

## Lesson Plan 4 Outline

### Objectives:

- Students will learn how to write methods with parameters.
- Students will learn about the *while* loop and conditionals.
- Students will learn how to generate and use random numbers.
- Students will use a nested *if/else*.
- Students will be introduced to the term “stepwise refinement.”

### Talking points:

1. Create an animation with one frog on the grass.
2. Write a jump method that takes as parameters *distance* and *height*. (get all three parts of the legs moving)
3. Test the method with various calls.
4. Create a copy of the frog.
5. Add the road and position the frogs so that they are facing the road. (Try turn to face – note that it doesn’t work – they turn to face the road’s center – add an axis to show where the center is.)
6. At this point, we see that direction the road is facing, we can use “orient to” to get the frogs facing the road (actually pointing in the same direction).
7. Discuss the use of random numbers so that our animation is different every time.
8. Create 4 variables (*randomDistance* and *randomHeight* for each frog) and give them random values. Test it.
9. Discuss the need for the *while* construct (we don’t know how many jumps it will take for one of the frogs to cross the road).
10. Build the conditional for the *while* loop. (There are two approaches: not(X or Y) ... not X and not Y)
11. Test the *while* loop.
12. After the loop, we must decide who the winner is. Using a nested *if/else*, we must decide if we have a tie, or if we have a winner. Show some faulty logic and some good logic.
13. If time permits, students can add scenery and additional actions for their frogs.