Lesson Plan: Tissues (CBSE Class IX 2026-27)

Teacher:

Class: IX

Subject: Science (Subject Code - 086)

Theme/Unit: Structure and Function of the Living World

Chapter: 3 – Tissues (Tissues in Action)

Estimated Number of Periods: 13

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1. Gist of the Lesson & Curricular Goals

- **Core Syllabus:** Level of organisation in living organisms; Plant and animal tissues; Meristematic and Permanent tissues (parenchyma, collenchyma, sclerenchyma, xylem, phloem); Animal tissues overview (epithelial, connective, muscular, nervous); Elementary idea of the musculoskeletal system, types of joints, and care of the musculoskeletal system (injuries, posture, nutrition, yoga).

- **Educational Aim:** To understand how cellular differentiation leads to a division of labour in multicellular organisms, and to correlate the structure of different tissues with their specific functions for the survival and fitness of the organism.

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2. Teaching-Learning Plan & Pedagogy

Key Concepts	Competencies (C) & Learning Outcomes	Teaching-Learning Activities (Pedagogy)	Assessment Strategies
Meristematic Tissues in Plants	**C-8.2:** Designs and implements a plan for scientific inquiry. • *Outcome:* Students will carry out an experiment to understand plant	• **Mandatory Practical (Activity 3.1):** Grow onion bulbs in two jars. Cut the root tips of one bulb on Day 3 and measure the length over 7 days to prove growth is	• **[Demonstrate Knowledge - VSA]:** *State* the location and function of the intercalary meristem. • **[Formulate &**

	growth due to apical meristems.	restricted to the apical meristem. • **Data Mapping:** Plot the root growth data on a graph to compare the two jars.	**Analyze - Case-Based]:** *Interpret* the graph from the onion root experiment to infer the role of dividing cells at the tip.
Permanent Plant Tissues & Tissue Culture	**C-4.2:** Relates the structure of different types of tissues with their functions. **C-6.1:** Discusses significant Indian contributions.	• **Compare & Contrast:** Use T.S. of a stem to differentiate simple tissues (parenchyma, collenchyma, sclerenchyma) and complex tissues (xylem, phloem). • **Contextual Learning:** Discuss Prof. Sipra Guha Mukherjee and S.C. Maheshwari's breakthrough in plant tissue culture, and F.C. Steward's concept of totipotency in carrots.	• **[Demonstrate Knowledge - Objective]:** *Identify* the dead, lignified tissue that provides mechanical strength to the coconut husk. • **[Application - SA]:** *Distinguish* between the functions of xylem and phloem.
Animal Tissues: Structure & Function	**C-4.2:** Explains the role of various types of tissues in animals.	• **Kinesthetic Activity (Activity 3.3):** Students touch their elbow (bone), fold their ear (cartilage), and	• **[Application - SA]:** *Explain* how the structure of epithelial tissue is suited for gas exchange in the

	• *Outcome:* Students will identify epithelial, connective, muscular, and nervous tissues based on physical actions.	wiggle fingers (tendons) to physically experience different connective tissues. • **Visual Mapping:** Draw a neuron and explain how it transmits signals to voluntary and involuntary muscles.	lungs. • **[Analyze & Evaluate - Assertion-Reasoning]:** *Evaluate* the structural difference between bone (hard matrix) and blood (fluid matrix).
Musculoskeletal System & Care	**C-5.3:** Establishes correlation between different tissues for fitness. **C-7.1:** Discusses medical recommendations for muscular injuries.	• **Observation (Activity 3.5):** Move different body parts to identify Ball and Socket, Hinge, Pivot, and Fixed joints. • **Real-World Connection:** Discuss the role of Yoga (e.g., Surya Namaskar) in maintaining posture and joint flexibility, and how tendons and ligaments differ during sports injuries.	• **[Demonstrate Knowledge - VSA]:** *Name* the type of joint present in the human neck. • **[Application - LA]:** *Describe* how muscles, bones, and tendons work together to bend the arm.

3. Assessment Structure & Weightage

Assessments are strictly modeled on the CBSE 2026-27 Theory Question Paper Design (80 marks):

- **Demonstrate Knowledge and Understanding (50%):** Assessed via questions asking students to *state, name, list, identify, define, suggest, describe, outline, and summarize* (e.g., naming types of joints, identifying simple permanent tissues).

- **Application of Knowledge/Concepts (30%):** Assessed via questions asking students to *calculate, illustrate, show, adapt, explain, and distinguish* (e.g., distinguishing between ligaments and tendons, explaining involuntary muscle function).

- **Formulate, Analyze, Evaluate and Create (20%):** Assessed via questions asking students to *interpret, analyze, compare, contrast, examine, evaluate, discuss, and construct* (e.g., analyzing experimental data on plant growth, evaluating the effect of debarking a tree).

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4. Digital Integration & Portfolio Enrichment (Internal Assessment - 20 Marks)

- **Subject Enrichment (Practical Work - 5 Marks):** Evaluated strictly on the execution of the apical meristem growth experiment (measuring onion roots). Students will represent their data in multiple modes (tables and graphs) in their practical records and draw scientific inferences about the localisation of growth in plants.

- **Digital Integration Strategy:** To reinforce spatial understanding of anatomy ahead of Periodic Assessments, utilize interactive 3D skeletal simulators (e.g., via the DIKSHA portal) to allow students to digitally isolate and rotate the hinge, pivot, and ball-and-socket joints, observing how ligaments restrict their range of motion.
- **Portfolio Task (5 Marks):** Students will *examine* the intersection of the musculoskeletal system and traditional Indian fitness practices. They will observe and document the 12 poses of *Surya Namaskar* (or another local dance/yoga form). They will prepare a brief visual report identifying which specific joints (e.g., hinge at the knee, ball and socket at the shoulder) and muscle groups are being engaged in three selected poses, securely adding this cross-disciplinary study to their academic portfolio.