Green Answers

1)

a)

12	15
1, 12, 2, 6, 3, 4	1, 15, 3, 5
1, 3	

b)

24	36
1, 24, 2, 12, 3, 8, 4, 6	1, 36, 2, 18, 3, 12, 4, 9, 6
1, 2, 3, 4, 6	

c)

81	60
1, 81, 3, 27, 9	1, 60, 2, 30, 3, 20, 4, 15, 5, 12, 6, 10
1, 3	

d)

45	16
1, 45, 3, 15, 5, 9	1, 16, 2, 8, 4
1	

e)

56	20
1, 56, 2, 28, 4, 14, 7, 8	1, 20, 2, 10, 4, 5
1, 2, 4	

f)

28	48
1, 28, 2, 14, 4, 7	1, 48, 2, 24, 3, 16, 4, 12, 6, 8
1, 2, 4	

1)

a) The common multiple is 12.

b) Children might suggest 24, 36, 48, 60 or any other common multiple of 4 and 6.

c) 24, 36, 48, 60, 72, 84, 96

2)

a) 3 5 — 15, 30, 45

b) 5 6 — 30, 60, 90

c) 3 7 — 21, 42, 63

d) 2 5 — 10, 20, 30

e) 4 7 — 28, 56, 84

f) 5 8 — 40, 80, 120

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

Key:
- multiples of 4
- multiples of 6
- multiples of 4 and 6

Children may also give other common multiples, formed by finding the product of the two numbers and then finding multiples of this product.

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

Yellow Answers

a) This is sometimes true. For example, 24 has 8 factors: 1 and 24; 2 and 12; 3 and 8; and 4 and 6. So 24 has an even number of factors. However, 16 has 5 factors: 1 and 16; 2 and 8; and 4.

b) This is sometimes true. For example, 45 and 15 are a pair of odd numbers. They have three common factors: 1, 3 and 5. 28 and 48 are a pair of even numbers. They also have three common factors: 1, 2 and 4. This proves that pairs of even numbers don't always have more common factors than odd numbers.

1) Levi is incorrect. If the pair of numbers do not share a common factor (other than 1), such as 4 and 7, then their lowest common multiple is their product, as in this example (28). However, if the pair of numbers do share a common factor, such as 4 and 6 (which have a common factor of 2), then their lowest common multiple is not their product. In this case, their lowest common multiple is 12 and their product is 24.

2)

a) 12, 24 and 36
Accept any pair of numbers from 2, 3, 4, 6 or 12.

b) 15, 30 and 45
Accept any pair of numbers from 3, 5 or 15.

c) 21, 42 and 63
Accept any pair of numbers from 3, 7 or 21.

d) 10, 20 and 30
Accept any pair of numbers from 2, 5 or 10.

e) 18, 27 and 36
3 and 9

f) 36, 72 and 108
Accept any pair of numbers from 2, 3, 4, 6, 9, 12, 18 or 36.

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.

Red Answers

1) Aaron is correct. 8 is a common factor of 64 and 48. 6 is only a factor of 48, and not 64.

2)

a) He could cut the ribbon into lengths of 5cm, 10cm, 20cm, 30cm or 60cm.

b) 40 is a factor of 240, but it is not a factor of 180. If he cut the 180cm ribbon into 40cm lengths, he would have 20cm left over.

1) Common multiples of 3 and 5 are 15, 30, 45 and 60. The two gauges will both beep at these times. Therefore, they will both beep at the same time four times in an hour.

2) Common multiples of 12 and 18 are 36, 72, 108, 144, 180, 216, 252, 288, 324 and 360. 360 is equivalent to 6 hours, which is how long the diving sessions last for. Therefore, the reports will come in at the same time 10 times between 7 a.m. and 1 p.m.

These common multiples need converting to times in order to work out when the reports will come in at the same time.

7:36 a.m.	8:48 a.m.	10:00 a.m.	11:12 a.m.	12:24 p.m.
8:12 a.m.	9:24 a.m.	10:36 a.m.	11:48 a.m.	1:00 p.m.

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