Simulations on the Graphing Calculator

The Texas Tornadoes and the Montreal Marauders will play in next week's Hockey Championship. Based on regular season play, the Tornadoes have a 60% chance of beating the Marauders in any one game.

1. If the championship were decided in only 1 game, what is the probability that the Marauders will win the championship?

2. Suppose the two teams played 100 games. How many games would you expect each team to win? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

3. Describe how you would design one trial of a simulation model for a one-game series. Use the random number generator on the calculator. How will you define the numbers to represent a Texas or a Montreal win?

4. Is it appropriate to use a coin flip as a model to determine which team wins a game? Use mathematics to justify your answer.

Suppose the teams play a **five game series**.

5. How many games need to be won by a single team to win and end the series?

6. Describe how to conduct one trial of a simulation model for this series?

7. How could you use this model to estimate the probability that the Tornadoes will win the series?

8. Conduct 20 trials and record the results of each trial on a separate sheet of paper. Summarize your results by completing the frequency table below. Note: the series will end as soon as one team wins three games.

Series Winner	Frequency
Tornadoes	
Marauders	
Total	20

9. Based on your data, what is the probability that Texas wins the Hockey Championship?

Simulations on the Graphing Calculator
Answer Key

1. 40%
2. Tornadoes should win approximately 60 games and Marauders should win 40 games.
3. Answers will vary. One possibility is to generate 10 numbers, let 6 of the numbers represent a Tornado win and let the other 4 represent a Marauder win.
4. Because the teams do not have an equal chance of winning (i.e. heads – Tornado win and tails – Marauder win), a coin can not be used to model the results of a single game.
5. 3 games
6. Using the number values assigned in #3, look at up to five digits at a time to observe who wins each game in the series. As soon as a team wins the series, begin a new trial.
7. Conduct many, many trials, and determine the probability that the Tornadoes will win.
8. Answers will vary. The results of one simulation are shown below:

Series Winner	Frequency
Tornadoes	16
Marauders	4
Total	20

9. Answers will vary. According to the above results: $\frac{16}{20} = 0.80$.