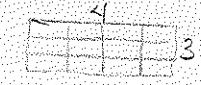
Multiplication and Division

Factors looks like: $4 \times 3 = 12$ ← product; $4 \cdot 3 = 12$; $4(3) = 12$

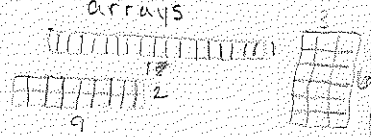
4 times 3 equals 12



Factors a number multiplied by another number to find a product

rainbows: 18: 1 2 3 6 9 18

arrays



Multiples – a product of two factors

looks like

2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72

common multiples of 2 and 6 are 6, 12, 18, 24 ...

Finding an unknown (not unknown)

1 has 4 times as many pencils as 2. They have 20 pencils total. How many pencils does 1 have? 2 has ___ pencils.

$20 = n \times 5$ (variable)

$n = 4$

Multiplying by powers of 10

$2 \times 3 = 6$

$2 \times 30 = 60$

$2 \times 300 = 600$

$8 = 4 \times 2$

$80 = 40 \times 2$

$800 = 400 \times 2$

$4 \times 2 = 8$

4 tens $\times$ 2 = 8 tens

Prime: has only 2 factors 1 and itself

② – 2×1

③ – 3×1

⑤ – 5×1

⑦ – 7×1

Composite: number that has more than 2 factors

④ – 4×1, 2×2

⑥ 2×3, 6×1

⑫ 1×12, 2×6, 3×4

Distributive Property

$6 \times 12 \rightarrow 12 = 10 + 2$

$6 \times (10 + 2)$

$(6 \times 10) + (6 \times 2)$

$60 + 12 = 72$

6	10	+	2
	6 × 10 = 60		6 × 2 = 12

30	+	6
90		4
30 × 90 = 2,700		30 × 4 = 120
6 × 90 = 540		6 × 4 = 24

2,700 + 540 + 120 + 24 = 3,384

30 + 6 × 90 + 4

Partial products

6×182

182×6

6×2 — 12

6×80 — 480

6×100 — 600

1,092

25×15

200 — 10 × 2 tens = 20 tens

50 — 10 × 5 ones = 50 ones

100 — 5 × 2 tens = 10 tens

25 — 5 × 5 ones = 25 ones

375

dividend: $12 \div 3 = 4$ ← quotient; ↑ divisor

12 divided by 3 equals 4

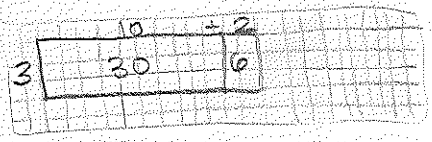
remainders

$4 \overline{)15}$ R 3

___ wants to divide 15 pieces of candy between 4 friends

Distributive property for division

$36 \div 3 = 12$



Partial Quotients

$330 \div 3 = 110$

3 | 330

100 + 10 = 110

3 | 300 | 30

expanded form:

$5 \times 143 \rightarrow 100 + 40 + 3$

$5 \times (100 + 40 + 3)$

$5 \times 100 + 5 \times 40 + 5 \times 3$

$500 + 200 + 15 = 715$

138

7 | 966

100 + 30 + 8

966	266	56
−700	−210	−56
266	56	0

100 + 30 + 8 = 138

What we know about multiplication and division

Inquiry

What we want to learn about multiplication and division

- We will look for and make use of structure to multiply numbers with 1 digit x 4 digits and 2 digits by 2 digits.
- We will find quotients with up to four-digit dividends and one-digit divisors by modeling with mathematics.