

# Example Context Elaboration: Calculating Probabilities

Focus: Calculate probabilities

## Achievement objective S8-4

*In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:*

Investigate situations that involve elements of chance:

A calculating probabilities of independent, combined, and conditional events

B calculating and interpreting expected values and standard deviations of discrete random variables

C applying distributions such as the Poisson, binomial, and normal

## Fair card games

Graham and Samantha play a game of cards. They each have a set of cards numbered 1 to 10. They call themselves player A and player B. One game consists of each player selecting a card at random from their set. They play twenty games, recording the results.

Player A wins if both cards are the same.

Player B wins if the total of the two cards is 12.

Graham and Samantha must decide how many points each player should be awarded when they win a game to make the game fair. Using a table or a tree diagram to systematically show all possible outcomes they are able to calculate the probability of a win for each player and work out a marking system.

Try other variations, for example, player B wins if the cards are different.