RICH MATHEMATICAL TASK BOOKLET

PROBABILITY

YEAR 1

Teacher Booklet

Task 1

Decide how likely it is that you will have these things for dinner tonight.

1. Weetabix
2. Chicken
3. Potatoes
4. Ice cream
5. Fish and Chips
6. Carrots

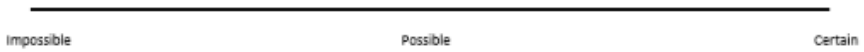
Put them on your continuum and be ready to justify why you have put them there.

Can you add two more things to your continuum and justify why you have put them there?

Teacher Notes

During the launch, ask the students to think of things that they would eat for dinner. Ask them to share things that it would be impossible that they would eat for dinner, possible, and certain.

Model putting these on a continuum as you discuss.



Provide each pair of students with a continuum (on paper or with masking tape and labels on the floor) and pictures of the food for them to place.

Facilitate the students to notice and discuss why the same events may be placed at different points on others' continuums.

Monitor for students using vocabulary of certain, impossible, possible, likely, unlikely or chance.

Big Ideas

When there is a chance-based situation, there are sets of possible outcomes that can be arranged into events.

Probability is the chance of an event occurring. This can be represented with probability language or numerical values (e.g., 0% - impossible or 100% certain).

Curriculum Links

During Year 1
Engage in stories that involve chance-based situations and:
– decide if something will happen, won't happen, or might happen

– identify possible and impossible outcomes (e.g., for what might happen next)

Shareback

Select students to share who have placed the events on a continuum and can give an explanation and justification for the placement of the event.

Ask students who may have placed the same events at different places to share their reasons for why it would be on a different place on the continuum for them.

Connect

Represent the continuum and ask the students where they would put mud and candy floss. Ask student to choose three more food types and then explain where they would be put on the continuum

Suggested Learning Outcomes

Use the language of probability to classify the chance of events happening.

Represent the probability of an event on a continuum.

Independent Tasks

Solve the following problems:

Leti's netball team scored 14 goals in one game and 3 goals in another game. How many goals did her team score altogether?

Sienna's netball team scored 6 goals in one game and 5 goals in another game. How many goals did her team score altogether?

4 + 15 =

6 + 7 =

9 + 8 =

Mathematical Language

Probability, impossible, unlikely, possible, likely, certain, chance.

Anticipations

Solutions, Misconceptions

Task 2

Decide the probability of these things happening at kura today.

1. We will eat some kai.
2. It will snow.
3. We will watch a movie.
4. We will go to Kapa haka practice.
5. Our teacher will read us a story.
6. We will play outside.
7. We will fly.
8. We will sing a song.

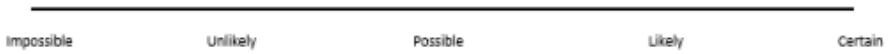
Put them on your continuum and be ready to justify why you have put them there.

Can you add two more things to your continuum and justify why you have put them there?

Teacher Notes

Before the launch, ask the students to sort the following situations into impossible, possible and certain.
If I look out the window, I will see:
A cloud in the sky.
A child walking past.
A pig flying.
A bird on the ground.
Some trees.

During the launch, introduce students to the new terms of likely and unlikely. Add these onto large class continuum and talk about what they mean with some examples.



Have a continuum available for students with new terms added.
Provide each pair of students with a continuum (on paper or with masking tape and labels on the floor) and the situations to place.
Facilitate the students to notice and discuss why the same events may be placed at different points on others' continuums.
Monitor for students using vocabulary of certain, impossible, possible, likely, unlikely, or certain.

For the independent task, provide students with a labelled continuum.

Big Ideas

When there is a chance-based situation, there are sets of possible outcomes that can be arranged into events.

Probability is the chance of an event occurring. This can be represented with probability language or numerical values (e.g., 0% - impossible or 100% certain).

Curriculum Links

During Year 1
Engage in stories that involve chance-based situations and:
– decide if something will happen, won't happen, or might happen

– identify possible and impossible outcomes (e.g., for what might happen next)

Shareback

Select students to share who have placed the events on a continuum and can give an explanation and justification for the placement of the event.

Ask students who may have placed the same events at different places to share their reasons for why it would be on a different place on the continuum for them.

Connect

Represent the continuum and ask the students where they would put the following statements:

1. We will go for a swim.
2. We will do maths.

Ask students to generate more events that would be placed on impossible and those that would be placed on certain on the continuum.

Suggested Learning Outcomes

Use the language of probability to classify the chance of events happening.

Represent the probability of an event on a continuum.

Independent Tasks

Think of what you will do after-school today. On your continuum draw a picture of something that is:

- certain to happen.
- impossible.
- possible.

Add other pictures to your continuum and choose where you place them.

Mathematical Language

Probability, impossible, unlikely, possible, likely, certain, chance.

Anticipations

Solutions, Misconceptions

Task 3

Tui's whanau are having ice cream sundaes for dessert. Tui is allowed to choose her ice cream flavour and one topping for her sundae.

Can you show the different combinations that Tui might choose?

How many different combinations are there?

Teacher Notes

During the launch, remind students of a tree diagram as a way to record different combinations.

Provide the pictures of the different sundae options to the students.
Notice whether students are able to systematically record the different options for the sundae and work out how many different combinations are possible.

During the connect, the possibility of each sundae option could be linked to fractions in relation to the chance of each. This could be recorded as one half for each ice-cream flavour and one quarter chance for each topping.

Shareback

Select students to share who have worked systematically to find all the possible combinations. Model to the students how to draw a tree diagram with cheese at the base.

Big Ideas

When there is a chance-based situation, there are sets of possible outcomes that can be arranged into events. Probability is the chance of an event occurring. This can be represented with language or values (e.g., 0% - impossible or 100% certain).

Data visualisations can be used to show what outcomes are possible and more likely. They can also be used to represent the results of a probability investigation.

Curriculum Links

During Year 1
Engage in stories that involve chance-based situations and:
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– identify possible and impossible outcomes (e.g., for what might happen next)

Connect

What is the chance that Tui chooses chocolate ice cream?
What are the chances that she chooses sprinkles as a topping?

How many combinations would there be if Tui could also choose hokey pokey ice-cream?

Suggested Learning Outcomes

Represent the different outcomes for an event.
Find all of the possible outcomes for an event.

Independent Tasks

Maia is choosing her lunch. She is allowed to choose either a sandwich, hamburger, pizza or a pie, and a piece of fruit.

Can you show the different combinations that Maia might choose?

How many different combinations are there?

What is the chance that Maia will have an apple with her lunch?

What is the chance that Maia will have a pie with her lunch?

Mathematical Language

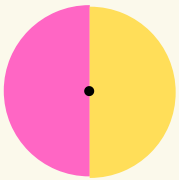
Probability, chance, unlikely, possible, likely, certain, half, quarter, equal chance.

Anticipations

Solutions, Misconceptions

Task 4

Archana has made this spinner for a game.



What is the chance it will land on pink?
What is the chance it will land on yellow?

What do you think will happen if you spin the spinner ten times?
Make a prediction with your buddy.

Spin the spinner ten times and record what happens.

What do you think will happen if you spin another ten times?
Record what you find.

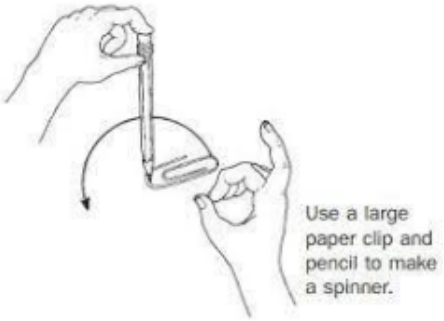
Represent your findings using a tally chart or pictograph.

What do you notice?

Teacher Notes

During the launch, remind students how to record outcomes using a tally chart using from the previous coin toss problem. Also remind students that they could represent the results using a picture graph and have squares of pink and yellow paper available for this.

Have copies of the spinner for each pair. Children can spin it using a pencil held upright in the middle and a paperclip.



Facilitate the students to notice that we can represent chance as a fraction. There is a half chance that the spinner will land on pink or yellow. This is also called an equal chance.

Notice whether students are recording the results accurately and systematically and support them to do this.

For the independent activity have colouring pens or pencils available.

Big Ideas

When there is a chance-based situation, there are sets of possible outcomes that can be arranged into events. Probability is the chance of an event occurring. This can be represented with language or values (e.g., 0% - impossible or 100% certain).

Data visualisations can be used to show what outcomes are possible and more likely. They can also be used to represent the results of a probability investigation.

Curriculum Links

During Year 1
Engage in stories that involve chance-based situations and:
– decide if something will happen, won't happen, or might happen

– identify possible and impossible outcomes (e.g., for what might happen next)

Shareback

Select students to share who have used a systematic way of recording the data to show the results of their chance investigation. Select students who have used tally-charts, or model this to the students. Ensure that you share the results from several pairs of students.

Connect

Who would be more likely to win for these spinners?

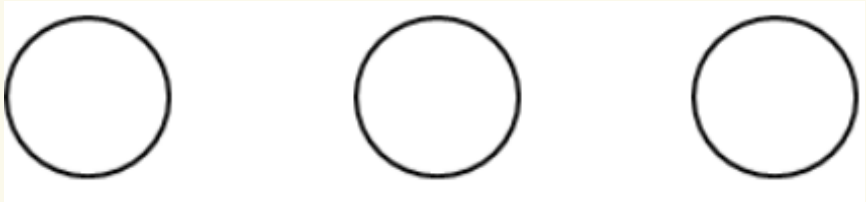
Can you draw a spinner that would have equal chance of winning?

Suggested Learning Outcomes

Identify possible outcomes in a chance situation.
Make a prediction about a chance situation.
Collect and record data for a chance investigation.
Create a data visualisation to represent the results of a chance investigation.

Independent Tasks

Make some spinners for a game of chance.



Make one spinner that has an equal chance for both colours.

Make other spinners that have an unequal chance. Label which colour is more likely to be spun.

Mathematical Language

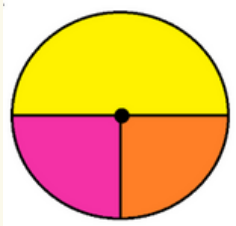
Chance, half, equal chance, tally-chart, picture graph.

Anticipations

Solutions, Misconceptions

Task 5

Lola has made this spinner for a game.



She says:

1. The spinner will either land on yellow, pink or orange.
2. There is an equal chance the spinner will land on pink or orange.
3. The spinner is most likely to land on orange.
4. The spinner might land on purple.
5. The spinner is least likely to land on pink.
6. There is
7. 1212
8. chance of the spinner landing on orange.

Decide which statements that you agree or disagree with and provide reasons.

Make your own statements about the spinner.

Teacher Notes

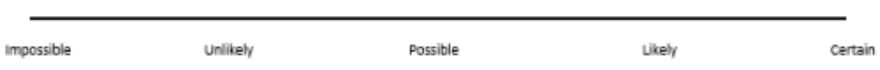
Expect students to justify their responses referring to the spinner and the layout of equal chance.

Monitor for students using vocabulary of certain, impossible, possible, likely, unlikely, or equal chance.

For the independent activity have colouring pens or pencils available.

Shareback

Select students to share back that are able to provide reasons for why they agree or disagree with the statements. Re-introduce the probability continuum during the sharing back and ask students to place the statements on this:



Big Ideas

When there is a chance-based situation, there are sets of possible outcomes that can be arranged into events. Probability is the chance of an event occurring. This can be represented with language or values (e.g., 0% - impossible or 100% certain).

For some situations or games, the chance or probability of particular outcomes can be calculated (theoretical probability). Theoretical probability and what happens in an experiment will differ.

For some situations or games using repeated testing can give a sense of which outcomes are more likely (experimental probability).
A probability experiment involves repeated trials. Results can differ in different trials.

Curriculum Links

During Year 1
Engage in stories that involve chance-based situations and:
– decide if something will happen, won't happen, or might happen

– identify possible and impossible outcomes (e.g., for what might happen next)

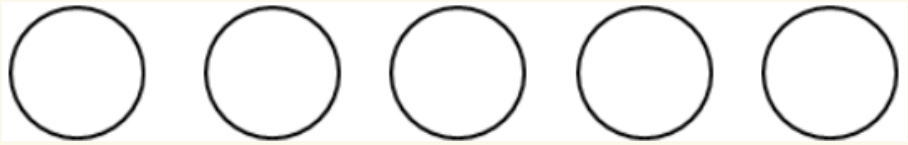
Connect

Make statements about these probability spinners:

Suggested Learning Outcomes

Identify possible outcomes in a chance situation.
Make a prediction about a chance situation.
Analyse statements about a chance situation.
Put statements about a chance situation on a probability continuum.

Independent Tasks



Can you make a spinner that has a half chance of landing on blue?

Can you make a spinner that has a half chance of landing on yellow?

Can you make a spinner that has an equal chance of landing on red or green?

Can you make a spinner that has the most chance of landing on blue?

Can you make a spinner that has the least chance of landing on yellow?

Mathematical Language

Chance, equal chance, half, probability, fair, unfair.

Anticipations

Solutions, Misconceptions

Task 6

Ali and Nesta are playing a game where they draw three balls out of a bag. The balls are blue, blue, and red:

They draw out the balls one at a time and put them in a row. If the blue ball is in the middle, then Nesta wins.

Is this a fair game?

Who do you think will win?

Undertake some trials and record the results.

Teacher Notes

During the launch remind students how to record outcomes using a tally chart.
Have feely bags and red and blue marbles or balls available for each pair to experiment with the chance situation.
Notice whether students are recording the results accurately and systematically and support them to do this.
For the independent task have a feely bag available with 2 red beans and 3 blue beans.

Shareback

Select students to share that are able to justify their ideas referring to the probability of the scenario. For the second part of the task, choose students to share that have recorded their outcomes systematically.

Connect

How could you design the game and number of balls so that it was an equal chance of winning?

How could you design the game and number of balls so that Ali had a higher chance of winning?

Big Ideas

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Curriculum Links

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Suggested Learning Outcomes

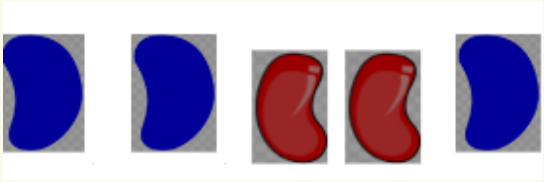
Identify possible outcomes in a chance situation.
Compare the likelihood of events.
Make a prediction about a chance situation.
Collect and record data for a chance investigation.

Mathematical Language

Chance, unfair, fair, likely, unlikely, tally chart.

Independent Tasks

Nina and Tasi are playing beanz. This is what they have in the bag:



Tasi wins if a blue bean and is drawn from the bag. Nina wins if a red bean is drawn from the bag.

Who do you think is more likely to win?

Play beanz by putting all the beans in a bag and drawing one out. Record the result and put the bean back in. Repeat this 10 times and record the results.

What do you notice?

Continue playing beanz for another 10 times and record the results.

What do you notice?

Anticipations

Solutions, Misconceptions

Task 7

Taika thinks that he is really lucky and says “When I roll a dice, I always roll a six”.

Do you think this is likely?
What do you think would happen if you rolled a dice?
Make a prediction with your buddy.

Roll the dice ten times and record if you get a six or not.
What do you notice?

What do you think will happen if you roll your dice another ten times?
Record what you find.

Represent your findings using a tally chart or picture graph.

What do you notice?

Teacher Notes

During the launch remind students how to record outcomes using a tally chart or picture graphs.
Have dice available for each pair.
Notice whether students are recording the results accurately and systematically and support them to do this.
For the independent task have dice available.

Shareback

Select students to share who have used a systematic way of recording the data to show the results of their chance investigation. Select students who have used tally-charts or picture graphs, or model this to the students. Ensure that you share the results from several pairs of students.

Connect

Why did different pairs/groups get different results?
Is it easier or harder to roll a six than other numbers?
Model to the students that each number has one sixth chance of being rolled.
Can we make predictions about what number the dice will roll?

Big Ideas

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Suggested Learning Outcomes

Identify possible outcomes in a chance situation.
Make a prediction about a chance situation.
Collect and record data for a chance investigation.
Create a data visualisation to represent the results of a chance investigation.

Mathematical Language

Chance, half, equal chance, tally-chart, picture graph.

Independent Tasks

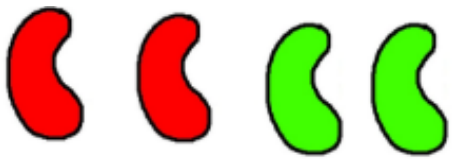
Assessment Task: Beans or Coins

Anticipations

Solutions, Misconceptions

Assessment Task 1 - Probability - Year 1

[Provide students with a feely-bag and models to carry out the chance experiment]
I put these beans in a bag and draw two out at the same time. What are all combinations that I could draw out?



Make statements about the likelihood of the combinations.

Now test your statements by drawing two beans, recording the results and putting the beans back. Play the game 15 times and record and represent your results. What do you notice?

Assessment Task 2 - Probability - Year 1

[Provide students with a feely-bag and models to carry out the chance experiment]
I toss two coins. What are all combinations of heads and tails that I could get?

Make statements about the likelihood of the combinations.

Now test your statements by tossing two coins and recording the results. Play the game 15 times and record and represent your results. What do you notice?