Reasoning and Problem Solving
Step 4: Division Using Factors

National Curriculum Objectives:

Mathematics Year 6: (6C5) Identify common factors, common multiples and prime numbers
Mathematics Year 6: (6C8) Solve problems involving addition, subtraction, multiplication and division

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Explain if a given factor pair could be used to divide a 3-digit number by a 2-digit number where one of the factors is either 2, 3, 4, 5 or 10.
Expected Explain if a given factor pair could be used to divide numbers up to 4-digits by a 2-digit number using their knowledge of multiplication facts up to 12 x 12.
Greater Depth Explain if a given factor pair could be used to divide numbers up to 4-digits by a 2-digit number using knowledge of times table facts to 12 x 12 and beyond.

Questions 2, 5 and 8 (Problem Solving)
Developing Find the factor pair to complete the division of a 3-digit number by a 2-digit number where one of the factors is either 2, 3, 4, 5 or 10.
Expected Find the factor pair to complete the division of numbers up to 4-digits by a 2-digit number using their knowledge of multiplication facts up to 12 x 12.
Greater Depth Find the factor pair to complete the division of numbers up to 4-digits by a 2-digit number using their knowledge of times table facts to 12 x 12 and beyond.

Questions 3, 6 and 9 (Reasoning)
Developing Explain if the statements about factor pairs are true where one of the factors is either 2, 3, 4, 5 or 10.
Expected Explain if the statements about factor pairs are true using their knowledge of multiplication facts up to 12 x 12.
Greater Depth Explain if the statements about factor pairs are true using their knowledge of times table facts to 12 x 12 and beyond.

More Year 6 Four Operations resources.

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Division Using Factors

1a. Marco says,



I can use the factors 4 and 3 when dividing three hundred and sixty by forty.

Is he correct? Explain why.

D

R

Division Using Factors

1b. Sadia says,



I can use the factors 6 and 2 when dividing two hundred and forty by sixty.

Is she correct? Explain why.

D

R

2a. Use the number cards to complete the calculation below.

2	4	10	3

$180 \div 20$

$180 \div \square = 18$

then

$18 \div \square = 9$

D

PS

2b. Use the number cards to complete the calculation below.

5	4	10	2

$250 \div 50$

$250 \div \square = 25$

then

$25 \div \square = 5$

D

PS

3a. Are the statements below true? Prove it.

A. Fourteen has an odd number of factor pairs.

B. Only one factor pair can be used to solve $444 \div 22$.

C. Twelve has more factor pairs than twenty-four.

D

R

3b. Are the statements below true? Prove it.

A. Eighteen has an even number of factor pairs.

B. The factor pairs 2 and 10 or 4 and 5 could be used to solve $480 \div 20$.

C. Thirteen and fifteen have one factor pair.

D

R

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Division Using Factors

4a. Danny says,



I can use the factors 8 and 6 when dividing eight thousand, four hundred and forty-two by forty-two.

Is he correct? Explain why.

E R

Division Using Factors

4b. Charlotte says,



I can use the factors 9 and 6 when dividing two thousand, seven hundred and fifty-four by fifty-four.

Is she correct? Explain why.

E R

5a. Use the number cards to complete the calculation below.

6	7	6	9

1,800 ÷ 36

1,800 ÷ ☐ = 300

then

300 ÷ ☐ = 50

E PS

5b. Use the number cards to complete the calculation below.

8	4	6	7

3,600 ÷ 48

3,600 ÷ ☐ = 600

then

600 ÷ ☐ = 75

E PS

6a. Are the statements below true? Prove it.

A. Forty-eight has fewer factor pairs than 56.

B. Four factor pairs could be used to solve 5,400 ÷ 27.

C. Thirty-six has an even number of factors.

E R

6b. Are the statements below true? Prove it.

A. Forty-two has an odd number of factors.

B. The factor pairs 3 and 21 or 7 and 9 could be used to solve 3,150 ÷ 63.

C. Forty-nine and sixty-four have the same number of factors.

E R

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Division Using Factors

7a. Jordan says,



I can use the factors 7 and 12 when dividing three thousand, nine hundred and ninety-one by ninety-one.

Is he correct? Explain why.

GD R

8a. Use the number cards to complete the calculation below.

7	5	13	15

3,750 ÷ 75

3,750 ÷ ☐ = 750

then

750 ÷ ☐ = 50

GD PS

9a. Are the statements below true? Prove it.

A. Eighty-five has more factor pairs than seventy-eight.

B. Three factor pairs could be used to solve 8,640 ÷ 64.

C. Fifty-one has an odd number of factors.

GD R

Division Using Factors

7b. Kayleigh says,



I can use the factors 5 and 13 when dividing three thousand, nine hundred and seventy-eight by seventy-eight.

Is she correct? Explain why.

GD R

8b. Use the number cards to complete the calculation below.

14	8	6	13

1,680 ÷ 84

1,680 ÷ ☐ = 280

then

280 ÷ ☐ = 20

GD PS

9b. Are the statements below true? Prove it.

A. Thirty-four has an even number of factors.

B. Only one factor pair can be used to solve 1,360 ÷ 68.

C. Sixty-five has fewer factor pairs than ninety-five.

GD R

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Reasoning and Problem Solving
Division Using Factors

Developing

1a. Marco is not correct because 4 and 3 are a factor pair of 12. A factor pair of 40 is 4 and 10.

2a. 10 and 2

3a. A. False, fourteen has 2 factor pairs – 1 and 14, 2 and 7.
B. True, only 2 and 11 can be used to solve 444 ÷ 22.
C. False, twelve has 3 factor pairs – 1 and 12, 2 and 6, 3 and 4, twenty-four has 4 factor pairs – 1 and 24, 2 and 12, 3 and 8, 4 and 6.

Expected

4a. Danny is not correct because 8 and 6 are a factor pair of 48. A factor pair of 42 is 7 and 6.

5a. 6 and 6

6a. A. False, forty-eight has 5 factor pairs – 1 and 48, 2 and 24, 3 and 16, 4 and 12, 6 and 8, and fifty-six has 4 factor pairs – 1 and 56, 2 and 28, 4 and 14, 7 and 8.
B. False, one factor pair could be used to solve 5,400 ÷ 27 – 3 and 9.
C. False, thirty-six has 5 factors – 1, 2, 6, 18, 36.

Greater Depth

7a. Jordan is not correct because 7 and 12 are a factor pair of 84. A factor pair of 91 is 7 and 13.

8a. 5 and 15

9a. A. False, eighty-five has 2 factor pairs – 1 and 85, 5 and 17, and seventy-eight has 4 factor pairs – 1 and 78, 2 and 39, 3 and 26, 6 and 13.
B. True, the factor pairs 2 and 32, 4 and 16 or 8 and 8 can be used to solve 8,640 ÷ 64.
C. False, fifty-one has 4 factors – 1, 3, 17, 51.

Reasoning and Problem Solving
Division Using Factors

Developing

1b. Sadia is not correct because 8 and 2 are a factor pair of 16. A factor pair of 60 is 6 and 10.

2b. 10 and 5

3b. A. False, 18 has 3 factor pairs – 1 and 18, 2 and 9, 3 and 6.
B. True, 2 and 10 or 4 and 5 could be used to solve 480 ÷ 20.
C. False, thirteen has 1 factor pair – 1 and 13, but fifteen has 2 – 1 and 15, 3 and 5.

Expected

4b. Charlotte is correct because 9 x 6 = 54 so they are a factor pair.

5b. 6 and 8

6b. A. False, forty-two has 8 factors – 1, 2, 3, 6, 7, 14, 21, 42.
B. True, 3 and 21 or 7 and 9 could be used to solve 6,345 ÷ 63.
C. False, forty-nine has 3 factors (1, 7, 49) and sixty-four has 7 factors (1, 2, 4, 8, 16, 32, 64).

Greater Depth

7b. Kayleigh is not correct because 5 and 13 are a factor pair of 65. A factor pair of 78 is 6 and 13.

8b. 6 and 14

9b. A. True, 34 has 4 factors – 1, 2, 17, 34.
B. False, two factor pairs could be used to solve 7,004 ÷ 68 – 2 and 34 or 4 and 17.
C. False, they both have 2 factor pairs. 65 has the factor pairs 1 and 65 and 5 and 13. 95 has the factor pairs 1 and 95 and 5 and 19.

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