Fun with P (geometric), Part 1

Getting started

1. Start by teaching the concept of geometric probability. I use the ‘need’ versus ‘have’ method. On top of the fraction is what you need/are looking for. On the bottom of the fraction is the entire surface or playing board.
2. I, on purpose, do not talk about any limitations, such as the assumption that the target will allows be hit.
3. I then draw a segment of any given length on the board. Make at least five distinct points with different lengths in between each set of points. I then work through several problems, including multi-region examples. Emphasize that as long as the playing surface does not change, the denominator does not change.

During the Activity

1. Using Cabri Jr., bring up the file named **GPSHAPES** project onto a flat surface.
2. Label the figures with lengths that make sense and are to scale for the projected image. Make sure that the playing surface, the outside box, is labeled so that the students will know the "have" portion of the probability.
3. Go over how to solve one of the probabilities for a single shape, and then allow the students to find multiple probabilities.
4. Ask the class for one of the probabilities, and whoever gets the correct answer, have them use the Frisbee to attempt to "beat the house."
5. Give the student 10 throws, and keep track of their statistics. Depending on how the student does, multiple lines of questioning can evolve.
6. How does not hitting the board affect the probability? Is this a limitation of geometric probability? What assumptions are being made when using geometric probability? Can a student ever beat the odds of the house?

Fun with P (geometric), Part 2

1. This activity involves a real world application, a dart board.
2. Project, using Cabri Jr., the file named **GPDART** onto a wall or whiteboard.
3. Label the playing surface and the radii of 4 circles with appropriate dimensions. Make sure that you see notice that the large circle has a diameter that is the same length of the short side of the playing board.
4. Examples of radii length are as follows (3, 5, 7, 9) and playing board dimensions of 28 by 18. 5.
5. Give one example, and then do some simple circle area probabilities. Make sure that the students know that when they do the larger circles, that the need to add the radii of all of the circles that are on the inside.
6. Expand thinking by having the students, without assistance; find the probability of hitting a single ring, not a circle. See how the students go about finding the probability. Clear up any misconceptions if needed. (Big circle area? little circle area) divided by the entire playing surface. Also, allow them to do the probability of hitting the background and not the actual dartboard.
7. Have the students use a nerf dart gun or Frisbee to beat the odds.

Fun with P (geometric), Part 3

1. This Part is the same type of activity that is in Part 1 and 2, but this time it involves a quiz to test for understanding of geometric probability.
2. Project, using Cabri Jr., the file named **GPSNOW** onto a wall or whiteboard.
3. Pass out the handout, **Snowmanquiz**, that is associated with this worksheet.
4. The handout gives the radii length and the board dimensions for the activity.
5. Allow the students to do the following probabilities:
    a. A. Head Shot B. Chest Shot C. Booty Shot D. Button Shot E. Snowman F. Chest, but no buttons G. Miss the Snowman Completely 6.
    b. Here are the answers for the above mentioned probabilities: A. 13.1 % B. 5.8 % C. 1.5 % D. 0.6 % E. 20.4 % F. 5.2% G. 79.6%