*Biology for a Changing World 2e,* Chapter 6 Test Bank

1. According to the World Health Organization

1. 1 in 10 people in the world are obese.
2. people in developing countries are more obese than those in more developed countries.
3. levels of obesity have been declining over the past 40 years.
4. obesity is caused by eating larger portions of food.
5. trans fats should be banned.

Answer: A

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Hard

Important Words/Concepts: obesity

2. Excess carbohydrates in our body are

1. recycled into nucleic acids.
2. stored as carbohydrates until needed.
3. stored as protein.
4. used immediately.
5. stored as fat.

Answer: E

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: the impact of biology and culture on BMI

3. Humans evolved an adaptation to store fat in response to

1. farming.
2. fishing.
3. famine.
4. fast foods.
5. hunting.

Answer: C

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: the impact of biology and culture on BMI

4. What role has evolution played in modern-day human weight gain?

*Answer:* For most of human evolution, famine was common, so humans are programmed to store extra calories as fat to help them survive periods of low food availability. Today, however, food is abundant, and overeating leads to excessive weight gain.

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: evolution

5. Native American Indians historically fed themselves with a combination of hunting and gathering, fishing, and farming crops such as corn and squash that are low in calories but high in nutrition. Given that these are the conditions under which they evolved, do you think that many Native Americans eating a modern American diet would have a weight problem? Why or why not?

*Answer:* Many Native American Indians would likely have a weight problem because they evolved to have a well-balanced diet of meat and vegetables along with high levels of activity associated with hunting, gathering, fishing, etc. They also likely evolved a genetic predisposition to store extra food as fat as insurance of survival during periods of famine. The modern American diet is full of high-calorie foods with little nutritional value, and the modern American lifestyle is sedentary. These factors likely work together to cause a weight problem in many Native Americans eating a modern American diet.

DQ: Why do humans weigh more now than in the past?

Type: Use It

Difficulty: Easy

Important Words/Concepts: evolution

6. A Body Mass Index between 25 and 29.9 is considered to be

1. overweight.
2. obese.
3. normal.
4. underweight.
5. anorexic.

Answer: A

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI)

7. A Body Mass Index will likely be overestimated in

1. an office worker.
2. an athlete.
3. a teacher.
4. a banker.
5. a student.

Answer: B

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI)

8. A Body Mass Index of 31 is an indication of

1. being overweight.
2. being underweight.
3. obesity.
4. normal weight.
5. anorexia.

Answer: C

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI)

9. Body Mass Index doesNOT take into account

1. ratio of height to weight.
2. height.
3. weight.
4. frame size.
5. All of the above.

Answer: D

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI)

10. What are the two measurements used to calculate a person’s Body Mass Index?

* 1. height and waist size
	2. height and hip size
	3. height and weight
	4. weight and waist size
	5. weight and hip size

Answer: C

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI)

11. Americans are heavier than people living in other countries for all of the following reasons EXCEPT

* 1. Americans eat more fast food.
	2. portion sizes are larger in America.
	3. American culture encourages eating.
	4. Americans eat unhealthier food.
	5. Americans have a slower metabolism.

Answer: E

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI), obesity

12. A Body Mass Index equal to or greater than \_\_\_\_\_\_\_\_\_ is considered obese.

* 1. 20
	2. 25
	3. 30
	4. 35
	5. 40

Answer: C

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI), obesity

13. The Body Mass Index is an estimate of \_\_\_\_\_\_\_\_\_ based on height and weight.

1. waist size
2. heart health
3. blood pressure
4. muscle mass
5. body fat percentage

Answer: E

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI)

14. The Body Mass Index is an estimate of body fat percentage based on

1. waist size.
2. weight and height.
3. blood pressure.
4. weight, age, and height.
5. waist size, gender, and age.

Answer: B

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI)

15. Discuss the limitations of a BMI measure based on height and weight, especially the limitations related to muscle mass.

*Answer:* Muscle tissue is denser than other tissues; therefore, individuals with high muscle mass will have a higher body weight. The BMI chart that is based just on height and weight will therefore show a person with larger muscles as overweight or obese.

DQ: Why do humans weigh more now than in the past?

Type: Use It

Difficulty: Easy

Important Words/Concepts: Body Mass Index (BMI)

16. What are some of the health problems associated with obesity?

*Answer:* heart disease, stroke, some kinds of cancer, and diabetes

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: health, obesity

17. Why would humans evolve the capacity to store large reserves of fat?

*Answer:* Humans who had the ability to store fat during times of plenty were more likely to survive periods of famine by using those reserves. Calorically, fat is far more energy dense than proteins or carbohydrates, so it is the ideal food storage compound.

DQ: Why do humans weigh more now than in the past?

Type: Use It

Difficulty: Hard

Important Words/Concepts: fat storage

18. Comparative research into average portion size between restaurants in Philadelphia and Paris concluded that they were

1. of equal or similar size.
2. 25% larger in Philadelphia.
3. 25% smaller in Philadelphia.
4. 25% larger in Paris.
5. 50% larger in Philadelphia.

Answer: B

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: portion size and obesity

19. In which American restaurant would you expect to find similar portion sizes to a Parisian establishment?

1. a fast food chain
2. a breakfast diner
3. a pizzeria
4. a bistro
5. a local Chinese takeout

Answer: D

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: portion size and obesity

20. Which portion size is smaller in the United States than in France?

1. hamburger
2. yogurt
3. ice cream
4. cooking ingredients
5. None of the above.

Answer: E

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Easy

Important Words/Concepts: portion size and obesity

21. If you are on vacation and eating every meal at a restaurant, list at least three things you can do at mealtime to avoid weight gain.

*Answer:*

* + Order less
	+ Choose low-fat vegetarian options
	+ Choose lean meats
	+ Choose grilled entrees instead of fried
	+ Split your meal with someone else
	+ Eat only half and save the other half for a future meal

DQ: Why do humans weigh more now than in the past?

Type: Use It

Difficulty: Easy

Important Words/Concepts: diet, portion size, weight gain

22. Which of the following portions is most likely to have the fewest Calories?

A. a 6-ounce steak

B. 6 ounces of French fries

C. 6 ounces of green beans with butter

D. A 12-ounce steak

E. 6 ounces of steamed green beans

Answer: E

DQ: Why do humans weigh more now than in the past?

Type: Know It

Difficulty: Hard

Important Words/Concepts: portion size

23. Which macromolecules have the greatest caloric value per gram?

1. fats
2. proteins
3. carbohydrates
4. nucleic acids
5. nucleotides

Answer: A

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: the caloric value of food

24. Which macromolecules have the least caloric value per gram?

1. fats
2. nucleic acids
3. proteins
4. carbohydrates
5. fatty acids and glycerol

Answer: B

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: the caloric value of food

25. One Calorie equals

1. 1000 calories.
2. 1 kilocalorie.
3. a unit of energy.
4. 1 kcal.
5. All of the above.

Answer: E

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: the caloric value of food

26. Match up macromolecules to breakdown products:

\_\_\_\_ Proteins A. sugar, phosphate, and nitrogenous base

\_\_\_\_ Lipids B. amino acids

\_\_\_\_ Carbohydrates C. glycerol and fatty acids

\_\_\_\_ Nucleic acids D. simple sugars

*Answers:* Proteins (B); Lipids (C); Carbohydrates (D); Nucleic acids (A).

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: macromolecules and their subunits

27. List at least five factors that influence how many Calories a person needs per day.

*Answer:*

* Gender
* Age
* Height
* Body type
* Activity level
* Genetics
* Muscle mass to fat ratio

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: Calorie, diet

28. List the following in order from least calories to most.

* 1. 50g of fat→200g of protein→150g sugar
	2. 50g of fat→150g of sugar→200g of protein
	3. 150g of sugar→200g of protein→50g of fat
	4. 150g of sugar→50g of fat→200g of protein
	5. 200g of protein→150g sugar→50g fat

Answer: B

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Hard

Important Words/Concepts: Calorie, diet

29. List the following in order from least calories to most.

* 1. 4g of fat→9g of protein→9g of sugar
	2. 4g of fat→9g of sugar→9g of protein
	3. 9g of sugar→9g of protein→4g of fat
	4. 9g of protein→9g of sugar→4g of fat
	5. They are all equal.

Answer: E

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Hard

Important Words/Concepts: Calorie, diet

30. What is the difference between a calorie and a Calorie?

* 1. A Calorie equals 1000 calories.
	2. A calorie equals 1000 Calories.
	3. A Calorie equals 100 calories.
	4. A calorie equals 100 Calories.
	5. Calorie and calorie mean the same thing.

Answer: A

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Calorie, diet

31. An average bacon, lettuce, and tomato sandwich contains 20g of fat, 35g of carbohydrate, and 10g protein. How many calories are coming from each of these three?

*Answer:* There are 180 calories from fat, 140 calories from carbohydrate, and 40 calories from protein.

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Hard

Important Words/Concepts: Calorie, diet

32. Which of the following snacks has the highest calorie content?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Snack | Carbohydrate | Fat | Protein |
| A | Energy bar | 100 grams | 100 grams | 50 grams |
| B | Cheese snack | 100 grams | 50 grams | 30 grams |
| C | Ice cream cone | 120 grams | 80 grams | 50 grams |
| D | Chinese stir fry | 200 grams | 90 grams | 5 grams |
| E | Salad with blue cheese dressing | 30 grams | 100 grams | 50 grams |

*Answer:* (A) Energy bar.

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Hard

Important Words/Concepts: fats, carbohydrates, proteins

33. Define calorie and Calorie. Which of these is the term used in food labels?

*Answer:* A calorie is the amount of energy needed to raise the temperature of 1 gram of water by 1 degree Celsius. A Calorie is 1000 calories. The “calorie” from food labels is the Calorie.

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Hard

Important Words/Concepts: Calories, calories

34. You decide to go on a fad diet consisting of protein shakes that contain 50 grams of protein and 15 grams of carbohydrates per shake. Your target is 1300 Calories/day. How many shakes will you drink each day? Explain.

*Answer:* Each shake contains 200 Calories of protein (50 grams × 4 Calories/gram) and 60 Calories of carbohydrate (15 grams × 4 Calories/gram) for a total of 260 Calories/shake. That means you can consume 5 shakes/day (260 × 5 = 1300)

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Medium

Important Words/Concepts: Calories, diet

35. You are trying to decide among the following meals, labeled A through E. Being underweight, you want to pick the meal with the highest calorie content. Fill in the table to determine which meal you should choose.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | E |
| Grams fat | 50 | 50 | 20 | 20 | 30 |
| Calories fat |  |  |  |  |  |
|  |
| Grams carbohydrate | 50 | 80 | 80 | 100 | 70 |
| Calories carbohydrate |  |  |  |  |  |
|  |
| Grams protein | 50 | 100 | 90 | 50 | 90 |
| Calories protein |  |  |  |  |  |
|  |
| Total Calories |  |  |  |  |  |

*Answer:* Choose meal B.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | E |
| Grams fat | 50 | 50 | 20 | 20 | 30 |
| Calories fat | 450 | 450 | 180 | 180 | 270 |
|  |
| Grams carbohydrate | 50 | 80 | 80 | 100 | 70 |
| Calories carbohydrate | 200 | 320 | 320 | 400 | 280 |
|  |
| Grams protein | 50 | 100 | 90 | 50 | 90 |
| Calories protein | 200 | 400 | 360 | 200 | 360 |
|  |
| Total Calories | 850 | 1170 | 860 | 780 | 910 |

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Hard

Important Words/Concepts: fats, carbohydrates, proteins, Calories, diet

36. A person’s daily energy needs depend on their

1. age.
2. body type.
3. physical activity.
4. gender.
5. All of the above.

Answer: E

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: energy needs

37. Glycogen for short-term energy storage is found in

1. liver and muscle cells.
2. fat cells.
3. adipose tissue.
4. connective tissue.
5. kidney cells.

Answer: A

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: short- and long-term energy storage

38. Glycogen is made up of

1. lipids.
2. glucose molecules.
3. fatty acids.
4. fatty acids and glycerol.
5. starch.

Answer: B

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: short- and long-term energy storage

39. Our bodies are designed for long-term energy storage of

1. triglycerides in muscle and liver cells.
2. glucose in liver cells.
3. triglycerides in fat cells.
4. glycogen in liver.
5. glycogen in muscle.

Answer: C

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: short- and long-term energy storage

40. Our bodies store extra energy in muscle and liver cells as

* 1. fat.
	2. glucose.
	3. glycogen.
	4. nucleic acids.
	5. protein.

Answer: C

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: energy, glycogen, short- and long-term energy storage

41. You go outside and take a walk down the street and back. Which of the following are you most likely to be using for energy?

1. fat
2. glycogen
3. nucleic acids
4. protein
5. triglycerides

Answer: B

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: energy, glycogen, short- and long-term energy storage

42. What is the advantage of storing extra energy as triglycerides instead of glycogen? What is the disadvantage for modern humans?

*Answer:* Storing extra energy as triglycerides is advantageous because triglycerides store twice as much energy per unit weight compared to glycogen. However, the disadvantage is that it takes a lot of activity to rid the body of extra fat.

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: energy, glycogen, triglyceride, short- and long-term energy storage

43. Excess Calories of energy are stored as \_\_\_\_\_\_\_ in our liver.

1. triglycerides
2. simple sugars
3. glycogen
4. starch
5. cellulose

Answer: C

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Calorie storage

44. Excess Calories of energy are stored as \_\_\_\_\_\_\_ in our muscle tissue.

1. glycogen
2. simple sugars
3. starch
4. triglycerides
5. cellulose

Answer: A

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Calorie storage

45. Excess Calories of energy are stored as \_\_\_\_\_\_\_ in our fat cells.

1. starch
2. cellulose
3. glycogen
4. triglycerides
5. simple sugars

Answer: D

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Calorie storage

46. \_\_\_\_\_\_ is considered short-term energy storage and \_\_\_\_\_\_ is long-term energy storage in humans.

1. Glycogen; starch
2. Starch; fat
3. Glycogen; fat
4. Fat; glycogen
5. Glycogen; sugar

Answer: C

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: short- and long-term energy storage

47. Glycogen is considered \_\_\_\_\_\_ energy storage and fat is \_\_\_\_\_\_ energy storage.

1. short-term; short-term
2. long-term; short-term
3. long-term, permanent
4. short-term; long-term
5. short-term; permanent

Answer: D

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: short- and long-term energy storage

48. Excess Calories are stored as \_\_\_\_\_\_\_ in our \_\_\_\_\_\_\_.

1. triglycerides; liver
2. simple sugars; red blood cells
3. glycogen; fat cells
4. simple sugars; fat cells
5. glycogen; liver

Answer: E

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: Calorie storage

49. ATP is a

1. protein.
2. nucleotide.
3. lipid.
4. amino acid.
5. carbohydrate.

Answer: B

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: ATP is the energy currency of the cell.

50. The stored energy in food is converted by cells into this useable energy-containing molecule.

1. glycogen
2. ADP
3. ATP
4. AMP
5. glucose

Answer: C

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: ATP is the energy currency of the cell.

51. ATP breakdown in cells is accompanied by

1. an endergonic reaction.
2. phosphate bonding.
3. energy storage.
4. a release of energy.
5. an increase in potential energy.

Answer: D

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: ATP is the energy currency of the cell.

52. The energy in ATP is stored between

1. the phosphate groups.
2. the carbon and hydrogen atoms.
3. ribose and the first phosphate group.
4. adenine and ribose.
5. adenine and the first phosphate group.

Answer: A

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: ATP is the energy currency of the cell.

53. The energy currency of the cell is called

* 1. ATP.
	2. ADP.
	3. DDT.
	4. triglycerides.
	5. glycogen.

Answer: A

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: ATP, energy

54. ATP stores energy in which bond(s)?

* 1. adenine-ribose
	2. adenine-phosphate
	3. ribose-phosphate
	4. ribose-ribose
	5. phosphate-phosphate

Answer: E

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: ATP, energy

55. \_\_\_\_\_\_\_\_ is the cell’s “energy currency.”

1. Adenosine monophosphate
2. Glycogen
3. Glucose
4. Cellulose
5. ATP

Answer: E

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: ATP, energy

56. What happens when a phosphate is removed from ATP?

*Answer:* Breaking of the phosphate bond releases energy that can be used to fuel cellular-level reactions.

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Easy

Important Words/Concepts: ATP, energy

57. Compare and contrast saturated and unsaturated fats with respect to their sources (plant or animal), which is solid and which is liquid at room temperature, and which is better for your health.

*Answer:* Saturated fats tend to come from animals, whereas unsaturated fats tend to come from plants; saturated fats are solid at room temperature, whereas unsaturated fats are liquid; and unsaturated fats are better for your health.

DQ: How does the body use the energy in food?

Type: Use It

Difficulty: Easy

Important Words/Concepts: saturated fat, unsaturated fat

58. All of the following are bad for your health EXCEPT

1. saturated fat.
2. unsaturated fat.
3. trans fat.
4. hydrogenated fat.
5. fats that are solid.

Answer: B

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: hydrogenated fat, saturated fat, trans fat, unsaturated fat

59. Which of the following lists foods in order from least healthful to most healthful?

A. lard→butter→olive oil

B. butter→olive oil→lard

C. olive oil→lard→butter

D. lard→olive oil→butter

E. They are all equally bad for your health.

Answer: A

DQ: How does the body use the energy in food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: hydrogenated fat, saturated fat, trans fat, unsaturated fat

60. The inputs for aerobic respiration are

1. glucose and oxygen.
2. ATP, glucose, and oxygen.
3. glucose and ATP.
4. carbon dioxide and glucose.
5. glycogen and oxygen.

Answer: A

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration of cells

61. The outputs for aerobic respiration are

1. glucose, carbon dioxide, and oxygen.
2. carbon dioxide, water, and energy.
3. oxygen, water, and glucose.
4. carbon dioxide and energy.
5. glucose, oxygen, and energy.

Answer: B

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration of cells

62. The cells carrying out cellular aerobic respiration in humans obtain oxygen from

1. blood from tissues.
2. rough ER.
3. blood from the lungs.
4. Golgi apparatus.
5. mitochondria.

Answer: C

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration of cells

63. What are the inputs and outputs of the process of aerobic respiration?

\_\_\_\_\_\_\_\_\_+ \_\_\_\_\_\_\_\_\_\_\_\_→\_\_\_\_\_\_\_\_\_+\_\_\_\_\_\_\_\_\_\_\_\_ +\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Answer:* Glucose + oxygen → carbon dioxide + water + energy (ATP, heat)

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: aerobic respiration of cells

64. What is the equation for aerobic respiration?

*Answer:* Oxygen + glucose = carbon dioxide + water + ATP

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: aerobic respiration, ATP, energy

65. Why do we need to breathe?

*Answer:* We breathe because we need to obtain oxygen, which is required for aerobic respiration to make ATP. We then exhale the carbon dioxide as a waste product.

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: aerobic respiration, ATP, energy, oxygen

66. Carbohydrates, proteins, and fats are digested and then absorbed into the bloodstream from the \_\_\_\_\_\_\_\_\_\_\_. These nutrients are delivered to the cells, where they are broken down further and their energy is used to make \_\_\_\_\_\_\_\_\_\_\_\_.

* 1. small intestine; ATP
	2. small intestine; glycogen
	3. stomach; ATP
	4. stomach; glucose
	5. stomach; glycogen

Answer: A

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration, ATP, energy

67. The \_\_\_\_\_\_\_\_ is the location of aerobic respiration.

1. chloroplast
2. nucleus
3. endoplasmic reticulum
4. mitochondrion
5. Golgi apparatus

Answer: D

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration, cell structures

68. Where does the oxygen required for aerobic respiration enter the body?

1. from food we eat
2. through the lungs
3. through the skin
4. from water we drink
5. through symbiotic bacteria living in our lungs

Answer: B

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: oxygen

69. What role do the lungs and red blood cells play in aerobic respiration?

*Answer:* The lungs provide oxygen to the red bloods cells, and the red blood cells deliver the oxygen to all cells of the body. The red blood cells return with carbon dioxide, which exits through the lungs.

DQ: How does aerobic respiration extract useful energy from food?

Type: Use It

Difficulty: Easy

Important Words/Concepts: aerobic respiration

70. Your liver cells need energy to survive and run cellular functions. How do they obtain that energy, and what are the components needed to process the energy?

*Answer:* All cells, including the liver cells, need an energy molecule, like glucose, that they will convert to ATP using aerobic respiration. For aerobic respiration, they also need oxygen. Both of these are delivered to the liver cell by blood.

DQ: How does aerobic respiration extract useful energy from food?

Type: Use It

Difficulty: Hard

Important Words/Concepts: aerobic respiration

71. In this/these process(es), carbon dioxide is produced.

1. photosynthesis and respiration
2. photosynthesis
3. electron transport
4. glycolysis
5. the citric acid cycle

Answer: E

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration of cells

72. This stage of aerobic respiration occurs in the cytoplasm.

1. glycolysis
2. photosynthesis
3. the citric acid cycle
4. electron transport
5. fermentation

Answer: A

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration of cells

73. Which of the following processes yields the most ATP?

1. the citric acid cycle
2. fermentation
3. glycolysis
4. electron transport
5. glucose transport

Answer: D

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: aerobic respiration of cells

74. Which of the following statements best explains why fat contains more Calories than proteins or carbohydrates?

* 1. Fats have more oxygen.
	2. Fats have more electrons.
	3. Fats have more ATP.
	4. The bonds of fat molecules are more easily broken.
	5. The bonds of fat molecules are more difficult to break.

Answer: B

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: aerobic respiration, ATP, energy

75. Which of the following puts the stages of aerobic respiration in the correct order?

* 1. electron-transport chain→citric acid cycle→glycolysis
	2. citric acid cycle→glycolysis→electron-transport chain
	3. citric acid cycle→electron-transport chain→glycolysis
	4. glycolysis→citric acid cycle→electron-transport chain
	5. glycolysis→electron-transport chain→citric acid cycle

Answer: D

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration, ATP, citric acid cycle, electron-transport chain, energy, glycolysis

76. Which of the following stages strips electrons from bonds between carbon atoms to use for ATP production?

* 1. glycolysis
	2. the citric acid cycle
	3. electron-transport chain
	4. A and B but not C
	5. A, B, and C

Answer: D

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration, ATP, citric acid cycle, energy

77. Oxygen is most directly important in which of the following stage(s) of aerobic respiration?

* 1. glycolysis
	2. the citric acid cycle
	3. electron-transport chain
	4. A and C but not B
	5. None of the above.

Answer: C

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration, ATP, electron-transport chain, energy, oxygen

78. Cyanide is a poison that works by preventing oxygen from receiving electrons. Therefore, cyanide directly affects which stage of cellular respiration?

* 1. glycolysis
	2. the citric acid cycle
	3. electron-transport chain
	4. A and B but not C
	5. A, B, and C

Answer: C

DQ: How does aerobic respiration extract useful energy from food?

Type: Use It

Difficulty: Easy

Important Words/Concepts: aerobic respiration, ATP, electron-transport chain, energy, oxygen

79. Which of the following stage(s) of aerobic respiration occur in the mitochondria?

* 1. glycolysis
	2. the citric acid cycle
	3. electron-transport chain
	4. B and C but not A
	5. A, B, and C

Answer: D

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: aerobic respiration, ATP, citric acid cycle, electron-transport chain, energy

80. Which of the following stage(s) of aerobic respiration produce(s) the most ATP?

* 1. glycolysis
	2. the citric acid cycle
	3. electron-transport chain
	4. B and C but not A
	5. A, B, and C

Answer: C

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: aerobic respiration, ATP, citric acid cycle, electron-transport chain, energy

81. Most of the ATP produced by aerobic respiration is generated

A. during electron transport.

B. during glycolysis.

C. during photosynthesis.

D. during the citric acid cycle.

E. in the cytoplasm.

Answer: A

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration

82. Glycolysis occurs in the

1. mitochondria.
2. chloroplasts.
3. vacuoles.
4. cytoplasm.
5. nucleus.

Answer: D

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration

83. The CO2 that we breathe out is generated

1. in the cytoplasm.
2. in the nucleus.
3. in the mitochondria.
4. during electron transport.
5. during glycolysis.

Answer: C

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Hard

Important Words/Concepts: aerobic respiration

84. What are the locations of the three steps of aerobic respiration?

*Answer:* Glycolysis occurs in the cytoplasm, the citric acid cycle occurs in the middle of the mitochondrion, and electron transport occurs on the inner-mitochondrial membrane.

DQ: How does aerobic respiration extract useful energy from food?

Type: Use It

Difficulty: Easy

Important Words/Concepts: aerobic respiration

85. In biological processes like everywhere else, no energy transfer is 100% efficient. This suggests that some of the food energy we consume is not converted into ATP. What happens to it?

*Answer:* The splitting of molecules releases heat energy, helping us maintain our body temperature.

DQ: How does aerobic respiration extract useful energy from food?

Type: Use It

Difficulty: Easy

Important Words/Concepts: aerobic respiration

86. Where is ATP energy produced during aerobic respiration? How much is produced in each location?

*Answer:* During glycolysis, only two ATP are produced. An additional two ATP are produced during the citric acid cycle. Most of the ATP, up to 36 more ATP, is produced during electron transport.

DQ: How does aerobic respiration extract useful energy from food?

Type: Use It

Difficulty: Hard

Important Words/Concepts: aerobic respiration

87. Plants produce food and oxygen by what process?

1. fermentation
2. glycolysis
3. photosynthesis
4. the citric acid cycle
5. electron transport

Answer: C

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: photosynthesis and aerobic respiration

88. Which inputs are required for photosynthesis to occur?

1. sunlight, carbon dioxide, and water
2. oxygen, water, and sunlight
3. glucose, oxygen, and carbon dioxide
4. water, oxygen, and sunlight
5. carbon dioxide and water

Answer: A

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: photosynthesis and aerobic respiration

89. These outputs from photosynthesis are essential to nearly all living organisms.

1. carbon dioxide and water
2. carbohydrates and oxygen
3. oxygen and carbon dioxide
4. water and oxygen
5. carbon dioxide and glucose

Answer: B

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: photosynthesis and aerobic respiration

90. Describe the relationship between sunlight, plants, and animals with respect to food sources, the manufacture of ATP, and waste products of ATP manufacture.

*Answer:* Sunlight provides energy that plants use to make their own food, a process called photosynthesis, which requires carbon dioxide and water. The waste product of photosynthesis is oxygen. Animals eat plants to gain their food energy and make ATP via aerobic respiration, which requires oxygen that has been put into the air by the plants. The waste product of aerobic respiration is carbon dioxide, which the plants then use for photosynthesis, thus completing the cycle.

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: aerobic respiration, ATP, energy, photosynthesis

91. If 90% of all plants suddenly disappeared from the Earth, what do you think would be the consequences to life on this planet?

*Answer:* If 90% of all plants disappeared, many other life forms would also disappear because plants produce oxygen, which is used by a large proportion of animal life to make ATP via aerobic respiration. Thus, carbon dioxide would increase in the atmosphere, oxygen would decrease, and most animals would disappear.

DQ: How does aerobic respiration extract useful energy from food?

Type: Use It

Difficulty: Easy

Important Words/Concepts: aerobic respiration, ATP, energy, photosynthesis

92. What by-product of cellular respiration is required for photosynthesis?

1. glucose
2. nitrates
3. oxygen
4. carbon dioxide
5. phosphates

Answer: D

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: photosynthesis, respiration

93. What by-product of photosynthesis is required for cellular respiration?

1. glucose
2. nitrates
3. oxygen
4. carbon dioxide
5. phosphates

Answer: C

DQ: How does aerobic respiration extract useful energy from food?

Type: Know It

Difficulty: Easy

Important Words/Concepts: photosynthesis, respiration

94. Fermentation occurs in cells in the absence of

1. glucose.
2. oxygen.
3. carbon dioxide.
4. water.
5. glycogen.

Answer: B

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: fermentation, oxygen

95. Which process does fermentation share with aerobic respiration?

1. electron transport
2. photosynthesis
3. glycolysis
4. the citric acid cycle
5. anaerobic respiration

Answer: C

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: fermentation, oxygen, glycolysis

96. If a child is born without mitochondria, can the cells still make ATP? If so, what process(es) will the cell use to make ATP, and what will be the waste product(s)?

*Answer:* Yes, such a child could still make ATP because glycolysis occurs in the cytoplasm, not the mitochondria. The products of glycolysis will then be transferred to the lactic acid cycle, and lactate will be the waste product.

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Use It

Difficulty: Hard

Important Words/Concepts: ATP, energy, fermentation, glycolysis, lactic acid

97. Compare and contrast aerobic respiration and fermentation with respect to efficiency at making ATP, types of organisms that use each, and waste products.

*Answer:* Aerobic respiration is more efficient at making ATP than fermentation, which does not harvest all the energy in the bonds of glucose. Humans usually use aerobic respiration but can switch to fermentation when the need of the cells for oxygen exceeds the supply. Many fungi, including yeast, use fermentation. The by-products of aerobic respiration are carbon dioxide and water, whereas the waste products of fermentation are either lactic acid or alcohol.

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Use It

Difficulty: Hard

Important Words/Concepts: aerobic respiration, ATP, energy, fermentation, lactic acid

98. There are two types of muscle fibers, slow and fast, and people differ in the percentage of each they have. Slow fibers are good at sustaining repeated contractions, while fast fibers are good at quick contractions but they fatigue quickly. Which type of fiber do you think is more prevalent in the muscle cells of a sprinter? Which type do you think is more prevalent in a marathoner? Which type of fiber do you think uses primarily aerobic respiration, and which uses fermentation?

*Answer:* Sprinters have more fast fibers, whereas marathoners have more slow fibers. Fast fibers use fermentation, whereas slow fibers use aerobic respiration.

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Use It

Difficulty: Hard

Important Words/Concepts: aerobic respiration, ATP, fermentation, lactic acid, muscles

99. How much ATP is produced from one molecule of glucose during fermentation?

1. 2
2. 4
3. 6
4. 12
5. 36

Answer: A

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: fermentation, ATP

100. The final product of fermentation in humans is

1. pyruvate.
2. glucose.
3. lactic acid.
4. acetic acid.
5. alcohol.

Answer: C

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: fermentation, lactic acid

101. The final product of fermentation in yeast is

1. pyruvate.
2. glucose.
3. lactic acid.
4. acetic acid.
5. alcohol.

Answer: E

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: fermentation, alcohol, yeast

102. Fermentation occurs in

1. the mitochondria.
2. the chloroplasts.
3. the vacuoles.
4. the cytoplasm.
5. the nucleus.

Answer: D

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: fermentation

103. Fermentation produces only 2 ATP per glucose, compared to about 36 in aerobic respiration. What happened to the rest of the usable energy from the glucose molecule?

1. It was given off as heat.
2. Much of it remains in lactate or alcohol.
3. Most of it was transferred to the mitochondria.
4. The ATPs made in fermentation contain more energy than those from aerobic respiration.
5. Much of it remains in NADH.

Answer: B

DQ: When does fermentation occur, and why can’t it sustain human life?

Type: Know It

Difficulty: Hard

Important Words/Concepts: fermentation, ATP, energy