Problem 26: Simple chance experiments

TR p119

Find a partner. Examine the descriptions and events below and match them up if they fit. Sometimes multiple events might fit one description and sometimes no events might fit a description. Be prepared to prove you are right to another pair of students at the end.

Match up the events to the right description:

Event	Description
Tomorrow I will sleep in late	Certain to happen
Tomorrow I will be a frog	
Tomorrow I will go to school	Likely to happen
Tomorrow I will love pizza	
Tomorrow I will have a hair cut	Could happen
Tomorrow I will eat bread	
Tomorrow I will visit my friend	Unlikely to happen
Tomorrow I will be sick	
Tomorrow the sun will rise in the morning	Impossible

Sharing time: Which ones were hard to work out? Why were they hard?

Understanding: Choose a statement that you and your partner disagree about. Explain how you know that you are right:

Questions:

1. Which event do you think is the most likely to happen? Why?

2. Which event do you think is the least likely to happen? Why?

3. Brainstorm some other words that we use to describe how likely something is to happen. Write any that you can think of here and give an example of an event that would be this likely:

Manipulation problem:

Two friends were trying to decide who should roll the die for their team. Charlie argued that she should roll because last time she rolled a six and therefore she is clearly a good roller. Liam argued that he should roll because Charlie couldn't roll another six when she had just rolled one. What do you think?

Teacher initials:

Date:

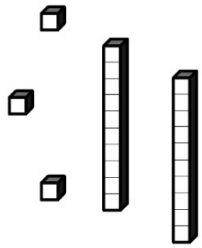
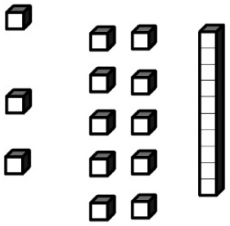
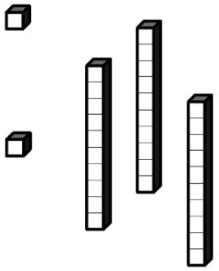
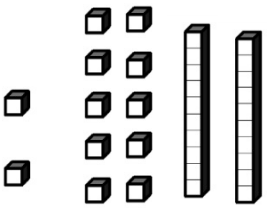
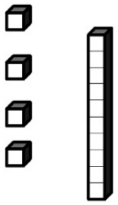
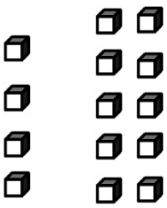
Problem solving / T&R:
- Problem solved with minimal or non-mathematical prompting
- Some leading questions were used to prompt thinking
- Solved after explanation
- Did not work out solution
- N/A- not a novel problem

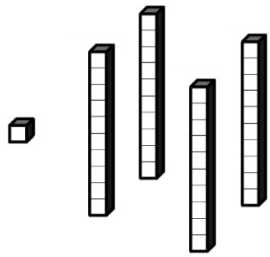
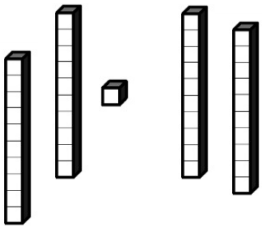
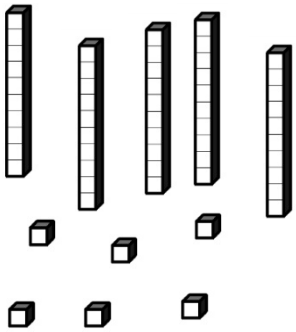
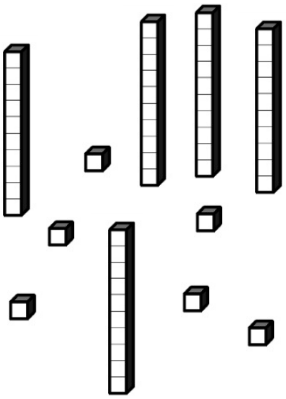
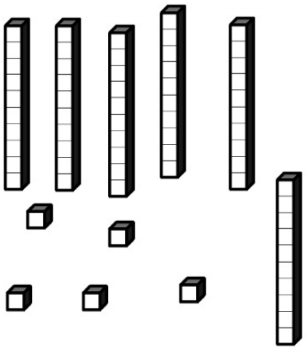
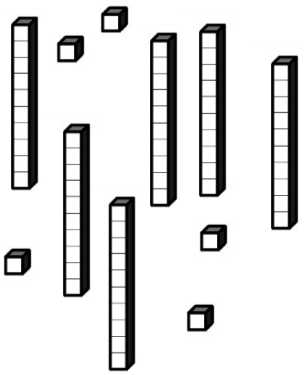
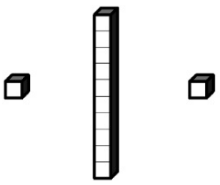
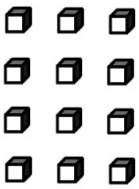
Reasoning / Comm.:
(verbal, written, working and equations, or visual representations)
- Clearly and logically reasoned
- Easily understood
- Understood with some interpretation needed
- Some gaps but on topic
- Minimal or off topic

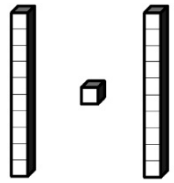
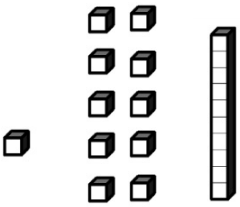
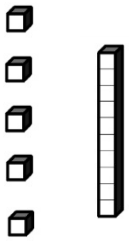
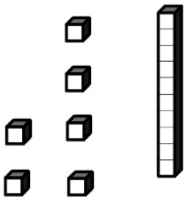
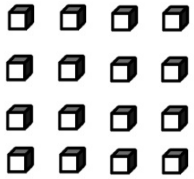
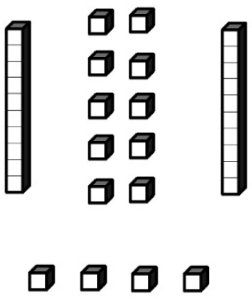
Understanding / Reflect:
- Well reasoned manipulation problem, saw problems with both arguments
- Some help with manipulation problem, but then saw problems with both arguments
- Answered manipulation problem by relying on previous experience not on reasoning, or saw problems with only one argument
- Did not answer appropriately

- Student not observed

Place Value card game

	23	Twenty-three	
	32	Thirty-two	
	14	Fourteen	

	41	Forty-one	
	56	Fifty-six	
	65	Sixty-five	
	12	Twelve	

	21	Twenty-one	
	15	Fifteen	
	16	Sixteen	
	34	Thirty-four	

I3. Language of chance

TR p115

Use the following terminology to describe the possibility of achieving the outcomes listed below. An example has been completed for you.

Terminology: certain, most likely, more likely, equally likely, less likely, least likely, multiple outcomes.

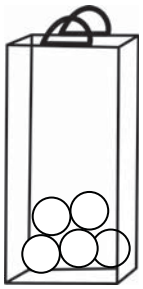
Example:
When I toss a coin, the likelihood of getting heads or tails is: equally likely.

Describe the likelihood of the following outcomes occurring:

1. The sun rising tomorrow.

2. Throwing a 6 on a dice compared to throwing a 3 on a dice.

3. A bag contains 5 balls. There are 4 red and 1 blue.
   - Describe the likelihood of getting a red ball over a blue ball:
   - Describe the likelihood of getting a blue ball over a red ball:



4. Choose three people from your class. List them below. Describe the likelihood of each one winning in a race:
   -
   -
   -

5. For the same three people from above, describe the likelihood of each one winning a mental maths competition against each other:
   -
   -
   -

6. Who in your class would be 'most likely' to win an art prize?

7. Who in your class would be 'equally likely' to have the same food for lunch?

8. Who would be 'least likely' to be found in the school computer room?

What patterns have I found?

Backwards Question:
Make up a question for which the answer would be, 'more likely':

11. Sample Space: all possible outcomes

TR p114

In this activity you will learn about the Sample Space in an experiment. Look at the descriptions below to work out what the sample space is. Use this to describe the sample space for the experiments listed below.

Example:
For tossing dice, the possible outcomes are 1, 2, 3, 4, 5 and 6.
The sample space is 1, 2, 3, 4, 5, 6.

Describe what you think sample space means:

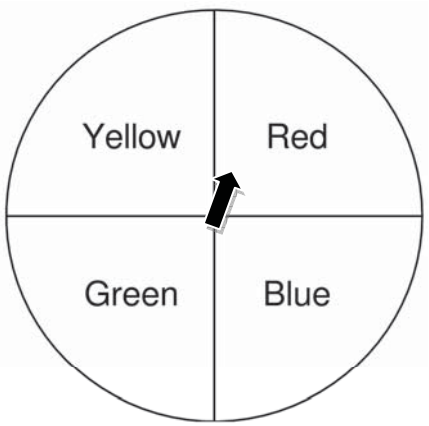
For the experiments below, list the sample space:

1. Tossing a coin

2. Choosing a ball from a bag that contains red and blue balls

3. Choosing a number from 1 – 10

4. Spinning the spinner shown below:



What does sample space mean?

Backwards Question:
If the sample space for a spinner was yellow, yellow, red, blue, what do you think the spinner might look like? Draw it:

12. Conduct experiments to collect data

TR p115

You are going to conduct some experiments to collect data. You will list the sample space in the left column of the tables below. You will repeat the experiment 20 times, and record the number of times each outcome occurs using tally marks.

Experiment 1: Tossing a coin

Sample Space:	Number of outcomes out of 20 trials:

What did you find?

Experiment 2: Rolling a die

Sample Space:	Number of outcomes out of 20 trials:

What did you find?

BACKWARDS QUESTION:

If an experiment gave the following results for 40 spins of a spinner, draw what you think the spinner might look like:

Red: 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸

Blue: 𝍸 𝍸

Why do you think having more spins makes a difference?

Interleaved practise

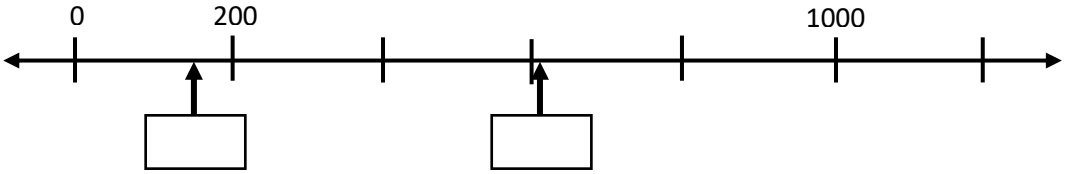
Year 3, week 8

Number:

1. Make up a number pattern that starts with the number 205. Write it on the lines and describe the pattern.
   205, _____, _____, _____, _____, _____

2. These biscuits are packed in boxes in layers that look like this. How many biscuits would there be if there were 2 layers in a box? Show how you worked it out.

3. What numbers would go where the arrows are pointing?



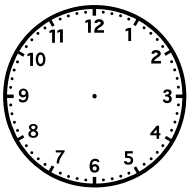
4. Use these rectangles to show which is bigger **one quarter** or **one fifth.**

5. I received $2.45 change from $5.00 when I bought some lollies. How much did I pay for the lollies?

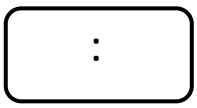
Measurement/Geometry:

6. I have measured out 1 litre of juice into this jug. How many 200mL glasses of juice can I pour with it?

7. Draw the hands on the clock to show 25 minutes to 4.



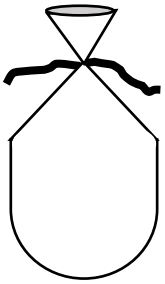
What would it look like on this digital clock?



8. On the back of this sheet, draw 3 objects you find in your home or classroom that are symmetrical.

Chance/Data:

9. Draw the counters that are in the bag using this information:
   - There are 14 counters in the bag. They are blue, yellow and green.
   - If I shut my eyes and take out a counter, I have the same chance of drawing a blue or a yellow counter



12. Difference between likely and certain

TR p120

Find a partner. Decide if the following statements are **certain** (absolutely will happen, nothing can stop this happening) and which are **very likely** (will almost certainly happen, but something could happen to stop it).

Situation	Circle the description that fits:
I will have tea tonight	Very likely / Certain
My favourite food today will be my favourite food tomorrow	Very likely / Certain
I will go to school on Tuesday	Very likely / Certain
The sun will rise tomorrow	Very likely / Certain
My teacher today will still be my teacher tomorrow	Very likely / Certain
It will be hot in Summer	Very likely / Certain
I will get a present or card on my birthday	Very likely / Certain
I will see you tomorrow	Very likely / Certain
It will rain sometime in the next year	Very likely / Certain

How did you decide if something was very likely or if it was certain?

Which ones did you argue over? Why?

BACKWARDS QUESTION:
Which one is the most certain? Explain your answer:

13. Difference between unlikely and impossible

TR p121

Find a partner. Decide if the following statements are **impossible** (absolutely will not happen, nothing can make this happen) and which are **very unlikely** (will almost certainly not happen, but something could happen to change this).

Situation	Circle the description that fits:
I will not have tea tonight	Very unlikely / Impossible
My favourite food today will not be my favourite food tomorrow	Very unlikely / Impossible
I will not go to school on Tuesday	Very unlikely / Impossible
The sun will not rise tomorrow	Very unlikely / Impossible
My teacher today will not still be my teacher tomorrow	Very unlikely / Impossible
It will be not hot in Summer	Very unlikely / Impossible
I will not get a present or card on my birthday	Very unlikely / Impossible
I will not see you tomorrow	Very unlikely / Impossible
It will not rain in the next year	Very unlikely / Impossible

How did you decide if something was very unlikely or if it was impossible?

Which ones did you argue over? Why?

BACKWARDS QUESTION:
Which one is the least certain? Explain your answer: