Flipping Coins

What do you think the odds are that you will flip a coin 10 times and it will land on heads all 10 times? It may surprise you that the odds are 1 out of 1024. In other words, not likely. What about getting heads 3 times in a row? That would be a 1 out of 8 chance. Calculating the probability of almost everything is done in all types of jobs. Insurance rates, the likelihood someone will make both free throws in a basketball game, and even the chance you will live to 100 are all calculated using data and probability.

You are going to look at a simpler example of flipping a coin two times. In the spaces provided using H for Heads and T for Tails, list the possible outcomes.

1st flip	2nd flip

1st flip	2nd flip

1st flip	2nd flip

1st flip	2nd flip

Check with your neighbor and see if they got the same thing as you. Look at the very end of this worksheet and you will see the answers at the bottom of the page. You can see there are only four possibilities, so the odds of flipping Heads twice in a row is 1 out of 4. Does this mean that if you did this 100 times, you would get Heads twice in a row exactly 25 times since 25/100 is 1 out of 4? In reality, you probably will not get it exactly 25 times, but it should be pretty close. The idea of probability is that if it were done an infinite amount of times, it would be right at 25%.

We want to do a simulation of flipping a coin 100 times, and we are going to do that using a spreadsheet. Watch the video of how we will do it first and then follow the directions and set up the spreadsheet in Google Sheets. Watch the video at
https://www.youtube.com/watch?v=0wdl6rNLZDI

Your teacher will give you the directions for creating the spreadsheet now. You can save the spreadsheet in your drive if you like.

Record your data below.

Data Chart (100 Rolls)

Outcome	Percent Occurrence Roll 1	Percent Occurrence Roll 2	Percent Occurrence Roll 3	Percent Occurrence Roll 4	Percent Occurrence Roll 5	Percent Occurrence Roll 6	Percent Occurrence Roll 7	Percent Occurrence Roll 8	Percent Occurrence Roll 9	Percent Occurrence Roll 10
Heads, Heads										
Tails, Tails										
Heads, Tails										
Tails, Heads										

Now that you have recorded your data, you have 1000 rolls.

Open up a new spreadsheet and make the chart like above and entire your data (numbers) into the spreadsheet. Make a Final Column where you add up each row. Your teacher will tell you if he/she wants you to save this file.

Questions to consider or your teacher might discuss them with you as a group. He/she will tell you.

Did any of your rows come out to 250?

If not, how close did you get?

Which of your Rolls (1-10) was the closest to having each one at 25%?

What could you do to try and use the powers of the spreadsheet to find which of your rolls (1-10) was the closest to being perfect (all results occurring 25 times)?

How could you have amended the spreadsheet to have gotten 1000 rolls right away? See if you can do it on the spreadsheet.

HH HT TT TH