

Student workbook thinking mathematically 3 Stage 1

Name:

Class:

Overview

For the next 2 weeks, we hope you will be having some fun with mathematics – getting sweaty brains, thinking hard and feeling successful when you solve a problem, develop more confidence or understand something better. Many of these activities are games and investigations that you can play with your family, friends and classmates. Have fun and think deeply!

Most of these tasks have a video and some have downloadable resources to support your learning. You can find these using the digital student resource link on the Learning from home, K-6 support – [mathematics page](#).

Day 1

Today we have 1 task. We will have the opportunity to deepen our understanding of patterns, exploring growing and shrinking patterns.



Resources – device to view videos, colour pencils/ markers

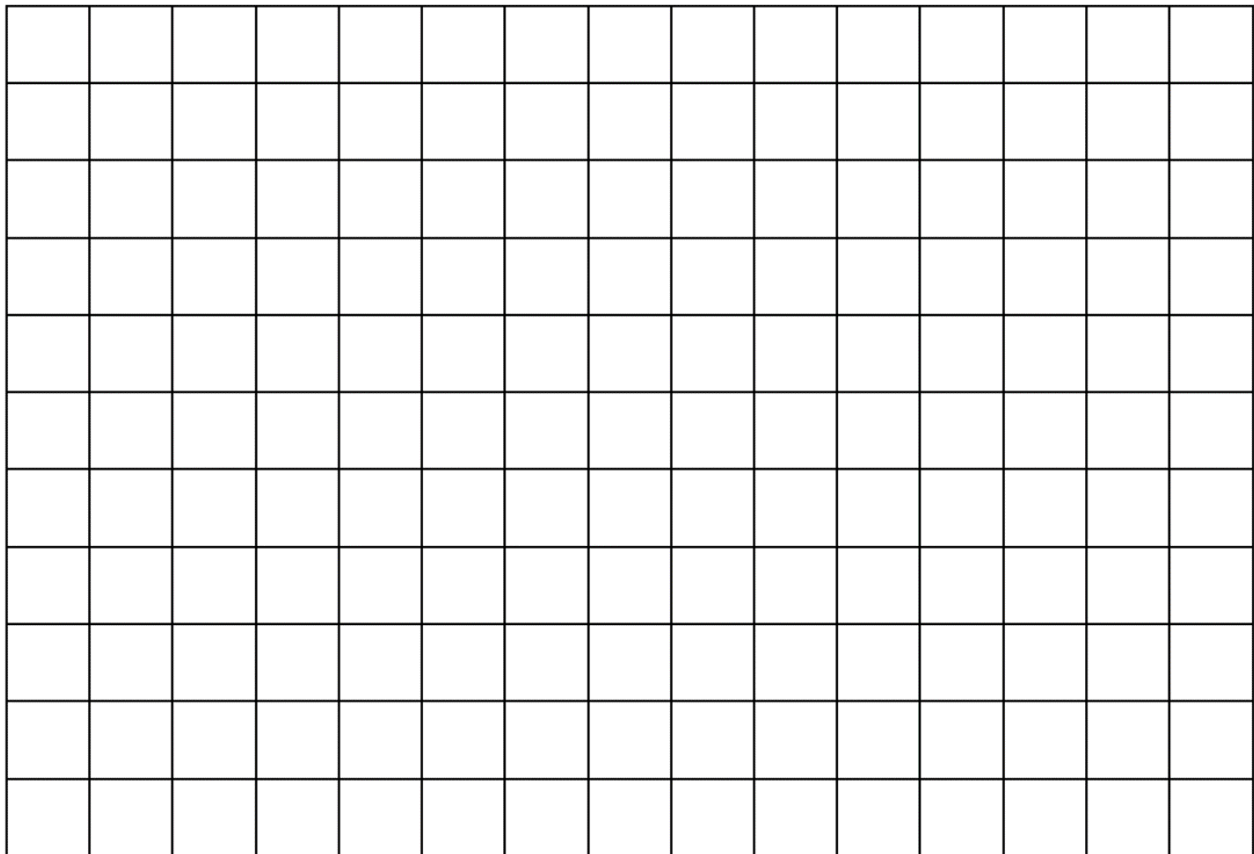
Staircase pattern



View video [Staircase pattern 1 – Part 1](#)



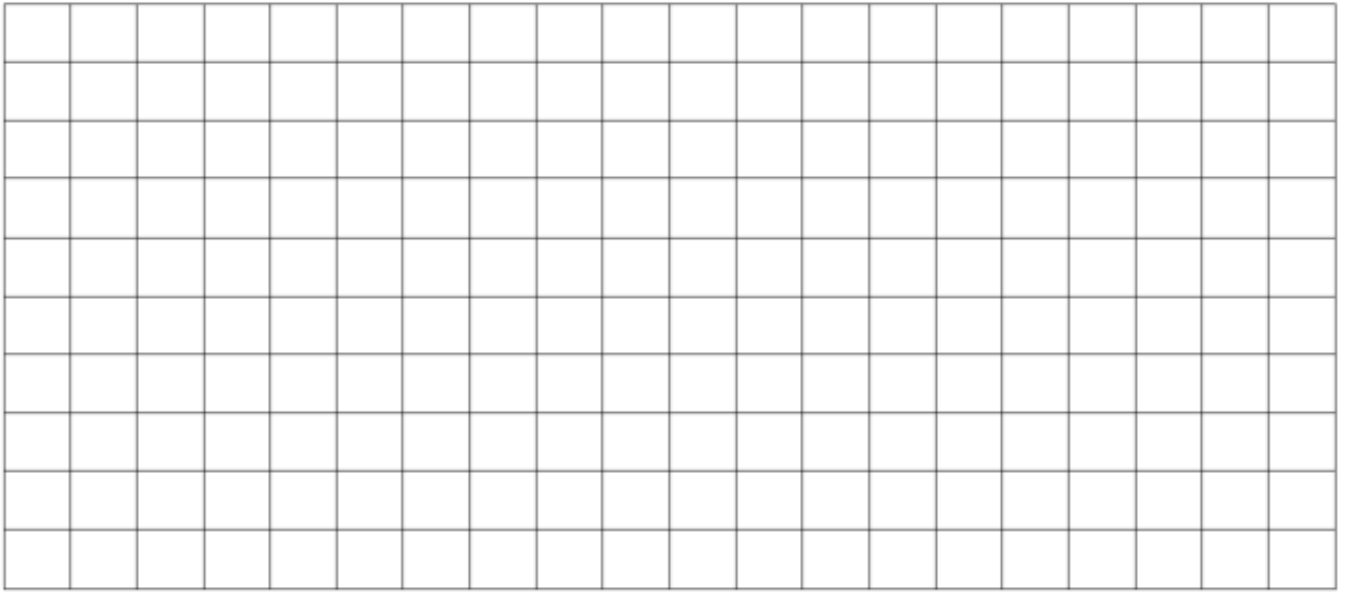
Draw the staircase pattern we've made in the video, continuing it down the other side.



View video [Staircase pattern 1 – part 2](#). Once you have clicked this link, scroll down to view part 2.



If you like, build the model. Then draw what the staircase will look like if we continue building it up and down the other side, using twos.

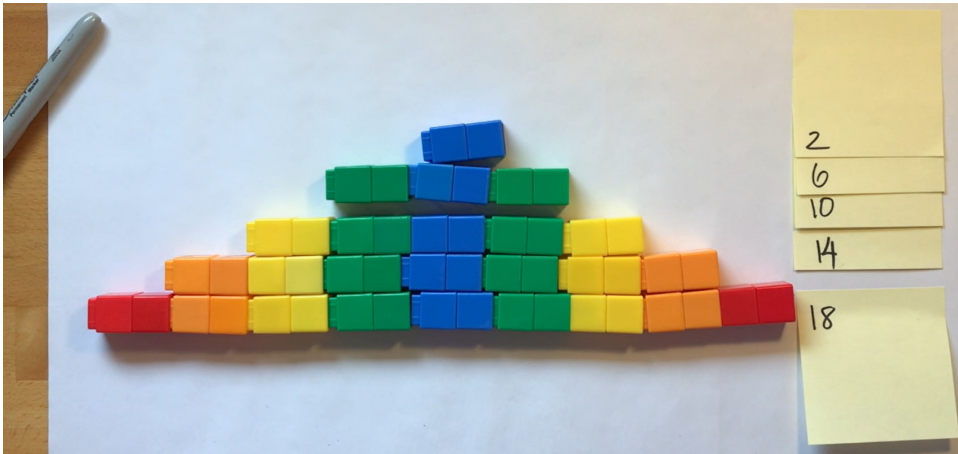




View video [Staircase pattern 1 – part 3](#) . Once you have clicked this link, scroll down to view part 3.



How many blocks are there altogether? Use diagrams to record the thinking you used to work out the solution.





You may like to view the episode of [Numberblocks step squad](#)

Reflection



Can you find any growing or shrinking patterns at home or at school?
Draw the patterns you find.

Talk about what you have discovered and learnt about today with someone at home.

Day 2

Today we have 2 tasks. We are going to explore different ways of thinking about numbers to help us better understand how numbers work. We will look at using a pan balance to investigate mass. We are also going to have a closer look at growing and shrinking patterns.



Resources – device to view videos, colour pencils/ markers, collection of objects like blocks or unifix cubes

Balancing numbers 1

(Inspired by the work of Dan Meyer)



View video [Balancing numbers 1 – part 1](#)



What do you notice?



What do you wonder?



View video [Balancing numbers 1 – part 2](#). Once you have clicked this link, scroll down to view part 2.



How many more bears are needed to make the scale balance?

(How many bears are equivalent in mass to The Hulk?)



What's an estimate that's way too high?



What's an estimate that's way too low?



What's an estimate that you think is reasonable?



View video [Balancing numbers 1 – part 3](#). Once you have clicked this link, scroll down to view part 3.



Create a drawing to represent the problem: How many bears are equivalent in mass to The Hulk?

Staircase pattern follow-up



View video [Staircase pattern 1 part 4](#)



Use objects, like blocks to create a new staircase structure.



Draw and describe the things you notice from the staircase structure you have made.



Explain the growing and shrinking patterns you can see inside your staircase.

Reflection



Share the drawings that you created as a mathematician. Talk to a family member or friend about the information you have shared in your mathematical drawings.

Day 3

Today we have 2 tasks. The Hulk is back and we will estimate and investigate mass using a pan balance.



Resources – device to view videos, figurines like LEGO mini figs or teddy bears.

Balancing numbers 2



View video [Balancing numbers 2 – part 1](#)



What's an estimate that's way too high?



What's an estimate that's way too low?



What's a reasonable estimate?



View video [Balancing numbers 2– part 2](#). Once you have clicked this link, scroll down to view part 2.



What would you do to solve this problem? Share your thinking with a fellow mathematician or write down your ideas.



Revise your estimate: how many paddle pop sticks are needed to balance the mass of The Hulk?



View video [Balancing numbers 2– part 3](#). Once you have clicked this link, scroll down to view part 3.



What do you think will happen to the balance scale?

Draw a picture to communicate your thinking.



View video [Balancing numbers 2– part 4](#). Once you have clicked this link, scroll down to view part 4.

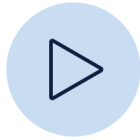


What can we say about the mass of The Hulk, the collection of bears and the collection of paddle pop sticks?

Handfuls: thinking multiplicatively



View video [Handfuls: thinking multiplicatively](#)



Play handfuls - thinking multiplicatively using groups of twos (with LEGO mini figs) and with fours (with bears).



Record your thinking about your games.

Reflection



What's something you feel more confident with today?

Day 4

Today we have 2 tasks. We will have opportunities to deepen your understanding of some important mathematical relationships by playing a game from Week 1. We will also make our own tangram.



Resources –device to view videos, 2 counters, 2 paperclips, 0-119 bottoms up hundreds chart (game board), 2 spinners (in appendix p.34) 1 square sheet of paper, pair of scissors

Race to zero

This game may seem familiar to you as we played it in week 1. If you still have the gameboard and spinner, please use them again. Otherwise, cut out the 2 spinners on page 34 and use the gameboard on the next page to play.



View video on [Race to zero page](#)



How to play?

Players place their counters at the end of 119. The person whose birthday is closest to February 29 goes first. Players take turns to spin both spinners and decide which to use, subtracting the amount from their current position. For example, a player rolled 60 and 4. He or she can choose to subtract 60 or 4. Players explain where they need to move their counter to and explain their thinking. If their partner agrees, they move the counter to the corresponding position. Players take turns until someone has been able to land exactly on zero. Students miss a turn if they cannot move. If a roll means they would move into negative numbers, they have to move their counter back to 25.

Another way to play:

- Use a 0-119-chart cut into a number strip as a game board



Play Race to zero

110 one- hundred and ten	111 one- hundred and eleven	112 one- hundred and twelve	113 one- hundred and thirteen	114 one- hundred and fourteen	115 one- hundred and fifteen	116 one- hundred and sixteen	117 one- hundred and seventeen	118 one- hundred and eighteen	119 one- hundred and nineteen
100 one- hundred	101 one- hundred and one	102 one- hundred and two	103 one- hundred and three	104 one- hundred and four	105 one- hundred and five	106 one- hundred and six	107 one- hundred and seven	108 one- hundred and eight	109 one- hundred and nine
90 ninety	91 ninety- one	92 ninety- two	93 ninety- three	94 ninety - four	95 ninety- five	96 ninety- six	97 ninety- seven	98 ninety- eight	99 ninety- nine
80 eighty	81 eighty- one	82 eighty- two	83 eighty- three	84 eighty- four	85 eighty- five	86 eighty- six	87 eighty- seven	88 eighty- eight	89 eighty- nine
70 seventy	71 seventy- one	72 seventy - two	73 seventy- three	74 seventy- four	75 seventy- five	76 seventy- six	77 seventy- seven	78 seventy- eight	79 seventy- nine
60 sixty	61 sixty-one	62 sixty-two	63 sixty- three	64 sixty- four	65 sixty-five	66 sixty-six	67 sixty- seven	68 sixty- eight	69 sixty- nine
50 fifty	51 fifty-one	52 fifty-two	53 fifty- three	54 fifty-four	55 fifty-five	56 fifty-six	57 fifty- seven	58 fifty- eight	59 fifty-nine
40 forty	41 forty- one	42 forty- two	43 forty- three	44 forty- four	45 forty-five	46 forty-six	47 forty- seven	48 forty- eight	49 forty- nine
30 thirty	31 thirty- one	32 thirty- two	33 thirty- three	34 thirty- four	35 thirty- five	36 thirty-six	37 thirty- seven	38 thirty- eight	39 thirty- nine
20 twenty	21 twenty- one	22 twenty- two	23 twenty- three	24 twenty- four	25 twenty- five	26 twenty- six	27 twenty- seven	28 twenty- eight	29 twenty- nine
10 ten	11 eleven	12 twelve	13 thirteen	14 fourteen	15 fifteen	16 sixteen	17 seventeen	18 eighteen	19 nineteen
0 zero	1 one	2 two	3 three	4 four	5 five	6 six	7 seven	8 eight	9 nine

How to make a tangram

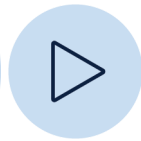


View video [How to make a tangram](#)



With an adult collect:

- pair of scissors
- 1 square sheet of paper (View video on [how to make a square](#) from week 1)



View video How to make a tangram with an adult and together make your own tangram. You will be using this tangram for Day 5 and Day 6 tasks.

Reflection



Think about the different strategies you used in Race to zero and compare these to the strategies your partner used. What similarities and differences were there?

Day 5

Today we have 3 tasks. We will use our tangram pieces to complete puzzles, learn a new game where we think multiplicatively and explore double facts with a game from last week!

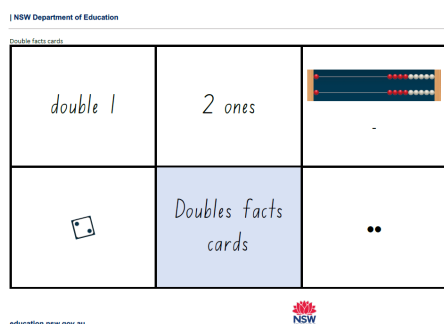


Resources – device to view videos, Double facts cards cut up, spinner in appendix page 35, paperclip, pen, counters for tokens for example dried pasta, collection of figurines with 2 legs or teddy bears.

Double facts concentration



Use your double facts cards from week 2. If you do not have them click [Doubles facts concentration](#) to download the doubles cards and cut them out.



How to play?

To set up a game of concentration (also known as memory or pairs), first shuffle the cards well and then place each card face down. Each player takes a turn by turning two cards over. If the cards match, then the player picks up the cards and keeps them. If they don't match, the player turns the cards back over. You can also play by yourself.

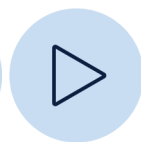


Play Double facts concentration with someone at home.

For each game



View video [For each game](#)



Play the For each game.

How to play

Make a spinner with 4, 6, 8, 10, 12, and 14. (Cut out from on page 35).

Spin the spinner to determine how many legs you need in total.

Imagine and then collect the number of figurines you need to make that many legs.

The player with the most figurines each round wins a token.

The first person to win 5 tokens wins the game.

Another way to play:

Use teddy bears instead of the figurines and find out how many teddy bears are needed to have that many paws. You could also use toy cards, trains, other animal figures or pictures of animals.

Tangram puzzle challenge



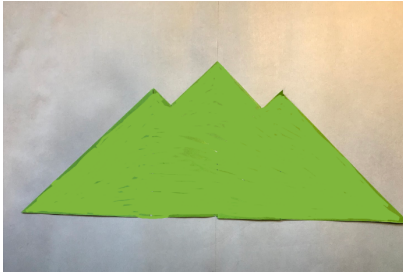
Using all the pieces of your [Tangram](#), try creating these formations!



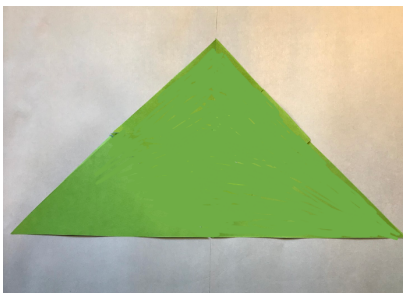
a heart



a tree



a mountain



a big triangle



a butterfly

Reflection



List 2 things about your learning that made you feel good today.

Day 6

Today we have 2 tasks. We will estimate and investigate mass using a pan balance and we will explore quadrilaterals.



Resources – device to view videos, colour pencils/ markers

Balancing numbers 3

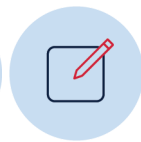
(Inspired by the work of Dan Meyer and Graham Fletcher)



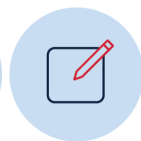
View video [Balancing numbers 3 – part 1](#)



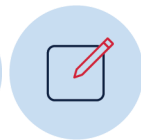
How many trapeziums (red shapes) are needed to balance the hexagons (yellow shapes)?



Write an estimate that's way too high.



Write an estimate that's way too low.



Write an estimate that's reasonable.



View video [Balancing numbers 3 – part 2](#). Once you have clicked this link, scroll down to view part 2.



How many triangles are needed to cover the area of 3 hexagons?

Michelle thinks she will need 6 trapeziums to cover the area of the 3 hexagons.

What do you think?



Draw a picture to share your thinking.



View video [Balancing numbers 3 – part 3](#). Once you have clicked this link, scroll down to view part 3.



How many triangles are needed to cover the area of 3 hexagons?



If you like, build the model then draw a picture to share your thinking.

Tangrams 1.1: exploring quadrilaterals



View video on [Quadrilaterals – part1](#)



Use this adapted Frayer chart to define a quadrilateral.

Examples (Draw, write or describe some examples)	Non-examples (Draw write or describe some non-examples. Ask yourself “What isn’t it?”)

Definition and features (Draw, write or describe a definition and some really important features)



View video on [Quadrilaterals –part 2](#). Once you have clicked this link, scroll down to view part 2.



How many different quadrilaterals can you make using your tangram pieces? Try making at least 1 quadrilateral with...

- 1 tangram piece
- 2 tangram pieces
- 3 tangram pieces
- 4 tangram pieces
- 5 tangram pieces
- 6 tangram pieces
- 7 tangram pieces

Reflection



Revisit your Frayer chart. Using a different colour pencil/marker add any more information or revise your thinking.

Day 7

Today we have 2 tasks. Today these tasks will help us see that as mathematicians, we get to be in charge of the numbers. We will see some different ways to solve the same problem. We will also play a strategic game with 2-digit numbers, which involves us using what we know about place value.



Resources – device to view videos, colour pencils or markers, sticky notes or small blank pieces of paper, 2 x [0-9 sided dice](#) (you could also use playing cards, spinner on p.34, numeral cards or the linked online dice).

Let's talk 4 – part 1



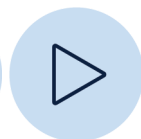
View video [Let's talk 4 – part 1](#)

Order! Order!

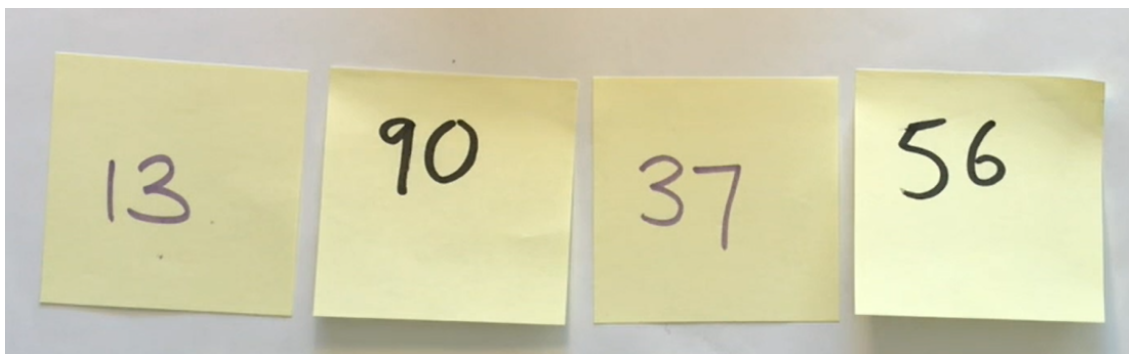
(From Mike Askew)



View video [Order! Order!](#)



Write these numbers on post-it-notes or paper and place them in this order.



Help Michelle and Barbara order these numbers from largest to smallest. Record how many moves it takes to order them. Remember you are aiming to use the fewest moves possible!



Play Order! Order!

Reflection



Draw a picture of 1 or 2 things that made your brain think hard today (that made your brain get sweaty).

Day 8

Today we have 2 tasks. We will further investigate how we can use numbers flexibly like our mathematical pirate and pony did yesterday when they visualised dots moving from one ten-frame to another. We will also learn to play Mastermind!



Resources – device to view videos, colour pencils/markers, piece of paper.

Let's talk 4 – part 2



View video [Let's talk 4 – part 2](#)



8+8+6?

What other quantities can you find that are equivalent in value to

Mastermind



View video [Mastermind](#)

How to play

- Each player writes down a 3-digit number (with no repeating digits).
- Each player draws up their game board (a table with 3 columns: 'guess', 'digits', 'places').
- Players take turns to guess a 3-digit number.
 - Their opponent tells them how many digits are correct and how many are in the correct place.
 - Players record their guess, the number of digits that are correct and the number of digits that are in the right place. Players then use this information to refine their guesses.
- The first player to correctly guess their opponents' number is the winner!
- Players can choose to play using 4-digit numbers, 5-digit numbers, 2-digit numbers. etc.



Play mastermind!

Reflection



Imagine yourself feeling good about mathematics. Draw a picture to show what you're doing when you feel good about mathematics.

Day 9

Today we have 2 tasks. We will learn a new game, circles and stars. We will also work on our conceptual subitising as we Splat!



Resources – device to view videos, colour pencils/ markers, A4 paper to make a game board, [1-6 dice](#), [playing cards 2, 5 and 10 cards](#) (or use the links to find online versions).

Splat!

(Adapted from Steve Wyborney)



View video [Splat!](#)

Make sure you have your subitising eyes ready to look for chunks that you recognise instantly so you don't have to count!



Draw how many dots you think you saw and how you saw them?

Circles and stars

(From Marilyn Burns)



View video [Circles and stars](#)



Collect your resources and play Circles and stars from Marilyn Burns. Remember you only need to draw enough stars to help you work out the product.

How to play

- Divide your paper into eighths
- Roll a dice to determine how many circles (groups) you need to make
- Turn over a playing card (or roll the dice again) to determine how many stars to add into each circle.
- Determine how many stars there are in total. You can draw all or some of the stars in each circle - you only need to draw what you need to help you work out the product.
- Continue taking turns until each player has had 6 turns each.
- Work together to work out who has the most stars altogether.

Reflection



What advice would you give someone who is joining you tomorrow for Splat?

Day 10

Today we have 1 task. We will play a new game that helps look for combinations of ten!



Resources – device to view videos, [0-9 dice](#) (or the spinner on p.34, playing cards A-9 or the linked online die) colour pencils/markers.

3 tens in a row



View video [3 tens in a row](#)



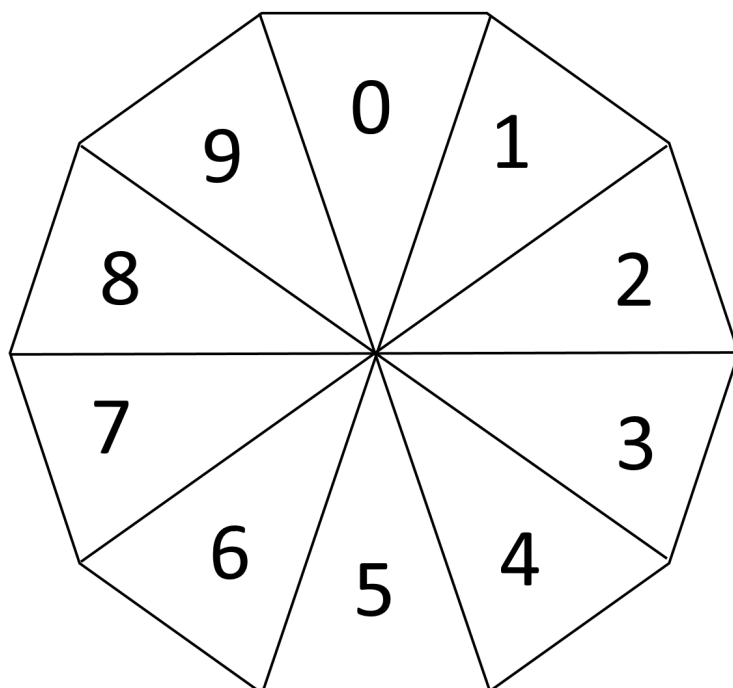
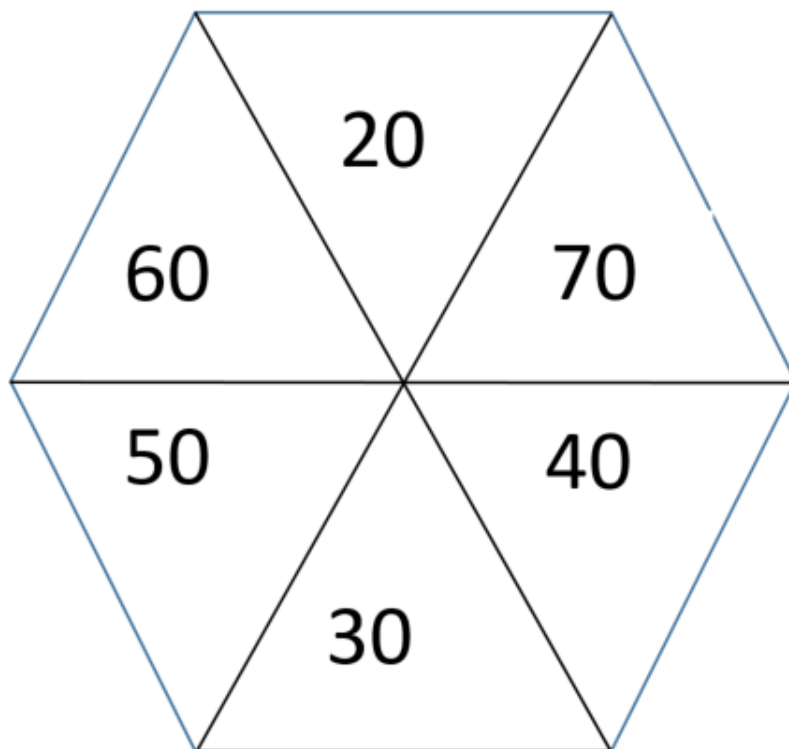
Play 3 tens in a row.

How to play

- Draw a 3x3 grid as a game board (like noughts and crosses game board).
- Players take turns to roll the dice and write the number in one of their boxes.
- The goal is to be able to write two numbers in each box that combine to make 10.
- Players continue taking turns until a player has been the first to make 3 tens in a row.

Appendix

Spinners for Day 3 Race to zero



← ***You will use
this 0-9
spinner many
times
throughout
the next 2
weeks!***

Spinners for day 5 for each game

