RICH MATHEMATICAL TASK BOOKLET

PROBABILITY

YEAR 0

Teacher Booklet

Task 1

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

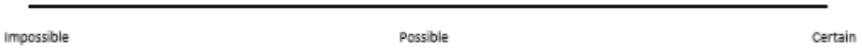
1. Weetabix
2. Chicken
3. Potatoes
4. Ice cream
5. Fish and Chips
6. Carrots

Put them on your continuum and be ready to justify why you have put them there. (Images in Copy Master if needed)

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.



Have a continuum available for students.

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 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 4 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 + 5 =
6 + 7 =
9 + 8 =

Mathematical Language

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

Anticipations

Solutions, Misconceptions

Task 2

Decide how likely it is that you will see these things on your journey home from kura today:

1. A dragon
2. A tree
3. A red car
4. A cat
5. A traffic light
6. A snowman
7. A rainbow

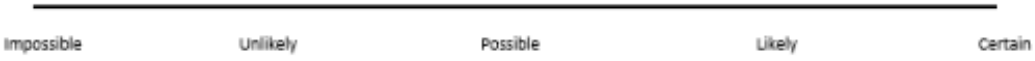
Put them on your continuum and be ready to justify why you have put them there.

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

Teacher Notes

During the launch, 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 for each pair of students with the new terms included.



Provide each pair of students with a continuum (on paper or with masking tape and labels on the floor) and the events 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.

For the independent task, have the pictures available to place on the 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

Lena lives right next to the school. What would her probability continuum look like?

Tom lives in the city. What would his probability continuum look like?

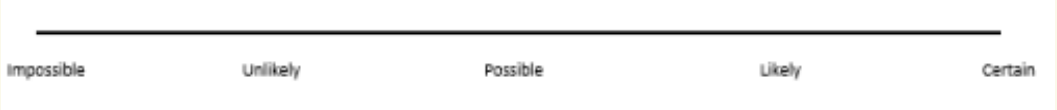
Suggested Learning Outcomes

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

Represent the probability of an event on a continuum.

Independent Tasks

Think about your journey home from kura today. Put the pictures on your continuum in regards to the likelihood you will see them:



Mathematical Language

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

Anticipations

Solutions, Misconceptions

Task 3

Melvin is making a sandwich for his lunch. Mum said he can have cheese and then one other filling to put in his sandwich. The options are:

1. Ham
2. Tomato
3. Lettuce
4. Marmite

Can you show the different filling combinations that Melvin might choose?

How many different filling combinations are there?

Teacher Notes

Provide the pictures of the different sandwich fillings to the students.

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

The possibility of each filling combination could be linked to fractions in relation to the chance of each combination.

This could be recorded as one quarter chance for each combination.

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:
– decide if something will happen, won't happen, or might happen

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

Connect

What is the chance that Melvin will have cheese in his sandwich?
What is the chance that Melvin will have a cheese and ham sandwich?
What is the chance that Melvin will have a peanut butter and jam sandwich?

Suggested Learning Outcomes

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

Independent Tasks

Tiffany is making a sandwich for her lunch. Mum said she can have butter and then one spread put on her sandwich. The options are:

1. Marmite
2. Jam
3. Peanut butter
4. Honey

Can you show the different combinations that Tiffany might choose?

How many different combinations are there?

What is the chance that Tiffany will have cheese?

What is the chance that Tiffany will have butter and jam?

Mathematical Language

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

Anticipations

Solutions, Misconceptions

Task 4

When you toss a coin, what is the chance that you will land on heads? What is the chance that you will land on tails?

What do you think will happen if you toss a coin ten times?
Make a prediction with your buddy.

Toss your coin ten times and record what happens.

What do you think will happen if you toss the coin another ten times?
Record what you find.

What do you notice?

Teacher Notes

During the launch, act out pulling two different coloured beans from a feely bag. Model to students how to record outcomes using a tally chart.

Have coins available for students to toss for the chance experiment.

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

Facilitate the students to notice that we can express probability as a fraction.

There is a half chance that the coin will lands on heads or tails. We can also call this an equal chance.

For the independent task, have counters with different coloured (blue and red) stickers on each side.

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)

Shareback

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

Connect

Model for the students how to represent their count or tall-chart using a picture graph using the pictures of the coins – heads or tails (see copy masters). Show results from different pairs of students.

Can we predict what way the coin will land and why?

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

John and Mia are playing a game where they flip the counter ten times. John wins the game if it lands on blue and Mia wins if it lands on red.

Is John or Mia more likely to win the game?

Flip the counter ten times and record the results.

Flip the counter ten more times and record the results.

What do you notice?

Mathematical Language

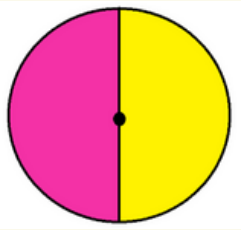
Chance, half, equal chance, tally-chart, picture graph.

Anticipations

Solutions, Misconceptions

Task 5

Archana has made this spinner for a game.



What is the chance that it will land on pink?
What is the chance that 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.

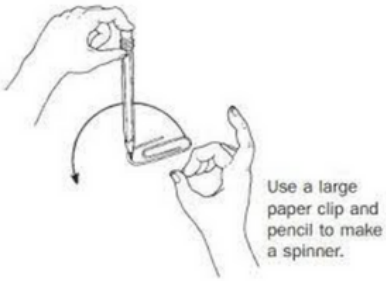
What do you think will happen if you spin another ten times?
Record what you find.

Represent your findings using a tally chart or picture graph.

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.



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)

Teacher Notes

Facilitate the students to notice that we can represent chance as a fraction. There is a $\frac{1}{2}$ 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.

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.

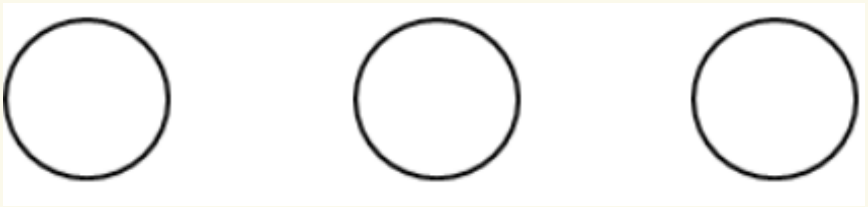
Create a data visualisation to represent the results of a chance investigation.

Mathematical Language

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

Independent Tasks

Make some spinners for a game of chance.



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

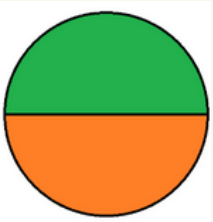
Make other spinners that have an unequal chance. Label which colour is more likely to be spun.

Anticipations

Solutions, Misconceptions

Task 6

Lucia has made this spinner for a game.



She says:

1. The spinner will land on green or orange.
2. There is a half chance of the spinner landing on green.
3. The spinner might land on blue.
4. Green and orange have an equal chance.
5. It will land on orange the most.

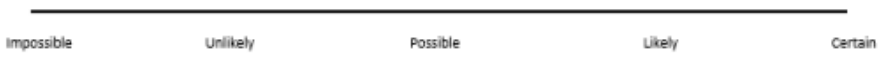
Decide if you agree with Lucia's statements and justify your thinking.

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

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For some situations or games using repeated testing can give a sense of which outcomes are more likely (experimental probability).
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Connect

Make statements about these probability spinners:

Suggested Learning Outcomes

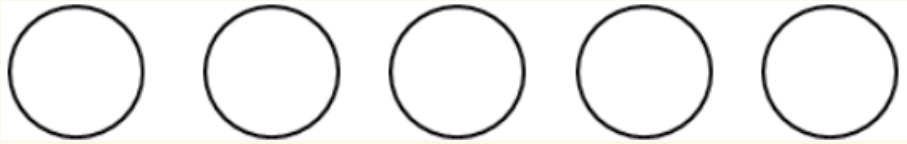
Identify possible outcomes in a chance situation.

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.

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.

Big Ideas

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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?

Mathematical Language

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

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

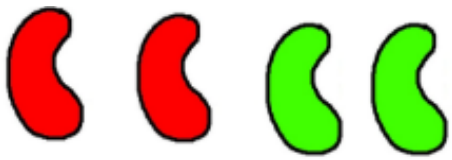
Assessment Task

Anticipations

Solutions, Misconceptions

Assessment Task 1 - Probability - Year 0

[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 0

[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?