

Mathematics Station Activities

for Texas Essential Knowledge and Skills (TEKS)
Grade 6



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Number, Operation, and Quantitative Reasoning

Set 1: Factors, Multiples, and Prime Factorization

Instruction

Goal: To provide opportunities for students to develop concepts and skills related to factors, multiples, and prime factorizations

Texas Essential Knowledge and Skills (TEKS)

1. Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. The student is expected to:
 - d. write prime factorizations using exponents.
 - e. identify factors of a positive integer, common factors, and the greatest common factor of a set of positive integers.
 - f. identify multiples of a positive integer and common multiples and the least common multiple of a set of positive integers.

Student Activities Overview and Answer Key

Station 1

Students use a number cube to generate two-digit numbers. Then they work together to decide if each of the numbers is prime or composite. If the number is composite, they find the prime factorization. Finally, students describe the strategies they used to identify the numbers as prime or composite.

Answers: Answers will depend on the numbers that are rolled.

Possible strategies: Any two-digit even number is composite; any number ending in 5 is divisible by 5, so it is composite; recognize familiar primes, such as 11 and 13.

Station 2

Students are given 12 red tiles and 18 blue tiles. They are asked to arrange the tiles in rows so that each row contains the same number of tiles and so that each row contains only red tiles or only blue tiles. The rows must also be as long as possible. When students have arranged the tiles following these rules, they reflect on how their arrangement is related to the greatest common factor of 12 and 18.

Answers: Each row has 6 tiles. There are 2 rows with 6 red tiles in each row and 3 rows with 6 blue tiles in each row. The number of tiles in each row (6) is the greatest common factor of 12 and 18.

Number, Operation, and Quantitative Reasoning

Set 1: Factors, Multiples, and Prime Factorization

Instruction

Station 3

Students use a highlighter to highlight all the numbers less than or equal to 100 that are multiples of 8. Then they use a different color to highlight all the multiples of 12. Students work together to check that the multiples are highlighted correctly. Then they look for common multiples (numbers highlighted in both colors) and identify the least common multiple.

Answers: Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96

Multiples of 12: 12, 24, 36, 48, 60, 72, 84, 96

Numbers highlighted in both colors (common multiples): 24, 48, 72, 96

The least common multiple of 8 and 12 is the smallest of the common multiples, 24.

Station 4

Students are given a set of cards with numbers on them. They choose two cards at random and work together to find the greatest common factor and least common multiple of the two numbers chosen. Students replace the cards, shuffle them, and repeat the process two more times. Then they reflect on the strategies they used.

Answers: Answers will depend upon the cards that are chosen.

Possible strategies: To find the greatest common factor, list all the factors of each number and choose the greatest factor that appears in both lists. To find the least common multiple, list several multiples of each number and choose the smallest multiple that appears in both lists.

Materials List/Setup

Station 1 number cube (numbered 1–6)

Station 2 12 small red tiles; 18 small blue tiles

Station 3 two highlighters (different colors)

Station 4 8 index cards with the following numbers written on them:
4, 6, 8, 10, 12, 15, 16, 18

Number, Operation, and Quantitative Reasoning

Set 1: Factors, Multiples, and Prime Factorization

Instruction

Discussion Guide

To support students in reflecting on the activities and to gather some formative information about student learning, use the following prompts to facilitate a class discussion to “debrief” the station activities.

Prompts/Questions

1. What are some ways to decide if a number is prime or composite?
2. Is it ever possible for an even number to be prime? Why or why not?
3. Suppose you had 98 red tiles and 66 blue tiles, and you wanted to arrange all of them in rows so that each row contained only red tiles or only blue tiles, and so that the rows were as long as possible. How could you find the number of tiles in each row without actually arranging all the tiles?
4. Can the least common multiple of two numbers ever be one of the given numbers? Explain.

Think, Pair, Share

Have students jot down their own responses to questions, then discuss with a partner (who was not in their station group), and then discuss as a whole class.

Suggested Appropriate Responses

1. Possible methods: Aside from 2, any even number is composite. A prime number cannot have a units digit of 5. Check to see if the number is divisible by any of the prime numbers that are smaller than it.
2. Yes; the number 2 is prime. Any other even number is not prime because it is divisible by 2.
3. Find the greatest common factor of 98 and 66.
4. Yes. For example, the least common multiple of 2 and 10 is 10.

Possible Misunderstandings/Mistakes

- Assuming that odd numbers are prime (e.g., stating that 39 is prime)
- Multiplying two numbers to find the least common multiple (e.g., stating that the least common multiple of 6 and 8 is 48)
- Forgetting that the greatest common factor of two numbers may be one of the numbers

NAME: _____

Number, Operation, and Quantitative Reasoning

Set 1: Factors, Multiples, and Prime Factorization

Station 1

You will find a number cube at this station. You will use the number cube to create some two-digit numbers.

Roll the number cube two times. Write the numbers in the boxes below.

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Work with other students to decide if this two-digit number is prime or composite. Write the answer on the line. _____

If the number is composite, write the prime factorization of the number on the line below.

Repeat the process two more times.

--	--

Prime or composite? _____

If composite, prime factorization: _____

--	--

Prime or composite? _____

If composite, prime factorization: _____

Write at least three strategies you used to help you decide whether each number was prime or composite.

NAME: _____

Number, Operation, and Quantitative Reasoning

Set 1: Factors, Multiples, and Prime Factorization

Station 2

At this station, you will find 12 red tiles and 18 blue tiles.

Work with other students to arrange the tiles in rows. You must follow these rules:

- Use all the tiles.
- A row can contain only blue tiles or only red tiles.
- Each row must contain the same number of tiles.
- The rows should be as long as possible.

Sketch your arrangement of tiles in the space below.

Work together to check that your arrangement matches all the rules.

How many tiles are in each row? _____

Explain how the number of tiles in each row is related to the greatest common factor.

NAME: _____

Number, Operation, and Quantitative Reasoning

Set 1: Factors, Multiples, and Prime Factorization

Station 3

You will find two highlighters at this station. Use one highlighter to highlight all the numbers in the grid that are multiples of 8. Use the other highlighter to highlight all the numbers in the grid that are multiples of 12.

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

Work together to check that you have highlighted the multiples correctly.

Which numbers are highlighted in both colors? _____

What can you say about these numbers? _____

Explain how to use your work to find the least common multiple of 8 and 12.

NAME: _____

Number, Operation, and Quantitative Reasoning

Set 1: Factors, Multiples, and Prime Factorization

Station 4

You will be given a set of index cards. Shuffle the cards and place them face down.

Choose two cards without looking. Turn the cards over. Write the two numbers below.

Work with other students to find the greatest common factor and least common multiple of the numbers.

Greatest common factor: _____

Least common multiple: _____

Put the cards back. Shuffle the cards. Then repeat the above process two more times.

Two numbers: _____

Greatest common factor: _____

Least common multiple: _____

Two numbers: _____

Greatest common factor: _____

Least common multiple: _____

Explain the strategies you used to find the greatest common factors.

Explain the strategies you used to find the least common multiples.
