Extra Challenge

I can identify prime numbers.

Sort the statements into the correct category.

Always True	Sometimes True	Never True

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Any odd number that is greater than five can be written as a sum of three prime numbers, e.g. 9 = 5 + 2 + 2.

All prime numbers are odd.

Prime numbers are one less or one more than a multiple of six.

Prime numbers only go up to 293.

Extra Challenge **Answers**

Question	Answer
	Sort the statements into the correct category.

Always True	Sometimes True	Never True
Any odd number that is greater than five can be written as a sum of three prime numbers, e.g. 9 = 5 + 2 + 2.	Prime numbers are one less or one more than a multiple of six.	All prime numbers are odd.
	This is correct for every prime number apart from two and three.	All are odd apart from the number two.
		Prime numbers only go up to 293.
		307 and 311 are prime numbers.

Identifying Prime Numbers 0-200

I can identify prime numbers.

Circle as many prime numbers as you can within the time limit.

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
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

Identifying Prime Numbers 0-200 **Answers**

Question	Answer
	Circle as many prime numbers as you can within the time limit.

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
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

Intel Prime Cards

Instructions: Cut out the cards and give one card to each child. The children then organise themselves into groups of three by arranging their numbers into consecutive prime numbers, e.g. 11, 13 and 17. Warning: There are some red herring cards that are not prime numbers. Children with a non-prime number needs to find the remaining children that have a similar non-prime number.

Prime group 1: 2, 3, 5

Prime group 2: 11, 13, 17

Prime group 3: 23, 29, 31

Prime group 4: 41, 43, 47

Prime group 5: 61, 67, 71

Prime Pair 6: 83, 89, 97

Prime Pair 7: 107, 109, 113

Prime Pair 8: 151, 157, 163

Non-prime numbers: 9, 25, 27, 62, 63, 99

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2	3	9	11	13
23	25	29	27	107
41	61	67	62	63
71	83	89	97	109
31	5	17	163	43
47	99	151	157	113

Prime Detectives

I can identify prime numbers.

Sing-Song Aloud is a very popular competition for singing. Every year, thousands of people enter the competition in search of fame.

This year is no different... but there has been a crime committed! Somebody has sabotaged the equipment and they have broken the microphones, with only pig-like sounds being emitted! The police have been investigating exactly what happened.

As the Detective Chief Inspector, it is your job to work out who the saboteur is. Your officers have taken down the names and descriptions of the people on set that day. Your task is to solve the clues and work out who has sabotaged the equipment!

Name	Gender	Height	Left-handed or right-handed
Amelia Killen-Browne	female	tall	left
Barry Shaw	male	short	right
Fenella Bentley	female	tall	left
Gurdeep Mehmi	male	short	left
Janice Twist	female	short	right
Ken Corder	male	tall	right
Ling Chang	male	tall	left
Mei Chang	female	short	left
Nancy Greene	female	tall	right
Ramesh Iqbal	male	tall	right

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Clue One

Circle all of the prime numbers. If the amount of prime numbers is odd, then the saboteur is female. If the amount of prime numbers is even, then the saboteur is male.

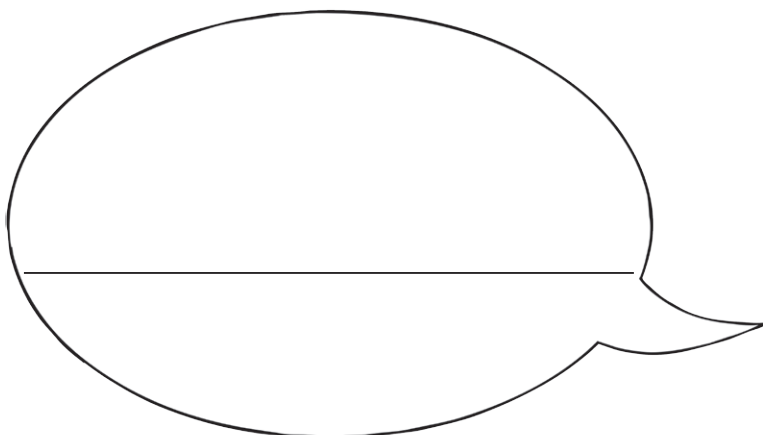|									
2	52	9	111	19	83	85	31	59	89
133	21	22	88	15	90	17	57	131	72

The saboteur is _____ .

Clue Two

Count in prime numbers from the first number in the circle, and then take the last number you reach and find the corresponding word in the table below. Rearrange the words to form a sentence and solve the first clue.

(1) ( ) ( ) ( ) ( )

(15) ( ) ( ) ( ) ( )

(47) ( ) ( ) ( ) ( )

(84) ( ) ( ) ( ) ( )

the	microphone	ran	stole
7	9	2	71
short	broken	saboteur	of
101	27	29	15
was	a	singer	tall
67	69	16	103

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Clue Three

Look at the numbers in the circles. Write the nearest prime number lower than the number in the left-hand boxes and the nearest prime number higher in the right-hand boxes. Then add each column of boxes up. If either column adds to exactly 183, the saboteur is left handed.

☐	⟵ (45) ⟶	☐
☐	⟵ (15) ⟶	☐
☐	⟵ (9) ⟶	☐
☐	⟵ (68) ⟶	☐
☐	⟵ (34) ⟶	☐

_____ _____

The saboteur is _____ handed.

The saboteur is _____ .

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Prime Detectives **Answers**

Question	Answer
1.	**Clue One** Circle all of the prime numbers. If the amount of prime numbers is odd, then the saboteur is female. If the amount of prime numbers is even, then the saboteur is male.

~~2~~	52	9	111	~~19~~	~~83~~	85	~~31~~	~~59~~	~~89~~
133	21	22	88	15	90	~~17~~	57	~~131~~	72

The saboteur is **male**.

2.	**Clue Two** Count in prime numbers from the first number in the circle, and then take the last number you reach and find the corresponding word in the table below. Rearrange the words to form a sentence and solve the first clue.

(1) (2) (3) (5) (7)

(15) (17) (19) (23) (29)

(47) (53) (59) (61) (67)

(84) (89) (97) (101) (103)

the **7**	microphone 9	ran 2	stole 71
short 101	broken 27	saboteur **29**	of 15
was **67**	a 69	singer 16	tall **103**

The saboteur was tall.

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3.	Clue Three Look at the numbers in the circles. Write the nearest prime number lower than the number in the left-hand boxes and the nearest prime number higher in the right-hand boxes. Then add each column of boxes up. If either column adds to exactly 183, the saboteur is left handed.

41	←	45	→	47
13	←	15	→	17
7	←	9	→	11
67	←	68	→	71
31	←	34	→	37

159   183
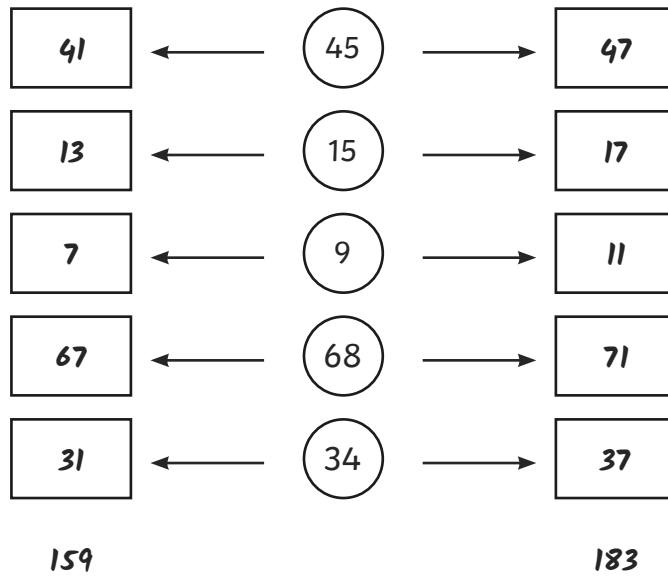
The saboteur is **left** handed.

The saboteur is **Ling Chang**.

Prime Number Generator

I can identify prime numbers.

Use each digit once to create five prime numbers. Various answers include:

5, 47, 61, 23, 809

2, 5, 13, 647, 809

0 1 2 3 4 5 6

7 8 9

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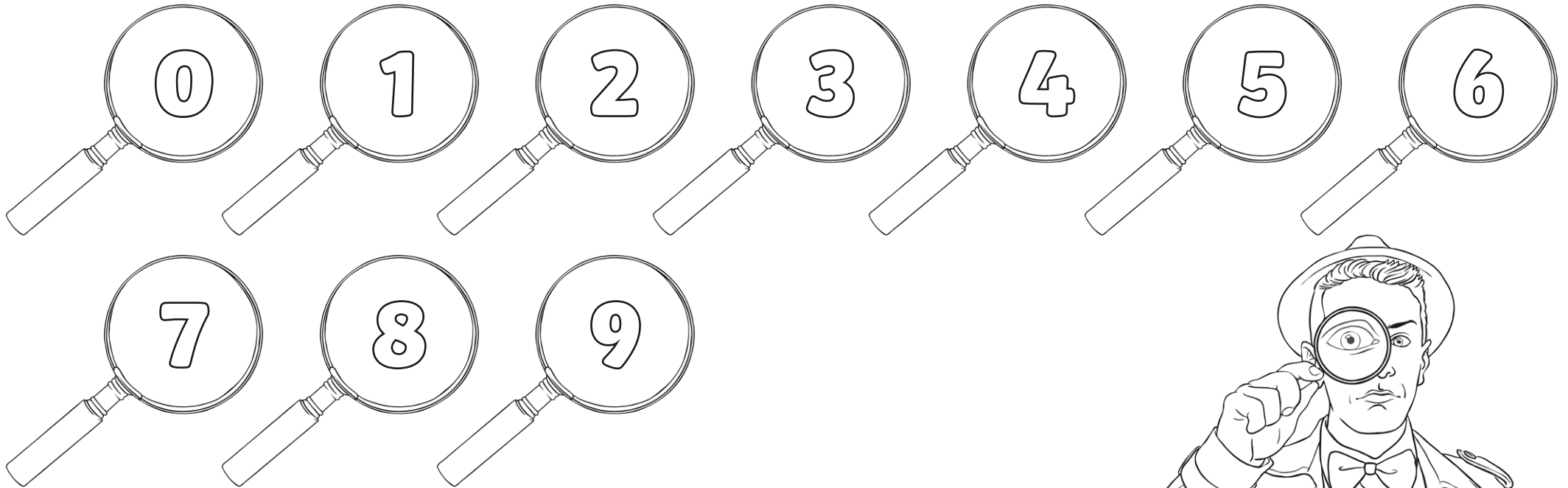
1)

a) 2, 3, 5, 7

b) 5, 7, 11, 13, 17, 19

c) 17, 19, 23, 29, 31, 37, 41, 43

d) 23, 29, 31, 37, 41, 43, 47

e) 31, 37, 41, 43, 47, 53, 59, 61, 67

f) 53, 59, 61, 67, 71, 73, 79, 83, 89

2) Children may find alternative intermediate steps to split a number into its factors, but the prime factors will be the answers shown.

12 → 3, 4 → (2, 2)

24 → 4 (2, 2), 6 (3, 2)

16 → 2, 8 → (2, 4 → (2, 2))

28 → 4 (2, 2), 7

42 → 6 (2, 3), 7

36 → 4 (2, 2), 9 (3, 3)
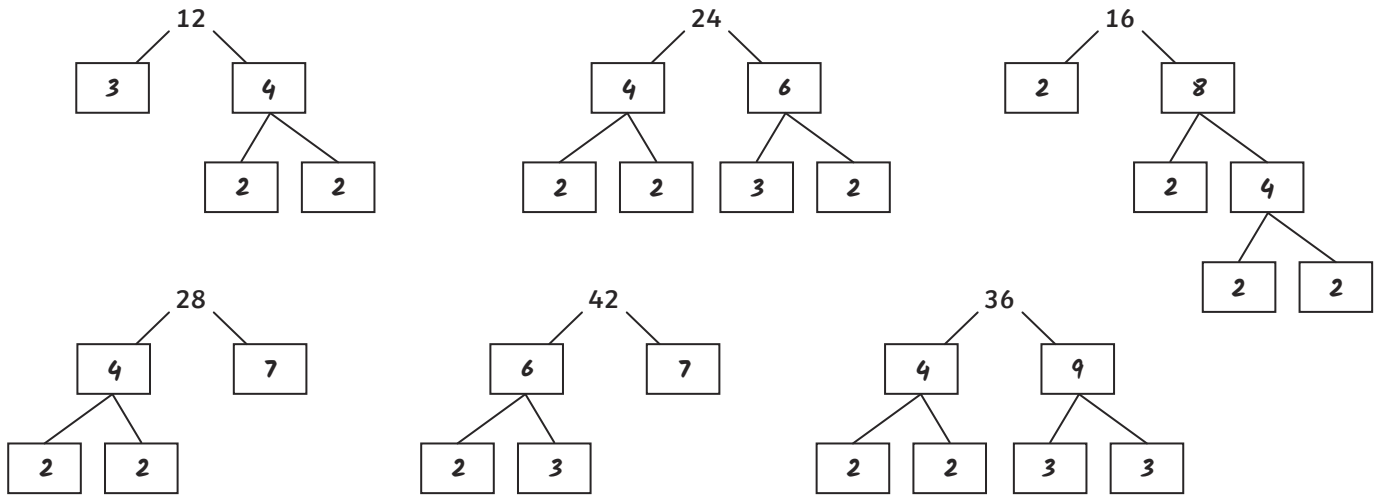
1) Bethany is correct. There are 15 prime numbers between 1 and 50 (2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43 and 47) and 10 prime numbers between 50 and 100 (53, 59, 61, 67, 71, 73, 79, 83, 89 and 97).

2) Michael is not entirely correct. Not all prime numbers are odd: 2 is a prime number and it is even. However, he is accurate in saying that not all odd numbers are prime. For example, 15 is an odd number but it is not prime: its factors are 1, 3, 5 and 15.

3) Kenneth is correct. 53 and 59 fit the criteria: they are both greater than 40, less than 60 and they are both prime. Their digit sums are even: 5 + 3 = 8 and 5 + 9 = 14.

13 + 40 = 53, 17 + 42 = 59 or 40 + 19 = 59, 42 + 19 = 61 or 48 + 13 = 61, 19 + 48 = 67 or 50 + 17 = 67, 48 + 23 = 71, 23 + 50 = 73, 50 + 29 = 79 or 62 + 17 = 79, 29 + 54 = 83, 54 + 35 = 89 and 35 + 62 = 97

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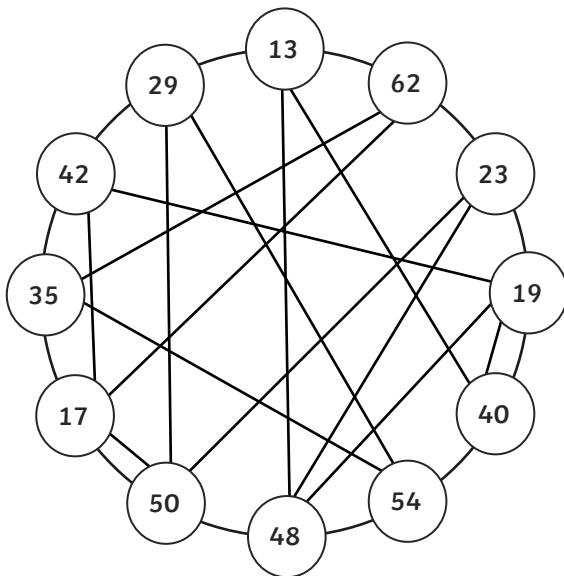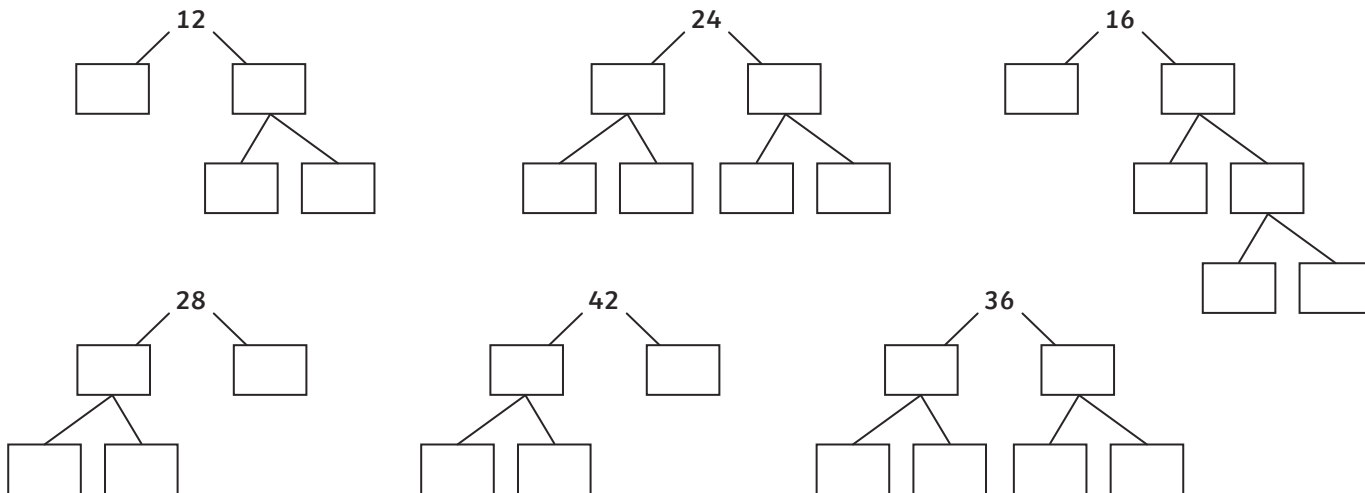
1) Identify all the prime numbers between each pair of numbers.

   a) 1 and 10 _____

   b) 5 and 20 _____

   c) 15 and 45 _____

   d) 20 and 50 _____

   e) 30 and 70 _____

   f) 50 and 90 _____

2) All numbers can be broken down to their prime factors. For each number below, fill in the spaces with their factors until you discover the prime factors.

12

24

16

28

42

36

---

1) Who do you agree with?
Explain your reasoning and provide examples.

_____

_____

_____

_____

Bethany: I think there are more prime numbers between 1 and 50.

Sienna: I think there are more prime numbers between 50 and 100.

2) Do you agree with Michael's statement?
Explain your reasoning?

_____

_____

_____

_____

Michael: All prime numbers are odd, but not all odd numbers are prime.

3) Arthur sets a challenge for his friend Kenneth.
Is Kenneth correct? Explain your reasoning.

_____

_____

_____

_____

Arthur: I am thinking of a number. It is greater than 40. It is less than 60. It is a prime number. The sum of its digits is an even number. How many possibilities are there for what the number could be?

Kenneth: There are two possibilities.

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Can you draw lines to add one number to another to make all the primes from 50 to 100?
Record your calculations as you go along.

13
29
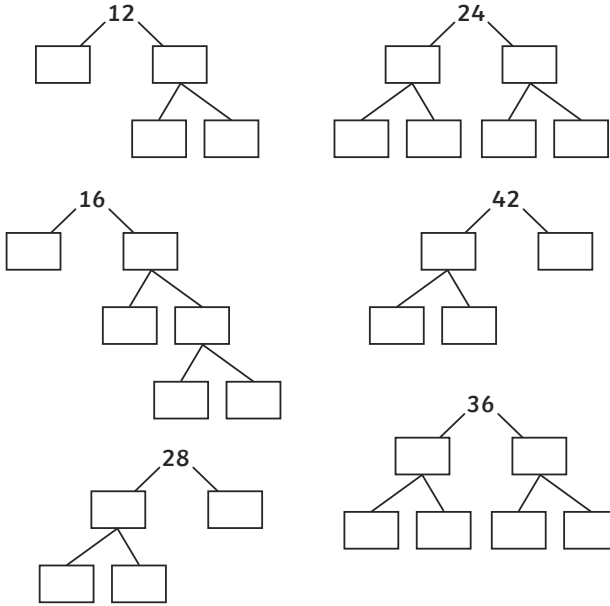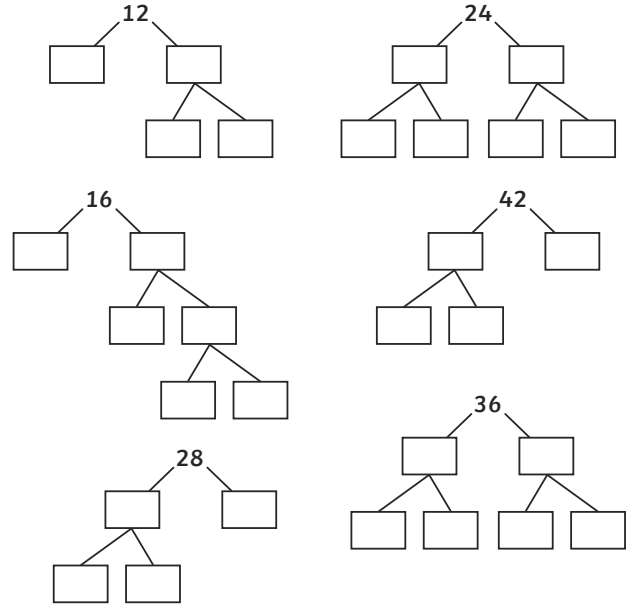62
42
23
35
19
17
40
50
54
48

1) Identify all the prime numbers between each pair of numbers.

a) 1 and 10   **d)** 20 and 50

b) 5 and 20   **e)** 30 and 70

c) 15 and 45   **f)** 50 and 90

2) All numbers can be broken down to their prime factors. For each number below, fill in the spaces with their factors until you discover the prime factors.

12

24

16

42

28

36

1) Who do you agree with? Explain your reasoning and provide examples.

Bethany

I think there are more prime numbers between 1 and 50.

Sienna

I think there are more prime numbers between 50 and 100.

2) Do you agree with Michael's statement? Explain your reasoning?

Michael

All prime numbers are odd, but not all odd numbers are prime.

3) Arthur sets a challenge for his friend Kenneth. Is Kenneth correct? Explain your reasoning.
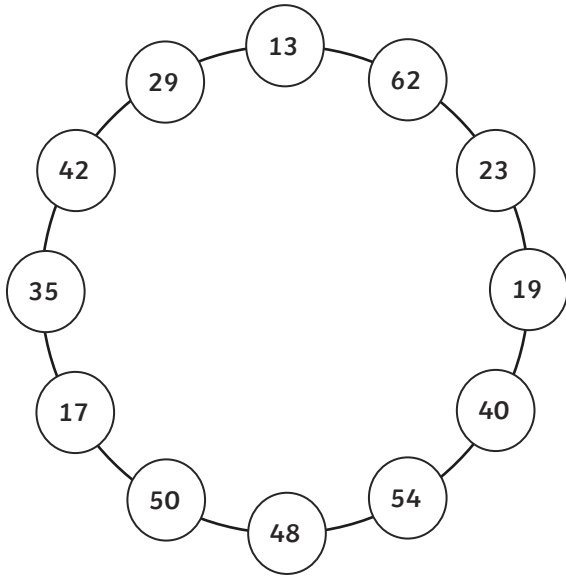
Arthur

I am thinking of a number. It is greater than 40. It is less than 60. It is a prime number. The sum of its digits is an even number. How many possibilities are there for what the number could be?

Kenneth

There are two possibilities.

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Can you draw lines to add one number to another to make all the primes from 50 to 100? Record your calculations as you go along.

13 29 62 23 42 19 35 40 17 54 50 48

Can you draw lines to add one number to another to make all the primes from 50 to 100? Record your calculations as you go along.

13 29 62 23 42 19 35 40 17 54 50 48