

DIFFERENTIATION

Multiply and Divide by 2

Multiplication and Division 10 Patterns and Algebra 18

Based on your Professional Teacher Judgment and Pre-assessment data, Levels with **1** may be included in the first lesson; Based on embedded assessment data, Levels with **2** **3** may be included in these lessons. The anchor charts for this concept may look like these on a 'Wall that Teaches' over a few lessons.

MD 1, 2 Divide in 2 ways – into 'groups of 2' and '2 equal groups'

Groups of 2 2 equal groups

MD 5 Divide into equal rows (array) describe using 2 division and 2 multiplication number sentences

12 ÷ 6 = 2
12 ÷ 2 = 6
2 × 6 = 12
6 × 2 = 12

MD 7, 8 Divide in 4 ways – into 'groups of 2' and '2 equal groups'

Groups of 2 2 equal groups

8 ÷ 2 = 4 8 ÷ 2 = 4

MD 10 Multiply by 2 Distributive property

MD 10 PA 17 Divide by 2 Related to halving

2 × 7 = 14
5 + 2
2 × 5 = 10
2 × 2 = 4
10 + 4 = 14

5 ÷ 2 = 7 r1
10 ÷ 5
4 + 1
10 ÷ 2 = 5
4 ÷ 2 = 2
5 + 2 = 7

$\frac{1}{2}$ of 15 = 7 r1
10 + 5
4 + 1
 $\frac{1}{2}$ of 10 = 5
 $\frac{1}{2}$ of 4 = 2

MD 11 Multiply by 4 Distributive property

4 × 7 = 28
5 + 2
4 × 5 = 20
4 × 2 = 8
20 + 8 = 28

MD 10 Divide by 4 Related to quartering

37 ÷ 4 = 9r1
20 + 17
16 + 1
20 ÷ 4 = 5
16 ÷ 4 = 4
5 + 4 = 9

$\frac{1}{4}$ of 37 = 9r1
 $\frac{1}{4}$ of 20 = 5
 $\frac{1}{4}$ of 16 = 4

MD 12 Multiply by 3 Distributive property

3 × 7 = 21
5 + 2
3 × 5 = 15
3 × 2 = 6
15 + 6 = 21

MD 12 Divide by 3 Related to thirding

16 ÷ 3 = 5 r1
9 + 7
6 + 1
9 ÷ 3 = 3
6 ÷ 3 = 2
3 + 2 = 5

$\frac{1}{3}$ of 16 = 5 r1
 $\frac{1}{3}$ of 9 = 3
 $\frac{1}{3}$ of 6 = 2

MD 13 Multiply by 5 Distributive property

5 × 7 = 35
5 + 2
5 × 5 = 25
5 × 2 = 10
25 + 10 = 35

MD 13 Divide by 5 Related to fifthing

37 ÷ 5 = 7r2
20 + 17
15 + 2
20 ÷ 5 = 4
15 ÷ 5 = 3
4 + 3 = 7

$\frac{1}{5}$ of 37 = 7r2
 $\frac{1}{5}$ of 20 = 4
 $\frac{1}{5}$ of 15 = 3
4 + 3 = 7

MD 14 Multiply by 9 Distributive property

9 × 7 = 63
5 + 2
9 × 5 = 45
9 × 2 = 18
45 + 18 = 63

MD 14 Divide by 9 Related to ninthing

71 ÷ 9 = 7r8
27 + 44
36 + 8
27 ÷ 9 = 3
36 ÷ 9 = 4
3 + 4 = 7

$\frac{1}{9}$ of 71 = 7r8
 $\frac{1}{9}$ of 27 = 3
 $\frac{1}{9}$ of 36 = 4

MD 15 Multiply by 6 Distributive property

6 × 7 = 42
5 + 2
6 × 5 = 30
6 × 2 = 12
30 + 12 = 42

MD 15 Divide by 6 Related to sixthing

23 ÷ 6 = 3r5
12 + 11
6 + 5
12 ÷ 6 = 2
6 ÷ 6 = 1
2 + 1 = 3

$\frac{1}{6}$ of 23 = 3r5
 $\frac{1}{6}$ of 12 = 2
 $\frac{1}{6}$ of 6 = 1

MD 17 Multiply by 7 Distributive property

7 × 6 = 42
5 + 1
7 × 5 = 35
7 × 1 = 7
35 + 7 = 42

MD 17 Divide by 7 Related to seventhing

37 ÷ 7 = 5r2
21 + 16
14 + 2
21 ÷ 7 = 3
14 ÷ 7 = 2
3 + 2 = 5

$\frac{1}{7}$ of 37 = 5r2
 $\frac{1}{7}$ of 21 = 3
 $\frac{1}{7}$ of 14 = 2

MD 20 Highest Common Factor

12 15
Factors of 12 = 1, 2, 3, 4, 6, 12
Factors of 15 = 1, 3, 5, 15
Common factors of 12 and 15 = 1, 3
Highest common factor of 12 and 15 = 3

MD 21 Simplifying Multiplication and Division Using Factors

144 ÷ 8 = 72 ÷ 4 = 36 ÷ 2 = 18
16 × 4 = 32 × 2

MD 22 Divisibility Tests

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- Divisible by 2 because it's even
- Not divisible by 4 because it has an odd tens digit and the ones digit is not 2 or 6
- Not divisible by 8 because it has an odd number of hundreds and the two-digit number is not 4 less and 4 more than a two-digit number that is divisible by 8
- Not divisible by 5 because the ones digit is not 5 or 0
- Not divisible by 10 because the ones digit is not 0
- Not divisible by 3 because – because each place value is one more than a multiple of 3, so the remainders are the digits. The digits do not add up to a multiple of 3.
- Not divisible by 9 because – because each place value is one more than a multiple of 9, so the remainders are the digits. The digits do not add up to a multiple of 9.
- Not divisible by 6 because it is not divisible by both 2 and 3

MD 23 FD 21 Divide by single-digit numbers, dividing remainders to create fractions

77 ÷ 6 = 12 $\frac{5}{6}$
60 + 17
12 + 5
60 ÷ 6 = 10
12 ÷ 6 = 2
5 ÷ 6 = $\frac{5}{6}$
10 + 2 + $\frac{5}{6}$ = 12 $\frac{5}{6}$

$\frac{1}{6}$ of 77 = 12 $\frac{5}{6}$
 $\frac{1}{6}$ of 60 = 10
 $\frac{1}{6}$ of 12 = 2
 $\frac{1}{6}$ of 5 = $\frac{5}{6}$

MD 24 Multiply two-digit numbers Distributive property

93 × 74 = 6882

90	30
6300	360
210	12

90 × 70 = 9 × 10 × 7 × 10 = 63 × 100 = 6300
90 × 4 = 9 × 10 × 4 = 36 × 10 = 360
3 × 70 = 7 × 10 × 3 = 70 × 3 = 210
3 × 4 = 12
6300 + 360 + 210 + 12 = 6882

MD 25 Multiply decimals by whole numbers and powers of 10

9.3 × 74 = 688.2

9	30	36
0.3	21	1.2

630 + 36 + 21 + 1.2 = 688.2

9 × 70 = 9 × 7 × 10 = 63 × 10 = 630
0.3 × 70 = 0.3 × 10 × 7 = 3 × 7 = 21
0.3 × 4 = $\frac{3}{10}$ × 4 = $\frac{12}{10}$ = 1.2

MD 25 Divide decimals by whole numbers and powers of 10

35.7 ÷ 4 = 8.925

32 + 3.7
3.6 + 0.1

Change the decimal to a fraction, divide.

32 ÷ 4 = 8
3.6 ÷ 4 = 0.9

Multiply the decimal by 10, divide, then divide the product by 10.

0.1 ÷ 4 = $\frac{1}{4}$ × 0.1 = $\frac{1}{4}$ × $\frac{1}{10}$ = $\frac{1}{40}$ = 0.025
 $\frac{1}{10} \div 4 = \frac{1}{4} \times \frac{1}{10} = \frac{1}{40} = 0.025$
 $\frac{10}{100} \div 4 = \frac{1}{4} \times \frac{10}{100} = \frac{10}{400} = \frac{1}{40} = 0.025$
 $\frac{100}{1000} \div 4 = \frac{25}{1000} = \frac{1}{4} \times \frac{100}{1000} = \frac{25}{1000} = 0.025$

8 + 0.9 + 0.025 = 8.925

MD 26 FD 27 Division is multiplication by a fraction

$\frac{1}{4}$ of 56 = 14 $\frac{1}{4}$ × 56 = 14

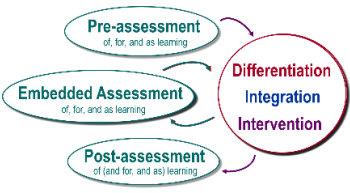
When we divide by 4, we are making the number a quarter times as big. When we divide by 4, we are multiplying by a quarter. We are multiplying by a fraction when we divide.

56 ÷ 4 = 14 $\frac{1}{4}$ × 56 = 14

40 ÷ 4 = 10 $\frac{1}{4}$ × 40 = 10

16 ÷ 4 = 4 $\frac{1}{4}$ × 16 = 4

10 + 4 = 14



Embedded assessment data may tell us we need to re-explicitly teach some Levels.