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Start Up
MATHEMATICS
Activity Book

NEP-Aligned
Skill Development and Practice

Effective **NEP** implementation
tools for learning mathematics

- Discovery, discussion and analysis-based learning
- Interdisciplinary and co-curricular strategy
- HOTS, critical thinking and problem solving
- Life skills
- Experiential learning promoting exchange of ideas
- Case studies to promote investigative thinking
- Precisely mapped with Start Up Mathematics coursebook

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Percentage

Picture Study

Skills Covered: • Problem solving • Creativity • Logical and critical thinking
• Observation • Decision making

Sara is out with her family to have dinner at a restaurant. The menu card of the restaurant is given below.



They ordered 3 sandwiches, 1 cottage cheese cutlet, 2 vegetable soups, 1 spring roll, 1 tea on the rocks, 2 buttermilks.

Can you find out the mistakes in the bill they received?

Items	Rate (in ₹)	Quantity Ordered	Amount (in ₹)
Sandwich	30	3	80
Cottage Cheese Cutlet	80	1	80

Vegetable Soup	50	2	30
Spring Roll	160	1	160
Tea on the Rocks	45	1	40
Buttermilk	40	2	80
Total Amount			470
GST @ 18%			84.60
Net Amount with GST			554.60

1. The total amount of the bill was ₹ _____.
2. The amount of GST @ 18% was ₹ _____.
3. The net amount with GST was ₹ _____.
4. Sara asked her father to order pasta next time instead of sandwich and fresh lime soda in place of buttermilk. Find the cost of the bill with these changes along with GST.

Data Study

Skills Covered: • Problem solving • Logical and critical thinking
• Observation • Decision making

Saran and her family visit a departmental store to purchase the following items.

Items	Quantity	Price Per Unit	GST
Tube light	4 pieces	₹ 160	5%
Toothpaste	2 pieces	₹ 80	5%
Milk	3 packets	₹ 120	5%
Shoe polish	1 piece	₹ 75	5%
Vegetables	2 kg	₹ 30	5%

1. The total amount without GST is _____.
2. The net amount inclusive of GST is _____.
3. Saran's father, paid using his credit card for which he was charged 5% more. The amount paid by him is _____.
4. Saran's mother asked him to add 2 litres cooking oil (@ ₹ 175 per litre) and 3 kg sugar (@ ₹ 40 per kg). What would be the amount for the new bill?

Life Skills

Skills Covered: • Problem solving • Logical and critical thinking • Decision making • Analytical skills
• Communication skills • Interpersonal skills • Teamwork • Social and emotional skills

1. The human body is made up mostly of water. In fact, on an average 60% of a person's total weight is water. If Anamika's weight is 70 kg, what amount of her weight is water? How much water should you drink every day?

2. Madhu's room measures $18\text{ m} \times 9\text{ m}$. She has a carpet in the room that covers 100 m^2 . What percent of her floor is covered by carpet?

Time To Investigate

Skills Covered: • Creativity • Teamwork • Problem solving • Observation • Logical and critical thinking
• Mathematical aptitude • Investigation • Data recording

Find the prices of following items in the years 2016 and 2021 using the Internet.

- LPG cylinder
- Gold per 10 gram
- Petrol per litre
- Mustard oil per litre

Then calculate the percentage increase in the prices of these items in 5 years.

Integrated Learning (Science)

Skills Covered: • Problem solving • Logical and critical thinking
• Cultural awareness • In-depth learning

Biogas and Natural Gas

Biogas is a mixture of gases, primarily consisting of methane and carbon dioxide. It is produced from raw materials such as agriculture waste, green waste and municipal waste. Natural gas is extracted with petroleum deposits when crude oil is brought to the surface.

Collect information about the composition of biogas and natural gas to answer the following questions.

1. What percent of biogas is methane?
2. What percent of natural gas is ethane?
3. Write two uses of biogas and natural gas.

Apply Your Learning

Skills Covered: • Observation • Critical and logical thinking
• Experiential learning • In-depth learning

Anaya's father bought the following books and some stationery items. Complete the table and then answer the questions that follow.

Name of the Book/Item	Cost Per Book/Item (in ₹)	Quantity	Total Cost
Mathematics Textbook for Class 8	12.50	1	_____
English Reader	129.75	1	_____
Eraser	4	4	_____
Pencil	5	10	_____
Gel pen	10	15	_____
Crayons	55	1	_____
Grand total			_____

1. Assuming that the bookseller gives 10% discount on the whole transaction, how much money would Anaya's father save?

- Calculate the additional amount of money Anaya's father had to pay if the bookseller charged 18% tax on the total amount.

Identify and Rectify

Skills Covered: • Observation • Critical and logical thinking
• Analytical reasoning

- Kinjal's salary is 20% less than that of Purnima. So, Purnima says that her salary is 20% more than that of Kinjal. Is Purnima correct? If not, explain why.
- The population of a city increases 20% annually. Meenu says that if present population is 10,800, the population of last year must be around 8,000. Is her estimate justifiable? If not, what could be the last year's population?

Higher Order Thinking Skills

Skills Covered: • Problem solving • Logical and critical thinking • Analytical skills
• Reasoning • Creativity and judgement

- For an amount, explain why, a 10% increase followed by a 10% decrease is less than the original amount.
- A person deposits an amount and it is increased by 25%. Then he again deposits the increased amount and it increases by 50%. If the person gets ₹ 93,750 in the end, what was the initial amount deposited by him?

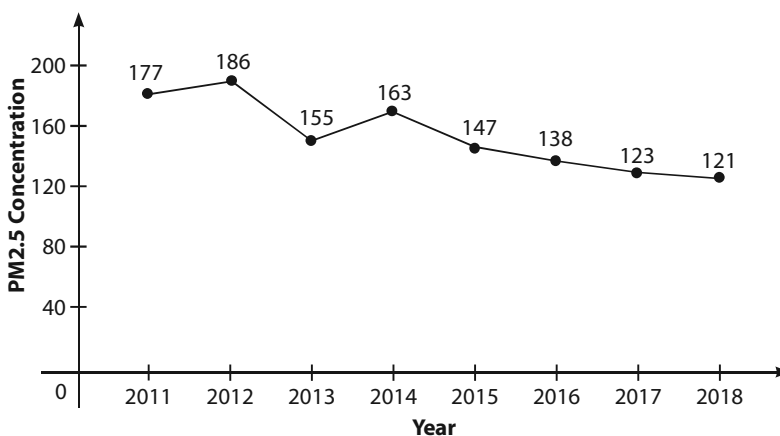
Case Study

Skills Covered: • Logical and critical thinking • Observation • Comprehension skills
• Analytical skills • Computation • Problem solving

Air Quality in Delhi

PM2.5 refers to a category of particulate pollutant that is 2.5 microns or smaller in size. PM stands for "particulate matter". Particles that are 2.5 microns or smaller are considered especially dangerous to human health because they bypass many of our body's defenses.

Consider the graph given below which shows the annual average level of PM2.5 in Delhi for the year 2011 to 2018.



Now, answer the following questions.

- Find the percentage decrease in PM2.5 concentration from year 2011 to 2018.
- Find the percentage increase in PM2.5 concentration from year 2013 to 2014.
- What causes PM2.5 pollution?