

LESSON PLAN

SUBJECT : BIOLOGY

TOPIC: Plant Growth and Development (Chapter 15)

Pre-content/Content/ Post-Content	Learning Outcome/Objectives	
	General	Specific
Pre-Content Names of hormones, their basic functions, meaning of growth, development Content Plant growth, differentiation, development ; Plant Growth Regulators- discovery & functions ; photoperiodism ; vernalisation Post-Content Project work on - measuring plant growth ; effect of hormones on plant growth ; growth curve	The Students will be able to:- -figure out that growth, differentiation, development are important for an organism to be living -appreciate the variety of ways plant hormones were discovered -inculcate the habit of observation -be aware of the natural/scientific phenomena like photoperiodism, phenology, plasticity -conclude that mimicking nature leads to higher productivity e.g. vernalisation, use of ethephon -learn to revere nature	Students will be able to- - arrive at the definition of growth - distinguish between differentiation, dedifferentiation and redifferentiation - describe how the different hormones were discovered - tabulate the functions of all PGRs - illustrate the phenomenon of photoperiodism with examples - explain vernalisation and its application

Homework and Assignments:

To answer questions from NCERT text book

AND PROGRESS

CLASS XI

MONTH: November

Teacher's Activity	Students' Activity	Teacher's Observation And Remedial
The teacher will- -ask the meaning of growth Activity based learning to study seed germination and seedling development in dicots and monocots (Annexure 1) -Give instructions to simultaneously measure the length of the radicle and observe its growth -Help recall the structure of T. S. of Dicot Stem and secondary growth -Enquire about how phytohormones were discovered; then gives details -Arrange for practicals on Phototropism, Geotropism, Apical dominance -Show images depicting functions of hormones, e.g. bolting in rosette plants as function of Gibberellins -Photoperiodism will be explained through ppt; as well as meaning of misnomer -Tell about the origin of the term as well as the phenomenon of vernalisation	Students will - -respond by including points like increase in length, width, number of cells and so on -perform the activity and learn another difference between dicots and monocots. They will measure the length of the radicle at regular intervals -respond by stating how medullary rays change into inter- fascicular cambium -understand and note in registers -observe and conclude the functions of different PGRs; write in practical file -study functions through use of internet & mark in their text books -learn various examples of long-day, short-day and day-neutral plants along with their definitions -appreciate the importance of cold treatment for flowering and the implications of this practice	Students can define growth Students add to the list of differences between dicots and monocots after performing the experiment Students are able to mark the zones of elongation on the root Students give differences between differentiation, dedifferentiation and redifferentiation Students listen intently Students note down and tabulate all the functions of all the phytohormones Students will draw the diagrams and write comments in their practical files Students define both long-day as well as short-night plants in the same manner, LDP being a misnomer Students are able to define the phenomenon

Teaching Aids : ICR- computer, LCD projector, screen, Smartboard.

Methodology/Innovative Methods: Activity based Learning, Laboratory Method, Computer-Aided Instruction, Discussion Method, Experiential Learning

Interdisciplinary Links: English, Physics, Chemistry, Maths, Geography

Vice-Principal

Principal

ANNEXURE 1

Activity – Difference between Germination in Monocots and Dicots

Subject	Biology
Class	XI
Chapter	Plant Growth and Development
Topic	Germination and Seedling Development in Monocots and Dicots
Duration	2 weeks
Nature of the Activity	Individual

What will I learn? (Learning Outcome)- to differentiate between monocot and dicot plants based on the difference in their germination

Skills- Observing, Analyzing, Critical thinking, Inferring

What I have to do?- Germinate commonly available seeds of a monocot and dicot plant, observe the process of germination and compare

What do I require?

Seeds of maize, pea/beans, two bowls and moist cotton, trowel, two small pots with soil

What do I need to know?

There are two main classes of Angiosperms, namely, Monocotyledonae and Dicotyledonae; differences between the two groups of plants, based on morphology. Parts of a dicot and monocot seed and embryo.

➤ **Teacher's activity-** Teacher will give instructions and share the procedure

➤ **How will I proceed?**

➤ **Student's activity-**

- 1) Soak the seeds in two different bowls and observe daily, for a week. Note your observations.
- 2) Take 2 pots with soil and label them (A) dicot and (B) monocot
- 3) Sow the seeds of pea/bean in A and those of maize in B, at least 5cm below the soil
- 4) Water these regularly, without flooding the soil.
- 5) Observe seed germination in both the pots and note
- 6) Observe the growth of seedlings in both pots

What do I observe?

	Maize seed	Bean seed
Number of Cotyledons		
Is the plumule covered with a sheath		
What is the sheath (covering) referred to as?		
Is hook formation seen during germination?		
What is the name of the part called as hook?(looks like a broad hair pin loop)		
Do cotyledons rise above the soil, during germination		
How much time do the cotyledons remain on the seedling?		

What have we learnt?

Monocots (Maize seed) have hypogeal and dicots (Bean seed) have epigeal kind of germination.

What would I like to know ?

Differences between monocot and dicot plants that can be studied by cutting a section of the stem, root, leaf (anatomical differences)

Let me Evaluate myself-

1. What is meant by hypogeal and epigeal kind of germination?
2. Give five examples each, of monocotyledonous and dicotyledonous plants.
3. Why are seeds sown at least 5-6 cm below the soil?
4. Complete the table:

Plant part	Monocots	Dicots
Seed		
Root		
Leaf		
Flower		

5. Differentiate between monocots and dicots on the basis of
 - i) Morphology
 - ii) Anatomy
 - iii) Germination process

