

MATHEMAGIC ACTIVITY BOOK

CLASS - VI

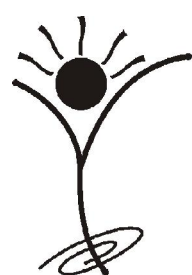
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SYLLABUS GUIDELINES

CLASS - VI

Based on CBSE, ICSE & GCSE Syllabus



Number System

(i) Knowing Numbers:

Consolidating the *sense* of numberness up to 5 digits, Size, estimation of numbers, identifying smaller, larger, etc. Place value (recapitulation and extension), connectives: use of symbols =, <, > and use of brackets, word problems on number operations involving large numbers up to a maximum of 5 digits in the answer after all operations. This would include conversions of units of length & mass (from the larger to the smaller units), estimation of outcome of number operations. Introduction to a sense of the largeness of, and initial familiarity with, large numbers up to 8 digits and approximation (of large numbers)

(ii) Playing with Numbers:

Simplification of brackets, Multiples and factors, divisibility rule of 2, 3, 4, 5, 6, 8, 9, 10, 11. (All these through observing patterns. Children would be helped in deducing some and then asked to derive some that are a combination of the basic patterns of divisibility.) Even/odd and prime/composite numbers, Co-prime numbers, prime factorization, every number can be written as products of prime factors. HCF and LCM, prime factorization and division method for HCF and LCM, the property $LCM \times HCF = \text{product of two numbers}$. All this is to be embedded in contexts that bring out the significance and provide motivation to the child for learning these ideas.

(iii) Whole numbers

Natural numbers, whole numbers, properties of numbers (commutative, associative, distributive, additive identity, multiplicative identity), number line. Seeing patterns, identifying and formulating rules to be done by children. *(As familiarity with algebra grows, the child can express the generic pattern.)*

(iv) Negative Numbers and Integers

How negative numbers arise, models of negative numbers, connection to daily life, ordering of negative numbers, representation of negative numbers on number line. *Children to see patterns, identify and formulate rules.* What are integers, identification of integers on the number line, operation of addition and subtraction of integers, showing the operations on the number line (addition of negative integer reduces the value of the number) comparison of integers, ordering of integers.

(v) Fractions:

Revision of what a fraction *is*, Fraction as a part of whole, Representation of fractions (pictorially and on number line), fraction as a division, proper, improper & mixed fractions, equivalent fractions, comparison of fractions, addition and subtraction of fractions (Avoid large and complicated unnecessary tasks). (Moving towards abstraction in fractions) Review of the idea of a decimal *fraction*, place value in the context of decimal *fraction*, inter conversion of fractions and decimal



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                              fractions (avoid recurring decimals at this stage), word problems involving addition and subtraction of decimals (two operations together on money, mass, length and temperature) Algebra Introduction to Algebra • Introduction to variable through patterns and through appropriate word problems and generalizations (example $5 \times 1 = 5$ etc.) • Generate such patterns with more examples. • Introduction to unknowns through examples with simple contexts (single operations) Ratio and Proportion • Concept of Ratio • Proportion as equality of two ratios • Unitary method (with only direct variation) • Word problems Geometry (i) Basic geometrical ideas (2 D): Introduction to geometry. Its linkage with and reflection in everyday experience. • Line, line segment, ray • Open and closed figures. • Interior and exterior of <i>closed</i> figures. • Curvilinear and linear <i>boundaries</i> • Angle - Vertex, arm, interior and exterior, • Triangle- vertices, sides, angles, interior and exterior, altitude and median • Quadrilateral- Sides, vertices, angles, diagonals, adjacent sides and opposite sides (only convex quadrilateral are to be discussed), interior and exterior of a quadrilateral. • Circle- Centre, radius, diameter, arc, sector, chord, segment, semicircle, circumference, interior and exterior.	 6 (ii) Understanding Elementary Shapes (2 D and 3 D) • Measure of Line segment • Measure of angles • Pair of lines • Intersecting and perpendicular lines • Parallel lines • Types of angles- acute, obtuse, right, straight reflex, complete and zero angle • <i>Classification</i> of triangles (<i>on the basis of</i> sides, and of angles) • Properties of parallel lines with transversal (alternate, corresponding, interior, exterior angles) Mensuration Concept of perimeter and introduction to area Introduction and general understanding of <i>perimeter</i> using many shapes. Shapes of different kinds with the same perimeter. Concept of area, Area of a rectangle and a square. <i>Counter examples to different misconcepts related to perimeter and area.</i> Perimeter of a rectangle – and its special case – a square. Deducing the formula of the perimeter for a rectangle and then a square through pattern and generalization. Data handling - What is data - choosing data to examine a hypothesis? - Collection and organisation of data - examples of organising it in tally bars and a table. - Pictograph- Need for scaling in pictographs interpretation & construction. - Making bar graphs for given data interpreting bar graphs.  5
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Activity work sheet



Grid Colouring Activity

Colour the grid with required specification.

1	2	3	4	5	6	7	8	9	10
20	19	18	17	16	15	14	13	12	11
21	22	23	24	25	26	27	28	29	30
40	39	38	37	36	35	34	33	32	31
41	42	43	44	45	46	47	48	49	50
60	59	58	57	56	55	54	53	52	51
61	62	63	64	65	66	67	68	69	70
80	79	78	77	76	75	74	73	72	71
81	82	83	84	85	86	87	88	89	90
100	99	98	97	96	95	94	93	92	91



1. Colour all the multiples of 2 by Red colour.
2. Colour all the multiples of 3 by Yellow colour.
3. Colour all the multiples of 4 by Green colour.
4. Colour all the multiples of 5 by Blue colour.

Now perform the following activity

Write how many numbers boxes are two coloured.....

Write how many number boxes are three coloured.....



 Activity work sheet



Forming Algebraic Expression

- 
 1. Eleven less than three times a number.
 2. Fifty divided by two times a number.
 3. Three times a number is twenty-one.
 4. Four times a number increased by seven.
 5. A number increased by seventeen is twenty-two.
 6. Twice a number is seventy-six.
 7. Twelve less than a number is thirty.
 8. Six is fifteen less than three times a number.
 9. Sixty divided by four times a number.
 10. Twice a number, decreased by nineteen.
 11. Eighty-one is three times a number.
 12. Twenty five is two times a number plus one.
 13. Twelve times a square of number.
 14. Thrice a number, increased by nineteen.
 15. Thirty six is nine less than three times a number.

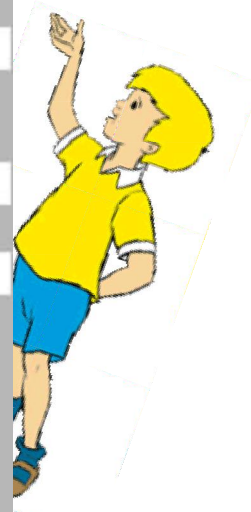
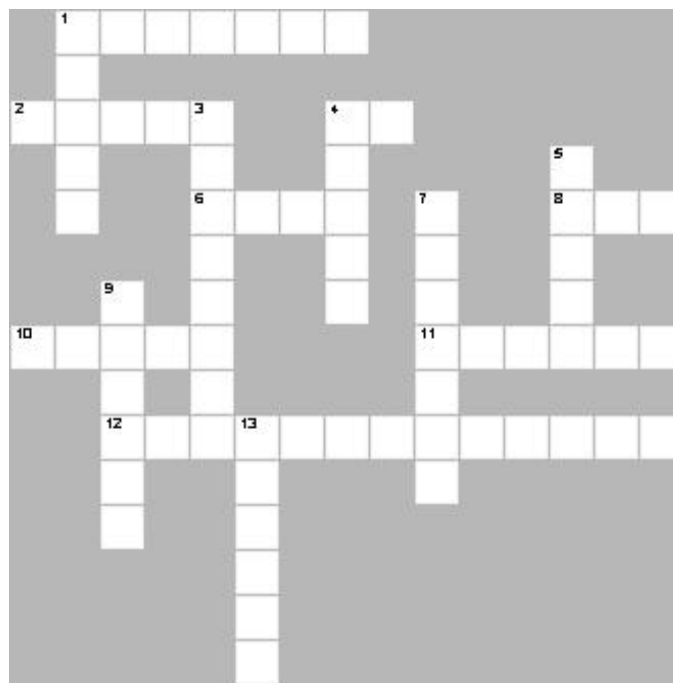




Activity work sheet



Crossword Puzzle

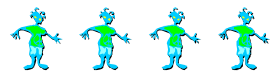


ACROSS

1. An instrument used to draw circles.
2. The shape of a circle.
4. The ratio of the circumference and diameter of any circle.
6. The number of square units occupied by the space inside the circle.
8. A part of a circle named by its endpoints.
10. A location in space that has no thickness.
11. The distance from the center of a circle to any point on the circle.
12. The distance around a circle.

DOWN

1. A line joining two points on the circle.
3. The distance across a circle through its center.
4. A circle divides a _____ into two parts.
5. Plural for half a diameter.
7. A circle has 360 of these units.
9. A shape with all points are at the same distance from its center.
13. All points in a circle are at the same distance from this point.



Activity work sheet

6



Do you have Math Anxiety?

Math anxiety is an emotional reaction to mathematics based on a past unpleasant experience which harms future learning. A good experience learning mathematics can overcome these past feelings and success and future achievement in math can be attained. If you have math anxiety talk to EduHeal Foundation.

Rate your answers from 1 to 5; add them up and check your score below.

(1) = Disagree,
(5) = Agree



- I dislike when I have to go to math class. 1 2 3 4 5
- I am uneasy about going to the board in a math class. 1 2 3 4 5
- I am afraid to ask questions in math class 1 2 3 4 5
- I am always worried about being called on in math class 1 2 3 4 5
- I understand math now, but I worry that it's going to get really difficult soon. 1 2 3 4 5
- I tend to feel odd in math class 1 2 3 4 5
- I fear math tests more than any other kind. 1 2 3 4 5
- I don't know how to study for math tests 1 2 3 4 5
- It's clear to me in math class, but when I go home it's like I was never there. 1 2 3 4 5
- I'm afraid I won't be able to keep up with the rest of the class 1 2 3 4 5

CHECK YOUR SCORE :

40-50	Sure thing, you have math anxiety. Talk to EduHeal Foundation/EduSys Today.
30-39	No doubt! You're still need to work on your math fears.
20-29	On the fence! shed your fears.
10 -19	Maths is no worry to you!

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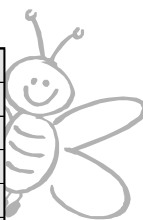
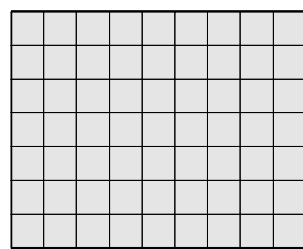
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Activity work sheet

Brain Benders

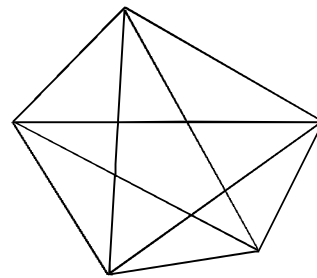


1. How many distinct squares (not necessarily different in size) can be traced out following only the lines of the grid drawn on the figure?



2. Kirti wishes to measure out 4 litres of water, but has only two jugs which, when full, hold 3 litres and 5 litres respectively and have no other markings on them. Plenty of water is available from a tap. How can Kirti measure out exactly 4 litres?

3. The diagram is of an irregular pentagon with all 5 of its diagonals drawn in. How many distinct triangles (not necessarily different) can be found, using only the lines (or parts of lines) in the diagram?

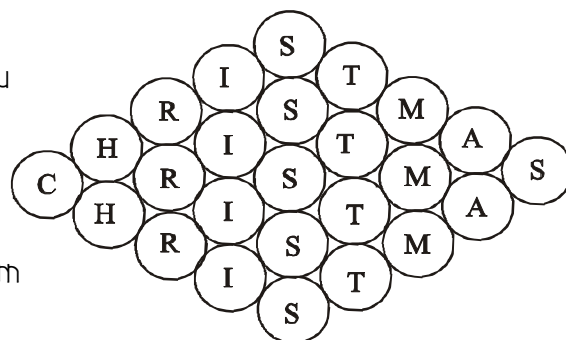


4. The drawing on the right is of a "puzzle dartboard". Each dart scores the number written in the cell in which it lands. You may throw as many darts as you like, but must score exactly 100.

16	0	24
0	39	0
23	0	17

What is the **least** number of darts you would need, and in which cells must they land?

5. In the diagram on the right, you must start on the 'C' at one end and move to the 'S' at the other. You must pass through 7 circles. You can only move from



10



6

In how many different ways can this be done?

- | | |
|--------------------------|--------|
| Egg and soup | Rs 72 |
| Egg and cake | Rs 84 |
| Egg, soup and beans | Rs 94 |
| Egg, soup and cake | Rs 118 |
| Egg, soup and 2 sausages | Rs 98 |

7. Father Christmas had a problem.

How many fair-haired, blue-eyed dolls saying 'Mama' were needed?