RICH MATHEMATICAL TASK BOOKLET

PROBABILITY

YEAR 5-6 ODD YEARS

Teacher Booklet

Task 1 (whole class option)

Ban Heng is ordering a lunch box at a local café. He is wondering what different combinations he could order with the following options. He can choose one item from each category.

Snack choice	Main choice	Drink choice
Apple	Toasted sandwich	Tea
Cookie	Sushi	Coffee
	Pie	
	Wrap	
	Pizza	

What are the different combinations that Ban Heng could order?

How many different combinations are there?

Can you prove that you have found them all?

Task 1 (independent)

At Subway you can order different sandwich combinations. You can choose one type of bread, one filling, and one sauce.

Bread	Fillings	Extra fillings
White	Chicken	Tomato
Wholemeal	Meatballs	Lettuce
	Egg	

What are the different combinations that you could order?

How many different combinations are there?

Can you prove that you have found them all?

Task 2

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

It always rains in January	Six is the hardest number to roll on a dice
A game is fair if you follow the rules.	You will see someone you know on the way home from school.
It is easier to get heads than tails when you flip a coin.	If you buy lots of lotto tickets, 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)

Lani is not convinced that the chance of rolling a six 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

The toyshop is selling marbles which come in three colours: gold, silver, and purple. They sell them in a packet with one of each colour.

The toyshop assistant had been sorting them into packets to sell, however, the larger bags spilled and got mixed up. The assistant randomly divided the marbles into bags of three to sell.

Help the toyshop assistant work out the probability of selecting three different colours of marbles for each packet if they are being selected randomly.

Begin by making a prediction for how often you think you will get one marble of each colour if you have 30 marbles (10 of each colour) and take three out randomly each time until they have all been packaged.

Now test your prediction by using the beads and feely bag. Trial this ten times and record the colours that you pull out each time.

Task 3 (independent)

I choose five cubes from a feely-bag without looking. There are three red cubes and two blue cubes. What colour cubes might be in the bag and how many of each?

Give a range of solutions and explain each one.

The probability of selecting a yellow cube from a feely-bag is $\frac{1}{3}$. What colour cubes might be in the bag and how many of each?

Task 4

Mere and Mepa were discussing what happens when you roll two dice and add the total.

Mere said “If I throw the dice twenty times, I will get any total from two to twelve”.

Mepa said: “No Mere, there are some totals that are more likely than others”.

Who do you agree with? Why?

Test your argument using the dice and roll the dice 40 times and add the total. Record and represent the results.

Task 4 (independent)

When you roll two dice would the sum of the dice be more likely to add to 9 than 10?

If you roll three dice, would the sum of the dice be more likely to add to 9 or to 10?

Use a representation or diagram to support your answer.

Now, test your prediction for three dice by rolling the dice and trialling this at least 40 times. Record and represent your results.

What do you notice?

Task 5

A game uses a set of digit cards from 2 to 6 (2, 3, 4, 5, 6).

To play, you randomly pick two cards out of the bag and add the numbers together.

If the total is even then you win.

If the total is odd then you lose.

Is this a fair game?

Test your prediction using the digit card at least 40 times and add the total. 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

Tiritiri Matangi Island is an open bird sanctuary.

The Department of Conservation runs a bird banding programme to help scientists learn about bird populations. This means they catch a sample of the birds and put a band on their foot.

Today you will be helping the scientists try and work out the fraction of four species of birds and how many birds are on the island.

Firstly, decide on how you will record the data. Then take ten bird pictures from the bag and put a sticker on them to indicate a band and record the species.

Now return all the bird pictures to the bag and mix them up.

This time take 20 bird pictures from the bag and put stickers on those that are not banded. Record the species and indicate which have already been banded.

Use the samples that you have taken to predict the fraction of birds that are each species. What might the total number of birds be? How many of the total would you expect to be each species?

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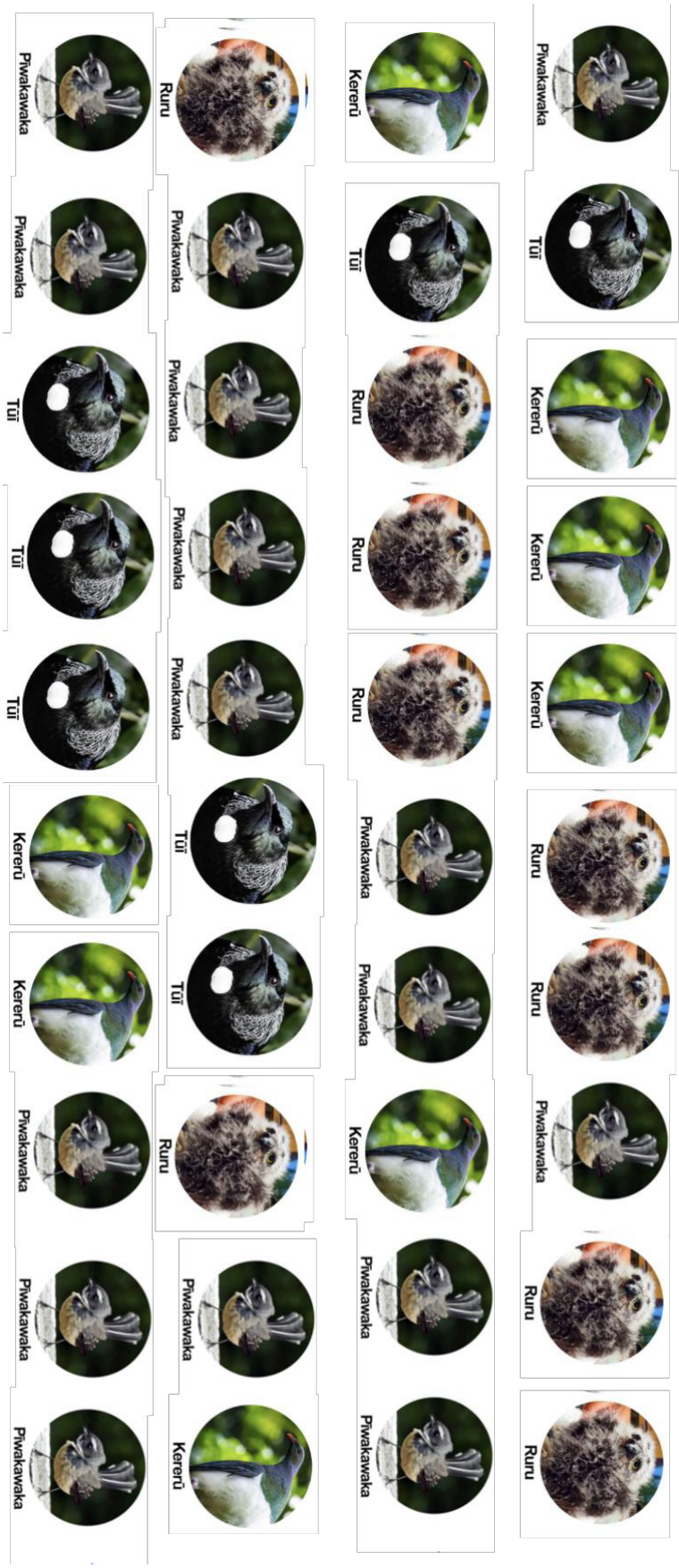
Task 6 (bird images)



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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?