Primary
National Strategy

Supporting children with gaps in their mathematical understanding

Wave 3 mathematics

Resources and index of games

department for
education and skills
creating opportunity, releasing potential, achieving excellence

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Contents

Index of Resource sheets

Number cards 0–10 and fraction cards

0	**1**	**2**
3	**4**	**5**
6	**7**	**8**
9	**10**	$\frac{1}{2}$
$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$

Number cards 11–25

11	12	13
14	15	16
17	18	19
20	21	22
23	24	25

Number cards 26–40

26	27	28
29	30	31
32	33	34
35	36	37
38	39	40

Number cards 41–55

41	42	43
44	45	46
47	48	49
50	51	52
53	54	55

Number cards 56–70

56	57	58
59	60	61
62	63	64
65	66	67
68	69	70

Number cards 71–85

71	**72**	**73**
74	**75**	**76**
77	**78**	**79**
80	**81**	**82**
83	**84**	**85**
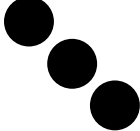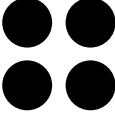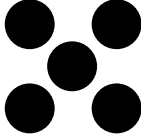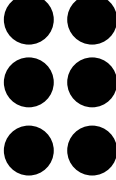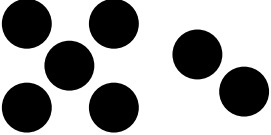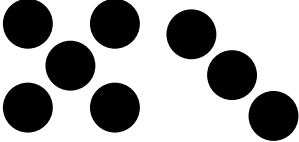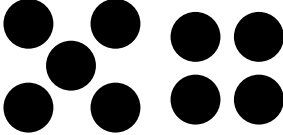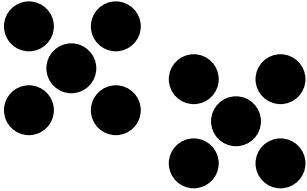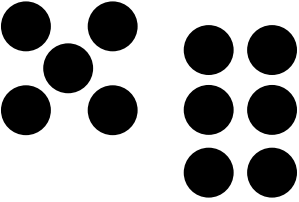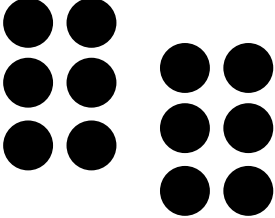
Number cards 86–100

86	**87**	**88**
89	**90**	**91**
92	**93**	**94**
95	**96**	**97**
98	**99**	**100**

Symbol cards

+	+	+
−	−	−
×	×	×
÷	÷	÷
=	=	=

Dotty cards

Count on cards

Count on 1	Count on 2	Count on 3	Count on 4
Count on 5	Count on 6	Count on 7	Count on 8
Add 1	Add 2	Add 3	Add 4
Go forward 1 step	Go forward 2 steps	Go forward 3 steps	Go forward 4 steps

Space hops game

Blank S-track

START
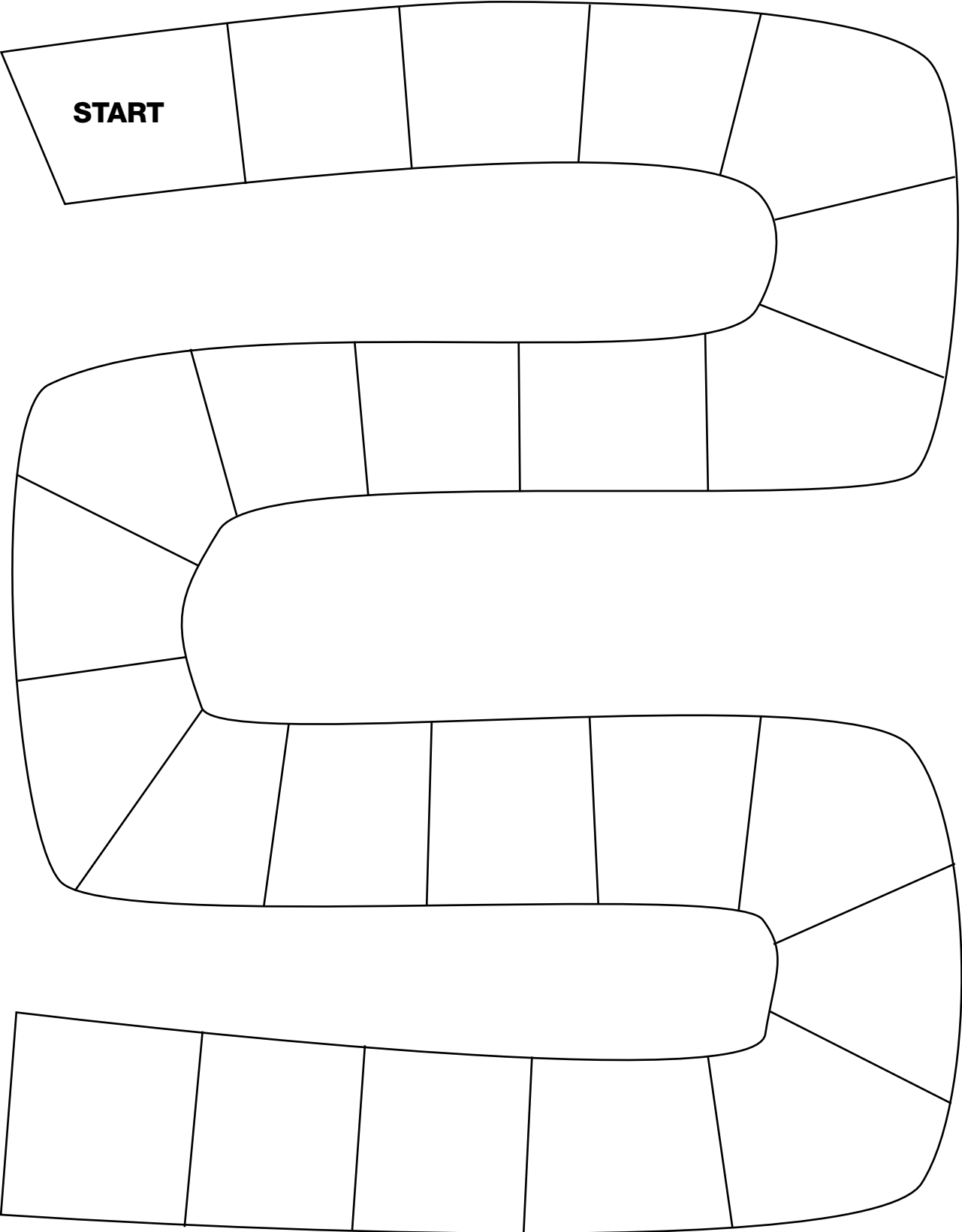
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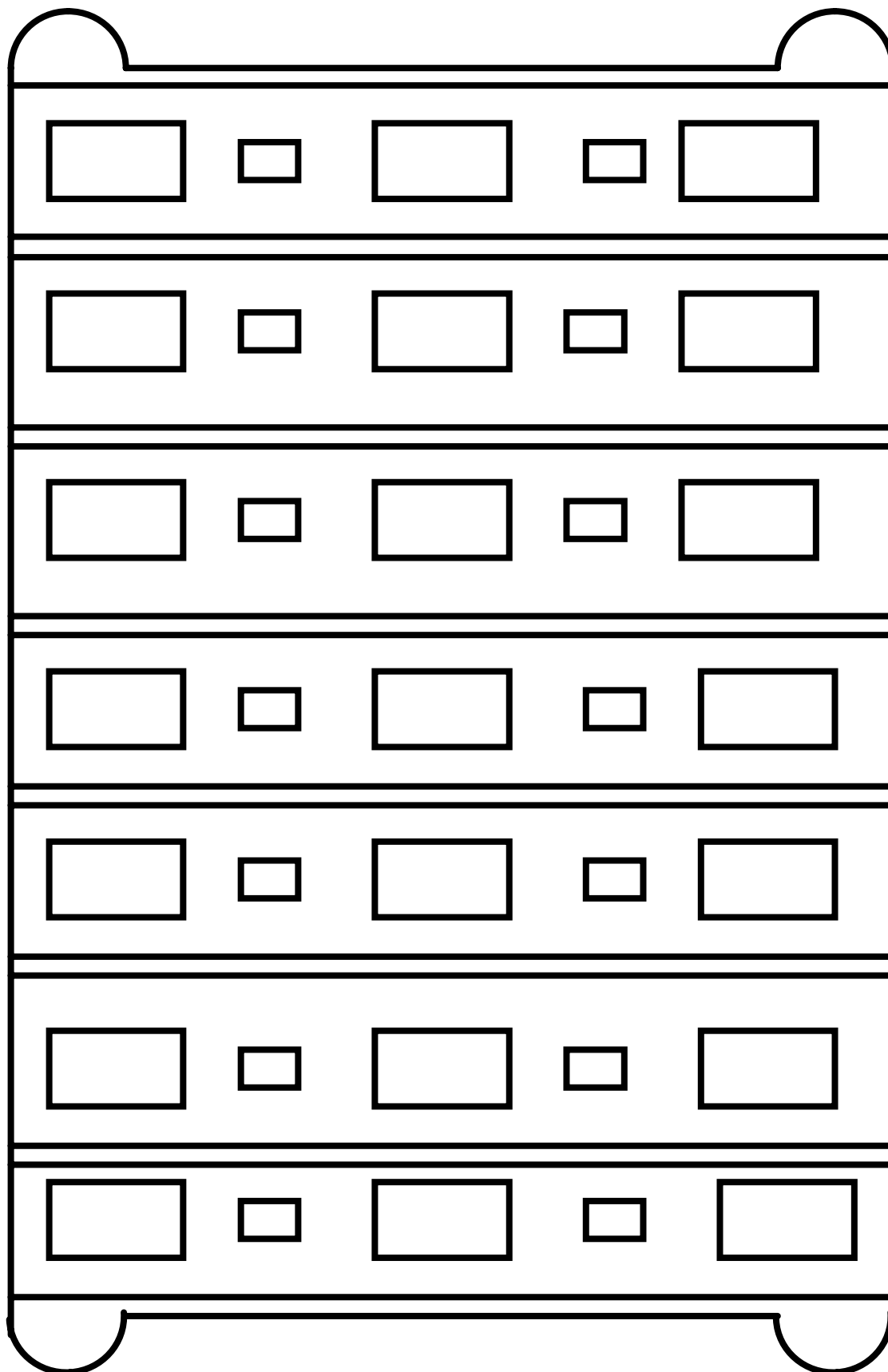
Blank spinners

Houses

and

and

and

and
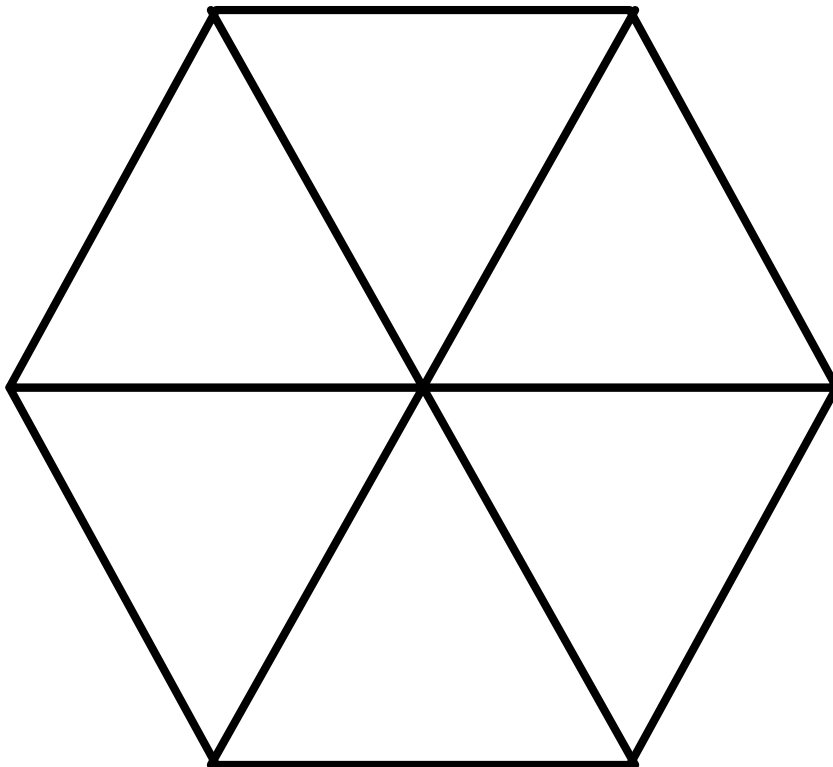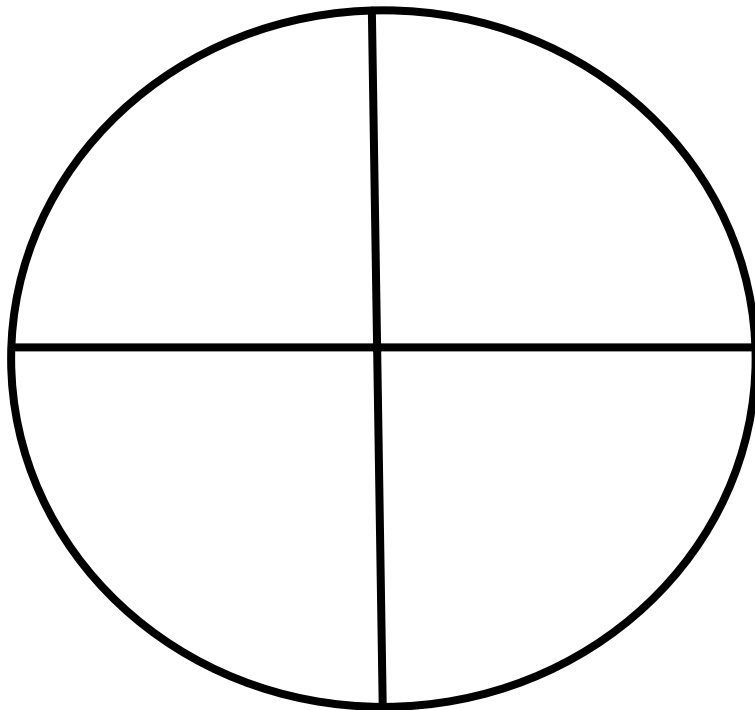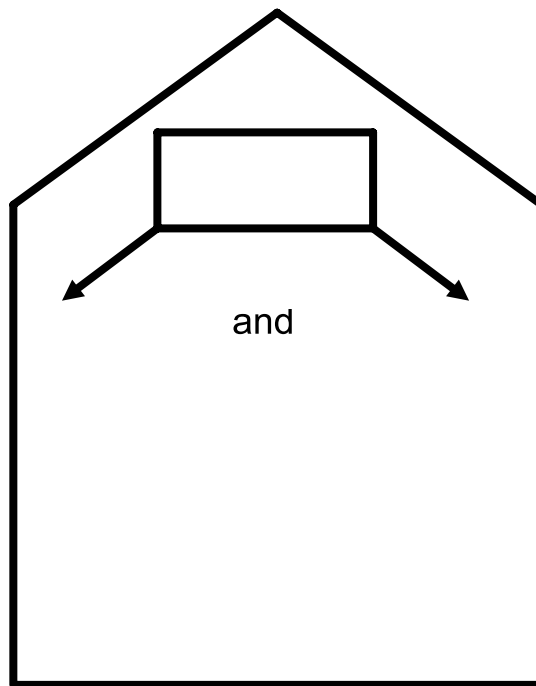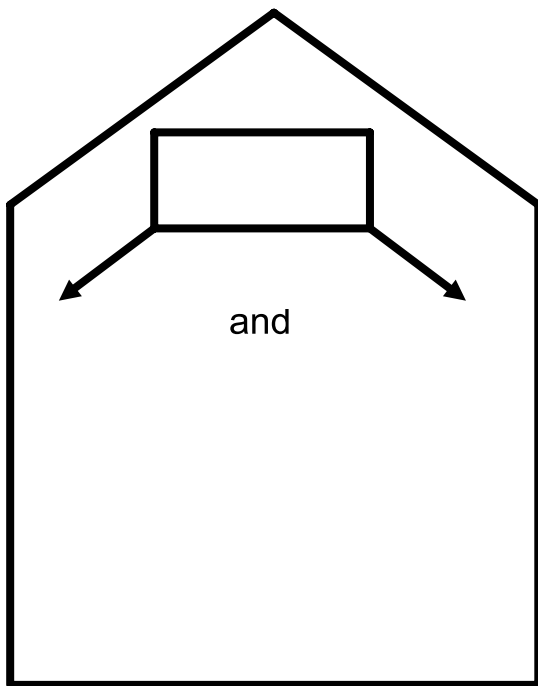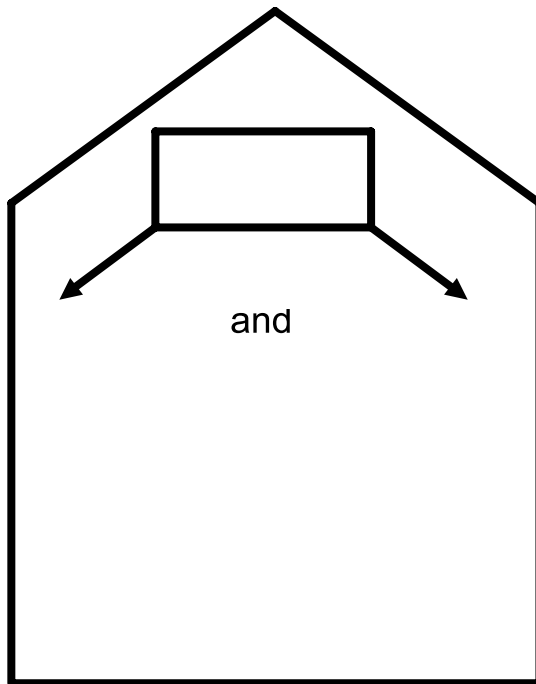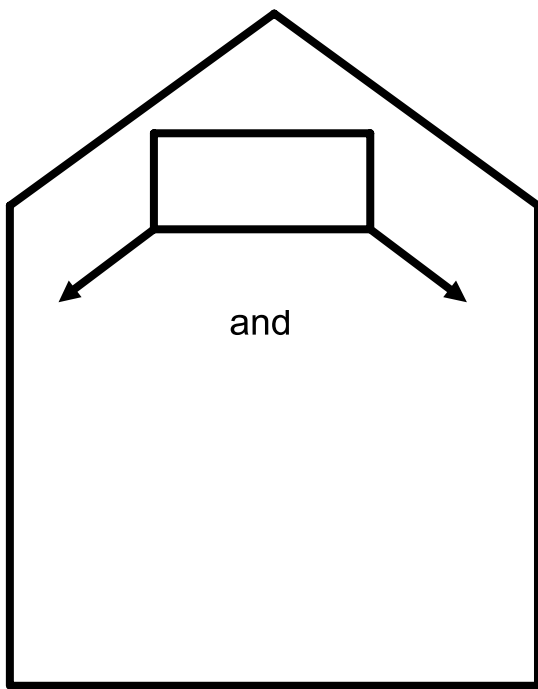
Methods

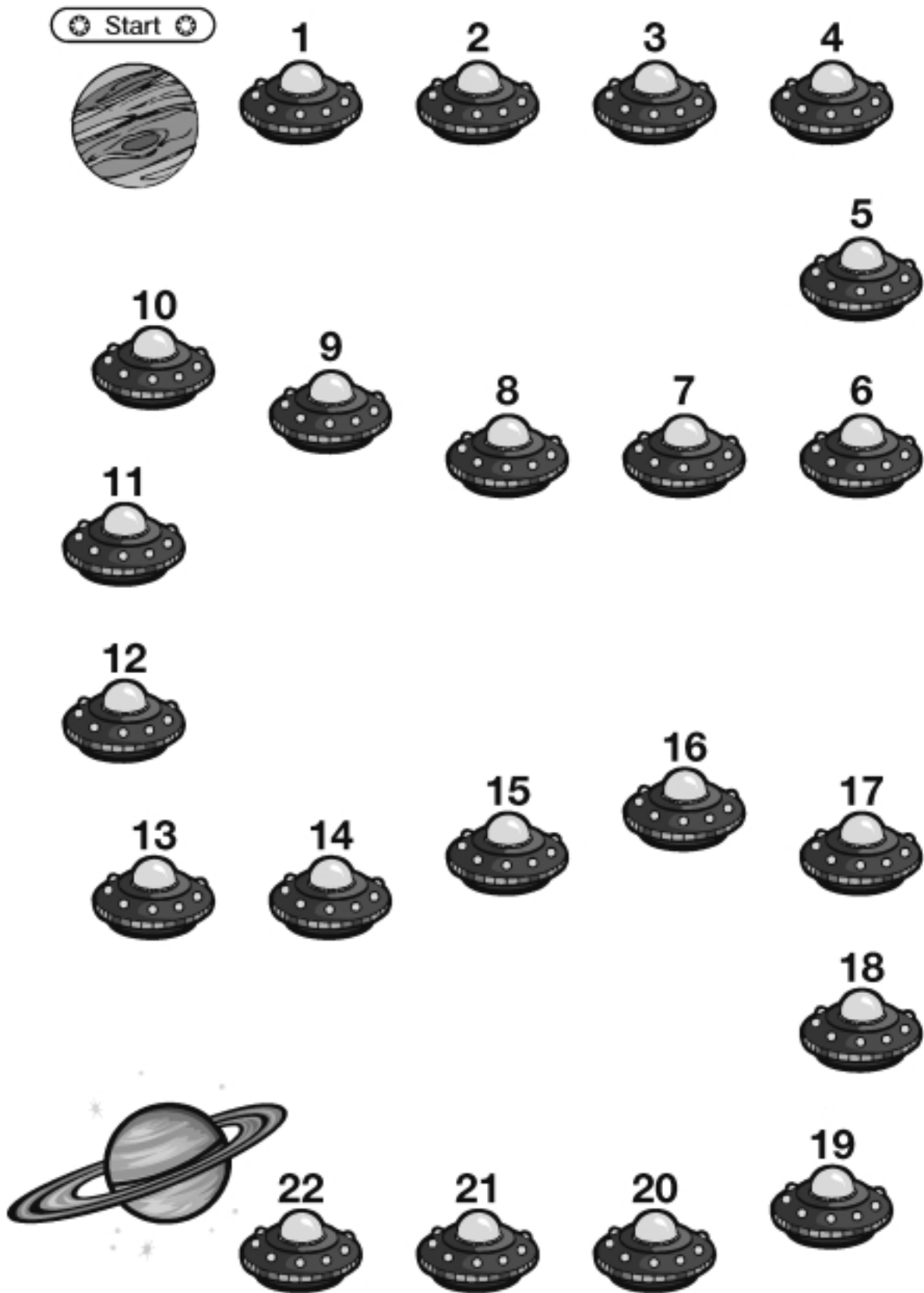|	
Use doubles or near doubles	Use similar calculations or patterns
Change the order of the numbers to make it easier	Use known facts and relate to addition and subtraction
Change the order of the numbers to make multiples of 10	Know by heart
Add 9 by adding 10 and and subtracting 1	Put the larger number first and adding on
Add or subtracting a near multiple of 10	Find a small difference by counting back
Use a number line	Partition into 5 and a bit or into tens and units

Note: Some calculations can be worked out using more than one method. Some of the methods here are extensions of others. Use the blanks for any other methods the child uses. For example, a child might want to say they have 'added the tens first, then the units'.

Calculations

Note: The calculations are in sets of three.

17 + 3	2 + 39
18 + 3	4 + 27
19 + 3	3 + 48
19 + 20	11 + 9
15 + 16	21 + 9
10 + 11	31 + 9
6 + 4	101 − 1
16 + 4	101 − 2
26 + 4	101 − 3

Calculations for estimating

Note: The calculations are in sets of three (close to 100, 200, 300, 400, 500 and 700).

51 + 52	200 + 198
48 + 53	284 + 106
149 – 50	501 – 97
115 + 96	1000 – 499
101 + 104	321 + 178
120 + 81	1500 – 989
441 – 139	601 + 100
135 + 153	599 + 91
150 + 151	300 + 442

Harder calculations

Note: The calculations are in sets of three.

19 + 21	25 − 5
51 + 49	35 − 15
30 + 29	45 − 25
17 + 13 + 42	36 +11
6 + 4 + 52	37 + 11
8 + 12 + 62	38 + 11
26 − 9	1004 − 3
36 − 9	1004 − 7
41 − 9	1004 − 9

Estimate, calculate, check

ECC

Estimate

About?

Calculate

Can I do it
in my head?

No.
So how shall I
do it?

Method 1:

Method 2:

Check

Am I sure I'm right?

Is it near my estimate?
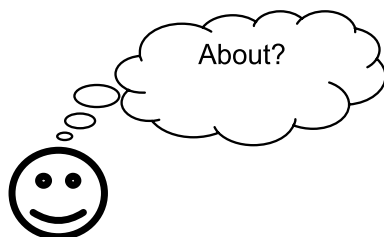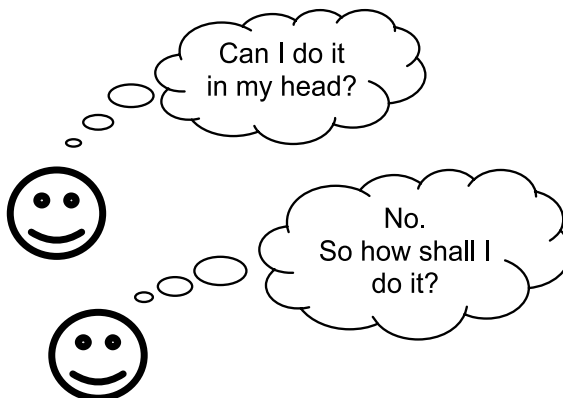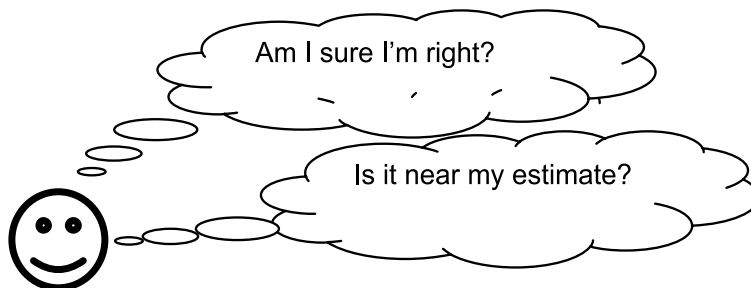
Café

Snacks

Yogurt	29p
Cheese roll	59p
Chips	79p
Green salad	99p

Drinks

Cola	49p
Water	39p
Milk	19p
Tea	59p

Lunch menu

	Egg and cress baguette	£1.99
	Tuna and sweetcorn baguette	£1.99
	Baked potato	£2.99
	Super deluxe chicken meal	£3.99
	Chef's special four-cheese salad	£4.99

Blank loop track

Start

Tape measures

25	25	25	25	25
24	24	24	24	24
23	23	23	23	23
22	22	22	22	22
21	21	21	21	21
20	20	20	20	20
19	19	19	19	19
18	18	18	18	18
17	17	17	17	17
16	16	16	16	16
15	15	15	15	15
14	14	14	14	14
13	13	13	13	13
12	12	12	12	12
11	11	11	11	11
10	10	10	10	10
9	9	9	9	9
8	8	8	8	8
7	7	7	7	7
6	6	6	6	6
5	5	5	5	5
4	4	4	4	4
3	3	3	3	3
2	2	2	2	2
1	1	1	1	1
0	0	0	0	0
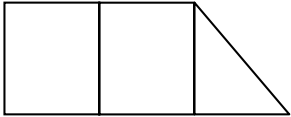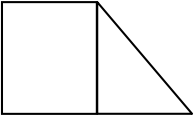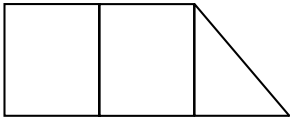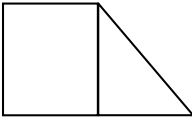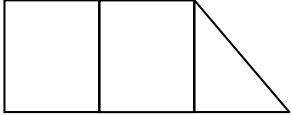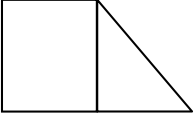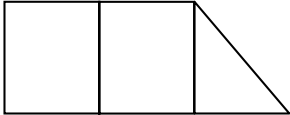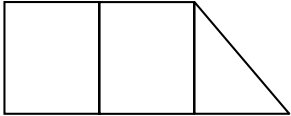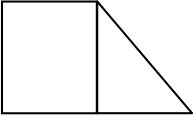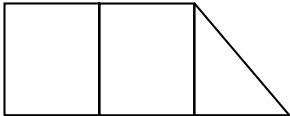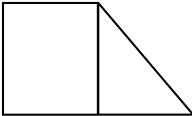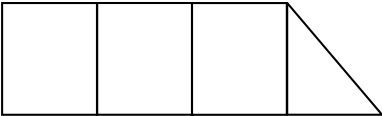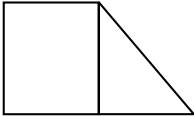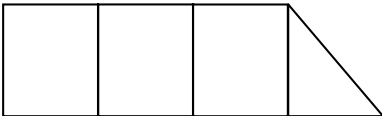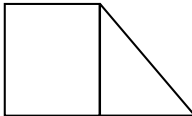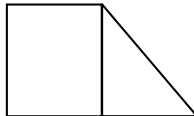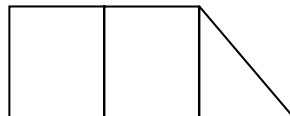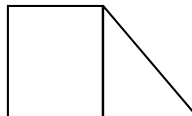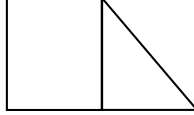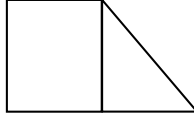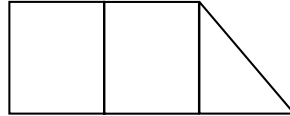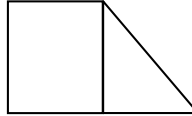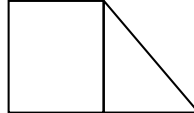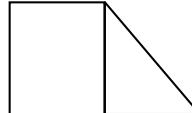
Partitioning

Tens cards

10	**20**	**30**
40	**50**	**60**
70	**80**	**90**
100	**0**	**0**

Hundreds cards

100	**200**	**300**
400	**500**	**600**
700	**800**	**900**
1000	**0**	**0**

Thousands cards

1000	**2000**	**3000**
4000	**5000**	**6000**
7000	**8000**	**9000**
10 000	**0**	**0**

Tenths cards

0.1	**0.2**	**0.3**
0.4	**0.5**	**0.6**
0.7	**0.8**	**0.9**
1.0	**0**	**0**

Climbing up

1000

900

800

700

600

500

400

300

200

100

0
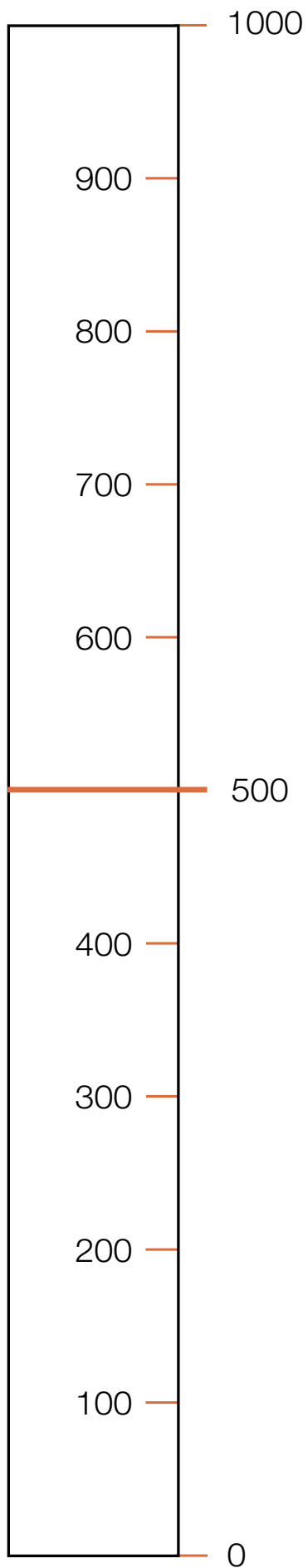
My working out

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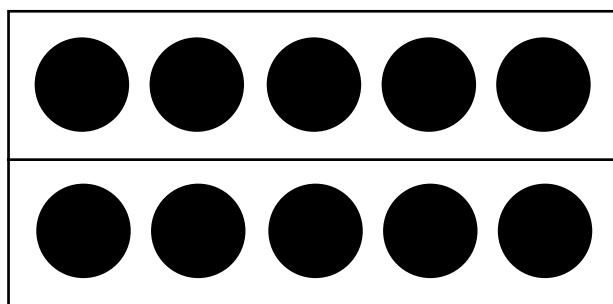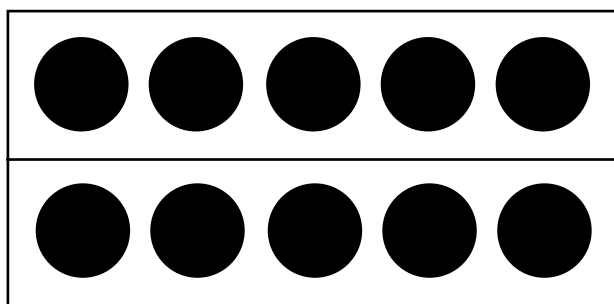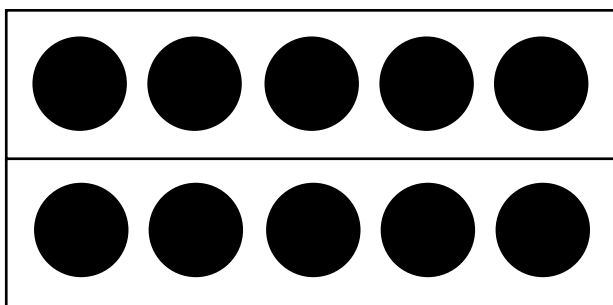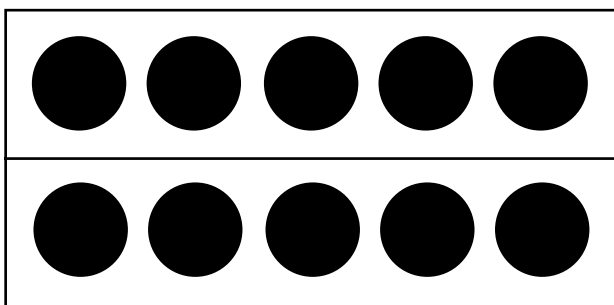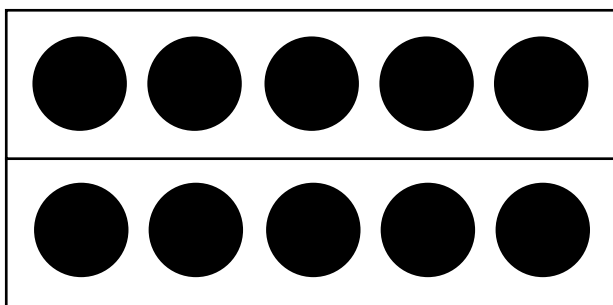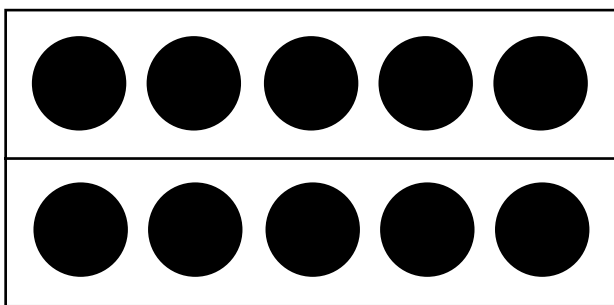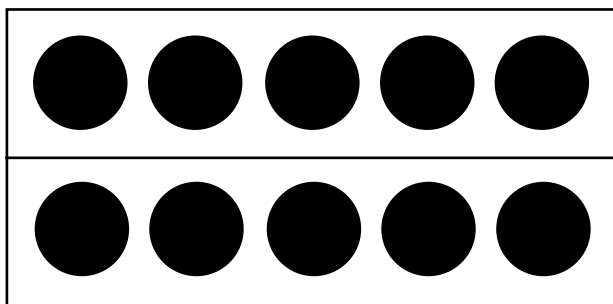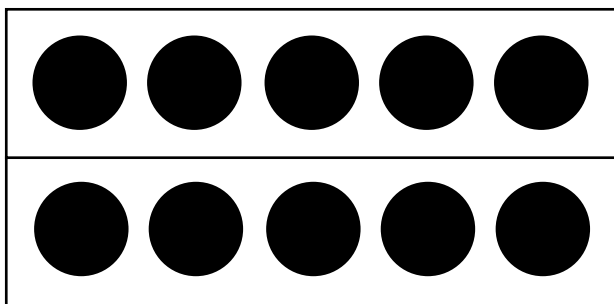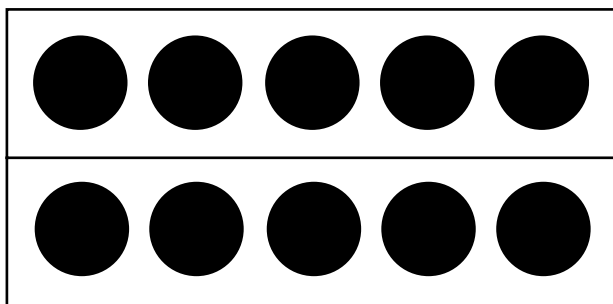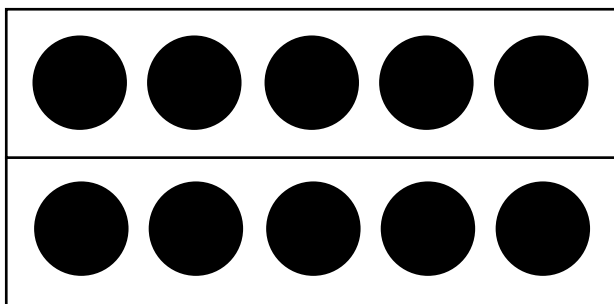
Sets of 2- and 10-dot cards
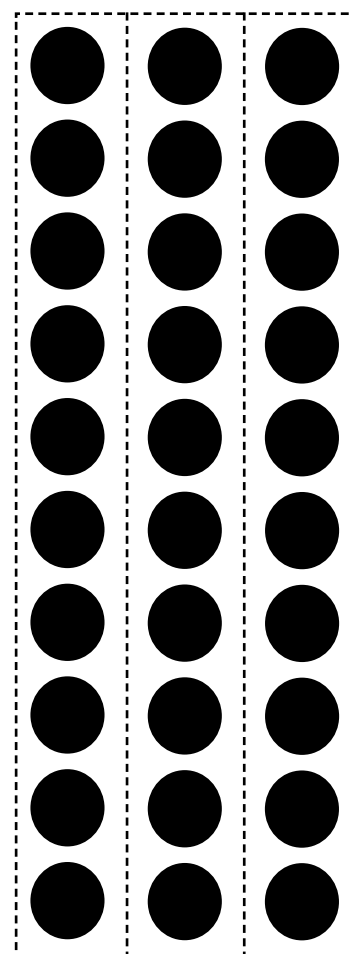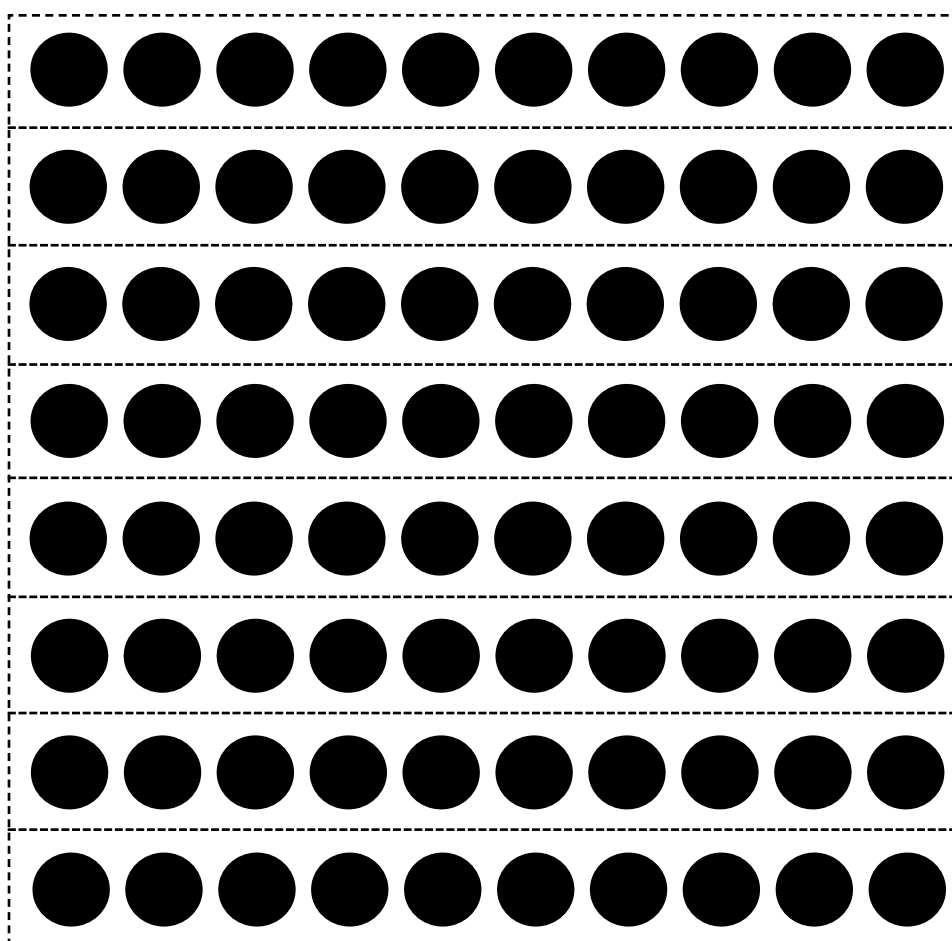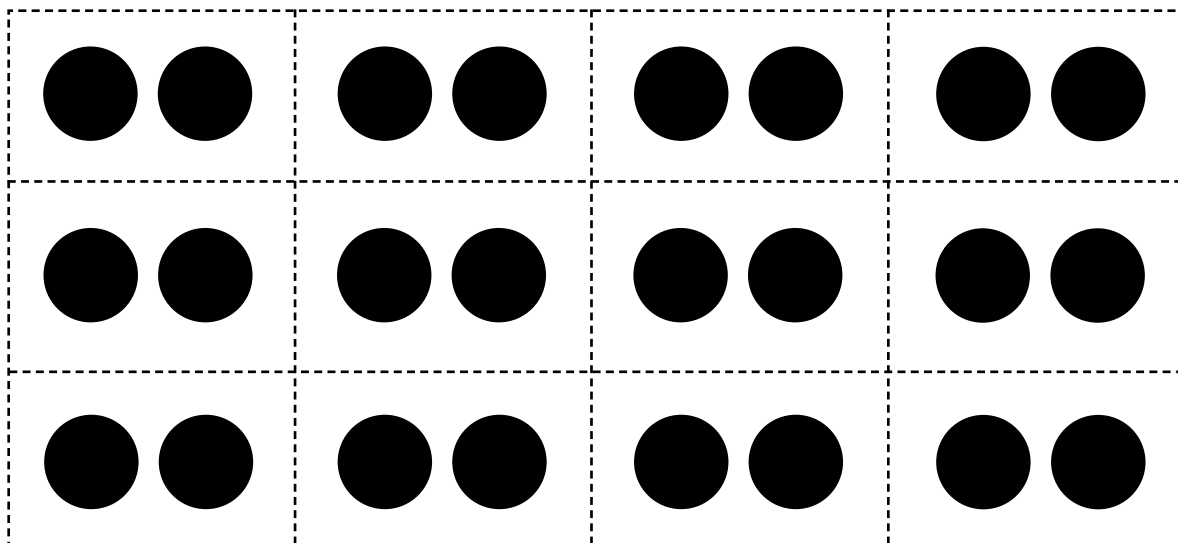
Swing cards

1 swing	2 swings	3 swings
4 swings	5 swings	6 swings
7 swings	8 swings	9 swings
2	2	2
2	2	2
2	2	2
10	10	10
10	10	10

Match it cards and board game

Ten multiplied by three	2 × 6	10 × 3	10, 20, 30
2 + 2 + 2	Two multiplied by six	2 × 3	I've got two, three times
Two marbles each are given to six children	I've got ten, three times		
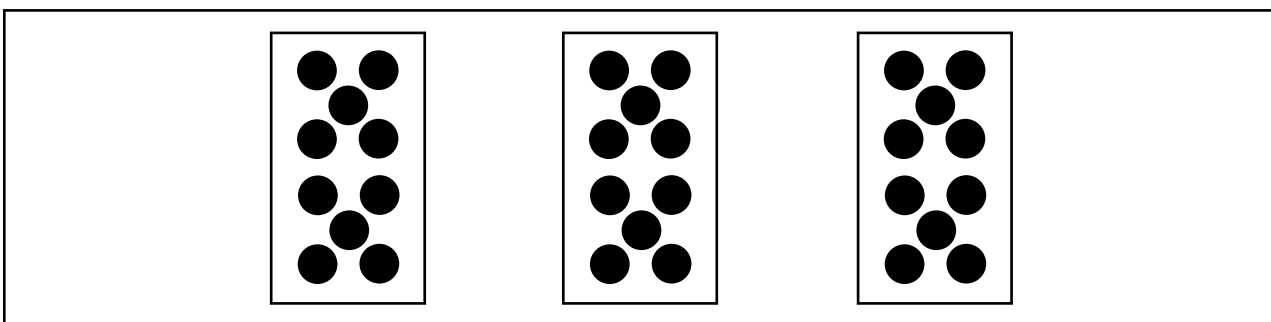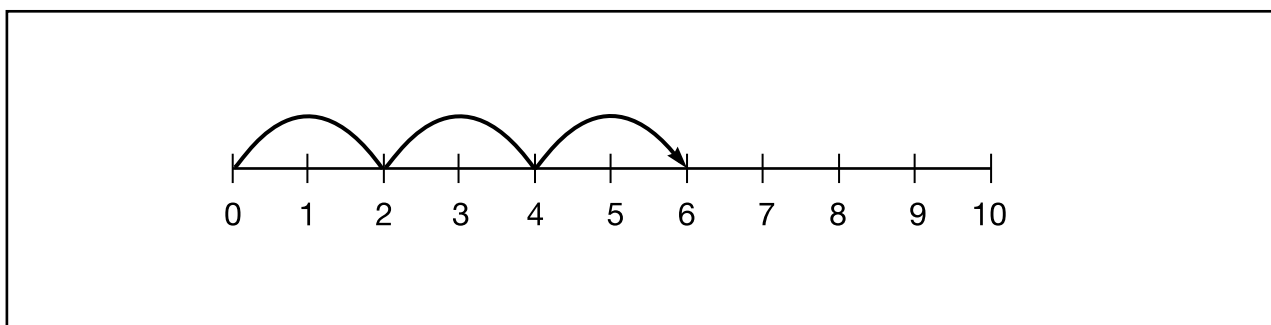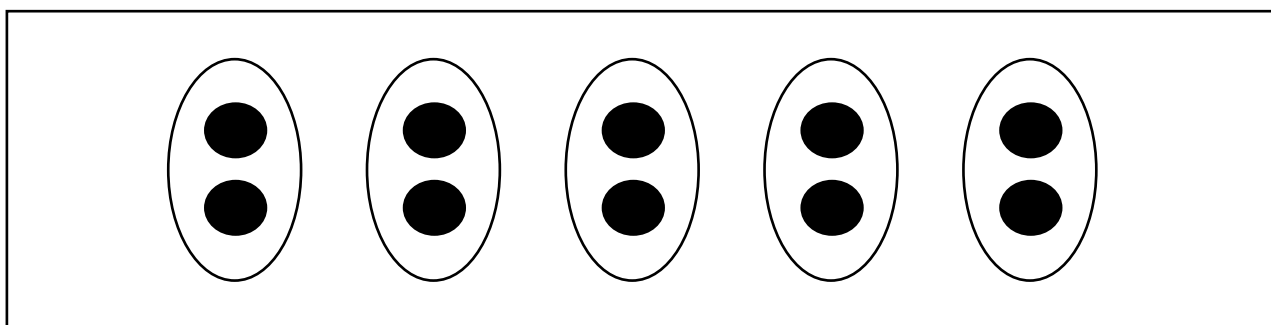
Doubling cards

× 2	**× 2**	**=**
twice	twice	**=**
double	double	**=**
two lots of	two lots of	**=**
multiplied by 2	multiplied by 2	**=**
is not	is not	**=**

Activity cards

Going to the shop	Riding my bike
Playing football	Going to school
Reading a comic	Playing a computer game
Preparing a snack	Learning spellings

Multiplication grid 1

✕	1	2	3	4	5		10
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Key: Pencil – I know these

Blue – I have to think about these

Red – I don't know these yet

Multiplication grid 2

✕	1	2	3	4	5	6	7	8	9	10
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Key: Pencil – I know these

Blue – I have to think about these

Red – I don't know these yet

Things to buy
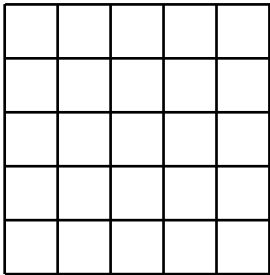
stickers		p each
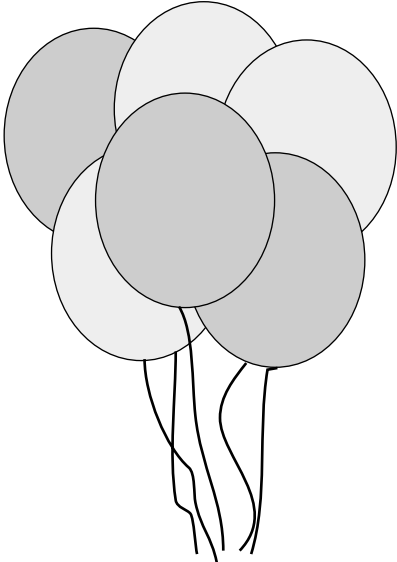
balloons		p each
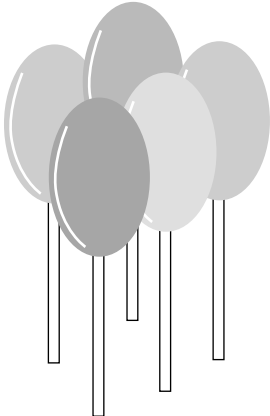
lollies		p each
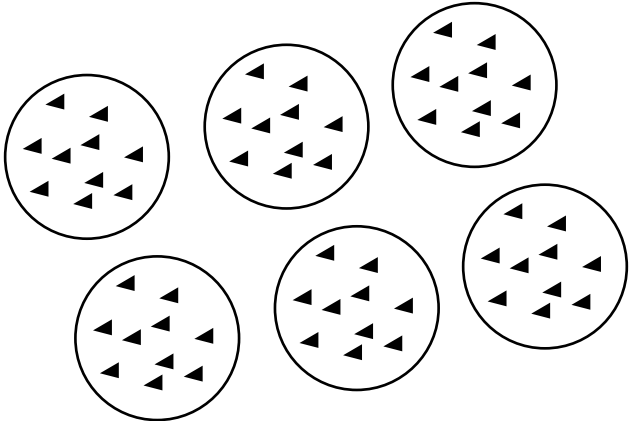
cookies		p each
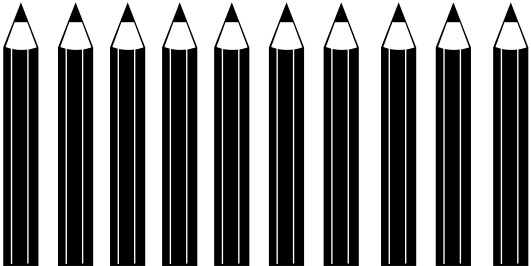
10 pencils		p each

Bingo! game sheet

6	20	15	4
12	13	17	10
8	1	5	18
11	3	14	9
16	7	19	2

10	190	160	20
150	140	180	120
90	60	170	30
80	200	130	100
110	10	50	40

Recording grids

Place value chart

0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1	2	3	4	5	6	7	8	9
10	20	30	40	50	60	70	80	90
100	200	300	400	500	600	700	800	900
1000	2000	3000	4000	5000	6000	7000	8000	9000

Fractions in the bin game board

cards

cards

cards

cards

+4   +4   +4   +4   +4

0   4   20

cards

bin
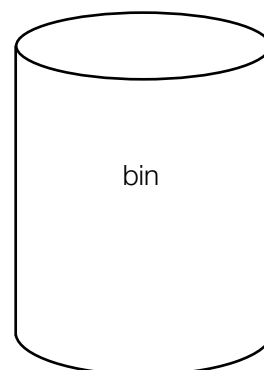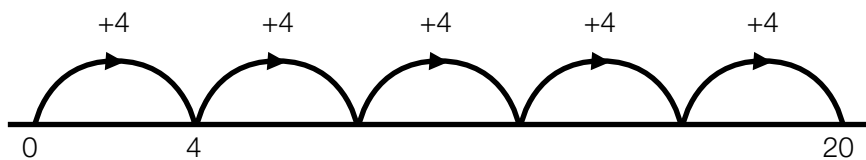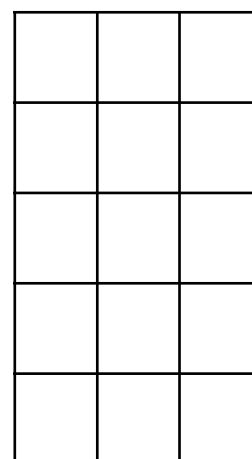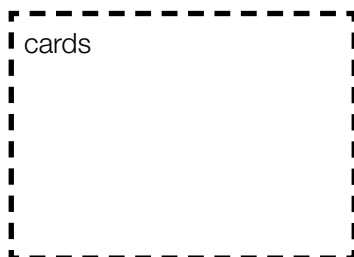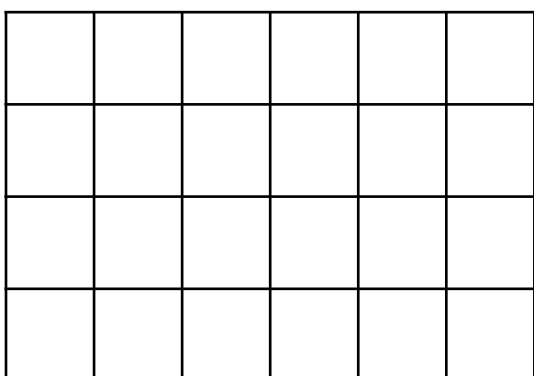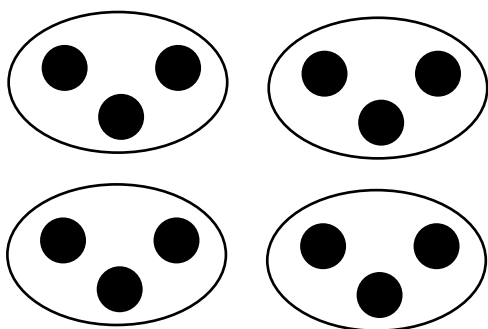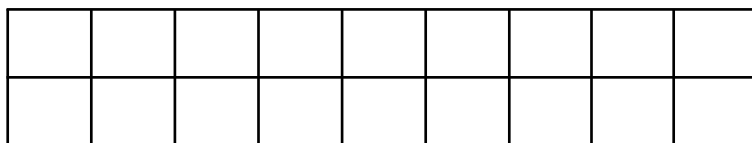
Fractions in the bin game cards

$24 \div 4$	4×5		6×4	$5 \div 20$
5×3	$15 \div 5$	$15 \div 3$	3×5	$5 \div 15$
3×4	$12 \div 3$	$12 \div 4$	4×3	$3 \div 12$
$18 \div 2$	2×9	$20 \div 5$	5×4	$9 \div 18$
$24 \div 6$	$20 \div 4$	4×6	9×2	$4 \div 12$

Fractions

$\frac{1}{4}$

quarter

$\frac{3}{4}$

three quarters

$\frac{1}{2}$

half

$\frac{1}{2}$

half

$\frac{1}{4}$

quarter

$\frac{1}{4}$

quarter

$\frac{1}{2}$

half

$\frac{1}{3}$

one third

$\frac{2}{3}$

two thirds
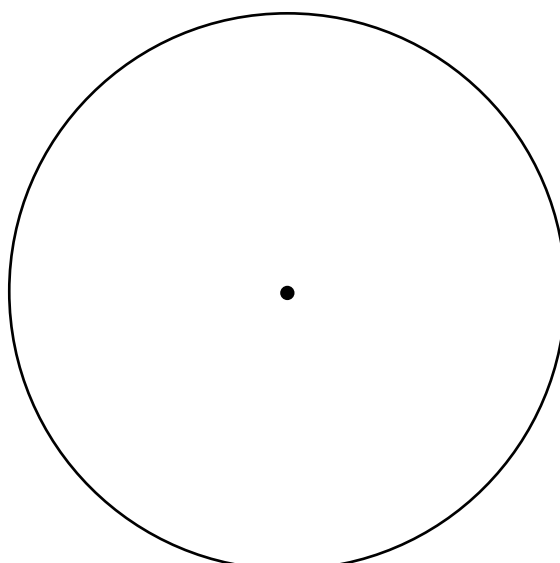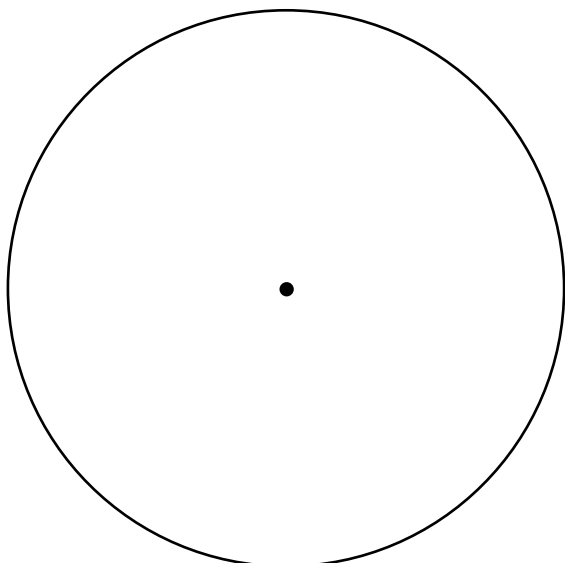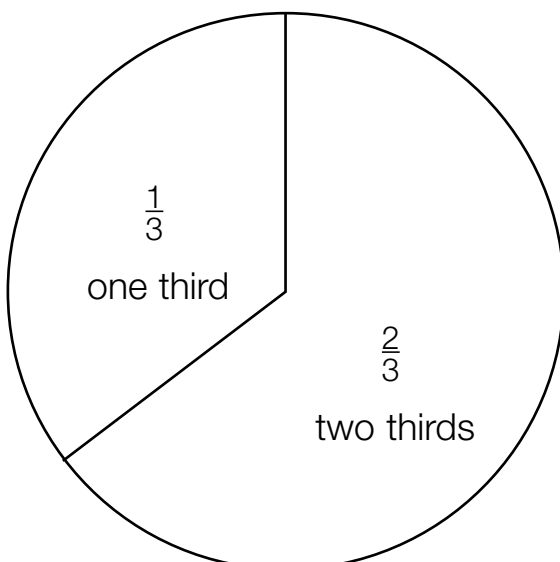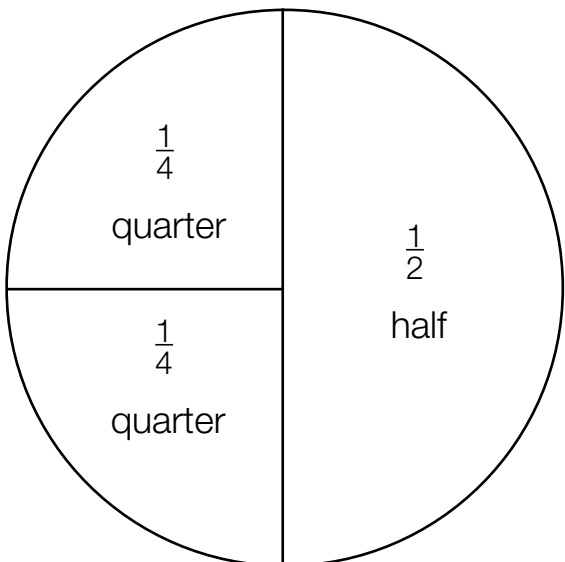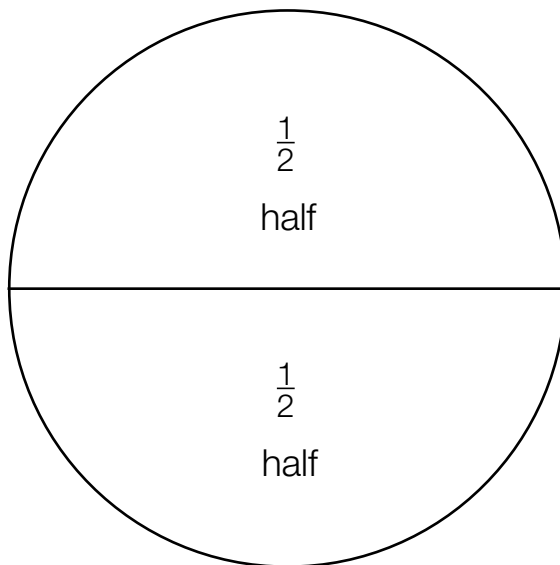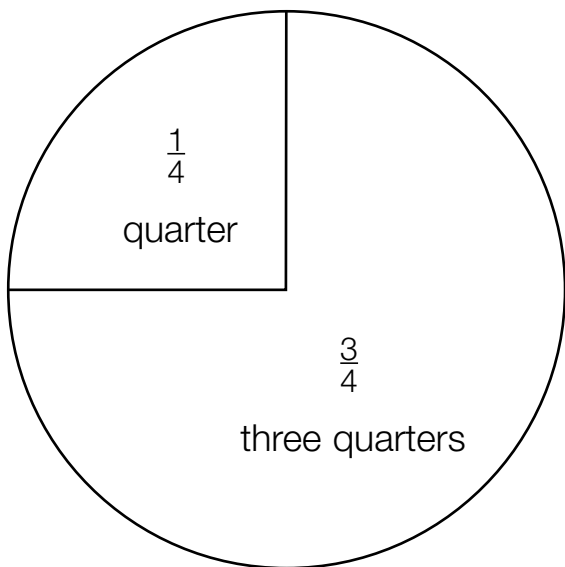
Picture match game board

1.

2.

3.

4.

Picture match game cards

How many halves in eight?	What is half of eight?
$8 \div \frac{1}{2}$	Eight divided in half
Eight divided by half	Eight divided into two
Eight divided by 0.5	$6 \div \frac{1}{4}$
What do 16 halves make?	When I divide my mystery number by $\frac{1}{4}$ the answer is 24. What is my mystery number?
When I divide my mystery number by $\frac{1}{2}$ the answer is 16. What is my mystery number?	Six divided into quarters
$6 \div \boxed{} = 12$	$8 \div \boxed{} = 16$
$\boxed{} \div \frac{1}{2} = 16$	$6 \div \boxed{} = 24$
$6 \div \frac{1}{2} = \boxed{}$	$\boxed{} \div 0.5 = 24$

Spinners
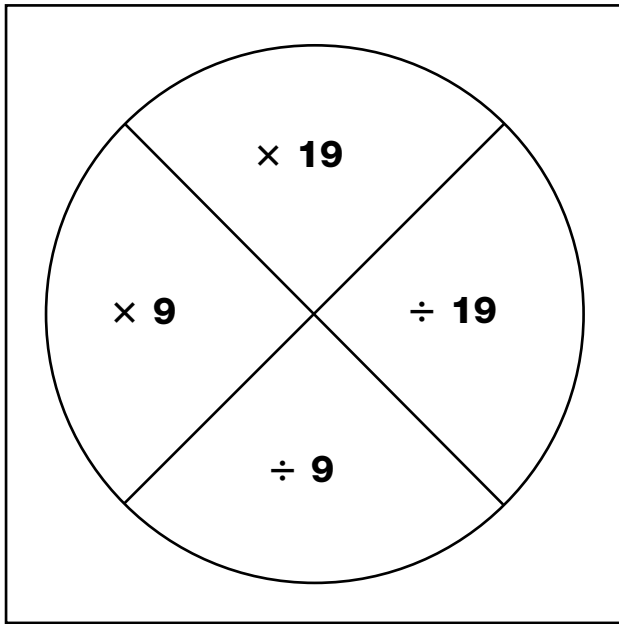
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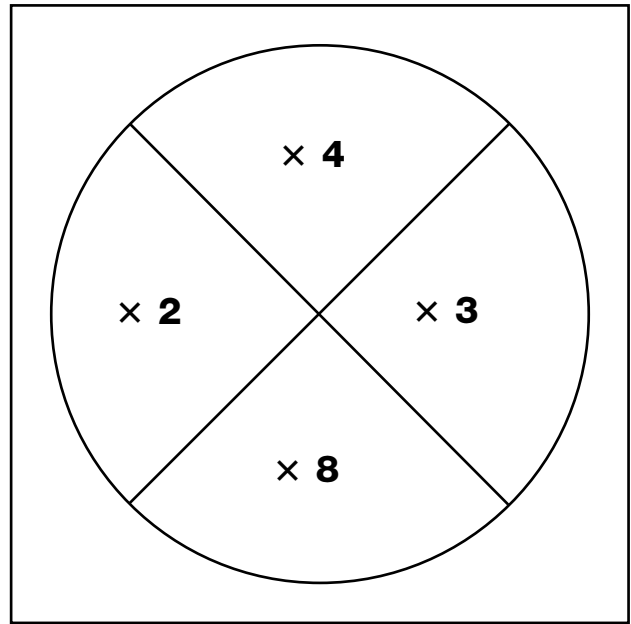
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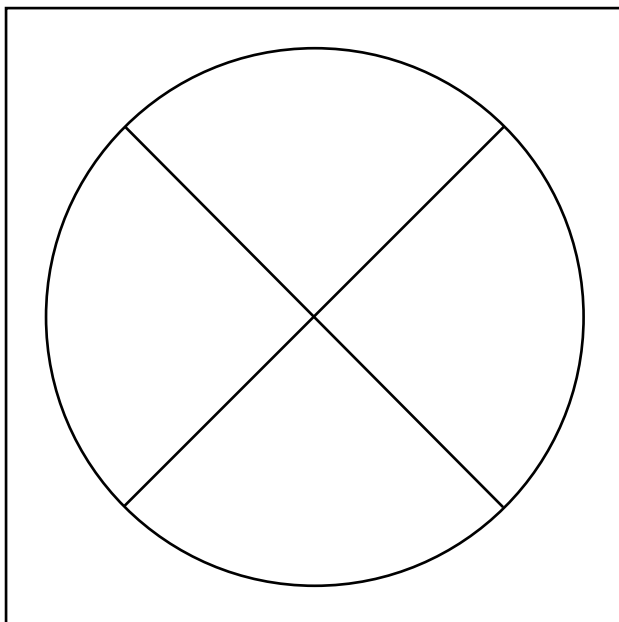
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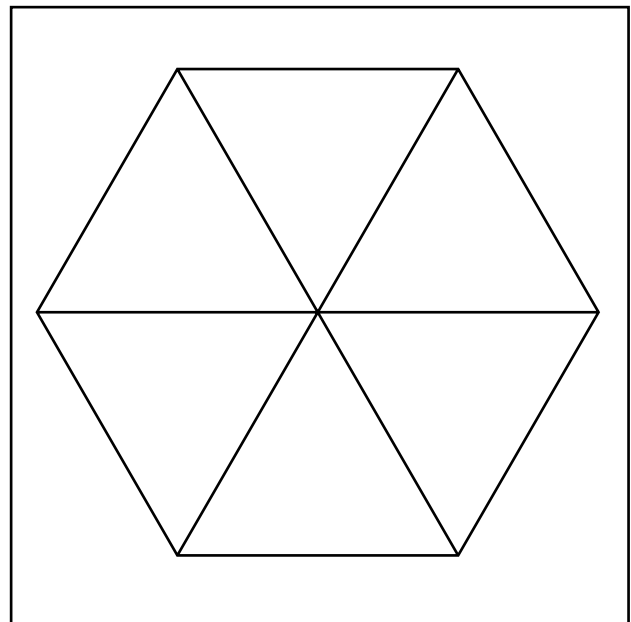
Spinner 4

Index to games in the teaching units

Addition and subtraction teaching units

Year 6 Addition and subtraction

Error / misconception	Spotlight or extra game	Title of game
1 Y6 +/– Has inefficient counting strategies and/or insecure understanding of the number system.	SL 5	How many digits?
2 Y6 +/– Rounding inaccurately, particularly when decimals are involved, and having little sense of the size of the number involved.	SL1 SL 5	Throw the dice Remembering rounding
3 Y6 +/– Has difficulty in partitioning numbers with zero place holders and/or numbers less than one, for example partitioning 0.45 as 0.4 and 0.05	SL 3 SL 5	Watch out for red! Zap the zero
4a Y6 +/– Has difficulty in choosing suitable methods for calculations that cross boundaries: addition	SL 5	Cross-boundary shout
4b Y6 +/– Has difficulty in choosing suitable methods for calculations that cross boundaries: subtraction	SL 5	Frog in the well

Year 4 Addition and subtraction

1 Y4 +/– Has insecure understanding of the structure of the number system, resulting in addition and subtraction errors and difficulty with estimating.	SL 5	Calculator zapping
2 Y4 +/– Has difficulty in partitioning, for example, 208 into 190 and 18, and 31 into 20 and 11	SL 5	Partitioning houses
3 Y4 +/– Does not make sensible decisions about when to use calculations laid out in columns.	SL 5	Doing odd jobs
4 Y4 +/– Has difficulty with adding three numbers in a column, except by adding the first two and then the last one	SL 5	Smallest possible

Year 2 Addition and subtraction

1 Y2 +/– Makes mistakes when counting using teen numbers and / or crossing boundaries.	SL 5	Run in the gap
2 Y2 +/– Has difficulty in remembering number pairs totalling between ten and twenty, resulting in calculation errors.	SL 5 Extra game	Shout it out Number pairs
3 Y2 +/– Counts up unreliably; still counting the smaller number to get one too many in the answer.	SL 3 SL 5	Land on 10 Space hops
4 Y2 +/– Does not relate finding a difference and complementary addition to the operation of subtraction.	SL 5 Extra game	Kangaroo hops Difference race
5 Y2 +/– Is insecure in making links between addition and subtraction and/or recognising inverses.	SL 5	Card triples
6 Y2 +/– Does not readily use number patterns to support calculating.	SL 5	Down the ladder

Year R Addition and subtraction

1 YR +/– Can only begin counting at one; inaccurately counts objects when rearranged; has no consistent recognition of small numbers of objects; lacks systematic approaches.	SL 5	Chink chink
2 YR +/– Misunderstands meaning of 'one more' and 'one less'; does not consistently identify the number before or after a given number.	Intro SL 2 SL 3 SL 4 SL 5	Fishing Game Bean bags Dropping pennies Number card game Ten-counter race
3 YR +/– Does not relate the combining of groups of objects to addition and / or does not interpret the counting of all the objects as the answer to the question 'How many are there altogether?'	SL 5 Extra game	Tiddlywinks Altogether makes
4 YR +/– Is not confident about when to stop counting when taking away (subtracting) in answer to the question 'How many are left?'	SL 5	Two-minute dice dash

Multiplication and division teaching units

Year 6 Multiplication and division

Error / misconception	Spotlight or extra game	Title of game
1 Y6 ×/÷ Misuses half-understood rules about multiplying and dividing by powers of ten and the associative law, for example: $145 \times 30 = 145\ 000$	SL 5	Beat the calculator
2 Y6 ×/÷ Has difficulty, when appropriate, interpreting a remainder as a fraction, for example $16 \div 3 = 5\frac{1}{3}$	SL 5	Double-decker pizza
3 Y6 ×/÷ Interprets division as sharing but not as grouping (repeated subtraction) so is unable to interpret a calculation such as $12 \div \frac{1}{2}$	SL 5	Picture match game
4 Y6 ×/÷ Is not confident in making reasonable estimates for multiplication or division calculations	SL6 Extra game	Which side? Who is the closest? In one move

Year 4 Multiplication and division

Error / misconception	Spotlight or extra game	Title of game
1 Y4 ×/÷ Is not confident in recalling multiplication facts.	SL 5	Red race
2 Y4 ×/÷ Is muddled about the correspondence between multiplication and division facts.	SL 5	Thinking threes
3 Y4 ×/÷ Describes the operation of multiplying by ten as 'add a nought'.	SL 3 SL 5	Bingo Move left
4 Y4 ×/÷ Does not apply partitioning and recombining when multiplying.		
5 Y4 ×/÷ Assumes that the commutative law holds for division also.	SL 5	Fractions in the bin
6a Y4 ×/÷ Writes a remainder that is larger than the divisor.	SL 5	Silly number sentences
6b Y4 ×/÷ Discards the remainder; does not understand. its significance.	SL 5	Hand over the beans
6c Y4 ×/÷ Does not recognise when a remainder is significant in the decision about whether to round up or down.		
7 Y4 ×/÷ Continues to subtract twos when calculating twenty divided by two without using knowledge that two multiplied by five equals ten.	SL 5	Chunking chase

Year 2 Multiplication and division

1 Y2 ×/÷ Still counts in ones to find how many there are in a collection of equal groups; does not understand vocabulary.	SL 5	Race to fifty pence
2 Y2 ×/÷ Does not link counting up in equal steps to the operation of multiplication; does not use the vocabulary associated with multiplication.	SL 5	Match it
3 Y2 ×/÷ Does not focus on 'rows of' or 'columns of' but only sees an array as a collection of ones.		
4a Y2 ×/÷ Has difficulty relating multiplying by two to known facts about doubles; records double four as 4 + 4.	SL 5	Double it
4b Y2 ×/÷ Does not use partitioning to find double twelve or double thirty-five.	SL 5	Doubles bingo
5 Y2 ×/÷ Does not use knowledge of doubles to find half of a number.	SL 4 SL 5	Numbers in my head Doubles and halves game
6 Y2 ×/÷ Is not systematic when sharing into equal groups; does not use the language of division to describe the process.	SL 5	Pirate gold
7 Y2 ×/÷ Does not understand that 'sets of' or 'groups of' need to be subtracted to solve the problem.	SL 5	Stick break

Year R Multiplication and division

1 YR ×/÷ Confuses numbers when counting in twos; has difficulty understanding a pair consists of two objects.	Extra game	Line up in twos
2 YR ×/÷ Has difficulty with identifying doubles and adding a small number to itself.	SL 1	Double Dudley
3 YR ×/÷ Makes unequal groups and is unable to compare the groups.		
4 YR ×/÷ When sharing, can sometimes make equal groups, but has no strategies to deal with any left over.		
5 YR ×/÷ Has difficulty with counting reliably in tens from a multiple of ten.	Intro SL 4 SL 5	Whisper and jump Tens race Eyes closed
6 YR ×/÷ When halving, makes two unequal groups or splits a single object unequally.		