DOWNLOAD PDF THE LIFE OF PLANTS (UNDERSTANDING PLANTS)

Chapter 1 : Plant Life Cycle

Growing marijuana requires a good understanding of its life cycle. By doing so, we become aware of its overall health by looking at the changes in its behavior.

This process is so much more than just how a plant grows, and it directly affects the health of the planet and all animal life on Earth, including humans. Many teachers ask their students about the life cycle of a plant to assess how much they understand about the natural world, and they will set tasks and activities to teach more about the life cycle of a plant for kids. What is the Life Cycle of a Plant for Kids? Many organic processes on Earth follow a cyclical pattern. The seasons come and go, plants die and then bloom again, and animals and plants need each other to function. Sciencing Video Vault The life cycle of a plant is the series of steps all plants go through to grow from a seed to a fully mature plant. The Seed seeds image by timur from Fotolia. Inside the seed is everything the plant will become, it just needs water and sunlight to begin to germinate and grow. Seeds of different plants can vary in size and appearance but they all have a seed coat which gives the plant food and protects it from damage. The Seedling Once a seed starts to grow, a root emerges and knows to head down into the soil away from the surface. The seedling is a very tiny plant which often already has a few leaves. Seedlings can be delicate and easily damaged. If left alone with access to water and sunlight they will begin to grow into an adult plant. Flowering Plant Once a plant reaches maturity it will begin to produce flowers. These flowers are often brightly colored and strongly scented, which attracts insects to pollinate them. This spreads the seeds further and helps new plants to grow. Releasing New Seeds dandilion image by Richard pigott from Fotolia. Seeds can be spread in a number of different ways, including dispersion on the wind, which helps the seeds to travel further and increases the area in which the plant can be found. Some animals will also eat the seeds and spread them by moving around and defecating in different areas. Humans can also help to spread seeds by planting them in gardens. Understanding and being able to explain the life cycle of a plant helps you to better appreciate our natural world and the processes that drive it.

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Chapter 2 : Understanding the Life Cycles of Cannabis Plants | Seedsman Blog

Understanding Plants - Part I: What a Plant Knows from Tel Aviv University. For centuries we have collectively marveled at plant diversity and formâ€"from Charles Darwin's early fascination with stems and flowers to Seymour Krelborn's distorted.

Students were asked to think about and draw a picture that showed the parts of a plant and all of the things that plants require for growth. In coding the drawings, we developed and used a checklist that came from emergent analytical coding. This checklist provided a set of features that emerged in analyzing the drawings of the children. Two members of the research team independently reviewed 15 drawings and recorded the various features of the drawings e. The two checklists were compared and condensed into a list of specific plant features that was then used as a draft-coding sheet. This condensed list was then used to code an additional fifteen drawings. Raters worked independently to code features from the list that were either present or absent. Additionally, the raters looked for features that were present in the drawings but were absent from the code sheet. Coding results were then compared and formal descriptions were developed for structures that had a high level of agreement. Discrepancies were discussed, and the reasons that they occurred were identified. This kappa value indicates a strong agreement, which correlates with the interrater reliability. Once final coding schemes were determined, the remaining drawings were coded and the results analyzed. Surveys were reviewed by both an early childhood and a science educator to ensure that: This portion of the survey consisted of 13 pictures of plants, nonplants, and objects made from plants. Students were asked to circle all pictures that related to or were specifically plants. This section of the survey had 12 pictures. Each picture within the survey was scored as 1, signifying a correct response, or 0, indicating an incorrect response. On completion, the survey data were analyzed using SPSS and correlated to the corresponding data for the drawings. This allowed us to look across the data to understand student thinking about plant structure and function. Descriptive statistics and frequencies were calculated across the surveys. All interviews were digitally audio-recorded and transcribed by the researchers. The interviews were used to verify the coding of the drawings done by the researchers and the surveys that were taken. For example, cards were created that were identical to the plants and nonplant structures that were found in survey. Students were asked to sort these cards into plant and nonplant structures. After sorting the cards, students were asked to explain their choices. These were then correlated to the responses on the surveys and to the drawings created by the students. While much of the previous research e. Drawings varied across the grade levels, with students in first grade beginning to provide more detailed drawings and, in some cases, including secondary objects or materials e. Additionally, the first grade students began to include other types of organisms in their drawings that they believed helped the plants grow and survive e. The results from the drawing data are described below. What emerged in the drawing data were that students were consistent in how they placed sunlight in their drawings.

Chapter 3 : Plant Biology: Understanding Plant Life | Youngzine

About this course: This class is aimed at people interested in understanding the basic science of plant theinnatdunvilla.com this four lecture series, we'll first learn about the structure-function of plants and of plant cells.

Plant proteins, mostly globulins, have been obtained chiefly from the protein-rich seeds of cereals and legumes. Small amounts of albumins are found in seeds. The best known globulins, insoluble in water, can be extracted from seeds by treatment with 2 to 10 percentâ€¦ Definition of the kingdom The kingdom Plantae includes organisms that range in size from tiny mosses to giant trees. Despite this enormous variation, all plants are multicellular and eukaryotic i. They generally possess pigments chlorophylls a and b and carotenoids , which play a central role in converting the energy of sunlight into chemical energy by means of photosynthesis. Most plants, therefore, are independent in their nutritional needs autotrophic and store their excess food in the form of macromolecules of starch. The relatively few plants that are not autotrophic have lost pigments and are dependent on other organisms for nutrients. Although plants are nonmotile organisms, some produce motile cells gametes propelled by whiplike flagella. Plant cells are surrounded by a more or less rigid cell wall composed of the carbohydrate cellulose, and adjacent cells are interconnected by microscopic strands of cytoplasm called plasmodesmata, which traverse the cell walls. Many plants have the capacity for unlimited growth at localized regions of cell division , called meristems. Plants, unlike animals, can use inorganic forms of the element nitrogen N , such as nitrate and ammonia â€”which are made available to plants through the activities of microorganisms or through the industrial production of fertilizers â€”and the element sulfur S ; thus, they do not require an external source of protein in which nitrogen is a major constituent to survive. Cutaway drawing of a plant cell, showing the cell wall and internal organelles. Diversity Plants have evolved into many diverse forms that define and sustain ecosystems. The life histories of plants include two phases, or generations, one of which is diploid the nuclei of the cells contain two sets of chromosomes , whereas the other is haploid with one set of chromosomes. The diploid generation is known as the sporophyte , which literally means spore -producing plant. The haploid generation, called the gametophyte , produces the sex cells, or gametes. The complete life cycle of a plant thus involves an alternation of generations. The sporophyte and gametophyte generations of plants are structurally quite dissimilar. Life cycle of a typical angiospermThe angiosperm life cycle consists of a sporophyte phase and a gametophyte phase. The cells of a sporophyte body have a full complement of chromosomes i. The gametophyte arises when cells of the sporophyte, in preparation for reproduction, undergo meiotic division and produce reproductive cells that have only half the number of chromosomes i. A two-celled microgametophyte called a pollen grain germinates into a pollen tube and through division produces the haploid sperm. An eight-celled megagametophyte called the embryo sac produces the egg. Fertilization occurs with the fusion of a sperm with an egg to produce a zygote, which eventually develops into an embryo. After fertilization, the ovule develops into a seed, and the ovary develops into a fruit. The concept of what constitutes a plant has undergone significant change over time. For example, at one time the photosynthetic aquatic organisms commonly referred to as algae were considered members of the plant kingdom. The various major algal groups, such as the green algae , brown algae , and red algae , are now placed in the kingdom Protista because they lack one or more of the features that are characteristic of plants. The organisms known as fungi also were once considered to be plants because they reproduce by spores and possess a cell wall. The fungi, however, uniformly lack chlorophyll, and they are heterotrophic and chemically distinct from the plants; thus, they are placed in a separate kingdom, Fungi. No definition of the kingdom completely excludes all nonplant organisms or even includes all plants. There are plants, for example, that do not produce their food by photosynthesis but rather are parasitic on other living plants. Some animals possess plantlike characteristics, such as the lack of mobility e. Despite such differences, plants share the following features common to all living things. Their cells undergo complex metabolic reactions that result in the production of chemical energy, nutrients, and new structural components. They respond to internal and external stimuli in a self-preserving manner. They reproduce by passing their genetic information to descendants that resemble them. They have evolved over geological time scales hundreds of millions of years by the process of natural selection into a wide array of forms and life-history strategies. The earliest plants undoubtedly evolved from an aquatic green algal ancestor as evidenced by similarities in pigmentation, cell-wall chemistry, biochemistry, and method of cell division , and different plant groups have become adapted to terrestrial life to varying degrees. Land plants face severe environmental threats or difficulties, such as desiccation, drastic changes in temperature , support, nutrient availability to each of the cells of the plant, regulation of gas exchange between the plant and the atmosphere, and successful reproduction. Thus, many adaptations to land existence have evolved in the plant kingdom and are reflected among the different major plant groups. An example is the development of a waxy covering the cuticle that covers the plant body, preventing excess water loss. Specialized tissues and cells vascular tissue enabled early land plants to absorb and transport water and nutrients to distant parts of the body more effectively and, eventually, to develop a more complex body composed of organs called stems , leaves, and roots. The evolution and incorporation of the substance lignin into the cell walls of plants provided strength and support. Significant events in plant evolution. AdaptationsPlants, ranging from the simple liverwort a bryophyte to the flowering plants angiosperms , have evolved structures enabling them to colonize the land of almost any habitat. Nonvascular plants Definition of the category Informally known as bryophytes , nonvascular plants lack specialized vascular tissue xylem and phloem for internal water and food conduction and support. They also do not possess true roots , stems , or leaves. Some larger mosses , however, contain a central core of elongated thick-walled cells called hydroids that are involved in water conduction and that have been compared to the xylem elements of other plants. Bryophytes are second in diversity only to the flowering plants angiosperms and are generally regarded as composed of three divisions: Bryophtya the mosses , Marchantiophyta the liverworts , and Anthocerotophyta the hornworts. Red carpet moss Bryoerythrophyllum columbianum. BryophytesBryophytes, such as mosses and liverworts, are the most primitive plants. Because bryophytes generally lack conducting cells and a well-developed cuticle that would limit dehydration , they depend on their immediate surroundings for an adequate supply of moisture. As a result, most bryophytes live in moist or wet shady locations, growing on rocks, trees, and soil. Some, however, have become adapted to totally aquatic habitats; others have become adapted to alternately wet and dry environments by growing during wet periods and becoming dormant during dry intervals. Although bryophytes are widely distributed, occurring in practically all parts of the world, none are found in salt water. Ecologically, some mosses are considered pioneer plants because they can invade bare areas. Bryophytes are typically land plants but seldom attain a height of more than a few centimetres. They possess the photosynthetic pigment chlorophyll both a and b forms and carotenoids in cell organelles called chloroplasts. The life histories of these plants show a well-defined alternation of generations , with the independent and free-living gametophyte as the dominant photosynthetic phase in the life cycle. This is in contrast to the vascular plants , in which the dominant photosynthetic phase is the sporophyte. The sporophyte generation develops from, and is almost entirely parasitic on, the gametophyte. The gametophyte produces multicellular sex organs gametangia. Female gametangia are called archegonia ; male gametangia, antheridia. At maturity, archegonia each contain one egg , and antheridia produce many sperm cells. Because the egg is retained and fertilized within the archegonium, the early stages of the developing sporophyte are protected and nourished by the gametophytic tissue. The young undifferentiated sporophyte is called an embryo. Although bryophytes have become adapted to life on land, an apparent vestige of their aquatic ancestry is that the motile flagellated sperm depend on water to allow gamete transport and fertilization. Bryophytes share some traits with green algae, such as motile sperm, similar photosynthetic pigments, and the general absence of vascular tissue. However, bryophytes have multicellular reproductive structures, whereas those of green algae are unicellular, and bryophytes are mostly terrestrial and have complex plant bodies, whereas the green algae are primarily aquatic and have less-complex forms. Representative members Division Bryophyta Moss is a term erroneously applied to many different plants Spanish moss , a flowering plant; Irish moss , a red alga; pond moss, filamentous algae; and reindeer moss , a lichen. True mosses are classified as the division Bryophyta. Peat moss Sphagnum flexuosum K. Multicellular rhizoids anchor the gametophyte to the substrate. The sporophyte plant develops from the tip of the fertile leafy shoot. After repeated cell divisions, the young sporophyte embryo transforms into a mature sporophyte consisting of foot, elongate seta, and capsule. The capsule is often covered by a calyptra, which is the enlarged remains of the archegonium. The capsule is capped by an operculum lid , which falls off, exposing a ring of teeth the peristome that regulates the dispersal of spores. Division Marchantiophyta Liverworts , the second major division of nonvascular plants, are found in the same types of habitat as mosses, and species of the two classes are often intermingled on the same site. There are two types of liverworts also called hepatics based on reproductive features and thallus structure. Thalloid thallose liverworts have a ribbonlike, or strap-shaped, body that grows flat on the ground. They have a high degree of internal structural differentiation into photosynthetic and storage zones. Liverwort gametophytes have unicellular rhizoids. Liverworts have an alternation of generations similar to that of mosses, and, as with mosses, the gametophyte generation is dominant. The sporophytes, however, are not microscopic and are often borne on specialized structures. They sometimes resemble small umbrellas and are called antheridiophores and archegoniophores. Division Anthocerotophyta The third division of bryophytes comprises the hornworts , a minor group numbering fewer than species. The gametophyte is a small ribbonlike thallus that resembles a thallose liverwort. The name hornwort is derived from the unique slender, upright sporophytes, which are about 3â€”4 cm 1. Vascular plants Definition of the category Vascular plants tracheophytes differ from the nonvascular bryophytes in that they possess specialized supporting and water-conducting tissue, called xylem , and food-conducting tissue, called phloem. The xylem is composed of nonliving cells tracheids and vessel elements that are stiffened by the presence of lignin , a hardening substance that reinforces the cellulose cell wall. The living sieve elements that comprise the phloem are not lignified. Xylem and phloem are collectively called vascular tissue and form a central column stele through the plant axis. The ferns , gymnosperms , and flowering plants are all vascular plants. Because they possess vascular tissues, these plants have true stems, leaves, and roots. Before the development of vascular tissues, the only plants of considerable size existed in aquatic environments where support and water conduction were not necessary. A second major difference between the vascular plants and bryophytes is that the larger, more conspicuous generation among vascular plants is the sporophytic phase of the life cycle. Tree fern Cyathea medullaris.

Chapter 4 : Understanding the Life Cycle of a Marijuana Plant

Plant biology is the science that is dedicated to the study of plants. Plant scientists dedicate themselves to understanding the many aspects of how plants make their living (survive and reproduce).

They are the major source of oxygen and food on earth since no animal is able to supply the components necessary without plants. Plants are used as state and national emblems as well, including state flowers and state trees. Trees from ancient times are famous and are revered. Plants hold world records as well. Often, plants prominently figure in literature, religion and mythology Plants also provide animals with shelter, produce clothing material, medicines, paper products, reduce noise levels and wind speed, reduce water runoff and soil erosion. Coal is also produced from plant materials that were once alive. Cash crops produce income for farmers. Peanut oil comes from peanuts, corn oil comes from corn and olive oil comes from olive. Cash crops also include typical products of agriculture like rice, rye, wheat and corn. Cocoa plants give us chocolate, coffee plants produce coffee and vanilla plants produce vanilla flavoring. Many beverages and drinks like tea and cola come from plants. Other cash crops include cotton, vegetables, fruit, lumber and rubber from trees. For overall ecology, plants are also important. The roots prevent soil erosion and when plants undergo photosynthesis, they use up carbon dioxide and give off oxygen, just like herbal plants do in this article. Plants are Food Either indirectly or directly, human nutrition is dependent on plants. Throughout the history of human beings, about seven thousand various species of plants have been used as food for humans. To a large extent, human nutrition depends on corn or maize, rice, wheat and other cereals. Other crop staples include legumes, cassava and potato. Human food also includes edible flowers, herbs, nuts, certain fruits, spices and vegetables. From plants, beverages produced include alcohol, beer, wine, tea and coffee. We obtain sugar from sugar beet and sugar cane and from flowers comes honey. From olives, sunflowers, safflowers, rapeseed and soybean comes margarine and cooking oils. Additives in food include pectin, starch, locust bean gum, guar gum and gum Arabic. Animals of livestock which are all herbivores include camels, goats, sheep, pigs and cows and most manly feed on grasses and cereal plants. In the maturation of cheese, some molds are important such as the kind you see in blue cheese. A great source of dietary fiber is found in edible mushrooms, which also happen to be a complete protein. Plus, some mushrooms used as food are medicinal, and provide a smattering of benefits to health. Mushrooms also make great ingredients in nutritious dishes that heal, as you can see in this course on healing foods. The help in purifying and distributing the water of the planet. Entrepreneurs apply plants such as fungi to provide biodegradable and sustainable products that are structural such as vehicle bumpers, packing materials and building materials. Enzymes produced by plants and fungi are valuable in the industry of paper pulp, for fashion and even bioremediation. Denim jeans are softened by enzymes from plants. In the year , the first eukaryole to have a sequenced genome was saccharomyces cerevisiae. Industrial synthesis basic chemicals include a fast array of organic chemicals that you can get from plants. These chemicals are utilized in vast varieties of experiments and studies. The rings of trees serve as a record of climates from the past and are an important dating method in archaeology. Often, basic biological research has been done with plants such as the peas used for deriving the laws of genetics by Gregor Mendel. Space colonies or space stations may one day depend on plants for the support of life. The ethnobotany field studies the use of plants by indigenous cultures which help in discovering new medicinal plants and in conserving species that are endangered. In the US, gardening is the most popular activity of leisure. Horticulture therapy or working with plants is beneficial for rehabilitating persons with disabilities. Certain plants contain chemicals psychotropics which are ingested after extraction including opium, cannabis and tobacco. It is also from plants that we get pesticides such as pyrethrin, strychnine, rotenone and nicotine. Poisonous substances are also derived from plants including curare, hemlock and ricin. Aesthetic Uses For aesthetic purposes, thousands of species of plants are cultivated. In addition, plants can help prevent soil erosion, provide privacy, abate noise, reduce wind, modify temperatures and provide shades. Often, people cut dried flowers to frame, and display house plants in greenhouses or indoors. In gardens, bedding plants, herbaceous perennials, vines, shrubs, ornamental trees, shade trees, lawn grasses and outdoor gardens are planted. Often, in textiles, photography, language, humor, architecture and art, images of plants are used often. These are also used on coats of arms, flags, stamps and money. There are art forms made of living plants as well including espalier, ikebana, bonsai and topiary. The course of history has sometimes been changed by plants such as the tulipomania. Each year, plants are the reason for the existence of a multi-billion dollar per year industry of tourism which includes traveling to forests, rainforests, tulip festivals, national parks, historic gardens, botanical gardens and arboretums. In the National Cherry Blossom Festival, there are forests filled with colorful leaves of autumn. Plants that are sold as novelties include the resurrection plant, sensitive plant and the Venus flytrap. Plants Are Used for Natural Products It is from plants that you get natural products that include cork, amber, alkaloids, resins, gums, latex, tannins, waxes, pigments, natural dyes, essential oils and fibers. Other products also include hemp rope, chewing gum, inks, plastics, linoleum, lubricants, varnish, rubber, turpentine, cosmetics, perfumes, shampoos, paints and soaps. Cotton is made from cellulose-derived synthetic fibers like acetate and rayon as well as rame, flax and cotton. From plants, renewable fuel comes as well including biofuels like peat and firewood. From plants, you can derive fossil fuel like petroleum and coal. Aside from its other myriad uses, the backbone of all habitats is also made up from plants. Other species of wildlife and fish also depend on pants for shelter and food. Wood is used for sports equipment, musical instruments, cardboard, paper, furniture and buildings. Medicine One fourth of the drugs that are prescribed is derivatives of or come directly from plants. In addition, 4 out of 5 people around the globe at the moment rely on plants for primary healthcare. Medicines derived from plants include vincristine, digitalis, colchicine, reserpine, quinine, morphine, taxol and aspirin. Plants are also important in the search for cancer drugs. Current therapeutics of cancer include paclitaxel, isolated from the Chinese happy tree camptothecin. There has been a long history for the search of anti-cancer drugs from plants and other natural sources. Promising sources of drugs are found in algae, sea squirts and sea sponges, which are all drug sources undergoing studies at the moment. When there is rapid loss of plant life, the consequences are far-reaching and the losses will affect future cancer discovery of drugs adversely. Also, extraordinarily powerful medicines are provided by fungi which have revolutionized massive economic worth like cholesterol medicine, immuno-suppressants and antibiotics and human health. The cephalosporins, statins, cyclosporines and penicillin drugs are all based on fungi-produced natural chemicals. In TCM or Traditional Chinese Medicine, mushrooms are also important ingredients and myriad activities that are therapeutic such as anti-tumor, anti-viral and anti-inflammatory effects have been attributed to them. Plants Relieve Stress To our living spaces, plants bring natural beauty. By creating balance and texture, a patio or room can be transformed instantly into a welcoming, comfortable environment. Just like beauty pageant queens, however, plants can do so much more than just look beautiful. They clean the air we breathe by acting as oxygen factories and absorbing toxins. They are also proven for reducing stress. Generally, plants simply make people feel better. By improving air quality and easing mental fatigue, plants manage to find themselves an indispensable part of life at home. Plants reduce stress-related muscle tension, lower blood pressure and calm the heart rate. No matter where they are located, you will find that plants are full of countless benefits, as you will see in this course on plants from China. Plants also help us focus and relax, leading to increased capabilities of solving problems, idea generation, creativity and increased productivity. As a matter of fact, the existence of plants is so significant that they have even been shown to relieve the experienced symptoms of children with ADD. At this point it is clear that our ancestors were on to something and that plants are so much more than just ornamental. We are deeply connected to plants on some level that just living with them in our home brings us repose and health.

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Chapter 5 : The Plant Life Cycle for Kids | Sciencing

theinnatdunvilla.com Business Review Q2 27 T o examine differences across plants or changes within a plant over time, we need to measure plantsâ„¢ size. One possibility is to measure the output of.

Plants and Life on Earth What is the environment? The environment is everything that lives on Earth plus the air, sun, water, weather, and the Earth itself. Sing a Song about the Role of Plants! Teachersâ€"download lesson plans to use in your classroom! Plants help the environment and us! Plants make food Plants are the only organisms that can convert light energy from the sun into food. And plants produce ALL of the food that animals, including people, eat. The animals that give us meat, such as chickens and cows, eat grass, oats, corn, or some other plants. Plants make oxygen One of the materials that plants produce as they make food is oxygen gas. This oxygen gas, which is an important part of the air, is the gas that plants and animals must have in order to stay alive. When people breathe, it is the oxygen that we take out of the air to keep our cells and bodies alive. All of the oxygen available for living organisms comes from plants. Plants provide habitats for animals Plants are the primary habitat for thousands of other organisms. Animals live in, on, or under plants. Plants provide shelter and safety for animals. Plants also provide a place for animals to find other food. As a habitat, plants alter the climate. On a small scale, plants provide shade, help moderate the temperature, and protect animals from the wind. Plants help make and preserve soil In the forest and the prairie, the roots of plants help hold the soil together. This reduces erosion and helps conserve the soil. Plants also help make soil. Soil is made up of lots of particles of rocks which are broken down into very small pieces. When plants die, their decomposed remains are added to the soil. This helps to make the soil rich with nutrients. Plants provide useful products for people Many plants are important sources of products that people use, including food, fibers for cloth , and medicines. Plants also help provide some of our energy needs. In some parts of the world, wood is the primary fuel used by people to cook their meals and heat their homes. Many of the other types of fuel we use today, such as coal, natural gas, and gasoline, were made from plants that lived millions of years ago. Plants beautify Plants, because of their beauty, are important elements of out human world. When we build houses and other buildings, we never think the job is done until we have planted trees, shrubs, and flowers to make what we have built much nicer.

Chapter 6 : The Secret Life of Plants - Wikipedia

The life cycle of a plant is the series of steps all plants go through to grow from a seed to a fully mature plant. As you look at diagrams of the life cycle of a leaf for kids, you'll see why scientists call it a cycle, because after a plant dies, the whole process starts over again.

Grow Marijuana Successfully by Learning the Life Cycle Growing marijuana requires a good understanding of its life cycle. By doing so, we become aware of its overall health by looking at the changes in its behavior. Along with this are changes in its requirements. The life cycle of the cannabis also helps us decide when to start pruning and training the plants. Thus, the role of the grower is to be ready for these changes. This includes adjusting the variables to the best levels and giving the plant the nourishment it needs. When we optimize the environment, we avoid any problems that occur at a specific stage. As a result, the plant will thrive and produce a good harvest. Hence, having a good grasp of its life cycle is a huge advantage. This knowledge is essential when growing marijuana. As such, it serves as a guideline on how to deal with certain issues and take better care of the plants. Ultimately, preparing to meet any mishaps is a vital practice in growing marijuana. It reduces the chances of a disappointing harvest and increases our confidence. So, start learning about the life cycle of the cannabis and become a successful grower. In general, plants which grow with some help from the grower are healthier and produce more harvest. We will also learn how these milestones differ when grown indoors and outdoors. Grow Phases of the Cannabis The life of marijuana plants consists of 5 phases with varying characteristics. To maintain a vigorous growth, we must look for these behaviors and give what it needs to level up to the next stage. It should be dark brown, hard, and completely dry. Avoid green and squishy ones since these are underdeveloped and will not germinate. Once we have selected the best seeds, begin growing them to start the germination stage. Expect the plant to accomplish this phase anywhere between 24 hours to 7 days. The key to this phase is to provide adequate moisture on the grow medium. This will encourage rooting as well as sprouting of the first leaves known as the cotyledons. When these small, oval leaves stretch out, it will soak up the sun and trigger photosynthesis. Now that the seed has the means to make its own food, get ready for the next stage. A cannabis plant that is still developing the full number of leaves is called a seedling. Finger leaves increase from 1, 3, 5 and 7 as the seedling matures although some plants may have more. The ideal seedling forms a dense vegetation and does not appear to stretch out its stem. Also, the leaves should be vibrant green in color. To get a healthy seedling, make sure that it continues to grow and expand its roots. At this stage, mold and diseases often occur due to too much moisture. Many growers lose their seedlings due to this problem. So, watch the plant closely to monitor any water excess problems while also keeping the environment clean. In addition, make sure that it gets 18 to 24 hours of light, so it can produce enough sugar while also avoiding mold growth. In general, the plant will remain in this phase for 2 to 3 weeks. If all goes well, the seedling will now move on to the vegetative stage. As such, we can move the plant to a larger container where we encourage the roots to expand and settle deeper into the soil. Because of the stronger root system, the foliage will get bushier. Hence, this is the best time to start pruning or topping the plant. Indica plants will exhibit shorter and denser nodes while Sativas are lanky and less dense. For both strains, start giving more water directed away from the stalks where the root tips are. Also, make sure that the plants receive at least 13 hours of sunlight for optimal growth. To further support the cannabis during this stage, feed the soil more nutrients especially nitrogen. Also, maintain the correct levels of TDS and pH of the soil. Growers who do this are usually rewarded with fast and healthy growth. As a result, they get more bud sites which leads to a bountiful harvest. In general, the marijuana plant takes around 2 to 8 weeks to complete this stage. But before it enters the flowering phase, it will first demonstrate the pre-flowering state. This is vital to growers since this is when we can start to identify the sex of the plants. Once we determine the male from the females, we separate them so that we only get the flowering females. We trigger this by reducing the light to 12 hours or less per day. This means that the plants will also get 12 hours or more of darkness. During the dark hours, it is essential to provide total darkness, or the plants will revert to the vegetative phase. When growing outdoors, we cover the crop with a dark cloth. As they bud, the plants require less nitrogen and more phosphorous. So, adjust the nutrients accordingly. Also, provide a trellis for the plant so that it can support all those developing buds. In general, this stage takes 6 to 8 weeks. As the flowers grow, avoid pruning after the first 2 weeks to allow the plant to focus on the buds. This will also prevent creating more stress which usually forces the plant to go back to the previous stage. Another thing that we want to avoid is allowing the plant to flower too long. Doing so will lessen the THC in the buds, leaving us with weaker effects. To avoid this problem, watch for signs of yellowing in the leaves. This usually means that we are a bit late in harvesting. For an accurate assessment, simply look at the color of the trichomes and pistils. They usually change from light to darker color as the buds ripen. Or we can first sample the buds by cutting a few of the ripest, then dry and smoke them. This avoids making the mistake of harvesting too early which is common among newbie growers. This eliminates the possibility of smoking molds which can be harmful to health. Also, curing is said to help enhance the richness of the cannabinoids. So, if we want high-quality weed, make sure to apply these processes. Life Cycles in Different Environments There are differences in the life cycle of marijuana depending on the environment where we choose to grow them. The biggest difference lies in the length of time that it takes from seedling to the harvest stage. However, some strains take up to 7 to 15 weeks to flower. One big advantage in indoor gardening is that we can control most of the stages. For example, we can hasten the vegetation phase by planting more plants per square foot. Also, we can choose the time to trigger the flowering stage once the plants reach our desired size. Sometimes, other factors in the grow room will trigger the flowering but not by more than 5 days. In cold regions, germinate the seeds indoors to avoid the frost outside. This is best done 2 months before the snow melts. Once the temperatures get warm, we can move the plants outside. If we want it easy, choose to grow auto-flowering seeds. Regardless of the environment, these plants will be ready for harvest in 10 weeks. Grow Marijuana Successfully by Learning the Life Cycle A vital element in growing marijuana is understanding its different life stages. By doing so, we increase the chances of success of getting a bountiful and rich harvest. This is because this knowledge enables us to better deal with the problems that often occur. Also, it gives us a clear idea on how to take care of the plant during a certain stage. So, expect to provide varying amounts of light, water, air, and nutrition throughout the life cycle. Moreover, we must adjust the temperature, humidity, and other factors depending on the phase. When we anticipate what the plants need, they will often thrive and reward us with great buds. You may also like

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Chapter 7 : Life - Wikipedia

For all forms of life, plants form the basic food staples, and this is just one reason why plants are important. They are the major source of oxygen and food on earth since no animal is able to supply the components necessary without plants. The fish we eat consume algae and the cattle we eat as.

Organism The characteristics of life Since there is no unequivocal definition of life, most current definitions in biology are descriptive. Life is considered a characteristic of something that preserves, furthers or reinforces its existence in the given environment. This characteristic exhibits all or most of the following traits: Living things require energy to maintain internal organization homeostasis and to produce the other phenomena associated with life. A growing organism increases in size in all of its parts, rather than simply accumulating matter. A response is often expressed by motion; for example, the leaves of a plant turning toward the sun phototropism , and chemotaxis. These complex processes, called physiological functions , have underlying physical and chemical bases, as well as signaling and control mechanisms that are essential to maintaining life. Alternative definitions See also: Entropy and life From a physics perspective, living beings are thermodynamic systems with an organized molecular structure that can reproduce itself and evolve as survival dictates. One systemic definition of life is that living things are self-organizing and autopoietic self-producing. Virus Adenovirus as seen under an electron microscope Whether or not viruses should be considered as alive is controversial. They are most often considered as just replicators rather than forms of life. However, viruses do not metabolize and they require a host cell to make new products. Virus self-assembly within host cells has implications for the study of the origin of life , as it may support the hypothesis that life could have started as self-assembling organic molecules. Biophysicists have commented that living things function on negative entropy. These systems are maintained by flows of information, energy , and matter. Some scientists have proposed in the last few decades that a general living systems theory is required to explain the nature of life. Instead of examining phenomena by attempting to break things down into components, a general living systems theory explores phenomena in terms of dynamic patterns of the relationships of organisms with their environment. Gaia hypothesis The idea that the Earth is alive is found in philosophy and religion, but the first scientific discussion of it was by the Scottish scientist James Hutton. In , he stated that the Earth was a superorganism and that its proper study should be physiology. Hutton is considered the father of geology, but his idea of a living Earth was forgotten in the intense reductionism of the 19th century. Nonfractionability The first attempt at a general living systems theory for explaining the nature of life was in , by American biologist James Grier Miller. Specifically, he identified the "nonfractionability of components in an organism" as the fundamental difference between living systems and "biological machines. Morowitz explains it, life is a property of an ecological system rather than a single organism or species. Robert Ulanowicz highlights mutualism as the key to understand the systemic, order-generating behavior of life and ecosystems. Mathematical biology Complex systems biology CSB is a field of science that studies the emergence of complexity in functional organisms from the viewpoint of dynamic systems theory. A closely related approach to CSB and systems biology called relational biology is concerned mainly with understanding life processes in terms of the most important relations, and categories of such relations among the essential functional components of organisms; for multicellular organisms, this has been defined as "categorical biology", or a model representation of organisms as a category theory of biological relations, as well as an algebraic topology of the functional organization of living organisms in terms of their dynamic, complex networks of metabolic, genetic, and epigenetic processes and signaling pathways. The underlying order-generating process was concluded to be basically similar for both types of systems.

Chapter 8 : Plant Facts | All About Plants for Kids | DK Find Out

One of the best ways to help kids learn about growing plants is by introducing them to the basic plant life cycle. Bean plants are a great way to do this. By allowing kids to both examine and grow their own bean plant, they can develop an understanding of the plant's seed life cycle.

The following outline describes the more common form of growth. Differences between varieties can be thought of as variations on this standard theme. Cannabis is an annual plant. A single season completes a generation, leaving all hope for the future to the seeds. The normal life cycle follows the general pattern described below. Cannabis Seed Germination With winter past, the moisture and warmth of spring stir activity in the embryo. The radical or embryonic root appears first. Once clear of the seed, the root directs growth downward in response to gravity. Now anchored by the roots, and receiving water and nutrients, the embryonic leaves cotyledons unfold. They are a pair of small, somewhat oval, simple leaves, now green with chlorophyll to absorb the life-giving light. The embryo has been reborn and is now a seedling living on the food it produces through photosynthesis. The process of germination is usually completed in three to 10 days. Cannabis Seedlings The second pair of leaves begins the seedling stage. They are set opposite each other and usually have a single blade. They differ from the embryonic leaves by their larger size, spearhead shape, and serrated margins. With the next pair of leaves that appears, usually each leaf has three blades and is larger still. A basic pattern has been set. Each new set of leaves will be larger, with a higher number of blades per leaf until, depending on variety, they reach their maximum number, often nine or The seedling stage is completed within four to six weeks. Cannabis Vegetative Growth This is the marijuana life cycle period of maximum growth. The marijuana plant can grow no faster than the rate that its leaves can produce energy for new growth. Each day more leaf tissue is created, increasing the overall capacity for growth. With excellent growing conditions, Cannabis has been known to grow six inches a day, although the rate is more commonly one to two inches. The number of blades on each leaf begins to decline during the middle of the vegetative stage. Then the arrangement of the leaves on the stem phyllotaxy changes from the usual opposite to alternate. The internodes stem space from one pair of leaves to the next, which had been increasing in length begin to decrease, and the growth appears to be thicker. Branches which appeared in the axils of each set of leaves grow and shape the plant to its characteristic form. The vegetative stage is usually completed in the third to fifth months of growth. The photoperiod is the daily number of hours of day light vs. In nature, long nights signal the plant that winter is coming and that it is time to flowers and produce seeds. As long as the day-length is long, the plants continue vegetative growth. If female flowers do appear, there will only be a few. These flowers will not form the characteristic large clusters or buds. If the days are too short, the plants flowers too soon, and remain small and underdeveloped. A flowering hormone is present during all stages of growth. This hormone is sensitive to light and is rendered inactive by even low levels of light. When the dark periods are long enough, the hormones increase to a critical level that triggers the reproductive cycle. Vegetative growth ends and flowering. The natural photoperiod changes with the passing of seasons. In the Northern Hemisphere, the length of daylight is longest on June Day-length gradually decreases until it reaches its shortest duration on December The duration of daylight then begins to increase until the cycle is completed the following June Because the Earth is tilted on its axis to the sun, day-length also depends on position or latitude on Earth. As one moves closer to the equator, changes in the photoperiod are less drastic over the course of a year. At the equator 0 degrees altitude day length lasts about In Maine about 45 degrees north , day-length varies between about 16 and nine hours. Near the Arctic Circe on June 21 there is no night. On December 22 the whole day is dark. The longer day-length toward the north prevents marijuana from flowering until later in the season. Over most of the northern half of the country, flowering is often so late that development cannot be completed before the onset of cold weather and heavy frosts. The actual length of day largely depends on local conditions, such as cloud cover, altitude, and terrain. On a flat Midwest plain, the effective length of day is about 30 minutes longer than sunrise to sunset. In practical terms, it is little help to calculate the photoperiod, but it is important to realise how it affects the plants and how you can use it to your advantage. Cannabis life cycle generally needs about two weeks of successive long nights before the first flowers appear. The photoperiod necessary for flowering will vary slight with 1 the variety, 2 the age of the plant, 3 its sex, and 4 growing conditions. Seedsman With an international team of writers and over a decade of experience in the industry, Seedsman aim to bring you the very latest in Cannabis news from across the globe.

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Chapter 9 : Plants II - Non-vascular and Seedless Vascular Plants - BIOLF - Confluence

Thomas Rainer and I have both been doing the botanical thing for decades; we know, and use, many of the same plants â€” and even much of the same horticultural vocabulary.

The seed will sprout and produce a tiny, immature plant called a seedling. The seedling will grow to adulthood and form a mature plant. The mature plant will reproduce by forming new seeds which will begin the next life cycle. As described above this life cycle is generally used by the flowering plants. The flowering plants include trees, grasses, shrubs, and, of course, flowers. There are also lower types of plants including ferns and mosses. These also have a life cycle but they do not produce seeds. They produce a different type of reproductive cells called spores. In the flowering plants, there are male and female structures inside the flower. These produce the seeds. A more detailed explanation and examination of seeds is found in the Bean Plant Activities section. It is instructive to examine flowers and seeds of various plants in order to study and learn their similarities and differences. It is also necessary to study ferns and mosses and compare them with the flowering plants. Flower study Materials various flowers or pictures of flowers Note: The students should be aware about flowers if they are allergic to them or if they have asthma. In cases where the presence of pollen and flowers in the classroom raises health issues, it is better to use pictures. Science Journals Procedure 1. Students brainstorm in class about what plants are included in the term flowering plants. Their suggestions and discussions are written on the board and in their Science Journals. They learn that in addition to common flowers, the flowering plants include trees, shrubs and grass plants. Students examine pictures of flowers. Flowers have various parts which can be studied. An example is shown below. They learn the different parts by completing a definition table as suggested below. Flower Part What the flower part does Stamen The stamen is the male part of the flower. It produces pollen which fertilizes the immature seeds. Pistil The pistil is the female part of the flower. It contains the immature seeds. After the immature seeds are fertilized they become the seeds which produce the next cycle of plants. Petal Many flowers have petals which have bright colors to attract insects. The insects carry pollen which fertilizes the immature seeds. Sepal The sepals appear like small green leaves. They are protective structures used when the flower is not completely developed in the bud stage. Receptacle The receptacle supports the flower on the end of the stalk. Students note differences between different types of flowers. Some flowers have sepals and petals that look the same. The gladiolus flower is an example. The sepals are colored the same as the petals and do not appear like small green leaves. Trees have flowers but they do not resemble the flowers usually displayed in flower shops. Tree flowers do not have the bright petals because trees do not use insects for pollination. They rely on the wind so there is no need to attract insects. Corn plants have tassels at the top of the plant which produce pollen. They have silks which are connected to the ears of corn. The silks and the corn kernels constitute the female reproductive parts of the plant. Corn uses wind pollination so does not need bright petals. It this study is done in the early spring, it is possible to see the trees flowering. Of course, anyone with allergies can tell that the trees are flowering without looking. Trees nearby will appear to have a reddish glow around them caused by the flowers. The flowers can be seen on trees with low-hanging branches. Students write about the similarities of the various flowers they studied. They make the table of the parts and see where the parts are located in the flowers. Students write about the differences of the various flowers they studied. They collect drawings or photographs of different flowers to show the ways in which they are different. Students study mosses to see the ways in which they are different from the flowering plants. Mosses are generally very small, usually between 10 and 20 mm in height. Mosses do not have veins or transport tissue in them as the higher plants do. Mosses do not produce flowers. The little moss plants are separate haploid male and female plants. After fertilization, the female moss plant produces a stalk at the top with a capsule. The capsule contains the spores which will begin the next moss life cycle. Students study ferns to see the ways in which they are different from the flowering plants. Ferns have underground stems. The leaves are the only structures usually found above ground. Ferns do not produce flowers. Ferns have specialized leaves which contain brown spots or they have brown spots on the undersides of regular leaves. These brown spots produce the spores which will begin the next fern life cycle.