## The Multiplication Game

Roll 2 dice. Multiply the numbers.
If the answer is odd, player \#1 gets a point.
If the answer is even, player \#2 gets a point.
Roll the dice 36 times.

Name $\qquad$
Date $\qquad$
Period $\qquad$

1) Predict whether or not you think this game is fair. Explain your prediction.
2) Play the game.

| 3) Roll <br> Number | Product | Odd or <br> even? | Roll <br> Number | Product | Odd or <br> even? | Roll <br> Number | Product | Odd or <br> even? |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1}$ |  |  | $\mathbf{1 3}$ |  |  | 25 |  |  |
| $\mathbf{2}$ |  |  | $\mathbf{1 4}$ |  |  | 26 |  |  |
| $\mathbf{3}$ |  |  | 15 |  |  | 27 |  |  |
| $\mathbf{4}$ |  |  | 16 |  |  | 28 |  |  |
| $\mathbf{5}$ |  |  | 17 |  |  | 29 |  |  |
| $\mathbf{6}$ |  |  | 18 |  |  | 30 |  |  |
| 7 |  |  | 19 |  |  | 31 |  |  |
| $\mathbf{8}$ |  |  | 20 |  |  | 32 |  |  |
| $\mathbf{9}$ |  |  | 21 |  |  | 33 |  |  |
| $\mathbf{1 0}$ |  |  | 22 |  |  | 34 |  |  |
| $\mathbf{1 1}$ |  |  | 23 |  |  | 35 |  |  |
| $\mathbf{1 2}$ |  |  |  | 24 |  |  | 36 |  |

Player One Score $\qquad$ Player Two Score $\qquad$ Winner $\qquad$
3) Based on your data, what is the experimental probability of rolling an odd product? An even product?

$$
\mathrm{P}(\text { odd })=\ldots \quad \mathrm{P}(\text { even })=
$$

4) Find all the possible products you can get when rolling two number cubes. Organize your data.
5) What is the theoretical probability of rolling an odd product? An even product?

$$
\mathrm{P}(\text { odd })=
$$

$\qquad$ $P($ even $)=$ $\qquad$
6) Is the multiplication game a fair game? Explain why or why not using probability.

## A "Dozen or Nothing" Game

Roll one die
If the number is 1 , player \#1 gets 12 points.
If the number is even, player \#2 gets that number of points.
If the number is a 3 or a 5 , neither player receives a score.
Roll the dice 36 times.

| Make a prediction: |
| :--- |
| Roll <br> Number Outcome Points/Player Roll <br> Number Outcome Points/Player Roll <br> Number Outcome <br> $\mathbf{1}$   $\mathbf{1 3}$   25  <br> $\mathbf{2}$   $\mathbf{1 4}$   26  <br> $\mathbf{3}$   $\mathbf{1 5}$   27  <br> $\mathbf{4}$   16   28  <br> $\mathbf{5}$   $\mathbf{1 7}$   29  <br> $\mathbf{6}$   $\mathbf{1 8}$   30  <br> $\mathbf{7}$   $\mathbf{1 9}$   31  <br> $\mathbf{8}$   20   32  <br> $\mathbf{9}$   21   33  <br> $\mathbf{1 0}$   22   34  <br> $\mathbf{1 1}$   23   35  <br> $\mathbf{1 2}$   24   36  |

Player One Score $\qquad$ Player Two Score $\qquad$ Winner $\qquad$
Is this a fair game? Explain why or why not using probability.

## A Game of Chance-fair or not?

The Game: Helen and Simon are playing a game with one die each. If the roll is a 5 or 6 , Helen gets the points on the die and Simon gets 0 .
If the roll is a $1,2,3$, or 4 , Simon gets the points on the die and Helen gets 0 points. The object of the game is to roll the die until someone reaches 20 points (or over) to win.

- Who do you think will win the game? Why?

Play the game a few times-
keep a record of the games and the winners.

- Has your opinion changed or not? Explain.
- Is this game fair? Explain why or why not using probability.

| Roll <br> Number | Outcome <br> (Points) | Who <br> gets the <br> points? | Total <br> points <br> for <br> player | Winner <br> (20 points <br> total) |
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