Grade 4 Mathematics

Terms 1, 2 and 3 - notes for 18 topics

IN EVERY TOPIC

- What you will learn and the key words.
- Short, clear notes with worked examples.
- Questions to try and a topic test, with the answers at the back.

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Strand 1.0 Numbers | Term 1

1.1 Whole Numbers

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- use place value and total value of digits up to tens of thousands in daily life situations
- read and write numbers up to 10,000 in symbols in real life situations
- read and write numbers up to 1,000 in words in day to day activities
- order numbers up to 1,000 in different situations
- round off numbers up to 1,000 to the nearest ten in different situations
- identify factors/divisors of numbers up to 50 in different contexts
- identify multiples of numbers up to 100 in different situations
- use even and odd numbers up to 100 in different situations
- represent Hindu Arabic numerals using Roman numerals up to X in different situations
- make patterns involving even and odd numbers in day to day life experiences
- use IT devices for learning and leisure

KEY WORDS

digit, place value, total value, round off, factor, multiple, even, odd, Roman numeral.

1. Place value of digits up to thousands

Finding the place value of each digit in 4,538

Write 4,538 in a place value chart: Thousands 4 | Hundreds 5 | Tens 3 | Ones 8.

The 4 sits in the thousands place, so its place value is thousands. The 5 is in the hundreds place, the 3 in the tens place and the 8 in the ones place.

Swap the 4 and the 8 to make 8,534. The same digits are used, but each one is in a different place, so the number is different.

2. Place value of digits up to ten thousands

Extending the place value chart to ten thousands

Write 45,392 in the chart: Ten thousands 4 | Thousands 5 | Hundreds 3 | Tens 9 | Ones 2.

Read it as "forty-five thousand, three hundred and ninety-two". The comma only helps us read; it is one number of five digits.

Point to each digit and name its place, moving from the right (ones) to the left (ten thousands).

Ten thousands	Thousands	Hundreds	Tens	Ones
4	5	3	9	2

45,392: forty-five thousand, three hundred and ninety-two

Name the places from the right: ones, tens, hundreds, thousands, ten thousands.

45,392 in the place value chart

3. Total value of a digit

Total value = the digit × the value of its place

In 4,538: the total value of 4 is 4 × 1,000 = 4,000; of 5 is 5 × 100 = 500; of 3 is 3 × 10 = 30; of 8 is 8 × 1 = 8.

Check: 4,000 + 500 + 30 + 8 = 4,538. The total values add up to the whole number.

Write "place value" and "total value" in two colours on the board so the two ideas stay apart.

4. Place value and total value: solving problems

Place value and total value of every digit in 38,246

3: ten thousands, total value 30,000. 8: thousands, total value 8,000. 2: hundreds, total value 200.
4: tens, total value 40. 6: ones, total value 6.
The 3 is worth 30,000, not 3 - so the person was wrong. Its place decides its worth.

5. Reading and writing numbers up to 10,000 in symbols

Writing "six thousand, two hundred and eighty-four" in symbols

Six thousand = 6,000; two hundred = 200; eighty = 80; four = 4.
6,000 + 200 + 80 + 4 = 6,284. Place each part in the chart: Thousands 6 | Hundreds 2 | Tens 8 | Ones 4.
If a place is not mentioned, write 0 there: "eight thousand and forty-six" is 8,046 (no hundreds).

6. Numbers up to 10,000: expanded form and counting on

Expanded form of 5,207

5,207 = 5,000 + 200 + 0 + 7. There are no tens, so the tens place holds 0.
Going the other way: 3,000 + 700 + 5 = 3,705 (write 0 in the empty tens place).
The next number after 9,999 is 10,000 - one more makes a new place, ten thousands.

7. Writing 2-digit and 3-digit numbers in words

Writing 47 and 365 in words

47: tens 4 is "forty", ones 7 is "seven", joined with a hyphen - forty-seven.
365: three hundred, then "and", then sixty-five - three hundred and sixty-five.
Write the words on the board and point to each digit as you say its word.

8. Numbers up to 1,000: from words to symbols and back

Moving between words and symbols

"nine hundred and nineteen" = 900 + 19 = 919. 840 = eight hundred and forty. 303 = three hundred and three.
Key questions: what do I write for hundreds? for tens? for ones? Is any place empty - is a 0 needed?
Number words go with the hundreds first, then "and", then the tens and ones.

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9. Comparing numbers up to 1,000

Comparing 468 and 486

Start with the highest place: hundreds are both 4, so look at the tens.
Tens: 6 is less than 8, so 468 is less than 486. Write 468 < 486, or 486 > 468.
The symbol always opens towards the bigger number, like a mouth that eats the bigger one.

10. Ordering numbers up to 1,000

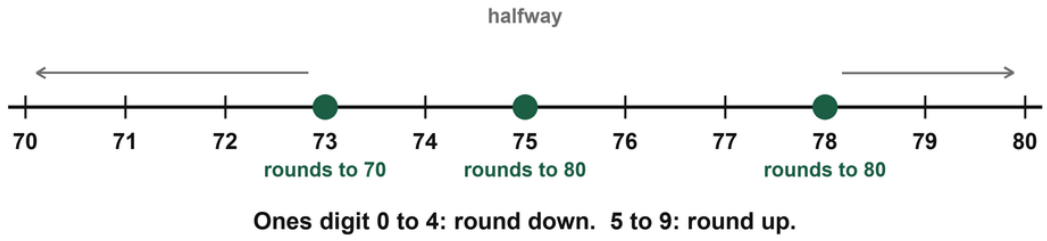
Ordering 512, 251, 521 and 125 from smallest to largest

Compare hundreds first: 125 has 1 hundred (smallest); 251 has 2; 512 and 521 have 5.
For 512 and 521 compare tens: 1 is less than 2, so 512 < 521.
Ascending order: 125, 251, 512, 521. Descending order is the same list read backwards.

11. Rounding off numbers to the nearest ten

Rounding 73, 78 and 75 to the nearest ten

Draw a number line from 70 to 80 with 75 in the middle.
73 is closer to 70, so it rounds down to 70. 78 is closer to 80, so it rounds up to 80.
Rule: look at the ones digit. 0 to 4 - round down; 5 to 9 - round up. So 75 rounds up to 80.



Rounding 73, 75 and 78 to the nearest ten

12. Rounding off to estimate in real life

Estimating a total by rounding each amount to the nearest ten

48 rounds to 50, 91 rounds to 90 and 33 rounds to 30.
Estimate: 50 + 90 + 30 = 170. The real total is 172, so Ksh 200 is enough.
An estimate is a quick, sensible guess that is close to the real answer.

13. Factors (divisors) of numbers up to 50

Finding all the factors of 12

A factor divides a number exactly with nothing left over. List pairs that multiply to 12: 1 × 12, 2 × 6, 3 × 4.
The factors of 12 are 1, 2, 3, 4, 6 and 12. Check: 12 divided by 5 leaves a remainder, so 5 is not a factor.
Always start at 1 and work upwards; stop when the pairs meet.

14. Multiples of numbers up to 100

Listing the multiples of 6

A multiple is what you get by multiplying a number by 1, 2, 3, 4 and so on.
Multiples of 6: 6, 12, 18, 24, 30, 36 ... (skip count by 6, or use the 6 times table).
To test a number, check if it is in the times table: 54 is a multiple of 6 because 6 × 9 = 54.

15. Even and odd numbers up to 100

Telling even and odd numbers apart

Make pairs with 14 bottle tops: 7 pairs, none left over - 14 is even. With 15, one is left over - 15 is odd.
Look at the ones digit: even numbers end in 0, 2, 4, 6 or 8. Odd numbers end in 1, 3, 5, 7 or 9.
So 68 is even (ends in 8) and 73 is odd (ends in 3).

16. Roman numerals from I to X

Roman numerals I to X

1 I, 2 II, 3 III, 4 IV, 5 V, 6 VI, 7 VII, 8 VIII, 9 IX, 10 X.
A smaller numeral in front of a bigger one is taken away: IV is 5 - 1 = 4 and IX is 10 - 1 = 9.
A smaller numeral after a bigger one is added: VII is 5 + 1 + 1 = 7.

1	2	3	4	5	6	7	8	9	10
I	II	III	IV	V	VI	VII	VIII	IX	X

Smaller before bigger: take away (IV = 5 − 1, IX = 10 − 1).
Smaller after bigger: add (VII = 5 + 1 + 1).

Roman numerals I to X

17. Number patterns with even and odd numbers

Finding the rule of a pattern

Even pattern: 2, 4, 6, 8, 10 ... the rule is add 2, and every number is even.
Odd pattern: 1, 3, 5, 7, 9 ... the rule is add 2 as well, and every number is odd.
Mixed pattern: 5, 10, 15, 20 ... the rule is add 5, and the numbers alternate odd, even, odd, even.

18. Exploring numbers with digital devices

Learning with a device, safely (or with number cards if there is no device)

Choose a free, teacher-checked number game on place value or ordering. Share one device between two or three learners.
Set a rule: 10 minutes, take turns, one learner reads the number aloud and the other checks it.
No device? Do the same activity with number cards: build a 4-digit number and name each digit's place.

19. Appreciating numbers in real life: a number hunt

A number hunt around the school

In groups, walk around the classroom or compound and list the numbers you find: page numbers, the date, a matatu route, prices, the class register.
For each one write what it tells us: how many, in what order, how much money, or which day.
Back in class, group the numbers you found by use: counting, ordering, money, time, labels.

20. Whole numbers: putting it all together

One number, many questions: 6,405

Place value of 4: hundreds. Total value of 4: 400. Expanded form: 6,000 + 400 + 5 (the tens place holds 0).
One more than 6,405 is 6,406; one less is 6,404. Compare it with 6,450: 6,405 < 6,450 because the tens 0 is less than 5.
Now a smaller number, 268: in words - two hundred and sixty-eight; rounded to the nearest ten - 270 (the ones digit 8 rounds up).

TRY THESE

1. Write the place value of the digit 7 in 7,214.
2. Write the place value of the digit 6 in 3,562.
3. Write the place value of the digit 8 in 82,417.
4. Write the place value of the digit 6 in 36,905.
5. What is the total value of 7 in 7,214?
6. What is the total value of 6 in 3,562?
7. What is the difference between the place value and the total value of 5 in 8,527?
8. Which number has a 4 whose total value is 400: 5,428, 4,082 or 9,241?
9. Write in symbols: three thousand, five hundred and twelve.
10. Write in symbols: eight thousand and forty-six.

11. Write 4,318 in expanded form.
12. Write 3,000 + 700 + 5 as a number.
13. Write 58 in words.
14. Write 214 in words.
15. Write 840 in words.
16. Write 303 in words.
17. Put <, > or = in the gap: 372 __ 327.
18. Put <, > or = in the gap: 905 __ 950.
19. Arrange from smallest to largest: 438, 384, 843, 348.
20. Arrange from largest to smallest: 610, 106, 160, 601.
21. Round 46 to the nearest ten.
22. Round 132 to the nearest ten.
23. Round each to the nearest ten and add: 58 + 61 + 74.
24. Estimate 39 + 52 by rounding to the nearest ten.
25. List all the factors of 18.
26. List all the factors of 24.
27. Write the first five multiples of 4.
28. List the multiples of 9 up to 60.
29. True or false: 68 is even.
30. Write the even numbers between 41 and 51.
31. Write 6 in Roman numerals.
32. Write 9 in Roman numerals.
33. Continue the pattern: 2, 4, 6, 8, __, __
34. Continue the pattern: 11, 13, 15, __, __, __
35. Build a 4-digit number in the game (or with cards). Write its place value chart.
36. Write your number in expanded form.
37. Write five numbers you found and say what each one tells us.
38. Arrange the numbers you found from smallest to largest.
39. Write 6,405 in expanded form and give the total value of the 4.
40. Round 268 to the nearest ten and write the answer in words.

TOPIC TEST

T1. Use the digits 3, 0, 7 and 9 once each to make the largest and the smallest 4-digit numbers.
T2. Write 60,000 + 3,000 + 400 + 20 + 5 as one number and name each digit's place.
T3. The digit 4 has total value 40,000 in a 5-digit number that ends in 6. Write two possible numbers.
T4. Make up two questions of your own about place value and total value and swap them with a partner.
T5. Write the number that is 1 more than 7,999 and the number that is 1 less than 8,000.
T6. Write 8,090 in expanded form and say what the 0 is doing.
T7. Write 999 in words, then write in words the number that comes after it.
T8. Write in words: 1,000 minus 1, and 500 + 55.
T9. Write three different numbers that are greater than 348 but less than 352.
T10. Use the digits 4, 7 and 1 once each to make all six numbers, then order them.
T11. What is the smallest whole number that rounds to 60? What is the largest?
T12. Estimate 398 + 204 by rounding to the nearest ten, then work out the exact answer and find the difference.
T13. Which number under 50 has the most factors? Try 36, 40 and 48.

T14. Find a number under 100 that is a multiple of both 4 and 6.

T15. Is the sum of an even and an odd number odd or even? Test with three examples.

T16. Add in Roman numerals and write the answer as a Roman numeral: VI + IV, and III + V.

T17. Make a pattern that starts at 100 and goes down by 2 each time. Is it even or odd?

T18. Invent your own number game with cards and teach the rules to another pair.

T19. Which of the numbers you found is even and which is odd? Round the largest to the nearest ten.

T20. Write a short "number story" that uses place value, rounding and even or odd numbers.

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