A landmark document, **the National Education Policy 2020 (NEP)** is a framework that emphasizes the holistic development of learners through experiential learning, arming them with twenty-first-century skills.

Ratna Sagar has always been at the forefront whenever any change is introduced by the government, the CBSE, the NCERT or other boards.

We updated our books and provided support for:

- **COMMUNICATIVE APPROACH**
- **NCF (2005)**
- **CCE (2010)**
- **NEP (2020)**
- **CBA (2021)**
- **NIPUN BHARAT (2021)**
- **SAFAL (2021)**

All our major courses are fully compliant with NEP 2020 guidelines.
Here we present Number Magic 6–8.

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Some Major Skills & Focus Areas

In Number Magic 6–8

"**Creativity** refers to new ways of seeing or doing things and includes generating new ideas, flexibility, originality, and building on others' ideas."

– 21st Century Skills Handbook by CBSE

Creativity

BK 6 Activities in pp. 305 (Ch 4), 309 (Ch 7), 311 (Ch 10), 313 (Ch 14)

BK 7 Activities in pp. 255, 367 (Ch 10), 370 (Ch 18), 371 (Ch 19)

BK 8 Activities in pp. 384, 385, 388 (Ch 18), 389 (Ch 19)

Critical Thinking

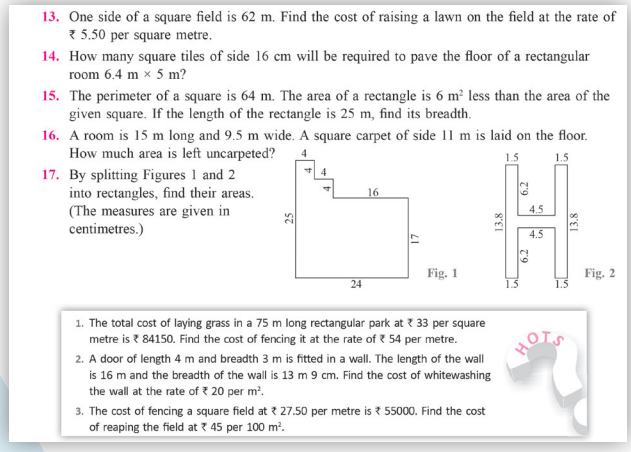
All HOTS questions & puzzles:

BK 6 pp. 220, 249, 257, 290 (Puzzle)

BK 7 pp. 16, 36, 153 (Puzzle), 247 (Magic Square), 341

BK 8 pp. 42, 117, 183, 278, 311

BK 6, p. 220 (HOTS)



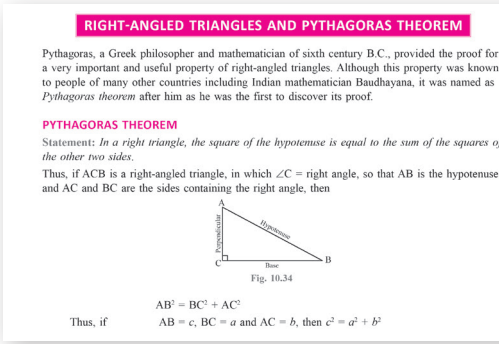
13. One side of a square field is 62 m. Find the cost of raising a lawn on the field at the rate of ₹ 5.50 per square metre.
14. How many square tiles of side 16 cm will be required to pave the floor of a rectangular room 6.4 m × 5 m?
15. The perimeter of a square is 64 m. The area of a rectangle is 6 m² less than the area of the given square. If the length of the rectangle is 25 m, find its breadth.
16. A room is 15 m long and 9.5 m wide. A square carpet of side 11 m is laid on the floor. How much area is left uncarpeted?
17. By splitting Figures 1 and 2 into rectangles, find their areas. (The measures are given in centimetres.)

Fig. 1 Fig. 2

HOTS

1. The total cost of laying grass in a 75 m long rectangular park at ₹ 33 per square metre is ₹ 84150. Find the cost of fencing it at the rate of ₹ 54 per metre.
2. A door of length 4 m and breadth 3 m is fitted in a wall. The length of the wall is 16 m and the breadth of the wall is 13 m 9 cm. Find the cost of whitewashing the wall at the rate of ₹ 20 per m².
3. The cost of fencing a square field at ₹ 27.50 per metre is ₹ 55000. Find the cost of reaping the field at ₹ 45 per 100 m².

Critical Thinking is the ability to think clearly and rationally and understand the logical connections between ideas; to analyze facts and come to a conclusion.



RIGHT-ANGLED TRIANGLES AND PYTHAGORAS THEOREM

Pythagoras, a Greek philosopher and mathematician of sixth century B.C., provided the proof for a very important and useful property of right-angled triangles. Although this property was known to people of many other countries including Indian mathematician Baudhayana, it was named as *Pythagoras theorem* after him as he was the first to discover its proof.

PYTHAGORAS THEOREM

Statement: *In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.*

Thus, if ACB is a right-angled triangle, in which ∠C = right angle, so that AB is the hypotenuse and AC and BC are the sides containing the right angle, then

Fig. 10.34

Thus, if $AB^2 = BC^2 + AC^2$, AB = c, BC = a and AC = b, then $c^2 = a^2 + b^2$

BK 7, p. 141

Collaboration

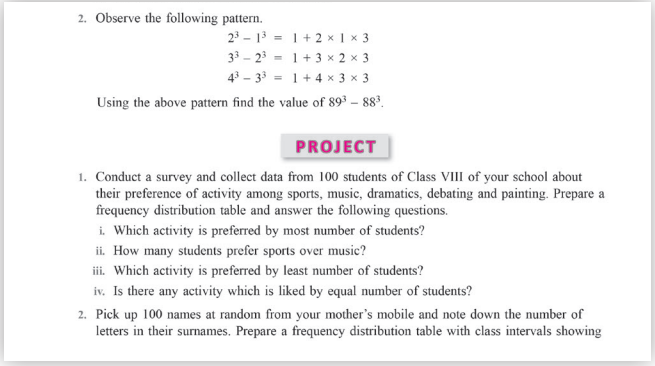
BK 6 pp. 307 (Ac 2), 309 (Ch 6), 312 (Ac 2)

BK 7 pp. 138 (Ac), 142 (Ac), 368 (Ch 16)

BK 8 pp. 168 (Project), 239 (Ac), 265 (Ac), 387 (Ch 11 & 16)

"**Collaboration** is the ability to effectively work together with others."

– 21st Century Skills Handbook by CBSE



2. Observe the following pattern.

$2^3 - 1^3 = 1 + 2 \times 1 \times 3$

$3^3 - 2^3 = 1 + 3 \times 2 \times 3$

$4^3 - 3^3 = 1 + 4 \times 3 \times 3$

Using the above pattern find the value of $89^3 - 88^3$.

PROJECT

1. Conduct a survey and collect data from 100 students of Class VIII of your school about their preference of activity among sports, music, dramatics, debating and painting. Prepare a frequency distribution table and answer the following questions.
   i. Which activity is preferred by most number of students?
   ii. How many students prefer sports over music?
   iii. Which activity is preferred by least number of students?
   iv. Is there any activity which is liked by equal number of students?
2. Pick up 100 names at random from your mother's mobile and note down the number of letters in their surnames. Prepare a frequency distribution table with class intervals showing

BK 8, p. 168

Problem-solving

BK 6 pp. 8 (Ex 1A), 35 (Mental Maths), 210 (Checkpoint), 294 (MCQs)

BK 7 pp. 30 (Ex 2A), 55, 88, 123, 345 (MCQs)

BK 8 pp. 163 (Ex 12B), 190 (Ex 14A), 239 (Checkpoint), 283 (Mental Maths), 365 (MCQs)

Conceptual Understanding refers to an integrated and functional grasp of ideas.

Ch = Chapter; Ac = Activity

SKILLS – page 2

FOCUS AREAS – page 3

Application of Knowledge

BK 6 pp. 66 (Ex 3I), 130 (6C/14–15), 154 (Checkpoint/1–3), 197 (Ex 9C)

BK 7 pp. 10 (1A/17–18), 105, 146 (Ex 10D), 273 (Ex 16D)

BK 8 pp. 44 (Ex 2B), 124, 207, 272, 298 (9-24)

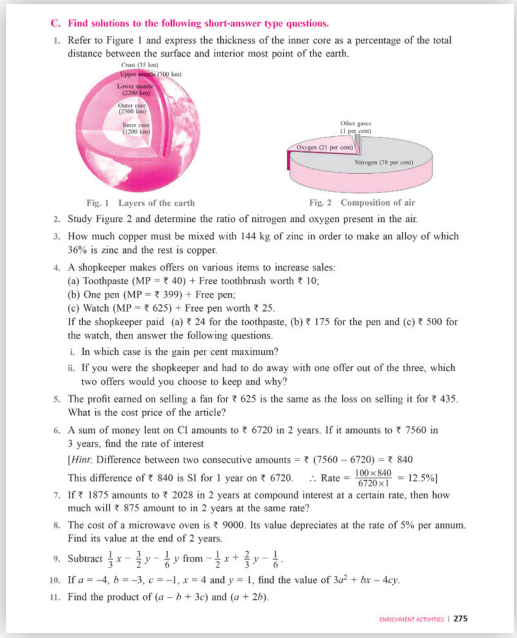
Conceptual Understanding

BK 6 pp. 49 (More Divisibility Rules), 115 (Prisms & Pyramids)

BK 7 pp. 85 (Probability), 90 (Forming an equation), 141 (Pythagoras theorem), 207 (Simple interest)

BK 8 pp. 191 (Discount), 233 (Maps), 305 (Time and work), 338 (Distance-time graph)

BK 8, p. 275 (C1 and C2) includes: Physics and Chemistry



C. Find solutions to the following short-answer type questions.

1. Refer to Figure 1 and express the thickness of the inner core as a percentage of the total distance between the surface and interior most point of the earth.

Fig. 1 Layers of the earth

Fig. 2 Composition of air

2. Study Figure 2 and determine the ratio of nitrogen and oxygen present in the air.
3. How much copper must be mixed with 144 kg of zinc in order to make an alloy of which 36% is zinc and the rest is copper.
4. A shopkeeper makes offers on various items to increase sales:
   (a) Toothpaste (MP = ₹ 40) + Free toothbrush worth ₹ 10;
   (b) One pen (MP = ₹ 399) + Free pen;
   (c) Watch (MP = ₹ 625) + Free pen worth ₹ 25.
   If the shopkeeper paid (a) ₹ 24 for the toothpaste, (b) ₹ 175 for the pen and (c) ₹ 500 for the watch, then answer the following questions.
   i. In which case is the gain per cent maximum?
   ii. If you were the shopkeeper and had to do away with one offer out of the three, which two offers would you choose to keep and why?
5. The profit earned on selling a fan for ₹ 625 is the same as the loss on selling it for ₹ 435. What is the cost price of the article?
6. A sum of money lent on CI amounts to ₹ 6720 in 2 years. If it amounts to ₹ 7560 in 3 years, find the rate of interest
   [*Hint:* Difference between two consecutive amounts = ₹ (7560 – 6720) = ₹ 840
   This difference of ₹ 840 is SI for 1 year on ₹ 6720. ∴ Rate = $\frac{100 \times 840}{6720 \times 1}$ = 12.5%]
7. If ₹ 1875 amounts to ₹ 2028 in 2 years at compound interest at a certain rate, then how much will ₹ 875 amount to in 2 years at the same rate?
8. The cost of a microwave oven is ₹ 9000. Its value depreciates at the rate of 5% per annum. Find its value at the end of 2 years.
9. Subtract $\frac{1}{3}x - \frac{3}{2}y - \frac{1}{6}y$ from $-\frac{1}{2}x + \frac{2}{3}y - \frac{1}{6}$.
10. If $a = -4$, $b = -3$, $c = -1$, $x = 4$ and $y = 1$, find the value of $3a^2 + bx - 4cy$.
11. Find the product of $(a - b + 3c)$ and $(a + 2b)$.

ENRICHMENT ACTIVITIES | 275

Experiential Learning

BK 6 Activities in pp. 215, 304 (Ch 3), 309 (Ch 6), 311 (Ch 10)

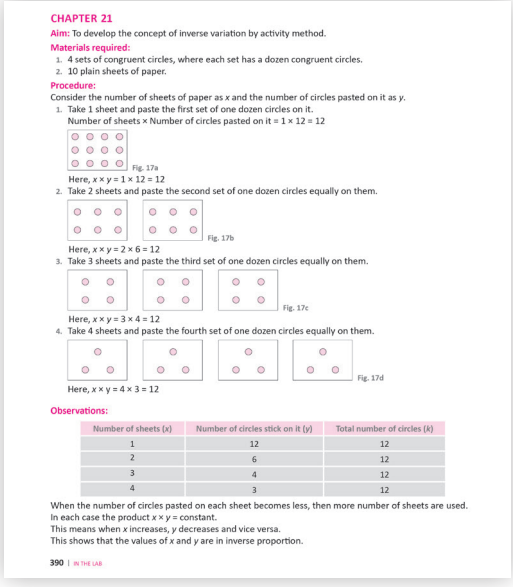
BK 7 Activities in pp. 138, 142, 161, 255

BK 8 Activities in pp. 247, 265, 390 (Ch 21), 391 (Ch 25)

▲ **Multidisciplinary Approach** involves several different subjects of study.

"**Experiential Learning** is learning imbibed through observing, understanding, practising and experiencing."

– 21st Century Skills Handbook by CBSE



CHAPTER 21

Aim: To develop the concept of inverse variation by activity method.

Materials required:
1. 4 sets of congruent circles, where each set has a dozen congruent circles.
2. 10 plain sheets of paper.

Procedure:

Consider the number of sheets of paper as x and the number of circles pasted on it as y.

1. Take 1 sheet and paste the first set of one dozen circles on it.
   Number of sheets × Number of circles pasted on it = 1 × 12 = 12
   Fig. 17a
   Here, $x \times y = 1 \times 12 = 12$
2. Take 2 sheets and paste the second set of one dozen circles equally on them.
   Fig. 17b
   Here, $x \times y = 2 \times 6 = 12$
3. Take 3 sheets and paste the third set of one dozen circles equally on them.
   Fig. 17c
   Here, $x \times y = 3 \times 4 = 12$
4. Take 4 sheets and paste the fourth set of one dozen circles equally on them.
   Fig. 17d
   Here, $x \times y = 4 \times 3 = 12$

Observations:

Number of sheets (x)	Number of circles stick on it (y)	Total number of circles (k)
1	12	12
2	6	12
3	4	12
4	3	12

When the number of circles pasted on each sheet becomes less, then more number of sheets are used.
In each case the product $x \times y$ = constant.
This means when x increases, y decreases and vice versa.
This shows that the values of x and y are in inverse proportion.

390 | IN THE LAB

BK 8, p. 390

Multidisciplinary Approach

BK 6 pp. 16 (Checkpoint/1), 137 (Checkpoint/1), 223 (Project)

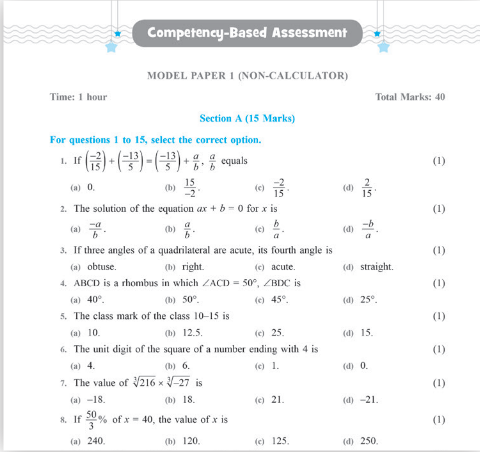
BK 7 pp. 14 (Example 16), 21 (Example 25), 22 (HOTS), 81 (C2 and C5), 141 (Biography)

BK 8 pp. 120 (Ex 4), 157 (Hardy-Ramanujan number), 278 (Project), 286 (Example 20), 287 (Example 21)

Listed here are just a few illustrative examples of NEP-compliant pages. We will be happy to provide the other page references.

Ratna Sagar support for NEP, CBA, SAFAL, etc. — Available on request

- Model question papers for CBA
- Summaries & paraphrase
- Extra activities & projects
- Extra questions
- Sample questions (SAFAL for classes 3, 5 & 8)
- Workshops
- More as newer policies are announced



Competency-Based Assessment

MODEL PAPER 1 (NON-CALCULATOR)

Time: 1 hour | Total Marks: 40

Section A (15 Marks)

For questions 1 to 15, select the correct option.

1. If $\left(\frac{-2}{15}\right)+\left(\frac{-13}{5}\right)=\left(\frac{-13}{5}\right)+\frac{a}{b}$, $\frac{a}{b}$ equals (1)
   (a) 0. (b) $\frac{15}{-2}$. (c) $\frac{-2}{15}$. (d) $\frac{2}{15}$.
2. The solution of the equation $ax + b = 0$ for x is (1)
   (a) $\frac{-a}{b}$. (b) $\frac{a}{b}$. (c) $\frac{b}{a}$. (d) $\frac{-b}{a}$.
3. If three angles of a quadrilateral are acute, its fourth angle is (1)
   (a) obtuse. (b) right. (c) acute. (d) straight.
4. ABCD is a rhombus in which $\angle ACD = 50°$, $\angle BDC$ is (1)
   (a) 40°. (b) 50°. (c) 45°. (d) 25°.
5. The class mark of the class 10–15 is (1)
   (a) 10. (b) 12.5. (c) 25. (d) 15.
6. The unit digit of the square of a number ending with 4 is (1)
   (a) 4. (b) 6. (c) 1. (d) 0.
7. The value of $\sqrt[3]{216} \times \sqrt[3]{-27}$ is (1)
   (a) –18. (b) 18. (c) 21. (d) –21.
8. If $\frac{50}{3}\%$ of $x = 40$, the value of x is (1)
   (a) 240. (b) 120. (c) 125. (d) 250.

CBA Test paper, Mathematics 8

Our forever support

Teacher's Companions	e-live 2.0	Apps	Teacher-training Workshops	
Resource material to support teachers Comprehensive lesson plans, worksheets and more	Innovative and comprehensive digital content such as 2-D and 3-D animation, test generator, eBooks, concept maps, videos, infographics, slideshows and more	Apptive Learn e-live 2.0 APPTIVE LEARN Apptive Practice e-live 2.0 APPTIVE PRACTICE	We train 60,000+ teachers across 5,000+ schools	Theme-based Notebooks, Planners and Posters

Forty years ago, Ratna Sagar made a commitment to education with this pledge:

> “Ratna Sagar stems from a deeply-felt desire to present only the finest in books . . . (our books) will represent exemplary standards of book publication and will embody the highest levels of teaching methodology, design and presentation, and pedagogical effectiveness.”

We are proud to have lived up to our pledge.
And we promise to continue doing so.

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