Growth and development biology notes pdf download 2016 download

This NCERT class 11 biology chapter 15 notes can also be used to cover the important concepts of the CBSE biology syllabus in class 11 as well as for competitive examinations such as the NEET. And so on. Changes in plant height, dry weight, area, volume, and the number of cells can be tracked with much ease and they are proportional to growth at the cellular level.More than 17,500 cells can be added within an hour in maize plants by a single root apical meristem. Class 11 Biology Chapter 15 Plant Growth and Development Notes - PDF DownloadPlant Growth and Development Class 11 Notes are cumulated in a systematic manner which gets rid of confusion among children regarding the course content since CBSE keeps on updating the course every year. The Discovery of Plant Growth RegulatorsThe Discovery of all of the 5 major PGRs was accidental.Charles Darwin and his son Francis Darwin observed coleoptile canary grass responds towards unilateral illumination by growing towards the light source. VernalisationFlowering in both qualitative and quantitative aspects depends on exposure to low temperature, this effect is called vernalization. For example, tracheary elements lose protoplasm to develop a strong, plastic secondary cell wall composed of lignin and cellulose to make water transport efficient even at high tensile strength. Example − root elongating at a constant rate. Though ethylene gas shows characteristics of both promoter and inhibitor of plant growth, it is largely an inhibitor. The NCERT class 11 chapter 15 notes are a part of NCERT class 11 unit 4 Plant physiology. A linear curve is obtained when the growth of an organ is plotted against time. IAA and Indole Butyric acid (IBA) are natural auxins found in plants. Growth is partnered with metabolism and it’s an active process. It delays leaf senescence. Plant growth-promoting hormones promote cell division, cell enlargement, pattern formation, tropic growth, flowering fruiting, and seed formation. The curve obtained by plotting the growth of the organ against time shows a characteristic sigmoid-shaped curve. EthyleneEthylene (C2H4) is a gaseous hormone that’s produced by tissues undergoing senescence and ripening fruits.It causes horizontal growth of seedlings and swelling of the axis.It also causes the formation of apical hook in dicot seedlings and initiates germination in some plants like peanut seeds, sprouting of potato tubers.Ethylene helps in the ripening of fruits as it increases the rate of respiration.It promotes senescence and abscission of plant organs (leaves and flowers specifically).Ethylene promotes root growth and root hair formation; this increases surface area for water and mineral absorption. DedifferentiationCells that have lost their dividing capacity restart dividing under certain conditions, this phenomenon is called dedifferentiation. From the viewpoint of exams, these CBSE class 11 biology chapter 15 notes also have quick points to remember. Plant growth and development class 11 notes cover a brief outline of topics such as growth, differentiation, dedifferentiation, redifferentiation, development, plant growth regulators, photoperiodism, and vernalisation. Significance of NCERT notes for class 11 biology chapter 15Plant growth and development class 11 notes will help students revise the chapter and have a better understanding of the major concepts addressed. Geometric Growth - Initial growth is slow (lag phase), followed by a rapid increase in growth (log/exponential phase), and followed by a phase where growth slows down (stationary phase). Thickening of cell walls and increase in volume and vacuole size occurs in the elongation phase. Many plants are day-neutral plants, i.e., flowering in them is not related to the duration of light exposure. Some plants flower only when the duration of light exposure is more than the critical duration; such plants are called long-day plants. Students can also easily download this class 11 biology chapter 15 notes pdf. NCERT Class 11 Notes Chapter-wiseSubject wise NCERT Exemplar solutions Subject wise NCERT solutions Notes Pollen tube development is measured by measuring the length of the pollen tube. Mathematically, arithmetic growth is expressed asLt = L0 + rt Lt = length at time ‘t’ L0 = length at time ‘zero’ r = growth rate / elongation per unit time. GA3 fastens up malting, so they are used in the brewing industry.They are used to increase the length of sugarcane stem, thereby increasing yield by 20 tonnes per acre.GAs fasten the maturity of juvenile conifers by early seed production.Gibberellins promote bolting (internode elongation) in beet, cabbages, and many plants with rosette habits.CytokininsCytokinins affect cytokinesis. Also, students can refer, GrowthBoth growth and differentiation are required for development to happen in plants. Plant Growth and Development Class 11 Notes would provide you with an effective preparation for your examinations.How do you define Plant Growth and Development?Growth is a characteristic of living beings in which an irreversible permanent increase in size of an organ or its parts occur or an increase in the size of a cell. Cotton, coriander, and larkspur are a few plants that show heterophylly, in these plants leaves of juvenile and mature stages are morphologically distinct. Spring varieties are planted in spring and produce fruit before the season ends. Plant Growth RegulatorsCharacteristics:Plant growth regulators (PGRs) are broadly characterized into two as plant growth promoters and inhibitors. Growth rate can be defined as the increase in growth per unit time. Zeatin was found in corn kernels and coconut milk and it has cytokinin-like activity. Kurosawa observed symptoms that appeared when treated with sterile filtrate of fungi, the active substance was found to be gibberellic acid.F. Skoog and co-workers observed that in internodal segments of tobacco stems, the callus (mass of undifferentiated cells) proliferated only if auxins were supplemented with either vascular tissue extracts, yeast extract, coconut milk, and DNA. GibberellinsGibberellins are denoted as GA1, GA2, GA3 …. Inhibitory plant growth regulators are released in response to wounds, biotic and abiotic stresses. Mature plants are a result of the development of a single-cell zygote. GA3 was the first gibberellic acid and continues to be the most studied gibberellin out of more than 100 gibberellins reported not only in higher plants but fungi also. Kinetin was discovered from autoclaved herring of sperm DNA but does not occur naturally in plants. Shoot apical meristem (SAM) and root apical meristem (RAM) are responsible for elongation of the plant along the shoot axis and root axis respectively, hence they perform primary growth. The meristematic phase has constantly dividing cells at RAM and SAM, cells at this phase have rich protoplasm and thin primary cell walls. Example- Fully differentiated parenchyma cells dedifferentiate to form meristems- interfascicular cambium and cork cambium. This response is called photoperiodism. Whereas some plants flower only when the duration of light exposure is less than the critical duration; such plants are called short-day plants. Auxins were isolated by F.W. Went from the tips of coleoptiles of oat seedlings.‘Bakane’ (foolish seedling) disease of rice seedlings is caused by fungal pathogen Gibberella Fujikuroi. Lateral meristems that appear in the later stages of dicotyledons and gymnosperms cause secondary growth, it increases the girth (circumference) of the plant. Growth in leaves is measured by an increase in surface area.Phases Of GrowthThere are 3 broad phases of growth namely, the meristematic phase, an elongation phase, and maturation phase. Resources - 300+Hours of Concept wise Video Lectures, Mock Tests, Practice Questions, Adaptive Time-Table - For Class 9 and 10 Engineering Aspirants Access Now Growth is measured by a growth rate that is the increased growth per unit time. Shoot apex can’t perceive photoperiodism, but they get modified to the flowering apex before flowering. Auxins, Gibberellins, and Cytokinins are growth-promoting phytohormones. Development is influenced by extrinsic (external) and intrinsic (internal) factors. This critical duration of light exposure differs among plants. Secondary growth is also caused by vascular cambium and cork cambium. Differentiation, Dedifferentiation and RedifferentiationDifferentiationDifferentiation or maturing of meristems takes place for them to get specialized in their functions. CBSE class 11 biology notes include all of the topics. Winter varieties are planted in autumn, small seedlings are produced in the winter season, and growth is resumed on the advent of spring and finally harvested in mid-summer. Inhibitors induce dormancy and abscission. RedifferentiationDedifferentiated cells lose their capacity to divide and become mature to attain a specialized function. Some plants induce flowering only when periodic exposure to light is there. Biochemically, kinetin is a modified form of adenine. Geometric growth happens when both daughter cells produced via mitosis continue to divide further into two by mitosis. Leaves are the site of light perception; they release flowering hormones that induce flowering when exposed to the necessary photoperiod. Growth Is MeasurableAn increase in protoplasm is considered as growth at a cellular level, but this change is difficult to measure. Cytokinins are naturally produced in parts where cells proliferate quickly, such as root apices, developing shoot buds, and early fruits. An initial lag phase is where the growth rate is very slow, this is followed by an exponential phase, but since resources are not unlimited, therefore the exponential phase is followed up by a stationary phase. The Notes covers all important points which provides the students a simple way to study or revise the chapter. It promotes flowering in some important food plants- wheat, barley, and rye. Abscisic acid plays an important role in seed maturation and dormancy.It also helps seeds to withstand desiccation and conditions unfavorable for growth.PhotoperiodismPlants can measure the duration of sunlight exposure. Seed germination takes place only under favorable environmental conditions, otherwise, it will remain in the suspended stage until viable. Plant Growth Generally Is IndeterminatePlant growth is open (unlimited). Development is the sum of growth and differentiation. A highly ordered succession of events happens in the zygote to give rise to complex structures like leaves, stems, flowers, seeds, and fruit. Water maintains cell turgidity required for extension; it is the medium for enzymatic activity. Naphthalene acetic acid (NAA) and 2,4-dichlorophenoxyacetic (2,4-D) are synthetic auxins. Indole-3-acetic acid (IAA) is a natural auxin. Environmental conditions such as temperature, light intensity, and gravity must be within the optimum range for growth to successfully take place. The tip of the coleoptile is the site of transmittable influence that is responsible for the bending of the entire coleoptile. These are growth-promoting hormones.Gibberellins are acidic and have a wide range of physiological responses.It increases length along the plant axis; therefore, it’s used to increase the length of grape stalks.GAs induce fruit elongation and improve shape in fruits like apples. Plants have meristematic tissues at certain locations; therefore, they retain their capacity for unlimited growth throughout their life. Abscisic acid is an example of inhibitory phytohormone. Example − all cells, tissues and organs show this type of growth.Learn more about the mean, median and mode in Plant Growth and Development Class 11 Notes pdf.Download this solution for FREE Download this PDF NCERT class 11 biology chapter 15 notes deal with growth and development phenomenon in higher plants. Auxins are produced by growing apices, then translocated to the site of action. Oxygen is required for aerobic respiration that will generate metabolic energy. Plants show two types of growth—Arithmetic and Geometric—according to the increase shown by the growth rate. Ethylene initiates flowering in mango and synchronizes fruit set in pineapple.Ethylene gas is widely used in agriculture.The aqueous solution of ethephon is widely used as an artificial ethylene source as it releases ethylene slowly.Ethephon is used to hasten fruit ripening in plants like tomato, apples, etc., and accelerates abscission in flowers and fruits.It is used to increase the yield of cucumbers as it promotes female flowers.Abscisic acidAbscisic acid is a growth inhibitor phytohormone.It inhibits seed germination and stimulates the closing of stomata.It increases the plant’s tolerance towards stresses; therefore, it’s called the stress hormone. Apical dominance can be suppressed by Cytokinins. Some of the topics covered in plant growth and development class 11 notes are phases of growth, growth rate, physiological effects of plant growth regulators, photoperiodism, and vernalisation. Skoog and Miller crystallized the cytokinesis promoting active substances i.e., kinetin.Abscisic acid was discovered independently by three researchers in the mid-1960s.Physiological Effects of Plant Growth RegulatorsAuxinsAuxin was first isolated from human urine. Removal of shoot tips (reduce auxin synthesis) increases the growth of lateral buds; this step is followed in tea plantations and hedge making.Auxins induce parthenocarpy in plants like tomatoes.They are also used as herbicides; 2,4-D is used to kill dicot weeds in monocot crop fields.It also controls xylem differentiation and helps in cell division. In the maturation phase, cells attain their maximum size. Nutrients are required for the synthesis of protoplasm and are a source of energy for plants. DevelopmentAll changes that an organism goes through throughout its life cycle from germination to senescence. Arithmetic growth (constant growth rate) is seen when after mitosis only one cell continues to proliferate while the rest daughter cells differentiate and cease to perform mitosis. Watermelon cells can increase in size by up to 3,50,000 times. Resources - Concept-oriented detailed solutions for NCERT (Class 6 to 12), Exemplar (Class 9 to 12) & CBSE Previous 5 year (Class 10 and 12) - For Maths and Science Access Now Growth is an irreversible permanent increase in size, this can take place at cellular, tissue, or organ level. The exponential growth can be expressed asW1 = W0 ert W1 = final size (weight, height, number etc.) W0 = initial size at the beginning of the period r = growth rate t = time of growth e = base of natural logarithms Growth between organs can be compared either in: Absolute terms i.e., total growth in unit time, or,Relative terms i.e., growth of system per unit time expressed on a common basis.Conditions for growthThe availability of a sufficient amount of water, oxygen, and nutrients are the most important conditions for growth. During differentiation, cells undergo structural changes in their cell wall and protoplasm. In 1926 E. In buttercup, the leaves are differently shaped (heterophyllous development) when in air versus as in water. Auxins have agricultural and horticultural applications.Auxins help to initiate root formation in stem cutting.They help in plant propagation, promote flowering in plants like pineapple, inhibit fruits and leaf fall in the early stage.Auxins promote abscission at maturity.Growing apical bud inhibits the growth of lateral buds, this effect is called apical dominance. Vernalisation prevents untimely reproductive development and therefore plants get sufficient time to reach maturity. Plants follow different pathways in response to the environment to form different structures. Arithmetic growth - Only one daughter cell continues to divide while others differentiate or mature.

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