1
Number World

Number game

"Do you like number games?", Zaina teacher asked.

"Oh! Yes!", said the children.

"I'll say a number; you give me the next number at once. Ready?"

"Ready!"

"Ten", teacher began.

"Eleven", said all the children.

"Forty three"

"Forty four"

The game went on.

"Four thousand ninety nine", teacher said.

"Five thousand", replied some one.

"Oh! No!... Four thousand and hundred", some caught on.

Such mistakes are common.
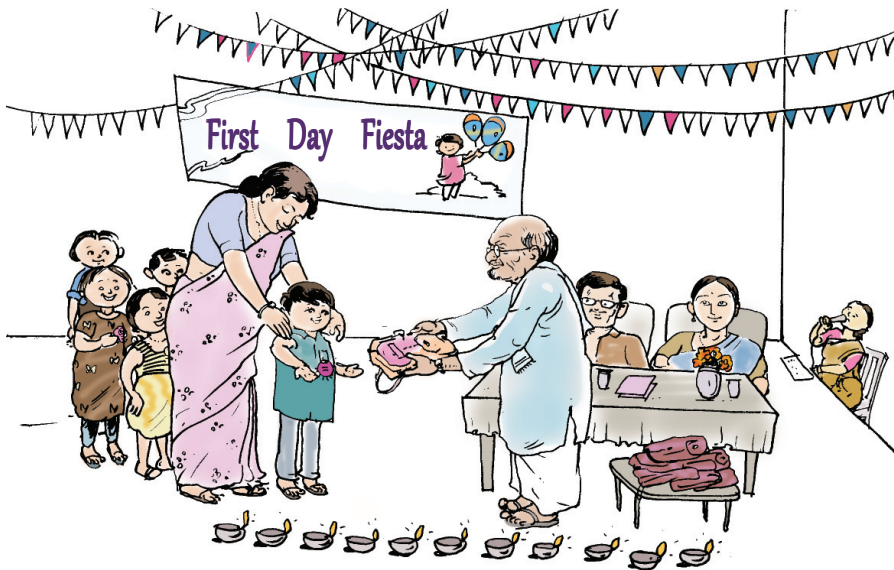
Try this on your friends.

First Day Fiesta

What is the number of children in class 1?

What is the largest number you can read?

What is the largest four-digit number?

What is the next number?

435268 children in Class 1.

And the largest five-digit number?

What is the next number?

How do we find this number?

How do we read it?

Look at the table of large numbers:

1	One
10	Ten
100	Hundred
1000	Thousand
10000	Ten thousand
100000	Lakh
1000000	Ten lakh
10000000	Crore
100000000	Ten crore

This continues with hundred crore, thousand crore, and so on.

Now can you say what we get when we add one to ninety nine thousand nine hundred and ninety nine?

$$99999 + 1 = 100000$$

How do we read this?

Look it up in the table.

Lakh has six digits.

That is, lakh is a six-digit number.

Can you write the largest six-digit number?

Can you write the number we get when we add one to nine lakh ninety nine thousand nine hundred and ninety nine?

How do we read it?

That is, 999999 + 1 =

Giant number

If we are asked for a large number, we often say crore or hundred crore. Putting ten zeros after one makes thousand crore. Think about the size of the number with hundred zeros after one. This is called googol. This name was popularized by Edward Kasner in 1938.

In most countries, one lakh is named hundred thousand and ten lakh is named million.

You're always counting numbers! What's your goal?
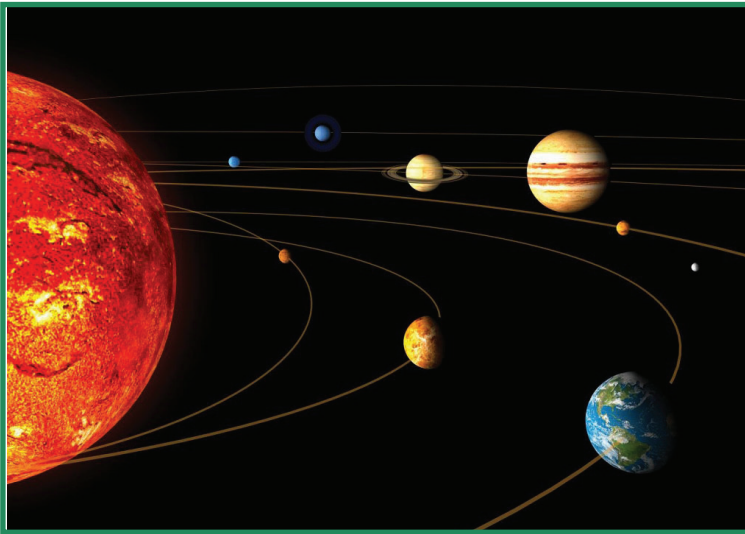
Googol!

- For each number below, find two numbers in the table between which it lies.

      3245;   435268;   26736;   43526720

- Write down a six-digit number. Between which two numbers of the table is it? How do you read it?

- Write down five numbers between a lakh and ten lakh. Read the numbers.

Distance of planets

The table gives the distances of the planets from the Sun.

Planets	Distance (km)
Mercury	57909175
Venus	108200000
Earth	149600011
Mars	227940000
Jupiter	778333000
Saturn	1429400000
Uranus	2870990000
Neptune	4504300000

What is the distance of the Earth from the Sun?

The table gives it as 149600011 kilometres. How do we read this number?

Fourteen crore, ninety six lakh and eleven.

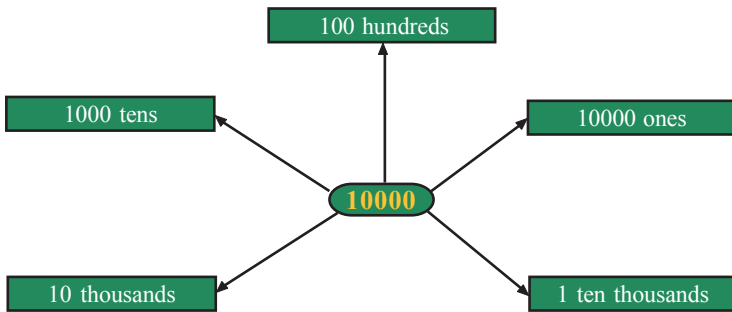What is the distance of Jupiter from the Sun?

What is the distance from the Sun to its nearest planet?

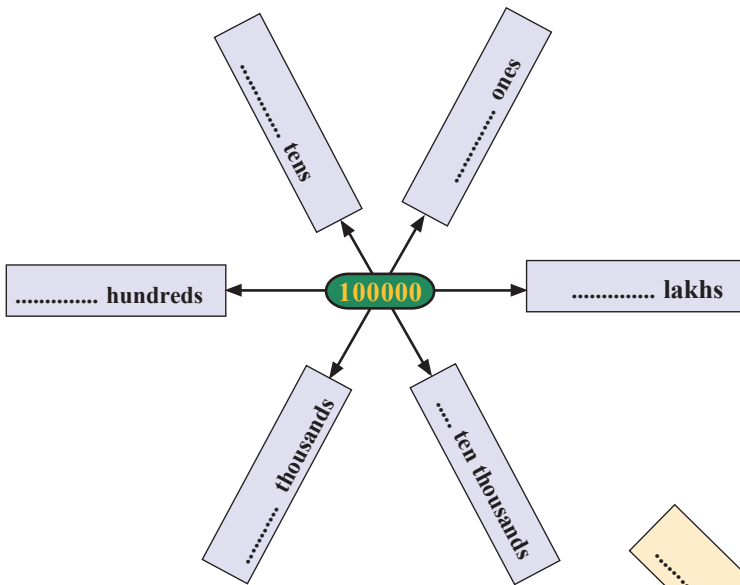What is the distance from the Sun to its farthest planet?

Read all these distances.
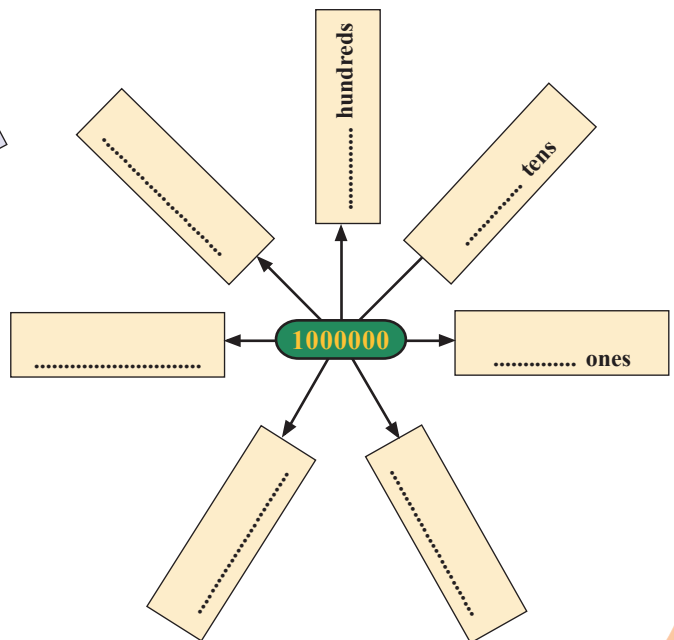
Many forms of ten thousand

See how 10000 is given in various forms:

| 100 hundreds |
| 1000 tens |
| 10000 ones |
| **10000** |
| 10 thousands |
| 1 ten thousands |

Now try this for 100000:

.... tens

.... ones

.... hundreds

100000

.... lakhs

.... thousands

..... ten thousands

And 1000000

.... hundreds

.... tens
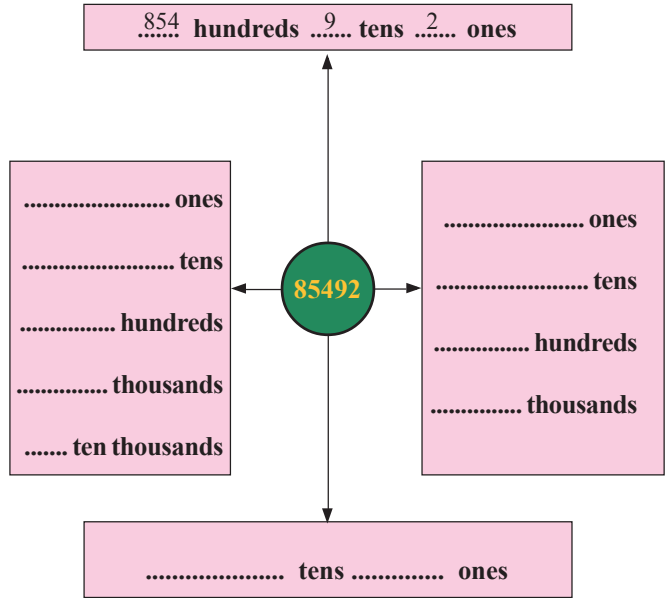
1000000

.... ones

One number, different forms
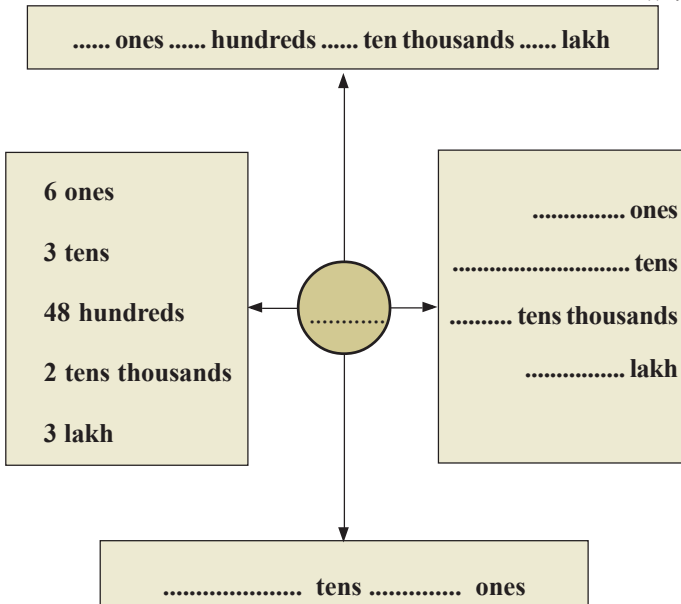
A game with digits

1 2 3 4 5

Write the above number five times, side by side. Now, you have a very large number. Strike off any ten digits you like. The remaining digits in the same order make a fifteen-digit number. What is the largest fifteen-digit number you can make like this?

- See how 85492 is written in different forms.

  854 **hundreds** 9 **tens** 2 **ones**

  .... **ones**
  .... **tens**
  .... **hundreds**
  .... **thousands**
  .... **ten thousands**

  85492

  .... **ones**
  .... **tens**
  .... **hundreds**
  .... **thousands**

  .... **tens** .... **ones**

- Fill the blanks with suitable numbers:

  Where are the remaining numbers, after you struck off what you didn't like?

  The remaining were those I didn't like at all!

  ...... **ones** ...... **hundreds** ...... **ten thousands** ...... **lakh**

  6 ones

  3 tens

  48 hundreds

  2 tens thousands

  3 lakh

  ....

  .... **ones**
  .... **tens**
  .... **tens thousands**
  .... **lakh**

  .... **tens** .... **ones**

- Write 136749 in different forms.

Population

The population of some states of India, according to the 2011 census, is given below:

States	Population
Jammu-Kashmir	12548926
Himachal Pradesh	6856509
Uttarakhand	10116752
Haryana	25353081
Rajasthan	68621012
Uttar Pradesh	199581477
Bihar	103804637
Sikkim	607688
Kerala	33387677
Tamil Nadu	72138958
Karnataka	61130704
Goa	1457723
Punjab	27704236

- From the table, which is the state with least population? What is its population?

- Which is the state with largest population? What is its population?

- What is the difference in population between these two states?

- What is the total population of our neighbour states, Tamil Nadu and Karnataka?

- How much more is the population of Uttar Pradesh than Bihar?

- Order the states according to their population.

Make more questions based on the table and present in the class.

Palindromic number

Numbers which read the same both forward and backward, such as 36563, are called palindromic numbers.

Can we make a palindromic number, staring with any number? Take any number. Reverse its digits and add to the original. Reverse the digits of this number and add.

Continue till we get a palindromic number. See what happens when we start with 69.

4884 is a palindromic number, isn't it?

Try with other numbers.

$$
\begin{array}{r}
69\ + \\
96 \\
\hline
165 \\
561 \\
\hline
726 \\
627 \\
\hline
1353 \\
3531 \\
\hline
4884
\end{array}
$$

It is not known whether this process will eventually reach a palindromic number every time. For example, it is found that starting with 196, this process does not gave a palindrome, even after seventy crore steps.
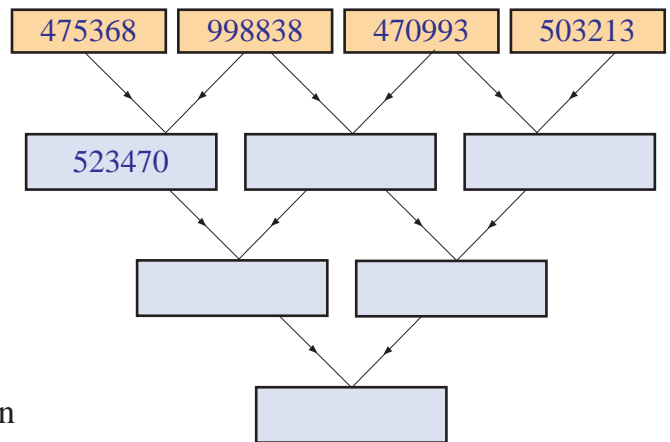
Let's make numbers

Ziad and Meera are making numbers with digit-cards. These are the cards they have:

| 4 | 0 | 7 | 8 | 5 | 6 |

- What is the largest number they can make with these cards?

- And the smallest?

- Find out the sum and differences of these.

Number chain

In the picture on the right, write in the second row, the difference of two nearby numbers in the first row. Then in the third row, write the difference of nearby numbers in the second row. And finally, the difference of these two numbers in the bottom box.

Digit sum and digital root

The sum of the digits of a number is called its digit sum. For example, the digit sum of

347 is $3 + 4 + 7 \to 14$.

The digit sum of 14 is $1 + 4 = 5$. 5 is called the digital root of 347.

What is the speciality of the digital roots of the numbers 9, 18, 27, 36...?

| 475368 | 998838 | 470993 | 503213 |

| 523470 | | |

Budget

In the budget of a Panchayath, money allotted for various sectors are as shown in this table:

Sectors	Amount (Rs)
Health	1255000
Education	789000
Road Development	2060000
Drinking water	490000

- Which sector is allotted the largest amount?

- And the least amount?

- How much more is allotted to Road Development than Education?

- What is the total allotment?

- For the next year, the allotment is to be increased by 4 lakhs. Draw up a revised budget, in two different ways.

Multiple multiplication

A school decided to give pens to all children participating in the Onam festival. The price of a pen is 6 rupees; and there are 256 children. What would be the total cost?

How do we calculate this?

$256 \times 6 = $ ....

A panchayath decided to provide furniture for the primary school. The price of a desk is 3456 rupees. What would be the total cost for 85 desks?

We want to calculate 3456×85.

We can write it out like this:.

$$3456 \times 85 \quad = \quad 3456 \times (5 + 80)$$

$$= \quad (3456 \times 5) + (3456 \times 80)$$

Now $\qquad 3456 \times 5 \ = $ ....

$\qquad\qquad 3456 \times 80 = $ ....

So, $\qquad 3456 \times 85 = $ ....

Start with any four digit number. Reverse the digits and find the difference of these numbers. Continue with this number. What do you see?

We can shorten it like this:

$$
\begin{array}{r}
3456 \times \\
85 \\
\hline
17280 \\
276480 \\
\hline
293760 \\
\hline
\end{array}
$$

Uniforms

There are 528 girls and 442 boys in a school. Uniform for a girl costs 210 rupees and for a boy, 160 rupees. What is the total cost for uniforms?

It's all the same

Rajeevan Master bought three packets of crayon, each for 12 rupees, as prize for the quiz. After the competition, two more children had to be given prizes and so he bought two more packets. How much did he spend in all?

$$\text{First, he spent} \ = \ 12 \times 3 \ = \ 36 \text{ rupees}$$

$$\text{Then he spent} \ = \ 12 \times 2 \ = \ 24 \text{ rupees}$$

$$\text{So altogether he spent} \ = \ 36 + 24 \ = \ 60 \text{ rupees}$$

This can be done in a different way:

He bought $3 + 2 = 5$ packets.

And the price of each packet is 12 rupees.

So he spent in all $12 \times 5 = 60$ rupees.

What do we see here?

$$(3 + 2) \times 12 \ = \ (3 \times 12) + (2 \times 12)$$

Doing in head

Do these without pen and paper:

- $(225 \times 98) + (225 \times 2)$
- $(45 \times 92) + (45 \times 8)$
- $(115 \times 88) + (115 \times 12)$
- $(132 \times 7) + (132 \times 993)$

Let's do it!

- In an educational district, there are 215 schools; and the district panchayath allotted 4850 rupees to each of these, for setting up Math Lab. And also 76500 rupees each for 36 schools for a Computer Lab. How much is the total allotment for labs?

- Under the Noon Meal Scheme, 150 grams of rice is allotted per day for each child. In a High School, 1240 children are in this scheme. How many kilograms of rice is needed per day?

- In an Upper Primary School, the PTA collected 236465 rupees to build a computer lab. It is in 1000, 500, 100, 50, 10 and 5 rupee notes. There are hundred 1000 rupee notes. What are the possible numbers of others? Write at least three different possibilities.

- It was decided to give 1221 books each to 587 selected libraries in the state during the *Reading Week*. How many books are to be bought in all?

- In an election, contested by two candidates, the winner got 374436 votes and his rival got 293760 votes. What is the winner's majority? 1436 votes were invalid. How many votes were polled?

Project

Write a four digit number and reverse the digits. Find the difference of these two. Do you note any speciality of the digital root of this number?

Looking back

Achievements	On my own	With teacher's help	Must improve
• Writing and reading large numbers like lakh, ten lakh and crore.			
• Interpreting place value as the ten fold increase in moving to the right.			
• Interpreting numbers in terms of ones, tens, hundreds, thousands and so on, depending on the context.			
• Finding appropriate methods to multiply by three digit numbers.			
• Describing various methods for multiplication.			
• Solving practical problems involving large numbers using the four basic operations.			