



Learn & Explore

MATHEMATICS





Benchmarks

Grade 4 – 5

Numbers, Data & Measurements

[Number] Students will be able to demonstrate knowledge of place value (5-digit to 7-digit numbers); represent whole numbers with words, diagrams, number lines, or symbols; order and compare numbers.

They will add and subtract numbers up to 6digit numbers; multiply (up to 5-digit numbers with 3-digit) and divide (up to 5 digit up to 2 digit number) Solve problems involving odd and even numbers, addition, subtraction, multiplication and division of numbers (involving missing numbers, money, quantities and measures), round numbers to nearest tens, hundreds and thousands and make estimates.

[Measurements] Students will be able to measure, compare and convert mass and time from one standard unit to another; read, write and convert time in 24 hour and 12 hour notation.

They would also solve problems involving mass/weight and time; solve problems.

[Data & Stat] Read and interpret data from tables, pictographs, bar graphs, tally charts, block graphs, line graphs, pie charts and Carroll diagrams.

Organise and represent data using tables, pictographs, bar graphs, tally charts, block graphs, line graphs, pie charts and Carroll diagrams to answer questions.

Solve problems in context in relation to averages of quantities, measures and numbers. Describe the probability of an event; represent the probability of an event including real world problems.

Fractions

Recognise fractions as parts of wholes or collections; represent fractions using words, numbers; compare and order simple fractions; add and subtract

simple like, unlike fractions, including those set in problem situations.

Demonstrate knowledge of decimal place value (up to three decimal place) compare, order, and round decimals (to the nearest whole number and up to two decimal place); add, subtract, multiply and divide decimals, including those set in real world problems (including money, quantities or measures).

Geometry

[Geometry] Students will be able to use properties to describe and compare quadrilaterals; identify three dimensional shapes and relate three dimensional shapes with their two dimensional representations.

They will also identify and draw types of angles up to 180 degrees and lines of symmetry in 2-D shapes; compare and order angles by size; identify circumference of a circle.

[Measurements] Students will be able to measure, compare and convert lengths and capacity

They would also solve problems involving length, capacity;

Solve problems involving perimeter and area of parallelogram, triangle, square, rectangle and rectilinear shapes.

Algebra

Students will be able to analyse and complete number patterns; find the missing number or operation in a number sentence.

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Unit: 1

Math Marvels: Exploring Numbers

Learning Objectives:

- Read, write and count up to 99,999 (5D numbers) in numerals and in words.
- Recognise the place value of each digit in 5D numbers.
- Read and write Roman numbers up to 100.
- Add and subtract up to 5-digit numbers mentally and in written form (with and without regrouping) including:
5D with 1D, 2D, 3D, 4D, and 5D.
- Estimate the answer to an addition and subtraction question.
- Recall rounding off numbers to the nearest tens, hundreds, thousands and round of numbers to nearest ten thousands.

Vocabulary:

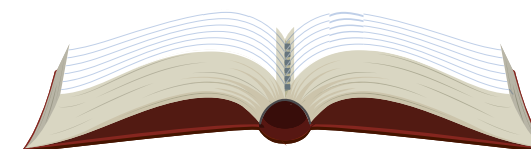
Place value

Estimation

Rounding

Roman numbers

Benchmark numbers





Expanded to Standard Form: 4 & 5 Digits



- Review the 3 digit place value using hundreds, tens and ones tool set.
- Ask them how we can represent the place value of numbers without using hundreds and tens blocks?
- Ask them do you know what arrow cards are?
- Give me any 3 digit number.
- Write it on board and break it into arrow cards with the help of students.



- Repeat the activity for a 4 digit number with arrow cards. Make sure to read aloud with students each place value (Eight thousand, four hundred, seventy, nine).

$$8000 \rightarrow 400 \rightarrow 70 \rightarrow 9 = \rightarrow$$

Thousands	Hundreds	Tens	Ones
8	4	7	9

- Now show same number in expanded form using just numbers.

$$8000 + 400 + 70 + 9 = \rightarrow$$



Repeat for various numbers.

Teacher notes:

Repeat this activity for 5 digit number after practicing the 4 digit numbers.



An activity for four students

- Make 5 four digit numbers using arrow cards, write in expanded form.
- Make 5 five digit numbers using arrow cards, write in expanded form.
- Activity ends with the show and tell of each group.

Solve **Question 3** from **Exercise 1**



Standard to Expanded Form: 4 & 5 Digits

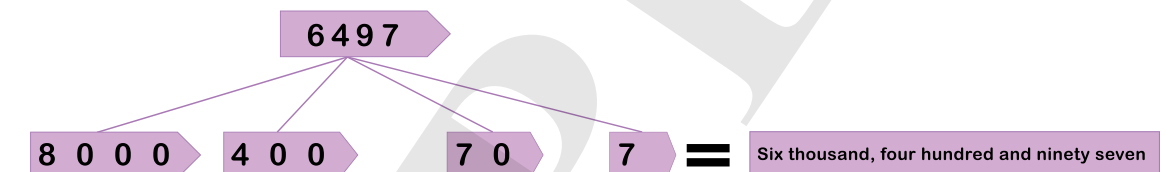


Write four and five digit numbers on the board and break them down into arrows using arrow cards.

$$8479 \rightarrow = 8000 \rightarrow 400 \rightarrow 70 \rightarrow 9$$

Now ask the students to also write the numbers in words. Repeat the same for more numbers.

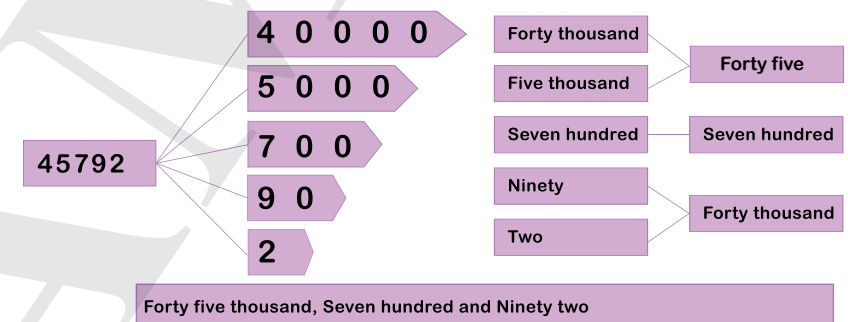
Thousands	Hundreds	Tens	Ones
6	4	9	7



Six thousands Four hundred Ninety Seven

Repeat the same for five digit numbers.

Ten thousands	Thousands	Hundreds	Tens	Ones
4	5	7	9	2



Solve **Question 3** from **Exercise 1**



An activity for four students

- Ask every group to write 8 four digit numbers in expanded form.
- Write those number in words.
- Do same for five digit numbers.
- End with random presentations.



Recognizing the Largest 5-Digit Number



A game for two players

You will need:

- Game cards: Page III (End of book)
- A 1-10 spinner



- Players write their names on the game card.
- Players take turns to spin the spinner. They write the number in any box on their game card.
- Play continues until all boxes on the game card have been filled to make four five-digit numbers.
- The player with the largest five-digit number scores six points, the next largest five points, and so on.
- Players add up all the points on their game card. The player with the largest total of points is the winner.



5-Digit Number Addition and Subtraction

Add or subtract to 50000



A game for four players

You will need:

- A score card: Page 11-20 (Game boards booklet)
- Five 1-6 dice
- Pencil and paper for jottings and calculations



- All players start with 50000 points. Players must aim to still have 50000 points after 10 rounds.
- Player 1 rolls the five dice. The player makes a five-digit number with the dice scores, then chooses whether to add or subtract the number from his/her current number of points.
- The player's new total is written on the scorecard.
- Play continues in the same way for the other players.
- The winner is the player whose final total is closest to 50000 after 10 rounds.

Solve **Question 6 and 7** from **Exercise 1**



Roman Numbers



Review Roman numbers from grade 3 and discuss the different benchmarks numbers.

Numbers	1	5	10	50	100
Symbols	I	V	X	L	C

Recap the three rules of roman numbers.

- Rule of repetition:

When a symbol is repeated, its value is added that number of times i.e ($XX = X+X = 10+10=20$).

Numbers	1	1+1	1+1+1	10	10+10
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I, X , C can not be repeated more than 3 times.

Symbols	III	IIII	XXX	XXXX
Numbers	3	4	30	40
	✓	✗	✓	✗

V, L cannot be repeated.

Symbols	VV	X	LL	C
Numbers	10	10	100	100
	✗	✓	✗	✓

- Rule of addition:

We write small value to the right of large value to represent a number.

Symbols	VI	XI	XV	XVI	LX
	V+I	X+I	X+V	X+V+I	L+X
Numbers	6	11	15	16	60

- Rule of subtraction:

We write small value on left of large value for subtraction.

Symbols	IV	IX	XV	XIV	XL
	V-I	X-I	X+V	XV-I	L-X
Numbers	4	9	15	14	40

We cannot repeat symbol for subtraction.

Symbols	IIV	III	IIX	VIII
Numbers	3	3	8	8
	✗	✓	✗	✓

Solve Question 8 and 9 from Exercise 1



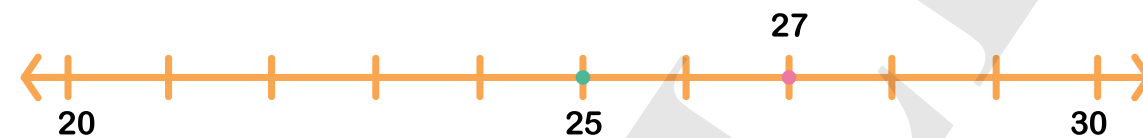
Rounding Off



Rounding Numbers Using Number Lines

Start by reviewing rounding off with the students. Ask them:

27 rounded off to nearest ten is? Draw 27 on a number line and show how it's closer to 30 so the answer is 30.



Repeat the same for 19, 11, 15, 54, 59 etcetera. Ask them what pattern they observe.

Once they have a good grasp of 2 digit numbers repeat the activity for three digit numbers and round off to nearest 100. Such as 560, 320, 323, 398, 765, 980 etcetera. Now repeat the activity for the same numbers but round off to nearest 10 instead. (Use number line to show which ten is closer).

Discuss what pattern they observe.

When rounding 27 to the nearest 10. We look at the number in the tens place and if the number on its right is less than 5 we round off to the lower ten which is 20 (Don't add) and if it's greater than or equal to 5 we round off to the higher ten which is 30 (Add 1).

$$\underline{2}7 = 30$$

Add 1 in 2
Make 7 zero



Repeat for more examples:

21 rounded to nearest 10.

$$\underline{2}1 = 20$$

Don't add in 2

Make 1 zero

327 rounded to nearest 100.

$$\underline{3}27 = 300$$

Don't add in 3

Make 2 and 7 zero

372 rounded to nearest 100.

$$\underline{3}72 = 400$$

Add 1 in 3

Make 7 and 2 zero

372 rounded to nearest 10.

$$\underline{3}72 = 370$$

Don't add in 7

Make 2 zero



Repeat for more examples:

2189 rounded to nearest 1000.

$$\underline{2}189 = 2000$$

Don't add in 2

Make 1, 8 and 9 zero

27999 rounded to nearest 1000.

$$\underline{2}7999 = 28000$$

Add 1 in 7

Make all numbers on right zero

27999 rounded to nearest 10000.

$$\underline{2}7999 = 30000$$

Add 1 in 2

Make all numbers on right zero

31000 rounded to nearest 10000.

$$\underline{3}1000 = 30000$$

Don't add in 3

Make all numbers on right zero

Solve **Question 10** from **Exercise 1**

Estimating Sums and Differences



Start by asking students different questions such as if you have Rs. 194 and your friend has Rs. 307. Can you tell me how much you both have?

They will say we have Rs. 501. Can we say you have about two hundred and your friend has three hundred and together you have about five hundred rupees.

Repeat the same exercises for different examples and ask them to tell you the answer by doing it mentally.

Naturally, they will start rounding the numbers off and give you rounded answers. Explain to them it's called Estimation.

Explain where and why we use estimation in real-life.

- Before leaving our house we estimate how long it will take to get there.
- When walking a distance we estimate how far it is.
- When going to the market, we estimate how much money we should take with us for everything we need to buy.

Solve **Question 11** from **Exercise 1**

Exercise 1

Question 1: Make arrow cards for the following numbers.

- a) 8369 b) 7462 c) 5308
d) 37821 e) 21849 f) 63810

Question 2: Write the following numbers in expanded form.

3617 = 3000 + 600 + 10 + 7

- a) 47209 b) 74012 c) 21934
d) 9311 e) 5612 f) 3191

Question 3: Write the following numbers in standard form.

- a) 3,000 + 200 + 50 + 8
b) 9,000 + 700 + 10 + 4
c) 6,000 + 500 + 2
d) 20,000 + 5,000 + 900 + 60 + 3
e) 10,000 + 2,000 + 300 + 40 + 5
f) 90,000 + 8,000 + 700 + 60 + 5

Question 4: Write the following numbers in words.

- a) 6,825 b) 9,437 c) 23,681
d) 5,902 e) 12,765 f) 45,189

Question 5: Write the following in numbers format.

- a) Six thousand eight hundred twenty-five
b) Nine thousand four hundred thirty-seven
c) Twenty-three thousand six hundred eighty-one
d) Five thousand nine hundred two
e) Twelve thousand seven hundred sixty-five
f) Forty-five thousand one hundred eighty-nine

Exercise 1

Question 6: Add the following numbers.

$\begin{array}{r} 1645 \\ + 2715 \\ \hline \end{array}$	$\begin{array}{r} 5281 \\ + 3999 \\ \hline \end{array}$	$\begin{array}{r} 1645 \\ + 2715 \\ \hline \end{array}$	$\begin{array}{r} 1645 \\ + 2715 \\ \hline \end{array}$	$\begin{array}{r} 4693 \\ + 3301 \\ \hline \end{array}$
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$\begin{array}{r} 3946 \\ + 2188 \\ \hline \end{array}$	$\begin{array}{r} 1523 \\ + 5017 \\ \hline \end{array}$	$\begin{array}{r} 2597 \\ + 2610 \\ \hline \end{array}$	$\begin{array}{r} 80296 \\ + 37842 \\ \hline \end{array}$	$\begin{array}{r} 67952 \\ + 15734 \\ \hline \end{array}$
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$\begin{array}{r} 67049 \\ + 52977 \\ \hline \end{array}$	$\begin{array}{r} 83296 \\ + 67849 \\ \hline \end{array}$	$\begin{array}{r} 42986 \\ + 37475 \\ \hline \end{array}$	$\begin{array}{r} 39507 \\ + 8796 \\ \hline \end{array}$
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Question 7: Subtract the following numbers.

$\begin{array}{r} 6755 \\ - 1498 \\ \hline \end{array}$	$\begin{array}{r} 5632 \\ - 884 \\ \hline \end{array}$	$\begin{array}{r} 8956 \\ - 2705 \\ \hline \end{array}$	$\begin{array}{r} 3283 \\ - 1758 \\ \hline \end{array}$	$\begin{array}{r} 4913 \\ - 2756 \\ \hline \end{array}$
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$\begin{array}{r} 5021 \\ - 3638 \\ \hline \end{array}$	$\begin{array}{r} 3912 \\ - 3576 \\ \hline \end{array}$	$\begin{array}{r} 2744 \\ - 396 \\ \hline \end{array}$	$\begin{array}{r} 83986 \\ - 57696 \\ \hline \end{array}$	$\begin{array}{r} 84219 \\ - 17539 \\ \hline \end{array}$
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$\begin{array}{r} 30791 \\ - 22079 \\ \hline \end{array}$	$\begin{array}{r} 18752 \\ - 14465 \\ \hline \end{array}$	$\begin{array}{r} 68340 \\ - 24910 \\ \hline \end{array}$	$\begin{array}{r} 79877 \\ - 40282 \\ \hline \end{array}$	$\begin{array}{r} 12528 \\ - 11957 \\ \hline \end{array}$
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$\begin{array}{r} 44235 \\ - 44051 \\ \hline \end{array}$	$\begin{array}{r} 42357 \\ - 29133 \\ \hline \end{array}$	$\begin{array}{r} 70983 \\ - 24410 \\ \hline \end{array}$	$\begin{array}{r} 51562 \\ - 41730 \\ \hline \end{array}$
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Exercise 1

Question 8: Write in roman numerals.

10	35	55
40	50	28
27	85	97
24	36	49
100	74	7
99	55	69
39	20	79
95	45	49

Question 9: Write in arabic numerals

LVII	XCIII	XXI
XCVI	LXIV	XL
LXX	XLIII	XCVII
LXXIX	LXIX	XLVI
X	XLII	XXXVIII
XXIX	XLVI	XXVIII
XXXVI	C	XVIII
XX	LX	XCIX

Exercise 1

Question 10: Round off the following numbers.

Rounding to the Nearest 10:

- a) Round 39 off to the nearest 10.
- b) Round 32 off to the nearest 10.
- c) Round 65 off to the nearest 10.
- d) Round 70 off to the nearest 10.
- e) Round 309 off to the nearest 10.
- f) Round 312 off to the nearest 10.

Rounding to the Nearest 100:

- a) Round 312 off to the nearest 100.
- b) Round 970 off to the nearest 100.
- c) Round 109 off to the nearest 100.
- d) Round 999 off to the nearest 100.
- e) Round 63 off to the nearest 100.

Rounding to the Nearest 1000:

- a) Round 999 off to the nearest 1000.
- b) Round 6200 off to the nearest 1000.
- c) Round 7500 off to the nearest 1000.
- d) Round 13500 off to the nearest 1000.
- e) Round 13500 off to the nearest 10000.

Rounding to the Nearest 10000:

- a) Round 15900 off to the nearest 10000.
- b) Round 19800 off to the nearest 10000.
- c) Round 27650 off to the nearest 10000.

Exercise 1

Question 11: You are going shopping and you have to purchase the following items. Estimate the total cost.



- a. You had Rs 1000/- and you purchased a cabbage, carrot and watermelon.
How much did you spend: _____
How much are you left with: _____
- b. You had Rs 2500/- and you purchased a watermelon and ten cabbages.
How much did you spend: _____
How much are you left with: _____
- c. You had Rs 5000/- and you purchased ten pumpkins, five pears, and ten cabbages.
How much did you spend: _____
How much are you left with: _____

References:

https://youtu.be/Awth8srDk0g?si=9PH3B_jDOzHIWRXa

<https://youtu.be/lzRGI0b6lug?si=JPAfqjIC84uDsVk6>

<https://youtu.be/Oy5ZzPjjqPg?si=wpiUI79badOwxIMz>

Unit: 2

Exploring Multiplication and Multiples

Learning Objectives:

- Multiply up to 4D numbers with 1D and 2D numbers mentally and in written form.
- Identify and differentiate between multiples and factors and find: Common multiples of two or more than 2D numbers.

Vocabulary:

Pattern

Double

Algorithm

Diagonal

Common multiple

Vertical

Horizontal

