



Mathcraft

A COURSE IN MATHEMATICS



A craft called Mathematics

Encyclopædia Britannica, with its indisputable reputation as a world reference authority for more than two centuries, presents *Mathcraft*, a series of nine Mathematics books.

This includes a primer for the Kindergarten and eight textbooks for Classes 1 to 8.

A Craft called Mathematics

Implementing the National Curriculum Framework 2005, the series focuses on

- Learning mathematical concepts outside the classroom
- Interactive study approach that helps self learning
- Activities built around real-life experiences
- Opportunities to reason and analyse
- Spiral sequencing of concepts
- Inclusion of cartoons and stories to make learning attractive

Mathcraft is designed to develop in students an enthusiasm for the craft of numbers, quantity, and space.

An interesting theme introduces topics and continues across the chapter's content and exercises keeping alive learner's enthusiasm.

Content of the Primer and Book 1 initiates both active and passive learning.

Young learner appeal in Primer to Book 5

The Primer and Books 1&2 are in workbook format to lighten learner load.

Abundant in-text activities, jokes, along with games in MathsLab pages for learners to enjoy and learn

Trace number 5 by crayon and colour five apples.

Complete 5 in the pictures by joining the dashes.

Write 5. Start from dot (1) and follow the arrows. Next start from dot (2) and follow the arrows. Say 'five' as you write.

When we add 1 to 5, we first add the ones and then the tens.

Example: Add 1 to 5

Step 1: Add the ones
6 ones + 2 ones = 8 ones, write 8 in the ones place.

Step 2: Add the tens
1 ten + 3 tens = 4 tens, write 4 in the tens place.

Sum is 48

EXERCISE 2.1

Find the sum of each of the following:

- | | |
|--------|---|
| T | O |
| 2 | 5 |
| + | 5 |
| 5 | 1 |
| Sum is | |
- | | |
|--------|---|
| T | O |
| 6 | 3 |
| + | 1 |
| 1 | 6 |
| Sum is | |
- | | |
|--------|---|
| T | O |
| 7 | 1 |
| + | 1 |
| 1 | 8 |
| Sum is | |
- | | |
|--------|---|
| T | O |
| 2 | 9 |
| + | 1 |
| 1 | 0 |
| Sum is | |
- | | |
|--------|---|
| T | O |
| 1 | 6 |
| + | 3 |
| 3 | 2 |
| Sum is | |

3 Numbers up to 20

In the garden

10 ones and 1 more make 10.

10 ones make 1 ten.

Maths Lab Activity

Objective: To develop the skill of using number grid for addition and subtraction

Materials Required: A number grid with numbers 1 to 100 prepared on a square lined paper and glued onto cardboard (1 grid for 2 students), red and blue plastic counters: 1 for each student

Procedure:

- This activity can be done in pairs.
- The teacher will write a sum on the board say $23 + 20$.
- The student will keep the red counter on 23.
- The partner will keep blue counter on 23 and move it 2 spaces down, so as to add 20.
- Blue counter will be on 43 and red counter on 23.
- Result will be noted.
- Many such addition sums will be done, with the partners taking turns at placing and moving the counters.
- Then teacher will write a subtraction sum on the board say $29 - 5$.
- Again the red counter will be kept on 29 and the partner will move the blue counter backwards by 5 spaces to reach 24. Result will be noted.
- Many subtraction sums will be done in the same way.

Recommendation: Students should also do the same sums in the traditional way with columns.

Record the activity

Addition and Subtraction sums in different columns

Addition		Subtraction	
Sum	Result	Sum	Result
$23 + 20$	43	$29 - 5$	24





Books 6,7,8
integrate
mathematical
skills

2 Playing with Numbers

INTRODUCTION

Playing with numbers is really interesting and it can sometimes be shown as magic. Let us take an example.

Keep the following list handy with you.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	3	3	6	1	4	6	2	5	0	3	5

OPERATIONS ON NUMBERS

Addition

Addition of two or more numbers gives us another number. The numbers which are added are called addends and the new number thus obtained is called the sum. For example,

$$34670 + 12345 = 47015$$

Here, 34670 and 12345 are called addends and 47015 is called the sum of 34670 and 12345.

Large numbers are added in the same way as the small numbers.

Addition by grouping

When we add three numbers, we can add any two numbers first and then add the third number to the sum. In other words, we can group any two of the three numbers to find the sum of the three numbers.

For example, let us add 12, 18 and 25. We can add 12 and 18 first to get 30, and then add 25 to 30 to get the sum 55.

Ask your friend to tell his or her date of birth. Let it be 6 August 1999. In the above list the number for August month is 2; the date of birth is 6; the year ends with 99. Divide 99 by 4 (to take leap years) and take the quotient. The quotient here will be 24.

Now, add all these four numbers:
 $2 + 6 + 99 + 24 = 131$.

Divide 131 by 7 and take the remainder. It will be 5. So, the day on your friend's birthday will be **Friday** (Sunday for 0, Monday for 1, Tuesday for 2, Wednesday for 3, Thursday for 4, Friday for 5, Saturday for 6).

Best of luck for your magic with numbers.

Mental math drilling in each chapter to instill the skill of quick calculations

Mental Maths

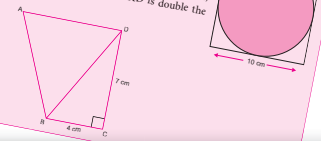


- _____ is the distance around a closed figure.
- The distance around a circular region is called its _____.
- 1 hectare = _____ m² and 1 acre = _____ m².
- If the area of a square is 64 cm², then its perimeter = _____.
- If the length of a regular octagon is 4 cm, then its perimeter = _____.
- If the side of a square is doubled, then its perimeter becomes _____ times the original perimeter.
- If both the height and base of a triangle are doubled, then its area becomes _____ times of the original area.
- If the circumference of a circle is 154 cm, then its radius is _____.
- If the area of a circle is 314 m², then its diameter is _____ (use $\pi = 3.14$).
- The area of circular ring with outer and inner radii r_1 and r_2 respectively is _____.

HOTS

Which is smaller, the perimeter of the square or the perimeter of the circle inscribed in it?

Calculate the area of $\triangle ABD$ in the figure given below. If $AD \parallel BC$ and the measure of AD is double the measure of BC .



Higher Order Thinking Skills (HOTS) interspersed frequently include problems that trigger analytical reasoning.

Interesting appetizers begin each chapter, whetting learner-interest.

Enjoyable cartoons and jokes inject humour into the classroom.

Take a break!



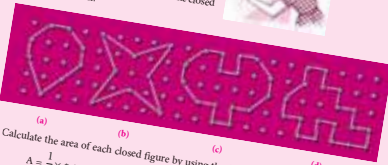
Maths Lab Activity

Objective: To determine the area of closed figures by using a dot paper.

Materials Required: Dot paper, geometry box

Procedure:

- Take a dot paper and join dots to make closed figure as shown:



- Calculate the area of each closed figure by using the formula
 $A = \frac{1}{2} \times p + q - 1$

where p = number of dots on the boundary of the figure
 q = number of dots inside the figure

- Let us find the area of the figures:

Area of Fig. (a), $A = \frac{1}{2} \times 8 + 5 - 1 = 4 + 5 - 1$
 $= 8$ square units

Area of Fig. (b), $A = \frac{1}{2} \times 8 + 5 - 1 = 4 + 5 - 1$
 $= 8$ square units

Area of Fig. (c), $A = \frac{1}{2} \times 16 + 6 - 1 = 8 + 6 - 1$
 $= 13$ square units.

Area of Fig. (d), $A = \frac{1}{2} \times 19 + 2 - 1$
 $= 9.5 + 2 - 1$
 $= 10.5$ square units

For more information visit www.britannica.com.

Maths-Lab Activity in each chapter facilitates hands-on learning and consolidation of mathematical concepts.

Value adds

- Content links connect new to the previous knowledge
- 4 Es followed in topics: Example – Explanation – Exercise – Evaluation
- Graded content with sufficient recapitulation
- Extensive drilling with an integrated revision exercise in each chapter
- Question banks for the three academic terms
- More: Summary of topics, puzzles, jokes, information snippets, and teacher's tips
- Attractive layout with child-friendly illustrations

Worksheet 3

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- A bus started its journey and reached different places with a speed of 60 km/hr. The journey is shown as
 - Find the total distance covered by bus from A to G.
 - Find the total distance covered by bus from C to F.
 - Find the time taken in entire journey from A to G.
- I am a number between 20 and 30. If you divide 71 and 94 by me, the remainder is 2. What number am I?
- Simplify:
 $100 + [10 + 15 \div 3 - (20 + 30 - 45 \div 5)]$
- Srikant plays basketball every day and Saurya plays basketball every fourth day. They played together on Monday. When will they get a chance to play together again?
- From school A out of 650 students, 250 were selected for essay writing and from another school B out of 800 students 325 were selected. From which school, more students were selected?
- A rope is of length 7.87 m. If 2.58 m is cut from it, how much of the rope is left? Is this rope sufficient to tie a cloth line between two hooks which are 6 m apart? If not, how much more is required?
- A monkey climbed up $\frac{1}{4}$ of a pole in first move, and in the next move it slipped down $\frac{1}{8}$ of the pole. In how many moves he finally reached on to the top of the pole?
- Rima is 11 years old and his uncle is 59 years old. How many years ago the age of Rima's uncle become 7 times the age of Rima?
- The interest on Rs 3,000 for one year is Rs 210. What is the interest on Rs 4,500 for a year at the same rate? If one wants to get an interest of Rs 700 at the same rate, what should be the principal?
- Construct an angle of 75° with the help of a ruler and a compass.
- Swapana was asked to find the number of students playing different games in the school. The information collected by her is as follows:

Football - 30	Badminton - 10
Cricket - 20	Volleyball - 30
Basketball - 40	

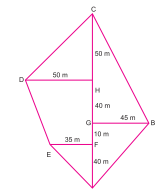
 Represent the above information with a pictograph.

Worksheets to add challenge for the learner

Extensive drilling to integrate concepts

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- Find the area of a trapezium whose parallel sides are 36 cm and 12 cm and its non-parallel sides are 15 cm each.
 - A rectangular water tank of base $11 \text{ m} \times 6 \text{ m}$ contains water up to a height of 5 m. If the water from the tank is transferred to a cylindrical tank of radius 3.5 m, find the height of water level in the cylindrical tank.
- D. Answer the following:** (6 × 5 = 30)
- Manish purchased two hand bags for Rs 750 each. He sold these bags, gaining 6% on one and losing 4% on the other. Find his gain or loss per cent in the whole transaction.
 Or
 Arman sold his motorcycle to Vineet at a loss of 28%. Vineet spent Rs 1680 on its repair and sold it for Rs 35910 after making a profit of 12.5%. Find the cost price of the motorcycle for Arman.
 - The value of a car is depreciating at the rate of $12\frac{1}{2}\%$ per annum. If its present worth is Rs 204800, what will be its value after 3 years.
 - A room is 4.5 m long, 3 m wide, and 2.8 m high. It has one door of dimensions 1.4 m × 2 m × 1.5 m. Find the cost of whitewashing the inner four walls at the rate of Rs 10 per m².
 - Find the area of following figure:



- The electricity bills (in Rs) of 25 houses of a certain locality for a month are given below:
 700, 324, 400, 617, 365, 356, 435, 548, 506, 736, 780, 378, 685, 570, 312, 630, 584, 674, 776, 754, 596, 745, 763, 565, 472
 Prepare a frequency distribution table using suitable class intervals and draw the histogram.



Mathcraft aims to allow the student to explore the multiple aspects of this subject through implementation of its principles in life and, thereby, develop a passion for it. The care and thought invested in designing *Mathcraft* will assuredly hone not only mathematical skill and ability but also foster a love and passion for the subject.

Math Support

Teacher's books: Along with abundant Teacher Tips in the books, each book is accompanied by a teacher's book to facilitate teaching and provide additional activities.

Website: Access more Math related information from www.britannica.com

Web support development in process



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