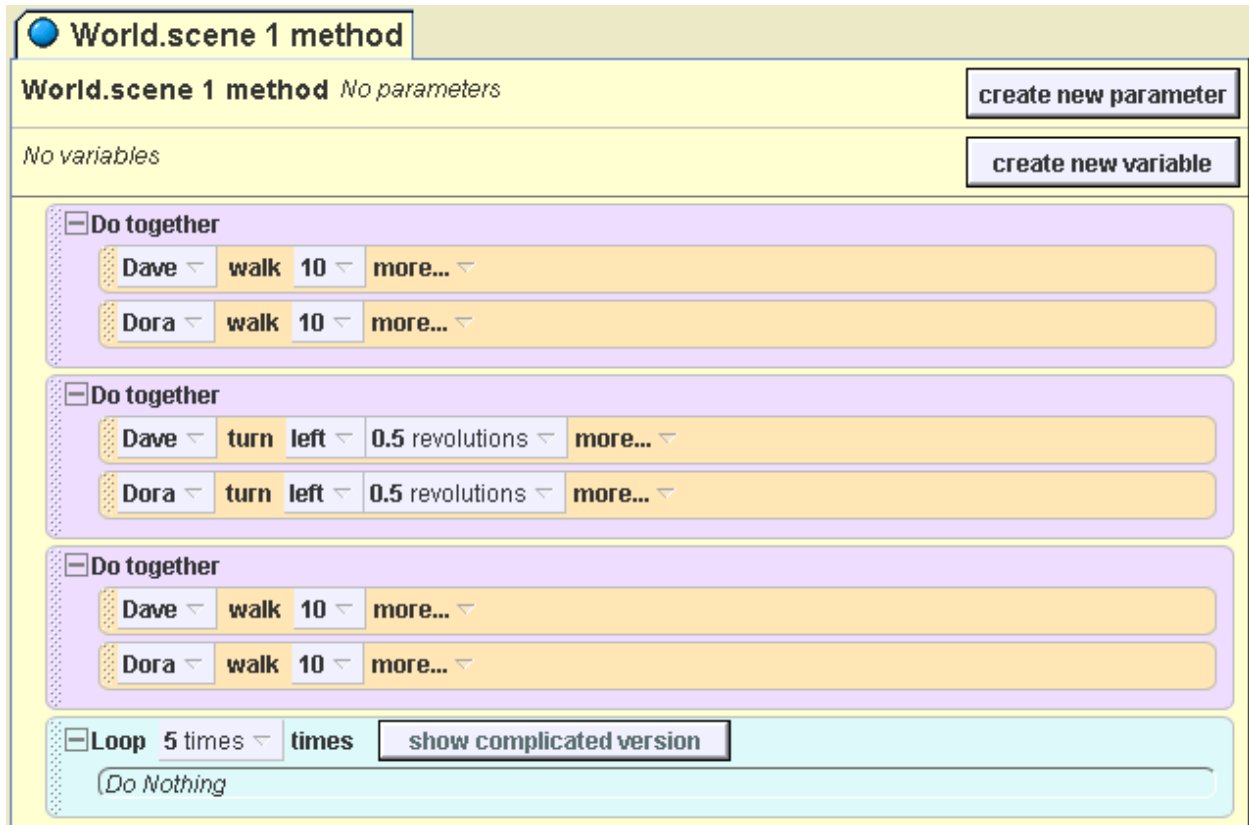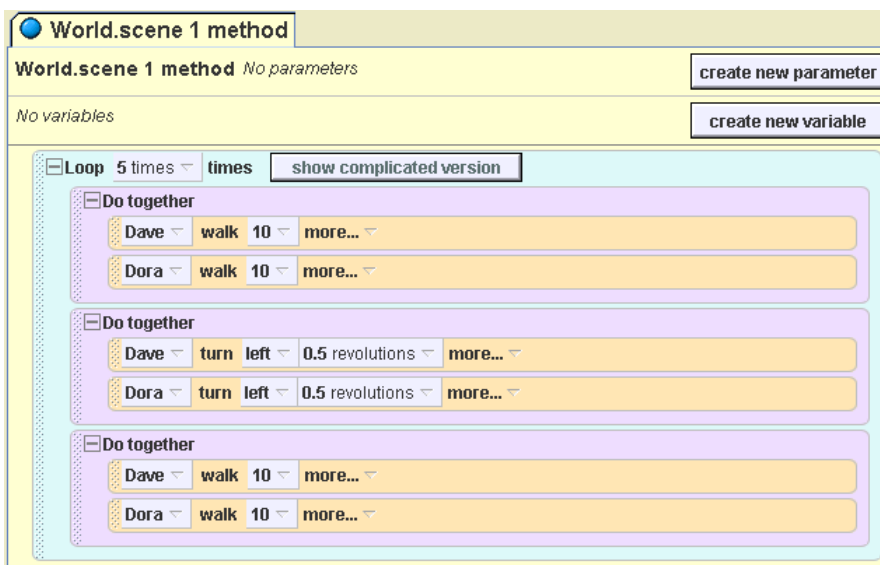15. Check to make sure the *Editor Area* looks like Figure 8.

Figure 8. Adding a Loop to the Editor Area.

16. Now, drag each of the `Do together` blocks *inside of* the `Loop` block, in the same order we already have them. After you're finished, your *Editor Area* should look like Figure 9.

Figure 9. Inserting All Blocks In the Loop.

Don't worry about the button that says "show complicated version." The only thing we care about is the number of times we loop through something. In this case, selecting the number 5 tells whatever is inside the `Loop` block to happen 5 times!

Note: Be careful that you don't accidentally put a [Do together] block inside of another [Do together] block. If you make a mistake, your *Editor Area* might look something like Figure 10 below.

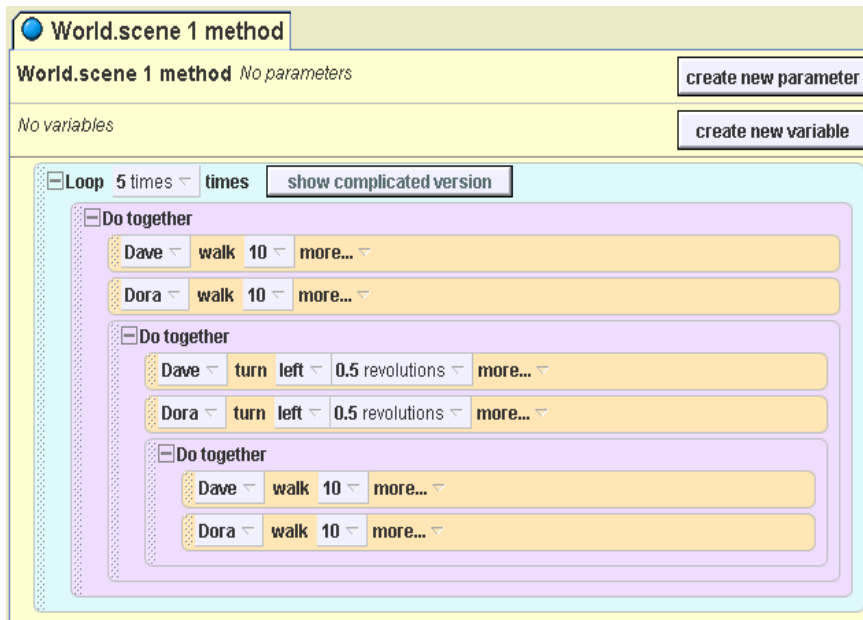Notice how the 2nd [Do together] block is inside of the first one, and the 3rd [Do together] block is inside of the 2nd one. Compare this picture with the one above. What would go wrong?

Figure 10. **We *Don't* Want This to Happen!**

If that happens, just drag the [Do together] that is accidentally *inside* of another [Do together] block out and try again. In the picture above, both the 2nd [Do together] block and the 3rd [Do together] block are in the wrong place. To fix this, first click along the top portion of the block (where it actually says "Do together," for example). Then, drag the block immediately *below* another [Do together].

17. Press [Play] again and see what happens now!

Notice that Dave and Dora Move 20 steps before turning again after the first turn. This is because walking is being repeated twice in the loop but the [turn] block is only being repeated once. We need to add another copy of the characters turning in the [Loop], underneath the other three [Do together] methods. This will make them walk 10, turn around, walk 10 back and then turn around again in every loop cycle.

18. R**ight click** on the second [Do together] block (where we tell Dave and Dora to each turn around) and select **make copy.**

19. Now that we have a copy of the walking block, move this new copy *after* Dave and Dora walk 10 steps. When you're done, the *Editor Area* should look like Figure 11.
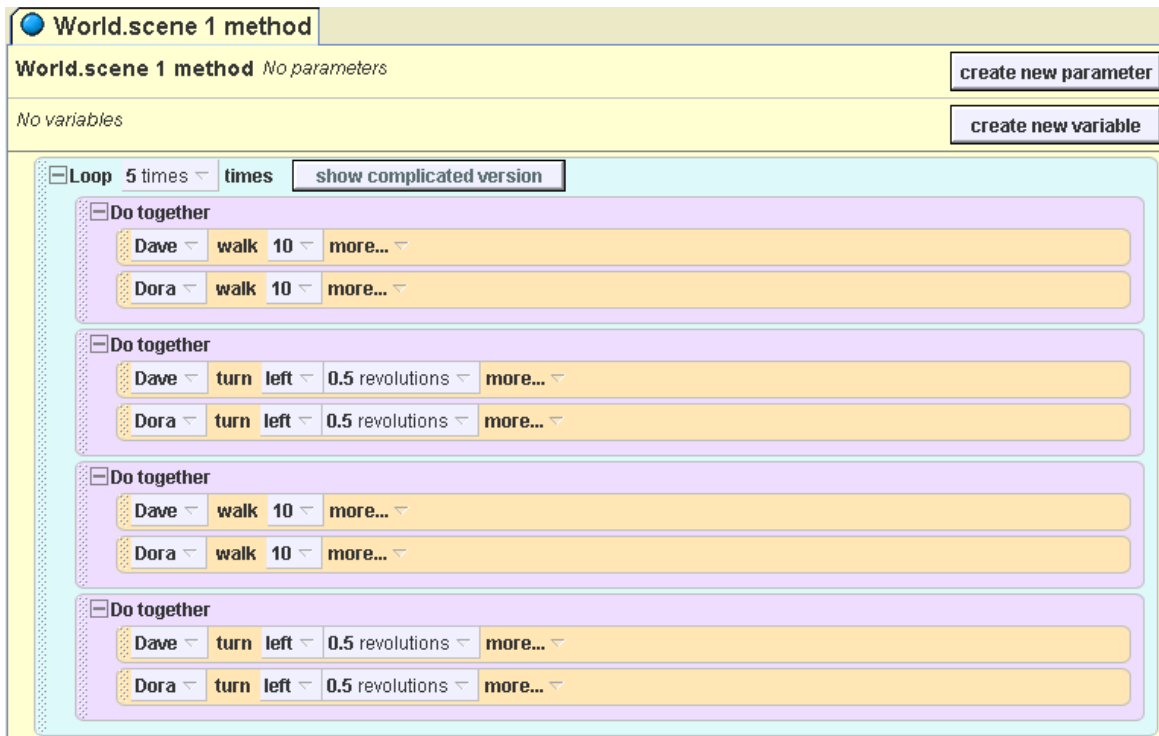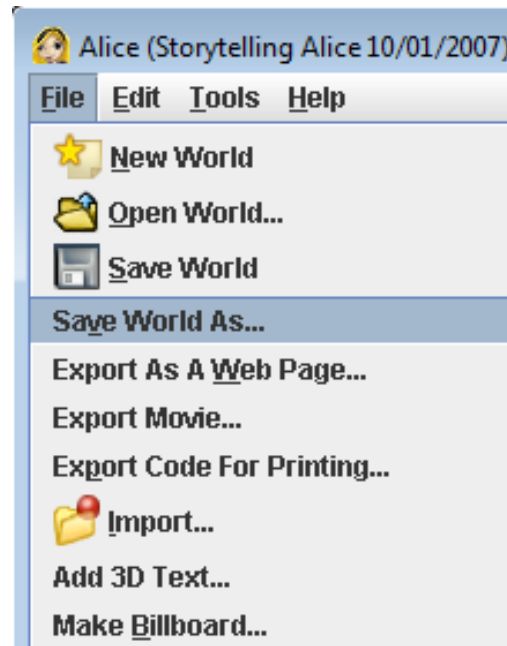
Figure 11. Finishing our loop.

Time to Save!

Now that you're done with today's lesson, make sure to save your video in a safe place where you can get to it again. Each lesson after this will use this race scene, so do your best not to lose it! To save, click on **File -> Save World As…**

Type the File Name as "**RacePractice_Lesson3**" and click **Save**.

Summary

Loops can be used to do just about anything over and over again. In this lesson, you learned how to use a loop to make Dave and Dora run back and forth across the gym 5 times! What a workout!

What To Look Forward To

In the next lesson we'll learn how to make Dave and Dora actually *run* across the gym, rather than walk, by creating our own actions!

Key Terms

1. **Loop**
   • Repeats whatever is inside of it a number of times.
2. **Do together Block**
   • Makes things happen over and over again.

Extra Exercises

★ Can you think of a way to keep the movie the exact same but decrease the number of Do together blocks inside the loop? Try out your solution.

★★ Make your script look like the picture of what we **don't want to happen** in Figure 10. What happens if you run the script with the Do together blocks inside of each other, rather than in order?

★★★ See what happens when you put another Loop inside of the first Loop. See if you can work out what will happen before watching it happen. Notice that anything inside of the second Loop will happen in order unless you put another Do together inside of it.

★★★★ Rather than just making Dave and Dora run straight back and forth, can you figure out how to make them run a lap in a circle around the gym floor?