

PM SHRI KENDRIYA VIDYALAYA PERAMBALUR

AUTUMN BREAK HOMEWORK

CLASS IX

SUBJECT	DETAILS
ENGLISH	Preparation regarding project (available in vlog)
MATHS	<i>Topic: Number Systems, Polynomials & Coordinate Geometry (based on NCERT)</i> GENERAL INSTRUCTIONS 1. Complete all five activities neatly in a separate Mathematics activity notebook. 2. Write the title, materials, procedure, and calculations (where applicable) for each activity. 3. Use colours, drawings, and real-life examples wherever suitable. 4. Do the work independently. Each activity should take only 15–20 minutes. 5. Submit the completed work on the first day after the autumn break. Activity 1: Representing Irrational Numbers Materials: Ruler, pencil, compass (optional). 6. Draw a number line and mark integers from 0 to 3. 7. Locate $\sqrt{2}$ and $\sqrt{3}$ approximately on the number line using the square-root spiral or geometric construction method. 8. Write one sentence explaining why $\sqrt{2}$ is an irrational number. Activity 2: Exploring Polynomials in Daily Life Materials: Pencil, notebook. 9. Think of three real-life situations that can be represented by linear or quadratic polynomials (e.g., area of a rectangle, cost of items). 10. Write the polynomial expression for each situation and state its degree and type (monomial / binomial / trinomial). 11. Find the value of each polynomial for a given value of the variable. Activity 3: Coordinate Geometry – My Classroom Map Materials: Graph paper / plain paper, ruler, pencil, colours. 12. Draw a simple coordinate plane (x-axis and y-axis) on paper. 13. Choose five objects in your room or classroom and assign approximate coordinates (e.g., door at (2, 3), window at (–1, 4)). 14. Plot the points and write the coordinates of each object. Identify the quadrant in which each point lies. Activity 4: Algebraic Identities Verification Materials: Paper, pencil, colours (optional). 15. Verify the identity $(a + b)^2 = a^2 + 2ab + b^2$ geometrically by drawing a square of side $(a + b)$. 16. Divide the square into parts representing a^2, b^2, and two rectangles of area ab. 17. Write the areas and show that the identity holds. Repeat for $(a - b)^2$ if time permits.

	Activity 5: Rational vs Irrational Card Game Materials: Paper or card, scissors, colours. 18. Make eight small cards. Write four rational numbers and four irrational numbers on them (e.g., $\frac{3}{5}$, 5, 0.333..., π, $-\frac{7}{2}$, 9, 2.15, $\sqrt{7}$). 19. Sort the cards into two groups: Rational and Irrational. Paste or draw them in your notebook. 20. For each irrational number, write one reason why it is irrational.
SCIENCE	PHYSICS Questions 1. A table is moved across the floor at constant velocity by applying a horizontal force F. What is the magnitude of the frictional force exerted by the floor on the table? 2. A ball moves on a smooth, frictionless surface. Choose the correct option for each statement. (a) If no net force acts on the ball, its velocity will (remain constant / increase / decrease). (b) If a net force acts in the direction of its motion, its speed will (remain constant / increase / decrease). (c) If a net force acts opposite to its direction of motion, its speed will (remain constant / increase / decrease). 3. Two blocks, P and Q, are placed on a smooth horizontal surface. Two forces of 4 N and 5 N act in opposite directions on block P. Block Q moves with constant velocity. Which statement is correct? (a) P experiences a net force, but Q does not. (b) P does not experience a net force, but Q does. (c) Both P and Q experience a net force. (d) Neither P nor Q experiences a net force. 4. During a snake-boat race, 95 oarsmen row in the direction that propels the boat forward, while 5 row in the opposite direction. Each oarsman applies a horizontal force of 200 N. Calculate the net force on the boat. Ignore drag and air resistance.

	5. When a net force acts on an object, in which direction does the object accelerate, and how is its acceleration related to the net force? (a) Opposite to the force; proportional to the force. (b) Opposite to the force; proportional to the mass. (c) In the direction of the force; inversely proportional to the force. (d) In the direction of the force; proportional to the force. 6. The position–time graphs of four objects, A, B, C and D, moving along a straight line are given in the accompanying figure. For which object does the graph indicate that a net force acts? .(Refer graph from book) 7. A sailor jumps forward from a small boat towards the shore. Will the boat move? If so, in which direction? Explain your answer. 8. Why is a landing mat or a sand bed provided for athletes during a high-jump event? 9. A loaded handcart collides with an identical empty handcart. Which statement correctly describes the forces the carts exert on each other? (a) The loaded cart exerts a greater force on the empty cart. (b) The empty cart exerts a greater force on the loaded cart. (c) Neither cart exerts a force on the other. (d) Both carts exert forces of equal magnitude on each other. 10. The acceleration–mass graph for objects acted upon by a force is given in the accompanying figure. Draw the corresponding force–mass graph. .(Refer graph from book) 11. The velocity–time graph of an object of mass 10 kg is given in the accompanying figure. Calculate the force acting on the object using the graph.(Refer graph from book) 12. A bullet of mass 50 g travels at 100 m s^{-1} and enters a heavy, stationary wooden block. It comes to rest after penetrating 50 cm. Assuming constant acceleration, calculate the stopping force acting on the bullet. 13. A football of mass 0.4 kg is kicked from rest and reaches a speed of 108 km h^{-1}. If the average force applied by the player is 800 N, calculate the contact
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time between the foot and the ball.

14. An object of mass 2 kg moves at 10 m s^{-1} and enters a rough patch. A frictional force of 7 N and an additional opposing force of 3 N act on it. Calculate the distance travelled before the object comes to rest.

15. A tractor pulls a harrow of mass m_1 with a force F , producing an acceleration a_1 . The same tractor pulls a trolley of mass m_2 with the same force F , producing an acceleration a_2 . If the tractor pulls the trolley with the harrow placed on it using the same force F , derive an expression for the resulting acceleration in terms of a_1 and a_2 . Ignore friction.

16. A bar magnet is brought near a magnetic compass. The magnet and the compass needle exert equal and opposite forces on each other, but the compass needle moves while the bar magnet appears stationary. Explain why.

Chemistry

Chapter: Journey inside the atom

1. Bohr's Atomic Model

State whether the following statements are correct or incorrect according to Bohr's atomic model. Give a reason for each answer.

(i) Electrons lose energy while moving in fixed orbits and slowly fall into the nucleus.

(ii) Electrons can exist anywhere around the nucleus without having fixed energy.

(iii) Electrons revolve around the nucleus in orbits of fixed energy without losing energy.

(iv) Electrons can be found between energy levels as they move around the nucleus.

2. Relationship Between Atomic Species

The composition of the nuclei of three atomic species, X, Y and Z, is given below.

Particle	X	Y	Z
Number of protons	18	17	17
Number of neutrons	19	18	20

Explain the relationship between the following pairs:

(i) Y and Z

(ii) Z and X

3. Evolution of Atomic Models

Arrange the following statements in the correct chronological order to show how atomic models evolved over time.

(i) Bohr's model proposed that electrons move in fixed orbits around the nucleus, each with a definite energy.

(ii) Thomson's model depicted the atom as a "plum pudding," with electrons embedded in a sphere of positive charge.

(iii) Rutherford's model proposed that atoms have a dense central nucleus.

(iv) Dalton's model described atoms as indivisible particles.

4. Stability of an Atom

Electrons move around the nucleus in orbits. Why do they not fly away from the atom? Explain what keeps them attracted to the nucleus.

5. Assertion–Reason Question

Assertion (A): The discovery of subatomic particles helped in understanding atomic structure.

Reason (R): The number of electrons is equal to the number of protons in an atom.

Choose the correct option:

(i) Both A and R are true, and R is the correct explanation of A.

(ii) Both A and R are true, but R is not the correct explanation of A.

(iii) A is true, but R is false.

(iv) A is false, but R is true.

6. Electronic Configuration of Magnesium

Magnesium is essential for many biological processes, including muscle contraction. An atom of magnesium has a mass number of 24 and an atomic number of 12.

Determine the number of:

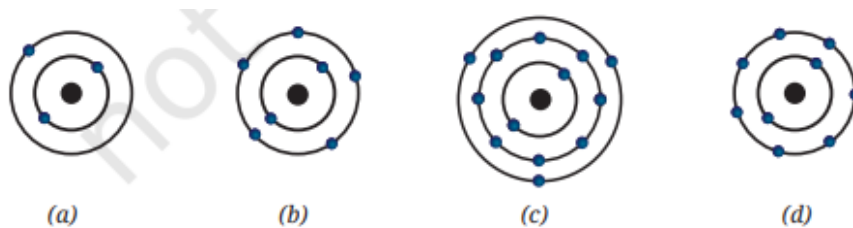
(i) Protons

(ii) Neutrons

(iii) Electrons

Also, illustrate the arrangement of electrons in a magnesium atom.

7. Identification of Elements



(i) Name of the element

(ii) Symbol

(iii) Total number of electrons

(iv) Number of valence electrons

(v) Valency of the element

(vi) Number of protons

(vii) Atomic number

8. Calculation of Neutrons

An atom of element X has a mass number of 70 and 31 electrons. How many neutrons are present in its nucleus?

9. Calculation of Neutrons and Electrons

An atom has 79 protons and a mass number of 197. Calculate:

(i) The number of neutrons

(ii) The number of electrons

13. Complete the Following Table

Complete Table 8.5 by filling in the missing information.

Atomic number	Mass number	Number of neutrons	Number of protons	Number of electrons	Name of the element
5	—	6	—	—	—
—	14	—	—	7	Nitrogen
—	24	—	12	—	—
15	—	16	—	—	—
—	1	0	—	—	—

10. Application-Based Questions on Atomic Structure

Aman was discussing atomic structure with his classmates. During the discussion, he learnt that an element X has a mass number of 35 and contains 18 neutrons.

Answer the following questions:

(i) How many electrons and protons does element X have?

(ii) What is its atomic number?

(iii) Identify element X.

(iv) Write its electronic configuration.

(v) How many valence electrons does it have?

(vi) What will be the mass number if two neutrons are added to its nucleus?

(vii) What is the relationship between element X and the new atom?

11. Effect of Replacing Electrons with Hypothetical Particles

An atom contains 12 protons and 12 neutrons in its nucleus. Imagine that all its electrons are replaced with hypothetical particles that have the same charge as

	electrons but are 500 times heavier. What effect will this replacement have on the atom's: (i) Atomic number? (ii) Atomic mass? (iii) Mass number? (iv) Overall charge? BIOLOGY 1. Name the two main type of reproduction. 2. What is a sexual reproduction? 3. Differentiate between sexual and asexual reproduction. 4. Explain the process of sexual reproduction in flowering plants
SOCIAL SCIENCE	1. Inter Disciplinary project Topic- Elections - relate it to History, Geography, Politics and Economics 2. News clippings on price of essential commodities in the Market and Analyse the trends
HINDI	हिन्दी 1. आप दीपावली कैसे मनाते हैं? इस विषय पर 100 शब्दों में लिखिए। 2. झांसी की रानी की कहानी 200 शब्दों में लिखिए।
SANSKRIT	१. राम, लता, फल शब्दरूपाणि लिखत तथा स्मरत। २. पठ्, गम्, लिख् धातुरूपाणि लट्-लकारे लिखत तथा स्मरत। ४. अस्मद् तथा युष्मद् शब्दरूपाणि लिखत तथा स्मरत। ५. विजयादशमी पर्वणि संस्कृत भाषायां न्यूनातिन्यूनं पञ्च सरलसंस्कृतवाक्यानि लिखत। Instruction: Complete the work neatly in your Sanskrit notebook.
ART	DRAW & colour, a figurative composition of a woman and her son are going to the temple for worship or A woman and her son are worshipping inside the temple.