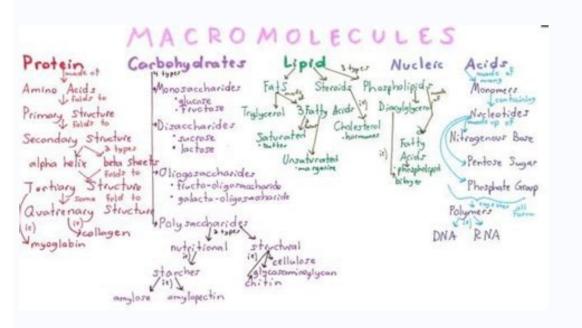
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Next

# Concept review carbohydrates and lipids answer key



# **Answer Key Cell Structure and Function**

### Lesson 1

#### Before You Read

disagree

# agree

#### Read to Learn a. cells

- 2. All living organisms are made of one or more cells, the cell is the smallest unit of life, and all new cells come from cells that
- 3. Scientists made better microscopes, which helped them observe individual cells and structures inside cells.
- 4. 1. b, 2. c, 3. a
- 5. many small molecules joined together
- 6. Like magnets, water molecules have a positive end and a negative end, which can attract the opposite charge.
- 7. sodium
- 8. proteins and carbohydrates
- 9. cell growth, cell reproduction, cell processes that enable a cell to respond to its environment
- 10. Possible answers: communicating among cells, moving substances around inside the cells, breaking down nutrients, providing support
- 11 Lipids protect cells, store energy, and help with cell
- 12. nucleic acids, proteins, lipids, carbohydrates

## After You Read

- 1. Possible answer: A lipid is a large macromolecule that does not dissolve in water.
- 2. proteins, keratin; lipids, vitamin A; carbohydrates, cellulose
- 3. Students should explain how highlighting the main ideas

helped them understand cells.

Reading Essentials

Cell Structure and Function

23 Compound composed of two monosecthandes
24 A sign alcohol with three carbons
25 Process the eliminates disable bonds from an unsurvased fifty acid - carved in shape because typicage instruction on opposite sides of the disable bond
28 Disauchander - product of starch breakblown
30 Disauchander - trake signs
31 Tool isself to revaluate human health using beight and mass data

13 Fathy acid with two or more disable bends
26 A instruction or more devolute bends
26 A instruction or more devolute bends
27 A instruction or more devolute bends
28 Prime polysacchands - coarved in shape
28 Compounds to end year of starch from an instruction or more devolute bends
28 A instruction or more devolute bends
28 A instruction or more devolute bends
29 A instruction or more devolute bends
20 A instruction or more devolute bends
20 A instruction or more devolute bends
20 A instruction or more devolute bends
21 A instruction or more devolute bends
22 A instruction or more devolute bends
23 A instruction or more devolute bends
26 Process the two or more devolute bends
27 A instruction or more devolute bends
28 A instruction or more devolute bends
28 A instruction or more devolute bends
29 A instruction or control or control or shape
20 A instruction or control or control

Address

1 Manocaccharistic - provides brain with energy
1 Compound composed of many manocaccharistics
2 Manocacch
10 Annual polysiz chamide found in muscle and liver
cells
13 Annual polysiz chamide found in muscle and liver
cells
14 Manocaccharide - braken down in cell respection
15 A compound made up of glycerol and three farry
acids
16 farty acid with one double band
17 Fat, waves, oils, or chemids
19 Type-of energy storage issociated with
19 Type-of energy clarifye issociated with
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29 Type-of en

Name:		Date:	Hour:
hapter 9: Pho espiration oncept Mappi		s and Cellul	ar
ng the terms and phrases providular respiration.	led below, complete the	concept map showing th	e characteristics o
anaerobic process	glucose	NAD*	
electron transport chain	glycolysis	pyruvate	
fermentation	Krebs cycle  Cellular		
	often begins with		
	which is broken down during		
	(2)		
which is an		which produces	
3	)	(•————————————————————————————————————	

that is used in

aerobic respiration

The organic compound consisting only of carbon, hydrogen and oxygen lactose is a disaccharide found in animal milk. It consists of a molecule of D-galactose and a molecule consisting of carbon (C,) hydrogen (H) and oxygen (O) atoms, usually with a hydrogen-oxygen ratio of 2:1 (as in water) and thus with the empirical formula Cm (H2 O) n (where m may or may not be different from n) However, not all carbohydrates meet this precise stoichiometric definition (e.g. uronic acids, deoxy-sugars such as fucose,) nor are all chemicals meeting this definition automatically classified as carbohydrates (e.g. formaldehyde and acetic acid). The term is most common in biochemistry, where it is synonymous with saccharides are divided into four chemical groups: monosaccharides, disaccharides, disaccharides and polysaccharides and disaccharides, and disaccharides, disaccharides the smallest (lowest molecular weight) carbohydrates, are commonly referred to as sugars. [1] The word saccharides of monosaccharides and disaccharides very often end in the suffix -ose, which was originally taken from glucose, from the ancient Greek 131"1µá; 101; 1 (gleA"kos, "wine, must") and is used for elmost all sugars, e.g. fructose (fruit sugar, suclanes) Carbohydrates play many roles in living organisms. Polysaccharides are used for energy storage (e.g. starch and glycogen) and as structural components (e.g. cellulose in plants and chitin in arthropods). Ribosin monosaccharide 5-carbon is an important component of coenzymes (e.g. ATP, FAD and NAD) and the spine of the genetic molecule As RNA. Related deoxyxiriboso is a component of DNA. Saccharides and their derivatives include many other important biomolecules that carry out key roles in the immune system, fertilization, pathogenesis prevention, blood coagulation and development. [3] Carbohydrates are central to nutrition and are found in a wide range of natural and processed foods. The starch is a polysaccharide. It is plentiful in cereals (wheat, corn, rice), potatoes and food based on cereal flour, such as bread, pizza or pasta. Sugars appear in the human diet mainly as table sugar (sucrose, extracted from sugar beet or sugar beet, lactose (flooding in milk), glucose and fructose, both that naturally occur in honey, many prepared foods such as jam, biscuits and cakes. The cellulose, a polysaccharide that is found in the cell walls of all plants, is one of the main components of insoluble food fiber. Although it is not digestive system [4] facilitating enerally, and some insects - especially termites, have more complex digestive system [4] facilitating enerally for the main components of insoluble food fiber. movement Through the Great Colon (ie, defecation). Other polysaccharides contained food fiber includes durable and inulin starch, which feed some bacteria to produce short-chain fatty acids. [5] [6] Terminology in scientific literature, the term "carbohydrate" has many synonyms, such as "sugar" (in a broad sense), "saccaride", [2] "glucide", [7] "hydrate of carbon vor Polyidrossi composed with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially "carbohydrate" and are also used with aldehyde or ketone ". Some of these terms, especially ". Some of the especial ". Som rich in complex carbohydrates starch (such ascereals, bread and pasta) or simple carbohydrates, such as the USDA national nutrient database, the term "carbohydrates" (or "carbohydrates" (or "carbohydrates by contrast") is used for anything other than water, protein, fat, ash and ethanol. [8] This includes chemical compounds such as acetic acid or lactic acid, which are not normally considered carbohydrates. It also includes dietary fiber which is a carbohydrate but which does not contribute to food energy (calories) in humans, even though it is often included in the calculation of total food energy just as if it were a digestible and carbohydrates, many of which are used in human food. Structure previously the name "carbohydrates" was used in chemistry for any compound with formula cm (H2O) n. Following this definition, some chemists considered formaldehyde (CH2O) to be the simplest carbohydrate, [9] while others claimed that title for glycolatdehyde. [10] Today, the term is generally understood in the sense of biochemistry, which excludes compounds with only one or two carbons and includes many biological carbohydrates that deviate from this formula. For example, while the above representative formulae appear to capture commonly known carbohydrates often display chemical groups such as: n-acetyl (e.g. chitin), sulphate (e.g. glycosaminoglycans), carboxylic acid and dexy changes (e.g. Fucosium and sialic acid). Natural saccharides are generally made of simple carbohydrates called With general formula (CH2O) N where n is three or more. A typical monosaccharide has a structure structure That is, an aldehyde or ketone with many hydroxyl groups added, usually one on each carbon atom that is not part of the functional group of Aldehyde or Ketone. Examples of monosaccharides are glucose, fructose and glyceraldehydes. However, some biological substances commonly called "monosaccharides" do not conform to this formula (e.g. uric acids and dexy sugars such as fuciso) and there are many chemicals that conform to this formula but are not considered monosaccharides (e.g. formaldehyde Ch2O and inositol (CH2O) 6). [11] The open-chain form of a monosaccharide often coexists with a closed-loop module in which the Aldehyde Group / Ketone Carbonyl (C = O) and hydroxyl group ( $\tilde{A}$ ¢  $\hat{a}$  "Oh) react by forming an emacetal with a new c ... Where's P Bridge. Monosaccharides can be linked together in what are called polysaccharides (or oligosaccharides or removed groups. For example, deoxyribose, a component of DNA, is a modified wersion of ribose; Chitin is composed of repeated units of n-acetyl glucosamine, a form containing glucose nitrogen. Divisional carbohydroxy aldehydes, ketones, alcohols, acids, their simple derivatives and their polymers having acetal-like bonds. They can be classified according to their degree of polymerization and can be divided initially into three main groups, namely sugars, oligosaccharides and polysaccharides and polysaccharides (3 9) Oligosaccharides (3 9) Oligo Maltodextrins Other oligosaccharides Raffinose, Stachyose, Fruit oligosaccharides Monoosaccarides Main article: MONOSACCHARUDE D-glucose is an aldoexose with formula (see H2O) 6. The red atoms highlight the Aldehyde group and the blu e atoms highlight the asymmetric center farther from the Aldehyde; Poiche. © This -Oh is on the right of Fischer projection, this is a sugar D. Monosaccharides are the simplest carbohydrates as they cannot be hydrolysed to smaller carbohydrates. They are aldehydes or ketones with two or more hydroxyl groups. The general chemical formula of an unchanged monopharide is (c... h2o) n, literally a "hydrocarbon". Monosaccharides are important fuel molecules and building blocks of nucleic acids. The smaller monosaccharides, so n = 3, are dihydroxycetone and d- and l-glyceraldehydes. Classification of monosaccharides I and glucose anometers. Note the position of the hydroxyl group (red o r green) on the anomeric carbon relative to the carbon-related CH2OH group 5: have identical absolute configurations (R, s or s, r) (I). [13] Monocarbons are classified according to three different characteristics: the position of its carbon group, the number of carbon atoms it contains and its chiral manual. If the carbon group is an aldehyde, the monosaccharide is a ketone, the monosaccharide is a ketone is a ketone, the monosaccharide is a ketone is a k classification systems are often combined. For example, glucose is an aldoexose (an aldehyde of six carbon), ribose is an aldoexose (an aldehyde of six carbon), except the first and the last are asymmetric, making them stereo centers with two possible each (R or S). Because of this asymmetry, a certain number of isomers may exist for any given monosaccharide formula (C2O)6, of which four of its six carbon atoms are stereogenic, making D-glucose one of the 24=16 possible stereoisomers. In the case of glycerides, an aldotriosis, there are a couple of possible stereoisomers, which are enantiomers and epimers. 1, 3-dihydroxyacetone, the ketosis corresponding to the glyceroldehyde aldose, is a symmetrical molecule without stereo centers. The allocation of D or L is made according to the orientation of the asymmetric carbon farther from the carbon group: in a standard Fischer projection if the hydroxy group is to the right the molecule is a D sugar, otherwise it is an L sugar. The prefixes "D-" and "L-" must not be confused with "d-" or "l-," which indicate the direction in which the sugar rotates the polarized light of the plane. This use of "d-" and "l-" is no longer followed in carbohydrate chemistry. [15] Chain-chain isomerism Glucose can exist in both chain and ring form. The aldehyde or ketone group on a different carbon atoms. The rings with five and six atoms are called furan and pyranous forms, respectively, and exist in equilibrium with the straight chain form. [16] During conversion from a straight chain form to a cyclic form, the carbon atom containing carbon dioxide, called anomeric carbon, becomes a stereogenic center with two possible configurations: The oxygen atom can take a position above or below the ring plane. The result possible pair of stereoisomers is called anomers. In anomer I, the substitute-OH on carbon rests on the opposite (trans) side of the ring on the CH2OH side The alternative form, in which the CH2OH substitute and the anomeric hydroxyl are on the same side (cis) of the plane of the ring, is called the anomer 2. Use in living organisms monosaccharides are the main source of fuel for metabolism, being used both as an energy source (glucose is the most important in nature being the product of photosynthesis in plants) and in biosynthesis. When monosaccharides are not immediately necessary, they are often converted into more efficient forms in terms of space (i.e. less soluble in water), often polysaccharides. In many animals, including humans, this form of accumulation is glycogen, especially in liver and muscle cells. In plants, the starch is used for the same purpose. The most abundant carbohydrate, cellulose, is a structural component of the cell wall of plants and many forms of algae. Ribosium is a component of RNA. deoxyribosium is a DNA component. The lissosis is a component of the lissoflavin that is found in the pathway of pentosium phosphate. Galactose, a lactose component of milk sugar, is found in the galactolyids of the cell membranes of the plants and in the glycoproteins of many tissues. Mannosium is present in human metabolism, especially in the glycosylation of certain proteins. The fructose, or fruit sugar, is found in many plants and in man, is metabolized in the liver, absorbed directly in the intestine during digestion, and is found in many plants and in man, is metabolized in the glycosylation of certain proteins. The fructose, or fruit sugar, is rapidly hydrolysed into two glucose molecules to support continuous flight. Discharging Sucrose, also known as table sugar, is a common disorder. It consists of two monosaccharides and are the simplest polysaccharides. Examples are sucrose and lactose. They consist of two monosaccharide units bound together by a covalent bond known as a glycoside bond formed by a dehydration reaction, resulting in one hydrogen atom from one monosaccharide and one hydroxy group from the other. The formula of unmodified disaccharides is C12H22O11. Although there are many types of disaccharides, some of them are particularly noteworthy. Sucrose, in the photo on the right, is the most abundant disaccharide and the main form of carbohydrate transport in plants. It consists of one molecule of D-fructofuranoside, indicates four things: Its monosaccharides glucose and a pyranose molecule of D-glucose, is naturally found in mammalian milk. The systematic designation of lactose is O-I2-D-galactopyranosyl- (1â¤Â¤Â¤A) -D-glucose bound Î2-1,4). Disaccharides are maltose (two D-glucose bound îA±-1,4) and cellobiosium (two D-glucose bound îA±-1,4) and cellobiosium (two D-glucose bound îD-glucose). reducing disaccharides. If the functional group is present in the bond with another sugar unit, it is called reducing disaccharide or biosium. Nutrition Cereal Products: Rich Sources of Carbohydrates consumed in foods produce 3.87 kilocalories per gram for simple sugars, [18] and 3.57 to 4.12 kilocalories per gram for complex carbohydrates in most other foods. [19] Relatively high levels of carbohydrates are the most common. associated with processed or refined plant-based foods, including confectionery, biscuits and breakfast cereals. quantities of carbohydrates are usually associated with non-refined, refined foods, Non-refined beans, tubers, rice and fruit [Discussable discussing]. [20] Foods of animal generally have the lowest levels of carbohydrates to produce energy. Glucose is an almost universal and accessible energy source. Many organisms also have the ability to metabolize other monosaccharides and disaccharides perone expresses enzymes for lactose digestion when it is present, but if there are lactose and glucose, the lactose operone is repressed, making sure that Glucose is used first (see: Diauxie). Polysaccharides are also common energy sources. Many organisms, however, cannot metabolize dby some bacteria and devices. The ruminants and termites, for example, use microorganisms to treat cellulose. Although these complex carbohydrates are not very digestible, they represent an important food element for the man, called food fiber. The fibers improve digestion, among other benefits. [21] The Institute of Medicine recommends that American and Canadian adults receive between 45 and 65% of food energy from integral carbohydrates. [22] The Organization for Food and Agriculture and the World Health Organization jointly recommend that national food guidelines establish a target of 55.75% of total energy from carbohydrates, but only 10 % directly from sugars (term for simple carbohydrates). [23] A Cochrane Systematic Review 2017 concluded There were no sufficient evidence to support the statement that the integral diets can affect cardiovascular diseases. [24] Classification Nutritionists often refer to carbohydrate" was used for the first time in the United States Senate Dietary Goals for the United States (1977), which aimed to distinguish sugars from other carbohydrates (which were considered nutritionally superior). [25] However, the report includes fruit, vegetables and whole grains in the Complex carbohydrate column, even if they may contain sugar other than polysaccharides. This confusion persists because © Today some nutritionists use the term complex carbohydrates to indicate any kind of digestible saccharide present in a whole food, where there are also fibres, vitamins and minerals (unlike processed carbohydrates, which provide energy but few other nutrients). The common use, however, is to classify carbohydrates chemically: simple if they are sugar (monosaccharides and disaccharides) and complex if they are polysaccharides (or oligosaccharides) and complex if they are polysaccharides (or oligosaccharides). [26] In any case, the simple and complex chemical distinction has little value in determining the nutritional quality of carbohydrates. [26] Some simple carbohydrates (e. g. fructose) rapidly increase blood glucose, while some complex carbohydrates (amides) slowly increase blood sugar. The digestion rate is determined by a number of factors including which other nutrients are consumed with carbohydrates are sometimes divided into "available carbohydrates", which are absorbed into the small intestine, and "unavailable carbohydrates", which pass into the small intestine, where they are fermented by the gastrointestinal microbiote. [28] Diet guidelines for Americans 2010 of USDA require moderate-high carbohydrate consumption from a balanced diet that includes six portions of of cereal-based foods per day, at least half from whole grains and the rest from fortified foods. [29] Glycemic (GI) and glycaemic load concepts have been developed to characterize feeding behaviour during human digestion. Foods rich in carbohydrates are classified based on the speed and magnitude of their effect on blood glucose levels. The glycemic index is a measure of how quickly dietary glucose in food. The insulin index is a measure of the total absorbable glucose in food. The insulin levels, which are caused by glucose (or starch) and certain amino acids in food. Health Effects of Dietary Carbohydrate Restriction Low-Carbohydrate diets can lose the health benefits â such as increased dietary fiber intake â offered by high-quality carbohydrate Restriction Low-Carbohydrate diets can lose the health benefits â such as increased dietary fiber intake â offered by high-quality carbohydrate Restriction Low-Carbohydrate Restriction Low-Carbohydrate Restriction Low-Carbohydrate diets can lose the health benefits â such as increased dietary fiber intake â offered by high-quality carbohydrate Restriction Low-Carbohydrate Restricti headache, and constipation, and in general the potential adverse effects of carbohydrate-restricted diets are under-researched, particularly for the possible risks of osteoporosis and cancer incidence. [32] Restricted diets can be effective as low-fat diets to help achieve weight loss in the short term when overall calorie intake is reduced. [33] A scientific statement from the Endocrine Society said that "when calorie intake is kept constant [...] body fat accumulation does not appear to be affected by even very pronounced changes in the amount of fat vs. carbohydrates in the diet".[33] Long-term, effective weight loss or maintenance depends on calorie restriction, [33] not the ratio of macronutrients in a diet. [34] The reasoning of Diet Supporters Carbohydrate diets have a "metabolic plan", is not supported by clinical trials. [33] [35] Moreover, it is not clear how low-carbohydrate diet affects cardiovascular health, although two reviews have shown that Diets with a reduced carbohydrate content are no longer effective than a conventional healthy diet in preventing the onset of type 2 diabetes, but for people with type 2 diabetes represent a valid option to lose weight or contribute to glycemic control. [38] [39] [40] Support the use of low carbohydrate diet routines in type 1. diabetes management [41] The American Diabetes Association recommends that diabetic people adopt a generally healthy diet, rather than concentrated on carbohydrates or other macronutrients [40]. An extreme form of poor carbohydrates or other macronutrients [40]. approval of the celebrities at the beginning of the 21st century, it became a fashion diet as a means to lose weight, but with risks of unwanted side effects, such as low levels of energy and hunger, insomnia, nausea and gastrointestinal disorders. [42] The British dietary association has defined one of the "Top 5 worst celebrity diets to avoid in 2018" [42] Metabolism Main article: Carbohydrate metabolism of carbohydrates in living organisms. The most important carbohydrate is glucose, a simple sugar (monosaccharide) that is metabolized by almost all known bodies. Glucose and other carbohydrates are part of a wide variety of metabolic paths among species: the plants summarize carbohydrates from carbon dioxide and from water by photosynthesis by storing energy absorbed internally, often in the form of a starch or Lipids. The vegetable components are consumed by animals and mushrooms and used as a fuel for cellular respiration. The oxidation of a gram of carbohydrates produces about 16Å, kj (4Ã, kcal) of energy, the oxidation of a gram of lipids produces about 38 kJ (9Å kcal). The human body stores between 300 and 300carbohydrate depending on body weight, with the skeletal muscle that contributes largely to accumulation.[43] The energy obtained from metabolism (e.g., glucose oxidation) is usually stored temporarily in cells in the form of ATP.[44] Anaerobic break down the largest molecules, extracting energy. There are two main metabolic routes of monosaccharide catabolism: glycolisis and citric acid cycle. In glycolisis, oligo- and polysaccharide are first disconnected into smaller monosaccharide catabolism. An investment of 2 ATP is necessary in the initial stages of glycolisis to phosphorate glucose in 6-phosphate fructose (F6P) and fructose (F6P) in 1,6-biphosphate fructose (F6P) i lacking, Carbohydrate chemistry Carbohydrate chemistry is a large and economically important branch of organic carbohydrate Acetalization Carbohydrate digestion Reaction of cyanohydrin Koenigsâ «Knorr Reaction Lobry de Bruynâ «Van Ekenstein Transformation of nef reaction Wohl Degradation See also Bioplastic Carbohydrate NMR Gluconeogenesis - A process where gluconeogenesis - A process where gluconeogenesis can be synthesized from non-carbohydrate sources. Glycobiology Glycogen Glycomics Glyco linked to the point. Nature. 421 (6920): 219A'20. Code Bib:2003Nature. 421.219F. two:10.1038/421 219a. MIDDLE 12 529 622. 622. ^ a b Avenas P (2012). "Etymology of the main names of polysaccharides" (PDF). In Navard P (ed.). European network of excellence of polysaccharides (EPNOE). Vienna: publishing house Springer. 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