

BODIES HUMAN

STUDENT WORKSHEET

INSTRUCTIONS

The following worksheets are mostly grouped according to the major systems of the body, just as the BODIES HUMAN exhibition is.

Complete these questions as you tour through the exhibition. Questions can be answered by reading the text, observing the specimens and others will require that you draw conclusions from your tour of the exhibition and personal experience.

Be sure to read the questions carefully so that you can eliminate answers that are incorrect. If you can't find the correct answer, mark it for discussion with your class at a later time.

SKELETAL SYSTEM

1. The smallest bones in the body are located in the _____.
 - a) nose
 - b) ear
 - c) fingers
 - d) toes
2. The bones play several roles in the body. Which of the following is not a function of bones?
 - a) protecting inner organs
 - b) deposit of minerals
 - c) body support
 - d) filtering harmful materials from the body
3. The human hand has an equal number of bones and muscles.
 - a) true
 - b) false
4. How much does an adult's skeleton weigh?
 - a) about 2 kg (5 pounds)
 - b) 7 to 9 kg (15-20 pounds)

- c) half of the weight of the body
 - d) about 45 kg (100 pounds)
- 5. The main blood cell production sites are in _____ bones such as the breast bone, ribs, shoulder blades and pelvis.
 - a) large
 - b) small
 - c) flat
 - d) long
- 6. Cartilage is one of the tissues of the body that is not supplied with blood.
 - a) true
 - b) false
- 7. The spine normally has how many vertebrae?
 - a) 13
 - b) 23
 - c) 33
 - d) 34
- 8. Which joint bears the most weight in the body?
 - a) shoulder
 - b) hip
 - c) knee
 - d) ankle
- 9. Ball-and-socket joints include the following:
 - a) neck and spine
 - b) toe and finger
 - c) ankle and knee
 - d) hip and shoulder
- 10. Arthritis is most common in those who are:
 - a) over the age of 50
 - b) overweight
 - c) overly active
 - d) a & b (over age of 50 and overweight)
- 11. What are the three bones that make up the shoulder joint?
 - a) the collarbone, the shoulder blade and the upper arm bone
 - b) the clavicle, the scapula and the humerus
 - c) both a. & b. since they refer to the same bones

 **COOL FACT:**

Your skeleton completely regenerates every 10 years! Bone-building cells called osteoblasts create new bone tissue while osteoclasts break down old bone, meaning your skeleton is continuously being replaced throughout your life.

MUSCULAR SYSTEM

1. When a muscle contracts it _____.
 - a) shortens
 - b) relaxes
 - c) lengthens
 - d) softens
2. There are more than 620 _____ muscles in the body.
 - a) involuntary
 - b) voluntary
 - c) total
 - d) arm and leg
3. Muscles convert energy into movement.
 - a) true
 - b) false
4. Muscle performance gradually declines beginning around the age of
 - a) 15
 - b) 30
 - c) 45
 - d) 60
5. What do tendons do?
 - a) connect bones to each other
 - b) reduce friction and lubricate joints
 - c) connect muscles to bones
6. Which of the following is true about muscles?
 - a) they can be increased by 15-20%
 - b) they are pre-determined in size when we are born
 - c) they are all attached to bones
 - d) they can double from their natural size through exercise
7. Which is true about voluntary and involuntary muscles?
 - a) Voluntary muscles cannot be controlled, while involuntary muscles can.

- b) Involuntary muscles and voluntary muscles can be controlled.
 - c) Voluntary muscles can be controlled, while involuntary muscles cannot be.
 - d) Involuntary muscles do not exist in adults, all adult muscles are voluntary.
8. Muscles are not used in which of the following activities
- a) breathing
 - b) moving
 - c) seeing
 - d) thinking
9. Males have more muscle mass than females
- a) true
 - b) false
10. Take a moment to describe which plastinates you felt best displayed the muscular system.

 **COOL FACT:**

The masseter (jaw muscle) is the strongest muscle in your body relative to its size! It can close your teeth with a force of up to 55 pounds (25 kg) on the incisors and 200 pounds (90 kg) on the molars.

NERVOUS SYSTEM

1. The brain and spinal cord make up the _____.
- a) central nervous system
 - b) nervous system
 - c) peripheral nervous system
 - d) upper body
2. The brain makes up _____ of our total body weight, but requires _____ of our blood supply.
- a) 20% and 2%, respectively
 - b) 2% and 20%, respectively
 - c) 3% and 30%, respectively
 - d) 30% and 3%, respectively
3. In terms of evolutionary brain development, the _____ is one of the oldest parts.
- a) cerebellum

- b) spinal column
 - c) brainstem
 - d) corpus callosum
4. Which part of the brain controls our movement?
- a) cerebrum
 - b) thalamus
 - c) cerebellum
 - d) corpus callosum
5. During a severe brain hemorrhage blood pours into the cerebral matter.
- a) true
 - b) false
6. Regular exercise stimulates the brain.
- a) true
 - b) false
7. The _____ is the largest part of the brain.
- a) brainstem
 - b) cerebrum
 - c) cerebellum
 - d) corpus callosum
8. Nerve cells can travel at speeds of up to _____.
- a) 8 km/h (5 mph)
 - b) 80 km/h (50 mph)
 - c) 400 km/h (250 mph)
 - d) 800 km/h (500 mph)
9. Nerve fibers originate directly _____.
- a) from in the brain
 - b) from in the spinal column
 - c) from either the brain or spinal column
10. List three activities that stimulate new brain areas and strengthen existing neural networks.
- a)
 - b)
 - c)

 **COOL FACT:**

Your brain has about 86 billion neurons (brain cells), but these make up only 10% of brain cells. The other 90% are glial cells that support, protect, and nourish neurons!

RESPIRATORY SYSTEM

1. Tar and soot particles from cigarette smoke form deposits in the _____ tissue.
 - a) skin
 - b) pulmonary
 - c) muscle
 - d) cardiovascular
2. Every minute, about _____ pints of air pass into the lungs.
 - a) 2-3
 - b) 5
 - c) 10-12
 - d) 20
3. Breathing is an exchange process of oxygen and carbon dioxide.
 - a) true
 - b) false
4. The thyroid is a gland in the neck that produces _____.
 - a) saliva
 - b) oxygen
 - c) hormones
 - d) all of the above
5. Nicotine raises the levels of a neurotransmitter called dopamine
 - a) true
 - b) false
6. Each lung contains _____ alveoli
 - a) 300 to 450
 - b) 300-450 thousand
 - c) 300-450 million
 - d) 300-450 billion
7. The bronchial passages of the lungs lead to clusters of tiny air sacs called _____.
 - a) alveoli
 - b) tracheas

- c) capillaries
 - d) bronchial trees
8. What causes deepening of the voice in puberty, particularly in males?
- a) the larynx growing larger and thicker
 - b) the larynx shrinking and getting thinner
 - c) chronic lung disease as a child
 - d) smoking and pollution
9. Studies show that _____ of all deaths caused by heart disease are related to smoking.
- a) 10%
 - b) 15%
 - c) 20%
 - d) 50%
10. Lung cancer is _____ common in smokers than non-smokers.
- a) 10 times less common
 - b) equally
 - c) 10 times more common
 - d) 20 times more common
11. The chemicals in cigarette smoke increase mutation rates and inhibit cells from repairing DNA.
- a) true
 - b) false
12. Nicotine raises the levels of a neurotransmitter called dopamine
- a) true
 - b) false
 - c) 50%
13. The effects of smoking are:
- a) skin wrinkles
 - b) accelerating our aging process
 - c) weakening our immune system
 - d) increasing the risk for diseases, such as cancer, heart attack, stroke, and eye diseases
 - e) all of the above
14. Which of these facts is NOT true?
- a) The surface area of the lungs is the same size as a tennis court
 - b) A sneeze travels at a speed of about 145 km/h (90 mph)
 - c) Your left lung is larger than your right lung

 **COOL FACT:**

You take about 20,000 breaths every day! Your right lung is slightly larger than your left lung because your heart takes up more space on the left side of your chest.

CARDIOVASCULAR SYSTEM

1. The size of the heart is roughly that of our fist and weighs approximately _____.
 - a) 60 g (2 oz.)
 - b) 150 g (5 oz.)
 - c) 300 g (11 oz.)
 - d) 600 g (21 oz.)
2. The network of arteries, veins, and capillaries is extraordinarily dense. In an adult, this network is more than _____ long.
 - a) 15 metres (600 inches)
 - b) 200 metres (600 feet)
 - c) 9.656 kilometres (6.000 miles)
 - d) 96.500 kilometres (60.000 miles)
3. Cardiovascular diseases are the number one cause of death globally. According to the World Health Organization (WHO) more than _____ people die of heart disease every year.
 - a) 500.000
 - b) 9 million
 - c) 17 million
 - d) 23 million
4. Which of these is not true?
 - a) Your heart beats around 70 times a minute.
 - b) The heart is the biggest organ in your body.
 - c) Your heart pumps a cup full of blood every time it beats.
5. In an adult normal blood pressure at rest is considered to be _____.
 - a) under 120/80 mmHg
 - b) over 120/80 mmHg
6. Our heart is the only muscle that does not grow with exercise.
 - a) true
 - b) false

7. Causes of an enlarged heart may include which of the following:
- a) exercise
 - b) high blood pressure
 - c) defects in the heart wall
 - d) all of the above
8. The heart sits tucked between _____.
- a) the stomach and chest muscles
 - b) the lungs
 - c) the spleen and liver
 - d) the ribs
9. Sometimes heart attacks go undiagnosed, because the signs are not as obvious as what people may be used to seeing depicted in the movies or on TV.
- a) true
 - b) false
10. "Smoker's leg" is a common term for severe peripheral arterial occlusive disease.
- a) true
 - b) false
11. Name three cardiovascular diseases shown in the exhibition.
- a)
 - b)
 - c)
12. The two chambers at the bottom of your heart are called ventricles.
- a) true
 - b) false
13. Which of the following is true:
- a) The pulmonary vein carries oxygen-rich blood to the heart.
 - b) Veins lead to the body from the heart.
 - c) Veins always carry oxygen-rich blood.
 - d) None of the above.

 **COOL FACT:**

Your heart will beat approximately 2.5 billion times during your lifetime! Each day, it pumps about 2,000 gallons (7,570 liters) of blood through your body.

DIGESTIVE SYSTEM & EXCRETORY SYSTEM

1. The stomach is a hollow, muscular organ, capable of holding _____ of food and liquids.
 - a) 0,5 to 1 litres (2-4 cups)
 - b) 2 to 3 litres (4-6 pints)
 - c) up to 10 litres (3 gallons)
2. Most digestion occurs in _____.
 - a) the mouth
 - b) the stomach
 - c) the small intestine
 - d) the large intestine
 - e) equally in all areas listed before
3. To enlarge the area available for nutrient absorption, the small intestine has ring-shaped folds and a dense network of finger-shaped villi that _____.
 - a) are each 1 mm (0.04 inches) in length
 - b) act like bristles of a microscopic brush
 - c) are tiny finger-shaped projections
 - d) all of the above
4. Water and vitamins are absorbed in the large intestine.
 - a) true
 - b) false
5. The pancreas secretes two hormones they are:
 - a) testosterone and estrogen
 - b) insulin and glucagon
 - c) oxytocin and cortisol
6. The liver is the largest organ in the body.
 - a) true
 - b) false
7. The _____ is the largest and heaviest organ of the body.
 - a) liver
 - b) heart
 - c) skin
 - d) stomach
8. Liver cells produce 0,75 to 1,25 litres (1,6-2,6 pints) of _____ each day.
 - a) bile

- b) blood
 - c) urine
 - d) waste
9. Excess alcohol intake causes _____ to accumulate in liver cells.
- a) blood
 - b) bile
 - c) fat
 - d) protein
10. Melanomas are a benign form of skin cancer.
- a) true
 - b) false
11. Factors that can tip the balance in favor of weight gain include:
- a) our genetic makeup
 - b) overeating
 - c) lack of physical activity
 - d) all of the above
12. Overweight and obesity are linked to more death worldwide than underweight.
- a) true
 - b) false
13. The body's total blood volume flows through the kidneys around _____ per hour.
- a) once
 - b) five times
 - c) ten times
 - d) fifteen times
14. The male urethra is about 20 cm (8 inches) long. In women, the urethra is about _____ cm long.
- a) 4 cm (1,5 inches)
 - b) 8 cm (3 inches)
 - c) 10 cm (4 inches)
 - d) also 20 cm (8 inches)

 **COOL FACT:**

Your digestive system is about 30 feet (9 meters) long! The surface area of your small intestine alone is about the size of a tennis court, which helps maximize nutrient absorption.

REPRODUCTIVE SYSTEM & FETAL DEVELOPMENT

1. The testes contain thousands of finely coiled tubes, called seminiferous tubules, in which about how many sperm cells mature every day?
 - a) 1 million
 - b) 100 million
 - c) 300 million
 - d) 1 billion
2. The prostate gland is roughly the size of a _____.
 - a) pea
 - b) chestnut
 - c) golf ball
 - d) tennis ball
3. What is the most common form of cancer in women?
 - a) lung
 - b) ovarian
 - c) breast
 - d) skin
4. A woman's egg cells develop throughout her life.
 - a) true
 - b) false
5. After only four weeks, an embryo already has developed the following:
 - a) a heart and eyes
 - b) four buds (beginnings of arms and legs)
 - c) all of the above
 - d) none of the above
6. After the eighth week of pregnancy, the developing child is called a _____.
 - a) embryo
 - b) fetus
 - c) baby
 - d) infant
7. In the fourth month of pregnancy the following organs develop _____.
 - a) kidneys
 - b) liver and pancreas
 - c) large and small intestines
 - d) all of the above

8. The placenta exists only during pregnancy.
- a) true
 - b) false
9. Twins that share the same genetic code are known as identical or _____.
- a) fraternal
 - b) dizygotic
 - c) monozygotic
 - d) brother and sister
10. In the exhibition what is described as the "life line" from the mother to the developing fetus?
- a) uterus
 - b) blood supply
 - c) umbilical cord
 - d) placenta

 **COOL FACT:**

At just 4 weeks after conception, an embryo's heart begins to beat, even though it's only about the size of a poppy seed! By 8 weeks, the embryo is developing at a rate of 8,000 new cells per second.

BODIES HUMAN & DAILY LIFE

1. Which system of the human body did you find most interesting at the Bodies Human exhibition, and why?

2. Describe one specimen from the exhibition that helped you better understand human anatomy:

3. How has the Bodies Human exhibition changed your understanding of how your body works?

4. After seeing the exhibition, what lifestyle choices might you make to keep your body healthy?

 **COOL FACT:**

Body donation is a precious gift to science and education. Every specimen in the Bodies Human exhibition comes from an individual who chose to donate their body to help others learn about human anatomy.