Four in a line

Pairs

×6

Purpose:

- to practise calculating multiples of 6
- to spot the patterns multiples of 6 make on number grids

Resources (per pair): PCM D, two 1–6 dice, pencils, opaque counters (ideally in two colours and at least 110 for Deeper level)

In this activity, children roll two dice, add the numbers rolled, and multiply the total by 6. They shade the product on their side of the game board on PCM D. A child wins the game by shading a given number of squares on their grid.

As they move from T to S to D, children discuss the different patterns made on the grids, and consider possible patterns on other grids.

Towards

Children use PCM D as a game board, and choose one grid each to play on.

They take turns to roll two dice, add the numbers rolled and multiply the total by 6. They shade the product on their chosen grid.

The first player to have four shaded squares in a diagonal line wins the game.

If you need to shade in 42, which multiplication fact do you need? What numbers do you need to roll? What is the same and what is different about your boards? Do you both have the same multiples of 6?

Securing

Before they start the game, children use counters to cover all the multiples of 6 on their chosen grid.

They play the game as described in Towards, but this time they have to find the product they are looking for hidden under a counter. If they lift the wrong one, they miss their turn.

The winner is the first player to remove six of their counters and shade the multiples of 6 underneath.

1	2	3	4	5	●	7
8	9	10	11	●	13	14
15	16	17	●	19	20	21
22	23	●	25	26	27	28
29	●	31	32	33	34	35
●	37	38	39	40	41	●
43	44	45	46	47	●	49
50	51	52	53	●	55	56
57	58	59	●	61	62	63

1	2	3	4	5
●	7	8	9	10
11	●	13	14	15
16	17	●	19	20
21	22	23	●	25
26	27	28	29	●
31	32	33	34	35
●	37	38	39	40
41	●	43	44	45
46	47	●	49	50
51	52	53	●	55
56	57	58	59	●
61	62	63	64	65

Deeper

Children cover all the numbers on their grid with counters except the top and bottom rows. They play as in Securing, but they must locate the product they are looking for by using the grid (or by counting).

How can you use the patterns made by the multiples to help you?

11p

pairs

×11

Purpose:

- to generate multiples of 11 using 10p coins and 1p coins

Resources (per pair): 10p and 1p coins (14 of each), an empty pot (yoghurt pot or similar)

In this activity, pairs of children take a handful of 10p coins and 1p coins and make multiples of 11p.

As they move from T to S to D, they try to make one set of each amount, equivalent to multiples of 11p, and go on to make predictions.

Towards

Children start with all the coins in the pot. They take turns to:

- take a handful of coins
- use a 10p coin and a 1p coin to make 11p
- make as many groups of 11p in this way as they can
- say the total value of the groups of 11p

They return the coins to the pot and repeat.

How many groups of 11p do you have? So how can you work out the total? Do you always need the same number of 10p coins and 1p coins to make sets of 11p?

Total: 44p

Securing

Same as Towards, but this time children predict the total value their groups of 11p will be able to make *before* they begin to pair up the 10p coins and 1p coins.

How many groups of 11p do you think you will be able to make? How will you make your estimate?

Total: 66p

Estimating amounts of money is an important skill. We use it when we look in our purse or wallet to see if we have enough change to pay for things in a shop. Children may estimate the number of one type of coin they have, ideally the lower number, and estimate the total based on that.

Deeper

Similar to Towards, but this time they play a competitive game as they each record the totals they make. The winner is the first player to collect every multiple of 11 up to 12 × 11.

Origami sevens

Pairs

×7

Purpose:

- to make a reminder to help remember the ×7 table facts
- to improve recall of ×7 table facts

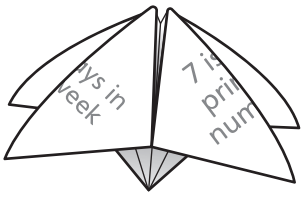
Resources (per child): PCM N, scissors

In this activity, children use PCM N to make an origami sevens game, based on the more familiar origami fortune tellers, and use this to practise their recall of facts in the ×7 table.

The tasks in S and D use the origami sevens made in T. As children move from T to S to D, they relate what they see to what they say, and link the number facts to related division facts and then to derived facts.

Children may already be familiar with making origami fortune tellers and so will not need guidance on how to make or use them.

Towards



Give each child a copy of PCM N and ask them to cut out the large square. Guide them through the instructions to make the origami sevens game.

Then they take turns to play the following game with a partner.

The first child puts their fingers inside their folded sevens game, and moves their fingers one way and then the other. They make 7 moves, then show their partner the inside. The second child points to one of the facts they can see and gives the answer. The first child looks under the flap to see if the answer is correct.

Securing

Same as Towards, but this time, when the second child points to a fact, they say the whole fact, for example, '6 times 7 is 42'. Then the first child responds by saying a related fact, for example, '7 times 6 is 42'.

Deeper

Same as Securing, but this time children need to give a related or a derived fact from the fact they choose, for example, if they choose 11 × 7, they could say '11 × 70 = 770', or for 6 × 7 they could say 'half of 6 × 7 is 21'.

How many related facts can you say? 2? 3? More?

You may wish to invite the children to take their origami sevens home, so they can play the game with their families.

Giant sorting diagram

whole class

×12

Purpose:

- to recognise that numbers that are multiples of both 3 and 4 are multiples of 12

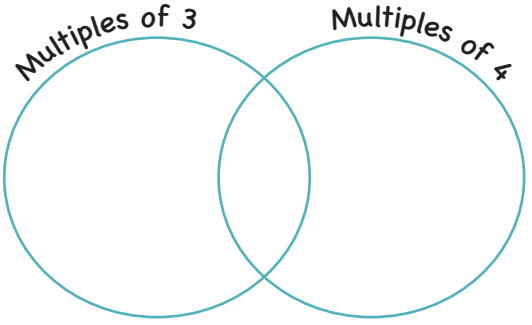
Resources (per child): individual whiteboard or paper, pens, chalk

In this activity, children make a giant sorting diagram in the playground which shows that numbers that are multiples of both 3 and 4 are also multiples of 12.

As they move from T to S to D they work in pairs to make their own similar sorting diagram, but extend beyond the 12th multiples in the 3 and 4 times tables to generate more multiples of 12, and then record the suite of facts that they have been exploring.

Towards

Draw a giant sorting diagram in the playground with chalk, and label the sets as shown.



Instruct each child to write a particular multiple of 3 or 4 on their whiteboard. (Depending on the size of the group there may be some duplicate multiples or some multiples may be missing. This will not affect the activity.)

Children take turns to come and stand inside the area that matches their number. Discuss the numbers that go in the intersection (overlap).

> Where do the numbers which are multiples of 3 *and* 4 belong? What can you say about these numbers – do they belong in another times table?

Securing

In pairs, children draw their own sorting diagram on an individual whiteboard or on paper to match the diagram described in Towards.

One child writes the multiples of 3 in the correct place in the diagram and the other writes the multiples of 4 in the correct place on the diagram.

They keep going beyond the 12th multiples of the ×3 and ×4 tables in order to generate greater multiples of 12.

> Are *all* the multiples of 12 also multiples of 3 and 4? How do you know? Can you predict which will be the next number that belongs in both groups? How do you know?

Deeper

Children choose any multiple of 12 and record the multiplication facts for ×3, ×4 and ×12 tables as shown.

48

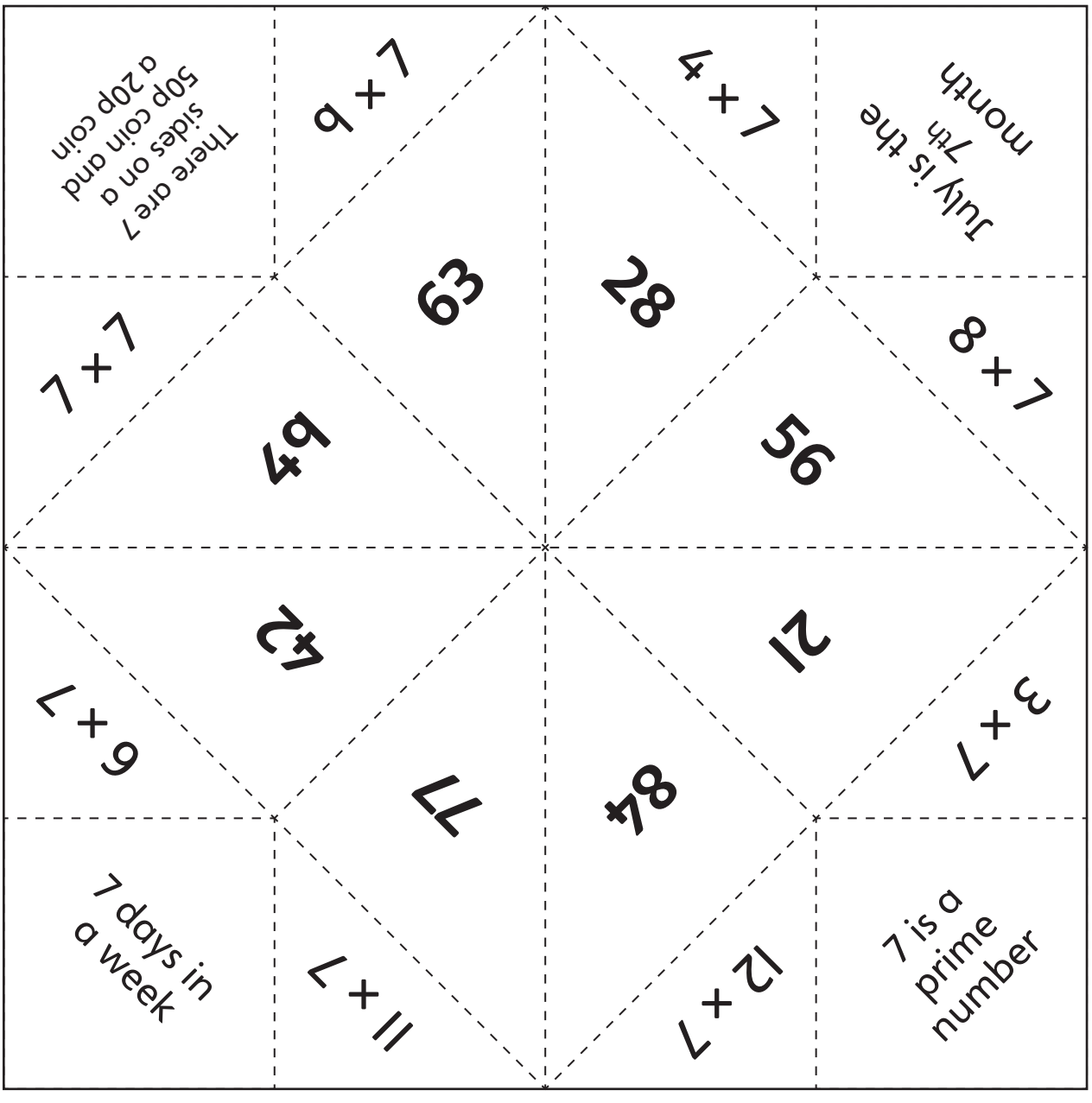
16 × 3 = 48

4 × 12 = 48

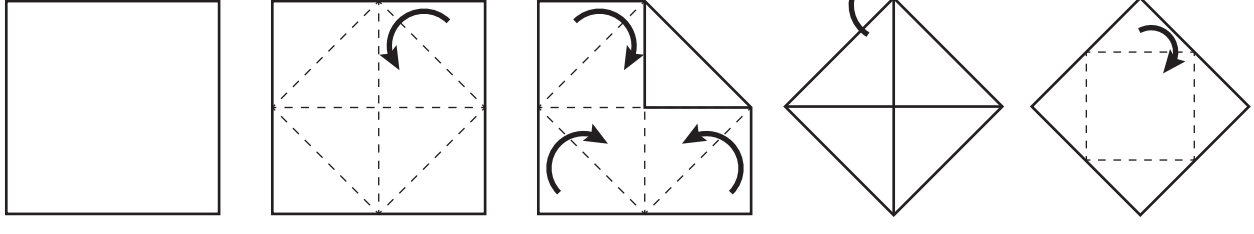
12 × 4 = 48

> Would you expect a remainder if you divided a multiple of 12 by 3? Why not?

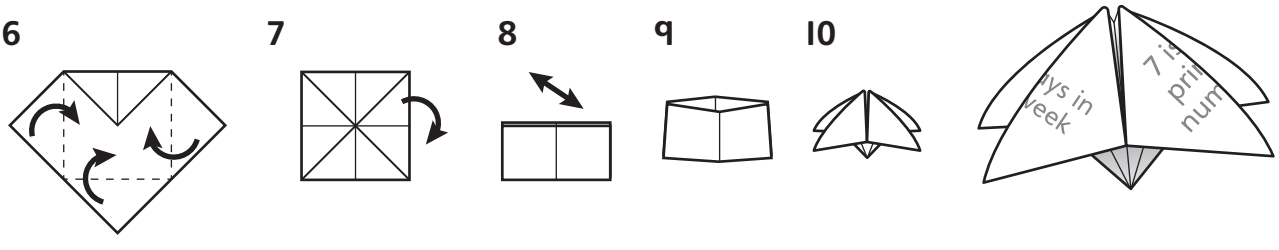
PCM N



1 2 3 4 5



6 7 8 9 10



Assessment: Mixed tables 3

T	S	D
1 $7 \times 11 = \square$	11 $\square \times 7 = 28$	21 $50 = \square \times 10$
2 $8 \times 9 = \square$	12 $5 \times \square = 40$	22 $12 = \square \times 12$
3 $3 \times 6 = \square$	13 $\square \times 12 = 60$	23 $21 \div 3 = \square$
4 $9 \times 12 = \square$	14 $9 \times \square = 72$	24 $36 \div 12 = \square$
5 $6 \times 7 = \square$	15 $4 \times \square = 24$	25 $6 \times 10 = \square \times 5$
6 $10 \times 9 = \square$	16 $9 \times \square = 45$	26 $7 \div 7 = \square$
7 $12 \times 7 = \square$	17 $4 \times 12 = 48$	27 $16 \div 4 = \square$
8 $5 \times 7 = \square$	18 $7 \times 12 = \square$	28 $30 = 3 \times \square$
9 $4 \times 11 = \square$	19 $\square \times 11 = 110$	29 $49 = \square \times 7$
10 $6 \times 12 = \square$	20 $7 \times \square = 42$	30 $40 \div 4 = 20 \div \square$

T **1** There are 12 stickers on a page, and there are 5 pages in each pack. How many stickers are in a pack?

_____

2 Write the next three numbers in the sequence.

30 36 42 48 ☐ ☐ ☐

S **1** There is enough water in a jug to fill 6 cups. Sadiq needs to fill 36 cups. How many times must he fill the jug?

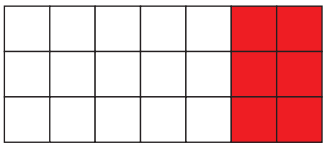
_____

D **1** One quarter of the cakes in a box of 40 have been eaten. How many are left?

_____

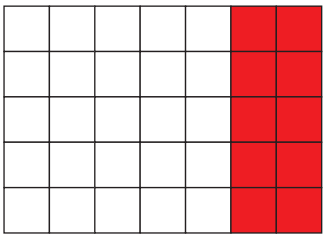
5s, 2s and 7s

T Calculate the number of white squares and the number of red squares in each array.

1 

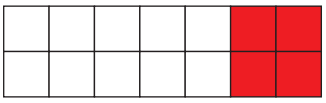
3 × 5 = 12

3 × 2 = 6

2 

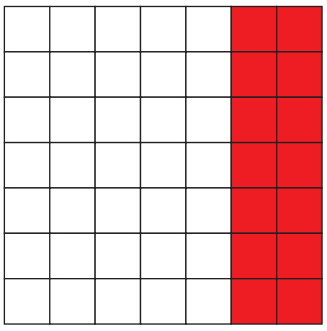
□ × 5 = □

□ × 2 = □

3 

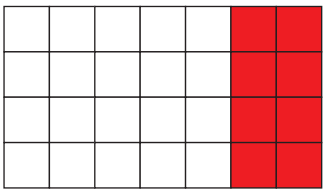
□ × 5 = □

□ × 2 = □

4 

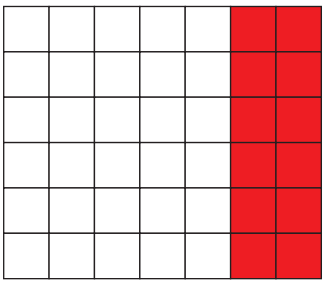
□ × 5 = □

□ × 2 = □

5 

□ × 5 = □

□ × 2 = □

6 

□ × 5 = □

□ × 2 = □

S For each of the arrays above complete the multiplication.

1 □ × 7 = □

2 □ × 7 = □

3 □ × 7 = □

4 □ × 7 = □

5 □ × 7 = □

6 □ × 7 = □

Can you spot a pattern linking the ×7 and the ×2 and ×5 facts?

D Complete the divisions.

1 □ ÷ 7 = 6

2 □ ÷ 7 = 2

3 □ ÷ 7 = 4

4 □ ÷ 7 = 7

5 □ ÷ 7 = 9

6 □ ÷ 7 = 5

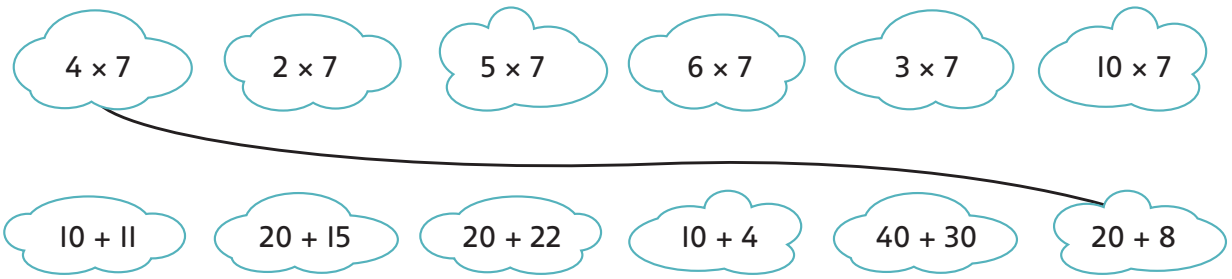
7 □ ÷ 7 = 3

8 □ ÷ 7 = 12

9 □ ÷ 7 = 8

Match to add

T Join each multiplication to an addition with the same answer.



S Write the missing numbers.

1 $5 \times 7 = 30 + \square$

2 $3 \times 7 = \square + 6$

3 $\square \times 7 = 35 + 7$

4 $\square \times 7 = 14 + 14$

5 $\square \times 7 = 25 + 24$

6 $8 \times 7 = 36 + \square$

7 $\square \times 7 = 35 + 35$

8 $9 \times 7 = 45 + \square$

D Use the four numbers in each set to make calculations that have the same answer. One side must be multiplication or division by 7 and the other must be addition or subtraction.

Write +, −, × and ÷ symbols in the circles.

1 7, 21, 25, 28

2 5, 7, 15, 20

3 3, 5, 7, 56

4 6, 7, 18, 60

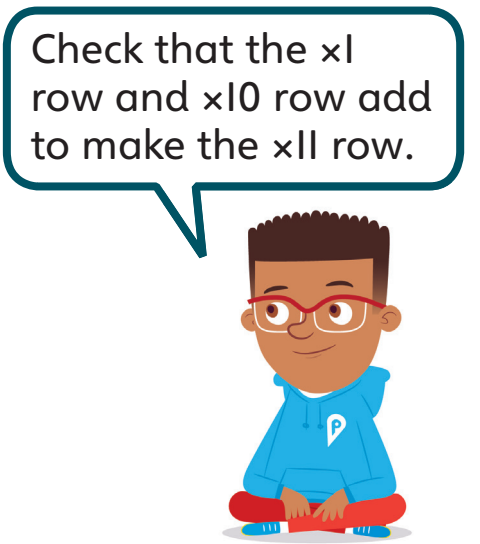
5 7, 9, 21, 42

6 7, 33, 45, 84

More 10s, 1s and 11s

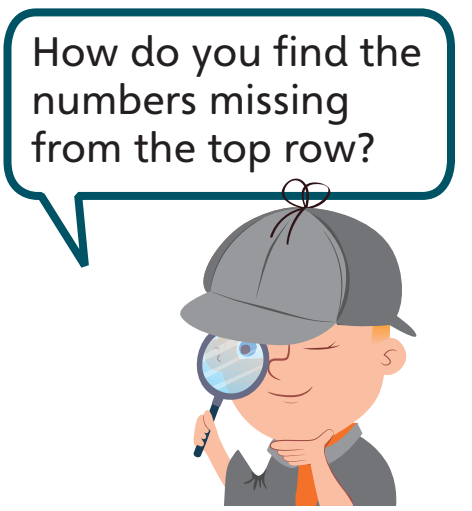
T Complete the table to make ×11 facts.

×	2	3	4	5	6	7	8	9
1	2							
10	20							
11	22							



S In this table the numbers at the top are between 3 and 9 but they are not in the right order. Write all the missing numbers.

×		9					8	
1				5	4			
10	30		60					70
11								



D The numbers in the top row are between 12 and 22 but they are not in order. Write all the missing numbers.

×				19		16			18		
10		140					220			170	130
11	165		231		220			132			