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Chapter 1 : Food chains and food webs (practice) | Khan Academy

Autotrophs form the base of food chains and food webs, and the energy they capture from light or chemicals sustains all the other organisms in the community. When we're talking about their role in food chains, we can call autotrophs producers.

This lesson introduces many vocabulary terms that will be used throughout the three lessons in this unit. Reinforcement of concepts is provided within this lesson to scaffold learning so that students will be prepared to understand limiting factors and energy pyramids. Instructional Procedures View Part 1: Energy Flow through Food Chains As a whole-class activity, generate a list of dinner food options e. Explain that autotroph is a synonym for producer and heterotroph is a synonym for consumer producer and consumer should be familiar terms. Present students with a model food chain, such as: Explain that each level of a food chain is called a trophic level. Ask students where the grass gets its energy i. Note that decomposers are not always included in food chains, and they can fit into a food chain at any level. Explain that decomposers can fit at any level because they break down waste material and dead organisms at every trophic level. Also note that detritivore is a subcategory that is sometimes used interchangeably with decomposer; examples are earthworms and crabs. Have each group sort the organisms into three piles, producers, consumers, and decomposers. Then have the groups further sort the consumers into piles representing herbivores, carnivores, and omnivores. Provide students with other examples of food chains. Ask students to identify the trophic levels in each of the food chains. Discuss why there are more producers than consumers in food chains. See the Marine Food Chain Web site in the Related Resources section for more information about feeding relationships between marine organisms. Have each student write a paragraph describing feeding relationships in one of the food chains from this lesson. The paragraph should include the terms energy, producers, and consumers in the description. Food Webs Ask students why food chains are a good model of feeding relationships in ecosystems. Elicit that they show the transfer of energy from one organism to another. Food Web Demonstrate this concept by having students brainstorm organisms that can be found in an open field e. Write the organisms on the board spread out. Have student volunteers draw arrows to show which animals eat each other in this field ecosystem. Students should see how complex even a simple food web can be, because each predator can have more than one type of prey, and each type of prey can be eaten by different predators. Food Webs If Internet access is available: After they view the video, have them identify various feeding relationships and identify producers and consumers from the coral reef ecosystem. Then, have small groups of students complete the Food Webs interactive activity see Materials section for this lesson. Assign each group one of the four food web choices. Monitor students as they work on this activity, asking questions about the feeding habits of the organisms in the food web. Additional online activities on food webs are available in the Related Resources section. Have each small group of students arrange the classifying cards into a food web on the sheet of unlined paper, drawing arrows on the paper to indicate the flow of energy. For Part 1, assist students by having them create a concept map using the following terms: Alternatively, display a list of organisms that would be found in a specific ecosystem, such as the desert. Help them make a food chain by connecting a producer, herbivore, and a carnivore. Challenge students who are performing above and beyond the standards by having them research other feeding relationships among marine organisms and creating an additional food chain see the Marine Food Chain Web site in Related Resources. For Part 2, have students who may need opportunities for additional learning copy the food web from the board into their notes. Remind students that the arrows point in the direction of energy flow. For the online activity, guide students in completing it step-by-step with you. For the classifying cards activity, remove a few of the cards to create a simpler food web. Challenge students who are performing above and beyond the standards to add extra organisms to the food web that they create in Part 2. Related Instructional Videos Note: Video playback may not work on all devices.

Chapter 2 : Food Chain - Kid's Corner

Like a spiders web, if one part is removed, it can affect the whole web. FOOD WEBS show how plants and animals are connected in many ways to help them all survive. FOOD CHAINS follow just one path of energy as animals find food.

Food Theme Page Every organism needs to obtain energy in order to live. For example, plants get energy from the sun, some animals eat plants, and some animals eat other animals. A food chain is the sequence of who eats whom in a biological community an ecosystem to obtain nutrition. A food chain starts with the primary energy source, usually the sun or boiling-hot deep sea vents. The next link in the chain is an organism that make its own food from the primary energy source -- an example is photosynthetic plants that make their own food from sunlight using a process called photosynthesis and chemosynthetic bacteria that make their food energy from chemicals in hydrothermal vents. These are called autotrophs or primary producers. Next come organisms that eat the autotrophs; these organisms are called herbivores or primary consumers -- an example is a rabbit that eats grass. The next link in the chain is animals that eat herbivores - these are called secondary consumers -- an example is a snake that eat rabbits. In turn, these animals are eaten by larger predators -- an example is an owl that eats snakes. The tertiary consumers are are eaten by quaternary consumers -- an example is a hawk that eats owls. Each food chain end with a top predator, and animal with no natural enemies like an alligator, hawk, or polar bear. The arrows in a food chain show the flow of energy, from the sun or hydrothermal vent to a top predator. As the energy flows from organism to organism, energy is lost at each step. A network of many food chains is called a food web. The trophic level of an organism is the position it holds in a food chain. Primary consumers are animals that eat primary producers; they are also called herbivores plant-eaters. Secondary consumers eat primary consumers. They are carnivores meat-eaters and omnivores animals that eat both animals and plants. Tertiary consumers eat secondary consumers. Quaternary consumers eat tertiary consumers. Food chains "end" with top predators, animals that have little or no natural enemies. When any organism dies, it is eventually eaten by detrivores like vultures, worms and crabs and broken down by decomposers mostly bacteria and fungi , and the exchange of energy continues. For example, when a bear eats berries, the bear is functioning as a primary consumer. When a bear eats a plant-eating rodent, the bear is functioning as a secondary consumer. When the bear eats salmon, the bear is functioning as a tertiary consumer this is because salmon is a secondary consumer, since salmon eat herring that eat zooplankton that eat phytoplankton, that make their own energy from sunlight. In any food web, energy is lost each time one organism eats another. Because of this, there have to be many more plants than there are plant-eaters. There are more autotrophs than heterotrophs, and more plant-eaters than meat-eaters. Although there is intense competition between animals, there is also an interdependence. When one species goes extinct, it can affect an entire chain of other species and have unpredictable consequences. Equilibrium As the number of carnivores in a community increases, they eat more and more of the herbivores, decreasing the herbivore population. It then becomes harder and harder for the carnivores to find herbivores to eat, and the population of carnivores decreases. A similar equilibrium exists between plants and plant-eaters.

Chapter 3 : Food Chains and Food Webs

Most food chains have no more than four or five links. There cannot be too many links in a single food chain because the animals at the end of the chain would not get enough food (and hence energy) to stay alive.

Blank index card one per student. Next Generation Science Standards: Support an argument that plants get the materials they need for growth chiefly from air and water. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. Organisms obtain gases, and water, from the environment, and release waste matter gas, liquid, or solid back into the environment. A system can be described in terms of its components and their interactions. Developing and Using Models: Modeling in 3â€”5 builds on Kâ€”2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Use models to describe phenomena. Support an argument with evidence, data, or a model. I list their responses on the board. Since we have already learned about the Food Chain, the students have more responses about this concept. I remind the students that a food chain only shows one direction of energy flow based on one organism. For example, energy comes from the sun, to green plants, to animals that eat plants, and to animals that eat other animals. When animals eat green plants and other animals eat those animals, the energy moves from one living thing to another along the food chain. Students will learn more about how the amount of energy passed along from each "trophic" level decreases in later grades but it is helpful to introduce this concept to the students. We also review the vocabulary Animals that eat plants are called herbivores, animals that eat both plants and animals are called omnivores, and animals that eat only other animals are called carnivores. All members of a food chain depend on the energy from the sun that green plants transform into food energy. I also remind the students that the green plants are producers and that the animals that eat the plants and other animals are the consumers. I then show them this page: This is one of my favorite activities to explain the food web and a classic. I have the students prepare different cards that include plants and animals from our local Mediterranean Ecosystem since we will be doing more activities with these organisms in a later lesson. I also make a card with a picture of the Sun. I have labeled each card and have handed each student a different one. I tell the students to draw a picture of the organism that is on the cards using photos from the Santa Monica Mountains National Recreation Area website. I tell the students that they are now going to make a food web. I take them outside weather permitting or to a larger indoor space on campus since they will need to make a large circle. I have distributed the organism cards ahead of time and the students are wearing these as we get in the circle. The student who is the Sun stands at the center of the circle. I ask the student representing the sun to hold the end of the yarn tightly and toss the ball to someone who can use that energy a green plant. When the student representing the green plant catches the ball of yarn, he or she should hold a piece of the yarn and throw the ball to someone else who could use the energy. For example, the sun might throw the yarn to the grass, the grass to the grasshopper, and the grasshopper to the meadowlark. After the yarn reaches a carnivore, I cut it off to represent one food chain. I also explain that humans, bears, raccoons, etc. I remind the students to keep holding onto the yarn and that they might be holding more than on strand during this activity. I then ask how can all these other plants and animals get the energy they need? The students should respond- through a Food Chain. I return the yarn to the sun to start another chain. This time the sun might throw its energy to the grass, the grass to the mouse, and the mouse to a great horned owl. I cut the yarn, throw it back to the sun, and have the sun start another chain. We continue making chains until every student holds at least one strand of yarn. I then ask the following questions students should answer what is in parentheses: Have we made food chains? Yes, lots of them! What do all of our food chains together look like? What is the difference between a food chain and food web? A food web is made up of several food chains. A web is more complicated than a chain because it has

connections among the chains. Who is holding the most pieces of yarn? Because each food chain starts with the sun. Who else is part of many food chains? Green plants What would happen if the green plants died? Nothing else in the Food Web would survive. Here are a few photos of the activity: Food Web activity 1.

Chapter 4 : Ninth grade Lesson Food Chains and Food Webs | BetterLesson

FOOD CHAINS AND FOOD WEBS Food Chains All living organisms (plants and animals) must eat some type of food for survival. Plants make their own food through a process called.

The movement of mineral nutrients is cyclic, whereas the movement of energy is unidirectional and noncyclic. Trophic species are encircled as nodes and arrows depict the links. Like maps of unfamiliar ground, food webs appear bewilderingly complex. They were often published to make just that point. Yet recent studies have shown that food webs from a wide range of terrestrial, freshwater, and marine communities share a remarkable list of patterns. Food cycle is an obsolete term that is synonymous with food web. Ecologists can broadly group all life forms into one of two trophic layers, the autotrophs and the heterotrophs. Heterotrophs consume rather than produce biomass energy as they metabolize, grow, and add to levels of secondary production. A food web depicts a collection of polyphagous heterotrophic consumers that network and cycle the flow of energy and nutrients from a productive base of self-feeding autotrophs. Feeding connections in the web are called trophic links. The number of trophic links per consumer is a measure of food web connectance. Food chains are nested within the trophic links of food webs. Food chains are linear noncyclic feeding pathways that trace monophagous consumers from a base species up to the top consumer , which is usually a larger predatory carnivore. Trophic species are functional groups that have the same predators and prey in a food web. Common examples of an aggregated node in a food web might include parasites , microbes, decomposers , saprotrophs , consumers , or predators , each containing many species in a web that can otherwise be connected to other trophic species. Trophic level A trophic pyramid a and a simplified community food web b illustrating ecological relations among creatures that are typical of a northern Boreal terrestrial ecosystem. The trophic pyramid roughly represents the biomass usually measured as total dry-weight at each level. Plants generally have the greatest biomass. Names of trophic categories are shown to the right of the pyramid. Some ecosystems, such as many wetlands, do not organize as a strict pyramid, because aquatic plants are not as productive as long-lived terrestrial plants such as trees. Ecological trophic pyramids are typically one of three kinds: Basal species, such as plants, form the first level and are the resource limited species that feed on no other living creature in the web. Basal species can be autotrophs or detritivores , including "decomposing organic material and its associated microorganisms which we defined as detritus, micro-inorganic material and associated microorganisms MIP , and vascular plant material. The top level has top or apex predators which no other species kills directly for its food resource needs. The intermediate levels are filled with omnivores that feed on more than one trophic level and cause energy to flow through a number of food pathways starting from a basal species. The trophic level is equal to one more than the chain length, which is the number of links connecting to the base. The base of the food chain primary producers or detritivores is set at zero. The technique has been improved through the use of stable isotopes to better trace energy flow through the web. This realization has made trophic classifications more complex. The basis of trophic dynamics is the transfer of energy from one part of the ecosystem to another. Omnivores, for example, are not restricted to any single level. Nonetheless, recent research has found that discrete trophic levels do exist, but "above the herbivore trophic level, food webs are better characterized as a tangled web of omnivores. Ecologists use simplified one trophic position food chain models producer, carnivore, decomposer. Using these models, ecologists have tested various types of ecological control mechanisms. For example, herbivores generally have an abundance of vegetative resources, which meant that their populations were largely controlled or regulated by predators. Alternatively to the top-down hypothesis, not all plant material is edible and the nutritional quality or antiherbivore defenses of plants structural and chemical suggests a bottom-up form of regulation or control. Links in a food-web illustrate direct trophic relations among species, but there are also indirect effects that can alter the abundance, distribution, or biomass in the trophic levels. For example, predators eating herbivores indirectly influence the control and regulation of primary production in plants. Although the predators do not eat the plants directly, they regulate the population of herbivores that are directly linked to plant trophism. The net effect of direct and indirect relations is called trophic cascades. Trophic cascades are separated into

species-level cascades, where only a subset of the food-web dynamic is impacted by a change in population numbers, and community-level cascades, where a change in population numbers has a dramatic effect on the entire food-web, such as the distribution of plant biomass. In other words, the mass of any one element at the beginning of a reaction will equal the mass of that element at the end of the reaction. Energy flow diagram of a frog. The frog represents a node in an extended food web. The energy ingested is utilized for metabolic processes and transformed into biomass. The energy flow continues on its path if the frog is ingested by predators, parasites, or as a decaying carcass in soil. This energy flow diagram illustrates how energy is lost as it fuels the metabolic process that transform the energy and nutrients into biomass. An expanded three link energy food chain 1. The transformity of energy becomes degraded, dispersed, and diminished from higher quality to lesser quantity as the energy within a food chain flows from one trophic species into another. Energy flow is directional, which contrasts against the cyclic flows of material through the food web systems. Biomass represents stored energy. However, concentration and quality of nutrients and energy is variable. Many plant fibers, for example, are indigestible to many herbivores leaving grazer community food webs more nutrient limited than detrital food webs where bacteria are able to access and release the nutrient and energy stores. These polymers have a dual role as supplies of energy as well as building blocks; the part that functions as energy supply results in the production of nutrients and carbon dioxide, water, and heat. Excretion of nutrients is, therefore, basic to metabolism. Different consumers are going to have different metabolic assimilation efficiencies in their diets. Each trophic level transforms energy into biomass. Energy flow diagrams illustrate the rates and efficiency of transfer from one trophic level into another and up through the hierarchy. This is because energy is lost to the environment with each transfer as entropy increases. The transfer of energy from primary producers to top consumers can also be characterized by energy flow diagrams. Food chain length is another way of describing food webs as a measure of the number of species encountered as energy or nutrients move from the plants to top predators. The mean chain length of an entire web is the arithmetic average of the lengths of all chains in a food web. The relative amount or strength of influence that these parameters have on the food web address questions about: Ecological pyramid Top Left: A four level trophic pyramid sitting on a layer of soil and its community of decomposers. A three layer trophic pyramid linked to the biomass and energy flow concepts. Illustration of a range of ecological pyramids, including top pyramid of numbers, middle pyramid of biomass, and bottom pyramid of energy. The terrestrial forest summer and the English Channel ecosystems exhibit inverted pyramids. There is usually a maximum of four or five links in a food chain, although food chains in aquatic ecosystems are more often longer than those on land. Eventually, all the energy in a food chain is dispersed as heat. The emergent pyramidal arrangement of trophic levels with amounts of energy transfer decreasing as species become further removed from the source of production is one of several patterns that is repeated amongst the planets ecosystems. In some instances biomass pyramids can be inverted. This pattern is often identified in aquatic and coral reef ecosystems. The pattern of biomass inversion is attributed to different sizes of producers. Aquatic communities are often dominated by producers that are smaller than the consumers that have high growth rates. Aquatic producers, such as planktonic algae or aquatic plants, lack the large accumulation of secondary growth as exists in the woody trees of terrestrial ecosystems. However, they are able to reproduce quickly enough to support a larger biomass of grazers. This inverts the pyramid. Primary consumers have longer lifespans and slower growth rates that accumulates more biomass than the producers they consume. Phytoplankton live just a few days, whereas the zooplankton eating the phytoplankton live for several weeks and the fish eating the zooplankton live for several consecutive years. Population structure, migration rates, and environmental refuge for prey are other possible causes for pyramids with biomass inverted. Energy pyramids, however, will always have an upright pyramid shape if all sources of food energy are included and this is dictated by the second law of thermodynamics. Hence, mineral and nutrient cycles trace food web energy pathways. Ecologists employ stoichiometry to analyze the ratios of the main elements found in all organisms: There is a large transitional difference between many terrestrial and aquatic systems as C: N ratios are much higher in terrestrial systems while N: P ratios are equal between the two systems. Food webs depict the pathways of mineral nutrient cycling as they flow through organisms. Most studies focus on the larger

influences where the bulk of energy transfer occurs. Primary producers form the base red spheres , predators at top yellow spheres , the lines represent feeding links. Original food-webs left are simplified right by aggregating groups feeding on common prey into coarser grained trophic species. Source web - one or more node s , all of their predators, all the food these predators eat, and so on. Sink web - one or more node s , all of their prey, all the food that these prey eat, and so on. Community or connectedness web - a group of nodes and all the connections of who eats whom. Energy flow web - quantified fluxes of energy between nodes along links between a resource and a consumer. Functional webs have compartments, which are sub-groups in the larger network where there are different densities and strengths of interaction. For example, human food webs, agricultural food webs, detrital food webs, marine food webs, aquatic food webs, soil food webs, Arctic or polar food webs, terrestrial food webs, and microbial food webs. These characterizations stem from the ecosystem concept, which assumes that the phenomena under investigation interactions and feedback loops are sufficient to explain patterns within boundaries, such as the edge of a forest, an island, a shoreline, or some other pronounced physical characteristic. Mushrooms produced by decomposers in the detrital web become a food source for deer, squirrels, and mice in the grazing web.

Chapter 5 : Lesson The Food Web | BetterLesson

Food chains and food webs describe feeding relationships. The population of species in a food chain is shown using a pyramid of numbers. Organisms in an ecosystem affect each other's population.

What is a food chain? A food chain is a flow of energy from a green plant producer to an animal consumer and to another animal another consumer and so on. In this lesson we are going to talk all about food chains and food webs in the environment. All organisms need energy to live. Energy is obtained from food. Green plants are the only organisms that can capture energy from sunlight and make their own food. Producers of a food chain A green plant should always be the first link of a food chain. Grass is a good example of producers Green plants are the best producers in the environment Herbivores are animals that only feed on plants. A sheep is an example of a herbivore Elephants are examples of herbivores A hippopotamus is an example of a herbivore A wallaby is an example of a herbivore Omnivores are animals that eat a variety of food of both plant and animal origin. A dog is an example of an omnivore A cat is an example of an omnivore Humans are examples of omnivores A squirrel is an example of an omnivore Carnivores and Top Predators Carnivores are animals that only feed on other animals. These are also known as the top predators as they are at the highest point of the food chain. Top predators have a little or no enemies. They usually consume all lower levels and are not consumed by any other animals until they die. Lions, tigers, crocodiles, eagles are the best examples for top predators. A cheetah is an example of a carnivore A crocodile is an example of a carnivore A tiger is an example of a carnivore Meerkats are examples of carnivores Some other examples of top predators Eagle is a best example of a top predator Lion is a best example of a top predator Leopard is a best example of a top predator Prey Prey is an animal that a predator feeds on. For example, a lion feeds on a zebra. So, the zebra is the prey of the lion. Example of a good predator and its prey All animals depend on plants directly or indirectly for food and energy. A chart that shows direct and indirect consumers Primary Consumers Primary consumers are the second link of a food chain. They are usually herbivores that eat green plants or sometime omnivores that eat both plants and animals. The green plants are the food of all herbivores that are primary consumers. Example of a food chain with two links showing the producer and the primary consumer Secondary Consumers Secondary consumers are the third link of a food chain. The herbivores are the food for carnivores that are secondary, tertiary or quaternary consumers. Secondary consumers are the food for carnivores or top predators that are tertiary or quaternary consumers. Example of a food chain with four links Sometimes tertiary consumers can be the food for quaternary consumers. Example of a food chain with five links Likewise, step by step, the energy in food flows from the producers to consumers. Scavengers and decomposers When an organism dies, it is eventually eaten by scavengers like crows, vultures, ants, worms and crabs and broken down by decomposers mostly bacteria and fungi , and the exchange of energy continues in the environment. They eat dead bodies of animals and plants. Example of a crow who is a best scavenger in the environment Bacteria, fungi, algae, lichens are the examples of decomposers. They break down dead bodies of plants and animals and let the essential nutrients in the dead matter mix with the ecosystem again, so that no waste would pile up. A wooden bench covered with lichens What is a food chain? What does a food chain show us? What are the features of a food chain? Each of these organisms in a food chain is called a link. These links make a food chain. This is the link where energy from the sun enters the food chain.

Chapter 6 : Food web - Wikipedia

a food web and a food chain? A food web consists of many food chains. A food chain only follows just one path as animals find food. eg: A hawk eats a snake, which has.

Water Pollution Food chains and food webs Black-crowned night-heron. This predator is adapted to hunt at night. In the French Guiana this is one of the major night heron species with its cousin the Yellow-crowned night-heron Nycticorax violacea. Feeds mainly on aquatic animals, including fish, amphibians and insects. It could be bees taking pollen from a flower, photosynthesis of plants, deer eating shrub leaves or lions eating the deer. A food chain shows how energy is transferred from one living organism to another via food. It is important for us to understand how the food chain works so that we know what are the important living organisms that make up the food chain and how the ecology is balanced. Photosynthesis is only the beginning of the food chain. There are many types of animals that will eat the products of the photosynthesis process. Examples are deer eating shrub leaves, rabbits eating carrots, or worms eating grass. When these animals eat these plant products, food energy and organic compounds are transferred from the plants to the animals. These animals are in turn eaten by other animals, again transferring energy and organic compounds from one animal to another. So for how many levels does this go on? To follow the food chain to its different levels and know how it works go to this site. You can also refer to the diagrammatic representations of food chains, food webs and ecological pyramids. A food chain describes how energy and nutrients move through an ecosystem. At the basic level there are plants that produce the energy, then it moves up to higher-level organisms like herbivores. After that when carnivores eat the herbivores, energy is transferred from one to the other. To understand how this happens visit the link. In the food chain, energy is transferred from one living organism through another in the form of food. There are primary producers, primary consumers, secondary consumers and decomposers- all part of the food chain. Follow this link for a good introduction to how food chains work. There are links to types of energy and also simple explanations to how photosynthesis is the starting point of the food chain. This site also tells us that because of our eating habits, we are in two food chains- marine and land. Plants that have photosynthesis are supplying us with the first product of the food chain. Not only that, they are the source for oxygen, the food we eat, our clothes, and even our furniture, among other things. Plants also remove greenhouse gas from the air, provide habitat to many animals. Therefore we should understand the ecology of the environment with respect to plants. What is their number in terms of individuals the population , and with respect to other living beings in the environment. Go to this page to see where plants are placed with respect to other living organisms. In typical grassland, for example, the plants outnumber all other levels in the pyramid combined. However in the forests, other living organisms compete for space with plants. But a balance is maintained in the ecosystem. There may be special relationships that have evolved within the community in which one particular species grows in obligate association with one other particular species, upon which still others depend. This site explores such relationships.

Chapter 7 : Sixth Grade (Grade 6) Food Chains and Webs Questions for Tests and Worksheets

Food chains "end" with top predators, animals that have little or no natural enemies. When any organism dies, it is eventually eaten by detrivores (like vultures, worms and crabs) and broken down by decomposers (mostly bacteria and fungi), and the exchange of energy continues.

If you do, you will need energy. Every time you run or jump, you are using up energy in your body. How do you get the energy to play? You get energy from the food you eat. Similarly, all living things get energy from their food so that they can move and grow. As food passes through the body, some of it is digested. This process of digestion releases energy. A food chain shows how each living thing gets its food. Some animals eat plants and some animals eat other animals. Each link in this chain is food for the next link. A food chain always starts with plant life and ends with an animal. Plants are called producers because they are able to use light energy from the Sun to produce food sugar from carbon dioxide and water. The process by which plants make food is called photosynthesis. They are called consumers. There are three groups of consumers. Then there are decomposers bacteria and fungi which feed on decaying matter. These decomposers speed up the decaying process that releases mineral salts back into the food chain for absorption by plants as nutrients. Image Map of the Nitrogen Cycle - What happens in the soil? Do you know why there are more herbivores than carnivores? In a food chain, energy is passed from one link to another. When a herbivore eats, only a fraction of the energy that it gets from the plant food becomes new body mass; the rest of the energy is lost as waste or used up by the herbivore to carry out its life processes e. Therefore, when the herbivore is eaten by a carnivore, it passes only a small amount of total energy that it has received to the carnivore. Of the energy transferred from the herbivore to the carnivore, some energy will be "wasted" or "used up" by the carnivore. The carnivore then has to eat many herbivores to get enough energy to grow. Because of the large amount of energy that is lost at each link, the amount of energy that is transferred gets lesser and lesser The further along the food chain you go, the less food and hence energy remains available. In other words, a large mass of living things at the base is required to support a few at the top Most food chains have no more than four or five links. There cannot be too many links in a single food chain because the animals at the end of the chain would not get enough food and hence energy to stay alive. Most animals are part of more than one food chain and eat more than one kind of food in order to meet their food and energy requirements. These interconnected food chains form a food web. The following is a possible food web: Note that the arrows are drawn from food source to food consumers This interdependence of the populations within a food chain helps to maintain the balance of plant and animal populations within a community. For example, when there are too many zebras; there will be insufficient shrubs and grass for all of them to eat. Many zebras will starve and die. Fewer zebras means more time for the shrubs and grass to grow to maturity and multiply. Fewer zebras also mean less food is available for the lions to eat and some lions will starve to death. When there are fewer lions, the zebra population will increase.

Chapter 8 : BBC Bitesize - KS3 Biology - Food chains and food webs - Revision 1

Food Chains and Webs All living organisms depend on one another for food. By reviewing the relationships of organisms that feed on one another, this lesson explores how all organismsâ€" including humansâ€"are linked.

Search Food Chains and Webs All living organisms depend on one another for food. By reviewing the relationships of organisms that feed on one another, this lesson explores how all organismsâ€" including humansâ€"are linked. If students understand the relationships in a simple food chain, they will better understand the importance and sensitivity of these connections, and why changes to one part of the food chain almost always impact another. Interactions, Energy and Dynamics. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. Construct an explanation about how the different parts of the food chain are dependent on each other. Develop a model to describe the cycling of matter and flow of energy among living parts of the food chain. Construct an argument, supported by evidence gathered through observation and experience, showing how changes to physical or biological components of an ecosystem affect populations. Evaluate competing design solutions for maintaining biodiversity and ecosystem services. Answer questions about how pollution affects food chains by applying scientific principles to design a monitoring plan for minimizing the human impact on the environment. Answer questions about the interdependence of herbivores, carnivores and producers as members of a food chain. Answer questions about how pollution affects food chains. Background A food chain is a simplified way to show the relationship of organisms that feed on each other. Green plants, called producers, form the basis of the aquatic food chain. They get their energy from the sun and make their own food through photosynthesis. Herbivores, such as ducks, small fish and many species of zooplankton animal plankton eat plants. Carnivores meat eaters eat other animals and can be small e. Omnivores are animals including humans that eat both plants and animals. Each is an important part of the food chain. In reality, food chains overlap at many points â€" because animals often feed on multiple species â€" forming complex food webs. Food web diagrams depict all feeding interactions among species in real communities. These complex diagrams often appear as intricate spider webs connecting the species. This lesson demonstrates that changes in one part of a food chain or web may affect other parts, resulting in impacts on carnivores, herbivores, and eventually on producers. An example of this might be the harmful effects of pollution. The point that should be made is that when something disrupts a food web, humans should try to understand and minimize the disturbance. Students should also come to recognize that humans, too, are part of this complex web of life. They also act as food, providing energy for other organisms. In the Great Lakes, most producers are phytoplankton, or microscopic floating plants. An example of phytoplankton is green algae. Large rooted plants, another type of producer, provide food and shelter for different organisms, fish and wildlife. Primary Consumers The next level in the food chain is made up of primary consumers, or organisms that eat food produced by other organisms. Examples of primary consumers include zooplankton, ducks, tadpoles, mayfly nymphs and small crustaceans. Secondary Consumers Secondary consumers make up the third level of the food chain. Secondary consumers feed on smaller, plant-eating animals primary consumers. Examples of secondary consumers include bluegill, small fish, crayfish and frogs. Top Predators Top predators are at the top of the food chain. They can be carnivores or omnivores. Top predators typically sit atop the food chain without predators of their own. Examples include fish such as lake trout, walleye, pike and bass, birds such as herons, gulls and red tailed hawks, bearsâ€"and humans! Food Webs In reality, many different food chains interact to form complex food webs. If one organism in a chain becomes scarce, another may be able to assume its role. In general, the diversity of organisms that do similar things provides a type of safety, and may allow an ecological community to continue to function in a similar way, even when one species becomes scarce. However, some changes in one part of the food web may have effects at various trophic levels, or any of the feeding levels that energy passes through as it continues through the ecosystem. At the base of the aquatic food web are: Plankton Plankton are microscopic plants and animals whose movements are largely dependent upon currents. Plankton are the foundation of the aquatic food web. Plankton are vital in the food

supplies of fish, aquatic birds, reptiles, amphibians and mammals. Phytoplankton Plant plankton are called phytoplankton and may be single cells or colonies. Several environmental factors influence the growth of phytoplankton: Zooplankton Animal plankton are called zooplankton. Zooplankton can move on their own, but their movement is overpowered by currents. Zooplankton may be herbivores or plant-eaters eat phytoplankton , carnivores or meat eaters eat other zooplankton or omnivores, which eat both plants and animals eat phytoplankton and zooplankton.

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Predator or prey, consumer or producer? How about all of the above? Tim and Moby talk about how the food chain connects every species.

Plants rely on the soil , water, and the sun for energy. Animals rely on plants as well as other animals for energy. In an ecosystem, plants and animals all rely on each other to live. Scientists sometimes describe this dependence using a food chain or a food web. Food Chain A food chain describes how different organisms eat each other, starting out with a plant and ending with an animal. For example, you could write the food chain for a lion like this: Here is another example in picture form: The grasshopper eats grass, the frog eats the grasshopper, the snake eats the frog, and the eagle eats the snake. Links of the Chain There are names to help describe each link of the food chain. The names depend mostly on what the organism eats and how it contributes to the energy of the ecosystem. Producers - Plants are producers. This is because they produce energy for the ecosystem. They do this because they absorb energy from sunlight through photosynthesis. They also need water and nutrients from the soil, but plants are the only place where new energy is made. Consumers - Animals are consumers. Animals that eat plants are called primary consumers or herbivores. Animals that eat other animals are called secondary consumers or carnivores. If a carnivore eats another carnivore, it is called a tertiary consumer. Some animals play both roles, eating both plants and animals. They are called omnivores. Decomposers - Decomposers eat decaying matter like dead plants and animals. They help put nutrients back into the soil for plants to eat. Examples of decomposers are worms, bacteria, and fungi. Lets go back to this example: