

Unit 7 Lesson 8: Not Always Ideal

1 When Does It Get Weird? (Warm up)

Student Task Statement

Lin, Kiran, and Diego are going to shoot 100 free throws each for practice. Based on their shooting in the past, Lin thinks they are all of similar ability, and Lin estimates that they each have a 60% chance of making each shot. They each shoot their shots.

- Lin makes 63 of the 100 shots.
- Kiran makes 75 of the 100 shots.
- Diego makes 35 of the 100 shots.

From the results, do you agree with Lin's estimate for the chance of each person making each shot? Explain your reasoning.

2 What is Reasonable?

Student Task Statement

1. What is the probability that you will flip heads when using the coin you have?
2. Estimate the number of heads you will get when you flip the coin 20 times.
3. Flip your coin 20 times and record the number of heads you get. Repeat this process 4 more times.

trial number	1	2	3	4	5
number of heads					

4. Create a dot plot that shows the number of heads in 20 flips using data from the class.
5. What is the fewest number of heads flipped by the class in 20 flips? What is the greatest number of heads flipped by the class in 20 flips?
6. Based on the class dot plot, describe a range of values that represent a reasonable number of heads to flip when flipping 20 times.
7. Priya flips her coin 20 times and it lands showing heads twice.
 - a. Is it possible for this to happen with a fair coin?
 - b. Based on the class distribution, should she be suspicious of this being an unfair coin? What can she do to provide evidence that it's not a fair coin?

3 Is That Fair?

Student Task Statement

The local news station wants to interview 8 students from a school. There are 25 students on the student council. Ten of the students are from the graduating class and 15 are from the other classes. The principal has a difficult time deciding which students from the council will get interviewed, so she tells the group of students that she will put all of the names in a bowl, mix the names, then the first 8 names who are selected from the bowl will get to be interviewed.

The next day, the principal returns with the names selected. It turns out that 5 of the students who get to be interviewed are in the graduating class and only 3 of the students selected are from other classes. The students who are not in the graduating class complain that this doesn't seem fair. They suspect that the principal chose the group rather than selecting at random.

1. Do you think the principal could have chosen this group of students at random like she promised? Explain your reasoning.
2. Simulate the drawing many times to find some possible results.
 - a. Cut a piece of paper into 25 equal-sized pieces. On 10 of the pieces of paper, write "graduating class." On the other 15 pieces of paper, write "other classes." Fold the papers in half and mix them up.
 - b. Take turns with your partner to draw 8 pieces of paper and record the number of students chosen that are in the graduating class.
 - c. Repeat this process 4 more times.

drawing number	1	2	3	4	5
number of students in the graduating class					

3. Create a dot plot that shows the number of students chosen from the graduating class by all of the students in your class.
4. Based on the dot plot, do you think it is reasonable that the principal selected the students for the interview at random and still chose 5 of the 8 students who are in the graduating class? Explain your reasoning.