DOWNLOAD PDF VISIBLE PARTS OF PLANTS

Chapter 1 : fungus | Definition, Characteristics, Types, & Facts | theinnatdunvilla.com

This page provides a glossary of plant theinnatdunvilla.comsts and other biologists who study plant morphology use a number of different terms to classify and identify plant organs and parts that can be observed using no more than a handheld magnifying lens.

Pixabay Hemp and marijuana are two popular names for the cannabis plant. The word cannabis often brings to mind images of a burning joint or a bong filling up with white smoke. But in reality, cannabis has just as much to do with these industrial hemp products as it does with the recreational drug better known as marijuana or pot. This begs the question â€" how is hemp different from marijuana? Genetics A 19th century illustration of Cannabis sativa Photo: Wikimedia Commons Cannabis is believed to be one of the oldest domesticated crops. Throughout history, humans have grown different varieties of cannabis for industrial and medical uses. Tall, sturdy plants were grown by early civilizations to make a variety of foods, oils and textiles, such as rope and fabrics. These plants were bred with other plants with the same characteristics, leading to the type of cannabis we now know as hemp. Other plants were recognized for being psychoactive and were bred selectively for medical and religious purposes. This led to unique varieties of cannabis that we now know as marijuana. The two species or subspecies of cannabis are known as Cannabis indica and Cannabis sativa. Wikimedia Commons Cannabis plants contain unique compounds called cannabinoids. Current research has revealed over 60 different cannabinoids so far, but THC is the most well known. THC is credited with causing the marijuana high. While marijuana plants contain high levels of THC, hemp contains very little of the psychoactive chemical. This single difference is what most rely on to distinguish hemp from marijuana. For example, countries like Canada have set the maximum THC content of hemp at 0. Any cannabis with higher THC levels is considered marijuana instead. Hemp and marijuana plants contain another important cannabinoid: Interestingly, research has shown that CBD acts to reduce the psychoactive effects of THC, separating hemp further from marijuana. Cultivation A hemp crop grown in Suffolk, England Photo: Adrian Cable Hemp and marijuana are grown for different uses, and therefore require different growing conditions. Marijuana growers usually aim to maintain stable light, temperature, humidity, CO_2 and oxygen levels, among other things. On the other hand, hemp is usually grown outdoors to maximize its size and yield and less attention is paid to individual plants. Legal Status A hemp-based skin balm sold in the U. However, outside the U. In , the top hemp-producing country was China, followed by Chile and the European Union. Interesting enough, it is legal to import hemp products into the United States. Marijuana, on the other hand, remains illegal in most countries. A few, such as Israel and Canada, have recently started to regulate marijuana as a medicine. But the legal production of marijuana is subject to stricter rules than hemp, since it is still widely considered a narcotic. Jan Slaski and Dr. AITF The strict laws surrounding both forms of cannabis â€" hemp and marijuana â€" makes any research very difficult. Recently, researchers at the University of Alberta created a supercapacitor using raw hemp material, making the manufacturing of cheap, fast-charging batteries from hemp a real possibility. Hemp fibre is also being used to develop new forms of renewable plastic, which has made it a common material in the car parts industry. But as legalization spreads across the globe, the opportunities to explore the potential of cannabis grows too. The possibilities are endless, and this is one thing hemp and marijuana have in common.

Chapter 2 : Mushroom Information - Mushrooms facts, Educational & Science Projects

Visible light is part of the larger electromagnetic scale which includes invisible spectrums such as radio waves and x rays. Each spectrum represents an electromagnetic frequency measured in nanometers (one billionth of a meter).

Only the sporophyte is visible, the gametophytes being the pollen and ovule Plant structures or organs fulfil specific functions, and those functions determine the structures that perform them. Among terrestrial land plants, the vascular and non-vascular plants Bryophytes evolved independently in terms of their adaptation to terrestrial life and are treated separately here see Bryophytes. The embryo develops into the sporophyte , which at maturity produces haploid spores , which germinate to produce the gametophyte, the haploid multicellular phase. The haploid gametophyte then produces gametes , which may fuse to form a diploid zygote , and finally an embryo. This phenomenon of alternating diploid and haploid multicellular phases is common to the embryophytes land plants and is referred to as the alternation of generations. A major difference between vascular and non-vascular plants is that in the latter the haploid gametophyte is the more visible and longer-lived stage. In vascular plants, the diploid sporophyte has evolved as the dominant and visible phase of the life cycle. In seed plants and some other groups of vascular plants the gametophyte phases are strongly reduced in size and contained within the pollen and ovules. The remainder of the vascular plant sections address the higher plants Spermatophytes or Seed Plants, i. Gymnosperms and Angiosperms or flowering plants. In the higher plants, the terrestrial sporophyte has evolved specialised parts. In essence, they have a lower, underground component and an upper, aerial component. The underground part develops roots that seek water and nourishment from the soil, while the upper component, or shoot , grows toward the light and develops a plant stem , leaves and specialised reproductive structures sporangia. In angiosperms, the sporangia are located in the stamen anthers microsporangia and ovules megasporangia. The specialised sporangia bearing stem is the flower. In angiosperms, if the female sporangium is fertilised , it becomes the fruit , a mechanism for dispersing the seeds produced from the embryo. New growth occurs at the tips apices of both the shoot and roots, where the undifferentiated cells of the meristem divide. Branching occurs to form new apical meristems. Growth of the stem is indeterminate in pattern not pre-determined to stop at a particular point. The stem also serves as a conduit, from roots to overhead structures, for water and other growth-enhancing substances. These conduits consist of specialised tissues known as vascular bundles , which give the name "vascular plants" to the angiosperms. The point of insertion, on the stem, of leaves or buds is a node , and the space between two successive nodes, an internode. The leaves , which emerge from the shoot, are specialised structures that carry out photosynthesis, and gas oxygen and carbon dioxide and water exchange. They are sheathed by an outer layer or epidermis that is coated with a waxy waterproof protective layer, which is punctuated by specialised pores, known as stomata , which regulate gas and water exchange. The leaves also possess vascular bundles, which are generally visible as veins , whose patterns are called venation. Leaves tend to have a shorter life span than the stems or branches that bear them, and when they fall, an area at the attachment zone, called the abscission zone leaves a scar on the stem. In the angle adaxial between the leaf and the stem, is the axil. Here can be found buds axillary buds , which are miniature and often dormant branches with their own apical meristem. They are often covered by leaves. Floral structure Location of main floral parts in angiosperms 1: Bract The flower, which is one of the defining features of angiosperms, is essentially a stem whose leaf primordia become specialised, following which the apical meristem stops growing: Just beneath subtended the flower there may be a modified, and usually reduced, leaf, called a bract. A secondary smaller bract is a bracteole bractlet, prophyll, prophyllum , often on the side of the pedicel, and generally paired. A series of bracts subtending the calyx see below is an epicalyx. Angiosperms are dealt with in more detail here; these structures are very different in gymnosperms. The floral parts are arranged at the end of a stem without any internodes. The receptacle also called the floral axis , or thalamus is generally very small. Some flower parts are solitary, while others may form a tight spiral, or whorl , around the flower stem. First, at the base, are those non-reproductive structures involved in protecting the flower when it is still a bud, the sepals , then are those parts that play a role in attracting pollinators and are typically coloured, the petals , which together with the sepals make up the perianth perigon, perigonium. If the perianth is differentiated, the outer whorl of sepals forms the calyx, and the inner whorl of petals, the corolla. If the perianth is not differentiated into sepals and petals, they are collectively known as tepals. In some flowers, a tube or cup-like hypanthium floral tube is formed above or around the ovary and bears the sepals, petals, and stamens. There may also be a nectary producing nectar. Nectaries may develop on or in the perianth, receptacle, androecium stamens , or gynoecium. In some flowers nectar may be produced on nectariferous disks. Disks may arise from the receptable and are doughnut- or disk-shaped. They may also surround the stamens extrastaminal , be at the stamen bases staminal , or be inside the stamina intrastaminal. Plant reproductive morphology Finally, the actual reproductive parts form the innermost layers of the flower. These leaf primordia become specialised as sporophylls , leaves that form areas called sporangia , which produce spores, and cavitate internally. The sporangia on the sporophytes of pteridophytes are visible, but those of gymnosperms and angiosperms are not. In the angiosperms there are two types. Some form male organs stamens , the male sporangia microsporangia producing microspores. Others form female organs carpels , the female sporangia megasporangia producing a single large megaspore. While sometimes leaflike laminar , more commonly they consist of a long thread-like column, the filament , surmounted by a pollen bearing anther. The anther usually consists of two fused thecae. A theca is two microspoorangia. A carpel is a modified megasporophyll consisting of two or more ovules , which develop conduplicatively folded along the line. The carpels may be single, or collected together, to form an ovary, and contain the ovules. Another term, pistil , refers to the ovary as its expanded base, the style , a column arising from the ovary, and an expanded tip, the stigma. Within the carpel the megasporangium form the ovules , with its protective layers integument in the megaspore, and the female gametophyte. Unlike the male gametophyte, which is transported in the pollen, the female gametophyte remains within the ovule. However, others have either one or the other and are therefore unisexual, or imperfect. In which case they may be either male staminate or female pistillate. Plants may bear either all bisexual flowers hermaphroditic , both male and female flowers monoecious , or only one sex dioecious , in which case separate plants are either male or female flower-bearing. Where both bisexual and unisexual flowers exist on the same plant, it is called polygamous. Polygamous plants may have bisexual and staminate flowers andromonoecious , bisexual and pistillate flowers gynomonoecious , or both trimonoecious. Other combinations include the presence of bisexual flowers on some individual plants and staminate on others androdioecious , or bisexual and pistillate gynodioecious. Finally, trioecious plants have bisexual, staminate, or pistillate flowers on different individuals. Arrangements other than hermaphroditic help to ensure outcrossing. The study of pollens which persist in soil for many years is called palynology. Reproduction occurs when male and female gametophytes interact. This generally requires an external agent such as wind or insects to carry the pollen from the stamen to the vicinity of the ovule. This process is called pollination. In gymnosperms literally naked seed pollen comes into direct contact with the exposed ovule. In angiosperms the ovule is enclosed in the carpel, requiring a specialised structure, the stigma , to receive the pollen. Once the ovule has been fertilised, a new sporophyte, protected and nurtured by the female gametophyte, develops and becomes an embryo. When development stops, the embryo becomes dormant, as a seed. Within the embryo are the primordial shoot and root. In angiosperms, as the seed develops after fertilisation, so does the surrounding carpel, its walls thickening or hardening, developing colours or nutrients that attract animals or birds. This new entity with its dormant seeds is the fruit , whose functions are protecting the seed and dispersing it. In some cases, androecium and gynaecium may be fused. The resulting structure is a gynandrium gynostegium, gynostemium , or column , which is supported by an androgynosphore. Vernation â€" the arrangement of leaves in an unopened bud. Roots [edit] Plants, with regard to identification and classification, are not often characterized by their roots, which are important in determining plant duration. However, in some groups, including the grasses, roots are important for proper identification. Adventitious â€" roots that form from other than the hypocotyl or from other roots. Roots forming on the stem are adventitious. Aerial â€" roots growing in the air. Root crown â€" the place where the roots and stem meet, which may or may not be clearly visible. Fleshy â€" describes roots that are relatively thick and soft, normally made up of storage tissue. Roots are typically long and thick but not thickly rounded in shape. Haustorial â€"

specialized roots that invade other plants and absorb nutrients from those plants. Lignotuber â€” root tissue that allows plants to regenerate after fire or other damage. Primary â€” root that develop from the radicle of the embryo, and is normally the first root to emerge from the seed as it germinates. Root Hairs â€” very small roots, often one cell wide, that do most of the water and nutrient absorption. Secondary â€" roots forming off of the primary root; often called branch roots. Taproot â€" a primary root that more-or-less enlarges and grows downward into the soil. Tuberous â€" roots that are thick and soft with storage tissue, and are typically thick and round in shape. Root structure terms[edit] Epiblema â€" Outermost epidermal layer of rootlets.

DOWNLOAD PDF VISIBLE PARTS OF PLANTS

Chapter 3 : Plant Cell Structure - AS Biology

The visible parts of plants. [Thomas P Hanna] -- "Why do plants need to be watered and what good does the wood in its trunk do for the tree? The root, stem, leaf, flower and seed - all the parts that most of us think of when we think of a plant -.

Some spectrums stimulate vegetative growth and others increase the yield in flowers and fruits. Other spectrums seem to have very little effect in plant growth. Thanks to the variable light spectrum available from LEDs we are finally starting to understand the relationship between light spectrum and plant growth. How do we measure light? Visible light is part of the larger electromagnetic scale which includes invisible spectrums such as radio waves and x rays. Each spectrum represents an electromagnetic frequency measured in nanometers one billionth of a meter: Do plants use all light spectrums produced by the sun? Most indoor growers seem to believe that the best indoor grow lights would have the same light spectrum as the sun â€” a relatively full spectrum over the visible light frequencies. After all, plants evolved over millions of years to best convert light energy into carbohydrates and sugars. The most readily available light from the sun is in the middle part of the spectrum which we see as green, yellow and orange. These are the primary frequencies that human eyes use. However, studies show that these are the least used light frequencies in plants. Most of the photosynthetic activity is in the blue and red frequencies. The main reason for this counter-intuitive use of light by plants seems to be related to early forms of bacteria and the evolution of photosynthesis. Photosynthesis first evolved in bacteria over millions of years in the primordial sea. This evolved in bacteria long before the appearance of more complex leafy plants. These early photosynthetic bacteria extensively used the yellow, green and orange middle spectrums for photosynthesis which tended to filter out these light spectrums for plants evolving at lower levels in the ocean. As more complex plants evolved at lower levels they were left with only the non-filtered spectrums not used by bacteria â€” mostly in the red and blue frequencies. The yellow, green and orange light is mostly reflected off the surface of the leaves and this is why photosynthesizing plants are green. Do different light spectrums do different work in plants? Not only do plants focus on specific light spectrums for photosynthesis but different light spectrums are used for different types of growth in plants. There are millions of photosynthetic receptors in a leaf of a green plant. Each receptor includes specialized pigments that absorb specific frequencies during photosynthesis. By measuring the amount of oxygen produced under various light spectrums we can measure the amount of photosynthetic activity under each light spectrum. This has produced a very detailed map of which light spectrum is related to which type of plant growth. How do plants use different light spectrums? Ultraviolet light 10nmnm Though overexposure to UV light is dangerous for the flora, small amounts of near-UV light can have beneficial effects. In many cases, UV light is a very important contributor for plant colors, tastes and aromas. This is an indication of near-UV light effect on metabolic processes. Studies show that nm UV light promotes the accumulation of phenolic compounds, enhances antioxidant activity of plant extracts, but does not have any significant effect on growth processes. It affects chlorophyll formation, photosynthesis processes, and through the cryptochrome and phytochrome system, raises the photomorphogenetic response. It also stimulates the production of secondary pigments which can enhance colors and is known to also stimulate Terpene i. Green light nmnm Most green light is reflected off the plant and plays a much smaller role in plant growth. However, there are some important aspects of light in this range so a certain amount of light in this spectrum range is beneficial. Green light is sometimes used as a tool for eliciting specific plant responses such as stomatal control, phototropism, photomorphogenic growth and environmental signaling. When combined with blue, red and far-red wavelengths, green light completes a comprehensive spectral treatment for understanding plant physiological activity. The function of green light is less well understood than the other spectrums, and there are only certain species of plants that require green light for normal growth. The pigments that can absorb green are found deeper in the leaf structure so it is thought that because green light reflects off of the Chlorophyll in leaf surfaces and thus is reflected deeper into the shaded areas of the canopy than Red and Blue which are readily absorbed, that green may actually be mostly absorbed through the undersides of the leaves as it bounces around in the shaded depths of the canopy. Red light nmnm Red light affects phytochrome reversibility and is the most important for flowering and fruiting regulation. These wavelengths encourage stem growth, flowering and fruit production, and chlorophyll production. The nm wavelength has a very strong photosynthetic action and also exhibits the highest action on red-absorbing phytochrome regulated germination, flowering and other processes. Most effective for light cycle extension or night interruption to induce flowering of long-day plants or to prevent flowering of short-day plants. Far red nm Although the nm wavelength is outside the photosynthetically active range, it has the strongest action on the far-red absorbing form of phytochrome, converting it back to the red-absorbing form. It becomes necessary for plants requiring relatively low values of the phytochrome photoequilibrium to flower. Can be used at the end of each light cycle to promote flowering in short-day plants such as Cannabis. Also, a higher ratio of far-red to red than found in sunlight can trigger the shade stretch response- where a plant when sensing it is shaded based on an elevated ratio of far-red to red- will stretch to try to elevate its canopy above its competitors. This is why too much far-red is not advised if compact plants are desired, or in general. Using Spectrum Control with Cannabis The exact way that plants use light is very specific to individual plant species and their natural environment. Evolution has produced a huge variety of plant strategies for growth and it is impossible to over generalize light responses. However, we do have a lot of practical experience with indoor cannabis growth results. Below are some general strategies and recommendations based on years of practical experiments with indoor lighting. There are basically 5 or possibly more different aspects to the end product in Cannabis that establish its value, and different people want different things. Overall flower yield 2 Flower density ie. Each can be individually optimized but there will be tradeoffs. Goals of the Commercial grower: What followers are SOME of the typical goals the average commercial grower might consider most important: Potency is extremely important here. Potency is also important and often lab measured. There numerous factors that play into this such as Resin content vs. With the market getting more and more competitive, this mindset will struggle to compete. Potency is important and often tested but typically considered strain specific and not considered that dependent on cultivation techniques. And please note, any fixed spectrum light source like HPS or MH will never have the ability to accomplish the ideal in any of these areas. That will require variable spectrum control. The single most important element in Cannabis yield is shaping of the plant BEFORE peak flower production such that only flower sites see light. This cannot be stressed enough. The best light and the best nutrients will not effect yield as much as insuring that only flowers sites and select sun leaves see light, and that all flowers left on the plant get enough light. Growth stages of Cannabis: There are also generally 4 growth stages in cannabis that have different spectrum requirements. Vegetation â€" In Vegetation VEG stage, rapid, healthy overall plant and root growth is desired, and in general most growers desire maximum growth but with shorter compact plants with short inter-nodal spacing preferred. Again, for most growers, the desire in this stage is to maximize SIZE, while limiting stretch. Maximum flower matter size and good structure is generally the goal here. Ripen or Finish â€" The Ripen period is generally from week 7 to finish in an 8-week flower where the Flower growth, i. This transition is not clearly defined, and some strains have big increases in resin production during this period, and others not as much. Optimizing spectrum for ideal results So understanding that enhancing each aspect of plant growth can be a tradeoff, and with the basics of our scientific understanding of Spectrum and Plant Morphology, we can now attempt to come up with some starting points for spectrum mixes for various end results. Please understand, these are starting points and you will need to experiment to reach the ideal for your environment, strain, and desired results. Goal 1 above, Maximum OIL content for processed edibles, etc. This includes both flower AND leaves, stems, etc. So a good starting point in terms of Spectrum programs would be: Obviously plant SIZE is the big driver at this point so a spectrum with full red and blue is important. In this case where flower structure is not important, only resin yield, a higher blue component ie. Because we are already running extra blue in flower, no changes are probably necessary in this stage. SO UVB should be supplemented for the last 5 weeks of flower minimum. In this example our goals are similar to Goal 1 above except there is a greater focus on Fragrance. UVB should be utilized all the way through the flower in this case because not only do we want to increase TCH in resin, but also terpene production and other pigments all the way through flower. This is the kind of growth pattern seen with HPS. Goal 4 â€” Maximum Top-shelf flower yield. So a good starting point for this type of grow would be: Extra deep blue will stimulate additional pigments during this critical growth period enhancing flower colors and fragrance. This is ratio that is found in the California LightWorks Full Cycle spectrum mix, or with the series full on. Even higher Red ratios by lowering the blue can be used to further promote flower matter, but there can be a sacrifice in resin, fragrance, and secondary pigments. At this point the higher blue ratio will not alter the flower structure or promote excess bud leaves, because flower growth is winding down, and transitioning to resin production. Results in this phase of growth are very strain specific and can be influenced by nutrient changes as well, so you are encouraged to try small changes each harvest to slowly dial in your ideal. IN this case UVB can be very important and it can be supplemented either the last weeks, or even throughout the entire flower period to stimulate pigments and terpenes and most importantly THC. By using this 4-stage spectrum control approach you can truly optimize the cosmetics, fragrance, density, and color, i. Conclusion So in conclusion, it can not be stressed enough that these recommendations are only starting points, because the all the results are strain specific and can also vary with other factors such as temperature, shading, and nutrients. Experimentation with additional changes such as varying the white ie. Too many changes in one cycle and you will not know what did what.

Chapter 4 : Plant & Animal Cells Staining Lab Answers â€“ SchoolWorkHelper

An area of the plant that produces sugars, such as leaves, or releases sugars from storage, such as roots during certain parts of the year. Summerwood Wood made later in the year than springwood, when water and nutrients are not as plentiful.

Nuclear Membrane enclosing the nucleus The nuclear membrane is also known as the nuclear envelope and encloses the contents of the nucleus of the cell - separating the contents of the nucleus from the rest of the cell. Nuclear pores in the nuclear membrane enable various substances, such as nutrients and waste products, to pass into and out of the nucleus. Rough Endoplasmic Reticulum RER Rough endoplasmic reticulum is the site of protein synthesis which takes place within the ribosomes attached to the surface of the RER as well as storage of proteins and preparation for secretion of those proteins. Smooth endoplasmic reticulum is the site of lipid synthesis and secretion within cells. They are bounded by double membranes, the inner of which is folded inwards, forming projections called cristae , hence the representation of mitochondria in diagrams e. Their function of mitochondria is energy production. Mitochondria contain enzyme systems needed to synthesize adenosine triphosphate ATP by oxidative phosphorylation. The quantity of mitochondria within cells varies with the type of cell. In the case of plant cells, mitochondria may be particularly abundant in sieve tube cells also called sieve tube members , root epidermal cells and dividing meristematic cells. Read more about mitochondria. Chloroplasts Chloroplasts are the sites of photosynthesis within plant cells. Chloroplasts are very important parts of plant cells. Some cells include up to 50 chloroplasts. The number of chloroplasts per cell varies according to the type of cell and its function. They are plentiful in leaf cells that receive sunlight - as opposed to root cells that do not receive light. Chloroplasts are a type of plastid. There are also other types of plastids not all of which are present in all plant cells but all of which are derived from proplastids. See the diagram of plastids on the right. Functions of the Golgi Apparatus: Modifies some newly-synthesized biomolecules before storing them in granules, sometimes called vesicles - ready for transport later. Forms lysosomes - which are tiny sacs filled with enzymes that enable the cell to utilize its nutrients, so are sometimes described as "cell digestion machines". Lysosomes also destroy the cell after it has died. Transports the proteins produced in the ER: After a protein has been synthesized in the ER, a transition vesicle or "sac" is formed then floats through the cytoplasm to the Golgi apparatus, into which it is absorbed. After processing the molecules inside the sac, a secretory vesicle is formed and released into the cytoplasm, moves to the cell membrane, then releases the molecules from the cell.

Chapter 5 : Plant Cells vs. Animal Cells (With Diagrams) | Owlcation

Why do plants need to be watered and what good does the wood in its trunk do for the tree? The root, stem, leaf, flower and seed - all the parts that most of us think of when we think of a plant - are examined in detail in this illuminating book to see how living structures are shaped by the jobs to be done.

Distinguish between male and female marijuana plants in different stages of development PART 2: Life Cycles of Cannabis Like a human being, Cannabis is a diploid organism: Chromosomes are microscopic structures within the cells on which the genes are aligned. One pair of chromosomes carries the primary genes that determine sex. These chromosomes are labelled either X or Y. Male plants have an XY pair of sex chromosomes. Each parent contribute one set of 10 chromosomes, which includes one sex chromosome, to the embryo. The sex chromosome carried by the female ovule can only be X. The one carried by pollen of the male plant may be either X or Y. Where the photoperiod is artificially controlled, as with electric lights, males respond quickly in about a week to a change to short photoperiods and usually show flowers sooner than the females. With these varieties, you can tell gender by the spacing between the leaves internodes. For the female, the emphasis is on compact growth. Each new leaf grows closer to the last, until the top of the plant is obscured by tightly knit leaves. The male elongates just prior to showing flowers. New growth is spaced well apart and raises the male to a taller stature. This may by the first time the male shows its classic tall, loosely arranged profile. The male preflower may be described as a "ball on a stick. Sometimes, a male plant will develop mature staminate flowers after prolonged periods of vegetative growth. These appear in clusters around the nodes. The following image shows a male plant in early flowering. Staminate flowers are located at the node between the stipule and emerging branch. Male flowers develop quickly, in about one to two weeks on a vigorous plant, not uniformly. Scattered flowers may open a week or more before and after the general flowering, extending the flowering stage to about four weeks. Most of the flowers develop near the top of the plant, well above the shorter females. The immature flower buds first appear at the tips of the main stem and branches. Then tiny branches sprout from the leaf axils, bearing smaller clusters of flowers. The immature male flowers are closed, usually green, and develop in tight clusters of knob-like buds. The main parts of the male flowers are five petal-like sepals which enclose the sexual organs. As each flower matures, the sepals open in a radiating pattern to reveal five pendulous anthers stamens. Inside the ovoid, sac-shaped anthers, pollen grains develop. Initially, pollen sifts through two pores near the top of the anther; then, starting from the pores, longitudinal slits slowly open zipperlike over the course of a day, releasing pollen to the wind. Once a flower sheds pollen, it shortly dies and falls from the plant. Normally, male plants begin to die one to two weeks after the bulk of their flowers have shed pollen. Healthy males may continue to flower for several more weeks, but secondary growth seldom has the vigour of initial bloom. Female marijuana plants flower when the average daily photoperiod is less then about 12 to 13 hours. However, some varieties and individuals may flower with a photoperiod of over 14 hours. Some Colombian varieties may not respond until the photoperiod falls below 12 hours for a period of up to three weeks. The duration of flowering also depends on the particular rhythm of the variety, as well as growing conditions, and whether or not the plant is pollinated. Within these variables, females maintain vigorous growth and continue to rapidly form flowers for a period that ranges from 10 days to about eight weeks. Females generally do not grow much taller during flowering. Growth emphasises a "filling out," as flower clusters develop from each leaf axil and growing tip. Normally, the flowers arise in pairs, but the pairs form tight cluster of 10 to over individual flowers that are interspersed with small leaves. These clusters are the "buds" of commercial marijuana. Along the top of the main stem and vigorous branches, "buds" may form so thickly that the last foot or more of stem is completely covered. Usually the leaves that accompany the flowers tend toward simpler structure, until each leaf has one to three blades. The visible parts of the female flower above are two upraised stigmas, one-quarter to one-half inch long, usually white or cream, sometimes tinged with red, that protrude from a tiny, green, pod-shaped structure called the floral bract. This consists of modified leaves bracts and bracteoles which envelop the ovule or potential seed. When fertilised, a single seed begins to develop within the bract, which then swells until it is split by the mature seed. Bracts are covered more densely with large resin glands than is any other part of the plant, and are the most potent part of the harvest. Resin glands may also be seen on the small leaves that are interspersed among the flowers. The differences between male and female Cannabis become more apparent as the plants mature. The same can be said of the differences between varieties. Often, two varieties may appear to be similar, until they actually flowers and fill out to different forms. These appear in many ways: Some plants but only the more vigorous ones will renew flowering even when pollinated. Females that are not well-pollinated continue to form flowers rapidly. This extends the normal flowering period, of 10 days to four weeks, up to eight weeks or more. Individual flowers are pollinated by individual pollen grains. In a matter of minutes from its landing on a stigma, the pollen grain begins to grow a microscopic tube, which penetrates the stigma and reaches the awaiting ovule wrapped within the bracts. The union of the male and female complements of genes completes fertilisation and initiates seed formation. The stigmas, having served their purpose, shrivel and die, turning rust or brown colour. On a vigorous female, the seeds reach maturity in about 10 days. When growing conditions are poor, the seed may take five weeks to ripen to full size and colour. Naturally, all the flowers do not form, nor are they pollinated at the same time - and there will be seeds that reach maturity weeks before others do. Although each flower must be individually fertilised to produce a seed, a single male plant can release many millions of pollen grains. A large female plant can produce over 10, seeds. Sexual Variants in Cannabis Cannabis has been studied for many years because of its unusual sexuality. Besides the normal dioecious pattern, where each plant bears exclusively male or female flowers, it is not uncommon for some plants to have both male and female flowers. These are called hermaphrodites, or monoecious plants, or intersexes. Hermaphroditic plants form normal flowers of both sexes in a wide variety of arrangements, in both random and uniform distributions. Natural Hermaphrodites Some hermaphrodites seem to be genetically determined protogenous. That is, they naturally form flowers of both sexes given normal growing conditions. Possibly genes carried on the autosomes the chromosomes other than the sex chromosomes modify the normal sexual expression. Monoecious varieties have been developed by hemp breeders in order to ensure uniform harvests. It is also possible that these particular are polyploid, which means they have more than the usual two sets of chromosomes. However, no naturally occurring polyploids have ever been verified by observation of the chromosomes in any population of Cannabis. Polyploids have been induced in Cannabis by using mutagens, such as the alkaloid colchicine. Whatever then genetic explanation may be, one or more of these natural hermaphrodites may randomly appear in any garden. They are sometimes faster-maturing, have larger leaves, and are larger in overall size than their unisexual siblings. They usually form flowers of both sexes uniformly in time and distribution, and in some unusual patterns. For example, from Mexican seed, we have seen a plant on which separate flowering cluster consisted of both female and male flowers: In other plants from Mexican seed, the growing tips throughout the plant have female flowers; male flowers sprout from the leaf axils along the main stem and branches. Plants from "Thai" seed sometimes form male and female flowers on separate branches. Branches with female flowers tend to predominate, but branches having mostly male flowers are located throughout the plant. Abnormal Flowers, Intersexes, Reversals Gender is set in the new plant at the time of fertilisation by its inheritance of either the X or the Y chromosome from the male staminate plant. With germination of the seed, the environment comes into play. Heritage sets the genetic program, but the environment can influence how the program runs. Sexual expression in Cannabis is delicately balanced between the two. When the environment does not allow a balance to be maintained, the normal genetic program may not be followed. This is mirrored by abnormal growth or sexual expression. Abnormal Flower Abnormal sexual expression includes a whole range of possibilities. Individual flowers may form abnormally, and may contain varying degrees of both male and female flower parts. For instance, a male flower may bear a stigma; or an anther may protrude from the bracts of a female flower. Abnormally formed flowers are not often seen on healthy plants, although if one looks hard enough, a few may be found in most crops. When many of the flowers are abnormal, an improper photoperiod coupled with poor health is the most likely cause. Abnormal flowers sometimes form on marijuana grown out of season, such as with winter or spring crops grown under natural light. One may find an isolated male flower or two; or there may be many clusters of male flowers on an otherwise female plant, or vice versa. These plants are called intersexes also hermaphrodites or monoecious plants.

DOWNLOAD PDF VISIBLE PARTS OF PLANTS

Chapter 6 : The Best Plant Light Spectrum for Growing Flowering Plants | Home Guides | SF Gate

The visible light spectrum emits light in red, orange, yellow, green, blue, indigo and violet colors. Colors on either end of the spectrum play the greatest role in plant growth and flowering.

Search term Section In plants, photosynthesis occurs in chloroplasts, large organelles found mainly in leaf cells. The principal end products are two carbohydrates that are polymers of hexose six-carbon sugars: Leaf starch is synthesized and stored in the chloroplast. Sucrose is synthesized in the cytosol from three-carbon precursors generated in the chloroplast and is transported from the leaf to other parts of the plant. Nonphotosynthetic nongreen plant tissues like roots and seeds metabolize sucrose for energy by the pathways described in the previous sections. Photosynthesis in plants, as well as in eukaryotic single-celled algae and in several photosynthetic prokaryotes the cyanobacteria and prochlorophytes , also generates oxygen. The overall reaction of oxygen-generating photosynthesis, is the reverse of the overall reaction by which carbohydrates are oxidized to CO2 and H2O. Figure Structure of starch. This large glucose polymer and the disaccharide sucrose see Figure are the principal end products of photosynthesis. Both are built of six-carbon sugars. Our emphasis is on photosynthesis in plant chloroplasts, but we also discuss a simpler photosynthetic process that occurs in green and purple bacteria. Although photosynthesis in these bacteria does not generate oxygen, detailed analysis of their photosynthetic systems has provided insights about the first stages in oxygen-generating photosynthesis â€" how light energy is converted to a separation of negative and positive charges across the thylakoid membrane , with the simultaneous generation of a strong oxidant and a strong reductant. In this section, we provide an overview of the stages in photosynthesis and introduce the main components, including the chlorophylls , the principal lightabsorbing pigments. Photosynthesis Occurs on Thylakoid Membranes Chloroplasts are bounded by two membranes, which do not contain chlorophyll and do not participate directly in photosynthesis Figure Of these two membranes, the outer one, like the outer mitochondrial membrane , is permeable to metabolites of small molecular weight; it contains proteins that form very large aqueous channels. The inner membrane, conversely, is the permeability barrier of the chloroplast ; it contains transporters that regulate the movement of metabolites into and out of the organelle. Figure The structure of a leaf and chloroplast. The chloroplast is bounded by a double membrane: Unlike mitochondria , chloroplasts contain a third membrane â€" the thylakoid membrane â€" that is the site of photosynthesis. In each chloroplast , the thylakoid membrane is believed to constitute a single, interconnected sheet that forms numerous small flattened vesicles, the thylakoids , which commonly are arranged in stacks termed grana see Figure The spaces within all the thylakoids constitute a single continuous compartment, the thylakoid lumen. The thylakoid membrane contains a number of integral membrane proteins to which are bound several important prosthetic groups and light-absorbing pigments, most notably chlorophyll. Carbohydrate synthesis occurs in the stroma, the soluble phase between the thylakoid membrane and the inner membrane. In photosynthetic bacteria extensive invaginations of the plasma membrane form a set of internal membranes, also termed thylakoid membranes, or simply thylakoids, where photosynthesis occurs. Three of the Four Stages in Photosynthesis Occur Only during Illumination It is convenient to divide the photosynthetic process in plants into four stages, each occurring in a defined area of the chloroplast: All four stages of photosynthesis are tightly coupled and controlled so as to produce the amount of carbohydrate required by the plant. All the reactions in stages 1 â€" 3 are catalyzed by proteins in the thylakoid membrane. The enzymes that incorporate CO2 into chemical intermediates and then convert it to starch are soluble constituents of the chloroplast stroma see Figure The enzymes that form sucrose from three-carbon intermediates are in the cytosol. Absorption of Light The initial step in photosynthesis is the absorption of light by chlorophylls attached to proteins in the thylakoid membranes. Like cytochromes , chlorophylls consist of a porphyrin ring attached to a long hydrocarbon side chain Figure The energy of the absorbed light is used to remove electrons from an unwilling donor water, in green plants , forming oxygen, and then to transfer the electrons to a primary electron acceptor, a quinone designated Q, which is similar to CoQ. Figure The structure of chlorophyll a, the principal pigment that traps light energy. In the porphyrin ring, a highly conjugated system, electrons are delocalized more Thus the overall reaction of stages 1 and 2 can be summarized as Many photosynthetic bacteria do not use water as the donor of electrons. This use of the proton-motive force to synthesize ATP is identical with the analogous process occurring during oxidative phosphorylation in the mitochondrion see Figures and The overall balanced equation is written as The reactions that generate the ATP and NADPH used in carbon fixation are directly dependent on light energy; thus stages 1 â€" 3 are called the light reactions of photosynthesis. The reactions in stage 4 are indirectly dependent on light energy; they are sometimes called the dark reactions of photosynthesis because they can occur in the dark, utilizing the supplies of ATP and NADPH generated by light energy. However, the reactions in stage 4 are not confined to the dark; in fact, they primarily occur during illumination. Each Photon of Light Has a Defined Amount of Energy Quantum mechanics established that light, a form of electromagnetic radiation, has properties of both waves and particles. When light interacts with matter, it behaves as discrete packets of energy quanta called photons. Note that photons of shorter wavelength have higher energies. Chlorophyll a Is Present in Both Components of a Photosystem The absorption of light energy and its conversion into chemical energy occurs in multiprotein complexes, called photosystems, located in the thylakoid membrane. A photosystem has two closely linked components, an antenna containing light-absorbing pigments and a reaction center comprising a complex of proteins and two chlorophyll a molecules. Each antenna named by analogy with radio antennas contains one or more light-harvesting complexes LHCs. The energy of the light captured by LHCs is funneled to the two chlorophylls in the reaction center, where the primary events of photosynthesis occur. Found in all photosynthetic organisms, both eukaryotic and prokaryotic, chlorophyll a is the principal pigment involved in photosynthesis , being present in both antennas and reaction centers. In addition to chlorophyll a, antennas contain other light-absorbing pigments: The presence of various antenna pigments, which absorb light at different wavelengths, greatly extends the range of light that can be absorbed and used for photosynthesis. The latter is a measure of the relative ability of light of different wavelengths to support photosynthesis. Figure Photosynthesis at different wavelengths. When chlorophyll a or any other molecule absorbs visible light, the absorbed light energy raises the chlorophyll a to a higher energy state, termed an excited state. This differs from the ground unexcited state largely in the distribution of electrons around the C and N atoms of the porphyrin ring see Figure Excited states are unstable, and will return to the ground state by one of several competing processes. For chlorophyll a molecules dissolved in organic solvents, such as ethanol, the principal reactions that dissipate the excited-state energy are the emission of light fluorescence and phosphorescence and thermal emission heat. The situation is quite different when the same chlorophyll a is bound to the unique protein environment of the reaction center. In the reaction center, this excited-state energy is used to promote a charge separation across the thylakoid membrane: The reduced primary electron acceptor becomes a powerful reducing agent, with a strong tendency to transfer the electron to another molecule. The positively charged chlorophyll, a strong oxidizing agent, will attract an electron from an electron donor on the luminal surface. These potent biological reductants and oxidants provide all the energy needed to drive all subsequent reactions of photosynthesis: Figure The primary event in photosynthesis. The significant features of the primary reactions of photosynthesis are summarized in the following model, in which P represents the chlorophyll a in the reaction center, and Q represents the primary electron acceptor: According to this model, the ground state of the reaction-center chlorophyll, P, is not a strong enough reductant to reduce Q; that is, an electron will not move spontaneously from P to Q. This photochemical electron movement, which depends on the unique environment of both the chlorophylls and the acceptor within the reaction center, occurs nearly every time a photon is absorbed. Chlorophyll a also absorbs light at discrete wavelengths shorter than nm see Figure b. This means that the quantum yield â€" the amount of photosynthesis per absorbed photon â€" is the same for all wavelengths of visible light shorter than nm. The chlorophyll a molecules within reaction centers are capable of directly absorbing light and initiating photosynthesis. To increase the efficiency of photosynthesis, especially at more typical light intensities, organisms utilize additional light-absorbing pigments. Light-Harvesting Complexes Increase the Efficiency of Photosynthesis As noted earlier, each reaction center is associated with an antenna, which contains several light-harvesting complexes LHCs , packed with chlorophyll a and, depending on the species, chlorophyll b and other pigments. LHCs promote photosynthesis by increasing absorption of nm light and by extending the range of wavelengths of light that can be absorbed see Figure Photons can be absorbed by any of the pigment molecules in each LHC. Within an LHC are several transmembrane proteins whose role is to maintain the pigment molecules in the precise orientation and position that are optimal for light absorption and energy transfer, thereby maximizing the very rapid and efficient process known as resonance transfer of energy from antenna pigments to reaction-center chlorophylls. As depicted in Figure a , some photosynthetic bacteria contain two types of LHCs: Figure b shows the structure of the subunits that make up the LH2 complex in Rhodopseudomonas acidophila. Surprisingly, the molecular structures of plant light-harvesting complexes are completely different from those in bacteria, even though both types contain carotenoids and chlorophylls in a clustered geometric arrangement within the membrane. Figure Light-harvesting complexes from the photosynthetic bacterium Rhodopseudomonas acidophila. Each LH2 complex consists of nine subunits more Although antenna chlorophylls can transfer absorbed light energy, they cannot release an electron. To understand their electron-releasing ability, we examine the structure and function of the reaction center in bacterial and plant photosystems in the next section. Chloroplasts are surrounded by a permeable outer membrane and an inner membrane that forms the permeability barrier; neither of these membranes participates in photosynthesis. In the chloroplast interior, the thylakoid membrane is folded into numerous flattened vesicles; the light-capturing and ATP-generating reactions of photosynthesis occur on this membrane see Figure Photosynthesis in plants can be described in four stages, which occur in specific parts of the chloroplast. In stage 1, light is absorbed by chlorophyll a molecules bound to reaction-center proteins in the thylakoid membrane. The energized chlorophylls donate an electron to a quinone on the opposite side of the membrane, creating a charge separation see Figure In green plants, the positively charged chlorophylls then remove electrons from water, forming oxygen. Transport of electrons is coupled to the movement of protons across the membrane from the stroma to the thylakoid lumen, forming a pH gradient across the thylakoid membrane. These reactions occur in the thylakoid stroma and cytosol. Chlorophyll a is the only light-absorbing pigment in reaction centers. Associated with each reaction center are multiple light-harvesting complexes LHCs , which contain chlorophylls a and b, carotenoids, and other pigments that absorb light at multiple wavelengths. Energy is transferred from the LHC chlorophyll molecules to reaction-center chlorophylls by resonance energy transfer see Figure By agreement with the publisher, this book is accessible by the search feature, but cannot be browsed.

Chapter 7 : Plant Disease Diagnosis

A plant has two basic plant parts: the shoot and root systems. In this lesson, you'll learn and be able to identify each individual plant part within the shoot and root systems. Basic Structure of.

A leaf is a plant organ and is made up of a collection of tissues in a regular organisation. The major tissue systems present are: The epidermis that covers the upper and lower surfaces The mesophyll also called chlorenchyma inside the leaf that is rich in chloroplasts The arrangement of veins the vascular tissue Epidermis[change change source] The epidermis is the outer layer of cells covering the leaf. The epidermis is covered with pores called stomata. They are part of a complex with a pore surrounded on each side by chloroplast-containing guard cells, and two to four subsidiary cells that lack chloroplasts. Opening and closing of the stoma complex regulates the exchange of gases and water vapor between the outside air and the interior of the leaf and plays an important role in allowing photosynthesis without letting the leaf dry out. Mesophyll[change change source] Most of the interior of the leaf between the upper and lower layers of epidermis is a tissue called the mesophyll Greek for "middle leaf". This assimilation tissue is the main place photosynthesis takes place in the plant. The products of photosynthesis are sugars, which can be turned into other products in plant cells. In ferns and most flowering plants, the mesophyll is divided into two layers: An upper palisade layer of tightly packed, vertical cells, one to two cells thick. Its cells contain many chloroplasts. The chloroplasts move by a process called "cyclosis". The slight separation of the cells provides maximum absorption of carbon dioxide. Sun leaves have a multi-layered palisade layer, while shade leaves closer to the soil are single-layered. Beneath the palisade layer is the spongy layer. The cells of the spongy layer are more rounded and not so tightly packed. There are large air spaces between the cells. These cells contain fewer chloroplasts than those of the palisade layer. The pores or stomata of the epidermis open into chambers, which are connected to the air spaces between the spongy layer cells. Leaves are normally green in color, which comes from chlorophyll found in the chloroplasts. Plants that lack chlorophyll cannot photosynthesize. In angiosperms the pattern of venation differs in the two main groups. Venation is usually is parallel in monocotyledons , but is an interconnecting network in broad-leaved plants dicotyledons. Hairs[change change source] Sticky trichomes of a carnivorous plant , Drosera capensis with a trapped insect Many leaves are covered in trichomes small hairs which have a wide range of structures and functions. Some trichomes are prickles, some are scaled, some secrete substances such as oil. Carnivorous plants secrete digestive enzymes from trichomes. Shape[change change source] What leaves look like on the plant varies greatly. Closely related plants have the same kind of leaves because they have all descended from a common ancestor. The terms for describing leaf shape and pattern is shown, in illustrated form, at Wikibooks.

Chapter 8 : Light Absorption for Photosynthesis

It is evident from these absorption and output plots that only the red and blue ends of the visible part of the electromagnetic spectrum are used by plants in photosynthesis. The reflection and transmission of the middle of the spectrum gives the leaves their green visual color.

Source What Are Cells? Cells have often been referred to as "the building blocks of life," and indeed they are. All forms of life, from simple bacteria to human beings, are made up of cells. What is remarkable is that, despite their differences in appearance, plant and animal life are made up of cells that are the same in most respects. In both animals and plants, cells generally become specialized to perform certain functions. Nerve cells, bone cells and liver cells, for example, all develop in ways that enable them to better perform their specific duties. The most important structures of plant and animal cells are shown in the diagrams below, which provide a clear illustration of how much these cells have in common. The significant differences between plant and animal cells are also shown, and the diagrams are followed by more in-depth information. Diagram of an animal cell. Source Diagram of an plant cell. Plant cells have to perform two functions that are not required of animal cells: Produce their own food which they do in a process called photosynthesis. Support their own weight which animals usually do by means of a skeleton. The structures possessed by plant cells for performing these two functions create the primary differences between plant and animals cells. A wall on the outside of the membrane, which, in combination with the vacuole as described below , helps the plant cell maintain its shape and rigidity. Used in photosynthesis to convert sunlight, carbon dioxide, and water into food. The most well-known plastids are chloroplasts, which contain the chlorophyll that gives many plants their green hue. While animal cells may have many tiny vacuoles, a plant cell usually has a single large vacuole, which serves as a storage tank for food, water, waste products, and other materials. The vacuole has an important structural function, as well. When filled with water, the vacuole exerts internal pressure against the cell wall, which helps keep the cell rigid. A plant that is wilting has vacuoles that are no longer filled with water. While animal cells do not have a cell wall, chloroplasts, or a large vacuole, they do have one component plant cells do not. Structures Unique to Animal Cells Centrioles: Animal cells contain organelles known as centrioles, which are not present in plant cells. Centrioles help move chromosomes during cell division. Since animal cells are softer than plant cells, centrioles are required to ensure the chromosomes are in the proper location when the cell divides. Plant cells, with their more fixed shape, can safely assume that the chromosomes are correctly positioned.

Chapter 9 : Glossary of plant morphology - Wikipedia

The parts of a flowering plant are characterized by two basic systems: a root system and a shoot system. These two systems are connected by vascular tissue that runs from the root through the shoot. The root system enables flowering plants to obtain water and nutrients from the soil.

For the Onion Skin Cell Peel off a small section of onion skin Place the onion skin in the centre of the slide Place the two drops of water on the onion skin. Touch the opposite edge of the cover slip with a paper towel to draw the stain under the slip Place the slide on the stage under low power. Use the coarse adjustment knob to focus Rotate the nosepiece to medium power. Use the fine adjustment knob to focus. Observe what you see Repeat step 8, but this time switch to high power and draw what you see use a pencil After you draw your diagrams, rotate the nosepiece back to low power. Remove the slide and dispose of the piece of onion, and wash the slide and cover slip For the Cheek Cell Take a clean toothpick and gently scrape the inside of your cheek Prepare a wet mount like in steps Instead, use the methylene blue solution as the dye Observations When observing the onion skin cell, we noticed that the cells took on a brick-like structure and within the cells, small dots the nuclei can be seen. When we viewed the onion skin cells at X total magnification, we noticed the nuclei of the cells looked clearer and larger and we were able to study the cell with more understanding than when we used the first magnification. The organelles that we were able to see in this type of cell were the nucleus, the cytoplasm and the cell wall. Unlike the onion skin cells, the cheek cells were more spread out from each other and they all had a round shape. When we viewed the cheek cells at 40X total magnification, we noticed that the cells were secluded and spread out see diagram provided. At X total magnification, we were only able to view one cell at a time, due to the fact that the cells were separated from each other. The organelles that were visible in this type of cell were the nucleus, the cytoplasm and the cell membrane. Aside from the actual cells, we were able to see air bubbles within both the onion skin cell slide and the cheek cell slide. Conclusion Furthermore, my stated hypothesis is somewhat correct and incorrect. I stated that all cells will be together in a large group, but now I realize that the statement was incorrect. Only the plant cells were together in a large group. The animal cells, however, were secluded, thus proving the statement wrong. I stated that both the cells were about 0. A correct statement in my hypothesis was that most of the important organelles are visible through the microscope. The important organelles that can be seen are the cell wall for the plant cells , the cell membrane, the nucleus, and the cytoplasm. We can see those organelles due to the fact that they are the largest organelles in the cell and also due to the dye which brought them out. The final statement in my hypothesis was that the overall image will not be clear enough for further detail. Overall, I have learned that onion skin cells plant cells are rectangular and are always with other plant cells and cheek cells animal cells are circular and are secluded from each other, and that the smaller organelles cannot be seen with just our school microscope. Applications Knowing that certain cells are different from other cells is important in our world for many reasons. The cell is the most basic unit of life and knowing about it will help us answer many different questions. If someone knows about the cell and how it works they could find a way to counteract viruses and illnesses, thus creating medicine and a way to cure the virus or illness. We should know about the cell because it helps us understand that every cell has an individual job to fulfill and those cells let us do what we can do now. Discussion The cheek cell, an example of an animal cell, generally has a circular, oval shape. Due to the fact that the cheek cell was not in groups or clumps, the arrangement of this type of cell is unknown. From previous labs, I remember that the cells were pushed together completely; each cell fitted beside another cell perfectly and so on. The animal cell structure is the most prominent in human cheek cells. The onion skin cell, an example of a plant cell, generally has a rigid, rectangular shape. The onion skin cells were positioned beside each other length touching length, width touching width and formed a checkered pattern. Also, like the cheek cell, the onion skin cells were pushed together so that no spaces were in between.