Are fungi like protists unicellular or multicellular

Protists II: Forms of Algae and Fungus Protists such as normative fungi are haploid forms, diploids are often restricted to a single cell. Diploid zygote can be adapted to living winter conditions, such as in freshwater green algae. Different groups of algae differ in the type of chlorophyll that cells have. All forms have a chlorophyll. Common Name of Phylum Morphological Reproduction Example euglenoids Euglenophyta Unicellular Asexual by longitudinal cell division; sexual reproduction is never observed. Euglena Dinoflagellates Dinoflagellata Unicellular; some colonials especially asexual, by elongated cell division; sexual reproduction has been observed in several spp. Gonyaulax spp. responsible for poisonous red tides in estuarine habitats. Gonyaulax Diatoms Bacillariophyta Unicellular; some colonial Asexual, with progressive reductions in cell size. Sexual reproduction is triggered when the cell reaches a certain minimum size. Dinobryon Golden Chrysophyta Unicellular algae; some colonials are especially asexual, and involve the production of star-speckled spores called zoospora. Synura Brown Algae Phaeophyta Multicellular Reproductive Cells, both asexual zoospora and sexual gametes, are usually flagged. Most have a life cycle with generational turnover. Green Algae Fucus Chlorophyta Unicellular, koenocytic; colonialism; multicellular both asexual and sexual reproduction occurs. Many species show a generational shift. Spirogyra Red Rhodophyta Most multicellular algae; some unicellular alterations of the sexual and asexual generation of Botryglossum farlowianum Protists such as Mushrooms · In many species, cells spend a lot of time in unicellular form; · Environmental or other cues cause cells to merge to form a flat thallus; · The fruitful body then appears, and is negatively geotactic. Common name Phylum Morphological Reproduction Examples of mucus plasmodial molds Myxomycota Multinukleate plasmodium Flagellated or amoeboid reproductive cells. It reproduces by spores in sporangia. Asexual and sexual phases of Physarum sp. Fisarum on the surface of the water: mucus mold: The cellular mucus mold Acrasiomycota Unicellular feeding stage; Asexual and sexual multicellular phases (snail & fruiting). Dictyostelium sp. Chemotaxis of the population of Dictyostelium: Dicty, in German, but you can get the essence of fruitful body development: Water molds Oomycota Coenocytic mycelium Biflagellate zoospores. Asexual and sexual phases; saprobe of dead aquatic organisms, detritus; parasites fish eggs & fish suffered. Saprolegnia sp. Mushrooms. This mucus mold, shown in dead wood, is like mushroom mushrooms Although this mold has no mouth, it still basically eats this rotting material. Protists like mushrooms are molds. They are absorptive feeders on rotting organic matter. They resemble fungi, and they reproduce with fungal-like spores. However, in other ways, they are very different from fungi and more like other protist. For example, they have cell walls made of cellulose, while fungi have cell walls made of chitin. Like other protists, they have a complicated life cycle with asexual and sexual reproduction. They are speckled over several stages of their life cycle. The two main types of mushroom-like protists are slime molds and water molds. Mucus molds are mushroom-like protists commonly found on rotting logs and compost. They move very slowly in search of rotting material to eat. When food is scarce, individual cells cluster together to form clot-like masses, such as the dog's vomiting mucus mold in the Image below. The mass glides along with its own secretions, ingesting rotting organic matter as it moves over it. Slime Mold Vomiting Dog. This slime print looks like his name. There are two types of mucus molds when it comes to how they swarm: acellular and cellular. When the acellular mucus molds swarm, they fuse together to form a single cell with multiple nuclei. When the cellular mucus molds swarm, they remain as different cells. Cellular mucus molds are used as model organisms in molecular biology and genetics. They may be key to how multicellular organisms evolved. Can you explain why? Water molds are commonly found in moist soil and surface water. Many are pathogens of plants that destroy crops. They infect crops such as grapes, lettuce, corn and potatoes. Some water molds are parasites of fish and other aquatic organisms. Summary Protists like mushrooms are molds. The mold is an absorptive feeder, found in rotting organic matter. They resemble fungi and reproduce with fungal-like spores. Examples of mushroom-like protists include slime molds and water molds. Reviews How mushroom-like protists are similar to mushrooms? What's one of those different ways? Why are cellular mucus molds, but not acellular mucus molds, key to how multicellular organisms evolve? What does the picture above look like for you? Bacteria? Animals? Plant? Actually, it's not found in any of those categories. The above organisms are called protist. Protists are unique categories of organisms because they are very different when compared to each other, but they can be very similar to plants, animals, and fungi. What are mushrooms? Their kingdoms of other organisms that are not associated with protists, but are equally interesting. It is estimated that there are 1.5 million species of fungi, although only 5% of them are classified. ProtistsLesson ObjectivesExplain why protists cannot be classified as plants, animals, or fungi. A list of similarities that exist among most Identify the three subdivisions of organisms in the kingdom of Protista. Check Your Understanding What are the basic differences between eukaryotic cells and prokaryotic cells? Lists some characteristics that all cells have. Autotroph vocabulary cilia filter-feeder heterotroph protist protozoa pseudopodia What are Protists? Protists are eukaryotes, and most are single-celled. You can think about protists because all eukaryotic organisms are not animals, or plants, or fungi. Even among themselves, they have little in common. Although thesis organisms were included in the Protista category by Ernst Haeckel in 1866, Kingdom Protista was not an accepted classification in the scientific world until the 1960s. These unique organisms can be so different from each other that sometimes Protista is called the kingdom of garbage drawers. This kingdom contains eukaryotes that cannot be incorporated into other kingdoms. Unicellular or Multicellular? Most of the protists, as shown in the Image below, are so small that they can be seen only with a microscope. Protists are mostly unicellular eukaryotes (single cells) that exist as independent cells. Some protists are multicellular and very large. These protists do not, however, demonstrate cellular specialization or differentiation into the network. For example, kelp is a multicellular protist and can be more than 100 meters long with cells doing most of the same work. Characteristics of Protists Some common characteristics among protists: They are eukaryotic, which means they have a nucleus. Most have mitochondria. They can become parasites. They all prefer aquatic or humid environments. For classification, protists are divided into three groups: Protists like animal Protists Like Plant Fungi-like Protists. But remember, protists are not animals, or plants, or fungi (Figure below). Classification of Protists Because there are many different types of protists, classification of protists can be difficult. Recently, scientists confirmed that protists are associated with analyzing their DNA. Protists with more general DNA sequences are more closely related to each other then those who have fewer common DNA sequences. Find information about different types of protist here: in various forms. This mucus mold is protist. Mucus molds had previously been classified as fungi but are now placed in the Royal Protista. Mucus mold lives on rotting plant life and in the soil. How Protists Get Food The protists need to perform all the functions that other cells perform, such as growing and reproducing, maintaining homeostasis, and gaining energy. They also need to get to provide energy to perform these functions. For such simple organisms, protists get their food in a complicated process. Although there are many many protists, such as algae, who get their energy from sunlight, many others have to swallow their food through a process called endocytosis. Endocytosis occurs when a cell picks up a substance through its membrane. This process is described below: Protist wraps the cell walls and cell membranes around its prey, which are usually bacteria. It creates food vacuoles, a kind of food storage compartment, around bacteria. Protist produces a poison that paralyzes its prey. After paralysis, foodstuffs move through the vacuole and into the cytoplasm protist. Another protist is a parasite and absorbs nutrients intended for its host, harming the host in the process. Protists like animals, like plants, and protists like fungi differ from each other mainly because they have different ways of obtaining carbon. Carbon is important in the formation of organic compounds such as carbohydrates, lipids, proteins, and nucleic acids. You get it from eating, as do other animals. Protists like animals called protozoa. Protozoa is a single-celled eukaryotes that share certain properties with organisms in the animal kingdom. Like animals, they can move, and they get their carbon from outside sources. They are heterotrophic, which means they eat stuff outside of themselves instead of producing their own food. Protists are very small animals, only about 0.01–0.5mm in size. Animal-like protists include zooflagellates, ciliates, and sporozoans (Figure below). Euglena is an animal-like protists. More than 1000 species of Euglena exist. They are used in industries in the treatment of waste. Some protists like animals literally eat with their tails. The protist tail is a flagellum. These protists are called flagellates. Flagellates are filter feeders. They obtain oxygen and nitrogen by constantly whipping flagellum back and forth, a process called filter-feeding. The flagellum whip creates a current that brings food into the protist. Remember that prokaryotes can also have flagella (plural flagellum). Different Types of Protists Like Animals Are there different types of protists such as animals? Yes. They are different because they move in different ways. Flagellates have a long flagella, or tail. Flagella rotates in a propeller-like way. An example of flagellate is Trypanosoma, which causes African sleep sick diseases. Other protists have so-called temporary pseudopodia, which is like temporary legs. The cell surface expands the membrane, and the strength of this membrane moves the cell forward. The example of a protist with a pseudopod is amoeba. Another way protists move is with the cilia movement. Cilia are thin, very small like a projection tail that extends out of the body of the cell. Cilia hit back and forth, protist together. Paramesium has cilia that pushes it. Some protists are does not move at all, like toxoplasma. These protists form spores that become new protists, and are known as sporozoa. Protists like plant protists like plants are autotrophic. This means that they produce their own food. They photosynthesis to produce sugar using carbon dioxide and energy from sunlight, such as plants. Protists like plants living in the ground, in seawater, on the outer cover of plants, and in ponds and lakes (Figure below). Protists like this can be unicellular or multicellular. Some protists, such as kelp, live in large colonies in the oceans. Plant-like protists are very important for the environment because they produce oxygen through photosynthesis, which helps other organisms, such as animals, survive. Protists such as plants are classified into a number of basic groups (Table below). Plants such as ProtistsPhylum Description Number (approx.) Chlorophyta Examples of green algae - associated with higher plants 7,500 Chlamydomnas, Ulva, VolvoxRhodophyta red algae 5,000 PorphyraPhaeophyta brown algae 1,500 MacrocystisChrysophyta diatom, Golden brown algae, yellow-green algae 12,000 CyclotellaPyrrophyta dinoflagellates 4,000 GonyaulaxEuglenophyta euglenoids 1,000 euglenaRed algae is a group of very large protitusis that make up about 5,000 heterotroph-like protists who have cell walls and reproduce by forming spores (see Lesson 9.2 for more information on spores). Protist-like fungi usually do not move, but some develop movement at some point in their lives. There are basically three types of protists such as mushrooms (see Table below): Water molds. Mushrooms are downy. Slime mold. Mucus molds represent the characteristics of protists such as fungi. Most mucus molds are about a centimeter or two in size, but some slime molds are several meters in size. They often have bright colors, such as bright yellow. Others are brown or white. Stemonitis is a kind of mucus mold that forms small brown markings on the outside of a rotting log. Polystyrene fisarum lives inside a rotting log and is a sticky web of yellow thread several centimeters long. Fuligo, sometimes called a vomit mold, is a yellow mucus mold found in rotting wood. Fungi such as ProtistsProtist Source of Carbon Environment Characteristics omycetes: water mold (Pictured below) rotting remains, parasites of plants and animals most living in water Cause various diseases of plants; a common problem in greenhouses where organisms kill new seedlings (plants from seeds); including downy mushrooms, which are easily identified by the appearance of white fungus on the leaves. Mucus molds (Pictured below) dispose of dead plant material, feed on bacteria common in the soil, in the yard, and in forests commonly on deciduous wood Including cellular mucus molds, which involve many individual cells attached to each other, forming forming A large supercell is basically a bag of cytoplasm containing thousands of individual nuclei. Plasmodial mucus molds spend most of their lives as individual cells, but when chemical signals are released, they form groups that act as one organism. Examples of slime molds. Nymphs of water insects are attacked by water mold. The importance of Human Protists could not have lived on Earth if it weren't for protilis. Why? Protists produce nearly half of the planet's oxygen, decompose and recycle the nutrients humans need to live, and form a large part of the food chain. Humans use protists for many other reasons: Many protilis are also commonly used in medical research. For example, drugs made from protists are used in the treatment of high blood pressure, digestive problems, ulcers, and arthritis. Other protists are used in scientific studies. For example, mucus molds are used to analyze chemical signals used in

cells. Protists are also valuable in the industry. Look behind the milk carton. You will most likely see carrageenan, which is extracted from red algae. It is used to make puddings and solid ice cream. Chemicals of other types of algae are used to produce many types of plastic. Lesson Summary Protists are very diverse organisms that belong to the Royal Protista. Protists are divided into three subgroups: protists like animals, protists like plants and protists like fungi. Animal-like protis is a unicellular eukaryotes that share certain traits with animals, such as mobility and heterotrophic. Plant-like protists are unicellular or multicellular autotrophs that live in the soil, in seawater, in the outer covers of plants, and in ponds and lakes. Mushroom-like protists, such as water molds, downy mushrooms, and mucus molds, are heterotrophs that reproduce by forming spores. Review Of QuestionsRecall 1. A shared list of characteristics of all protists. 2. List two ways for protists to get food. 3. Explain protist characteristics such as animals. 4. Explain protist characteristics such as plants. 5. Explain protist characteristics such as mushrooms. Apply Concept 7. Explain why protilis is important for life on Earth. 8. You find a protist who is heterotroph and lives in the oceans. Is this protist most similar to plants, animals, or fungi? Why or why not? Critical Thinking 9. Imagine that you are a scientist giving a paper called Protists: Junk-Drawer Kingdom. Explain your reasons for this title? Further Reading / Additional LinksKing, Katie and Ball, Jacqueline, Protists and Mushrooms. Publishing Gareth Stevens 2003. Marguilis, L., Corliss, J.O., Melkonian, M.,and Chapman, D.J. 1990. Protoctista handbook. Jones and Bartlett, Boston.Jahn,T.L., Bovee, E.C. & Jahn, F.F. 1979 How to Know Protozoa. 2nd ed. Wm.C. Brown Publishers, Div. from McGraw Hill, Hill, Iowa.Patterson, D.J. 1996. Free Living Freshwater Protozoa: Color Guide. John Wiley & Sons, NY. Streble H., Krauter D. 1988. Living in water droplets. Microscopic freshwater flora and fauna. An identification book. to ConsiderFungi consists of one of the eukaryotic kingdoms. Think about what might distinguish a protist like a mushroom from a true mushroom? Given the huge differences between the protists discussed in this lesson, think about the possibility of dividing this kingdom into additional kingdoms. How could that division be achieved? Is that a good idea or will it just cause confusion? FungiLessonDescribe objectives characteristic of fungi. Identify the structures that distinguish fungi from plants and animals. Explain how mushrooms can be used in the industry. Check Your UnderstandingWhat are the significant differences between protist and other eukaryotic organisms? What are the distinguishing characteristics of protists such as fungi? Vocabularybu chitin fruited body hyphae mycelial fragmentation mycelium mycorrhizal symbiosis parasitic spores What is Fungus? Ever seen a blue-green mold grow on a piece of bread? Do you like your pizza with mushrooms? Do doctors ever prescribe antibiotics to you? If so, then you have found mushrooms. Fungi are organisms included in Kingdom Fungi (Figure below). Our neighborhood needs mushrooms. Mushrooms help decipher the material and make nutritious food for other organisms. Mushrooms are all around us and useful in many ways. These different types of organisms show great diversity in Kingdom Fungi.If you had to guess, did you say mushrooms are plants or animals? Scientists used to argue about which kingdom to put the fungus in. But they were wrong. Now, scientists know that mushrooms are not plants at all. Mushrooms are very different from plants. The main difference between plants and fungi is how they get energy. Plants are autotrophic, which means that they make their own food using energy from sunlight. Mushrooms are heterotrophic, which means that they get their food from outside themselves. In other words, they have to eat their food like animals and a lot of bacteria do. Yeasts, molds, and fungi are different types of fungi (Figure below). There may be as many as 1.5 million species of fungi. You can easily see the mold of bread and mold without a microscope, but mostly can't you see. Fungi are too small to be seen without a microscope, or they live where you can not see them easily - deep in the ground, under rotting logs, or inside plant plants Animals. Some mushrooms even live on or over other fungi. The blue in this blue cheese is actually a mushroom. Fungi and Symbiotic Relationships If it weren't for fungi, many plants would be starving. In the soil, fungi grow tightly around the roots of plants, and they begin to help each other. This mutually helpful form is called mycorrhizal symbiosis. Mycorrhizal means root and symbiosis means the relationship between organisms (Figure below). When plants and fungi form a close relationship, plants and fungi feed on each other. This plant provides glucose and sucrose in fungi that plants make through photosynthesis, which fungi cannot do. The fungus then provides minerals and water to the roots of the plant. These fungi and trees live in symbiosis with each other. Moss Have you ever seen an organism called lichen? Moss is crusty, hard growth that you may find in trees, logs, walls and stones. Although mosses may not be the prettiest organisms in nature, they are unique. A lichen is really two organisms that live very closely together: fungi and bacteria or algae. Cells from algae or bacteria live inside the fungus. Each organism provides nutrients for the other. What is its name when two organisms live close together and form relationships? Symbiotic. A lichen is the result of symbiosis between fungi and other organisms. Since this relationship helps both organisms, it is called a mutually beneficial relationship. Fungi and Insects Many insects have a symbiotic relationship with a certain type of fungus: Ants and termites grow fungi in the garden of the underground fungus they create. When ants or termites have eaten a large meal of wood or leaves, they also eat some mushrooms from their garden. Mushrooms help them digest wood or leaves. The Ambrosia beetle lives on the bark of trees. Like ants and termites, they plant fungi inside the bark of trees and use them to help digest their food. Fungi as Parasites Although many symbiotic relationships help both organisms, sometimes one of the organisms is harmed. When that happens, useful and edable organisms are called parasites. Examples of parasitic fungi include the following: Starting in 1950, the Dutch Elm tree in the United States began to die. Since then many species have been eliminated. The disease is caused by fungi that act as parasites. Mushrooms that kill trees are carried by beetles to the trees. The tree tries to stop the growth of mold by blocking its own ability to get water. However, without water the tree soon died. Some parasitic fungi cause human diseases such as athlete's foot and ringworm. This fungus feeds on the outer layer of warm and moist skin. Mushrooms as Predatory Fungi growing on tree trunks do not seem to be very dangerous. But Mushrooms are actually hunters. For example, for example, mushroom trap nematodes. Nematodes are worms that some fungi like. These hungry fungi live deep in the ground where they set traps for unsuspecting nematodes by making circles with their hyphens. Hyphae are like arms and legs. They look like cobwebs and can be sticky. The fungus sets a circular ring of hyphae with bait in it, which brings the nematode into the fungus (Figure below). Hyphae are mushroom arms and legs like cobwebs. Mushrooms are Good Eating Mushrooms can grow fast because they are good eaters. The fungus has many surface areas and this large surface area eats. Surface area is how many open areas are compared to their overall volume. Most of the surface area of the fungus is actually underground. These are the measures involved in eating fungi: Fungi spray special enzymes into their environment. Enzymes help digest large organic molecules, similar to cutting out your food before you eat. The fungal cells then absorb the damaged nutrients. Why do you think large surface areas allow fungi to get more nutrients? Fungal Body Parts The most important parts of the fungus include: Cell walls: Layers around the membrane of fungal cells, similar to those found in plant cells. Hyphae: It is a thread-like structure that is interconnected and clusters into mycelium. Ever seen mold on a wet wall or on old bread? The things you see are really mycelia. Hyphae and mycelia help fungi absorb nutrients from other organisms. Special structure for reproduction: One example is a fruitful body. Fungi are fruitful bodies, which are part of the fungi that produce spores (Figure below). The spores, discussed in the next section, are basic reproductive units of fungi. Mushrooms are fruitful bodies. Reproductive Mushrooms Reproduction of fungi is different for different fungi. Many fungi reproduce either sexually or asexually, while some reproduce only sexually and some only asexually. Asexual reproduction requires only one parent and sexual reproduction requires two parents. Asexual Reproductive Fungi reproduce asexually through three methods: Spores: Spores formed by fungi and released to create new fungi. Have you ever seen a puffball? Puffball is a type of fungus that has thousands of spores in a giant ball. Eventually the puffball explodes and releases spores in a large puff. Shoots: The fungus grows part of its body, which eventually breaks up. Damaged pieces become new organisms. Mycelium fragmentation: In this method, a piece of mycelium separates from the fungus. A fragmented piece of mycelium can eventually be new mushroom colonies. Asexual reproduction is faster and produces more fungi than sexual reproduction. Some species of fungi can only perform asexual reproduction. This form of reproduction is controlled by a variety of factors, including including conditions such as the amount of sunlight and carbon dioxide the fungus receives, as well as the availability of food. Sexual Reproduction Almost all fungi can reproduce through the process of meiosis. Meiosis is a type of cell division in which haploid cells are produced (discussed in the chapter titled Cell Division, Reproduction and DNA). But meiosis in fungi is completely different from sexual reproduction in plants or animals. In plants and animals, meiosis occurs in diploid cells and is a process that produces haploid cells. Remember, diploid cells are cells with two sets of chromosomes, one from each parent. Haploid cells have a set of chromosomes. In meiosis, four haploid cells are produced. Each haploid cell has half the number of stem cell chromosomes. However, in fungi, meiosis occurs right after two fuse haploid cells, producing four haploid cells. Mitosis then produces multicellular haploid adult organisms or unicellular haploid organisms. Mitosis is a division of cells that creates two genetically identical hereditary cells (Image below). Diagrams of how asexual and sexual reproduction work in fungi. Classification of Mushroom Scientists used to think that mushrooms are members of the plant kingdom. They think this is because mushrooms have some similarities to plants. For example, fungi and plants usually have leaves or flowers attached to the stems. Also: Fungi and plants have the same structure. Plants and fungi live in the same type of habitat, as they grow in the soil. Plants and fungi both have cell walls, which have no animals. Structure of Fungi There are a number of characteristics that make fungi different from other eukaryotic organisms: Fungi can not make their own food as plants can, because they do not have chloroplasts and can not perform photosynthesis. Fungi are more like animals because they have to get their food from outside sources. Cell walls in many species of fungi contain chitin. Chitin is a nitrogen-containing material found in the shells of animals such as beetles and lobsters. Plant cell walls are made of cellulose, not chitin. Unlike many plants, most fungi do not have structures that transfer water and nutrients. One of the unique characteristics for fungi is the presence of hyphae, which combines in groups called mycelia, as described above. The evolution of fungal fungi emerged during the Paleozoic Era, a geological time period that lasted from about 570 million to 248 million years ago. This is also the moment when fish, insects, amphibians, reptiles and land plants appear. The first fungus most likely lives in water and has a flagella that releases spores. The first soil fungus may have appeared in the Silurian period (443 million years ago to about 416 million years ago), the same time period land plants also first appeared. See different types of mushrooms here: . Role Roles Fungi are found all over the world in different types of habitats. Mushrooms even thrive in the desert. Most fungi are found on land rather than in the sea, although some species live only in marine habitats. Fungi are very important to this ecosystem because they are one of the main decomposers of organic matter. Scientists have estimated that there are nearly 1.5 million species of fungi. The Importance of Mushrooms for Humans Using Humans uses mushrooms for the preparation or preservation of food and other purposes. Yeast is the aid of fermentation of beer, wine and bread (Figure below). Some mushrooms are used in the production of soy sauce and tempeh, a source of protein used in Southeast Asia. Mushrooms are used in the diet of people all over the world. Fungi can produce antibiotics, such as penicillin. Chitin in the cell walls of fungi has been said to have healing properties. , a single-range mushroom called Brewer or Baker yeast, used in bread making and in making wine and beer through fermentation. There are several other yeast species used in brewing beer. Each can give a distinctive taste. Edible and Poisonous mushrooms Some of the most famous types of mushrooms are mushrooms, which can be eaten or poisonous (Figure below). Many species are commercially grown, but others are harvested from the wild. When you order a pizza with mushrooms or add it to your salad, you most likely eat Agaricus bisporus, the most commonly eaten species. Other fungal species are collected from the wild for people to eat or sell commercially. Many species of fungi are toxic to humans. Some mushrooms will only give you abdominal pain, while others may kill you. Some mushrooms you can eat when cooked but poisonous when raw. Have you ever eaten blue cheese? Do you know what makes it blue? You guessed it. Mushrooms. For certain types of cheese, manufacturers add fungal spores to milk curds to promote the growth of mushrooms, which makes the cheese blue. The mold used in the production of cheese is safe for humans to eat. Some of the most famous types of mushrooms are edible and poisonous mushrooms. Fungus Pest Control Some fungi work as natural pesticides. For example, some fungi can be used to limit or kill harmful organisms such as mites, insect pests, certain animal-drugs, worms, and other fungi that harm or kill plants. Mushrooms Summary Lessons are classified in their own kingdom based on their structure, how to get food, and on which they reproduce. Fungi live with other organisms in symbiotic relationships. Fungi reproduce asexually and sexually. Mushrooms appeared during the Paleozoic Era. Mushrooms are widely used in food, industry, and medicine. Reviews 1. What are the two distinguishing characteristics of fungi from plants? 2. How many species of fungi are there? 3. Name two human diseases caused by fungi. 4. What is lichen? Apply Concept 5. Explain how mycorrhizal mycorrhizal Work. 6. Describe the relationship between ambrosia beetles and fungi. 7. If you see mushrooms in your bread, which part of the mushroom do you observe? 8. Describe three methods of asexual reproduction in fungi. Critical Thinking 9. Sexual reproduction in fungi is similar to sexual reproduction in animals. Explain why this statement is true or false. 10. You go back in time to talk to scientists who believe that mushrooms are a type of plant. What would you say to them? Further Reading/LinksMoney Supplement, Nicholas, Victory Mushrooms: The History of Rot. Oxford University Press, 2006.Webster, Robert and Weber, Roland, Introduction to Mushrooms. Cambridge University Press, 2007.Moore-Landecker, Elizabeth, Mushroom Basics. Benjamin Cummings, 1996.Points to ConsiderPlants is an interesting and diverse organism. Although scientists used to think that fungi are plants, we now know that plants and fungi are separate. In this lesson we have discussed mushrooms. Next we begin to discuss plants. What do you think distinguishes plants from fungi? Mushrooms?