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Investigating Mystery Number Puzzles

To solve the puzzles you may need to think about more than one clue at a time.

Clues	Workspace

1 Puzzle A

- ☐ Square number less than 100
- ☐ Sum of digits is a square number
- ☐ Tens digit is greater than the ones digit

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2 Puzzle B

- ☐ Multiple of 21 less than 10×21, but greater than 4×21
- ☐ Difference between the hundreds digit and the tens digit $= 3$
- ☐ Difference between the ones digit and the tens digit $= 3$

☐☐☐

3 Write 3 clues that will give the mystery number 85.

Puzzle C

- ☐ ______________________
- ☐ ______________________
- ☐ ______________________

8	5

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Extension
Lesson 2

Factoring

Complete the number sentences with 3 factors other than 1. Do not use the same set of three factors more than once.

1

$48 = 12 \times 2 \times 2$

$48 = \square \times \square \times \square$

$48 = \square \times \square \times \square$

$48 = \square \times \square \times \square$

2

$150 = \square \times \square \times \square$

$150 = \square \times \square \times \square$

$150 = \square \times \square \times \square$

$150 = \square \times \square \times \square$

3

$60 = \square \times \square \times \square$

$60 = \square \times \square \times \square$

$60 = \square \times \square \times \square$

$60 = \square \times \square \times \square$

4 Can 30 be written in more than one way with factors other than 1? Explain.

$30 = \square \times \square \times \square$

$30 = \square \times \square \times \square$

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Finding Common Factors

List all of the common factors for each pair of numbers.

1. **24** and **48**

____

2. **25** and **48**

____

3. **26** and **48**

____

4. **27** and **48**

____

5. **28** and **48**

____

6. What do you predict the common factors of 95 and 96 to be? Explain your prediction and then check to see if you found all of the common factors.

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Extension
Lesson 4

Investigating Prime and Composite Numbers

Cross out the factors of the first number with a red ×.

Cross out the factors of the second number with a blue +.

List common factors other than 1. If there are none, write *relatively prime.*

1 **48 and 60** common factors other than 1: ______________________

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

2 **35 and 6** common factors other than 1: ______________________

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					

3 **80 and 63.** common factors other than 1: ______________________

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

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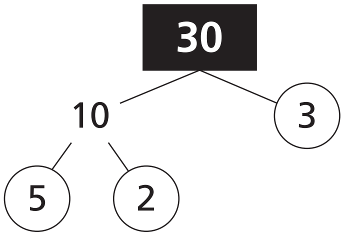
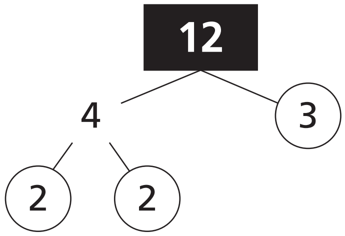
Writing a Number as the Product of Prime Factors

You can find the Greatest Common Factor (GCF) of two numbers by multiplying the prime factors common to both of them as shown below.

Example





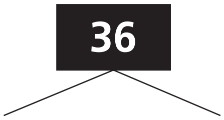
$30 = 3 \times 2 \times 5$

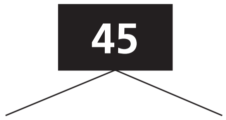
$12 = 2 \times 2 \times 3$

Prime factors common to both: 2 and 3

GCF = 6 ($2 \times 3 = 6$)

1

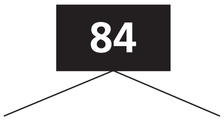


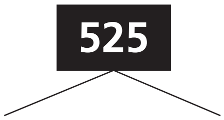


36 = ____________________ 45 = ____________________

Prime factors common to both: __________ GCF = ________

2





84 = ____________________ 525 = ____________________

Prime factors common to both: __________ GCF = ________

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Extension
Lesson 6

Investigating Divisibility by 2, 5, and 10

Put a ☑ in each true box.

	Divisible by . . .	2?	5?	10?
1	465	☐	☐	☐
2	986	☐	☐	☐
3	3,680	☐	☐	☐
4	14,285	☐	☐	☐

Decide whether the statement is True (T) or False (F) and put a ☑ in the correct box.

5. If a number is divisible by 10, it is ALWAYS divisible by 5 and 2. Give an example.

   T ☐ F ☐

   ____

   ____

6. If a number is divisible by 5, it is ALWAYS divisible by 10. Give an example

   T ☐ F ☐

   ____

   ____

7. If a number is divisible by 2, it MAY be divisible by 5. Give an example.

   T ☐ F ☐

   ____

   ____

8. If a number is divisible by 2, it MAY be divisible by 10. Give an example.

   T ☐ F ☐

   ____

   ____

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Investigating Divisibility by 3, 6, and 9

Put a ☑ in each true box.

	Divisible by . . .	2?	3?	5?	6?	9?	10?
1	432	☐	☐	☐	☐	☐	☐
2	465	☐	☐	☐	☐	☐	☐
3	510	☐	☐	☐	☐	☐	☐
4	2,988	☐	☐	☐	☐	☐	☐
5	31,842	☐	☐	☐	☐	☐	☐
6	702,945	☐	☐	☐	☐	☐	☐

Use each of the digits 0, 3, and 6 once to make a 3-digit number that matches the clues.

7
- ☐ Divisible by 3
- ☐ Divisible by 9
- ☐ Not divisible by 6

☐☐☐

8
- ☐ Divisible by 3 and 9
- ☐ Divisible by 6
- ☐ Hundreds digit is greater than both the tens and ones digits

☐☐☐

9
- ☐ Divisible by 9
- ☐ Divisible by 3 and 6
- ☐ Ones digit is greater than both the tens and hundreds digits

☐☐☐

10
- ☐ Divisible by 6
- ☐ Divisible by 3 and 9
- ☐ Tens digit is greater than hundreds and ones digits

☐☐☐