THIRD SPACE LEARNING

Multiplication and Division Diagnostic Quiz

Diagnose learning gaps with 25 multiple choice questions and answers

Multiplication and Division Diagnostic Quiz

Don't forget to tick your answer!

Please tick your answer to each question.
You can use the space on the right for your working out if you need it.

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1. Which number is the lowest common multiple of 4 and 12?

a) ☐ 24

b) ☐ 48

c) ☐ 4

d) ☐ 12

2. What is the highest common factor of 6 and 12?

a) ☐ 2

b) ☐ 6

c) ☐ 3

d) ☐ 12

3. Which number is prime?

a) ☐ 2

b) ☐ 1

c) ☐ 4

d) ☐ 9

4. 2, 2, 3, 3
This set of numbers are prime factors for _____

a) ☐ 10

b) ☐ 2

c) ☐ I don't know what prime factors are

d) ☐ 36

5. 3 475 x 6 =

a) ☐ 18 420

b) ☐ 18 244 230

c) ☐ 24 243

d) ☐ 20 850

6. Mentally divide 480 by 8

a) ☐ 6

b) ☐ 60

c) ☐ 37

d) ☐ 70

7. Joe earns £2 078 a month. How much does he earn in a year?

a) ☐ £24 801

b) ☐ £6 234

c) ☐ £24 936

d) ☐ £27 136

8. 24 x _____ = 624

a) ☐ 23

b) ☐ 6

c) ☐ 60

d) ☐ 26

9. Mentally work out 80 x 40

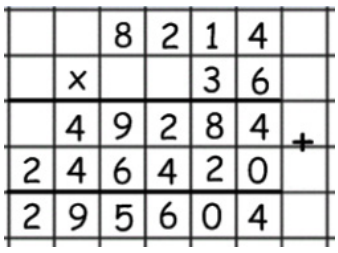
a) ☐ 3 200

b) ☐ 320

c) ☐ 2 400

d) ☐ 32 000

10. What is the mistake?



		8	2	1	4	
	x			3	6	
	4	9	2	8	4	+
2	4	6	4	2	0	
2	9	5	6	0	4	

a) ☐ There is no mistake - it is the correct answer

b) ☐ The place-holder has been forgotten

c) ☐ Forgot to carry into the hundreds column when adding up the tens

d) ☐ Made a mistake when multiplying by 6

11. Sydney collected 6 438 badges in half a year. If she collected the same number of badges each month, how many badges did she collect each month?

a) ☐ 1 073 badges

b) ☐ 38 628 badges

c) ☐ 1 931 badges

d) ☐ 3 219 badges

12. Which number is not a cubed number?

a) ☐ 25

b) ☐ 64

c) ☐ 8

d) ☐ 27

13. 9409 ÷ 4 =

a) ☐ 2 352.25

b) ☐ 2 352.1

c) ☐ 2 352 ¼

d) ☐ 2 352 r1

Don't forget to tick your answer!

14. Which equation does not express 4 x 360?

a) ☐ 4 x 6 x 6 10

b) ☐ 4 x 8 x 9 x 10

c) ☐ 4^2 x 9 x 10

d) ☐ 2^2 x 6^2 x 10

15. Shay picks 560 strawberries. This is 7 times the amount that Tiya picks. How many strawberries do they pick altogether?

a) ☐ 640 strawberries

b) ☐ 700 strawberries

c) ☐ 80 strawberries

d) ☐ 480 strawberries

16. Mentally do 120 x 0.3

a) ☐ 360

b) ☐ 0.36

c) ☐ 36

d) ☐ 3.6

17. Solve 7 + 3 x 4

a) ☐ 40

b) ☐ 19

c) ☐ 14

d) ☐ 84

18. Which number is a composite number (non-prime)?

a) ☐ 57

b) ☐ 19

c) ☐ 41

d) ☐ 1

19. Solve 30 - 9 ÷ 3

a) ☐ 1

b) ☐ 24

c) ☐ 7

d) ☐ 27

20. Solve 5 658 ÷ 23

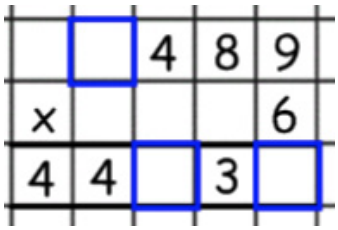
a) ☐ 2 463 r9

b) ☐ 202 r12

c) ☐ 246

d) ☐ I don't know how to work out this question

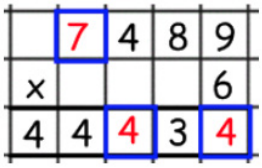
21. Fill in the missing digits to complete the equation



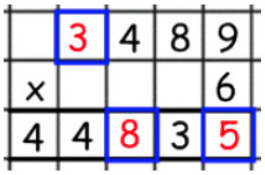
a) ☐

b) ☐

c) ☐



d) ☐



22. Which equation does not equal 9?

a) ☐ 1 + 2 x 3

b) ☐ 21 ÷ 7 x 3

c) ☐ 23 - 2 x 7

d) ☐ 34 - 5^2

Don't forget to tick your answer!

23. Dylan has some marbles in his bag. He says that when he groups all his marbles into groups of 3, he uses them all. The same happens when he groups them in 6s or in 9s. Which amount cannot be the number of marbles in Dylan's bag?

a) ☐ 36 marbles

b) ☐ 27 marbles

c) ☐ 18 marbles

d) ☐ 54 marbles

24. Spot the mistake

	1	6	4	1	r	4
5	8	7	0	9		

a) ☐ It is wrong because you need to start with the ones/units column

b) ☐ A mistake has been made with the carrying of numbers

c) ☐ A mistake has been made in the tens column

d) ☐ A mistake has been made in the hundreds column

25. A company orders 5 000 footballs from a factory. If the factory can make 1 436 footballs every hour, how many more footballs will still be needed after 3 hours?

a) ☐ 692 footballs

b) ☐ 4 308 footballs

c) ☐ 1 308 footballs

d) ☐ 1 702 footballs

Congratulations on finishing the quiz.
You've worked really hard to get this far. Well done!

Don't forget to tick your answer!

Multiplication and Division Diagnostic Quiz

1. Which number is the lowest common multiple of 4 and 12?
Checks understanding of 'lowest common multiple'

a) 24
This is a common multiple, but not the lowest

b) 48
Multiplied 4 and 12 together to find a common multiple, but this is not the lowest

c) 4
Pupil may be confused between common multiples and common factors

d) 12
Correct answer

2. What is the highest common factor of 6 and 12?
Checks understanding of 'highest common factor'

a) 2
Pupil may have an understanding of common factors but this is not the highest common factor

b) 6
Correct answer

c) 3
Pupil may have an understanding of common factors but this is not the highest common factor

d) 12
Pupil may be confused between lowest common multiple and common factors

3. Which number is prime?
Checks understanding of prime numbers

a) 2
Correct answer

b) 1
Misconception - the definition of a prime number is that it has only 2 factors - 1 and itself; since 1 only has one factor - it is not prime

c) 4
Pupil lacks understanding of what a prime number is

d) 9
Possible misconception - odd numbers are prime numbers

4. 2, 2, 3, 3. This set of numbers are prime factors for _____
Checks knowledge of prime factors

a) 10
Lacks understanding of prime factors - pupil has simply added all the numbers

b) 2
Lacks understanding of prime factors - pupil has simply found the difference between some of the numbers

c) I don't know what prime factors are
No knowledge of prime factors and how to derive them

d) 36
Correct answer

5. 3 475 x 6
Checks multiplication of a 4-digit number by a 1-digit number

a) 18 420
Pupil has forgotten to carry across columns

b) 18 244 230
Error in carrying digits, they have been written as part of the final answer

c) 24 243
Pupil has carried the wrong digit across to each column

d) 20 850
Correct answer

6. Mentally divide 480 by 8
Checks dividing numbers mentally drawing on known facts

a) 6
Pupil may have understood that 6 x 8 = 48, but may have place value misconception

b) 60
Correct answer

c) 37
Random answer - pupil lacks understanding of how to use the times table facts to help solve

d) 70
Pupil may have made a mistake with times table facts

7. Joe earns £2 078 a month. How much does he earn in a year?
Checks solving problems in context; multiplying a 4-digit number by a 2-digit number

a) £24 801
Misconception - pupil carrying the wrong digit to the next column

b) £6 234
Pupil forgets to put in the place holder when multiplying by 10

c) £24 936
Correct answer

d) £27 136
Misconception around multiplying by 0. Pupil thinks a x 0 = a

8. 24 x _____ = 624
Checks solving missing number problem by using the inverse operation

a) 23
Pupil may have used estimation to know that the answer would be 'twenty something' but may not be able to work it out

b) 6
Pupil has little understanding of the relationship between multiplication and division and has used '6' as is this the 'missing digit' in the answer when compared to 24

c) 60
Random answer - pupil has little or no understanding of the relationship between multiplication and division

d) 26
Correct answer

9. Mentally work out 80 x 40
Checks multiplication of 2-digit numbers using known multiplication facts

a) 3 200
Correct answer

b) 320
Pupil may have some understanding of using the fact 8 x 4 = 32; but error lies in place value

c) 2 400
Possible error with times table facts, i.e. 8 x 4 = 24

d) 32 000
Pupil may have some understanding of using the fact 8 x 4 = 32; but error lies in place value

10. What is the mistake?
Checks understanding of the algorithm for multiplication of a 4-digit by a 2-digit number

a) There is no mistake - it is the correct answer
There is no error until the addition part - ensure that the pupil checks all sections of the calculation

b) The place-holder has been forgotten
Pupil may not have clear understanding of when and why place-holders are necessary

c) Forgot to carry into the hundreds column when adding up the tens
Correct answer

d) Made a mistake when multiplying by 6
No mistakes were made when multiplying by 6 - check pupils times table knowledge

11. Sydney collected 6 438 badges in half a year. If she collected the same number of badges each month, how many badges did she collect each month?
Checks solving problems of 4-digit divide by a 1-digit number

a) 1 073 badges
Correct answer

b) 38 628 badges
Pupil has multiplied the two numbers - lacks understanding of the question

c) 1 931 badges
Pupil has done the division but has started the algorithm for the ones/units column instead of the thousands column

d) 3 219
Pupil has halved the number of badges using the keyword 'half' - check pupil understands what the question is asking for

12. Which number is not a cubed number?
Checks for understanding of cubed numbers

a) 25
Correct answer

b) 64
$4^3 = 64$

c) 8
$2^3 = 8$

d) 27
$3^3 = 27$

13. 9 409 ÷ 4
Checks understanding of representing the remainder in division in 3 ways

a) 2 352.25
Pupil lacks understanding that the algorithm can be extended into decimals

b) 2 352.1
Correct answer - if pupil fails to choose this one; then a common misconception would be that you simply place the remainder behind a decimal point

c) 2 352 ¼
Pupil does not understand that the remainder can be written as ¼ as this means the same as '1 divided by 4'

d) 2 352 r1
Pupil has incorrectly solved the division equation and has not found a remainder of 1

14. Which equation does not express 4 x 360?
Checks understanding of partitioning numbers and commutative and associative aspect of multiplication

a) 4 x 6 x 6 10
Pupil may not understand the associative law of multiplication and cannot see that 6 x 6 x 10 = 360

b) 4 x 8 x 9 x 10
Correct answer

c) 4^2 x 9 x 10
Pupil may not realise that 4^2 = 4 x 4 and that 36 has factors 4 x 9

d) 2^2 x 6^2 x 10
Pupil cannot relate this equation with equation a)

15. Shay picks 560 strawberries. This is 7 times the amount that Tiya picks. How many strawberries do they pick altogether?
Checks solving a problem in context involving simple rates, using a combination of operations

a) 640 strawberries
Correct answer

b) 700 strawberries
Random answer - but pupil may have some understanding of the number of strawberries increasing in to

c) 80 strawberries
Pupil has worked out correctly the number of strawberries Tiya picked, but failed to answer the questio

d) 480 strawberries
Pupil has worked out how many more strawberries Shay picked than Tiya - pupil needs to read the question more carefully

16. Mentally do 120 x 0.3

Checks understanding of multiplying by a decimal number and adjusting place value columns

a) 360

Pupil has multiplied by 3 and has not adjusted - pupil may lack the understanding that 0.3 = 3 ÷ 10

b) 0.36

Pupil may have worked out 36 and then put it after the decimal point - lack of place value understanding

c) 36

Correct answer

d) 3.6

Pupil has adjusted too much and has multiplied by 0.03 - not secure with place value knowledge

17. Solve 7 + 3 x 4

Checks understanding of the order of operations

a) 40

Pupil has not taken into account the order of operations and simply worked from left to right

b) 19

Correct answer

c) 14

Pupil has done 7 + 3 + 4; ensure pupil is reading equations carefully

d) 84

Pupil has worked out 7 x 3 x 4; ensure pupil is reading equations carefully

18. Which number is a composite number (non-prime)?

Checks for understanding of composite or non-prime numbers

a) 57

Correct answer

b) 19

Pupil may lack understanding of what is meant by prime or non-prime

c) 41

Pupil may lack understanding of what is meant by prime or non-prime

d) 1

Common misconception - 1 is neither prime nor composite

19. 19) Solve 30 - 9 ÷ 3
Checks understanding of the order of operations

a) 1
Pupil has worked out 30 ÷ 3 - 9; lacks understanding that division is not associative or commutative

b) 24
Pupil has worked out 30 - 9 + 3; ensure pupil reads equations more carefully

c) 7
Pupil has worked out equation from left to right - lacks understanding of the order of operations

d) 27
Correct answer

20. Solve 5 658 ÷ 23
Checks ability to solve a long division equation; 4-digit divide by a 2-digit number

a) 2 463 r9
Pupil may have used the bus stop algorithm but forgot the place holder, therefore misaligning the digits

b) 202 r12
Error in forgetting to carry over the remainders into the next column and/or mistakes in subtracting

c) 246
Correct answer

d) I don't know how to work out this question
Pupil may not be familiar with using long division

21. Fill in the missing digits to complete the equation
Checks understanding of the algorithm in a formal multiplication method

a) 

Pupil is carrying digits incorrectly; may lack accuracy in times table knowledge

b) 

Correct answer

c) 

Error - pupil forgot to add on the 5 hundreds that were carried over

d) 

Random answer - pupil has limited understanding of the algorithm

22. Which equation does not equal 9?
Checks understanding of the order of operations

a) 1 + 2 x 3
Correct answer

b) 21 ÷ 7 x 3
Error could lie in times table knowledge

c) 23 - 2 x 7
Pupil did not take into account the order of operations - lacks understanding

d) $34 - 5^2$
Pupil did not take into account the order of operations - lacks understanding

23. Dylan has some marbles in his bag. He says that when he groups all his marbles into groups of 3, he uses them all. The same happens when he groups them in 6s or in 9s. Which amount cannot be the number of marbles in Dylan's bag?
Checks understanding of common factors and multiples

a) 36 marbles
Pupil may lack understanding of common multiples or may have made an error in times tables work

b) 27 marbles
Correct answer as 27 is not a multiple of 6

c) 18 marbles
Pupil may lack understanding of common multiples or may have made an error in times tables work

d) 54 marbles
Pupil may lack understanding of common multiples or may have made an error in times tables work

24. Spot the mistake
Checks understanding of the bus stop algorithm

a) It is wrong because you need to start with the ones/units column
Pupil lacks understanding of the bus stop algorithm

b) A mistake has been made with the carrying of numbers
Pupil may have poor times table knowledge or lack understanding of the bus stop algorithm

c) A mistake has been made in the tens column
Pupil may have poor times table knowledge or lack understanding of the bus stop algorithm

d) A mistake has been made in the hundreds column
Correct answer

25. A company orders 5 000 footballs from a factory. If the factory can make 1 436 footballs every hour, how many more footballs will still be needed after 3 hours?

Checks solving a 2-step problem in context using a combination of operations

a) 692 footballs

Correct answer

b) 4 308 footballs

Pupil has worked out the number of balls made in 3 hours - ensure pupil reads the question more carefully

c) 1 308 footballs

Pupil has worked out the number of balls made, but error occurred in the subtraction whereby the smaller digit is always taken from the larger digit in each column

d) 1 702 footballs

Pupil has not carried over correctly during the multiplication part

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