DOWNLOAD PDF WHATS INSIDE OF PLANTS?

Chapter 1 : Inside plant - Wikipedia

Research the various parts of a plant cell. You'll find that plant cells contain parts that are not in animal cells, called chloroplasts. What are the parts that both animal and plant cells contain? What shapes are these parts? Use Crayola Dry-Erase Markers to draw a plant cell on a dry-erase.

Algae Algae comprise several different groups of organisms which produce food by photosynthesis and thus have traditionally been included in the plant kingdom. The seaweeds range from large multicellular algae to single-celled organisms and are classified into three groups, the brown , red and green algae. There is good evidence that the brown algae evolved independently from the others, from non-photosynthetic ancestors that formed endosymbiotic relationships with red algae rather than from cyanobacteria, and they are no longer classified as plants as defined here. With a few exceptions, the green plants have the following features in common; primary chloroplasts derived from cyanobacteria containing chlorophylls a and b, cell walls containing cellulose , and food stores in the form of starch contained within the plastids. They undergo closed mitosis without centrioles , and typically have mitochondria with flat cristae. The chloroplasts of green plants are surrounded by two membranes, suggesting they originated directly from endosymbiotic cyanobacteria. Two additional groups, the Rhodophyta red algae and Glaucophyta glaucophyte algae , also have primary chloroplasts that appear to be derived directly from endosymbiotic cyanobacteria , although they differ from Viridiplantae in the pigments which are used in photosynthesis and so are different in colour. These groups also differ from green plants in that the storage polysaccharide is floridean starch and is stored in the cytoplasm rather than in the plastids. They appear to have had a common origin with Viridiplantae and the three groups form the clade Archaeplastida , whose name implies that their chloroplasts were derived from a single ancient endosymbiotic event. In contrast, most other algae e. They are not close relatives of the Archaeplastida, presumably having acquired chloroplasts separately from ingested or symbiotic green and red algae. They are thus not included in even the broadest modern definition of the plant kingdom, although they were in the past. The green plants or Viridiplantae were traditionally divided into the green algae including the stoneworts and the land plants. However, it is now known that the land plants evolved from within a group of green algae, so that the green algae by themselves are a paraphyletic group, i. Paraphyletic groups are generally avoided in modern classifications, so that in recent treatments the Viridiplantae have been divided into two clades, the Chlorophyta and the Streptophyta including the land plants and Charophyta. There are about 4, species, [26] mainly unicellular or multicellular marine organisms such as the sea lettuce, Ulva. The other group within the Viridiplantae are the mainly freshwater or terrestrial Streptophyta, which consists of the land plants together with the Charophyta, itself consisting of several groups of green algae such as the desmids and stoneworts. Streptophyte algae are either unicellular or form multicellular filaments, branched or unbranched. The freshwater stoneworts strongly resemble land plants and are believed to be their closest relatives. With 19th century developments in microbiology , Ernst Haeckel introduced the new kingdom Protista in addition to Plantae and Animalia, but whether fungi were best placed in the Plantae or should be reclassified as protists remained controversial. In , Robert Whittaker proposed the creation of the kingdom Fungi. Molecular evidence has since shown that the most recent common ancestor concestor , of the Fungi was probably more similar to that of the Animalia than to that of Plantae or any other kingdom. Unlike plants, which generally gain carbon through photosynthesis, and so are called autotrophs , fungi do not possess chloroplasts and generally obtain carbon by breaking down and absorbing surrounding materials, and so are called heterotrophic saprotrophs. In addition, the substructure of multicellular fungi is different from that of plants, taking the form of many chitinous microscopic strands called hyphae , which may be further subdivided into cells or may form a syncytium containing many eukaryotic nuclei. Fruiting bodies, of which mushrooms are the most familiar example, are the reproductive structures of fungi, and are unlike any structures produced by plants. Diversity of living green plant Viridiplantae divisions Informal group.

Chapter 2 : Whatâ€™s inside the first new US nuclear plant in two decades

Ganeri's book provides a detailed explanation of the various parts of plants, from the one-celled variety to the giant redwood. The audience for this book is unclear. The format suggests that it is for students in elementary grades, but the technical vocabulary, information, and detailed diagrams make it comparable to a sophomore biology text.

In each rod are fuel pellets made out of a compound of enriched uranium. There are of these fuel assemblies held underwater in the Seabrook Station power plant, which generates more than 1, megawatts. But the system needs to be slowed down sometimes or shut down for refueling. The control rods are the metal tubes that fit over fuel rods below them. They are made of an alloy that absorbs the neutrons being thrown off by the nuclear reaction in the reactor to slow the rate of fission. Plant operators can also release boron into the reactor water, which also slows the pace of fission. A pellet this size holds as much energy as a ton of coal, according to the guide at the Seabrook Station power plant. That heat is transferred to a separate water loop to turn it into steam, which is then sent through the spinning turbine to generate electricity. They are all connected to this generator on the left by a single spinning shaft. The heat from the operation made the room on our visit about degrees and noisy. Nine tubes that have cables inside them surrounded by an insulator gas send electricity at , volts to the grid. They connect to three transmission lines at this interconnection point, two of which go to points in New Hampshire and one in Massachusetts. There was once an incident about eight years ago where ice caked up on these transmission line connections, essentially causing a short that led to the computer turning the generator off. The plant itself needs a significant amount of power to operate, so it has diesel generators with enough fuel for a week. The reactor heats water to about degrees and is kept under high pressure, at 2, pounds per inch. That pressurized water is circulated to a heat exchanger, which creates steam from a second water loop. The steam is sent to the turbine to turn the generator and make electricity. That steam is cooled with ocean water and turned back into water and recirculated back through. But because the Nuclear Regulatory Commission is still working on long-term storage of nuclear waste, Seabrook Station, like other power plant operators, stores some of its spent fuel in dry casks. The concrete structures with the white doors hold canisters with the used fuel. Every 18 months, spent fuel assemblies are rotated out and new ones put in. During this time, the plant is shut down for about three weeks. To remove the spent fuel assemblies, plant workers fill the tank above the reactor, take off the lid, pull out the spent assemblies, and put them here for storage. Water acts as a shield against the radioactive material in the assemblies. This is a photo of a presentation shown by a Seabrook Station employee. Martin LaMonica 10 of 16 Dropping fuel assemblies A closer view of a fuel assembly being handled during refueling. The spent fuel assemblies are transferred underwater to a building adjacent to the reactor where they are kept in a pool underwater. Each assembly is 12 feet high. There are giant pipes built underneath the sea marsh surrounding the plant that take water in from about eight feet above the ocean floor. After cooling the steam in the plant, the water is sent back out to sea. The full length of each tube is about three miles. But what about the fish? This is a serious concern because of the impact on the local ecosystem and fish populations. You can see a few starfish and seaweed from the screens that take out debris. However, on stormy days, they need to continually empty out this basket and throw away the debris. But it gives you an idea of how big the pipes are that transfer the seawater into the turbine building for cooling. Above the three pipes that carry seawater are very large pumps with powerful motors. The dome over the reactor rises about feet above ground level, but much of the reactor is below ground. A neutron is fired at an isotope of uranium, which causes it to split and throw off other neutrons. Each neutron hits another uranium nucleus, which then splits and throws off neutrons, causing a chain reaction. Each time an atom is split, it gives off a tremendous amount of energy in the form of heat. That heat is what creates steam to drive a turbine to make electricity in a generator.

Chapter 3 : Plant - Wikipedia

Bright, indirect sun is ideal for this plant, but be careful with waterings: It requires a "drench and dry" approach (water thoroughly, then let the soil dry out) along with weekly mistings.

Other living organisms such as algae also have cells that contain chloroplasts. If you know the number of atoms, the density of the atoms, and what type of atoms are in an object you can calculate its mass. Photosynthesis also produces energy-rich carbohydrates like starch. Photosynthesis occurs in the chloroplast of a plant cell Have you ever wondered where plants get their mass? All those leaves and branches have to come from somewhere, but where? It turns out that the main ingredients for plant growth are water, air, and energy. Where plants get their mass. The Story of Air The molecule carbon dioxide is made of one carbon atom and two oxygen atoms. Air is made of tiny bits that we call molecules. If you had enough air molecules, you could even weigh them. Two of the molecules in air are oxygen and carbon dioxide. You may think oxygen is the most important moleculeâ€”we need it to live. But carbon is important too. All living things on Earth are made of carbon. If you removed the water from our bodies, you would find that carbon makes up most of the rest of our weight, or mass. The same is true for plants. We get carbon from our food, but where do you think plants get carbon? Plants pull carbon out of the air. Are Plants Made from Thin Air? Plants need energy from the sun, water from the soil, and carbon from the air to grow. Air is mostly made of nitrogen, oxygen, and carbon dioxide. So how do plants get the carbon they need to grow? This carbon makes up most of the building materials that plants use to build new leaves, stems, and roots. The oxygen used to build glucose molecules is also from carbon dioxide. Water is another important material plants need to grow, and they get it by absorbing it through their roots. Water is made of two hydrogen atoms and one oxygen atom. The hydrogen in water is used to help build glucose molecules. Think of the water as the filler they use between carbon structures. If we take away the water from a plant though, and look at just the dry material, a large majority of that material comes from thin air. Plants also need tiny bits of vitamins and minerals to grow properly, which they get through their roots. Plants need a lot of energy to take care of their cells and to build new ones so they can grow. Plants get their energy from the sun. The Carbon Story Plants absorb carbon dioxide through small openings called stomata that are on the surface of the leaf. Stomata are holes made from spaces between special cells. These holes are where plants absorb carbon dioxide from the air. Once inside the leaf, the carbon dioxide can enter plant cells. Inside the plant cells are special cell parts called chloroplasts, where photosynthesis takes place. Circled inside the plant cell is one of hundreds of chloroplasts that live within the cell. Plant cells look green due to molecules in the chloroplasts that reflect green light. There are many, many chloroplasts in every green plant cell. Most of the rest of the cell usually looks clear. In the chloroplasts, carbon, oxygen, hydrogen, and energy are used to make a sugar called glucose. The whole process of making glucose is called photosynthesis. Molecules of glucose join together to form cellulose. Next, glucose molecules combine to form long chains called cellulose. Cellulose is then used to build plant structures, like cell walls. These structures and the materials they hold are also built with water. When new cell structures are built, cells can grow and divide, making new cells. These new cells make for new plant growth. This lets the plants get bigger. So if you are creating a cookbook of life and want to include a recipe for plant growth you would add the following. Carbon, which makes up the most of the rest of the plant, comes from the air and enters the plant through holes in its leaves. Oxygen from carbon dioxide, and hydrogen from water, enter through the leaves and roots, and are used to make glucose. Energy, which the plant needs for photosynthesis to work, is absorbed from sunlight. In order to grow, plants need water, carbon dioxide from air , and energy from sunlight. Click the image for the full carbon story poster. This section was contributed by Karla Moeller and Charles Kazilek. Images are by Sabine Deviche.

Chapter 4 : What Are Plants Made Of? | Ask A Biologist

Excellent resource book for learning more about the botany of plants to indentify them better. Plenty of full color, well taken photogrpahs for clear illustration and examples. Very informative for the student of any age, for schools, homeschool, or personal reference collection.

To some, its opening later this year heralds the beginning of a much-anticipated nuclear renaissance in the US. The project started in and was suspended in when the growth in power demand began to decline for TVA. Its sister unit, Watts Bar Unit 1, went on to open in May , and was the last nuclear plant to do so in the United States. Work resumed in on WB2. When operational, WB2 will add more than 1, megawatts of generating capacity to the TVA system â€" enough to power , homes. But it has successfully passed a number of pre-operational tests of key systems and confirmed that all equipment and facilities ordered or built 40 years ago have been properly refurbished and updated. WB2 meets the latest safety standards, including those instituted after the Fukushima disaster in Japan. One example is the steel reactor vessel with nine-inch-thick walls that can withstand a system pressure of 2, pounds per square inch. It serves as an important barrier for any radioactive material produced in the reactor core during the operation of the plant. In a nuclear power plant, rods of uranium fuel are submerged in a pool of water. Fission chain reactions in the nuclear fuel generate heat and, by circulating water through the reactor core, the power plant produces steam that turns a turbine to generate electricity. Water is continuously pumped through the reactor core to remove the heat and avoid overheating that could cause problems. The design, construction, and operation of the plants rely on the principle of having multiple safety barriers, which is called defense in depth in the industry. Prepared for the worst A key safety feature of the plants is that the fission rates â€" or the rate of uranium chain reactions that create heat â€" will slow down if the cooling water temperature gets too high. That will reduce the power output and avoid overheating. The Fukushima accident taught a valuable lesson when massive tsunami waves damaged four nuclear plants. In response, the Nuclear Regulatory Commission mandated new safety rules to lower the risk from this type of threat. Plants now have sheltered facilities where emergency equipment including power sources, pumps, hoses and communication devices are stored. The Watts Bar site features foot tall, inch thick tornado-proof doors. The site is also served by one of two response centers at nearby Memphis, Tennessee, where five sets of portable emergency equipment are maintained. The ice condenser containment building at Watts Bar 2 has come in for some criticism because it has a smaller volume than those at most other pressurized water reactors. It features beds of ice that could quench steam generated in major accidents and thus protect the reactor core and the containment building, the structure that encloses the reactor vessel and the core to prevent the escape of radiation in an emergency. Eight other pressurized water plants in the US, including the Watts Bar Unit 1 and Sequoyah Unit 1, which is also in Tennessee, have similar ice condenser containments. In studies analyzing the risk associated with nuclear plants, the overall risk of operating the Sequoyah plant is estimated to be comparable to nuclear plants without ice water containment. The need for nuclear energy The world needs affordable, clean energy and entrepreneurs are working on figuring out new ways to generate it. Natural gas could be an inexpensive source of energy in the near term, but fracking technique used to extract it may pose substantial geological concerns and releases methane, a potent greenhouse gas. Furthermore, combustion of natural gas produces a significant amount of greenhouse gases. The Watts Bar 2 nuclear plant will use the Westinghouse AP design, which is being used in other countries including China. Westinghouse Even Bill Gates has established a company to develop and eventually build a so-called breeder reactor. This new type of nuclear reactor could operate with recycled used nuclear fuel and uranium tailings left over from enrichment plants. Breeder technology would help solve the problems associated with disposal of used nuclear fuel and at the same time produce affordable clean energy for the foreseeable future. As the WB2 plant in and four other plants with the AP nuclear power plant design prepare to go online over the next few years, nuclear deserves to take a prominent role as a carbon-free source of energy in the US.

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Chapter 5 : Inside a Nuclear Power Plant | HowStuffWorks

Introduces the parts of plants, the physiology of plants, varieties of plants, and more.

Share on Pinterest Bamboo palms Chamaedorea seifrizii This sturdy plant is known for its easy elegance and height. It likes bright, but not direct sunlight, and does have preferences about its care. Bamboo palms also transpire a healthy dose of moisture into the air, making it a welcome addition in dry winter months. Keep the soil moist. Place bamboo palms where air circulates freely, and mist occasionally to prevent spider mites. Bamboo palms are safe to keep in a house with pets. Different varieties will prefer different light situations, from bright, indirect light to low-light spaces. Toxic to animals and humans: The chemicals in the sap can also cause severe contact dermatitis in humans, especially those with sensitive skin. These plants love bright, filtered light and a little attention now and then. Water moderately to keep the soil moist, especially in the winter. Prune the leaves and wipe them down to keep them looking pretty. Rubber plants are toxic to cats and dogs. In addition to looking patterned and colorful, these pretty plants can remove many common toxins. But caring for these plants may require extra attention. Water moderately and allow compost to almost dry out before watering. Chinese evergreens like high humidity, a little regular misting, and getting repotted every few years. Chinese evergreen plants are toxic to dogs. Keep soil slightly moist. Peace lilies thrive in most lighting conditions, but too little light can prevent flowers from blooming. Despite its calming name, this beautiful plant is toxic to cats, dogs, and children. Keep your floors clean by vacuuming and mopping. Avoid synthetic cleaners or air fresheners. Reduce humidity in your air. In fact, some studies also used air filters in combination with plants.

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Chapter 6 : Inside a nuclear power plant (photos) - CNET

With different plant boxes, choose you desired type of plant you want to get a monthly delivery of. In-Season Plants From an assortment of air plants to a rare vibrant indoor potted plant, House Plant Box simply delivers healthy in-season plants.

All types of plants were originally outdoor plants, of course, but certain plants are now referred to as indoor plants, or houseplants, because of their low tolerance for cool temperatures, their long life span and their ability to thrive in containers. Temperature Tolarance Plants grown inside are generally species that thrive in temperatures between 60 and 80 degrees Fahrenheit. Most indoor plants that grow well in this temperature range are tropical plants. Tropical plants enjoy warm temperatures and humidity, but they do not require constant sunlight. Outdoor plants can tolerate a wider temperature range. Types Some common houseplants include Ficus elastica rubber plant , Chlorophytum comosum spider plant and aloe vera. These are all tropical plants. Popular plants for outdoor gardens include ornamental trees and shrubs, vines, vegetables and herbs, perennial flowers flowers that return for three or more years and annual flowers, which grow for one season. Dormancy Period Differences Most outdoor plants have dramatically visible signs of death or dormancy. Plants wither, lose leaves and decay. Annual plants only last for one growing season, and perennial plants return after a period of dormancy. Indoor plants also have a dormant period. Indoor plants will stop growing during autumn and winter; some plants may look faded and tired during their dormant period. Putting Houseplants Outdoors Some plants can thrive both indoors and outdoors, providing that they are brought in during the coldest months. Many houseplants do well with a "summer vacation" outside. Since many indoor plants are tropical, they grow well in the more humid outdoors, and breezes help fight off houseplant pests and fungal diseases. Wait until nighttime temperatures are above 50 degrees Fahrenheit before moving indoor plants outdoors. Place the plants in a partially shaded location, as most indoor plants cannot tolerate full sun. Growing Garden Plants Indoors Certain outdoor plants, such as vegetables, can be grown indoors. Place these plants by a south-facing window so that they can absorb the required five hours of sunlight. Supplemental high-intensity plant grow lights are also recommended. Space-saving dwarf varieties of tomatoes and peppers and many types of herbs are best for an indoor garden.

Chapter 7 : How to Water Indoor Plants: 13 Steps (with Pictures) - wikiHow

Luring insects into its pools of digestive juices, then dissolving the bugs into "amino acids, peptides, phosphates, ammonium and urea, from which the plant obtains its mineral nutrition," the Pitcher Plant is famously carnivorous. But what does it look like inside the stomach of a Pitcher.

Chapter 8 : About Your Privacy on this Site

In telecommunication, the term inside plant has the following meanings. All the cabling and equipment installed in a telecommunications facility, including the main distribution frame (MDF) and all the equipment extending inward therefrom, such as PABX or central office equipment, MDF heat coil protectors, and grounding systems.