MPI: Finding common multiples

Spicy

Colour all the multiples of 9

Circle all the multiples of 6

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Continue the lists of multiples.

Multiples of 5

5, 10, 15, ☐, ☐, ☐, ☐, ☐, ☐,
☐, ☐, ☐, ☐, ☐

Multiples of 7

7, 14, 21, ☐, ☐, ☐, ☐, ☐, ☐,
☐, ☐, ☐, ☐, ☐

Circle the common multiples of 5 and 7

List any common multiples of 9 and 6

_____

Write the first five common multiples of these numbers.

a) 2 and 3

_____

b) 3 and 12

_____

c) 15 and 10

_____

I worked out the common multiples of 4 and 6 by multiplying 4 and 6 together to get 24. Then I added on 24 again and again: 24, 48, 72 . . .

Jack

I think your method might miss some common multiples.

Rosie

Who do you agree with and why?

_____
_____
_____

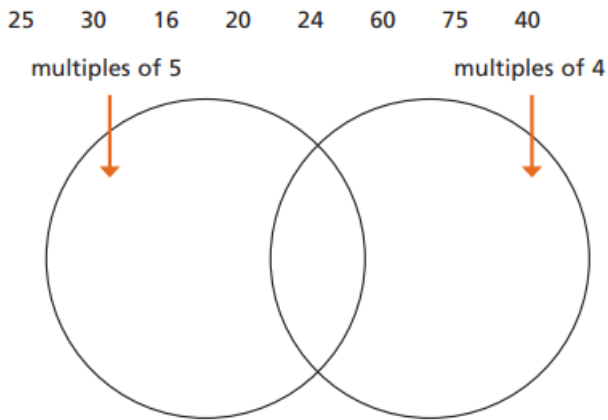## MPI: Finding common multiples

Write the numbers in the sorting diagram.

25   30   16   20   24   60   75   40

multiples of 5   multiples of 4

Write all the common multiples of 4 and 5 from the list.

_____

Look at the common multiples of 4 and 5.
What do you notice?

Describe how to find more common multiples
to add to this list.

Could you ever run out of common multiples?

Journal your answers in your Maths book.

Rita has 2 grandchildren in different years at school.

On Rita's 90th birthday she says to her grandchildren,

"My age is a multiple of both your ages today."

How old could Rita's grandchildren be?

Describe two different solutions.

_____

_____

_____

What is the lowest common multiple of
6 and 8?

_____

Put at least 3 numbers into
each region. Include the
lowest common multiple.

Multiples of 4   Multiples of 6

Multiples of 9

3 cm

8 cm
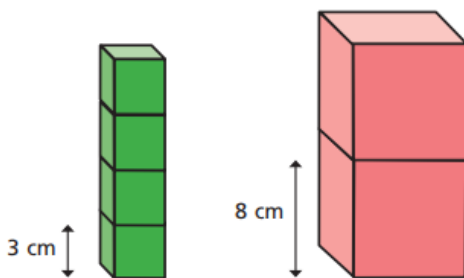
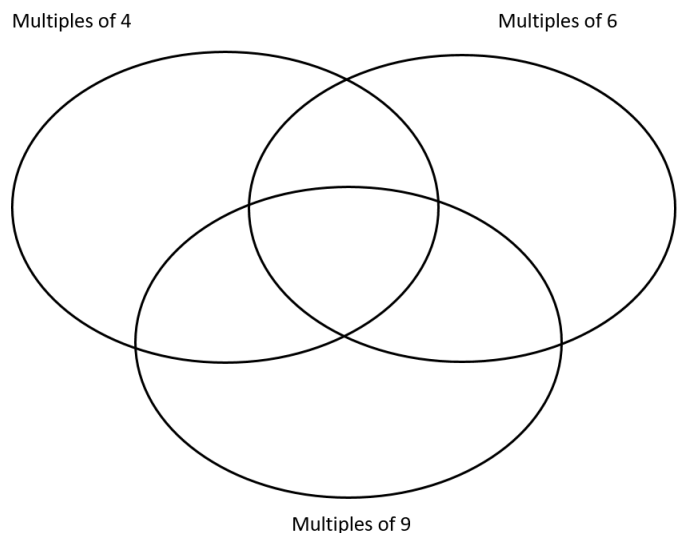Scott is building a tower from blocks 3 cm tall.

Dora is building a tower from blocks 8 cm tall.

They each build a tower taller than 50 cm, but shorter than 1 m.
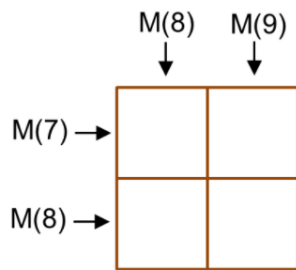
The towers are exactly the same height.
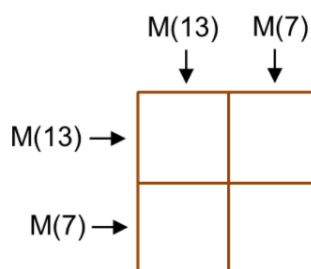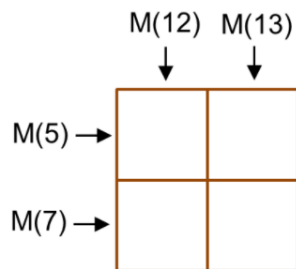
How tall could the towers be?
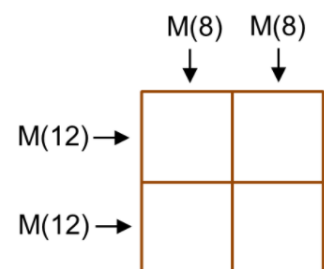
BONUS CHALLENGE

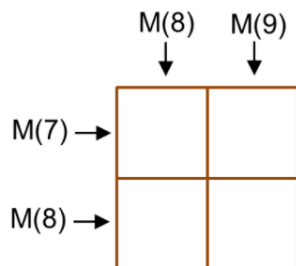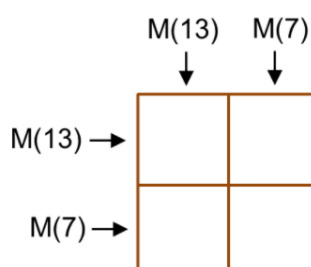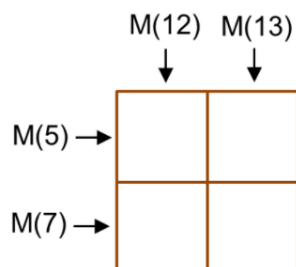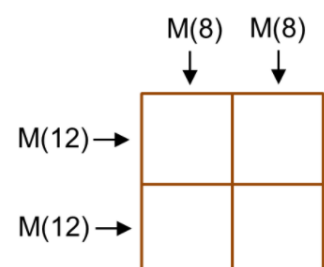M(15) means the number must be a multiple of 15 i.e. 15 or 30 or 45 or 60 or 75 or 90 find four digits (all differenet) to go in each of the boxes to make 2-digit multiples of the required number when you read across and down:

	M(8)	M(9)
M(7) →		
M(8) →		

	M(8)	M(8)
M(15) →		
M(12) →		

	M(7)	M(15)
M(12) →		
M(17) →		
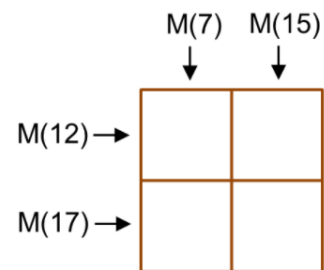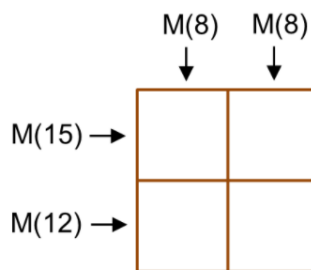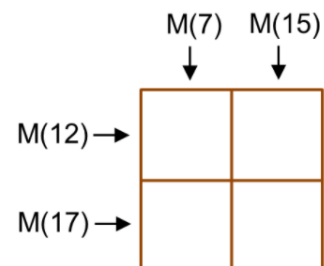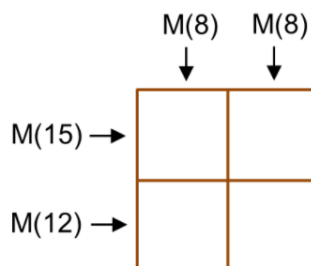
all the 4 digits in each problem should be different

	M(12)	M(13)
M(5) →		
M(7) →		

	M(13)	M(7)
M(13) →		
M(7) →		

3 solutions possible

	M(8)	M(8)
M(12) →		
M(12) →		

3 solutions possible

MPI: Finding common factors

What are the common factors of 18 and 24?
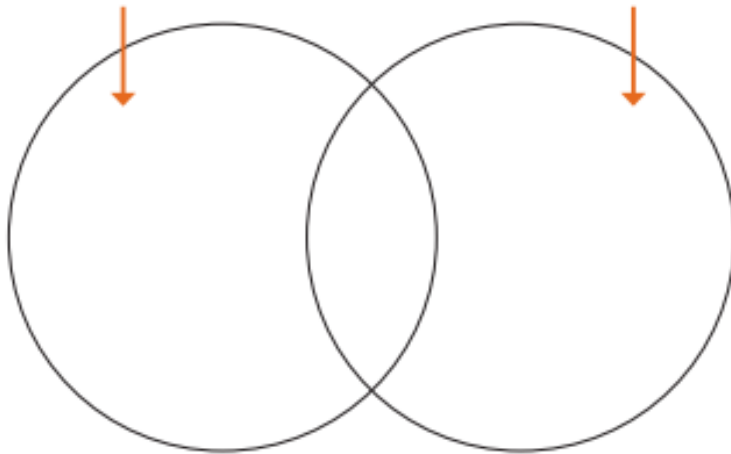
_____

Write the numbers in the sorting diagram.

1   2   3   4   5   6   8   12   15   24

factors of 15   factors of 24

Complete the sentence.

The common factors of 15 and 24 are _____

Find the common factors of each pair of numbers.

a) 12 and 20

_____

b) 16 and 25

_____

c) 20 and 50

_____

d) 20 and 60

_____

MPI: Finding common factors

I am thinking of a 2-digit number.

Annie

My number has a factor of 7 in common with Annie's number.

Dexter

The common factors of my number and Annie's number are 1, 5 and 10

Ron

What number is Annie thinking of?

_____

Whitney is trying to simplify these fractions.

$$\frac{18}{46} \qquad \frac{24}{81} \qquad \frac{40}{100}$$

$$\frac{121}{132}$$

I can use common factors to work out how to simplify these fractions.

Show how Whitney's method could work.

Talk about your answer with a partner.

Complete the table.

Factor pairs of 50	Factor pairs of 75	Factor pairs of 100
1 × 50 2 × 25 5 × 10	1 ×	

What are the common factors of 50, 75 and 100?

_____

Alex is making party bags.

She has 35 sweets and 25 balloons.

The sweets and balloons need to be shared equally, so that each bag has the same number of sweets and balloons.

I can put 5 sweets and 5 balloons in each bag because 5 is a common factor of 35 and 25

Is Alex correct? _____

Explain your answer.

_____

_____

List 3 common factors of 360 and 180 that are greater than 50

_____

BONUS CHALLENGE

a number has 4 factors, one of which is 9, what is it?

a number is one less than a square number; it has 4 factors, one of which is 5; what could it be?

a number has 4 factors, two of which add up to 10, what could it be? how many numbers could it be?

what types of number have exactly 4 factors? why?

MPI: Finding prime numbers and factors

Circle the prime numbers in each list.

a) 1   2   3   4   5   6   7

b) 17   22   9   36   21   35   23

c) 10   18   38   74   92   2   14

In your Maths book, journal the answer to these questions:

a) Many people think that 1 is a prime number.

Explain why 1 is not a prime number.

b) Many people think that 2 is not a prime number.

Explain why people might think this.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Cross out all the numbers that are **not** prime numbers.

List the prime numbers between 0 and 50

_____

_____

Write ten numbers in the sorting diagram. Each section must have at least one number.

	Even	Not even
Prime		
Not prime		

MPI: Finding prime numbers and factors

Journal your responses in your Maths books...

I think 87 is a prime number because it is odd and most numbers that end in 7 are prime.

$\star + \blacksquare = 100$

Both $\star$ and $\blacksquare$ are prime numbers.

How many different solutions can you find?

Do you agree with Rosie? _____

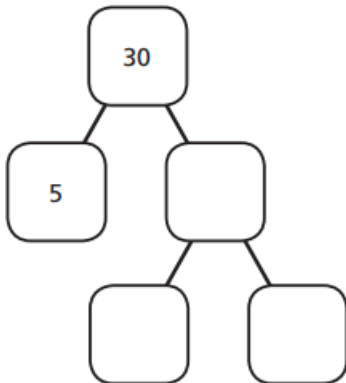Test whether or not 87 is a prime number and show your reasoning.

How many prime numbers are there between 50 and 80?

What is the first prime number after 100?

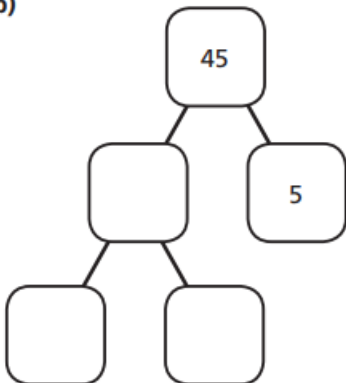What is the only even prime number?

Complete the prime factor trees.

For each factor tree, write the prime factors as an equation.

a)

30

5

c)

36

b)

45

5

d)

66

BONUS CHALLENGE

Place the numbers 1, 2, 3,..., 9 one on each square of a 3 by 3 grid so that all the rows and columns add up to a prime number. Two solutions are considered to be the same if, as in the example shown, they contain the same six triples. How many different solutions can you find?

```
2 8 3
6 4 9
5 7 1
```

```
2 3 8
5 1 7
6 9 4
```

Show that it is impossible to place the numbers 1, 2, 3,..., 9 one on each square of a 3 by 3 grid so that the diagonals, as well as all the rows and columns, add up to prime numbers.

MPI: Investigating prime numbers: Challenge 1

the primes less than 100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

find two primes that sum to a multiple of 6

find two primes that have a difference of 6

find two primes that add up to 54

which decade (less than 100) has least primes in?

find primes that are one more than a multiple of 6

find primes that are one less than a multiple of 6

twin primes are two apart e.g. 41 and 43

what is a common property of twin primes?

Thursday 21.10.21

MPI: Investigating prime numbers: Challenge 2

(a) find two prime numbers that sum to:

(1) 4   note that 1 is not a prime number
(2) 14
(3) 24
(4) 34   you may use the same prime
(5) 44   number twice e.g. 34 = 17 + 17
(6) 54

(b) find two prime numbers that sum to:

(1) 24
(2) 30
(3) 36
(4) 42
(5) 48
(6) 54   does a pattern continue?