
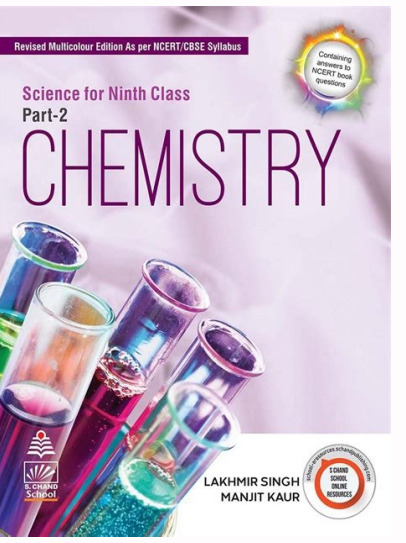
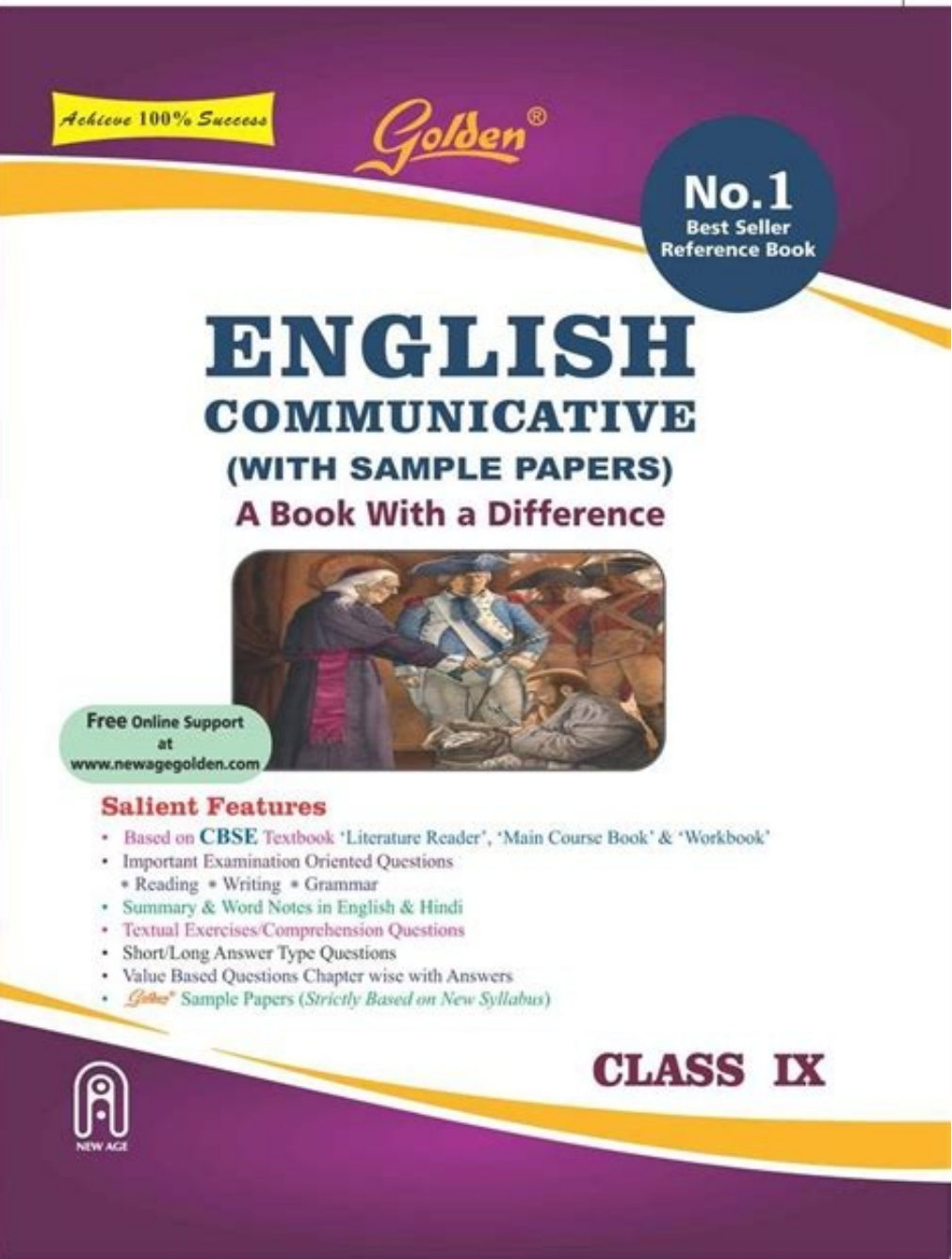


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Science for Tenth Class (Part-3) Biology

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Containing answers to NCERT book questions and value-based questions

LAKHMIR SINGH
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The animals which live in water (aquatic animals) use the oxygen dissolved in water to carry out respiration. Figure 59. To do a reverse number lookup, choose a site that offers the service, such as WhitePages, navigate to the phone lookup section and enter the number. Let us discuss this in a little more detail. The gas exchange in a leech also S. Much less energy is produced in anaerobic amount of energy. The printed phone books grew in popularity during the decades and centuries. Please note that : (a) the anaerobic respiration in plants (like yeast) produces ethanol and carbon dioxide as end products. oxygen breaks down lactic acid accumulated in muscles into carbon dioxide and water, and hence gives us relief from cramps. Since the Amoeba is very small in size, so the oxygen spreads quickly into the whole body of Amoeba. Under these conditions, the roots will respire anaerobically, producing alcohol. All the respiratory organs have thin walls for easy diffusion and exchange of respiratory gases. We will now learn the mechanism of breathing. In addition to fish, many other aquatic animals like prawns and mussels also have special organs called 'gills' for breathing and respiration. The blood contains respiratory pigments which take up oxygen from air and carry it to the body cells. © S. Thus, Amoeba, Paramecium and Planaria all breathe through their cell membranes. (Frogs, however, breathe both by lungs and skin). We will now describe the process of respiration in Amoeba, earthworm, fish and human beings. Again, during day time, carbon dioxide 38 SCIENCE FOR TENTH CLASS : BIOLOGY produced by respiration is all used up in photosynthesis by leaves. The exchange of respiratory gases air present in-between the soil particles plants (or trees) have in leaves takes place through tiny pores called through the root hair. plants or trees do not have stomata. 1. Thus, the respiration in roots occurs by the diffusion of respiratory gases (oxygen and carbon dioxide) through the root hairs (see Figure 50). Our nose has two holes in it which are called nostrils (see Figure 64). This oxygen is then transported to all the cells of the earthworm by its blood where it is used in respiration. The human respiratory system is shown in Figure 64. On the other hand, an animal performs respiration as a single unit. Actually, human blood contains a respiratory pigment called haemoglobin which carries the oxygen from the lungs to all the body cells very efficiently. The end products in anaerobic respiration may be are carbon dioxide and water. The plants get this energy by the process of respiration. And carbon dioxide produced by respiration diffuses out into air. Diffusion is insufficient to meet the oxygen requirements of large Figure 55. So, the net gas exchange in leaves at night is : O₂ diffuses in, CO₂ diffuses out. For seller-fulfilled items from Sports collectibles and Entertainment collectibles categories, the sellers need to be informed of the damage / defect within 10 days of delivery. Chand And Company Limitedtakes place through its thin and moist skin, occurs through its skin. The gas exchange in an earthworm Figure 57. 4. This is because due to the smallness of Amoeba cell, the oxygen does not have to go far. respiration. The function of respiratory system is to breathe in oxygen for respiration (producing energy from food), and to breathe out carbon dioxide produced by respiration. So, the exchange of respiratory gases in the stems of herbaceous plants takes place through stomata. Complete breakdown of food occurs in aerobic 2. These items are not eligible for self-return. Both, inhalation and exhalation take place regularly during breathing. Just like earthworms, the leeches also absorb the oxygen needed for respiration through their skin (see Figure 57). (b) Breathing out. This lactic acid accumulates in the muscles. It was a single printed card with some numbers printed on it. The accumulation of lactic acid in the muscles causes muscle cramps. In order to understand the respiration in stems of plants we should remember that the soft stems of small, herbaceous plants have stomata in them whereas the hard and woody stems of large plants and trees have lenticels in them. Due to this, the net gaseous exchange in the leaves of a plant is as follows : (i) During day time, when photosynthesis occurs, oxygen is produced. This means that the respiratory surface of an earthworm is its skin. So, in large animals, there is a blood circulatory system to carry oxygen to all the parts of the body quickly (and remove carbon dioxide). 3. The respiration in plants differs from that in animals in three respects : 1. Thus, the respiration in plants also involves the exchange of oxygen and carbon dioxide. This is because a fish does not have lungs to utilise the oxygen of air for breathing and respiration. The water then goes out through the gill slits (hidden under the gill cover), Chand And Company Limitedgases in Amoeba takes place through its cell membrane. So, the respiratory organ in the earthworm is the skin. Other information that may be included if you're looking up a business is the company profile and a link to the company website. The breathing organs of human beings are lungs (see Figure 61). The upward and outward movement of rib cage, as well as the downward movement of diaphragm, both increase the space in the chest cavity and make it larger [see Figure 63(a)]. The similarity between aerobic respiration and anaerobic respiration is that in both the cases, energy is produced by the breakdown of food like glucose. Chand And Company LimitedAir in Air out Rib cage Rib cage (with lungs moves upward moves inside) and downward outward and inward Diaphragm Diaphragm moves moves upward downward (b) Breathing out : chest cavity becomes (a) Breathing in : chest cavity becomes smaller, air is pushed out of lungs bigger, air is sucked into lungs Figure 63. Since the amount of dissolved oxygen in water is low as compared to the amount of oxygen in the air, therefore, the rate of breathing in aquatic animals in much faster than in terrestrial animals (or land animals). (iii) The aquatic animals like fish, prawns and mussels have gills as the respiratory organs which extract oxygen dissolved in water and take away carbon dioxide from the body. Anaerobic respiration takes place in the absence of oxygen. The carbon dioxide gas produced during respiration diffuses out into the air through the same stomata. During heavy physical exercise (or any other heavy physical activity), most of the energy in our muscles is produced

by aerobic respiration. The respiration in plants occurs at a slow rate. We know that plants contain oxygen. The main organs of human respiratory system are : Nose, Nasal passage (or Nasal cavity), Trachea, Bronchi, Lungs and Diaphragm. The ordinary air which we take into the lungs is rich in oxygen and the air expelled from the lungs is rich in carbon dioxide. The oxygen from water diffuses into the body of Amoeba, through its cell membrane (see Figure 54). This is because oxygen will have to travel large pigment in blood which carries oxygen distances inside the human body to reach each and every cell of the from the lungs to all the body cells very body. The extension of the epidermal cells of a root are called root hair. Note: For seller fulfilled items from Books, Movies & TV Shows categories, the sellers need to be informed of the damage/ defect within 14 days of delivery. Respiration in Fish The fish has special organs of breathing called 'gills'. To do it, you enter the house number and street in one search box and the city and state or zip code in the second search box before running the query. Please note that the fish and earthworm do not exchange the gases during respiration in the same way. Plants also use oxygen of air for respiration and release carbon dioxide. The fish lives in water and this water contains dissolved oxygen in it. We get this oxygen by breathing in air. When we breathe out (or exhale), even then two things happen at the same time : (i) the muscles between the ribs relax causing the rib cage to move downward and inward, and (ii) the diaphragm relaxes and moves upward [see Figure 63(b)]. The taking in of air rich in oxygen into the body during breathing is called 'inhalation' and giving out (or expelling) the air rich in carbon dioxide is called 'exhalation'. Anaerobic respiration in muscles provides only some extra energy which is needed under the conditions of heavy physical activity (like running very fast or running for a long time) (see the people running a long distance race in Figure 48). (ii) The animals like earthworms which live in the soil use their skin to absorb oxygen from air and remove carbon dioxide. All the parts of a plant (like root, stem and leaves) perform respiration individually. supply. That is , we will now learn how air from outside is sucked into our lungs during inhaling (breathing in), and how air from our lungs is pushed out during exhaling (breathing out). Aerobic respiration produces a considerable 4. Thus, the net gas exchange in leaves during day time is : O2 diffuses out; CO2 diffuses in. Thus, muscle cramps occur due to the accumulation of lactic acid in muscles when the muscles respire anaerobically (without Figure 48). When water passes over the gills, the gills extract dissolved oxygen from this water. And carbon dioxide produced inside the leeches (during respiration) also goes out through the skin. During respiration in plants, there is a little transport of respiratory gases from one part of the plant to the other. These are red blood cells multicellular organisms like humans because the volume of human (RBCs). As the chest cavity becomes larger, air is sucked in from outside into the lungs. Breathing is a continuous process which goes on all the time throughout our life. This energy is used for maintaining our life. Diagram to show the process of depend on the simple diffusion of gases for breathing and breathing (gaseous exchange) in Amoeba. On the other hand, the respiration in animals occurs at a much faster rate. Respiration in Stems The stems of herbaceous plants (or herbs) have stomata. Just imagine what would happen if the fast running deer trying to escape from the clutches of cheetah gets a leg cramp at this very moment (due to accumulation of lactic acid in its leg muscles produced during anaerobic respiration). This oxygen is used for respiration (energy release) inside the Amoeba cell. 40 SCIENCE FOR TENTH CLASS : BIOLOGY Respiration in Earthworm The earthworm exchanges the gases through its skin (see Figure 56). The process of breathing takes place in our lungs. The nasal passage is separated from the mouth cavity (buccal cavity This air then goes into nasal passage. ethanol and carbon dioxide (as in yeast plants), or lactic acid (as in animal muscles). Let us answer one question now. In addition to Amoeba, other simple animals like Paramecium and Planaria also Figure 54. Thus, the breathing surface (or respiratory surface) of Amoeba is its cell surface membrane. Amoeba lives in water. The leaves use some of this oxygen for respiration and the rest of oxygen diffuses out into air. We can long distance race) leg muscles respire anaerobically (without get relief from cramps in muscles caused by heavy oxygen) to produce extra energy. But this is not so in larger animals like earthworms, grasshopper, fish and man (humans), etc. In other words, the exchange of © S. A breath means 'one inhalation plus one exhalation'. The main differences between aerobic respiration and anaerobic respiration are given below. The gills are covered by gill covers so they are not visible from outside. Chand And Company Limited 2. Oxygen from air diffuses into a leaf through stomata and reaches all the cells where it is used in respiration. The human beings need oxygen to stay alive. When we inhale air, it enters our nostrils , passes through nasal passage and windpipe, and reaches our lungs. For example, it has been estimated that if diffusion were to provide oxygen in our body, then it would take about 3 years for a molecule of oxygen from our lungs to reach our toes by the process of diffusion. The fish breathes by taking in water through its mouth and sending it over the gills (see Figure 60). The roots of a plant take the oxygen required for respiration from the air present in-between the soil particles by the process of diffusion. The downward and inward movement of rib cage, as well as the upward movement of diaphragm, both decrease the space in our chest cavity and make it smaller [see Figure 63(b)]. Please note that all the respiratory organs (whether skin, gills, trachea or lungs) have three common features : 1. The process by which energy is released from food in our body is called respiration. RESPIRATION IN ANIMALS Different animals have different modes of respiration. Something went wrong. Most of the animals have, however, specific organs for respiration. (b) the anaerobic respiration in animal muscle tissue produces lactic acid as the end product. We can live without food and water for many days but we cannot live for more than a few minutes without air. The return timelines for seller-fulfilled items sold on Amazon.in are equivalent to the return timelines mentioned above for items fulfilled by Amazon. Before we go further and describe the human respiratory system in detail, it is necessary to learn the process of breathing which is an important part of respiration. During vigorous physical exercise (such as running a oxygen) while doing hard physical exercise. (iv) In the insects like grasshopper, cockroach, housefly and a mosquito, the tiny holes called spiracles on their body and the air tubes called tracheae are the respiratory organs (see Figure 53). The gases exchanged between blood and air are oxygen and carbon dioxide. Thus, in earthworm, gaseous exchange takes place through the skin which is thin and moist. The extracted oxygen is absorbed by the blood and carried to all the parts of the fish. oxygen. Due to improved blood flow, anaerobic respiration which took place in leg muscles during the supply of oxygen to the muscles increases. The oxygen from air diffuses into the stem of a woody plant through lenticels and reaches all the inner cells of the stem for respiration. This may kill the plant. This is because in these cases the oxygen has to travel a very large distance to reach each and every cell of the body. There is a passage in the nose behind the nostrils which is called nasal passage (or nasal cavity). For seller-fulfilled items from Fine Art category, the sellers need to be informed of the damage / defect within 10 days of delivery. So, the earthworm absorbs the oxygen needed for respiration through its moist skin. The end products in aerobic respiration 3. Some results may be free, while others may require a fee to unlock the information.Reverse Address LookupA reverse address lookup is another type of search you can do if you only have part of the information about the number you need to find. Air contains oxygen. The process of respiration produces carbon dioxide gas continuously. In woody stems, the bark (outer covering of stem) has lenticels for gaseous exchange (see Figure 51). This happens as follows. The carbon dioxide gas produced in the cells of the stem during respiration diffuses out into the air through the same lenticels. lenticels for the exchange stomata. Respiration in Leaves The leaves of a plant have tiny pores called stomata (see Figure 52). Even more carbon dioxide is taken in from air. During breathing, we take air into our lungs through the nose, and then expel it. To do this, open your device and run a search for either a specific online directory, such as Telkom or WhitePages. The exchange of respiratory gases in the leaves takes place by the process of diffusion through stomata. Carbon dioxide and water are the two by- products of respiration. Diaphragm forms the floor of chest cavity. Woody stems of Figure 52. This is because too much water expels all the air from in-between the soil particles. A resin cast of the human lungs. It is a common observation that when a fish is taken out from water it dies soon (even though there is a lot of oxygen in the air around LIFE PROCESSES 41 It). It has been found that the land plants die if their roots remain waterlogged for a considerable time. By 2017, many states in the United States had even made it illegal to print phone books, according to TruthFinder. The breathing in human beings takes place through the organs called lungs. This marathon (a long-distance running race). Chand And Company Limited(a) This is a grasshopper. An online phone book, like the Telkom phone book, provides a quick way to look up numbers of people and businesses you want to call or locate. The fish has gills on both the sides of its head (see Figure 60). The hard and woody stems of big Root Ground level Soil particles Air spaces Root hair Figure 50. The root hair are in contact with the air in the soil. If you're looking on a site with a map function, you may also see a map with the location pinned and an option to get turn-by-turn directions to the place you're calling.Reverse Phone Number LookupA reverse phone number lookup is done when you have only a phone number and want to know who it belongs to before you call. This happens as follows : (a) Breathing in. above picture has just got a cramp in the leg due to the Hot water bath (or massage) improves the circulation accumulation of lactic acid in the leg muscles produced by the of blood in the muscles. Roots absorb oxygen from Figure 51. This is because air is necessary for breathing. Once the air (containing oxygen) enters the skin or lungs, blood absorbs the oxygen and transports it to various tissues of the animal. This will become more clear from the following example. Sample Problem. The lungs get filled up with air and expand. Thus, a terrestrial animal has an advantage over an aquatic animal in regard to obtaining oxygen for respiration that it is LIFE PROCESSES 39 surrounded by an oxygen-rich atmosphere from where it can take any amount of oxygen. A faster rate of breathing provides more oxygen to the aquatic animal. The terrestrial animals (or land animals) use the oxygen of air or atmosphere for breathing and respiration. This type of search doesn't deliver consistent results, though it can be useful and delivers some results in map or satellite form.Brief History of Phone BooksThe first printed phone book was handed out in 1878 in New Haven. It is an insect(b) We can see the tiny holes called(c) This picture shows a bigger air tube spiracles on the body of grasshopper in called trachea in the body of a grasshopper this magnified picture dividing into smaller air tubes called tracheoles Figure 53. Therefore, diffusion alone can supply all the cells of the plants with as much oxygen as they need for respiration. Human beings breathe through their lungs. So, when we breathe in air, it is actually the oxygen gas present in air which is utilised by our body (to break down food and produce energy). The anaerobic respiration does not take place only in the muscles of human beings, it also takes place in the muscles of other animals such as lion, tiger, cheetah, deer, and many other animals when they run very fast and require much more energy than normal. MORE FROM QUESTIONSANSWERED.NET A series of books for Classes IX and X according to the CBSE syllabus and CCE PatternRatings and reviews aren't verifiedinfo_outlineRatings and reviews aren't verifiedinfo_outlineA people found this review helpfulDid you find this helpful?8 people found this review helpfulDid you find this helpful?5 people found this review helpfulDid you find this helpful? The cheetah is sure to get enough lunch or dinner ! 36 SCIENCE FOR TENTH CLASS : BIOLOGY lion, tiger, cheetah and deer, etc., can get leg cramps due to the accumulation of lactic acid in leg muscles if they run very fast for a considerable time. So, oxygen and carbon dioxide are called respiratory gases. Lungs are connected to our nostrils (holes in the nose) through nasal passage (or nasal cavity) and windpipe. This means that even the animals like Figure 49. The oxygen from air diffuses into the stem of a herbaceous plant through stomata and reaches all the cells for respiration. On the other hand, photosynthesis occurs only during the day time (no photosynthesis occurs at night). All the respiratory organs like skin, gills and lungs have a rich blood supply for transporting respiratory gases (only in the tracheal system of respiration, air reaches the cells directly). They contain a red pigment called body is so big that oxygen cannot diffuse into all the cells of the haemoglobin. The carbon dioxide produced by respiration is brought back by the blood into the gills for expelling into the surrounding water. All the respiratory organs have a large surface area to get enough oxygen. The fish has gills which can extract only dissolved oxygen from water and provide it to fish. The carbon dioxide produced during respiration is carried back by the blood. Plants get Oxygen by Diffusion Plants have a branching shape, so they have quite a large surface area in comparison to their volume. Gills cannot take in the oxygen from air on land. Aerobic respiration takes place in the presence of 1. We can now define breathing as follows : Breathing is the process by which air rich in oxygen is taken inside the body of an organism and air rich in carbon dioxide is expelled from the body (with the help of breathing organs). Oxygen (from air in the soil particles) diffuses into root hairs and reaches all the other cells of the root for respiration. Diffusion being a very slow process will take a lot of time to effectively. Haemoglobin is present in red blood corpuscles. It is in the lungs that the gases are exchanged between the blood and air. Lenticel is a small area of bark in a woody stem where the cells are loosely packed allowing the gaseous exchange to take place between the air and the living cells of the stem. of respiratory gases. So, the respiratory surface of a fish is the surface of its gills. The fish has no lungs like us, the gaseous exchange in fish takes place in the gills. Breathing involves the movements of the rib cage and the diaphragm. When we breathe in (or inhale), then two things happen at the same time : (i) the muscles between the ribs contract causing the rib cage to move upward and outward, and (ii) the diaphragm contracts and moves downward [see Figure 63(a)]. As the chest cavity becomes smaller, air is pushed out from the lungs. The skin of an earthworm is quite thin and moist, and has a good blood ©Figure 56. Since fish does not get oxygen for breathing when taken out of water, it dies. The mechanism of breathing. Then, find the search box and enter the name of the person or business you want to call.Results to ExpectIf you're searching in the Telkom directory, expect to find the name, address and phone number of the party you want to call, if they have a listed number. Differences between Aerobic and Anaerobic Respiration © S. It should be noted that respiration in leaves occurs during the day time as well as at night. (v) The respiratory organs of the land animals such as man (humans), birds, lizard, dog, and frog, etc., are the lungs. Due to this, oxygen is not available to the roots for aerobic respiration. In the small, single-celled animals such as Amoeba, the volume of their body is so small that oxygen can be introduced quickly into the whole body by the process of diffusion. The man on the right side in the exercise by taking a hot water bath or a massage. The diffusion of gases takes place through the thin cell membrane of Amoeba. The rib cage encloses the lungs in it [see Figure 63(a)]. The seller will arrange the return pick up for these items. Diagram to show the gills in fish which extract dissolved oxygen from water. Carbon LIFE PROCESSES 37 dioxide gas produced in the cells of the root during respiration moves out through the same root hairs by the process of diffusion. Chand And Company LimitedAerobic respiration Anaerobic respiration 1. The air for respiration is drawn into our body through the nostrils present in the nose. by the fish when it flows over the gills. (b) mitochondria RESPIRATION IN PLANTS Like animals, plants also need energy. Amoeba depends on simple diffusion of gases for breathing. Then, in 2005, the demand for printed phone books started to drop. Our two lungs hang in an airtight space in our body called 'chest cavity'. This carbon dioxide is expelled from the body of the earthworm through its skin. You can search these sites by name, keywords or location and, sometimes, you can enter a phone number to do a reverse search.Telkom Cell Phone ContractsAs Africa's biggest integrated telecommunications company, Telkom mobile contracts are also part of the company's offerings. 2. If you do not receive a response from the seller for your return request within two business days, you can submit an A-to-Z Guarantee claim. The oxygen helps to break down the food absorbed in the body to release energy. Thus, the dissolved oxygen is extracted from water Figure 58. The anaerobic respiration by muscles brings about partial breakdown of glucose (food) to form lactic acid. For example : (i) In simple unicellular animals like Amoeba, respiration takes place by the simple diffusion of gases through the cell membrane. If you've received a seller-fulfilled product in a condition that is damaged, defective or different from its description on the product detail page on Amazon.in, returns are subject to the seller's approval of the return. The process of respiration takes place inside the cells of our body. Figure 60. Let us discuss this in somewhat detail. Gill of fish. For breathing, the fish uses the oxygen which is dissolved in water. Blood also picks up the carbon dioxide from the tissues and brings it back to the skin or lungs for throwing it out into the air. Respiration in Amoeba Amoeba is a single-celled animal. RESPIRATORY SYSTEM IN HUMANS (OR MAN) In human beings, many organs take part in the process of respiration. Thus, we 'breathe in' air to supply oxygen to the cells of our body (for 42 SCIENCE FOR TENTH CLASS : BIOLOGY the breakdown of food to release energy), and we 'breathe out' to remove waste product carbon dioxide from our body (which is produced during the breakdown of food in the cells). In large animals, the volume of body is so big that oxygen cannot diffuse into all the cells of the body quickly. We will now discuss the process of breathing and respiration in some large animals like earthworm, fish and humans. Wait a moment and try again. Learn more about returning seller fulfilled items. make oxygen available to all the body cells. Chand And Company Limited Respiration in Humans Like other land animals, human beings are air breathers. Diffusion occurs in the roots, stems and leaves of plants. One way to access an online phone book is through the browser of your mobile device. On the other hand, respiratory gases are usually transported over long distances inside an animal during respiration. We call them organs of respiratory system. (ii) At night time, when no photosynthesis occurs and hence no oxygen is produced, oxygen from air diffuses into leaves to carry out respiration. It involves our respiratory system. (The painful contractions of muscles are called cramps). The human respiratory system begins from the nose. At the bottom of the chest cavity is a curved sheet of muscle called diaphragm [see Figure 63(a)]. This water has oxygen gas dissolved in it. The fish exchanges the gases by using its special organs called 'gills' whereas the earthworm exchanges the gases through its thin and moist 'skin'. Fish in water, the human respiratory system in detail. Haemoglobin is a respiratory human body quickly. Around the sides of the chest cavity is the rib cage with sheets of muscles between the ribs. Figure 62. We will now describe Figure 61. Partial breakdown of food occurs in anaerobic respiration. The carbon dioxide produced during respiration diffuses out from the leaf into the air through the same stomata. On the other hand, the blood circulatory system in humans carries oxygen to all the parts of the body quickly (and removes carbon dioxide). Respiration in Roots Air is present in-between the particles of soil. This is discussed below. Grasshopper (an insect) breathes and respire through tiny holes called spiracles, air tubes called tracheae and their branches called tracheoles. This carbon dioxide gas diffuses out through the membrane of Amoeba into the surrounding water (see Figure 54). No Text Content! 2ATP (muscle tissue) Energy (1 molecule) (Pyruvic acid) (2 molecules) The sudden build up of lactic acid in our muscles during vigorous physical activity can cause muscular 'cramps'. The breakdown of pyruvate to give carbon dioxide, water and energy takes place in : (a) cytoplasm (b) mitochondria (c) chloroplast (d) nucleus (NCERT Book Question) Answer.

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