Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_

# WS 12-2

# Probability and Odds Day 2

Activity 1: The probability of a kiss

**Background:** The paper “What is the Probability of a Kiss? (It’s not what you Think)” (*Journal of Statisticss Education* (2002)) posed the following question: What is the probability that a Hershey’s Kiss will land on its base (as opposed to its side) if it is flipped onto a table? Unlike flipping a coing, there is no reason to believe that this probability would be ½.

1. As a class, develop a pan for a simulation that would enable you to estimate the probability. State the plan below:

2. Carry out the plan and use it to produce an estimate of the desired probability.

4. Do you think that a kiss is equally likely to land on its base or its side? Explain.

Activity 2: The Odds of Hunger Games

“You become eligible for the reaping the day you turn twelve.  That year, your name is entered once.  At thirteen, twice.  And so on and so on until you reach the age of eighteen, the final year of eligibility, when your name goes into the pool seven times.  That’s true for every citizen in all twelve districts in the entire country of Panem.

But here’s the catch.  Say you are poor and starving as we were.  You can opt to add your name more times in exchange for tesserae.  Each tessera is worth a meager year’s supply of grain and oil for one person.  You may do this for each of your family members as well.  So, at the age of twelve, I had my name entered four times.  Once, because I had to, and three times for tesserae for grain and oil for myself, Prim, and my mother.  In fact, every year I have needed to do this.  And the entries are cumulative.  So now, at the age of sixteen, my name will be in the reaping 20 times.” *Hunger Games*

This begs the question: What are the odds of being selected? How does the probability of being selected change with the number of tresserae you elect to receive?

1. What do we need to know to be able to estimate the probability?

2. We will assume that there are roughly the same number of boys as girls and roughly the same amount of children in each age bracket from 12-18. If there are roughly 700 girls in District 12 between the age of 12-18 estimate the number of names in the reaping (excluding tressarae) from District 12.

3. If we calculate on the assumption that each kid asks for 1.5 tressarae on average we get a total of 14,000 names in the reaping. What is the probability that you will be chosen the first year your name is in the reaping?

4. If you are 16 and you ask for 3 tressarae each year for you and your family what is the probability your name will be selected in the reaping?

5. If you are 18 and you have asked for 7 tressarae each year for you and your family what is the probability your name will be selected in the reaping?