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2. plants display a hypersensitive response that limits the ability of pathogens to survive and spread. 3. plants display systematic acquired resistance, whereby an infection induces immunity to diverse pathogens in other parts of the plant.

Secondary growth is a product of two different, though related, tissues, which both fall under the umbrella term lateral meristems. Vascular cambium exists between xylem and phloem; on its inside the cambium produces what is known as secondary xylem, on its outside it forms secondary phloem. The primary xylem and phloem are pushed further inward and outward, respectively. As xylem gets older it often becomes clogged and ceases to function; this tissue is called heartwood, in direct contrast to sapwood, which comprises the functioning xylem cells. The vascular cambium is more productive during the growing seasons. During the rest of the year it creates little growth. This phenomenon creates distinct rings of growth, each ring representing a single growing season. By studying these rings, it is possible to calculate the age of a plant, and even possible to determine the specific conditions of a particular growing season. The second lateral meristem is called cork cambium, and is responsible for the formation of cork bark , which replaces the epidermis is the protective covering of shoot and root. Gymnosperms Gymnosperms are commonly known as conifers, and includes spruces, firs, hemlocks, and othercommon evergreens. Like all tracheophytes, gymnosperms contain vascular tissues. They have developed seeds and nonflagellated sperm; male gametes carried inside pollen grains are moved by the wind instead of through water. The dominant phase in the gymnosperm life cycle is the diploid sporophyte stage; the gametophytes are very small and cannot exist independent of the parent plant. Male and female cones, the reproductive structures of the sporophyte, produce two different kinds of haploid spores: This phenomenon is called heterospory. These spores give rise to gametophytes of the same sex, which in turn produce the gametes. Gymnosperm Life Cycle The separation of sexes in the gametophyte stage is a step forward from the dual- sex gametophytes of bryophytes and lower tracheophytes such as ferns. For more information on the life cycles of plants, see Alternation of Generations. Gymnosperm are also characterized by a specialized fertilization process, involving differentiated male and female gametophytes. Fertilization occurs when pollen grains male gametophytes are carried by the wind to the open end of an ovule, which contains the eggs, or female gametophyte. Angiosperm Life Cycle Angiosperms Angiosperms are typically divided into two classes: As discussed in Xylem and Phloem , angiosperms have a vascular advantage over gymnosperms. The vessel elements in their vascular tissue, which evolved from the tracheids found in conifers, are more specialized for conducting fluids. In addition, fibers within angiosperm xylem give added support to the plant structure. Another positive adaptation that is exclusive to angiosperms is the flower, which attracts insects and thus facilitates the transfer of pollen. Flowers, the reproductive structures of angiosperms, take the place of gymnosperm cones. Furthermore, while the ovules of gymnosperms are exposed on the surface of the cone , angiosperm seeds which develop from ovules are enclosed within an ovary. This ovary later matures into a fruit, which aids in the dispersal of the seeds through animals or wind and protects the seeds from drying out. Much of the angiosperm life cycle resembles that of gymnosperms. The sporophyte stage dominates, and the gametophytes are even smaller than those of gymnosperms. The mature diploid plant produces male and female haploid spores through heterospory, which gives rise to single-sex gametophytes, which in term produce gametes. These gametes, through either self-pollination or cross-pollination, join to form a diploid zygote that eventually becomes a seed for a new angiosperm. For more information on the life cycles of angiosperms see Alternation of Generations.

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How the Yeast Plant Grows in a Loaf of Bread[edit] Which would you rather do, get inside a loaf of bread, or put the bread inside of you? That makes you laugh. But you never tried getting inside a loaf of bread. If you get inside before it is baked, you will find plenty of playmates. Bread dough is just full of little living cells of protoplasm. They eat the bread before you do. They eat and eat and grow, and make millions of other cells like themselves. Let us watch them. They are very active little plants so they can easily be studied. Your mama buys a yeast cake when she wants to make bread. It may be dry and hard, or it may be a soft paste wrapped in tin foil. It has an odd smell, and does not seem alive at all. She takes a half cup of warm water, and a little flour and a tiny bit of sugar and mixes them. Then she breaks her yeast cake into the cup, stirs them all together and stands the cup in a warm place. If you ask her why she does that, she may say: Soon little bubbles begin to burst. The batter swells and foams, and rises to the top of the cup. Study it with a microscope. The whole mass is in motion. Mama says the yeast ferments, but that is just another name for growing, for yeast plants. There, the secret is out. Mama made a garden. The flour and water and sugar are soil. In the soil she scattered yeast plants-just as a farmer scatters wheat seeds in a field. The yeast is a water plant and will grow in warm water alone, but it will grow faster if given the starch in flour. And it likes sugar, too, just as you do. It uses these things to grow on and, in using them, it changes them. It turns the starch and sugar sour, and gives off the same gas-carbon dioxideâ€”that animals give off in breathing. This gas is what puffs the bread so it rises to the top of the pan. There is very little food in the cup. Soon the yeast plants will stop growing and making gas. Then the paste will fall flat. Mama must hurry and get a big pan full of dough ready, to give the yeast plants more food. This time she takes a quart of water, and a lot of flour, and the foaming yeast in the cup. She beats the batter with a big spoon to scatter the yeast plants all through the soil and to beat in air, too. All living things need air, you know. Yeast plants want their food warm just as the baby does; but they grow best in the dark, so mama covers the bread pan. The yeast plant is that little round cell filled with the magic jelly, protoplasm. It likes to float around in a warm bath. In some strange way it soaks food through its thin cell wall and grows larger. When it is grown up, it sprouts another little bud of a cell filled with jelly. Sometimes these buds break away from the parent cell and start a new family, but sometimes they hang together in a little knot or string of cells. The yeast plant has neither stem nor roots nor leaves nor blossoms nor fruit. Each little bag of jelly is a whole plant. There are a great many plants on earth much like yeast, that you can find and study. One of them likes bread after it is baked. Yeast, showing single cells and how they grow and multiply by budding. It is blue mould. Blue mould grows on old bread, and on the top of glasses of jelly. Under a microscope it is very beautiful. It is a feathery mass of delicate blue threads. Black moulds and mildews, rust on wheat, black smut on corn, and puff ball smoke, all belong to the same family of plants. Cells of these kinds of plants are always in the air. You can make a garden of them by leaving a saucer of flour paste, fruit jelly, or a bit of stale bread exposed, for a week or two. They have a family name. They are called Fungi fun-ji. The blue mould is often called Fairy Fungi. It looks like a fairy forest. Toad-stools and mushrooms are fungi, too. The fungi all have one very bad habit. They live on other plants, and even on animals. But they like dead or dying things best. Around old trees and fallen logs you will find toad stools and mushrooms. There are two ways in which you may know the fungi. They live on some other living, or dead and decaying, plant or animal, and they are never green. They do not have stems or roots or leaves or flowers or fruit or seeds. Any tiniest cell of a fungus, if put into the right soil will grow and multiply cells, just as the yeast plant does in the batter. It is the very lowest order of plants. Mushroom, which is one kind of fungus. But it became a higher kind of plant when it had to. Fungi like the dark. The first plants were born in the dark of deep sea water. You know earthquakes lifted the floor of the ocean. The plants were lifted, too. As the plants came near the surface of the water they got more light. Do you know what sunlight does to plants? Did you ever find a board lying on the grass? The next time you find one, lift it. You will find that the grass under the board has turned yellow or white. The outside leaves of a head of cabbage or lettuce are green, while the inside leaves, shut away in the dark, are white. Sunshine turns plants green. Nature took as long a step upward as the giant who wore seven league boots, when the first sea plants got enough sunlight to turn green. Green plants were lifted clear out of the fungi class. They began to earn their own living for one thing, and they learned to do a lot of things. She seems to like to see how many different things she can make of a few simple things. All the plants and animals begin to grow in a little cell of protoplasm. So, when we understand the fungi, the simplest of all plants, we have learned the A. Knowing the letters, we can spell the words and read the story of the living world.

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Chapter 3 : Section 2: Part 1

This guide provides information on selective herbicides as one tool for invasive plant management on rangeland, pastures, and natural areas. Information on herbicide use rates, herbicide selectivity on non-target plants, sprayer calibration, seeding guidelines, environmental considerations, and other useful tips are provided in this document.

After you have completed this section, you will be able to: Distinguish between plant sporophytes and gametophytes. Identify the various parts of a typical flower and give their functions. Relate the sequence of events that give rise to microspores and megaspores. Describe the development of the male and female gametophyte. Explain how endosperm is formed as well as what the function of endosperm is. Like most other eukaryotes, plants reproduce sexually. Meiosis reduces their chromosome number by half. Fertilization restores that number. Unlike most animals, plants have other methods of asexually propagating themselves. These include bulbs, runners, and corms. This will be discussed later in this section. Flowering plants are the most recently evolved major plant group. Angiosperms first appeared million years ago, during the Mesozoic Era. Imagine the world before flowers, when dinosaurs roamed the Earth, and our remote mammalian ancestors were little more than shrew-sized creatures. What made angiosperms so successful that they could out-compete and overthrow established plant species? A new wrinkle on sexual reproduction was chief among angiosperm advances: Life Cycles A life cycle is a diagram illustrating the various steps or events during the life of a particular type of creature. Life cycles also show the positions of meiosis and fertilization. We can draw a life cycle for any organism. Several life cycle patterns occur. Many protistan life cycles are dominated by the haploid phase. Animals and some protists have life cycles dominated by the diploid phase. Plants and many types of algae have distinct haploid and diploid phases that are organisms in their own right. Animal life cycles have a diploid dominant phase in which meiosis is followed by gametogenesis and the production of gametes. Gametes are produced directly by meiosis. Male gametes are sperm, and female gametes are eggs. In the plant life cycle, meiosis produces haploid spores. The spores develop into the gametophyte phase of the plant life cycle. The gametophyte undergoes mitosis to produce gametes. During fertilization, gametes fuse together to produce the diploid sporophyte spore-producing phase. Within the plant kingdom, the dominance of phases varies. Nonvascular plants, which include the mosses and liverworts, have the dominant gametophyte phase. Vascular plants show a progression of increasing sporophyte dominance from the ferns and fern allies to angiosperms. Alternation of generations in a seed plant illustrating the sporophyte and gametophytes.

Chapter 4 : Modern Biology () :: Homework Help and Answers :: Slader

A summary of Tracheophytes in 's Plant Classification. Learn exactly what happened in this chapter, scene, or section of Plant Classification and what it means. Perfect for acing essays, tests, and quizzes, as well as for writing lesson plans.

Chapter 5 : General Biology Lab #7 - Plant Evolution

All the plants and animals begin to grow in a little cell of protoplasm. So, when we understand the fungi, the simplest of all plants, we have learned the A. B. C.'s of life. Knowing the letters, we can spell the words and read the story of the living world.

Chapter 6 : SparkNotes: Plant Classification: Tracheophytes

Interactive Textbook Introduction to Plants SECTION 2 Name Class Date Seedless Plants continued c b d a Gametophyte The sporophyte releases spores into the air.