

**BEA Math Camp**  
**8/9 July 2015**

**Name:**

**Project 4: The 2-12 mouse race.**

1. If you have not completed project 3 (mouse race from yesterday), do so now. You will need similar code to answer the question in 2.

2. Suppose you have a mouse race with each mouse representing the **sum** of two dice rolls: The mice represent the outcomes 2, 3, 4, 5, .....,12.

**Q1.** WHICH MOUSE WOULD YOU PICK TO WIN?

**Q2.** How often would that mouse win?

(write the answer before proceeding).

3. Create a variable **sum** and *set it to (random 1 to 6) + (random 1 to 6)*. Look under **operators** on how to do this.

4. Next, follow the instructions for project 3 (create a sprite as the finish line etc). but, in addition, set up variables to represent each mouse (2 to 12) and increment it each time the number comes up and keep track of the **total** number of rolls.

5. Write a script to compute the fraction of the number of times each mouse wins over the total number of die rolls. Run the race a few times – what do you notice? How do your answers compare to what you see from your experiment? Can you explain the results of your experiment?

## Project 5: Animating Rolling Dice

1. In this project, we will animate a die so that the costume will change as we roll the die, by simulating each roll, by choosing *a random number between 1 and 6.*
2. You will require two sprites, one called **Face** and one called **Dice**. Each sprite will have six costumes. You will have to download the images for the costumes from <http://cs.dal.ca/~nauzerk/mathcamp>  
You will go to costumes tab and insert the 6 images. There is a center tool to help.
3. Your goal is to set up the sprites so that if the number rolled is, say 5, then the costume representing Face 5 will be shown. Same will work for each of the six costumes. This will be achieved by using the if then else loop.
4. You will need to create enough variables to account for all the possible rolls and a Count and Face.
5. Next, use an **if-then block** to switch the costume if the value of the die roll variable is 1 (or any of the other five possible outcomes. If it is 1 then increase the value of the variable representing 1 by 1, changing the variable by 1.
6. Create another sprite that is the rolling of the die – as soon as the sprite finishes rolling, **broadcast a message** (see events), telling the other sprite to display their faces. This is done by using a **broadcast** block.
7. When the sprites receive the message, they all show their values (i.e. the number of times each of the other die faces appears.)
8. Don't forget to hide the sprites when appropriate.