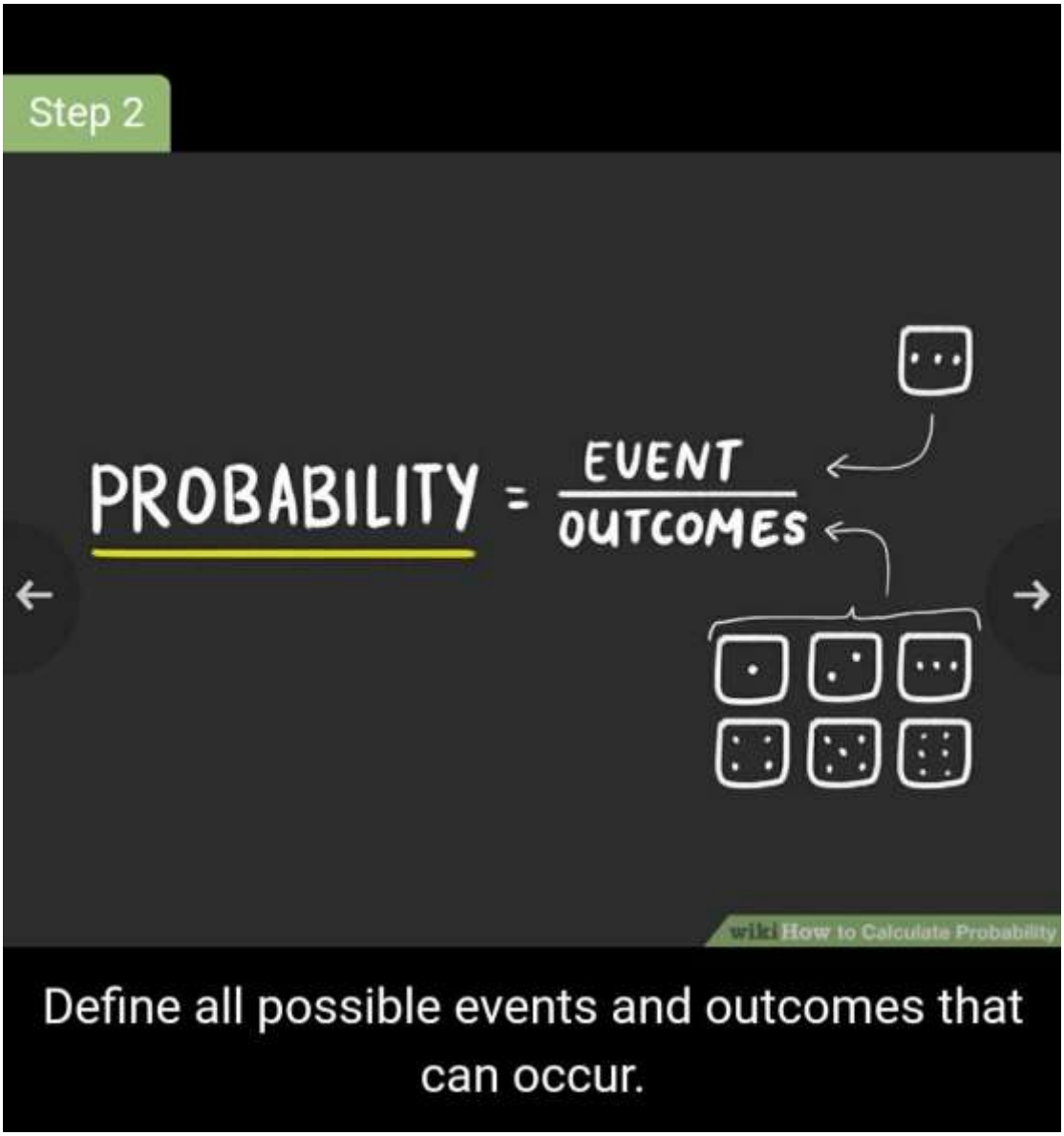
How to Calculate Probability

LEC 6

OLA ALI

1

Choose an event with mutually exclusive outcomes. Probability can only be calculated when the event whose probability you're calculating either happens or doesn't happen. The event and its opposite both cannot occur at the same time. Rolling a 5 on a die, a certain horse winning a race, are examples of mutually exclusive events. Either a 5 is rolled or it isn't; either the horse wins or it doesn't.

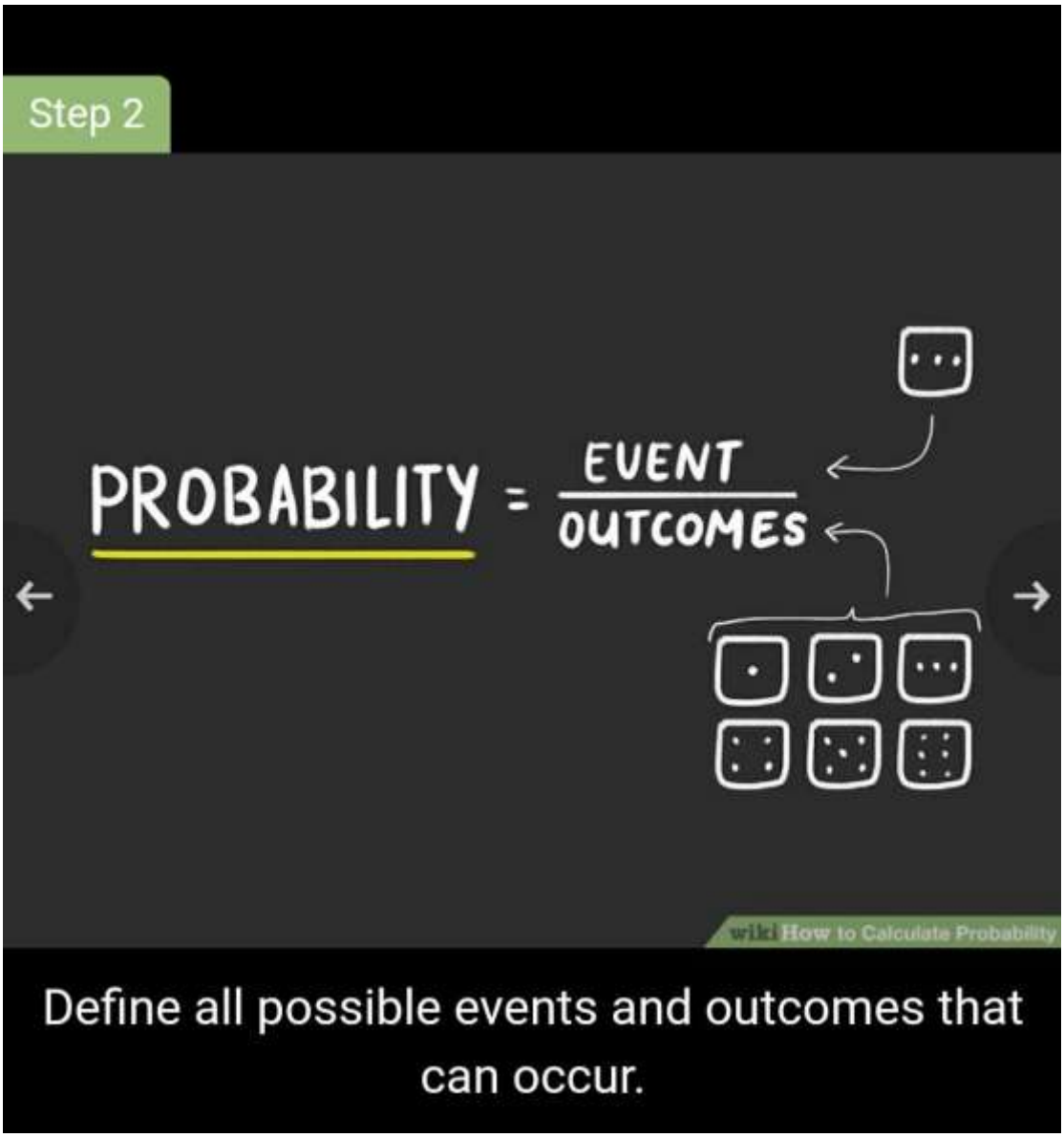


2

Define all possible events and outcomes that can occur. Let's say you're trying to find the likelihood of rolling a 3 on a 6-sided die. "Rolling a 3" is the event, and since we know that a 6-sided die can land any one of 6 numbers, the number of outcomes is 6. So, we know that in this case, there are 6 possible events and 1 outcome whose probability we're interested in calculating.[3] Here are 2 more examples to help you get oriented:

- **Example 1**: *What is the likelihood of choosing a day that falls on the weekend when randomly picking a day of the week?* "Choosing a day that falls on the weekend" is our event, and the number of outcomes is the total number of days in a week: 7.
- **Example 2**: *A jar contains 4 blue marbles, 5 red marbles and 11 white marbles. If a marble is drawn from the jar at random, what is the probability that this marble is*

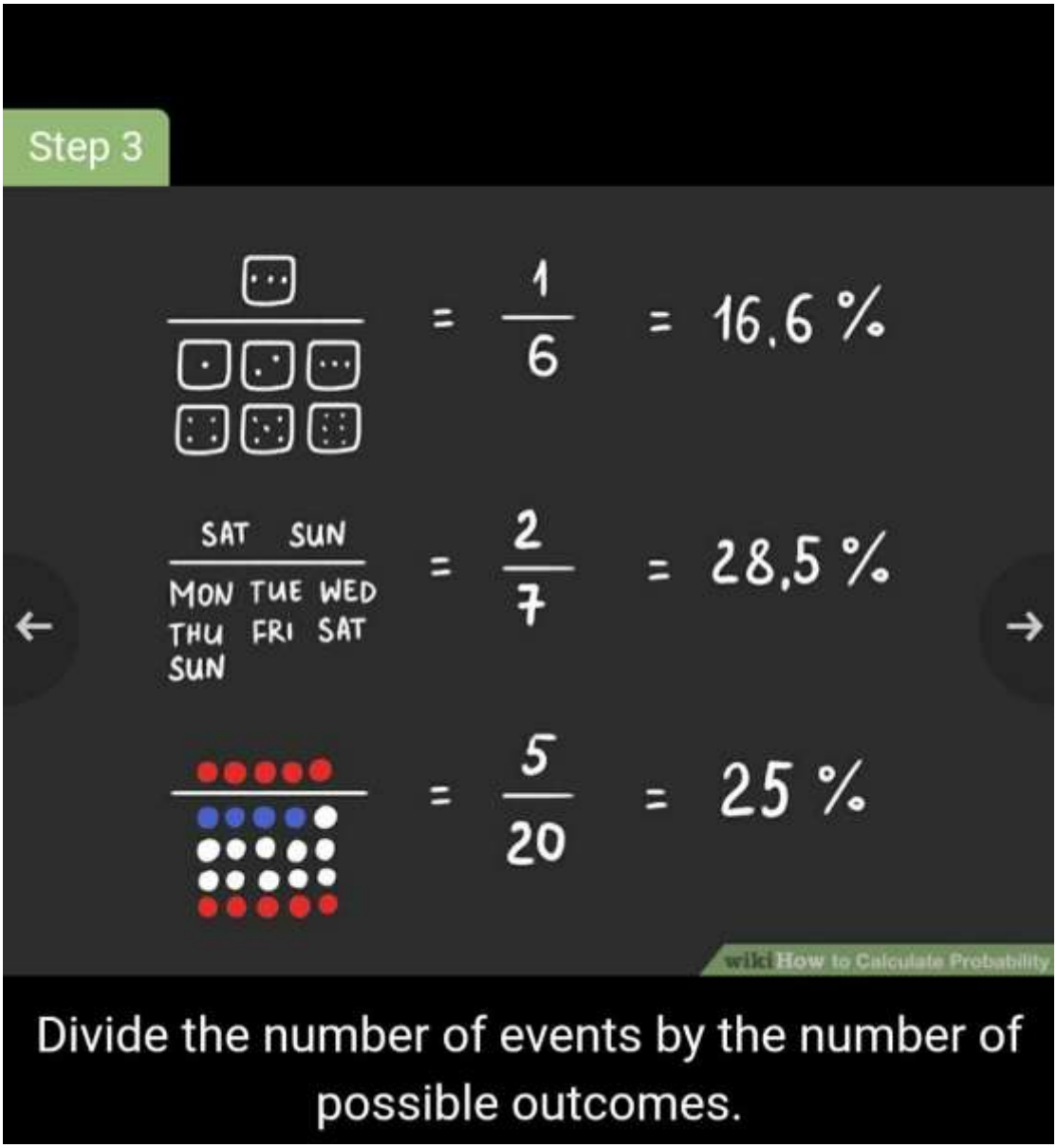
red? "Choosing a red marble" is our event, and the number of outcomes is the total number of marbles in the jar, 20.



3

Divide the number of events by the number of possible outcomes. This will give us the probability of a single event occurring. In the case of rolling a 3 on a die, the number of events is 1 (there's only a single 3 on each die), and the number of outcomes is 6. You can also express this relationship as 1 ÷ 6, 1/6, 0.166, or 16.6%.[4] Here's how you find the probability of our remaining examples:[5]

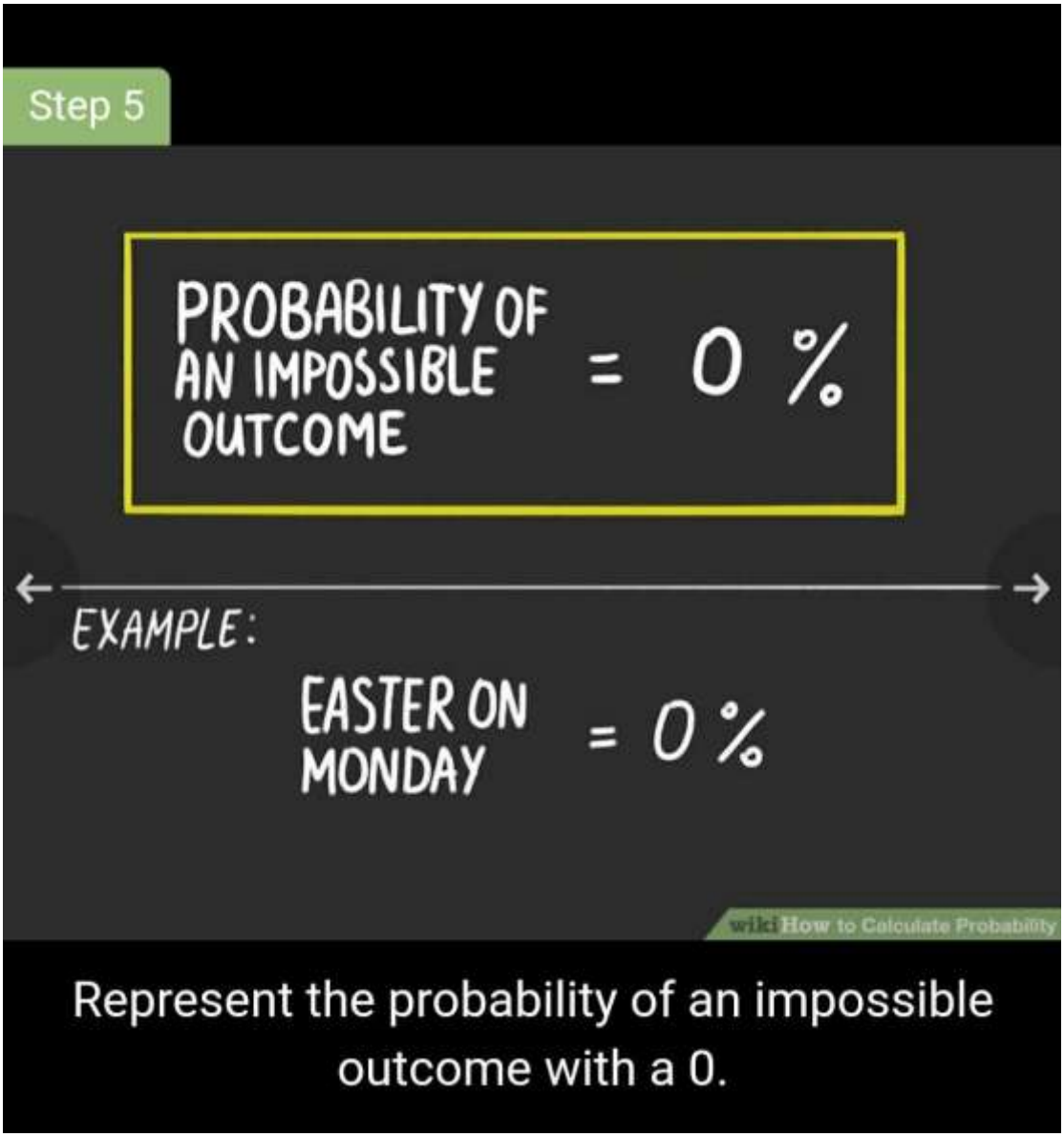
- **Example 1**: *What is the likelihood of choosing a day that falls on the weekend when randomly picking a day of the week?* The number of events is 2 (since 2 days out of the week are weekends), and the number of outcomes is 7. The probability is 2 ÷ 7 = 2/7. You could also express this as 0.285 or 28.5%.
- **Example 2**: *A jar contains 4 blue marbles, 5 red marbles and 11 white marbles. If a marble is drawn from the jar at random, what is the probability that this marble is red?* The number of events is 5 (since there are 5 red marbles), and the number of outcomes is 20. The probability is 5 ÷ 20 = 1/4. You could also express this as 0.25 or 25%.


Step 3
= 1/6 = 16,6 %
SAT SUN
MON TUE WED
THU FRI SAT
SUN
= 2/7 = 28,5 %
= 5/20 = 25 %
wikiHow to Calculate Probability
Divide the number of events by the number of possible outcomes.

4

Add up all possible event likelihoods to make sure they equal 1. The likelihood of all possible events needs to add up to 1 or to 100%. If the likelihood of all possible events doesn't add up to 100%, you've most likely made a mistake because you've left out a possible event. Recheck your math to make sure you're not omitting any possible outcomes.[6]

- For example, the likelihood of rolling a 3 on a 6-sided die is 1/6. But the probability of rolling all five other numbers on a die is also 1/6. 1/6 + 1/6 + 1/6 + 1/6 + 1/6 + 1/6 = 6/6 , which = 100%.



5

Represent the probability of an impossible outcome with a 0. This just means that there is no chance of an event happening, and occurs anytime you deal with an event that simply cannot happen. While calculating a 0 probability is not likely, it's not impossible either.