Equation Detectives

Compare both sides to find expressions with the same value.

4.CE.2 "The student will estimate, represent, solve, and justify solutions to single-step and multistep problems, including those in context, using multiplication with whole numbers, and single-step problems, including those in context..."

NAME _____ DATE _____

EQUAL EXPRESSIONS

Expressions are equal when both sides have the same value. An equal sign means "has the same value as."

$14 + 16 = 5 \times 6$

NOT EQUAL EXPRESSIONS

Expressions are not equal when the two sides have different values. Use the not equal sign when the values do not match.

$81 \div 9 \neq 8 + 2$

1 SORT

8 items

For each equation, circle EQUAL or NOT EQUAL, then choose two items for PROVE IT and write the value of each side to explain your choice.

1.	$36 \div 4 = 3 \times 3$	EQUAL NOT EQUAL
2.	$7 \times 8 = 50 + 6$	EQUAL NOT EQUAL
3.	$64 \div 8 = 7 \times 2$	EQUAL NOT EQUAL
4.	$9 \times 6 = 80 - 26$	EQUAL NOT EQUAL
5.	$45 \div 5 = 4 + 4$	EQUAL NOT EQUAL
6.	$12 \times 3 = 40 - 5$	EQUAL NOT EQUAL
7.	$11 \times 4 = 6 \times 7 + 2$	EQUAL NOT EQUAL
8.	$72 \div 9 = 5 + 3$	EQUAL NOT EQUAL

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write one new EQUAL equation and one new NOT EQUAL equation. Use multiplication or division in each equation.

EQUAL _____

NOT EQUAL _____

CHALLENGE

Write an EQUAL equation with multiplication on one side and addition or subtraction on the other side.

ANSWER KEY

Equation Detectives

GRADE 4 · 4.CE.2

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	36 ÷ 4 = 3 × 3	**EQUAL**	Both sides equal 9.
2	7 × 8 = 50 + 6	**EQUAL**	Both sides equal 56.
3	64 ÷ 8 = 7 × 2	**NOT EQUAL**	The left side is 8 and the right side is 14.
4	9 × 6 = 80 - 26	**EQUAL**	Both sides equal 54.
5	45 ÷ 5 = 4 + 4	**NOT EQUAL**	The left side is 9 and the right side is 8.
6	12 × 3 = 40 - 5	**NOT EQUAL**	The left side is 36 and the right side is 35.
7	11 × 4 = 6 × 7 + 2	**EQUAL**	Both sides equal 44.
8	72 ÷ 9 = 5 + 3	**EQUAL**	Both sides equal 8.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **EQUAL**: 8 × 8 = 16 × 4
- **NOT EQUAL**: 63 ÷ 7 ≠ 10

Challenge: 7 × 8 = 60 - 4

For PROVE IT, accept explanations that show or state the value of both sides and correctly compare them. Check that student-created equations use multiplication or division and have the labeled relationship.