RICH MATHEMATICAL TASK BOOKLET

PROBABILITY

YEAR 5-6 EVEN YEARS

Teacher Booklet

Task 1

TV NZ is running a ‘best catches’ competition for cricket.

To enter you need to list the catches in order from A to D. There are four to choose from:

Catch A – Trent Boult

Catch B – Tom Latham

Catch C – Kane Williamson

Catch D – Tim Southee

What are all the different ways that the catches could be ordered?

How many entries would you need to cover all the possibilities?

Task 1 (independent)

In the table tennis singles championships, the semi-finalists were:

Santiago, Lia, Chaewon, and Pania.

All of the players had to play each other once. How many matches were played altogether?

For the next round the semi-finalists had to partner each other for one game. How many games would have to be played?

Task 2

Read the statements below and discuss whether you agree or disagree with them.

The All-blacks will win the next world cup	One is the hardest number to roll on a dice
A game is unfair if you don't follow the rules.	A friend will come over to your house after school.
It is easier to roll an even number on a dice than an odd number.	If you buy lots of scratch and win cards you will win a prize.

Everyone in your group must agree and you should provide a range of reasons for your argument.

Task 2 (independent)

Frankie is not convinced that the chance of rolling a one on a dice is the same as other numbers.

Use the dice and undertake a trial to see if you can convince her.

First roll the dice twenty times and record the results in a tally-chart. Represent these in a column graph.

For the next trial, roll the dice 100 times and record the results in a tally-chart. Represent these in a column graph.

What do you notice?

Compare your results with other students. Are they the same or different?

Combine your results with 4 other students and add up the total of rolling a dice 500 times.

What do you notice?

Task 3

Lyric has made up the rules for a game of beanz. She asks her brother Sanjay to play it with her. Lyric puts four beans in the bag with two blue beans and two red beans.

Lyric's rules are to pick two beans from the bag without looking. If the beans are different colours then Lyric gets a point, if the beans are both red then Sanjay gets a point.

Is Lyric's game fair?

Explain your answer.

How many points do you think Lyric would get if they play the game 10 times?

Use the beans and bags and test the game by trialling picking out the beans 10 times. Record your results in the table:

	Lyric wins	Sanjay wins	No winner
Outcome of 10 trials			
Outcome of 40 trials			
Total outcome			

Now test the game by trialling picking out the beans 40 more times and record the results and total the outcomes.

Make statements about what you notice.

Make statements about the results.

Task 3 (independent)

Hamuera has a jar with jellybeans in it.

There are 3 red jellybeans, 4 green jellybeans, and 5 yellow jellybeans.

If you could not see what colours you were taking out, how many jellybeans would you have to take out of the jar to make sure that you had two of the same colour?

If you could not see what colours you were taking out, how many jellybeans would you have to take out of the jar to make sure that you had three different colours?

Task 4

The money or the bag gameshow involves contestants choosing from 10 balls hidden in a bag. There are 5 red balls, 3 yellow balls, and 2 blue balls. To win you need to pull out the red balls.

Contestant Number One pulls out the first ball and it is red. This means that they win a large amount of money. Now they have a choice:

1) Stop playing and take the prize money.
2) Pick another ball with these results:
   - If it is red, they double their money.
   - If it is yellow, they lose all the money.
   - If it blue, they can pick one final ball.

What should Contestant Number One do? Provide reasons for your choice.

Use the feely-bags and cubes to test your predictions. Record the results of at least 30 trials.

Does this change your advice?

Task 4 (independent)

Invent your own dice games.

Design one game which you think is fair.

Design one game which you think is unfair.

Ask someone to play both games with you for ten rounds.

Record the results and represent these.

Explain whether the results support your predictions about the fairness or unfairness of the games.

Task 5

Lucas has made up a game with dice for two players.

The rules are that you roll both dice and subtract the smaller number from the larger number.

Player One gets a point if the difference is 0, 1, 2

Player Two gets a point if the difference is 3, 4, 5.

Do you think this game is fair? Make a prediction and explain your thinking using a representation.

Test your argument using the dice and roll the dice 30 times and work out the difference. Record and represent the results.

Task 5 (independent)

You can work with a buddy or by yourself for this activity.

Select a question about a game from the questions that were brainstormed with your teacher at the beginning of the mathematics lesson.

Begin by considering how you will investigate the question.

What outcomes are possible in relation to your question?

What is the theoretical probability of the different outcomes?

Develop a representation that shows this including a graph.

Write a plan for how you will investigate the experimental probability of the outcomes. This will need to have trials with different sample sizes. Develop representations that show these results including graphs.

Make statements about what you have found out.

Make a poster that has the following information;

1) An introduction including what you choose to investigate.
2) The theoretical probability and related representations.
3) The plan to investigate the probability outcomes.
4) The outcomes of your trials with different sample sizes and the related representations.
5) Statements related to your findings.
6) A conclusion.

Task 6

Siautu and Niu like to play Suipi but they think they need a better understanding of the probability of drawing certain cards.

They list some possibilities and then marked them on the probability scale below:

1) A spade
2) An ace
3) A red card
4) A red jack
5) A picture card
6) A heart
7) A diamond or club.

Where would each be marked on the scale?

_____

100% 50% 0%

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Task 7

Read the probability experiment poster.

What is interesting?

What is something you have learned from the poster?

What is a question that you have about the experiment?