THIRD SPACE LEARNING

Number and Place Value Diagnostic Quiz and Answers

Diagnose pupils' individual learning gaps in number and place value

Number and Place Value Quiz

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

Don't forget to tick your answer!

1. What is this written number in numerals?
Eight million, two hundred and eight thousand and fourteen

a) ☐ 8 002 814

b) ☐ 8 280 014

c) ☐ 8 208 014

d) ☐ 8 200 8 014

2. What is this number in words?
7 208 014

a) ☐ Seven million, two thousand and eight and fourteen

b) ☐ Seven million, two hundred and eighty thousand and fourteen

c) ☐ Seven million, two hundred and eight thousand and fourteen

d) ☐ Seven thousand, two hundred and eight and fourteen

3. What is the value of the digit 5 in this number?
1 050 413

a) ☐ 5 thousand

b) ☐ 50 thousand

c) ☐ 500 thousand

d) ☐ 5 hundreds

4. Alex partitioned a number like this:
400 000 + 30 000 + 900 + 20 + 7
What is his original number?

a) ☐ 430 927

b) ☐ 403 927

c) ☐ 43 927

d) ☐ 439 270

5. How many digits are there in 5 million?

a) ☐ 6

b) ☐ 8

c) ☐ 5

d) ☐ 7

6. 9 470 305 ÷ 1000

a) ☐ 94 703.05

b) ☐ 9 470 305 000

c) ☐ 9 470.305

d) ☐ 9 470.35

7. Which number is exactly 200 000 bigger than 5 317 165?

a) ☐ 5 500 000

b) ☐ 7 317 165

c) ☐ 5 337 165

d) ☐ 5 517 165

8. The population of a city is 3 479 507. Over the next 10 years, it is predicted to fall by 300 000. What will the estimated population be in 10 years?

a) ☐ 3 179 507

b) ☐ 479 507

c) ☐ 3 779 507

d) ☐ 3 199 507

Don't forget to tick your answer!

9. Put these numbers in ascending order from the smallest to the largest:
100 111 1 000 000 110 010 11 101

a) ☐ 1 000 000, 100 111, 110 010 , 11 101

b) ☐ 1 000 000, 110 010, 11 101, 100 111

c) ☐ 11 101, 110 010, 100 111, 1 000 000

d) ☐ 11 101, 100 111, 110 010, 1 000 000

10. What is the missing number in the calculation?
2 131 071 = 2 000 000 + _____ + 30 000 + 1000 + 70 + 1

a) ☐ 1

b) ☐ 10 000

c) ☐ 100 000

d) ☐ 1 000 000

11. What is the difference between 5 035 149 and 5 038 149?

a) ☐ 30 000

b) ☐ 3 000

c) ☐ 300

d) ☐ 300 000

12. 30.073 x 100

a) ☐ 3 007.3

b) ☐ 30 073

c) ☐ 0.30073

d) ☐ 30.07300

13. Round the following number to the nearest 100 000:
6 729 675

a) ☐ 6 730 000

b) ☐ 7 000 000

c) ☐ 6 800 000

d) ☐ 6 700 000

14. Which digit is in the hundredths place?
2.047

a) ☐ 2

b) ☐ 0

c) ☐ 4

d) ☐ 7

Don't forget to tick your answer!

15. Choose the correct words and symbols to be put into the space to make this statement correct.
−456 _____ −379

a) ☐ Is greater than (<)

b) ☐ Is greater than (>)

c) ☐ Is less than (<)

d) ☐ Is less than (>)

16. Which decimal number has the largest value?

a) ☐ 0.41

b) ☐ 0.3

c) ☐ 0.402

d) ☐ 0.395

17. Which number below shows three tenths?

a) ☐ 30

b) ☐ 0.3

c) ☐ 0.03

d) ☐ 0.003

18. Which number is exactly 30 000 smaller than 2 713 109?

a) ☐ 2 413 109

b) ☐ 2 683 109

c) ☐ 2 710 109

d) ☐ 2 743 109

19. What is the difference between 7 301 438 and 7 281 438?

a) ☐ 120 000

b) ☐ 2

c) ☐ 121 438

d) ☐ 20 000

20. Round this number to the nearest 2 decimal places: 183.765

a) ☐ 183.8

b) ☐ 183.76

c) ☐ 184

d) ☐ 183.77

Don't forget to tick your answer!

21. What is the difference between 14 and –34?

a) ☐ 20

b) ☐ 48

c) ☐ -20

d) ☐ -48

22. Sara has one of these four cards:
775 105, 778 013, 765 101, 772 989
She says, "When I round my number to the nearest 10 000, I get 770 000". Which cards could be Sara's card?

a) ☐ 775 105, 778 013 and 772 989

b) ☐ All of them

c) ☐ 765 101 and 772 989

d) ☐ 772 989

23. The population of London is 8.674 million people. The population of San Francisco is approximately 10 times smaller than London. What is the approximate population of San Francisco?

a) ☐ 0.08674 million people

b) ☐ 867 400 people

c) ☐ 86.74 million people

d) ☐ 867.4 million people

24. What is the value of this Roman numeral?
MMDCXLVII

a) ☐ 2 467

b) ☐ 2 5147

c) ☐ 3 947

d) ☐ 2 647

25. A number rounded to the nearest 100 000 is 8 000 000
What is the largest number it could be?

a) ☐ 7 999 999

b) ☐ 7 599 999

c) ☐ 8 049 999

d) ☐ 8 099 999

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

Don't forget to tick your answer!

1. Read this number: 8 208 014 (Writing numbers up to 10 million in numerals)

a) Eight million, two thousand and eight and fourteen
Writing out the numbers they are reading- not secure with place value above one thousand

b) Eight million, two hundred and eighty thousand and fourteen
Careless mistake- not double checking. Can group digits into groups of 3

c) Eight million, two hundred and eight thousand and fourteen
Correct answer

d) Eight mllion, two hundred and eight thousand and fourteen
Writing out the numbers they are reading- not secure with place value above one thousand

2. Write out this number in words: 7 208 014
(Very little understanding of place value and the number system for writing large numbers)

a) Seven million, two thousand and eight and fourteen
Pupil is unclear on how to read the thousands group of numbers

b) Seven million, two hundred and eighty thousand and fourteen
Mixing up the order of the thousands number

c) Seven million, two hundred and eight thousand and fourteen
Correct answer

d) Seven thousand, two hundred and eight and fourteen
Place value of larger numbers up to 10 million

3. What is the value of the digit 5 in this number? 1 050 413
(Knowledge of the place of the ten thousand column and the value of the digit within it)

a) 5 thousand
Place value - relating the digit to the correct column and value

b) 50 thousand
Correct answer

c) 500 thousand
Place value - relating the digit to the correct column and value

d) 5 hundreds
Place value - relating the digit to the correct column and value

4. Alex partitioned a number like this: 400 000 + 30 000 + 900 + 20 + 7. What is his original number?
Is the pupil able to combine a number after it has been partitioned, using place holders accurately

a) 430 927
Correct answer

b) 403 927
Place value of thousands numbers

c) c) 43 927
Use of place holders is not secure

d) d) 439 270
Has some understanding of place value in that the pupil understands that 400 000 number needs 6 digits, but has misconceptions with place holder positioning.

5. How many digits are there in 5 million?
Knowledge of place value columns and headings up to 10 million

a) 6
Place value headings

b) 8
Place value headings

c) 5
Place value headings

d) 7
Correct answer

6. 9 470 305 ÷ 1000
Does the pupil know that digits move 3 columns to the right when dividing by 1000 due to the base ten system

a) 94 703.05
Has understanding of moving digits to the right, but may not be sure how many columns to move

b) 9 470 305 000
Confusion between x 1000 and ÷ 1000

c) 9 470.305
Correct answer

d) 9 470.35
Some idea of division and moving digits, but misconception over keeping digits in order, including the place holders

7. Which number is exactly 200 000 bigger than 5 317 165
Does the pupil know that when adding on a multiple of 1000, 10 000, 100 000 etc, that the columns containing a zero do not change in the answer

a) 5 500 000
May have some understanding of adding to the correct column, but confusion over rounding the number or not sure what to do with the rest of the digits

b) 7 317 165
Adding to the incorrect column, but may have some understanding that the remainder of the digits do not change

c) 5 337 165
Adding to the incorrect column, but may have some understanding that the remainder of the digits do not change

d) 5 517 165
Correct answer

8. The population of a city is 3 479 507. Over the next 10 years, it is predicted to fall by 300 000. What will the estimated population be in 10 years?
Does the pupil know that when subtracting a multiple of 1000, 10 000, 100 000, etc, the columns containing a zero do not change in the answer

a) 3 179 507
Correct answer

b) 479 507
Subtracting 3 million instead of 300 000 – place value accuracy up to 10 million

c) 3 779 507
Adding 300 000 instead of subtracting – pupil may not have understood the problem

d) 3 199 507
May have known to subtract the 300 000 but then made careless mistake of not checking all the other digits carefully

9. Put these numbers in ascending order from the smallest to the largest:
100 111 1 000 000 110 010 11 101
Can the pupil order and compare numbers up to 1 million

a) 1 000 000 , 100 111 , 110 010 , 11 101
Comparing digits from the left, but without consideration to the overall number of digits each number has

b) 1 000 000 , 110 010 , 11 101 , 100 111
Comparing and ordering digits from the right without consideration to the overall number of

c) digits each number has.

11 101 , 110 010 , 100 111 , 1 000 000

d) Number of digits identified and ordered, but misconception of value in the thousands group of digits.

11 101 , 100 111 , 110 010 , 1 000 000
Correct answer

10. What is the missing number in the calculation?
2 131 071 = 2 000 000 + _____ + 30 000 + 1000 + 70 + 1
Partioning numbers accurately up to 10 million

a) 1
Misconception with partitioning of numbers and the value of numbers in each position

b) 10 000
Place value - the number of digits correspond to the column

c) 100 000
Correct answer

d) 1 000 000
Place value – the number of digits correspond to the column

11. What is the difference between 5 035 149 and 5 038 149?
Does the pupil know the value of change when one digit is changed in a number up to 10 million

a) 30 000
Place value of thousands groups of digits is not secure

b) 3 000
Correct answer

c) 300
Place value of ones group of digits is not secure.

d) 300 000
Place value of thousands groups of digits is not secure

12. 30.073 x 100
Does the pupil know that multiplying numbers (including decimals) by 100 moves digits two places to the left due to the base ten system

a) 3 007.3
Correct answer

b) 30 073
Some concept of moving digits to the left, but unsure of how many times

c) 0.30073
Dividing instead of multiplying

d) 30.07300
Sees multiplying by 100 as just adding two zeros on the end and not as the digits moving columns and getting 100 time larger

13. Round the following number to the nearest 100 000: 6 729 675
Rounding large numbers to the nearest 100 000

a) 6 730 000
Can round to the nearest 10 000, but maybe unsure of rounding to nearest 100 000

b) 7 000 000
Can round to the nearest million – some pupil may just round to the first digit in the number regardless of what the question is asking, as they have only had practise with those types of questions

c) 6 800 000
Know to round to 100 000 but concept of rounding is not yet secure

d) 6 700 000
Correct answer

6. Which digit is in the hundredths place? 2.047 Does the pupil know place value of decimals (hundredths)

a) 2
No understanding that hundredths relates to a decimal position

b) 0
Some understanding of hundredths relating to a decimal position, but not secure with column headings

c) 4
Correct answer

d) 7
Maybe relating 'hundreds' to the third column before the decimal point and so 'hundredths' must be the third column after the decimal point

15. Choose the correct words and symbols to be put into the space to make this statement correct.
-456 _____ –379 Can the pupil compare two negative numbers, using the signs 'greater than' (>) and 'less than' (<) accurately.

a) Is greater than (<)
Concept of negative numbers – treating the numbers as positive. The symbol is incorrect

b) Is greater than (>)
Concept of negative numbers – treating the numbers as positive. The symbol matches the statement

c) Is less than (<)
Correct answer

d) Is less than (>)
Concept of negative number is accurate, but not secure with matching the correct symbol to the statement

16. Which decimal number has the largest value? Understanding the place value of a decimal number

a) 0.41
Correct answer

b) 0.3
Lacks understanding of place value in the decimal columns

c) 0.402
May have confused with the 'larger' number after the decimal place is bigger – may refer to the number as 'zero point four hundred and two'

d) 0.395
May have confused with the 'larger' number after the decimal place is bigger – may refer to the number as 'zero point four hundred and two'

17. Which number below shows three tenths: Understanding the position of the tenths column.

a) 30
Lacks understanding of place value in the decimal columns. May be confused between the 'tenth' and 'tens' column

b) 0.3
Correct answer

c) 0.03
Maybe relating 'tens' to the second column before the decimal point and so 'tenths' must be the second column after the decimal point

d) 0.003
Understands that 3 tenths is a decimal number, but is unsure of the column headings

18. Which number is exactly 30 000 smaller than 2 713 109?
Understanding the base ten system and the concept of exchange in the larger columns.

a) 2 413 109
Understands how to subtract but has subtracted in the wrong column. Place value knowledge of larger numbers is not secure

b) 2 683 109
Correct answer

c) 2 710 109
Understands how to subtract but has subtracted in the wrong column. Place value knowledge of larger numbers is not secure.

d) 2 743 109
Added 30 000 instead of subtracting - may be an issue with understanding the problem

19. What is the difference between 7 301 438 and 7 281 438? Does the pupil have a secure understanding of place value up to 10 million as it involves exchange of the 100 thousands column

a) 120 000
Has recognition that the hundred thousand and ten thousand column has changed, but misconception may lie in poor understand of base 10 system

b) 2
Knows there is a difference of 2 between 30 ten thousands and 28 ten thousands, but may not know how to express this correctly

c) 121 438
Has recognised a difference between the hundred thousands and ten thousands columns, but is unsure what to do with the rest of the digits. Misconception with subtraction

d) 20 000
Correct answer

20. Round this number to the nearest 2 decimal places: 183.765 Rounding decimal numbers to 2 decimal places

a) 183.8
Able to round to 1 decimal place, may be unaware what is meant by '2 decimal places'

b) 183.76
May have some understanding of rounding to 2 decimal places, but not secure

c) 184
Rounding to nearest whole number, may be unaware what is meant by '2 decimal places'

d) 183.77
Correct answer

21. What is the difference between 14 and −34?
Understanding of negative numbers and how to calculate the difference across zero

a) 20
Misconception whereby the −34 is treated as a positive integer

b) 48
Correct answer

c) −20
Confusion over the use of the '−' sign as well as treating −34 as a positive integer

d) −48
Confusion over the use of the '−' sign, but has some understanding of the difference between the two numbers

22. Sara has one of these four cards: 775 105 778 013 765 101 772 989. She says, "When I round my number to the nearest 10 000, I get 770 000". Which cards could be Sara's card?
Place value of large numbers (hundred thousands) to the nearest 10 000

a) 775 105 , 778 013 and 772 989
Just choosing the numbers that start with 77 – concept of rounding is not fully secure

b) All of them
May not have much understanding of rounding larger numbers

c) 765 101 and 772 989
Correct answer

d) 772 989
May have some understanding of rounding down but unsure of rounding up

23. The population of London is 8.674 million people. The population of San Francisco is approximately 10 times smaller than London. What is the approximate population of San Francisco?
Ability to divide by 10 and also to understand that a tenth of a million is the same as a hundred thousand

a) 0.08674 million people
Some understanding of moving digits to the right for division, but unsure of how many places

b) 867 400 people
Correct answer

c) 86.74 million people
Multiplying by 10, may be due to lack of understanding of the problem or relating the calculation to the word 'ten times' in the question

d) 867.4 million people
Multiplying by 100, unsure of the problem and how to solve it

24. What is the value of this Roman numeral? MMDCXLVII
Reading Roman numerals up to 10 000

a) 2 467
Confusion over the placement of the hundreds letters (DC) and the tens letters (XL)

b) 2 5147
Lack of understanding the value of some of the letters

c) 3 947
Partitioning letters incorrectly, lacks understanding of the value of each letter

d) 2 647
Correct answer

25. A number rounded to the nearest 100 000 is 8 000 000. What is the largest number it could be?
Secure concept of place value and rounding of numbers up to 10 million

a) 7 999 999
Some understanding of rounding to the nearest 100 000, but has failed to recognise that larger numbers could be rounded down to make 8 000 000

b) 7 599 999
Lacks secure place value knowledge of larger numbers – maybe rounding to the nearest million and associating with the digit '5' as being important

c) 8 049 999
Correct answer

d) 8 099 999
Rounding to the nearest million instead of the nearest 100 000 – lacks secure knowledge of the concept of rounding larger numbers

Next steps

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