

At home materials
Learner Pack
Year 4 Weeks 1-4

Pack 1: Numbers

Session A) Counting and grouping

Session B) Value of the place

Session C) Regrouping

Session D) Build and adjust

Pack 3: Multiplication facts

Session A) Multiplication facts

Session B) Doubling

Session C) Multiples of 10 and 5

Session D) Derived facts

Pack 4: Multiplication strategies

Session A) Adjusting a factor by 1

Session B) Monthly payments

Session C) Adjusting a factor by 10

Session D) Exploring calculation strategies

Pack 11: Division strategies

Session A) Division and multiplication

Session B) Halving strategies

Session C) Division structures

Session D) Models of division



Timing

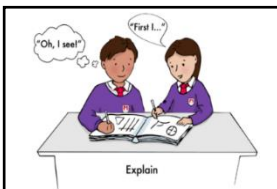
Each session is 30 minutes
20 minute Talk Task and 10 minute independent activity

Session guidance

Get talking and grow your language.

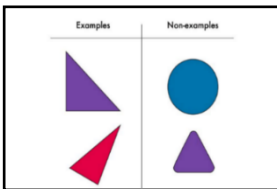
Use equipment, manipulatives, models and images to show and explain.

Challenge **yourself** to think mathematically. Use the Prompts for Thinking listed below to help build up habits in the way you think about mathematical situations.



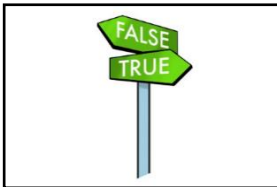
Reason it

Explain how you know. Focus on reasons rather than answers. What could you say, do, draw or write to help someone else understand?



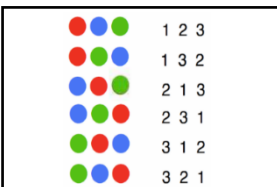
Generate examples and non-examples

What are the important features? What features are not important (e.g. colour)?



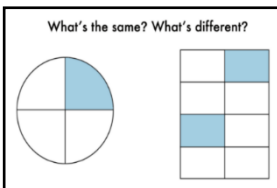
True or false?

If true, give examples to support your answer. If false, give a counter example.



Find all possibilities

Have you found all the possible answers? How do you know? Did you work systematically?



What's the same? What's different?

Compare and contrast and look for connections. How many different answers can you give?



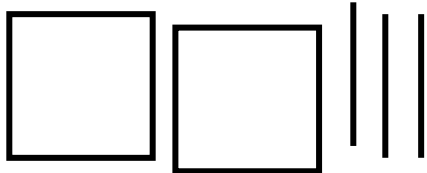
Always, sometimes or never true?

Give examples to show if the statement is always, sometimes or never true. How do you know?

Pack 1 Session A

Activity: Counting and grouping

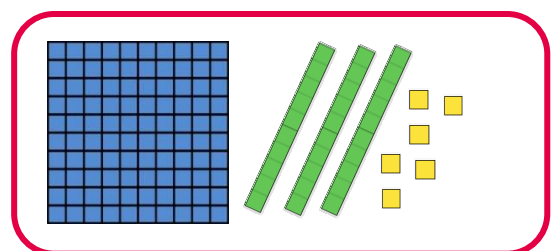
1) Complete the table to show each number with Dienes and in words.

number	Dienes	words
		One hundred and fifty four
		_____
307		_____

2) If you count in steps of 10 starting at 56, will you say these numbers?
Tick the ones you will say. What other numbers would you say?

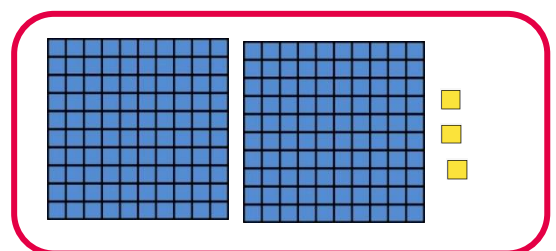
65

Ninety six



106

One hundred
and ten



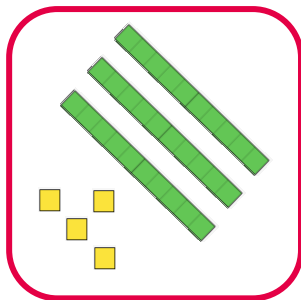
160

Two hundred
and twenty six

Pack 1 Session B

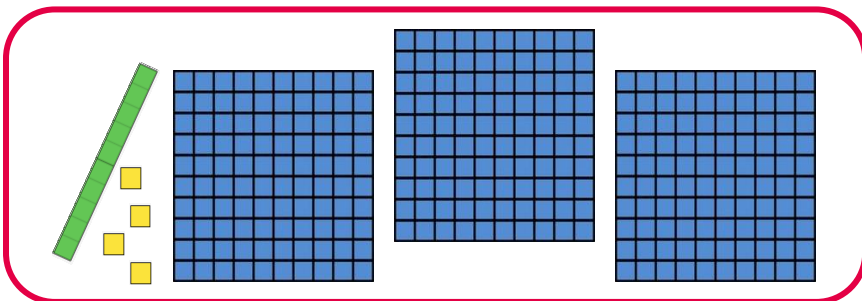
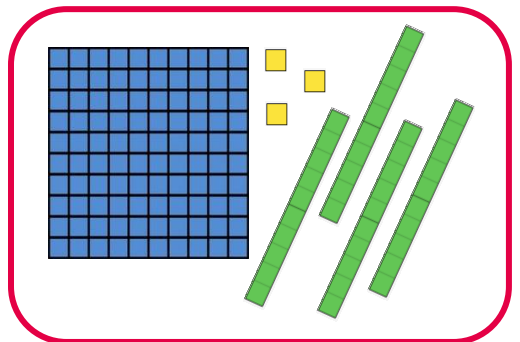
Talk Task: The value of the place

How many different 2-digit and 3-digit numbers can you build and write with these digits?



Fourteen

Four hundred and thirteen



How do you know you have found them all?

● ● ●	1 2 3
● ● ●	1 3 2
● ● ●	2 1 3
● ● ●	2 3 1
● ● ●	3 1 2
● ● ●	3 2 1

Pack 1 Session B

Activity: The value of the place

1) Use these digits to create numbers for each of the properties



a) A number less than 100

b) A number greater than 300

c) An even number

d) A number that you can show with 7 Dienes blocks

e) An odd number

2) Generate at least two examples and non-examples for each

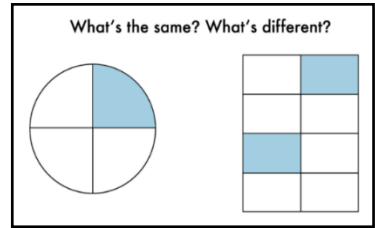
	Examples	Non-examples
A number with 4 tens that is greater than 500		
An even number with 3 hundreds		
A number with 6 ones that is greater than 100 but less than 200		

Pack 1 Session C

Talk Task: Counting coins

What is the same? What is different?

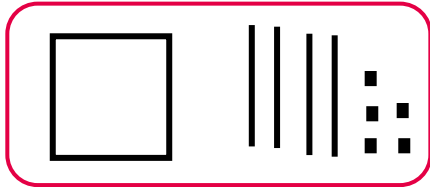
Use Dienes to explain and show why



Pack 1 Session C

Activity: Regrouping

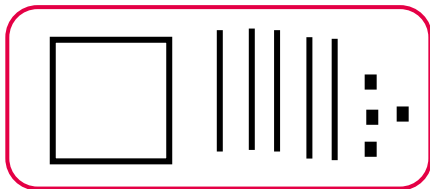
1) Match the representations



$$90 + 14$$

5 tens and
95 ones

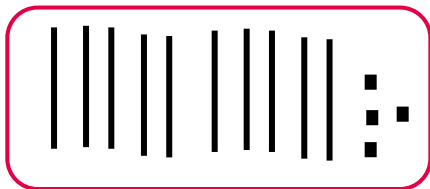
$$154$$



$$90 + 55$$

1 hundred,
2 tens and
34 ones

$$145$$



$$100 + 40 + 14$$

4 tens and
64 ones

$$104$$

2) Fill in the blanks to show each number in different ways. How many more can you think of?

$$42$$

- $40 + \square$
- $\square + 12$
- $20 + \square$
- $\square + 21$

$$84$$

- $\square + 4$
- $60 + \square$
- $\square + 34$
- $51 + \square$

$$168$$

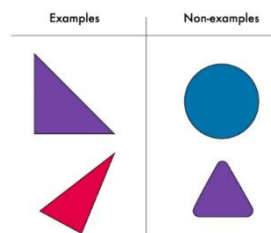
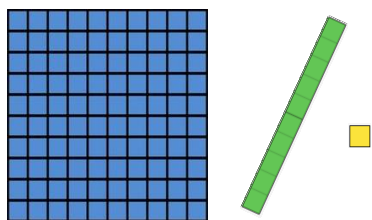
- $\square + 60 + 8$
- $100 + 50 + \square$
- $100 + \square + 28$
- $\square + 70 + 8$
- $90 + 60 + \square$
- $90 + \square + 28$

Pack 1 Session D

Talk Task: Build and adjust

Exactly ten blocks

What numbers can and cannot be shown?



Adjust your model

Add one block.

What could happen? What could not happen?

Take away one block.

What could happen? What could not happen?

Choose a number. Add 10

The digit in the ones place changes.

The digit in the tens place changes.

The digit in the hundreds place changes.

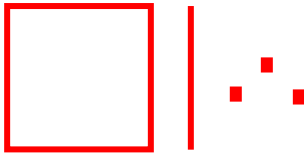
Explore if the statements are always, sometimes or never true.



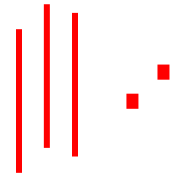
Pack 1 Session D

Activity: Build and adjust

1) Draw and write numbers with **exactly five Dienes blocks**



113



32

2) Circle always, sometimes or never and give examples to support your answer.

always

sometimes

never

If you add 1 to a number, the digit in the ones place changes.

always

sometimes

never

If you add 1 to a number, the digit in the tens place changes.

always

sometimes

never

If you add 1 to a number, the digit in the hundreds place changes.

Pack 3 Session A

Talk Task: Multiplication facts

×	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

What is this grid? How do you read it?

What is the result if a number is multiplied by zero or one?

Are there numbers that appear more than once?

Colour in the facts you know. Which facts do you find tricky?

Are they near each other in the grid?

Pack 3 Session A

Activity: Multiplication facts

Multiplication facts I know. I have them memorised:

Multiplication facts I can quickly work out:

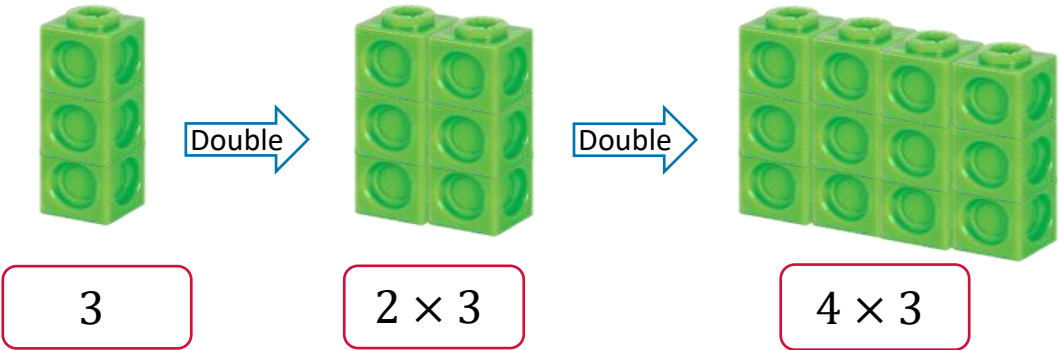
Multiplication facts I find tricky:

Pack 3 Session B

Talk Task: Doubling

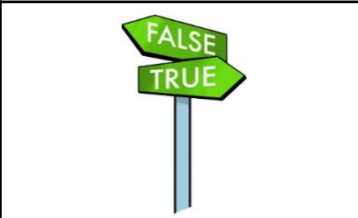
Choose a number.
Double and double again.
You get a multiple of 4.

always
 sometimes
 never



Double 4×6
is 8×6

Double 4×6
is 6×6



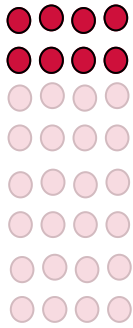
Double 4×6
is 4×8

Double 4×6
is 4×12

Pack 3 Session B

Activity: Equal groups

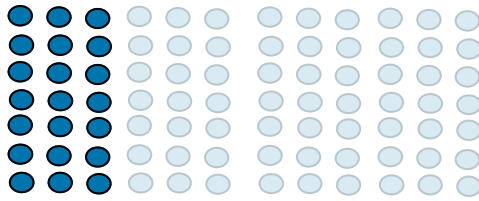
1) Use these arrays and doubling to complete the calculations



$$4 \times 2 = \square$$

$$4 \times 4 = \square$$

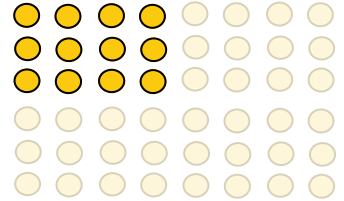
$$4 \times 8 = \square$$



$$3 \times 7 = \square$$

$$\square \times 7 = 42$$

$$12 \times 7 = \square$$



$$3 \times \square = 12$$

$$3 \times 8 = \square$$

$$\square \times 8 = 48$$

2) Give examples to show that each of these strategies works.

To divide a number by 4,
I can halve twice

To multiply a number by 8,
I can double three times

3) Match each calculation to a valid strategy and then to the answer.

$$7 \times 8$$

$$8 \times 6$$

$$5 \times 8$$

$$8 \times 9$$

$$9 \times 4 \times 2$$

$$8 \times 3 \times 2$$

$$7 \times 4 \times 2$$

$$5 \times 2 \times 2 \times 2$$

56

72

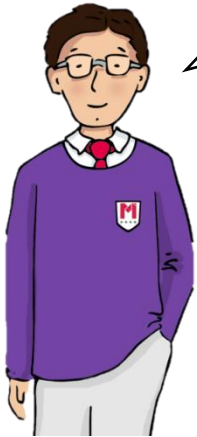
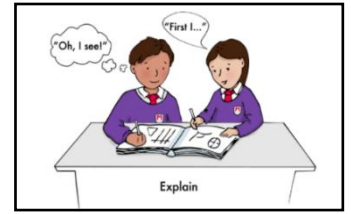
40

48

Pack 3 Session C

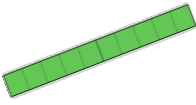

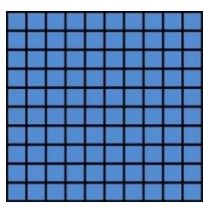
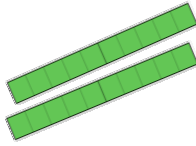
Talk Task: Multiples of 10 and 5

Improve this explanation



To multiply by 10
just add zero

12 + 0 is not 120.

Hundreds	Tens	Ones
	1 	2 
1 	2 	0

The zero is a place holder.
What do you think this means?

Use the models and calculations to explain how multiplying by 10 and halving can be used to multiply by 5

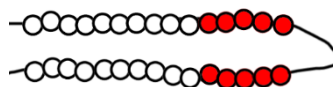
$$3 \times 10$$



Half of 30



$$3 \times 5$$



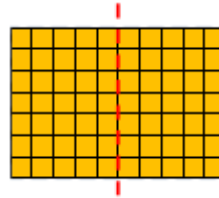
Pack 3 Session C

Activity: Regrouping

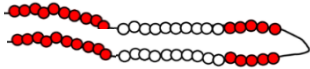
1) Write calculations to describe each model.



$$\square \times \square = \square$$



$$\square \times \square = \square$$

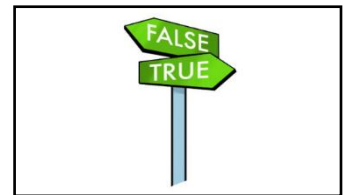


$$\square \times \square = \square$$



$$\square \times \square = \square$$

2) Decide if the following are true or false. If they are true, then calculate the answer. If they are false, give a correct statement and calculate the answer.



Half of 80 = 5×8

$7 \times 5 =$ half of 30

$12 \times 5 = 6 \times 10$

3) Use the relationships between multiples of 10 and 5 to complete the calculations

$$12 \times 10 = \square$$

$\xrightarrow{\text{find half}}$

$$\square = 12 \times 5$$

$$\square \times 10 = 160$$

$\xrightarrow{\text{find half}}$

$$80 = 16 \times \square$$

$$26 \times \square = 260$$

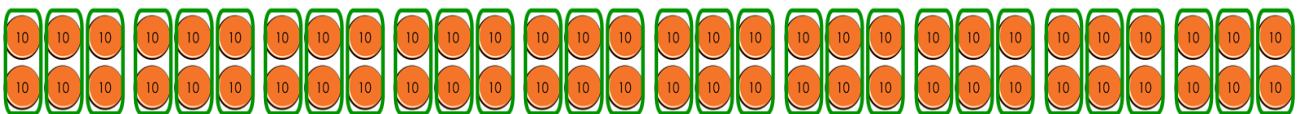
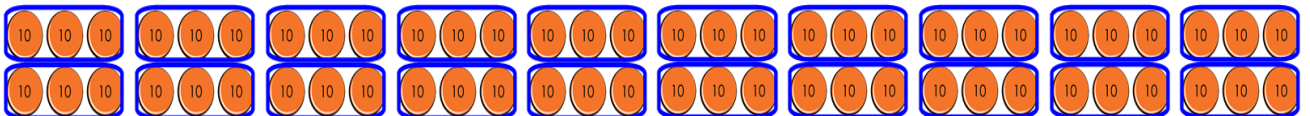
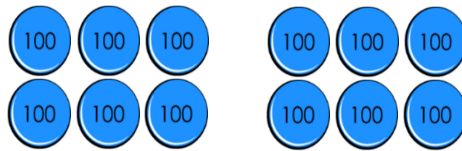
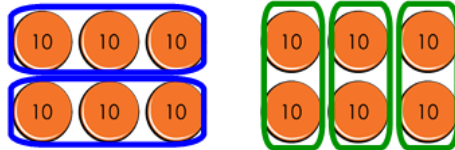
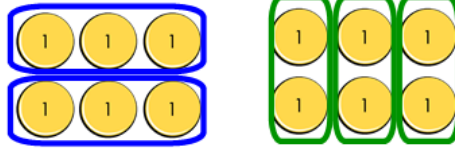
$\xrightarrow{\text{find half}}$

$$\square = 26 \times 5$$

Pack 3 Session D

Talk Task: Derived facts

What multiplication and division facts can these arrays represent?



If a factor is 10 times greater, the product is ____ times greater.

If a factor is 100 times greater, the product is ____ times greater.

If both factors are 10 times greater, the product is ____ times greater.

Pack 3 Session D

Activity: Derived facts

Copy and complete the calculations this array could represent as the value of each counter is changed.

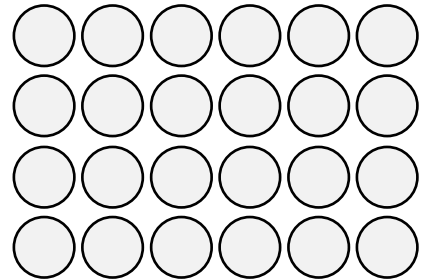
Each counter has a value of 1

$$4 \times 6 = \square$$

$$\square \times 4 = 24$$

$$24 \div 6 = \square$$

$$\square \div 4 = 6$$



Each counter has a value of 10

$$40 \times 6 = \square$$

$$\square \times 40 = 240$$

$$240 \div 6 = \square$$

$$240 \div \square = 6$$

$$4 \times 60 = \square$$

$$\square \times 4 = 240$$

$$\square \div 60 = 4$$

$$240 \div \square = 60$$

Use the fact that $4 \times \square = 28$ to answer the following.

I do 40 minutes of exercise every day. How many minutes will I have done after 7 days?

280 grams of sugar is split into bowls with 40g in each. How many bowls of sugar are there?

Completing a level of a game gets you 70 points. You manage to do 40 levels, how many points do you have?

£280 is shared equally between 4 people. How much does each get?

Pack 4 Session A

Talk Task: Derived facts – adjusting a factor by 1



There are 8 apples in each bag.

$$8 \times 7 = 56$$

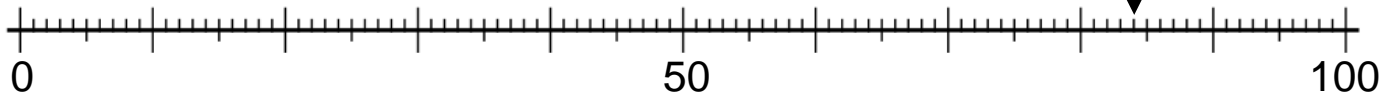
Take away a bag

Add a bag

Take one apple
out of every bag

Add one apple
to every bag

$$14 \times 6$$
$$84$$



14×5

14×7

13×6

15×6

14×5 is ___ less than 14×6

13×6 is ___ less than 14×6

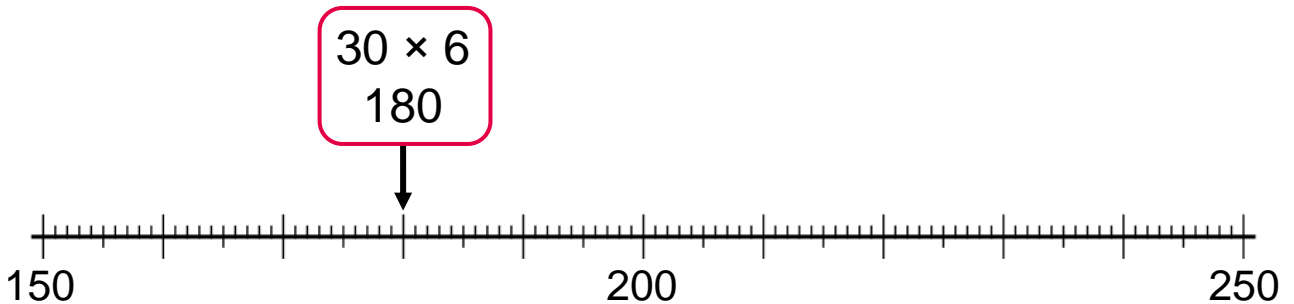
14×7 is ___ more than 14×6

15×6 is ___ more than 14×6

Pack 4 Session A

Activity: Derived facts – adjusting a factor by 1

- 1) Use the known fact to place the calculations onto the number line and complete the statements to describe the relationship.



31×6 29×6 30×7 30×5

29×6 is ___ less than 30×6 31×6 is ___ more than 30×6
 30×5 is ___ less than 30×6 30×7 is ___ more than 30×6

- 2) Complete the calculations. What relationships do you notice..

$3 \times 5 + 3 = 3 \times \boxed{}$

$9 \times 2 = 20 - 2$

$4 \times 5 + 4 = 4 \times \boxed{}$

$9 \times 3 = \boxed{} - 3$

$5 \times 5 + 5 = 5 \times \boxed{}$

$9 \times 4 = 40 - \boxed{}$

$6 \times 5 + 6 = 6 \times \boxed{}$

$9 \times \boxed{} = 50 - 5$

$7 \times 5 + 7 = \boxed{}$

$9 \times 6 = \boxed{} - 6$

$9 \times 14 = 140 - \boxed{}$

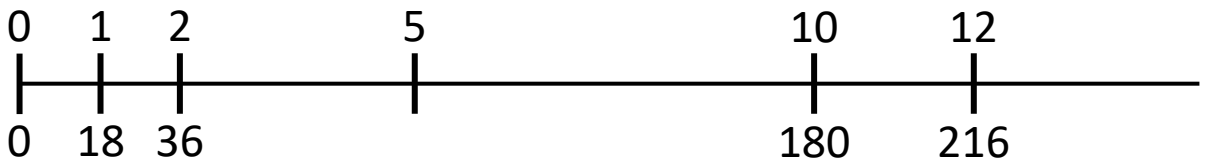
Pack 4 Session B

Talk Task: Monthly payments

My mobile phone costs £18 a month.

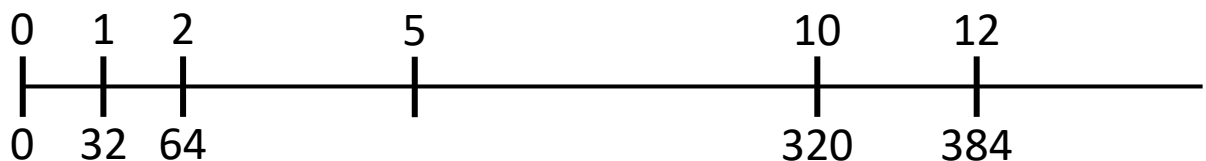


Month	1	2			5					10		12
Cost	18	36								180		



I have a Saturday job and I earn £32.

Week	1	2			5					10		12
Money	32	64								320		



Pack 4 Session B

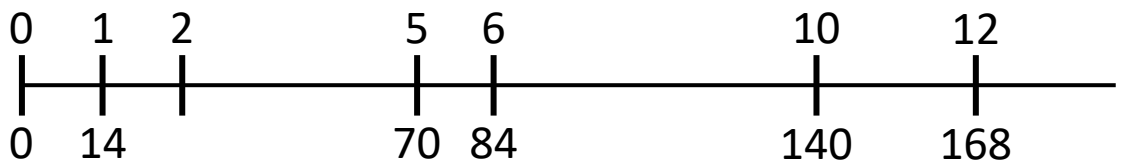
Activity: Monthly payments

For each situation, write as much information as you can about the cost across a year.

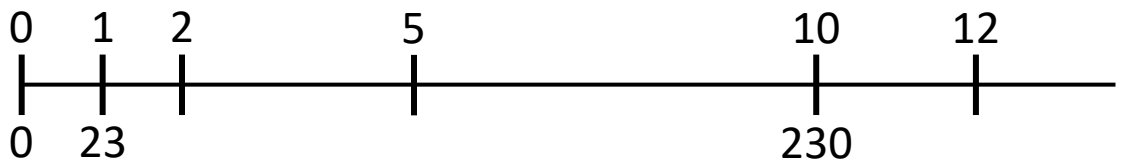
My contact lenses cost £14 each month.



Month	1	2			5					10		12
Cost	14									140		

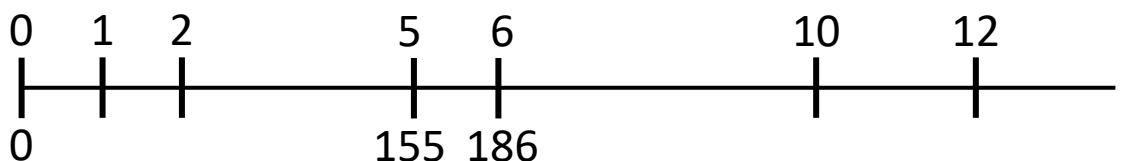


My mobile phone costs £23 each month.



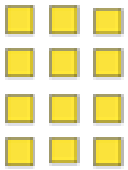
After 5 months I have paid £155

After 6 months I have paid £186

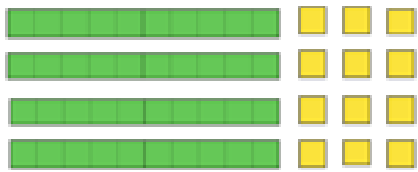


Pack 4 Session C

Talk Task: Derived facts – adjusting by a factor by 10

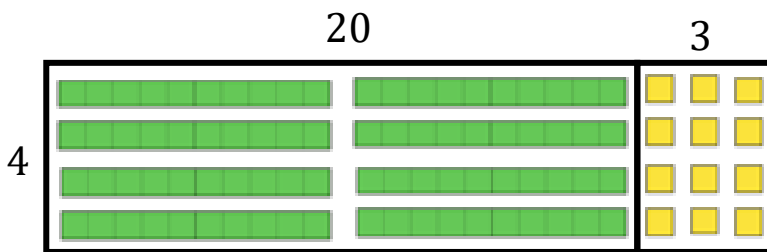


$$3 \times 3$$



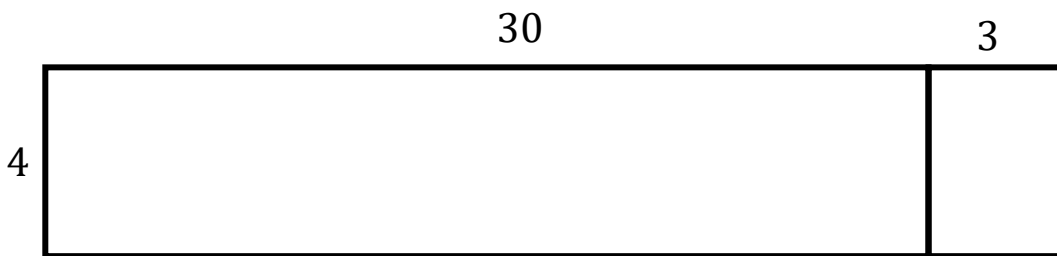
$$13 \times 4$$

$$10 \times 4 + 3 \times 4$$



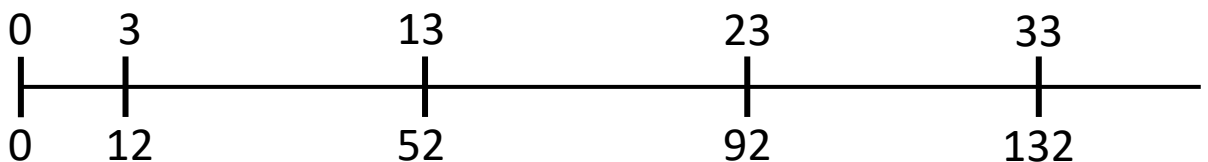
$$23 \times 4$$

$$20 \times 4 + 3 \times 4$$



$$33 \times 4$$

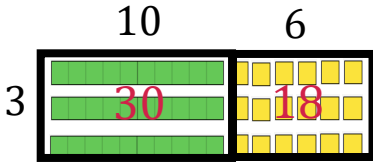
$$30 \times 4 + 3 \times 4$$



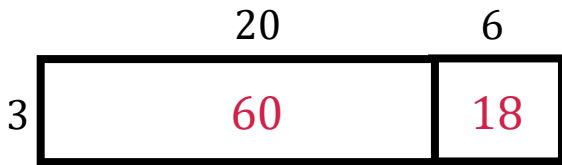
Pack 4 Session C

Activity: Derived facts – adjusting a factor by 10

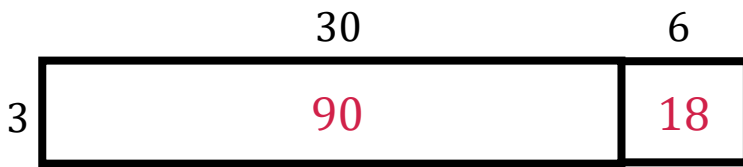
1) Label the area models and complete the calculations.



$$16 \times 3 = \boxed{} + 18 = \boxed{}$$



$$26 \times 3 = \boxed{} + 18 = \boxed{}$$



$$36 \times 3 = \boxed{} + 18 = \boxed{}$$

2) Draw models to represent multiplication calculations

Draw an array with Dienes to represent 24×3

Draw and label a rectangle to represent 29×4

3) Complete the statements.

14×5 is 50 more than $\boxed{} \times 5$

$\boxed{} \times 3$ is 30 less than 18×3

$16 \times \boxed{}$ is 40 more than 6×4

8×7 is 70 less than $\boxed{} \times 7$

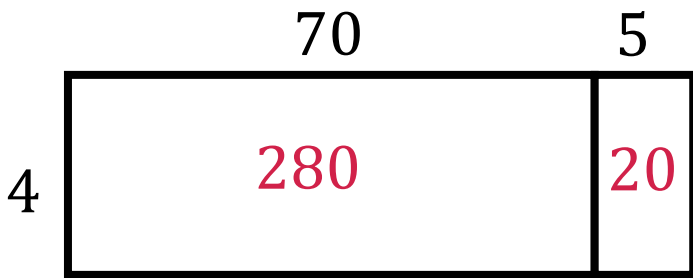
Pack 4 Session D

Talk Task: Exploring calculation strategies

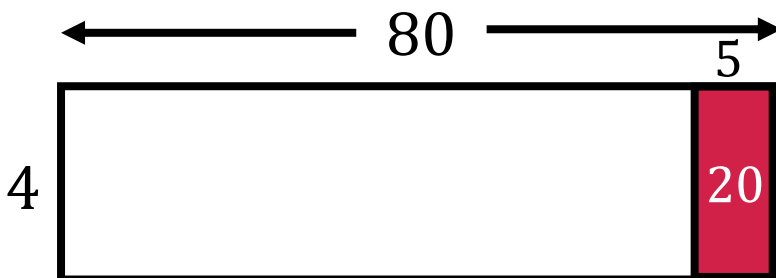
$75 \times 4 = 300$

75	75	75	75
150		150	
300			

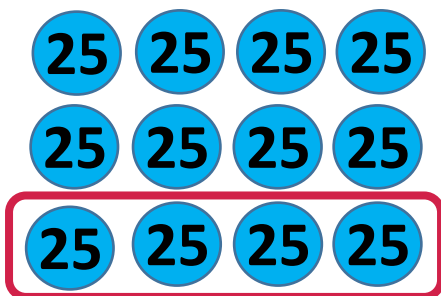
Double 75 is 150
Double 150 is 300



$(70 + 5) \times 4$
 $70 \times 4 + 5 \times 4$
 $280 + 20$



$(80 - 5) \times 4$
 $80 \times 4 - 5 \times 4$
 $320 - 20$

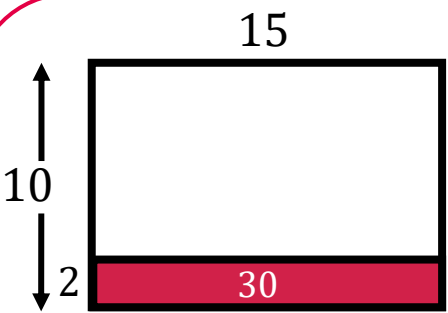


$(3 \times 25) \times 4$
 $3 \times (25 \times 4)$
 3×100

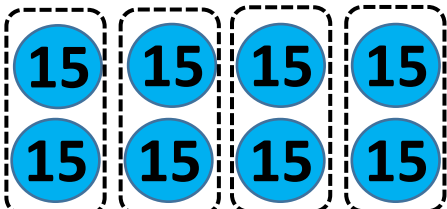
Pack 4 Session D

Activity: Exploring calculation strategies

1) Complete the calculations for two ways to calculate 15×8



$15 \times 8 = 15 \times 10 - 15 \times \boxed{}$
 $= \boxed{} - 30$



$15 \times 8 = 15 \times 2 \times \boxed{}$
 $= \boxed{} \times 4$

2) Show with models and calculations three different ways to calculate 25×12

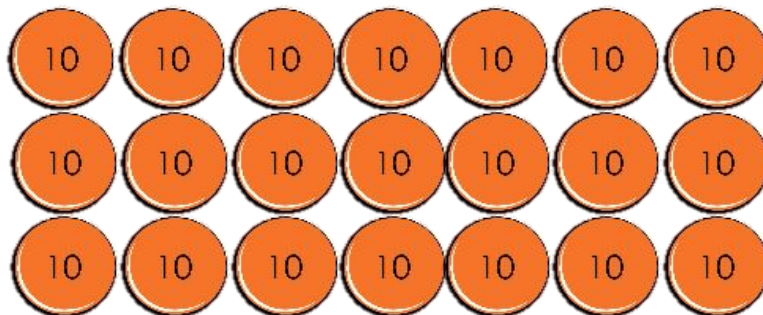
Blank area for the first method of calculation.

Blank area for the second method of calculation.

Blank area for the third method of calculation.

Pack 11 Session A

Talk Task: Division and multiplication



___ is a multiple of ___

___ is divisible by ___



How many numbers **divisible by seven** can you place on the line?

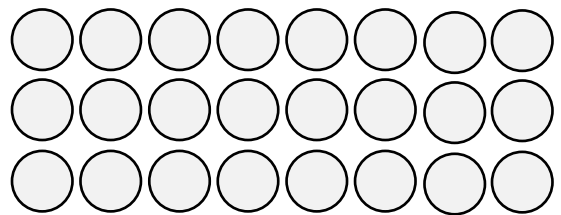
Pack 11 Session A

Activity: Division and multiplication

1) Copy and complete the calculations this array could represent as the value of each counter is changed.

a) Each counter has a value of $\textcircled{1}$

$$\begin{array}{l} 3 \times 8 = \square \\ \square \times 3 = 24 \\ 24 \div 8 = \square \\ \square \div 3 = 8 \end{array}$$



b) Each counter has a value of $\textcircled{10}$

$$\begin{array}{l} 30 \times 8 = \square \\ \square \times 30 = 240 \\ 240 \div 8 = \square \\ 240 \div \square = 8 \end{array}$$

$$\begin{array}{l} 3 \times 80 = \square \\ \square \times 3 = 240 \\ \square \div 3 = 80 \\ 240 \div \square = 3 \end{array}$$

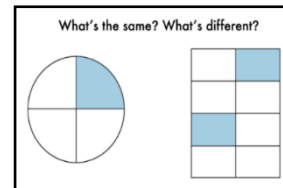
$$\begin{array}{l} 24 \times 10 = \square \\ \square \times 24 = 240 \\ \square \div 10 = 24 \\ 240 \div \square = 10 \end{array}$$

2) Use the fact that $4 \times 6 = 24$ to answer the following:

£240 is shared equally between 4 people. How much does each person get?	240 grams of sugar is split into bowls with 60 g in each. How many bowls of sugar are there?
Completing a level of a game gets you 60 points. You have 2400 points. How many levels have you completed?	I do 40 minutes of exercise every day. How many days until I have done 240 minutes?

Pack 11 Session B

Talk Task: Halving strategies



Half of 72

$72 \div 2$

$72 = 12 \times 6$
Half of 12×6
is 12×3

$72 = 60 + 12$
Half of 60 is 30
Half of 12 is 6

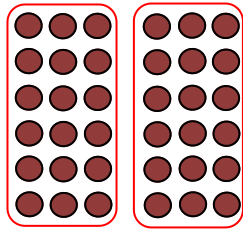
$72 = 70 + 2$
Half of 70 is 35
Half of 2 is 1

$72 = 6 \times 12$
Half of 6×12
is 6×6

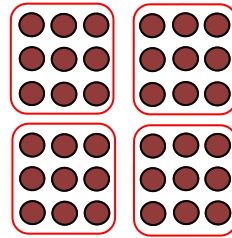
Pack 11 Session B

Activity: Halving strategies

1) The images show a halving strategy. Complete the boxes.

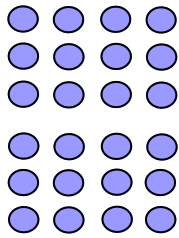


Two groups of
 $36 \div 2 =$

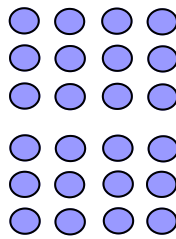


groups of 9
 $36 \div$ $= 9$

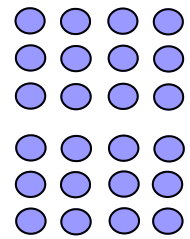
2) Complete the images to match the steps of the halving strategy.



Half of 24 is 12
 $24 \div 2 = 12$



Half of 12 is 6
 $24 \div 4 = 6$



Half of 6 is 3
 $24 \div 8 = 3$

3) Complete the strategy and show it works with another calculation.



To divide a number by 6, I
can halve and then divide by 3

Half of 48 is
24 divide by 3 is
 $48 \div$ $= 8$

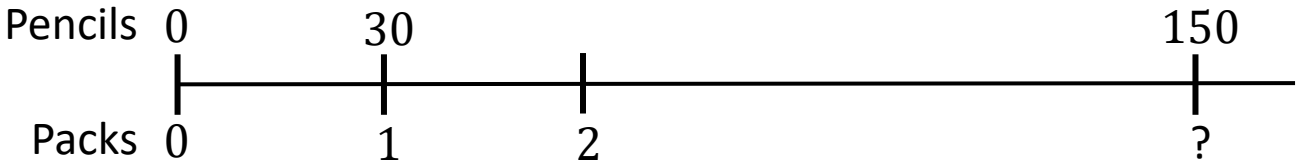
Pack 11 Session C

Talk Task: Division structures

$$150 \div 30$$



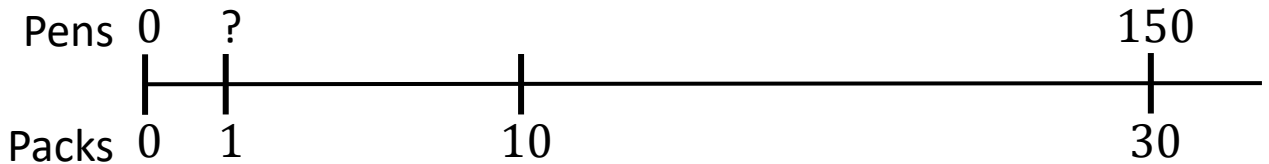
There are 30 pencils in each pack.
How many packs is 150 pencils?



___ groups of 30
is equal to 150



I have 30 packs of pens.
I have 150 pens.
How many pens in 1 pack?

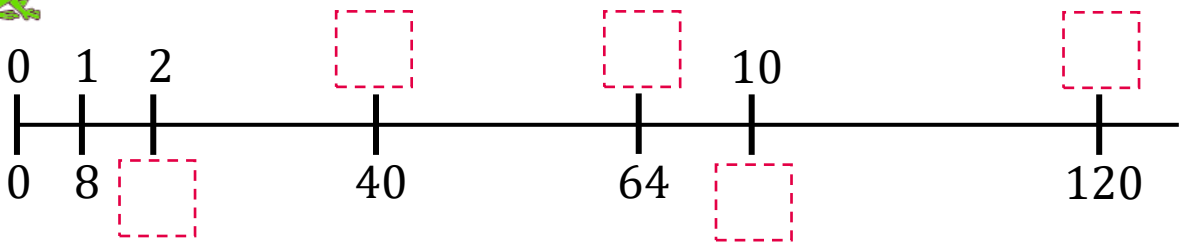


30 groups of ___
is equal to 150

Pack 11 Session C

Activity: Division structures

1) A frog travels 8 cm for each jump.



- a) How far has it travelled after 2 jumps? cm
- b) How many jumps does it take to travel 40 cm?
- c) How many jumps does it take to travel 64 cm?
- d) How far has it travelled after 10 jumps? cm
- e) How many jumps does it take to travel 120 cm?

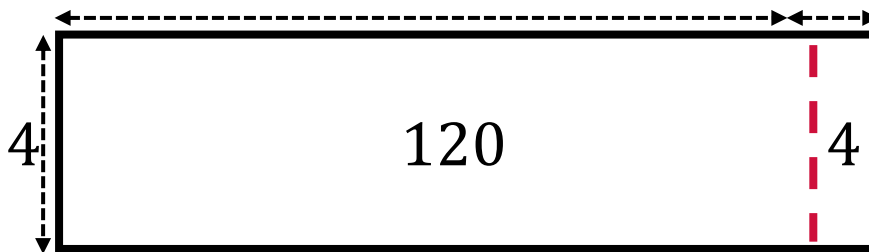
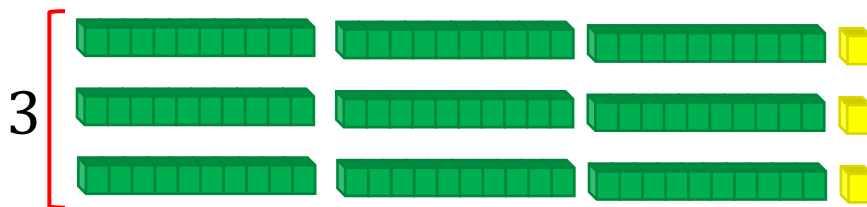
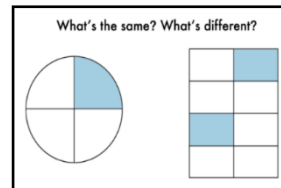
2) This frog has jumped 15 equal jumps and travelled 75 cm.



- a) How far how it travelled after 5 jumps? cm
- b) How far has it travelled after 10 jumps? cm
- c) How big is each jump? cm
- d) How far has it travelled after 3 jumps? cm

Pack 11 Session D

Talk Task: Models of division



$$93 \div 3 = 31$$

$$96 \div 3 = 32$$

$$124 \div 4 = 31$$

Pack 11 Session D

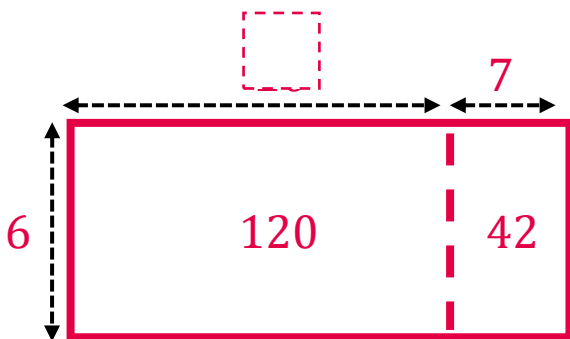
Activity: Models of division

1) Label the models and complete the calculations.



$$92 \div 4 = \square$$

$$\square \times 4 = 92$$



$$162 \div 6 = \square$$

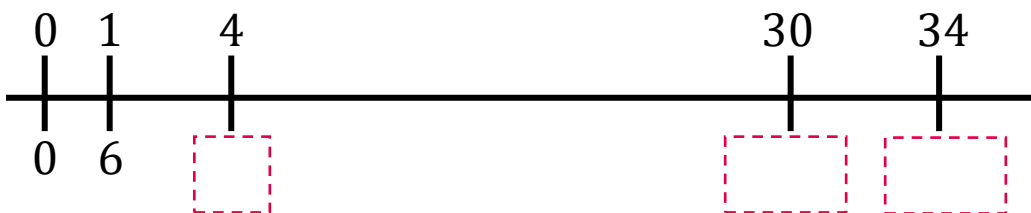
$$\square \times 4 = 162$$

2) Complete the calculations and label the number line.

a) $4 \times 6 = \square$ $\square \div 6 = 4$

b) $30 \times 6 = \square$ $\square \div 6 = 30$

c) $34 \times 6 = \square$ $\square \div 6 = 34$



3) Draw a model to represent $72 \div 3 = 23$