LINKED NUMBER FACTS

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

A fact family is a set of related facts.

$3 + 5 = 8$ $5 + 3 = 8$

$8 - 3 = 5$ $8 - 5 = 3$

8	
3	5

1 Use the bar model to complete the fact family.

11	
7	4

$7 + 4 = 11$

$11 - \square = 4$

$4 + \square = 11$

$11 - 4 = \square$

2 Use the bar model to complete the fact family.

15		
5	5	5

$3 \times 5 = \square$

$15 \div 3 = \square$

$5 \times \square = 15$

$15 \div \square = 3$

3 Use $26 + 14 = 40$ to complete these.

a) $40 - 14 = \square$ **b)** $40 - 26 = \square$ **c)** $14 + 26 = \square$

4 Use $6 \times 8 = 48$ to complete these.

a) $48 \div 6 = \square$ **b)** $48 \div 8 = \square$ **c)** $8 \times 6 = \square$

d) True or false? $6 \div 48 = 8$ TRUE FALSE

LINKED NUMBER FACTS

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Related facts work with letters too.

$a + 4 = 10$ so $10 - 4 = a$ and $10 - a = 4$

The whole goes first in a subtraction fact.

10	
a	4

1 Write the four facts shown by this bar model.

23	
15	8

....

....

2 Write two multiplication facts and two division facts for this bar model.

12			
3	3	3	3

....

....

3 Use the bar model to complete the facts.

20	
y	6

$6 + y =$ ☐ $20 - 6 =$ ☐

$20 - y =$ ☐ So $y =$ ☐

4 $9 \times k = 54$. Use this fact to complete these.

a) $54 \div 9 =$ ☐ **b)** $54 \div k =$ ☐ **c)** $k =$ ☐

LINKED NUMBER FACTS

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

One fact gives three more. + and × are commutative, so the order can change. For – and ÷ the whole always comes first: if 4p = 36, then 36 ÷ 4 = p and 36 ÷ p = 4.

FLUENCY

1 Write three related facts for each calculation.

a) **37 + 45 = 82**

b) **9 × 13 = 117**

c) **7.2 – 3.5 = 3.7**

2 Write three related facts for each equation.

a) **w + 8 = 31**

b) **4p = 36**

c) **h – 12 = 5**

REASONING

3 Ali says, "If 72 ÷ m = 8, then 8 ÷ 72 = m."

a) Explain Ali's mistake.

b) Write three correct related facts for 72 ÷ m = 8.

4 p – q = r. Is each statement true or false? Circle your answer.

a) **p – r = q** TRUE FALSE

b) **r + q = p** TRUE FALSE

c) **q – p = r** TRUE FALSE

d) **r – p = q** TRUE FALSE

e) Draw a bar model to explain your answer to part c.

LINKED NUMBER FACTS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) One addition fact gives three other different facts. ALWAYS SOMETIMES NEVER

b) If $6 \times n = t$, then $t \div 6 = n$. ALWAYS SOMETIMES NEVER

c) If $a - 9 = b$, then $9 - a = b$. ALWAYS SOMETIMES NEVER

d) $x \div 2$ has the same value as $2 \div x$. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 This bar model shows the equation $3m + 11 = 35$. Use related facts to find m.

35	
3m	11

$3m = 35 - \square$

$3m = \square$

$m = \square$

3 Use $1.8 \times 45 = 81$ to work out these.

a) $81 \div 1.8 = \square$ **b)** $81 \div 45 = \square$

c) $0.18 \times 45 = \square$ **d)** $810 \div 18 = \square$

★ CHALLENGE FOR ALL

4 The three different numbers in an addition fact family ($a + b = c$) add up to 60. One of the numbers is 18.

a) Find the other two numbers. ☐

b) Write the whole fact family: _____

c) In a multiplication fact family ($a \times b = c$) the three numbers multiply to 3600. One of them is 12. Find the other two. ☐

LINKED NUMBER FACTS

ANSWERS

BUILDING BLOCKS

1 4 + 7 = 11 · 11 – 7 = 4 · 11 – 4 = 7

2 15 · 3 · 5 · 5

3 a) 26 · b) 14 · c) 40

4 a) 8 · b) 6 · c) 48 · d) false (48 ÷ 6 = 8)

SUPPORT

1 15 + 8 = 23 · 8 + 15 = 23 · 23 – 15 = 8 · 23 – 8 = 15

2 4 × 3 = 12 · 3 × 4 = 12 · 12 ÷ 4 = 3 · 12 ÷ 3 = 4

3 20 · y · 6 · y = 14

4 a) k · b) 9 · c) k = 6

CORE

1 a) 45 + 37 = 82, 82 – 37 = 45, 82 – 45 = 37 · b) 13 × 9 = 117, 117 ÷ 9 = 13, 117 ÷ 13 = 9 · c) 7.2 – 3.7 = 3.5, 3.5 + 3.7 = 7.2, 3.7 + 3.5 = 7.2

2 a) 8 + w = 31, 31 – 8 = w, 31 – w = 8 (w = 23) · b) p × 4 = 36, 36 ÷ 4 = p, 36 ÷ p = 4 (p = 9) · c) 5 + 12 = h, h – 5 = 12, 12 + 5 = h (h = 17)

3 a) division is not commutative — the whole (72) must come first; 8 ÷ 72 is less than 1 · b) 72 ÷ 8 = m, 8 × m = 72, m × 8 = 72 (m = 9)

4 a) true · b) true · c) false · d) false · e) bar: whole p, parts q and r — so p – q = r, not q – p

GREATER DEPTH

1 a) sometimes (4 + 4 = 8 only gives 8 – 4 = 4) · b) always · c) sometimes (only when a = 9, b = 0) · d) sometimes (only when x = 2 or x = –2)

2 11 · 24 · m = 8

3 a) 45 · b) 1.8 · c) 8.1 · d) 45

4 a) 12 and 30 (a + b + c = 2c = 60, so c = 30) · b) 12 + 18 = 30, 18 + 12 = 30, 30 – 12 = 18, 30 – 18 = 12 · c) a × b × c = c^2 = 3600, so c = 60; the other number is 5