LESSON MAKER PRO

Factor Pair Quest

Build equal groups with whole numbers.

GRADE 4 · 4.CE.2.e

4.CE.2.e "Determine all factor pairs for a whole number 1 to 100, using concrete, pictorial, and numerical representations."

NAME _____ DATE _____

FIND THE PAIRS

Factor pairs are two whole numbers that can make a total in equal groups. Start with 1, test larger numbers, and stop when the two numbers meet or would repeat a pair. You can picture counters or square tiles arranged in equal rows to check each pair. Before Practice 1, your teacher supplies 14 identical counters or square tiles and grid paper. Build actual equal rows with all 14 pieces, then draw each different array and label its multiplication statement. Rotating an array does not make a new factor pair.

WORKED EXAMPLE

Find all factor pairs of 36.

1. Start with the pair 1 and 36.
2. Test 2 and 18, then 3 and 12.
3. Picture 4 rows of 9 squares, then find 6 rows of 6 squares.
4. Stop after 6 and 6 because later pairs repeat.

Answer: (1, 36), (2, 18), (3, 12), (4, 9), (6, 6)

PRACTICE 6 problems

1 Use the 14 pieces supplied by your teacher. Build every different rectangular array with all 14 pieces, no gaps or leftovers. Draw each array on the supplied grid paper and label rows × pieces per row. List all factor pairs of 14, counting a rotated array only once.

ANSWER _____

2 A rectangle made from 27 square tiles has equal rows. List all possible numbers of rows and tiles in each row. List each factor pair once; reversing the two factors counts as the same pair.

ANSWER _____

3 List all factor pairs of 40.

ANSWER _____

4 Imagine 55 counters arranged in equal rows. List all possible row arrangements. List each factor pair once; reversing the two factors counts as the same pair.

ANSWER _____

5 List all factor pairs of 63.

ANSWER _____

6 List all factor pairs of 97.

ANSWER _____

APPLY IT Show your work

1 A game club has 48 trading cards. The cards will be placed in equal stacks with no cards left over. What are all possible numbers of stacks and cards in each stack? List each factor pair once; reversing the two factors counts as the same pair.

WORK SPACE

ANSWER _____

2 An art club has 72 beads for matching bracelets. They will make the same number of beads on each bracelet, with no beads left over. What are all possible numbers of bracelets and beads on each bracelet? List each factor pair once; reversing the two factors counts as the same pair.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A school display uses 100 photos in a rectangle with equal rows. List every possible number of rows and photos in each row. Then explain why you stop after the middle pair. List each factor pair once; reversing the two factors counts as the same pair.

WORK SPACE AND ANSWER

ANSWER KEY # Factor Pair Quest

GRADE 4 · 4.CE.2.e

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the 14 pieces supplied by your teacher. Build every different rectangular array with all 14 pieces, no gaps or leftovers. Draw each array on the supplied grid paper and label rows × pieces per row. List all factor pairs of 14, counting a rotated array only once.	**(1, 14), (2, 7). Actual arrays and matching drawings: 1 row of 14 and 2 rows of 7; labels 1 × 14 = 14 and 2 × 7 = 14. Rotations are equivalent.**
2	A rectangle made from 27 square tiles has equal rows. List all possible numbers of rows and tiles in each row. List each factor pair once; reversing the two factors counts as the same pair.	**(1, 27), (3, 9)**
3	List all factor pairs of 40.	**(1, 40), (2, 20), (4, 10), (5, 8)**
4	Imagine 55 counters arranged in equal rows. List all possible row arrangements. List each factor pair once; reversing the two factors counts as the same pair.	**(1, 55), (5, 11)**
5	List all factor pairs of 63.	**(1, 63), (3, 21), (7, 9)**
6	List all factor pairs of 97.	**(1, 97)**

PART 2 · APPLY IT

1. **(1 stack, 48 cards), (2 stacks, 24 cards), (3 stacks, 16 cards), (4 stacks, 12 cards), (6 stacks, 8 cards)** Find the factor pairs of 48. Each pair names a possible number of stacks and the number of cards in each stack.
2. **(1 bracelet, 72 beads), (2 bracelets, 36 beads), (3 bracelets, 24 beads), (4 bracelets, 18 beads), (6 bracelets, 12 beads), (8 bracelets, 9 beads)** Find the factor pairs of 72. Each pair shows a possible number of bracelets and beads per bracelet.

CHALLENGE

(1, 100), (2, 50), (4, 25), (5, 20), (10, 10). Stop after 10 and 10 because any larger number of rows repeats a pair already listed.

Accept pairs written in either order, as long as every pair is included once. Accept words, multiplication statements, or row-by-column descriptions for the equal-group arrangements. Supply 14 identical pieces and grid paper before Practice 1. Observe actual arrangements; require both distinct arrays, corresponding drawings, and numerical labels. Support grid-paper drawing without replacing the learner build. For contextual lists, pairs are unordered as explicitly stated in the prompts.

Factor Pair Quest

Practice 1: two rows of 7 pieces; 2 × 7 = 14. A rotated array is equivalent.

