A You roll a number cube once. Complete the table of theoretical probabilities for the different outcomes. Remember that theoretical probability is the ratio of the number of ways an event can occur to the total number of equally likely outcomes.

Number	1	2	3	4	5	6
Theoretical Probability	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

17% 17% 17% 17% 17% 17%

B Using your knowledge of theoretical probability, predict the number of times each number will be rolled out of 30 total rolls.

1: 5 times   3: 5 times   5: 5 times

2: 5 times   4: 5 times   6: 5 times

$\frac{1}{6} = \frac{x}{30}$

$6x = 30$

$x = 5$

C Roll a number cube 30 times. Complete the table for the frequency of each number and then find its experimental probability.

Number	1	2	3	4	5	6
Frequency	6	5	2	8	3	6
Experimental Probability	$\frac{6}{30}$ 20%	$\frac{5}{30}$ 17%	$\frac{2}{30}$ 7%	$\frac{8}{30}$ 27%	$\frac{3}{30}$ 10%	$\frac{6}{30}$ 20%

D Look at the tables you completed. How do the experimental probabilities compare with the theoretical probabilities?

Some are close, some not so close.

E Conjecture By performing more trials, you tend to get experimental results that are closer to the theoretical probabilities. Combine your table from C with those of your classmates to make one table for the class. How do the class experimental probabilities compare with the theoretical probabilities?

they will get closer to theoretical

REFLECT

3. Could the experimental probabilities ever be exactly equal to the theoretical probability? Why or why not?

Yes. it is random.