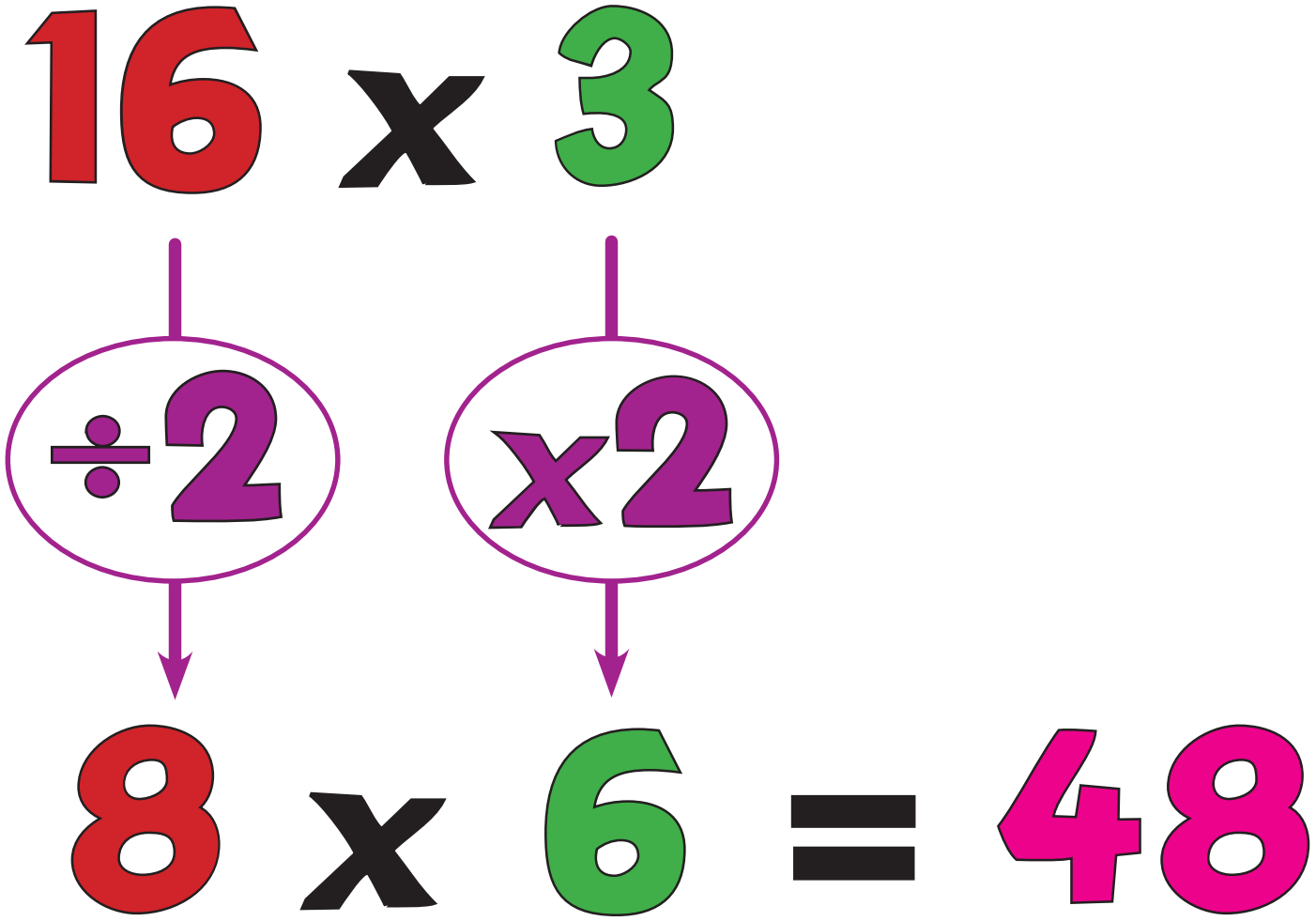
Mental Multiplication

10 Cool Strategies for Mental Multiplication

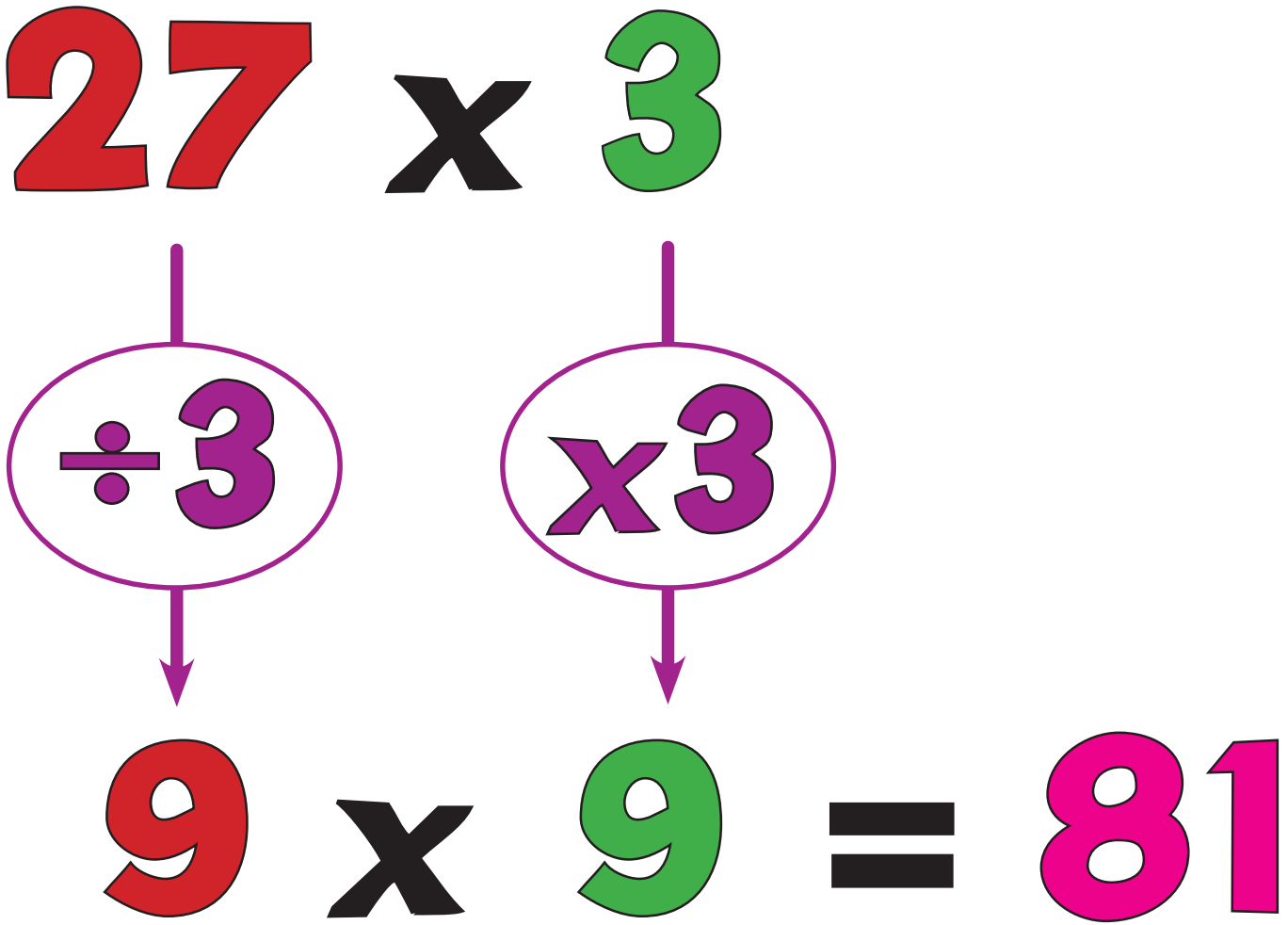
MM1: Manipulate Calculation

5



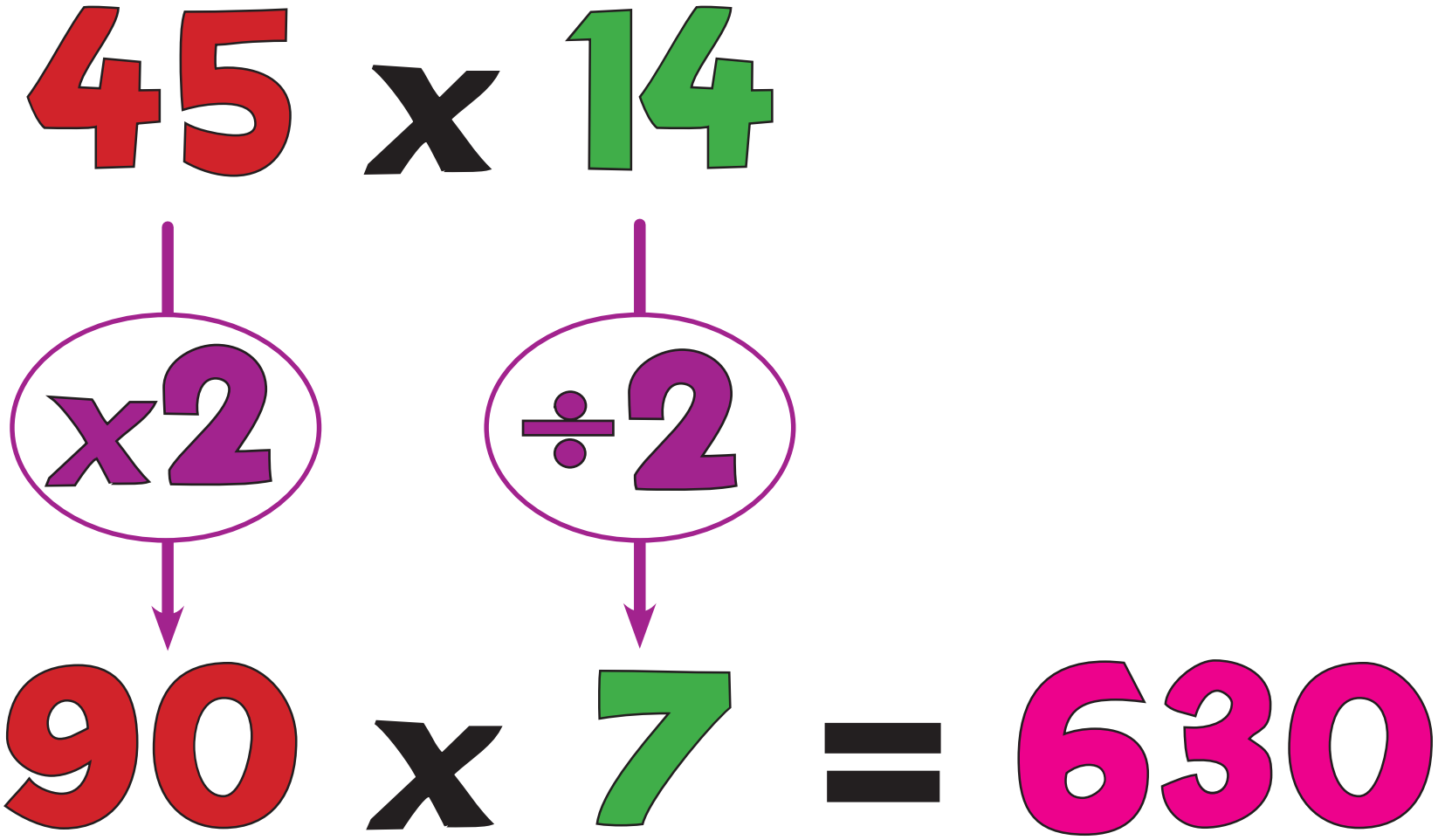
MM1a: Manipulate Calculation

5



MM1b: Manipulate Calculation

5



MM1c: Manipulate Calculation

5/6

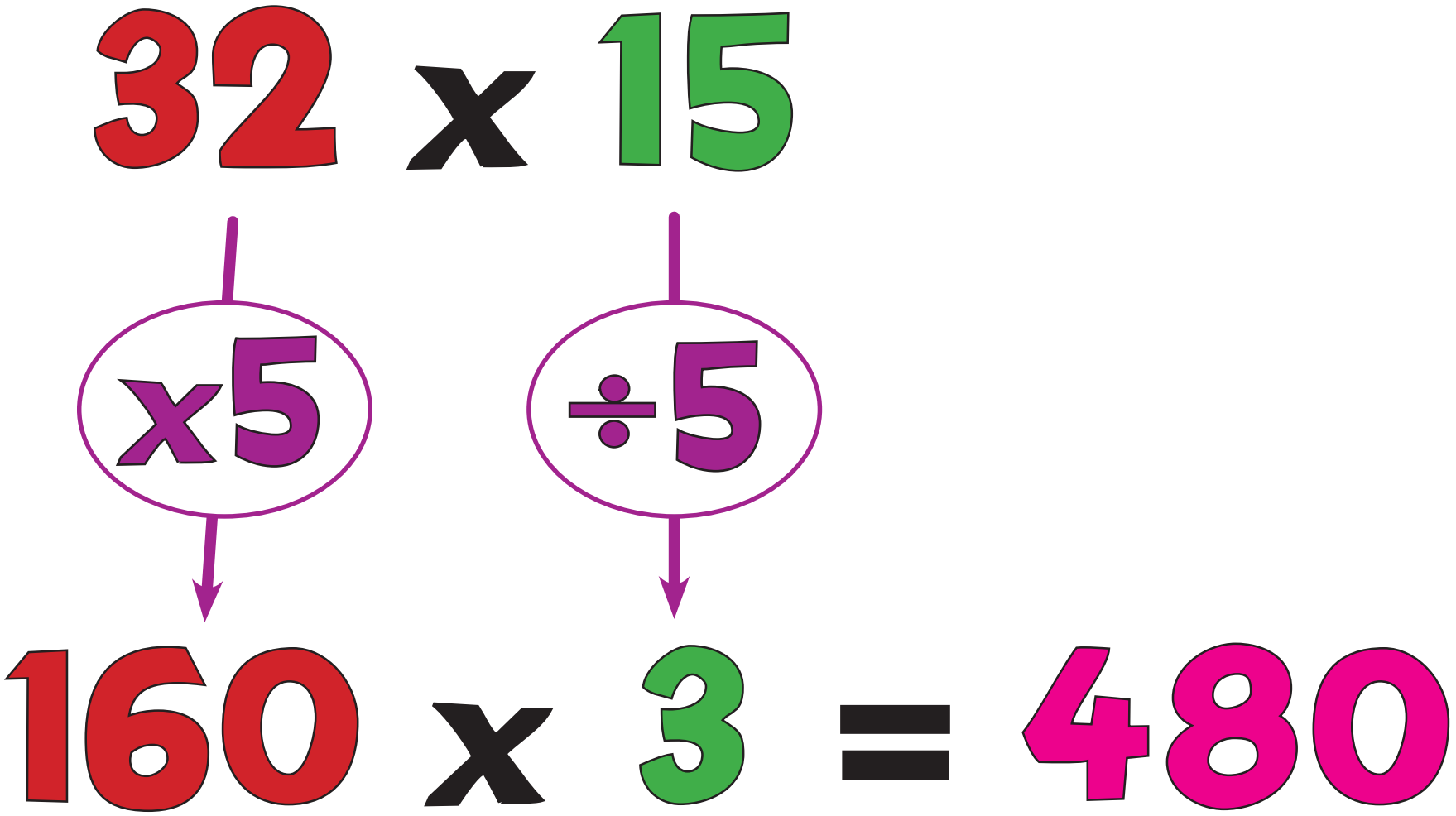
$$36 \times 25$$

÷4 ↓ x4 ↓

$$9 \times 100 = 900$$

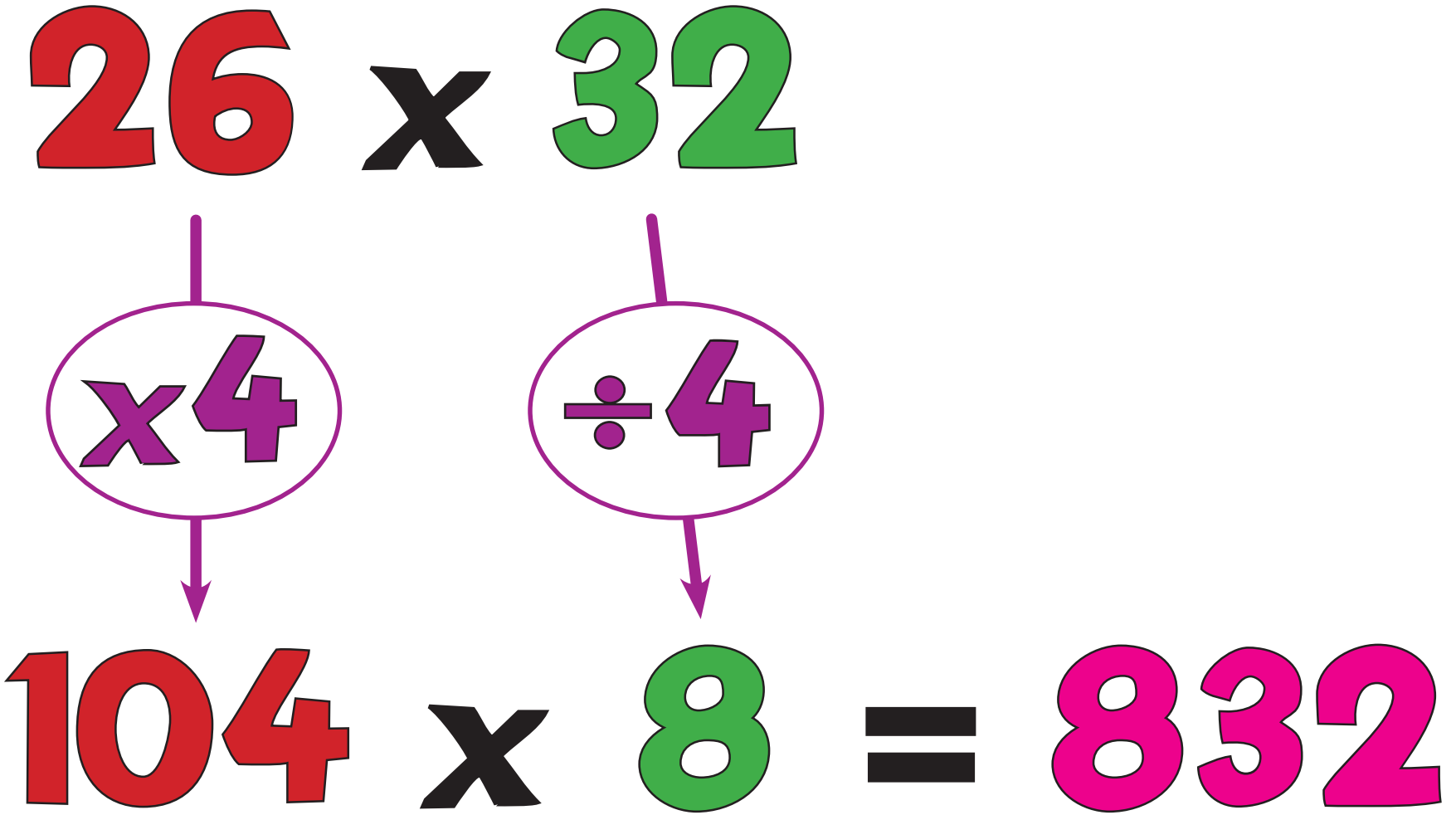
MM1d: Manipulate Calculation

6



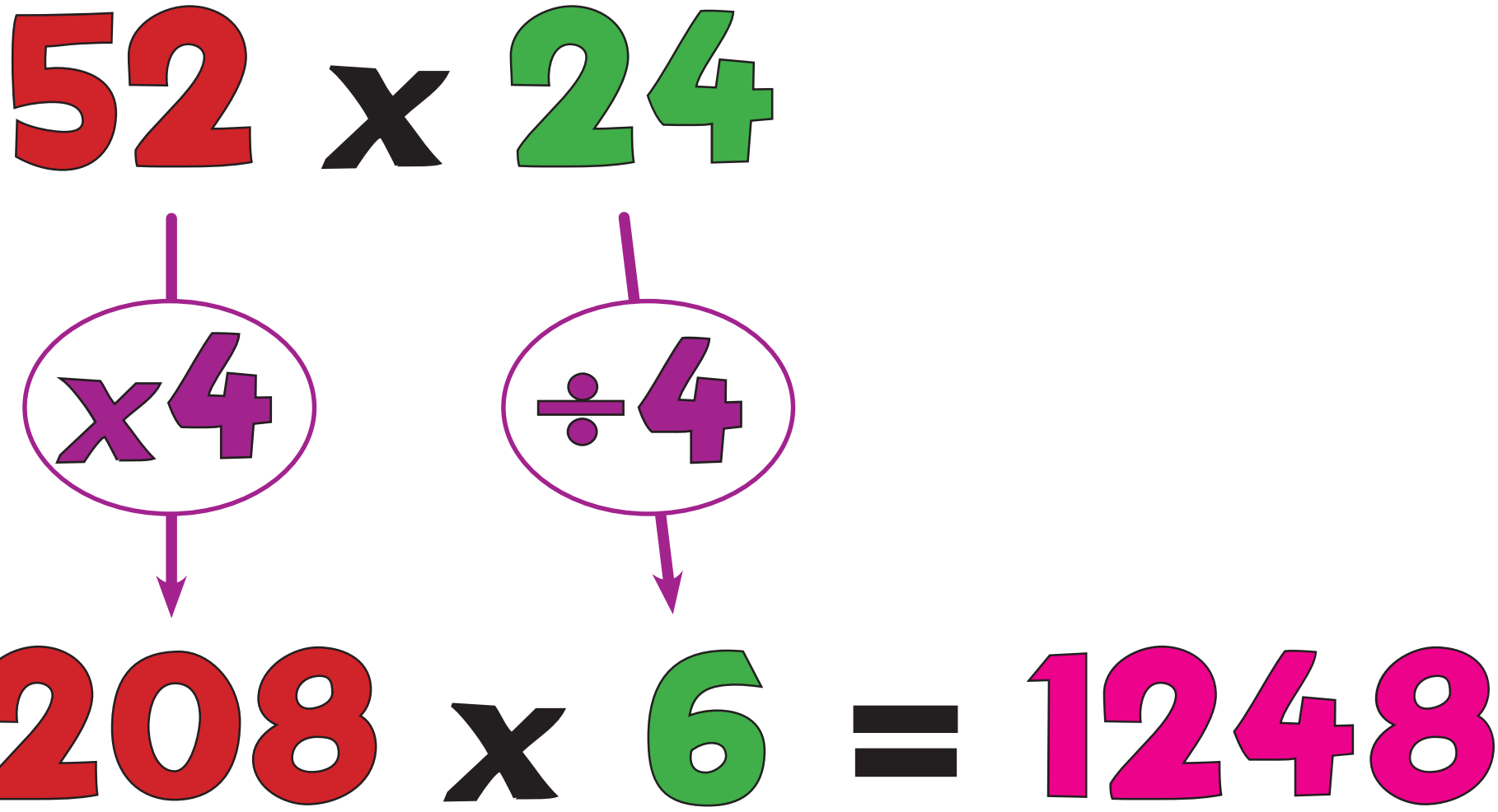
MM1e: Manipulate Calculation

6



MM1f: Manipulate Calculation

6



MM2: Factorising

4

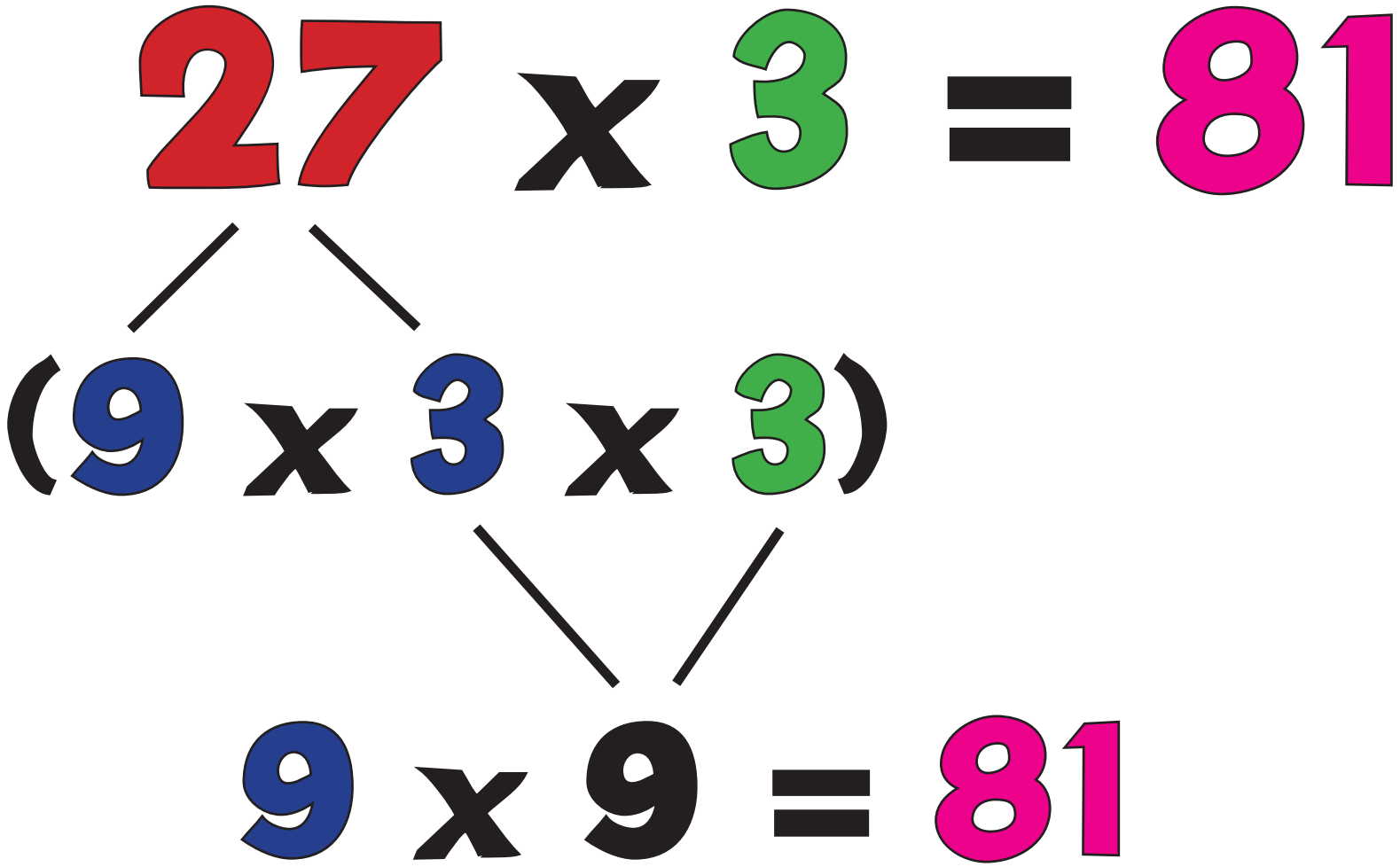
$16 \times 3 = 48$

$(8 \times 2 \times 3)$

$8 \times 6 = 48$

MM2a: Factorising

4



MM2b: Factorising

5

$45 \times 14 = 630$

$(45 \times 2 \times 7)$

$90 \times 7 = 630$

MM2c: Factorising

5/6

$$36 \times 25 = 900$$

$$(9 \times 4 \times 25)$$

$$9 \times 100 = 900$$

MM2d: Factorising

6

$$32 \times 15 = 480$$

$$(32 \times 5 \times 3)$$

$$160 \times 3 = 480$$

MM2e: Factorising

6

$$26 \times 32 = 832$$

$$(26 \times 4 \times 8)$$

$$104 \times 8 = 832$$

MM2f: Factorising

6

$52 \times 24 = 1248$

$(52 \times 4 \times 6)$

$208 \times 6 = 1248$

MM3: Re-ordering

5

$(9 \times 2) \times 5$

$18 \times 5 = 90$

$(9 \times 5) \times 2$

$45 \times 2 = 90$

$(2 \times 5) \times 9$

$10 \times 9 = 90$ *

MM3a: Re-ordering

5/6

$(7 \times 4) \times 5$

$28 \times 5 = 140$

$(7 \times 5) \times 4$

$35 \times 4 = 140$

$(4 \times 5) \times 7$

$20 \times 7 = 140$ *

MM3b: Re-ordering

6

$(9 \times 8) \times 6$

$72 \times 6 = 432$

$(9 \times 6) \times 8$

$54 \times 8 = 432$ *

$(8 \times 6) \times 9$

$48 \times 9 = 432$

MM4: Partitioning

4

15 x 5 = 75

50 + 25 = 75

(10 x 5) (5 x 5)

MM4a: Partitioning

4/5

$$37 \times 4 = 148$$

$$120 + 28 = 148$$

(30 x 4) (7 x 4)

MM4b: Partitioning

5

126 x 6 = 756

600 + 120 + 36 = 756

(100 x 6) (20 x 6) (6 x 6)

MM4c: Partitioning

6

4.3 x 8 = 34.4

32 + 2.4 = 34.4

(4 x 8) (0.3 x 8)

MM4d: Partitioning

6

2.16 x 3 = 6.48

6 + 0.3 + 0.18 = 6.48

(2 x 3) (0.1 x 3) (0.06 x 3)

MM5: Round & Adjust

4

$$49 \times 3 = 147$$

$$(50 \times 3) - (1 \times 3)$$

$$150 - 3 = 147$$

MM5a: Round & Adjust

5

$$198 \times 4 = 792$$

$$(200 \times 4) - (2 \times 4)$$

$$800 - 8 = 792$$

MM5b: Round & Adjust

5/6

$$3.9 \times 5 = 19.5$$

$$(4 \times 5) - (0.1 \times 5)$$

$$20 - 0.5 = 19.5$$

MM5c: Round & Adjust

6

£5.99 x 6 = £35.94

(£6 x 6) - (1p x 6)

£36 - 6p = £35.94

MM6: Doubling

2

20 + 14 = 34

Double 17 = 34

(15 + 2)

30 + 4 = 34

MM6a: Doubling

3

60 + 14 = 74

Double 37 = 74

(35 + 2)

70 + 4 = 74

MM6b: Doubling

4

140 + 16 = 156

Double 78 = 156

(75 + 3)

150 + 6 = 156

MM6c: Doubling

4

Double 340 = 680

600 + 80 = 680

MM6d: Doubling

4/5

800 + 160 = 960

Double 480 = 960

(450 + 30)

900 + 60 = 960

MM6e: Doubling

5

400 + 140 + 16 = 556

Double 278 = 556

(250 + 28)

500 + 28 = 556

MM6f: Doubling

5/6

1400 + 120 + 16 = 1536

Double 768 = 1536

(750 + 18)

1500 + 36 = 1536

MM6g: Doubling

6

Double 3.7 = 7.4

6 + 1.4 = 7.4

MM7: Doubling Table Facts

3

$8 \times 6 = 48$

(4 x 2)

$4 \times 6 = 24$

↓ ↓ x 2

$8 \times 6 = 48$

MM7a: Doubling Table Facts

4

$12 \times 7 = 84$

(6 x 2)

$6 \times 7 = 42$

↓ ↓ x 2

$12 \times 7 = 84$

MM7b: Doubling Table Facts

5

$16 \times 7 = 112$

(8 x 2)

$8 \times 7 = 56$

↓ ↓ x 2

$16 \times 7 = 112$

MM7c: Doubling Table Facts

6

22 x 12 = 264

(11 x 2)

11 x 12 = 132

↓ ↓ x 2

22 x 12 = 264

MM8: Doubling Up

3/4

17 x 4 = 68

Double 17 = 34 (17 x 2)

Double 34 = 68 (17 x 4)

MM8a: Doubling Up

5

36 x 8 = 288

Double 36 = 72 (36 x 2)

Double 72 = 144 (36 x 4)

Double 144 = 288 (36 x 8)

MM8b: Doubling Up

6

125 x 16 = 2000

Double 125 = 250 (125 x 2)

Double 250 = 500 (125 x 4)

Double 500 = 1000 (125 x 8)

Double 1000 = 2000 (125 x 16)

MM9: Mult by 10, 100 & 1000 then Halve

5

$$86 \times 5 = 430$$

$$86 \times 10 = 860$$

$$860 \div 2 = 430$$

MM9a: Mult by 10, 100 & 1000 then Halve

6

$$56 \times 25 = 1400$$

$$56 \times 100 = 5600$$

$$5600 \div 2 = 2800$$

$$2800 \div 2 = 1400$$

MM10: Jump!

3/4

x100

x10

1000	100	10	1
3	4	0	0
	3	4	0
		3	4

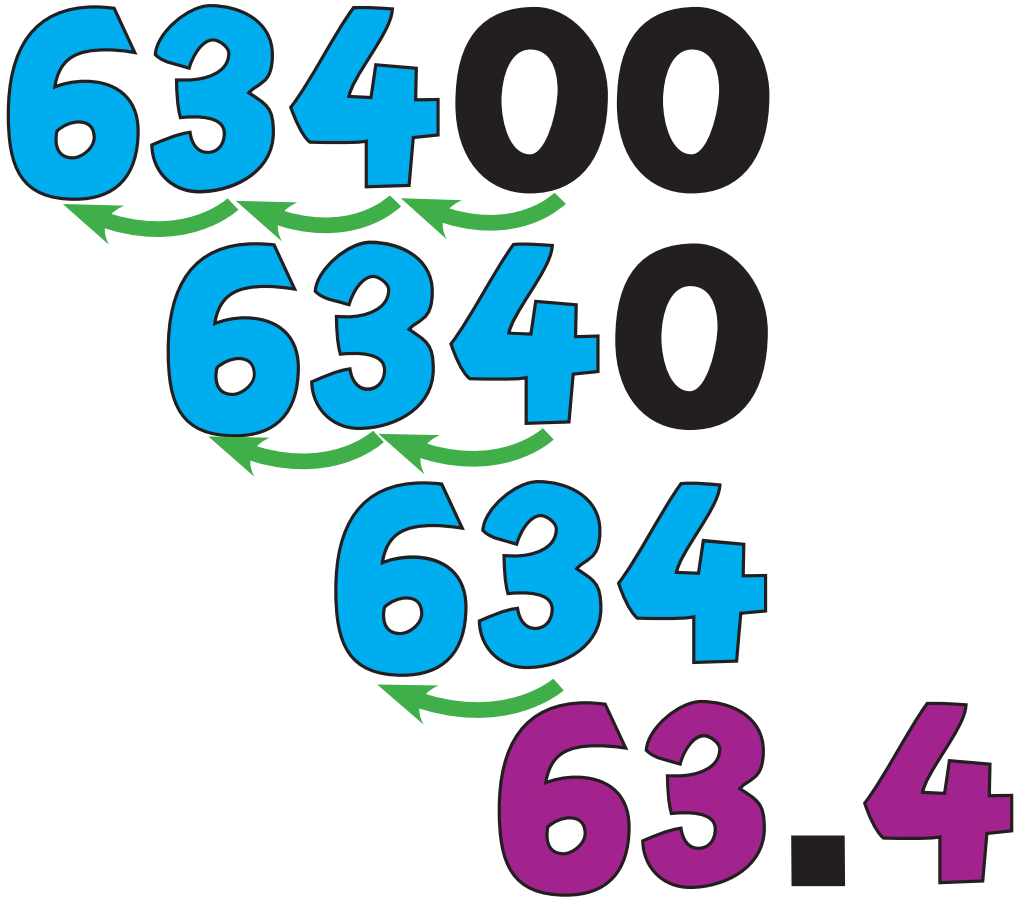
MM10a: Jump!

5/6

x1000

x100

x10



Mental Division

7 Cool Strategies for Mental Division!

MD1: Manipulate Calculation

3

Small Quotient

$$140 \div 20$$

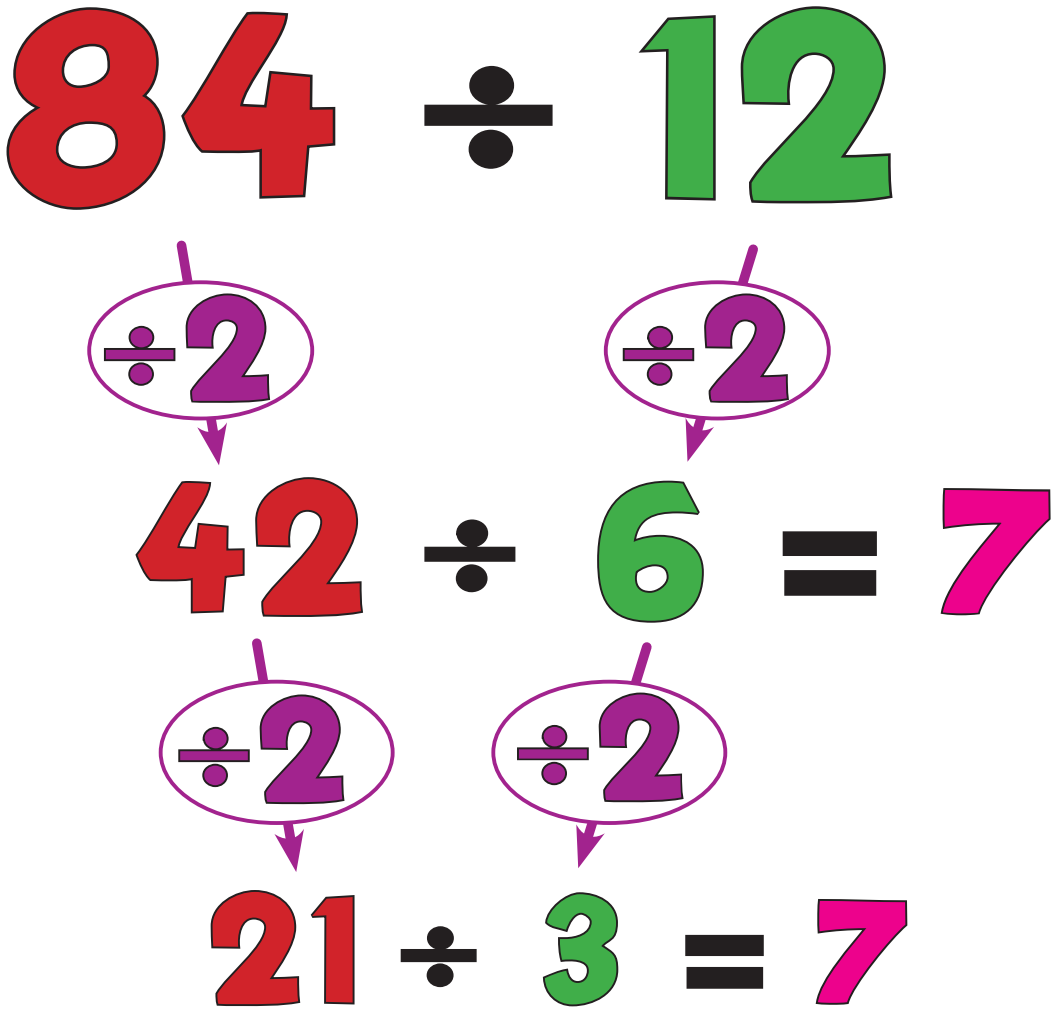
$\div 10$ $\div 10$

$$14 \div 2 = 7$$

MD1a: Manipulate Calculation

4

Small Quotient



MD1b: Manipulate Calculation

4

Small Quotient

$1200 \div 400$

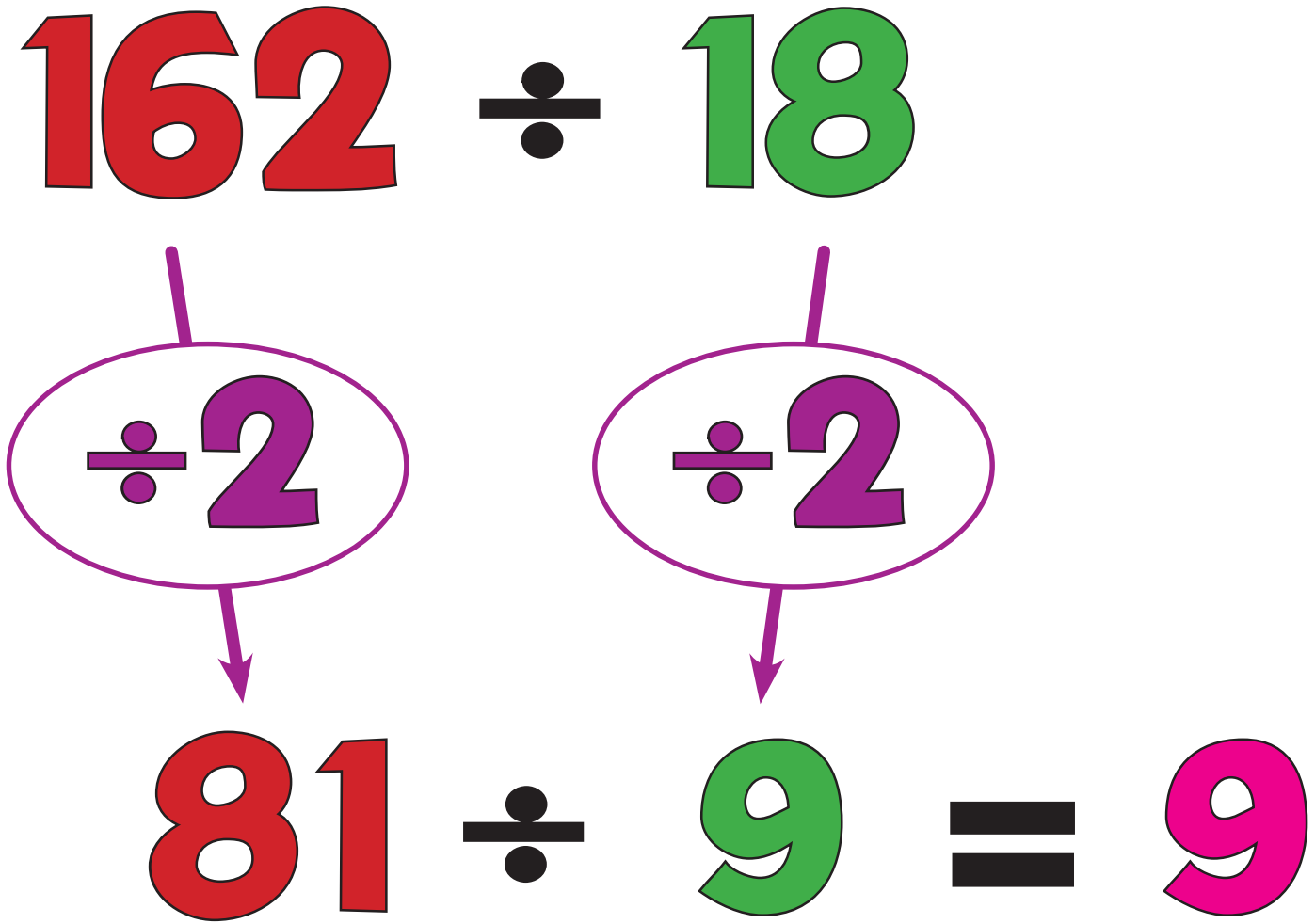
÷100 ÷100

$12 \div 4 = 3$

MD1c: Manipulate Calculation

5

Small Quotient

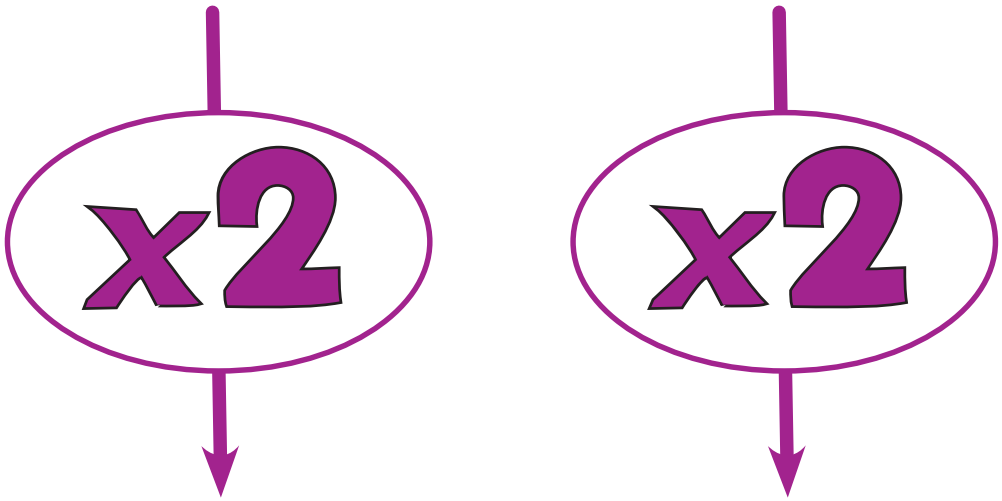


MD1d: Manipulate Calculation

6

Small Quotient

$$18 \div 1.5$$



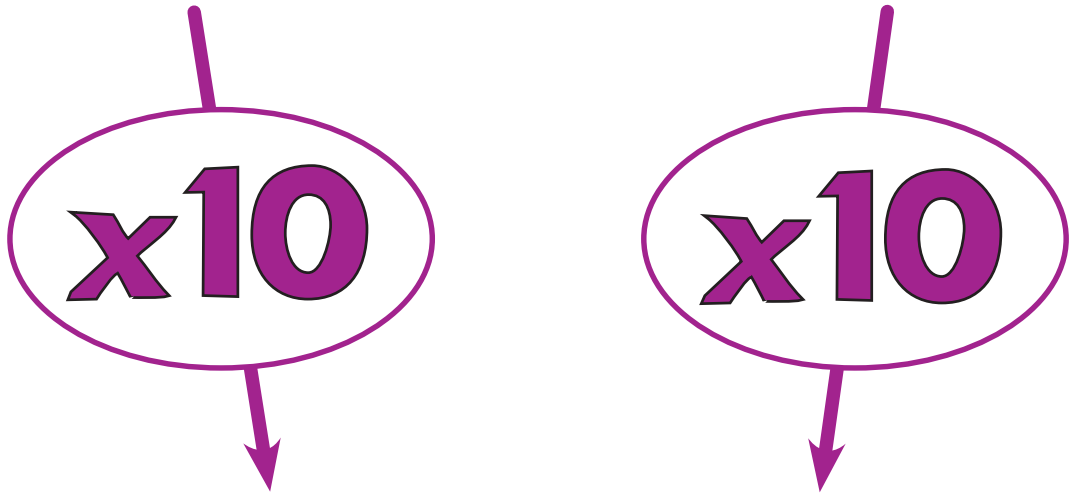
$$36 \div 3 = 12$$

MD1e: Manipulate Calculation

6

Small Quotient

$$9.3 \div 0.3$$



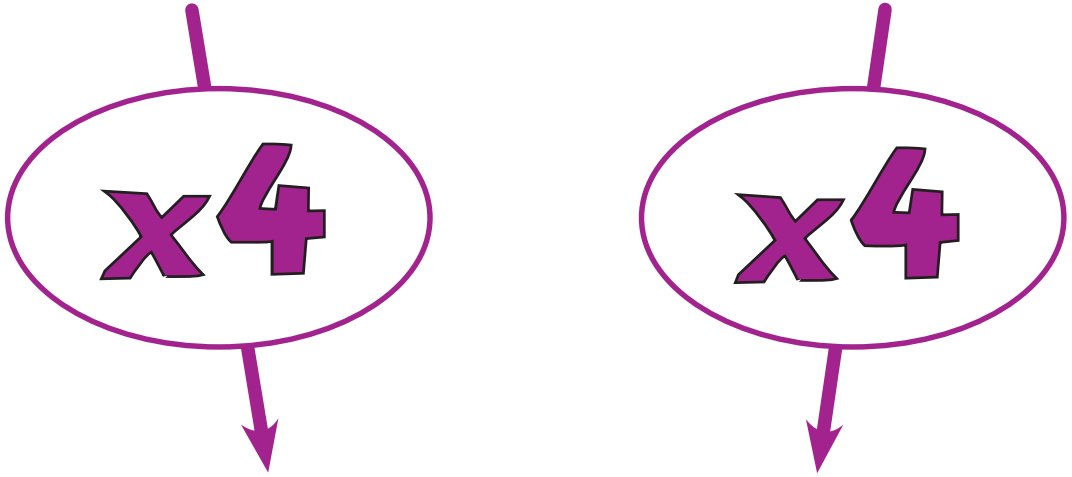
$$93 \div 3 = 31$$

MD1f: Manipulate Calculation

6

Small Quotient

$$6.25 \div 0.25$$



$$25 \div 1 = 25$$

MD2: Divide by 100 then Double

4

$$800 \div 50 = 16$$

$$800 \div 100 = 8$$

$$8 \times 2 = 16$$

MD2a: Divide by 100 then Double twice

5

800 ÷ 25 = 32

800 ÷ 100 = 8

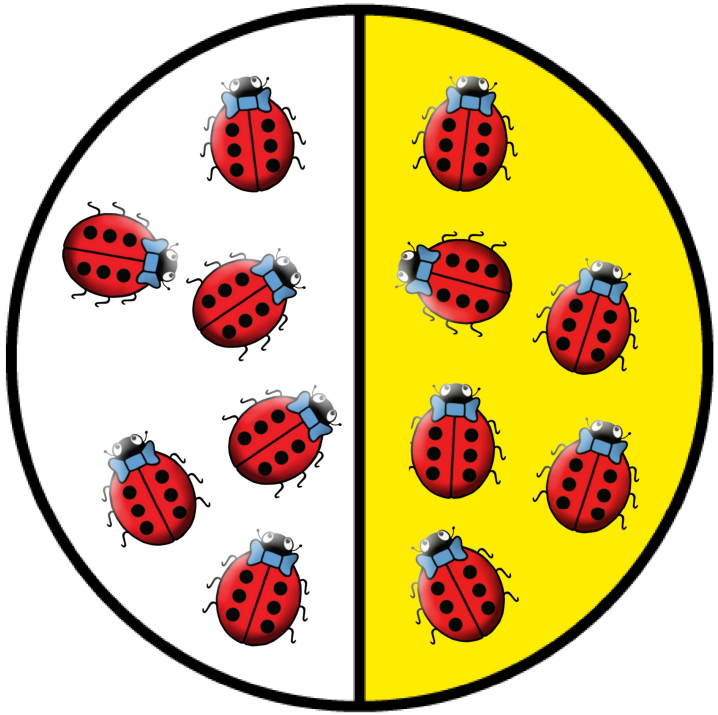
8 x 2 = 16

16 x 2 = 32

MD3: Halving

1

Half of 12 is equivalent to 12÷2

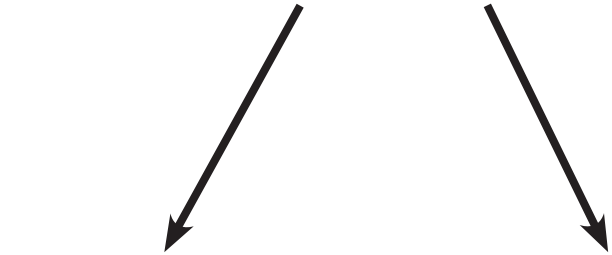


$\frac{1}{2}$ of 12 = 12÷2

MD3a: Halving

2

Half of (20) 26



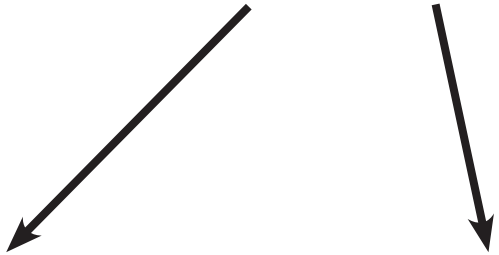
10 + 3 = 13

MD3b: Halving

3

(50)

Half of 58



25 + 4 = 29

MD3c: Halving

4

Half of 92

(80 + 12)

40 + 6 = 46

Half of 92

45 + 1 = 46

MD3d: Halving

5

Half of 326

(32 tens)

160 + 3 = 163

Half of 326

150 + 10 + 3 = 163

MD3e: Halving

6

Half of 5.84

2.5 + 0.4 + 0.02

= 2.92

MD3f: Halving

6

Half of 34.72 = 17.36

15 + 2 + 0.35 + 0.01

(2 tens + 14 ones + 6 tenths + 12 hundredths)

Half of 34.72

10 + 7 + 0.3 + 0.06

MD4: Halve & Halve Again

3

84 ÷ 4 = 21

Half of 84 = 42 (84 ÷ 2)

Half of 42 = 21 (84 ÷ 4)

MD4a: Halve & Halve Again

(finding a quarter)

$$128 \div 4 = 32$$

Half of 128 = 64 (128 ÷ 2)

Half of 64 = 32 (128 ÷ 4)

MD4b: Halve, Halve, Halve

5

(finding an eighth)

360 ÷ 8 = 45

Half of 360 = 180 (360 ÷ 2)

Half of 180 = 90 (360 ÷ 4)

Half of 90 = 45 (360 ÷ 8)

MD4c: Halve, Halve, Halve

6

5000 ÷ 8 = 625

Half of 5000 = 2500 (5000 ÷ 2)

Half of 2500 = 1250 (5000 ÷ 4)

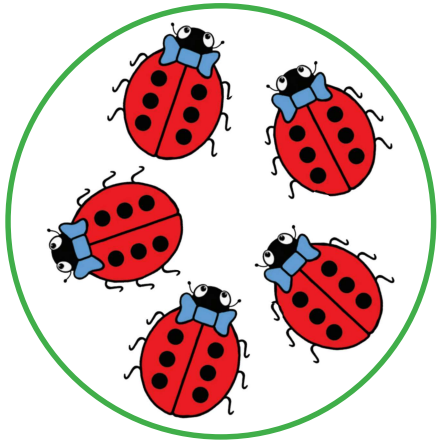
Half of 1250 = 625 (5000 ÷ 8)

MD5: Division as a Fraction

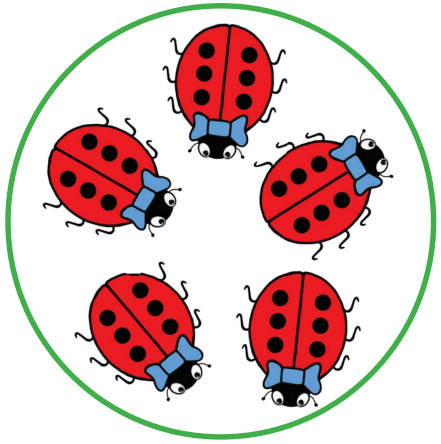
3

Sharing Model

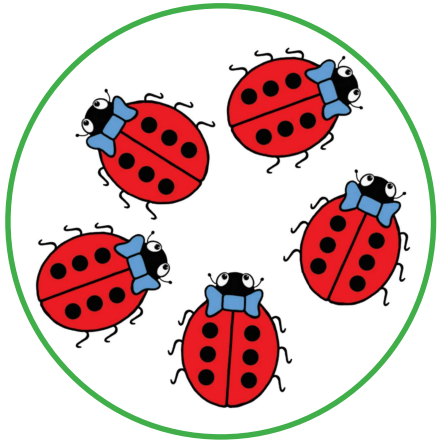
$$\frac{1}{4} \text{ of } 20 = 20 \div 4 = 5$$



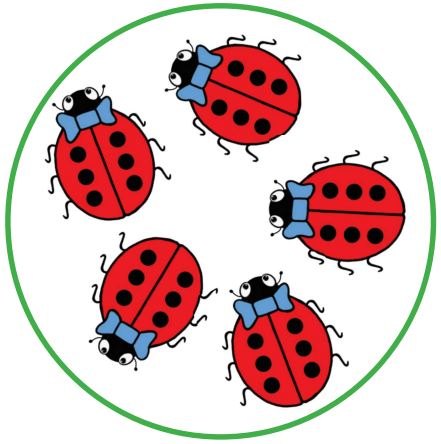
$\frac{1}{4}$



$\frac{1}{4}$



$\frac{1}{4}$



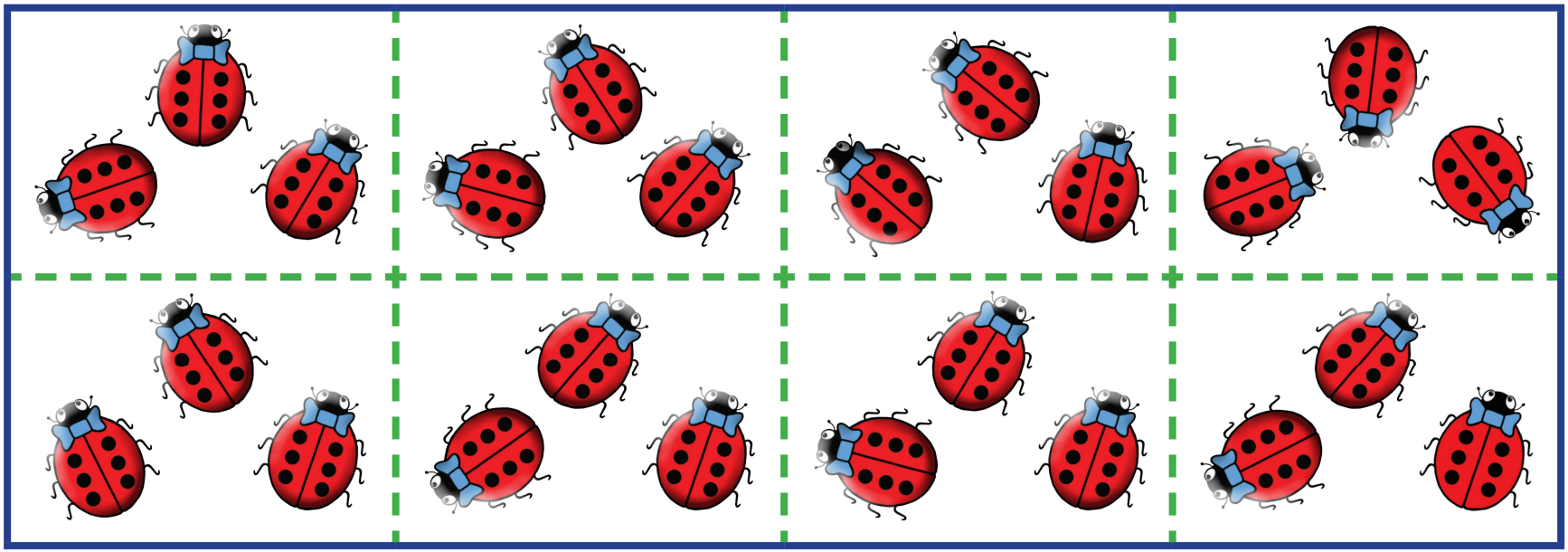
$\frac{1}{4}$

MD5a: Division as a Fraction

4

Sharing Model

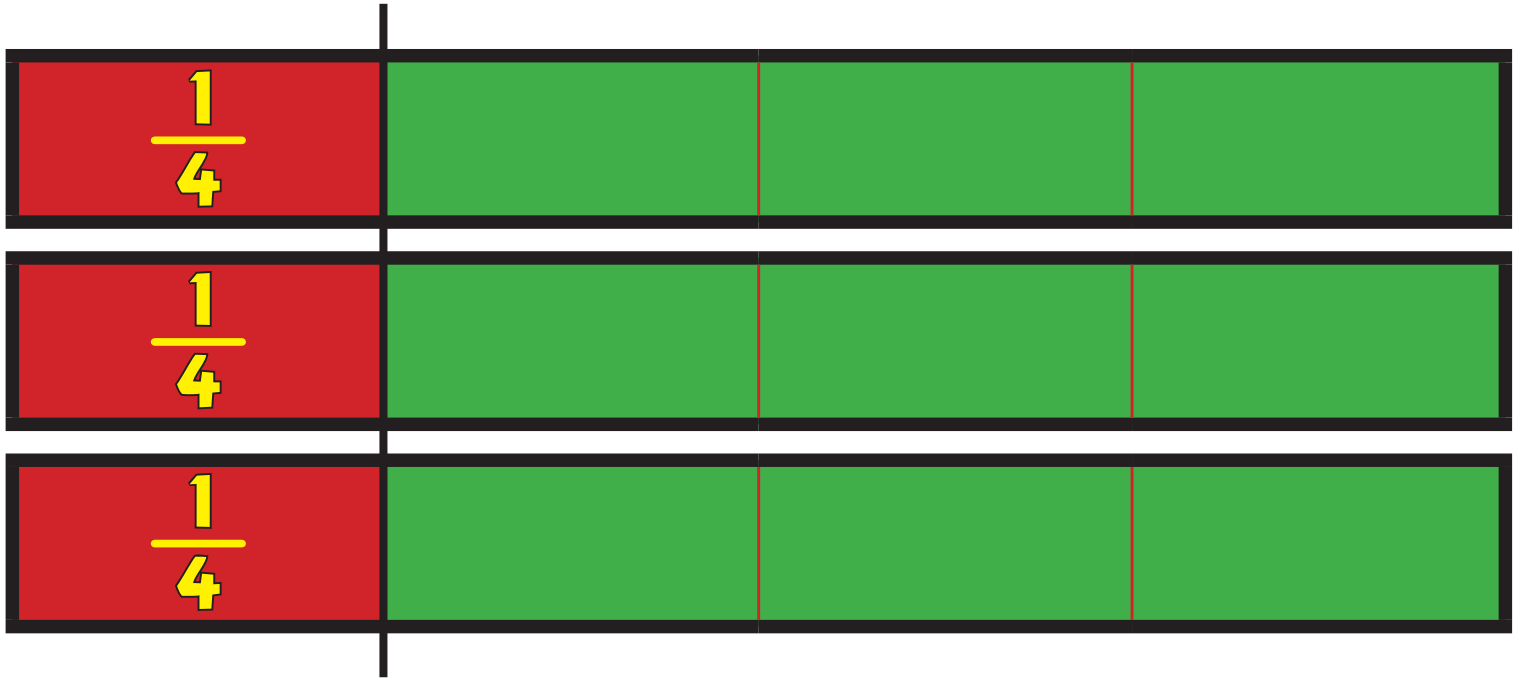
$\frac{1}{8}$ of 24 = 24 ÷ 8 = 3



MD5b: Division as a Fraction

4

$$\frac{1}{4} \text{ of } 3 = 3 \div 4 = \frac{3}{4}$$

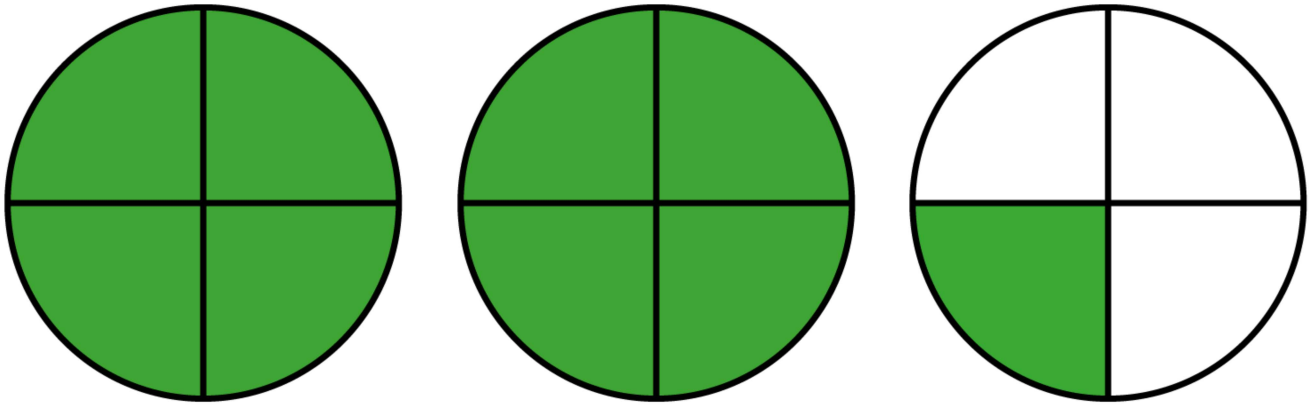


MD5c: Division as a Fraction

5

Mixed Number Model

$\frac{1}{4}$ of 9 = 9 ÷ 4 = $\frac{9}{4}$ = $2\frac{1}{4}$



(9 quarters = 2 and a quarter)

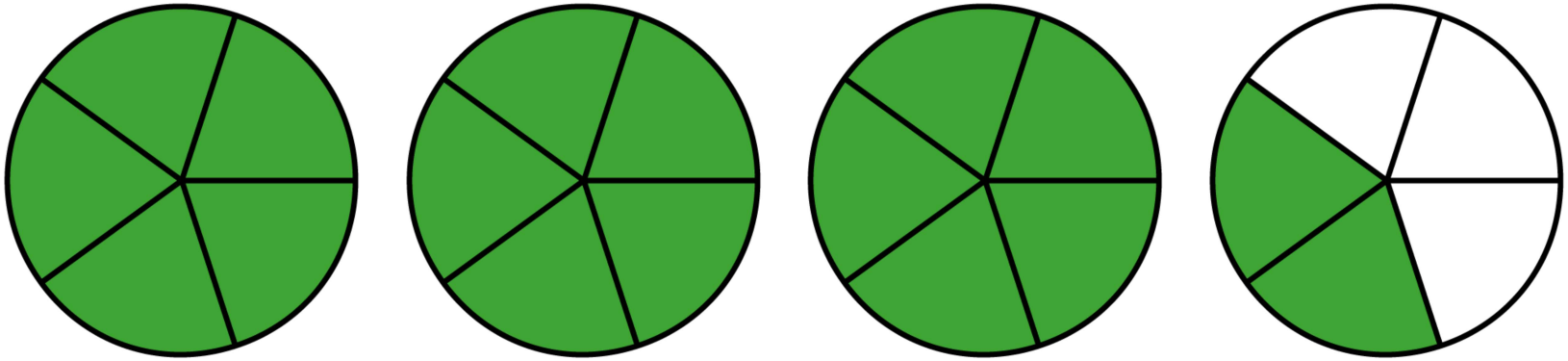
MD5d: Division as a Fraction

5

Mixed Number Model

$\frac{1}{5}$ of 17 = 17 ÷ 5 = $\frac{17}{5}$ = $3\frac{2}{5}$

(3.4)



(17 fifths = 3 wholes and 2 fifths)

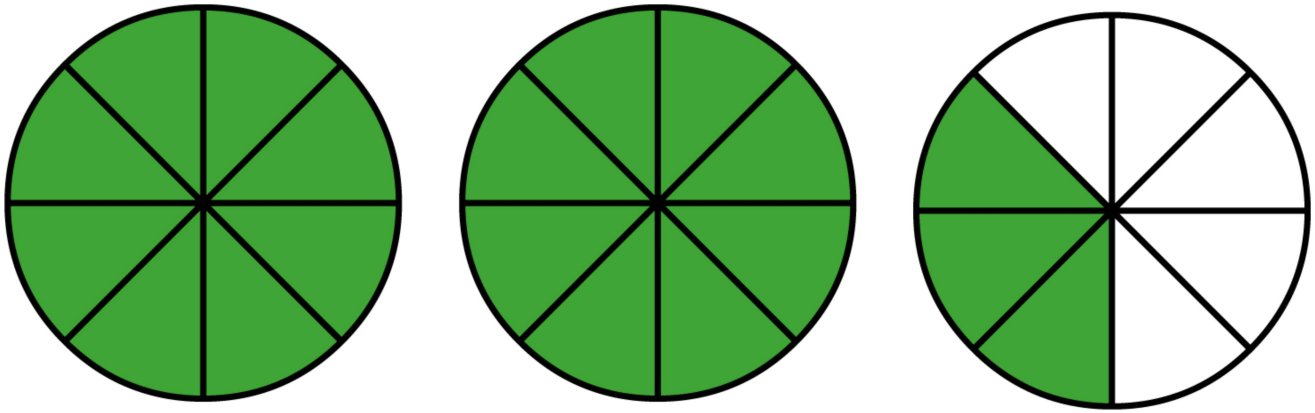
MD5e: Division as a Fraction

6

Mixed Number Model

$$\frac{1}{8} \text{ of } 19 = 19 \div 8 = \frac{19}{8} = 2\frac{3}{8}$$

(2.375)



(19 eighths = 2 and 3 eighths)

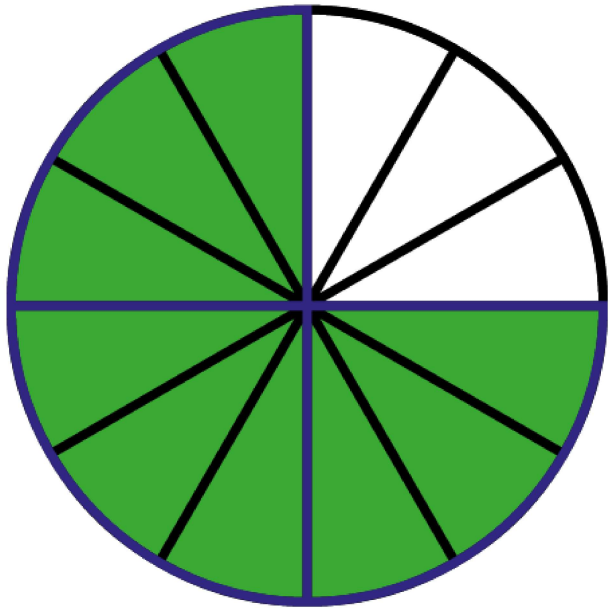
MD5f: Division as a Fraction

6

Mixed Number Model

$$\frac{1}{12} \text{ of } 9 = 9 \div 12 = \frac{9}{12} = \frac{3}{4}$$

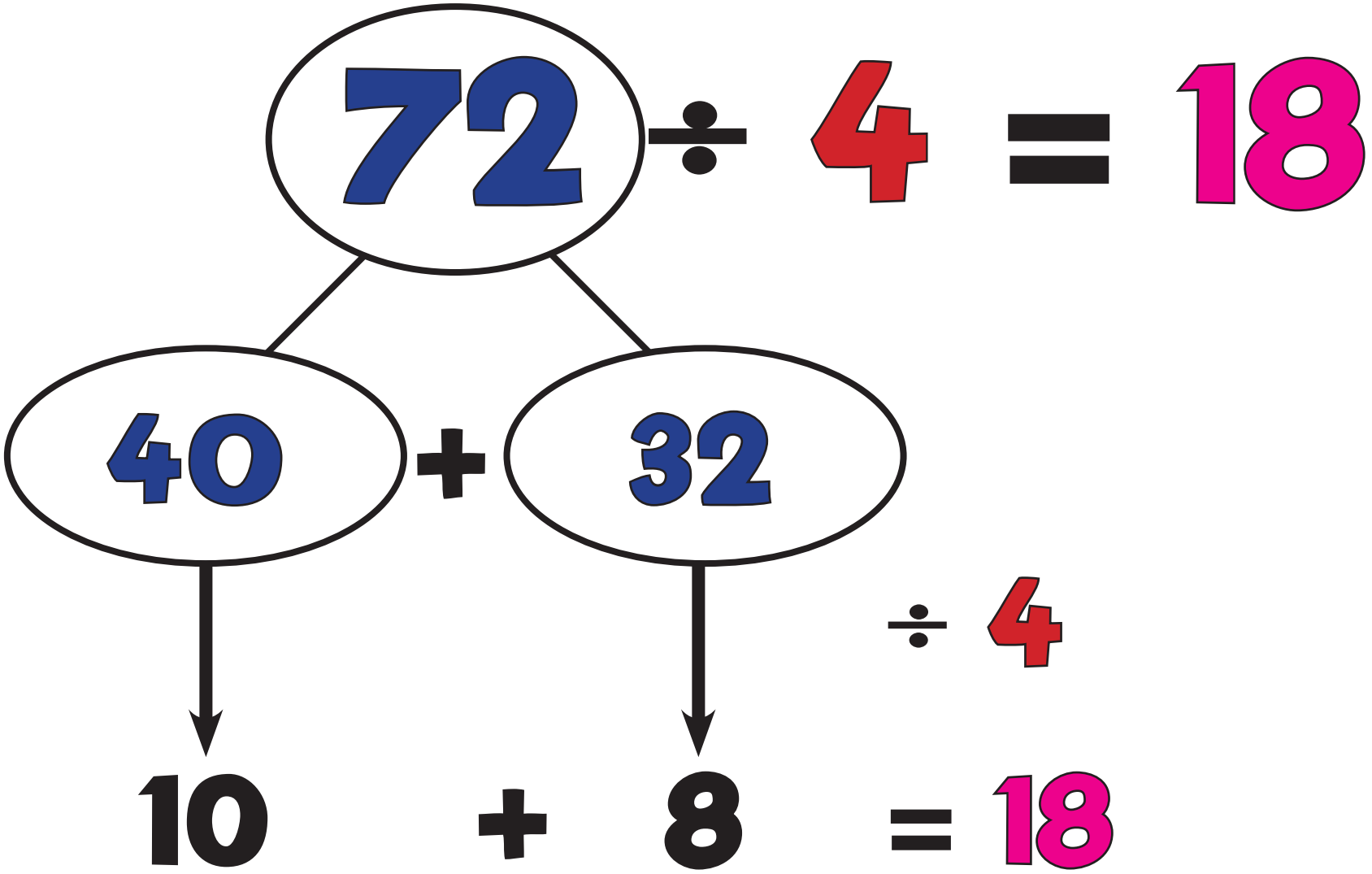
(0.75)



(9 twelfths = 3 quarters)

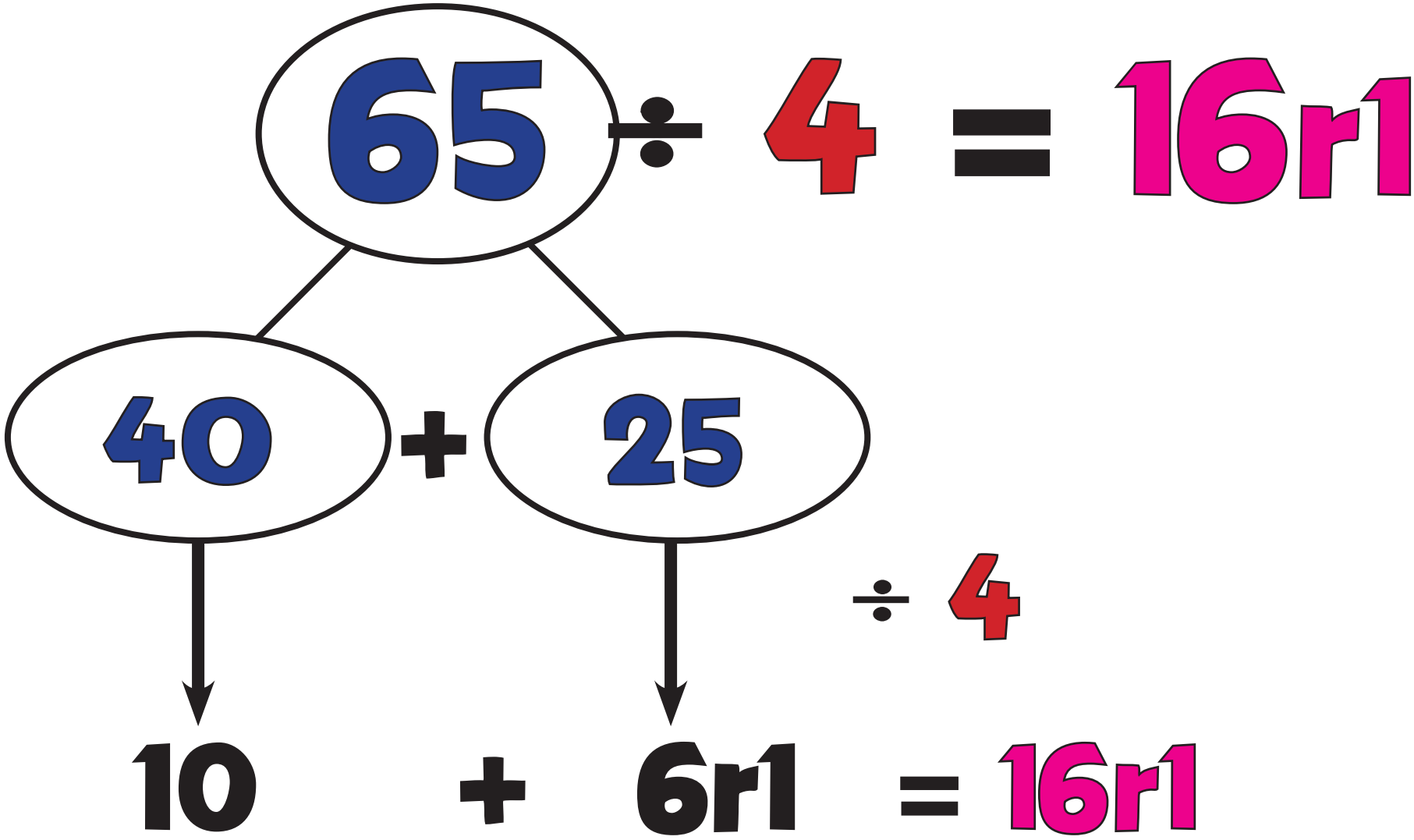
MD6: Find the Hunk!

4



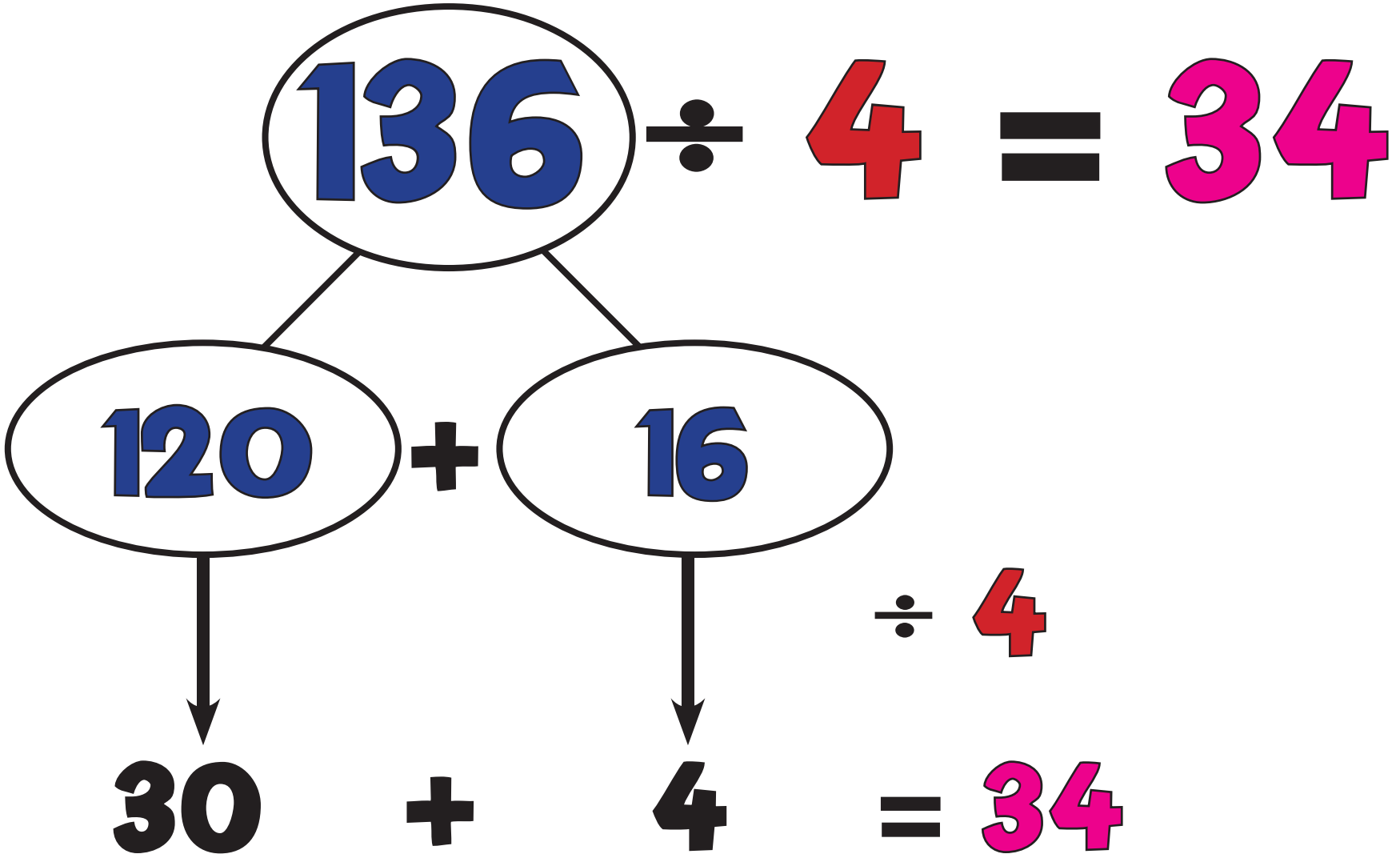
MD6a: Find the Hunk!

4



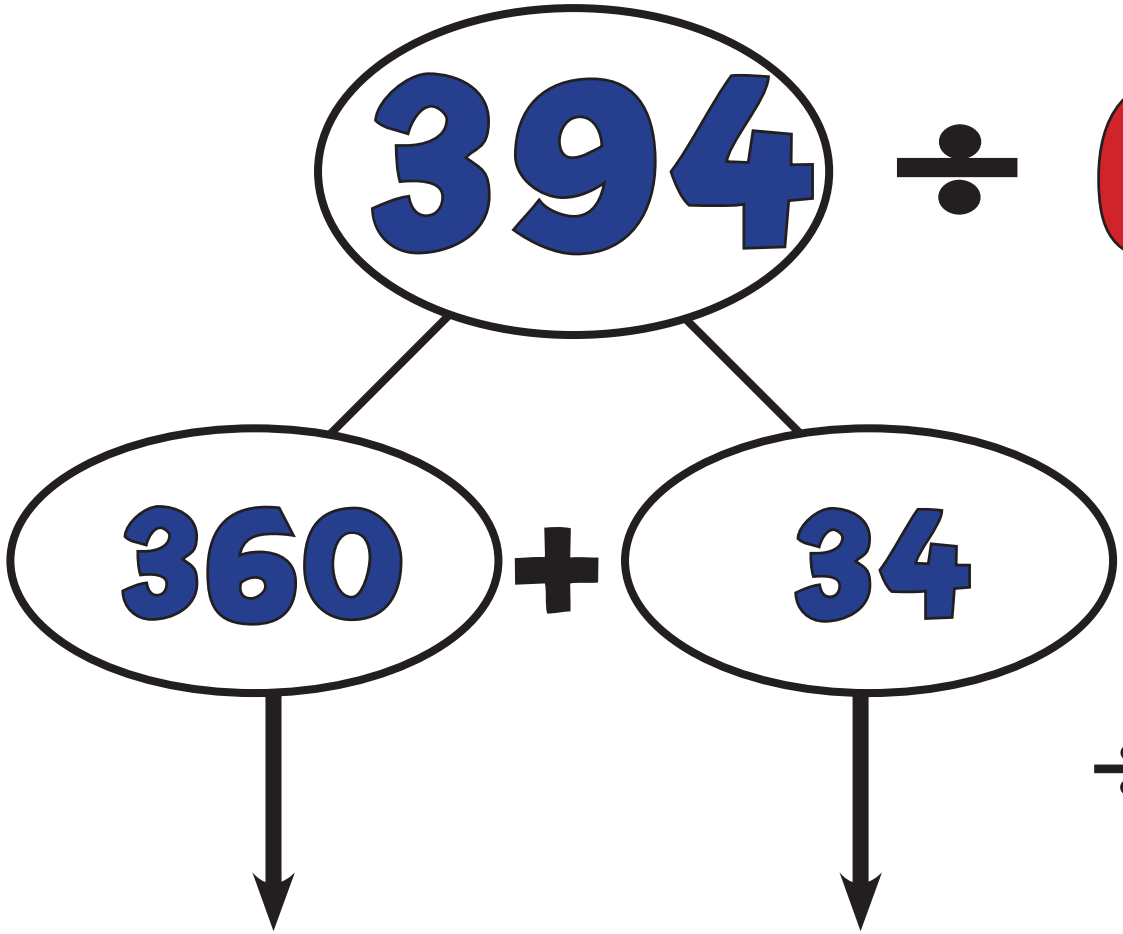
MD6b: Find the Hunk!

5



MD6c: Find the Hunk!

5



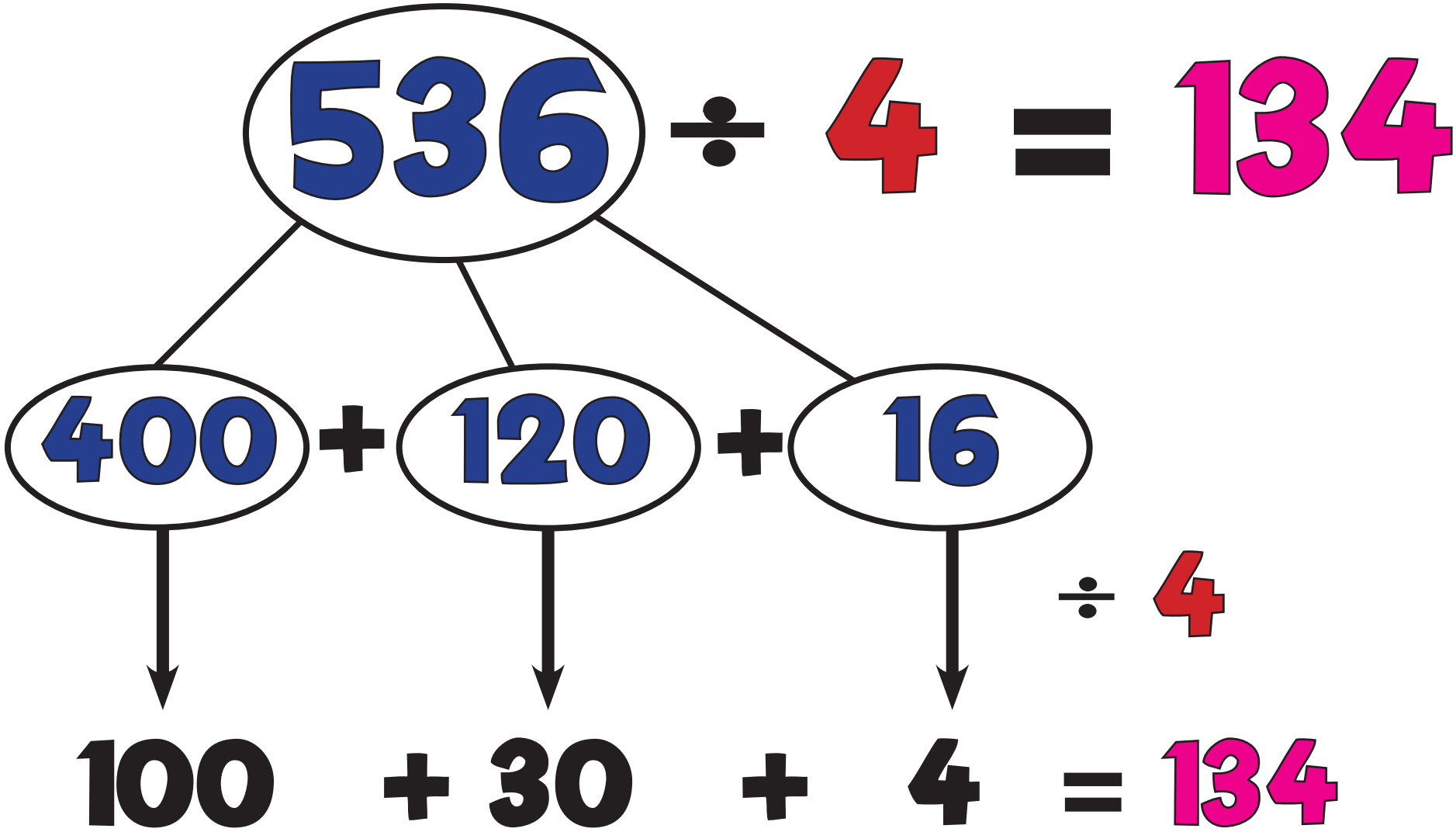
394 ÷ 6 = 65r4

÷ 6

60 + 5r4 = 65r4

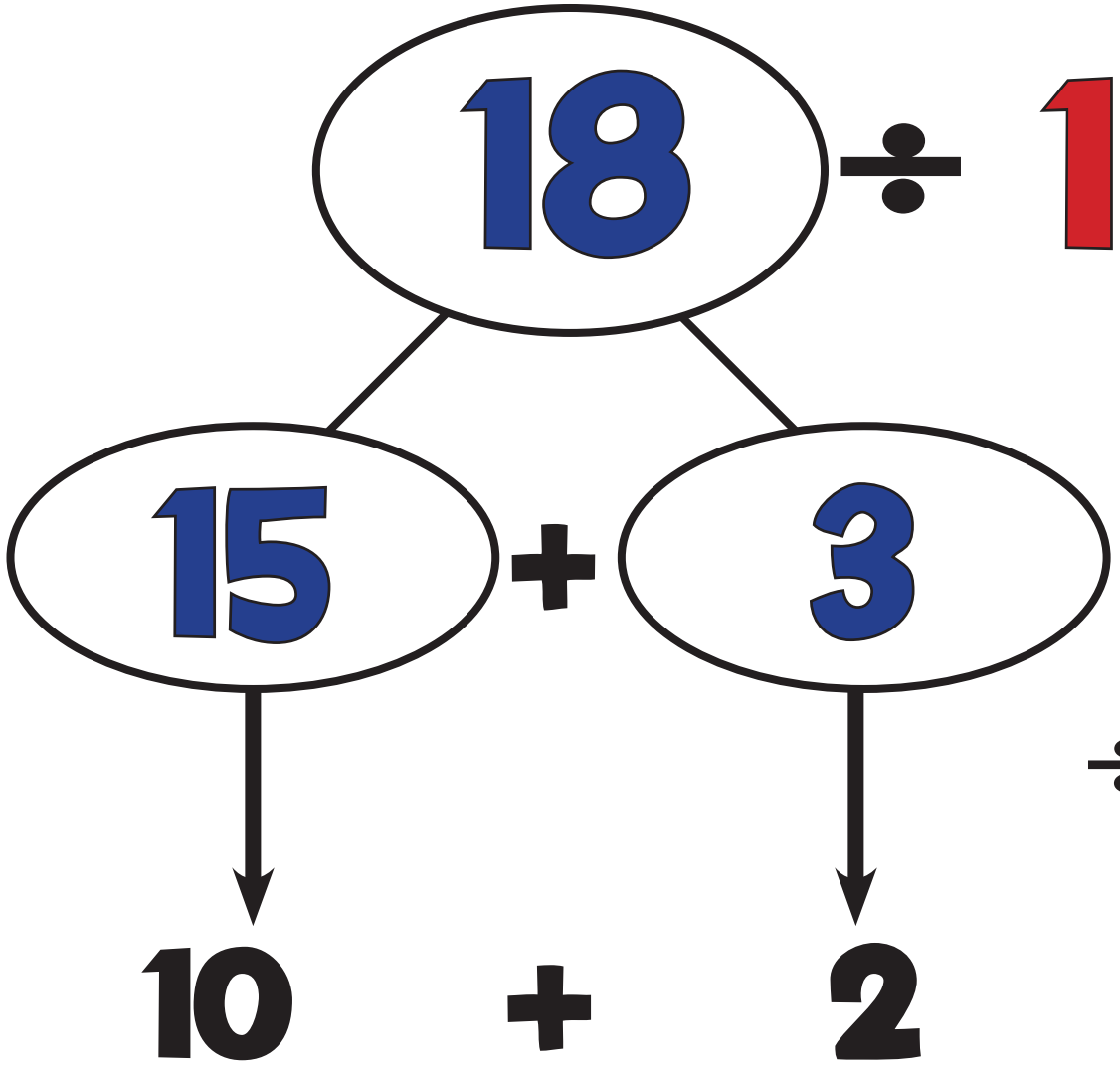
MD6d: Find the Hunk!

5/6



MD6e: Find the Hunk!

6



18 ÷ 1.5 = 12

÷ 1.5

= 12

MD7: Jump (÷10)

2

10	1
80	
	8

÷10

MD7a: Jump (÷10)

3

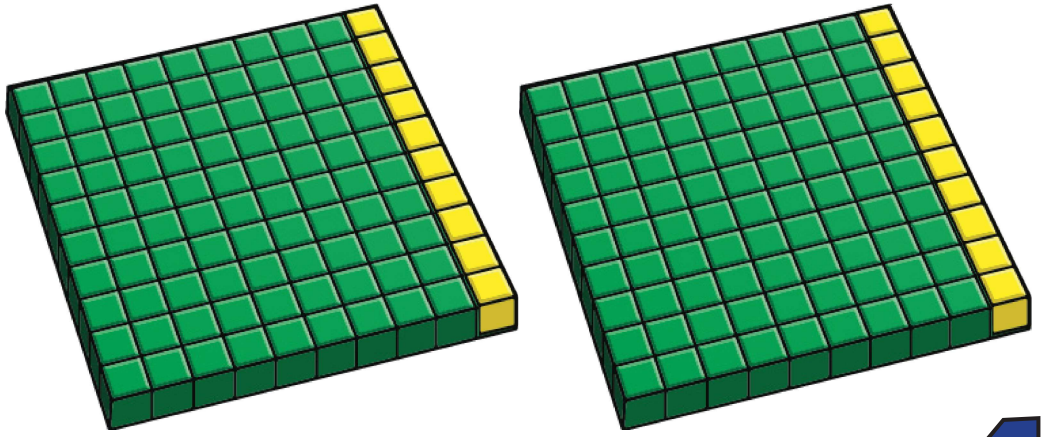
100	10	1
360		
	36	

÷10

MD7a: Jump (÷10)

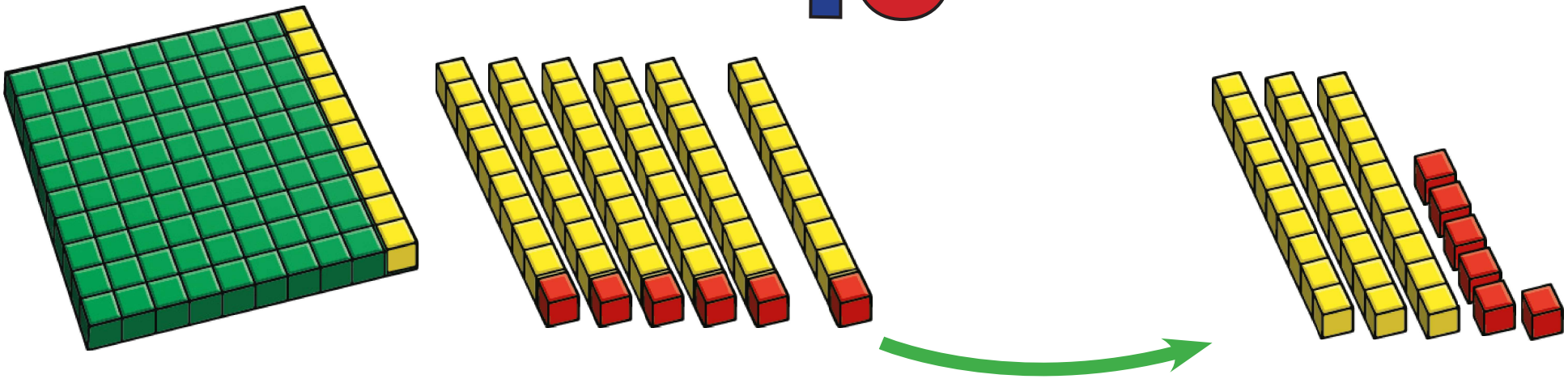
3/4 (Pictorial)

100	10	1
3	6	0



÷10

100	10	1
	3	6



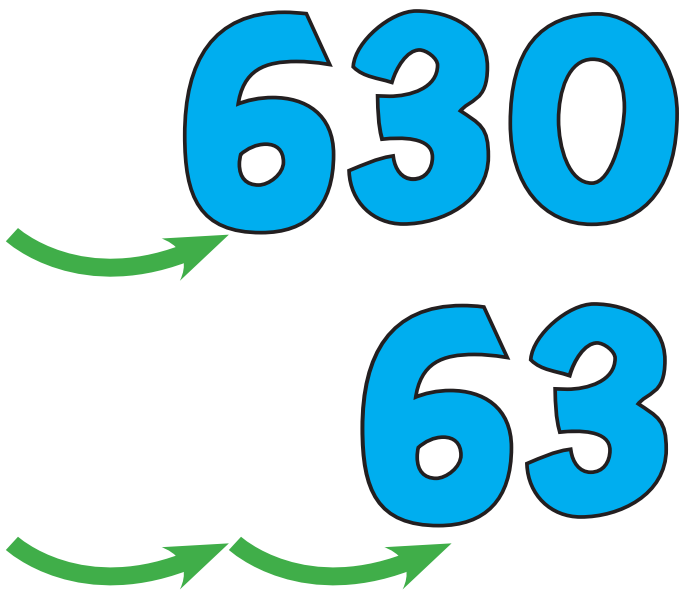
MD7b: Jump (÷10/100)

4/5

1000	100	10	1
	6	3	0

÷10

÷100



MD7c: Jump (÷10/100/1000)

5/6

100	10	1	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
	6	3	.	4		

÷10 → 63.4

÷100 → 6.34

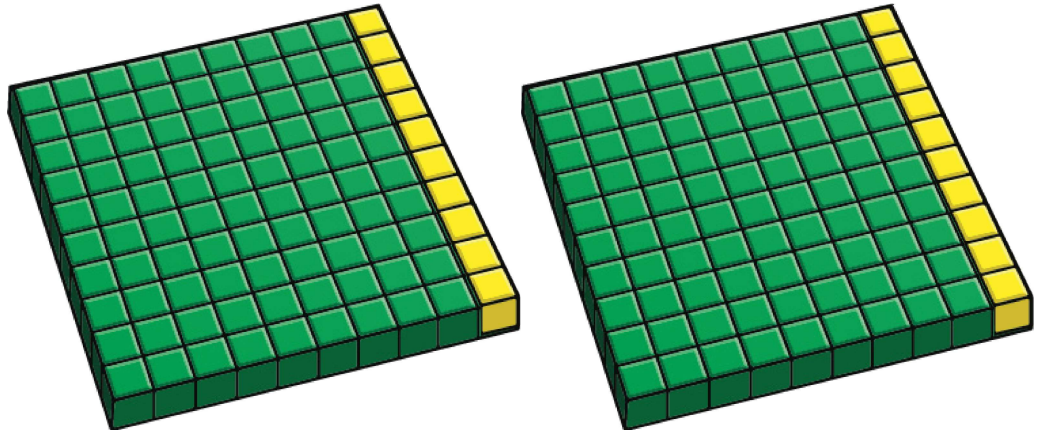
÷1000 → 0.634

MD10b: Jump! (x10)

3/4 (Pictorial)

100	10	1
	3	6

360



x10