

Third Grade “The Human Body” Assessment

- 1a. The _____ system is the system in the body that includes muscle cells and tissues that cause organs or body parts to move.
- nervous
 - muscular
- 1b. The _____ system is the system in the body that includes muscle cells and tissues that cause organs or body parts to move.
- skeletal
 - nervous
 - muscular
 - digestive
- 1c. Explain what the muscular system is and what it does in the human body.
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-
-
- 2a. What are muscles, and what do they do in our bodies?
- they are the tissues that join bones together
 - they are the tissues that make the body parts move
- 2b. What are muscles, and what do they do in our bodies?
- they are the tissues that join bones together
 - they are the soft tissues inside the bones
 - they are the tissues that make the body parts move
 - they are tissues that connect the body to the brain
- 2c. Define muscles. What are they, and what function do they have in the body?
-
-
-
- 3a. There are three kinds of muscles. Match each of the three kinds with the correct definition:
- | | |
|---------------|--|
| _____skeletal | a. the muscle forming the strong walls of the heart |
| _____cardiac | b. muscles attached to bones, allowing movement of limbs |
| _____smooth | c. muscles found in internal organs, helping with movement in the various body systems |
- 3b. The _____ muscles are those attached to our bones and make our limbs move, such as our arms and legs. The _____ muscle is our heart muscle. The _____ muscles are found in our internal organs and move on their own, such as in our circulatory or digestive systems.

3c. Name and describe each of the three kinds of muscle found in our bodies.

4a. _____ muscles are muscles that you control, like the ones in your arms and legs. _____ muscles work automatically on their own even if you are unaware of them, like the heart or the muscle that makes your eye blink.

- a. Voluntary; Involuntary
- b. Involuntary; Voluntary

4b. _____ muscles are muscles that you control, like the ones in your arms and legs. _____ muscles work automatically on their own even if you are unaware of them, like the heart or the muscle that makes your eye blink.

- a. Cardiac; Skeletal
- b. Voluntary; Involuntary
- c. Involuntary; Voluntary
- d. Smooth; Skeletal

4c. Explain the difference between voluntary and involuntary muscles. Give an example of each type.

5a. The _____ system, or _____, is the framework of the body, or the system of bones that protects and supports the body and its internal organs and holds it together.

- a. skeletal; skeleton
- b. muscular; muscle

5b. The _____ system, or _____, is the framework of the body, or the system of bones that protects and supports the body and its internal organs and holds it together.

- a. muscular; muscle
- b. skeletal; skeleton
- c. nervous; nerve
- d. digestive; intestine

5c. Explain, in your own words, what the skeletal system, or skeleton, is and what it does in the human body.

6a. One of the pieces of hard and dense material that supports the rest of the body is called _____ . A soft, flexible tissue found in the joints is called _____ .

- a. bone; cartilage
- b. cartilage; bone

6b. One of the pieces of hard and dense material that supports the rest of the body is called _____ . A soft, flexible tissue found in the joints, where it cushions against shock, is called _____ .

- a. cartilage; a bone
- b. tissue; a bone
- c. tissue; cartilage
- d. a bone; cartilage

6c. Explain the difference between bone and cartilage.

7a. _____ is the soft tissue inside bones where red blood cells are made.

- a. cartilage
- b. marrow

7b. _____ is the soft tissue inside bones where red blood cells are made.

7c. List two facts you know about bone marrow.

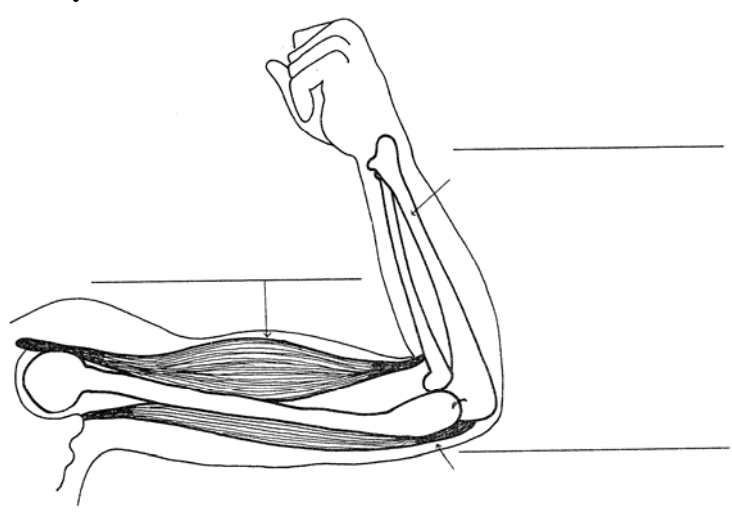
8a. Bones are fastened together at the joints by bands of tissue called _____. Muscles are connected to the bones by strong pieces of tissue known as _____.

- a. tendons; ligaments
- b. ligaments; tendons

8b. Bones are fastened together at the joints by bands of tissue called _____. Muscles are connected to the bones by strong pieces of tissue known as _____.

- a. tendons; ligaments
- b. cartilage; ligaments
- c. tendons; cartilage
- d. ligaments; tendons

8c. Label this diagram of the arm with the following parts: ligament, tendon, bone. Spell them correctly.



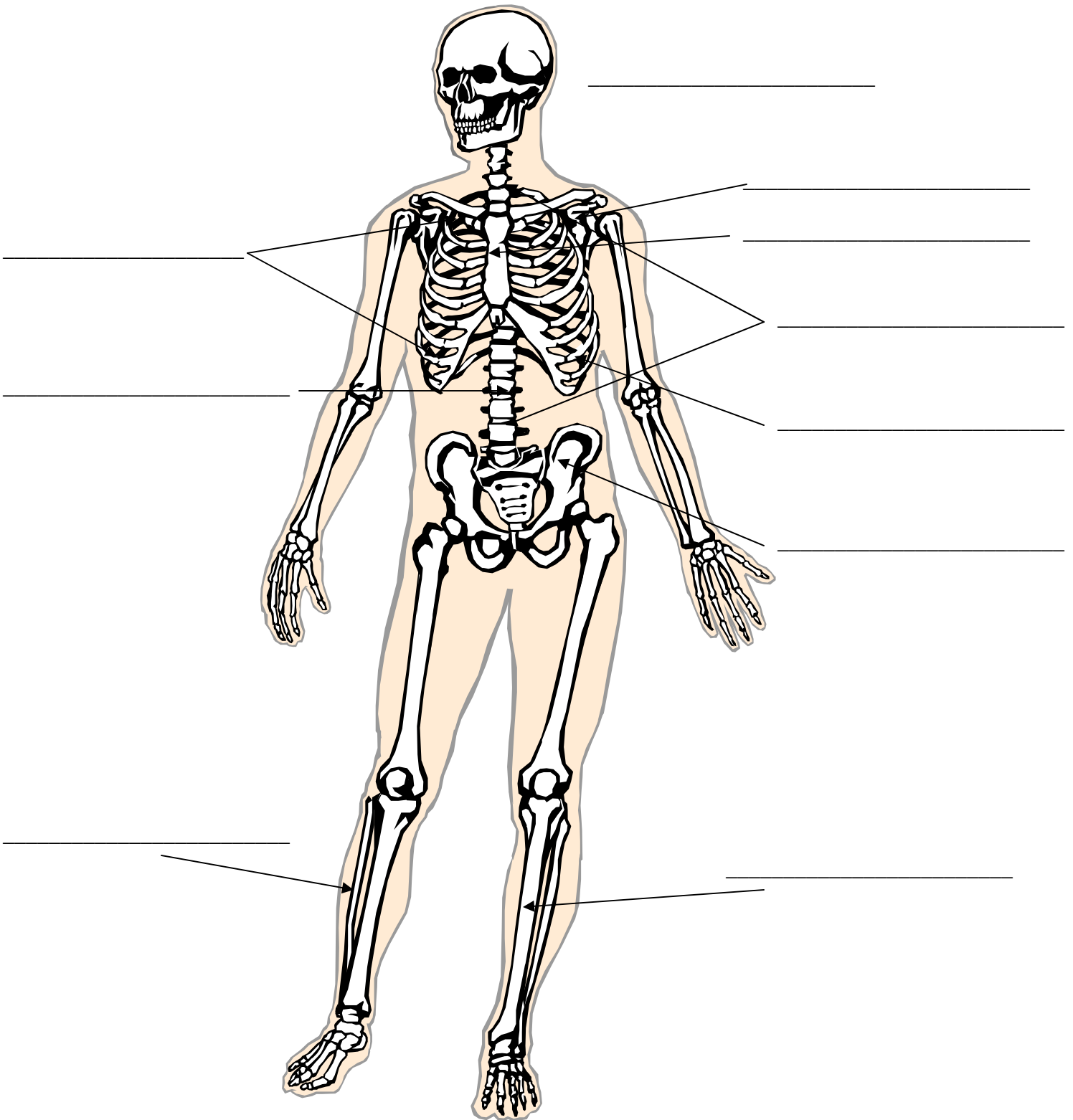
9a. The _____ is named after a legendary Greek hero who could only be wounded in his heel.

- a. Zeus tendon
- b. Achilles tendon

9b. The _____ is named after a legendary Greek hero who could only be wounded in his heel.

9c. Explain how the Achilles tendon received its name.

10a. Label the following bones on the picture of the skeleton: cranium (skull), spinal column, vertebrae, ribs, rib cage, sternum, scapula (shoulder blades), pelvis, tibia, fibula.



- 10b. Label the following bones on the picture of the skeleton: cranium (skull), spinal column, vertebrae, ribs, rib cage, sternum, scapula (shoulder blades), pelvis, tibia, fibula.

Use skeleton from 10a.

- 10c. Draw (stick-figure drawings are fine) and label the following bones: cranium (skull), spinal column, vertebrae, ribs, rib cage, sternum, scapula (shoulder blades), pelvis, tibia, fibula. Then choose three of the bones and write one fact about each of them.

- 11a. One of the functions of bones is protection of internal organs. Match each bone to the body part it protects.

_____ cranium	a.	spinal cord
_____ spinal column	b.	lungs and heart
_____ rib cage	c.	brain

- 11b. The _____ offers protection to the brain, the spinal column gives protection to the _____, and the rib cage protects the _____.

11c. What common functions do the cranium, the spinal column, and the rib cage all share? Explain in your own words.

12a. Which of the following is true (circle the true answer)?
a. Ribs are bone or cartilage segments forming the spinal column.
b. Vertebrae are bone or cartilage segments forming the spinal column.

12b. The bone or cartilage segments forming the spinal column are called _____.
a. ribs
b. muscle
c. nerves
d. vertebrae

12c. Explain the difference between ribs and vertebrae.

13a. A place in the body where two bones meet is called a _____.
a. ligament
b. joint

13b. A place in the body where two bones meet is called a _____.

13c. Define a joint and name two kinds of joints.

14a. There are several kinds of movable joints that allow body parts to move.
_____ joints give movement to elbows and knees. _____
_____ joints help our shoulders and hips to move.

- a. Hinge; Ball and socket
- b. Ball and socket; Hinge

14b. There are several kinds of movable joints that allow body parts to move. Match each body part with the corresponding joint:

- _____ elbow
 - _____ shoulder
 - _____ knee
 - _____ hip
- a. hinge
 - b. ball and socket

- 14c. Name two kinds of joints and the body parts they move:
- | | <u>Kind of Joint</u> | <u>Body Part They Move</u> |
|----|----------------------|----------------------------|
| 1. | _____ | _____ |
| 2. | _____ | _____ |
- 15a. The form of energy used by doctors to take pictures of the inside of the body (so they can see things that might be wrong) is called _____.
- light
 - an x-ray
- 15b. Which of the following facts about x-rays is NOT true?
- an x-ray is a form of energy like light, but it can go through many surfaces that would stop light
 - doctors use x-rays to take pictures of the inside of the body so they can see things that might be wrong
 - an x-ray is the same as an ultra-violet ray
 - a photograph taken with an x-ray is called an x-ray
- 15c. Describe the connection between broken bones and x-rays.
- _____
- _____
- _____
- 16a. Helmets, knee pads, safety belts, and good nutrition are all ways to help prevent _____.
- broken bones
 - sleepless nights
- 16b. Helmets, knee pads, safety belts, and good nutrition are all ways to help prevent _____.
- 16c. List three ways to help prevent broken bones:
- _____
 - _____
 - _____
- 17a. There are three parts that make up the nervous system. They are the brain, the spinal cord, and _____.
- muscles
 - nerves

- 17b. There are three parts that make up the nervous system. Check the three parts from the following choices:
- a. _____ muscles
 - b. _____ bones
 - c. _____ brain
 - d. _____ spinal cord
 - e. _____ nerves
 - f. _____ intestines

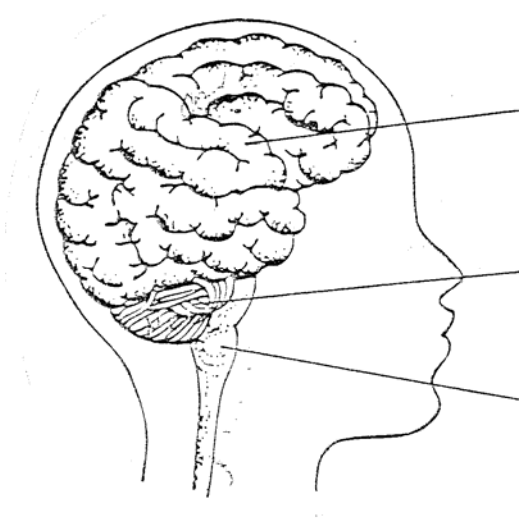
- 17c. List the three parts of the nervous system:
- 1. _____
 - 2. _____
 - 3. _____

- 18a. The nervous system
- a. takes in all the information coming from the senses, and arranges it for us
 - b. supports the body, and is the glue that holds it all together

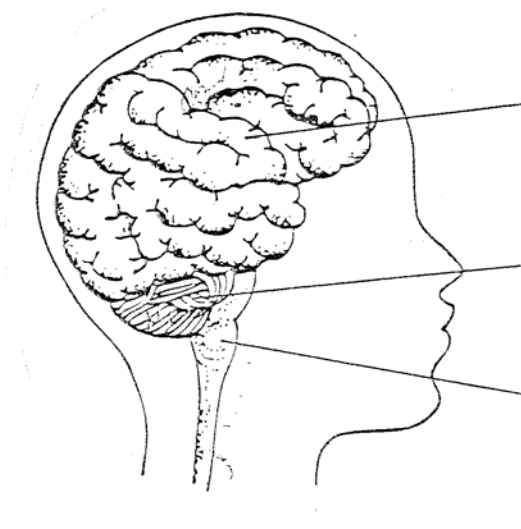
- 18b. The nervous system
- a. takes in all the information coming from the senses, and arranges it for us
 - b. supports the body, and is the glue that holds it all together
 - c. allows us to breathe
 - d. takes in food and breaks it down so it can be used by the body

- 18c. Describe how the nervous system can be compared to a busy airport.
- _____
- _____
- _____

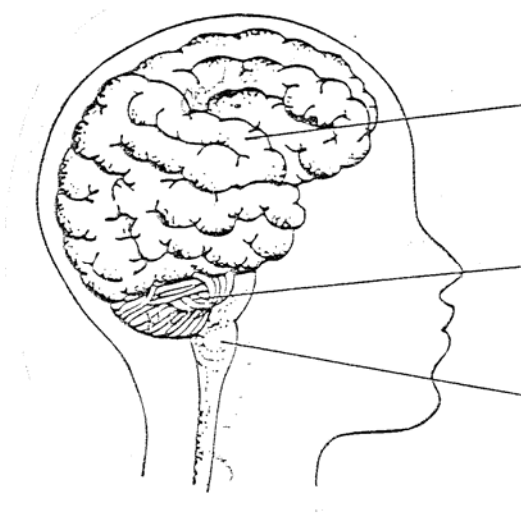
- 19a. Label this diagram of the brain with its three parts: medulla (brain stem), cerebellum, cerebrum (cerebral cortex). Spell them correctly.



19b. Identify and label the three parts of the brain.



19c. Identify and label the three parts of the brain. Then tell the function of each part.



1. _____
2. _____
3. _____

20a. There are two parts of the brain working all the time, even when we don't know it. The _____ keeps your heartbeat and your breathing regular. The _____ coordinates your muscles and gives you balance.

- a. medulla; cerebellum
- b. cerebellum; medulla

20b. There are two parts of the brain working all the time, even when we don't know it. The _____ keeps your heartbeat and your breathing regular. The _____ coordinates your muscles and gives you balance.

- a. medulla; cerebrum
- b. cerebellum; medulla
- c. medulla; cerebellum
- d. cerebrum; medulla

20c. Explain how the medulla (brain stem) and the cerebellum are similar and how they are different.

21a. The part of the brain that controls thinking, sensing, and moving is known as the _____. It is in control when we are aware of our world. The outer coiled gray matter making up most of this part of the brain is called the _____.

- a. cerebrum; cerebral cortex
- b. medulla; brain stem

21b. The part of the brain that controls thinking, sensing, and moving is known as the _____. It is in control when we are aware of our world. The outer coiled gray matter making up most of this part of the brain is called the _____.

- a. cerebrum; cerebral cortex
- b. medulla; brain stem
- c. medulla; cerebral cortex
- d. cerebrum; brain stem

21c. The part of the brain that controls thinking, sensing, and moving is known as the _____. It is in control when we are aware of our world. The outer coiled gray matter making up most of this part of the brain is called the _____.

22a. Match the items in the first column with the corresponding part of the brain from the second column:

- | | |
|----------------------------|---------------|
| _____ play a game | |
| _____ balance on a bicycle | a. cerebrum |
| _____ breathe | b. medulla |
| _____ read a book | c. cerebellum |
| _____ balance on skates | |

22b. List a job for each of the three main parts of the brain:
cerebrum _____
medulla _____
cerebellum _____

22c. List the three main parts of the brain, and describe the job each one does.

23a. What is the spinal cord?
a. a long piece of muscle that connects the head to the rest of the body
b. a long piece of nerve tissue that runs from the brain down through the backbone

23b. A long piece of nerve tissue that runs from the brain down through the backbone is called the _____.

23c. Describe the spinal cord.

24a. What are nerves, and what do they do in the body?
a. tiny fibers found in the spinal cord and all over the body that send messages to the brain
b. tiny fibers found in the spinal cord and all over the body that hold the bones in place

24b. Which of the following is NOT true?
a. Nerves pick up information and send it up the spinal cord to the brain.
b. Nerves tell us when we are seeing, feeling, hearing, smelling, or touching something.
c. Nerves are tiny fibers found in the spinal cord and all over the body that hold the bones in place.
d. Nerves are tiny fibers found in the spinal cord and all over the body that send messages to the brain.

24c. Define nerves and tell what they do in the body.

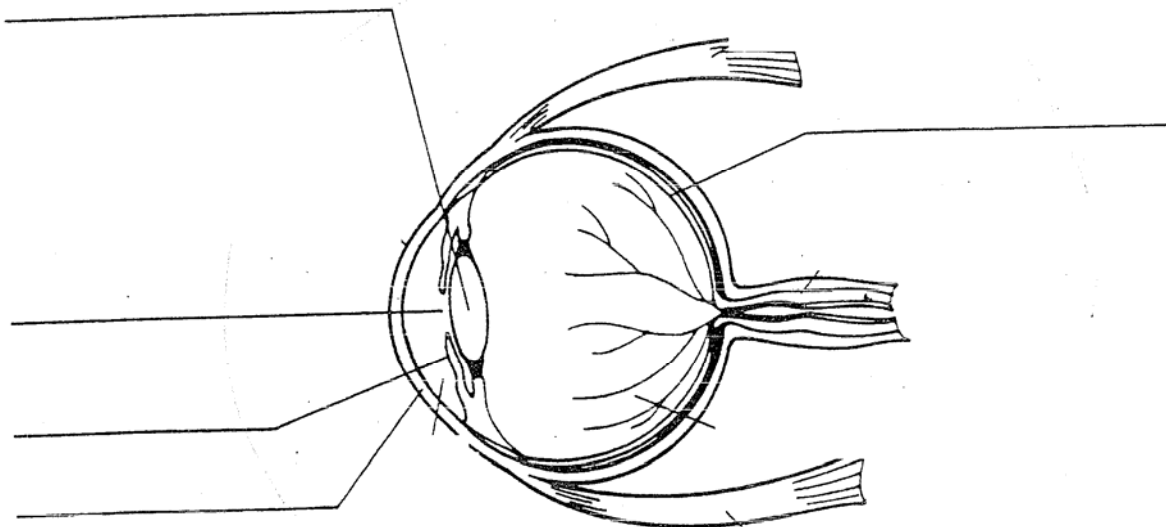
25a. A _____ is a quick action that happens so fast we cannot even think about it, such as moving our finger after touching a hot stove.
a. repeat
b. reflex

25b. Mark the following items if they are REFLEX actions, or ones happening so fast that a person cannot think about them.

- dodge a ball
- cross a street
- pull your arm away from a hot iron
- go shopping
- jump at the sound of thunder

25c. Explain what happens when you dodge a ball. Give the name for this action and why it happens.

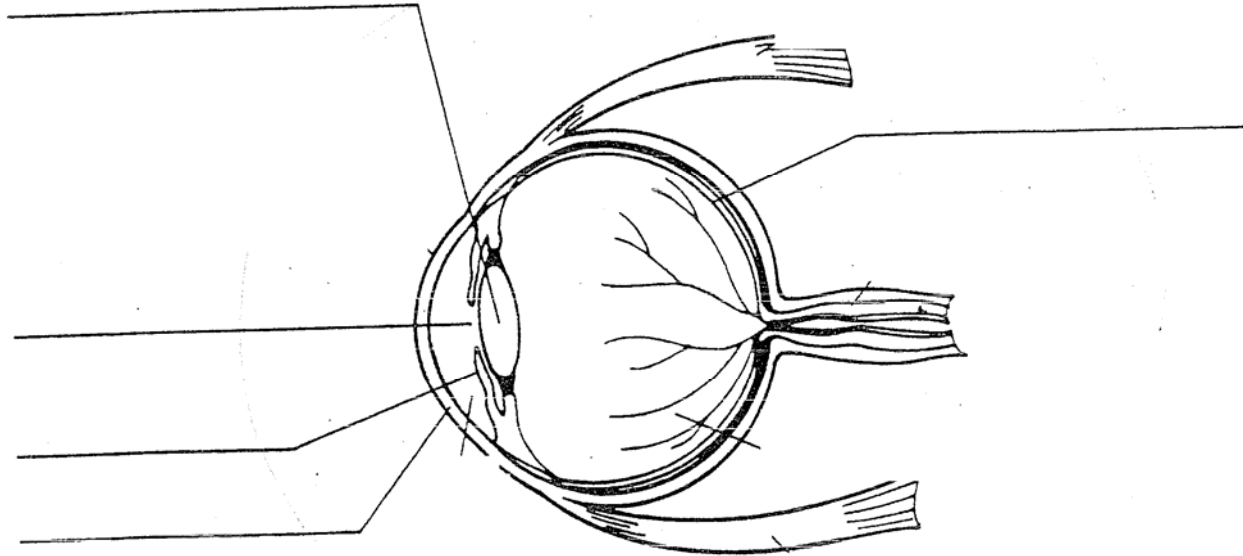
26a. Label the following parts of the eye: cornea, iris, pupil, lens, retina. Spell these correctly.



26b. Match each of the parts of the eye from the first column with the definitions in the second column:

- | | | |
|---------------------------------|----|---|
| <input type="checkbox"/> cornea | a. | dark opening in the eye through which light enters |
| <input type="checkbox"/> iris | b. | transparent, see-through covering on outside of eye |
| <input type="checkbox"/> pupil | c. | part of the eye that focuses light rays onto the retina |
| <input type="checkbox"/> lens | d. | a layer of tissue at the back of the eye |
| <input type="checkbox"/> retina | e. | colored part of the eye |

26c. Label the eye and choose three parts to define in your own words.



27a. Number the following steps IN ORDER to describe how the eye works.

- _____ The retina sends the upside-down picture to the optic nerve.
- _____ Light passes through the cornea, and then through the pupil, and finally through the lens.
- _____ The optic nerve sends the upside-down picture to the brain where the picture is flipped right-side up and we see.
- _____ The light is focused on the retina, at the back of the eye, where it forms an upside-down picture.

27b. In the following explanation of how the eye works, fill in the missing steps (in your own words).

- a. Light passes through the cornea, and then through the pupil, and finally through the lens.
- b. _____
- c. The retina sends the upside-down picture to the optic nerve.
- d. _____
- e. We see.

27c. Explain the steps for how the eye works.

28a. The _____ connects the eye to the brain and carries messages there which the brain interprets so we can see.

- a. spinal cord
- b. optic nerve

28b. Which of the following is NOT true?

- a. The optic nerve connects the eye to the brain.
- b. The optic nerve carries messages from the eye to the brain.
- c. The brain interprets the messages from the eye so we can see.
- d. The optic nerve carries messages all over the body.

28c. List at least two facts about the optic nerve.

- 1. _____
- 2. _____

29a. The iris makes the pupil _____ when light is dim so we can see better in the dark. The iris makes the pupil _____ in bright light to protect our eye from too much light.

- a. bigger; smaller
- b. smaller; bigger

29b. The iris makes the pupil bigger when light is _____ so we can see better in the dark. The iris makes the pupil smaller when light is _____ to protect our eye from too much light.

- a. dim; bright
- b. bright; dim

29c. Explain why your pupil gets bigger when light is dim, and smaller when the light is bright.

30a. _____ is an eye problem that causes distant objects to appear distinct while nearby objects look fuzzy. _____ is an eye problem that causes nearby objects to be clear but distant objects appear fuzzy.

- a. farsightedness; nearsightedness
- b. nearsightedness; farsightedness

30b. _____ is an eye problem that causes distant objects to appear distinct while nearby objects look fuzzy. _____ is an eye problem that causes nearby objects to be clear but distant objects appear fuzzy.

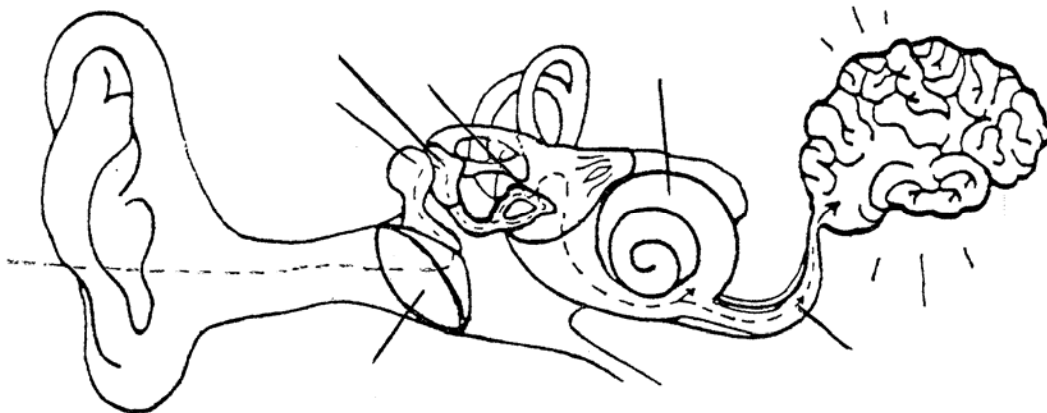
30c. Explain the difference between nearsightedness and farsightedness.

31a. Sound is caused by _____, which is movement back and forth very fast.
a. locomotion
b. vibration

31b. Sound is caused by _____, which is movement back and forth very fast.
a. locomotion
b. nodding
c. waving
d. vibration

31c. Describe what causes sound.

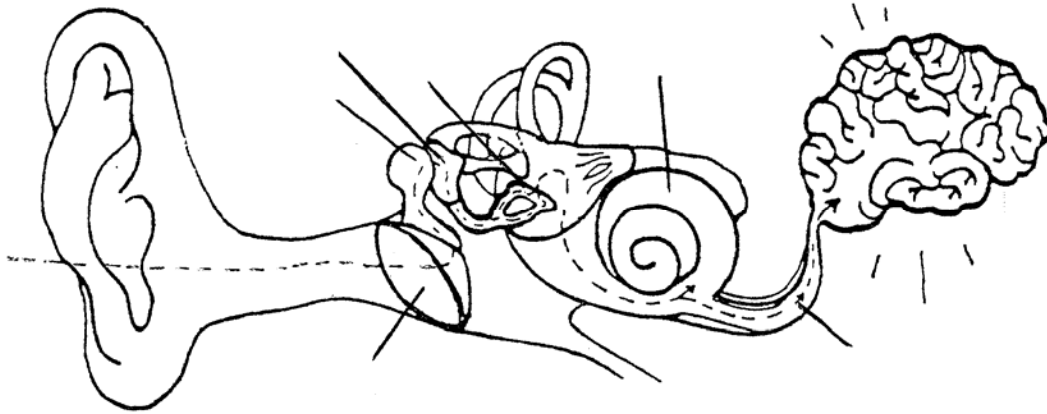
32a. Label the following parts of the ear: outer ear, eardrum, cochlea, auditory nerve, hammer, ear canal, stirrup, anvil.



32b. Match each of the parts of the ear in the first column with the correct definition in the second column.

- | | |
|------------------------------|---|
| _____ outer ear | a. ear bones inside the ear |
| _____ ear canal | b. passage that leads from the opening of the ear to the inner part of the ear |
| _____ eardrum | c. nerve that connects inner ear to the brain and carries messages to the brain |
| _____ hammer, anvil, stirrup | d. opening of the ear through which sound waves enter the ear |
| _____ cochlea | e. thin skin that stretches across inner end of the ear canal |
| _____ auditory nerve | f. spiral-shaped organ filled with liquid and small hairs which are sensitive to vibrations |

- 32c. Label the following parts of the ear: outer ear, eardrum, cochlea, auditory nerve, hammer, ear canal, stirrup, anvil. Then choose three parts (the three bones only count as one part) to describe in your own words.



- 33a. Number the following steps **IN ORDER** to describe how we hear:
- _____ Sound waves enter our ear through the outer ear and travel down the ear canal to the eardrum.
 - _____ The vibrations in the little bones inside the ear vibrate the liquid and the little hairs found in the cochlea.
 - _____ The auditory nerve sends a signal to the brain and we hear.
 - _____ The sound waves make the eardrum vibrate.
 - _____ Through the vibrations in the hairs in the cochlea connections are made with the auditory nerve.
 - _____ The vibrations of the eardrum cause vibrations in the hammer, anvil, and stirrup (the little bones in the ear).
- 33b. In the following explanation of how we hear, fill in the missing steps (in your own words).
- a. Sound waves enter our ear through the outer ear and travel down the ear canal to the eardrum.
 - b. _____
 - c. Vibrations begin in the hammer, anvil, and stirrup, the little bones of the ear.
 - d. _____
 - e. Vibrations in the hairs of the cochlea make connections with the auditory nerve.
 - f. _____
 - g. We hear.

33c. Explain the steps for how we hear:

The following Colorado Model Content Standards are covered in this assessment by the questions indicated:

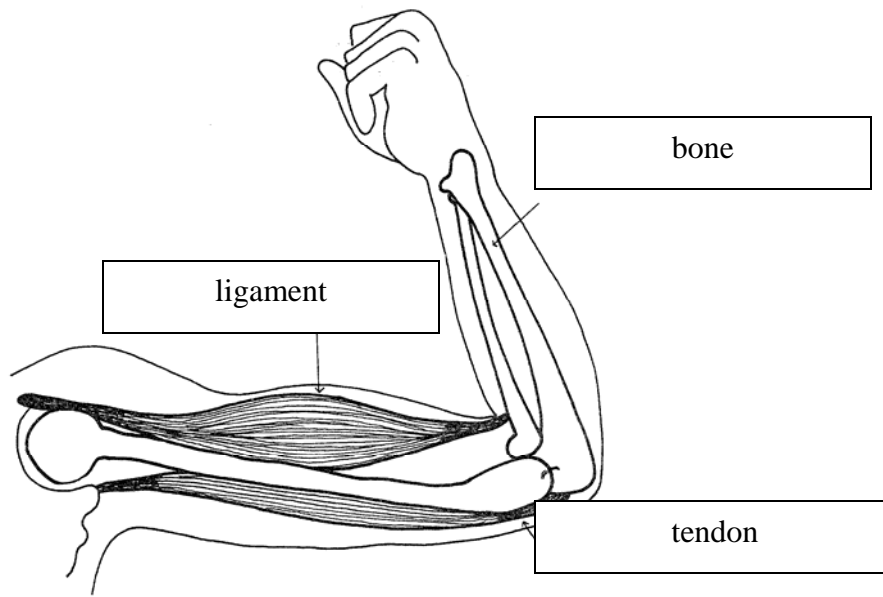
Questions 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c, 8a, 8b, 8c, 9a, 9b, 9c, 10a, 10b, 10c, 11a, 11b, 11c, 12a, 12b, 12c, 13a, 13b, 13c, 14a, 14b, 14c, 15a, 15b, 15c, 16a, 16b, 16c, 17a, 17b, 17c, 18a, 18b, 18c, 19a, 19b, 19c, 20a, 20b, 20c, 21a, 21b, 21c, 22a, 22b, 22c, 23a, 23b, 23c, 24a, 24b, 24c, 25a, 25b, 25c, 26a, 26b, 26c, 27a, 27b, 27c, 28a, 28b, 28c, 29a, 29b, 29c, 30a, 30b, 30c, 31a, 31b, 31c, 32a, 32b, 32c, 33a, 33b, 33c: Standard K-4.3.3.a describing human body systems (*for example, digestive, respiratory, circulatory, skeletal, muscular*)

Answer Key

- 1a. b. muscular
1b. c. muscular
1c. Acceptable answers could include:
-the system in the body that includes muscle cells and tissues that cause organs or body parts to move
- 2a. b. they are the tissues that make the body parts move
2b. c. they are the tissues that make the body parts move
2c. Acceptable answers could include:
-tissues that make the body parts move
- 3a. b, a, c
3b. skeletal, cardiac, smooth
3c. Acceptable answers could include (in any order):
-skeletal-muscles attached to our bones which make our limbs move, such as arms and legs
-cardiac-muscle forming strong walls of the heart, or simply heart muscle
-smooth-muscles found in internal organs which move on their own, such as moving the blood in the circulatory system or food in the digestive system
- 4a. a. Voluntary; Involuntary
4b. b. Voluntary; Involuntary
4c. Acceptable answers could include (in any order):
-voluntary-muscles that you control like in your arms or leg
-involuntary-muscles that work automatically on their own like your heart beating or breathing or blinking an eye
- 5a. a. skeletal; skeleton
5b. b. skeletal; skeleton
5c. Acceptable answers could include:
-the framework of the body
-system of bones that protects and supports the body and its internal organs
-system of bones that holds the body together
- 6a. a. bone; cartilage
6b. d. a bone; cartilage
6c. Acceptable answers could include:
-bone-one of the pieces of hard, dense material that supports the rest of the body
-cartilage-soft, flexible tissue found in the joints where it cushions against shock
- 7a. b. marrow
7b. Marrow

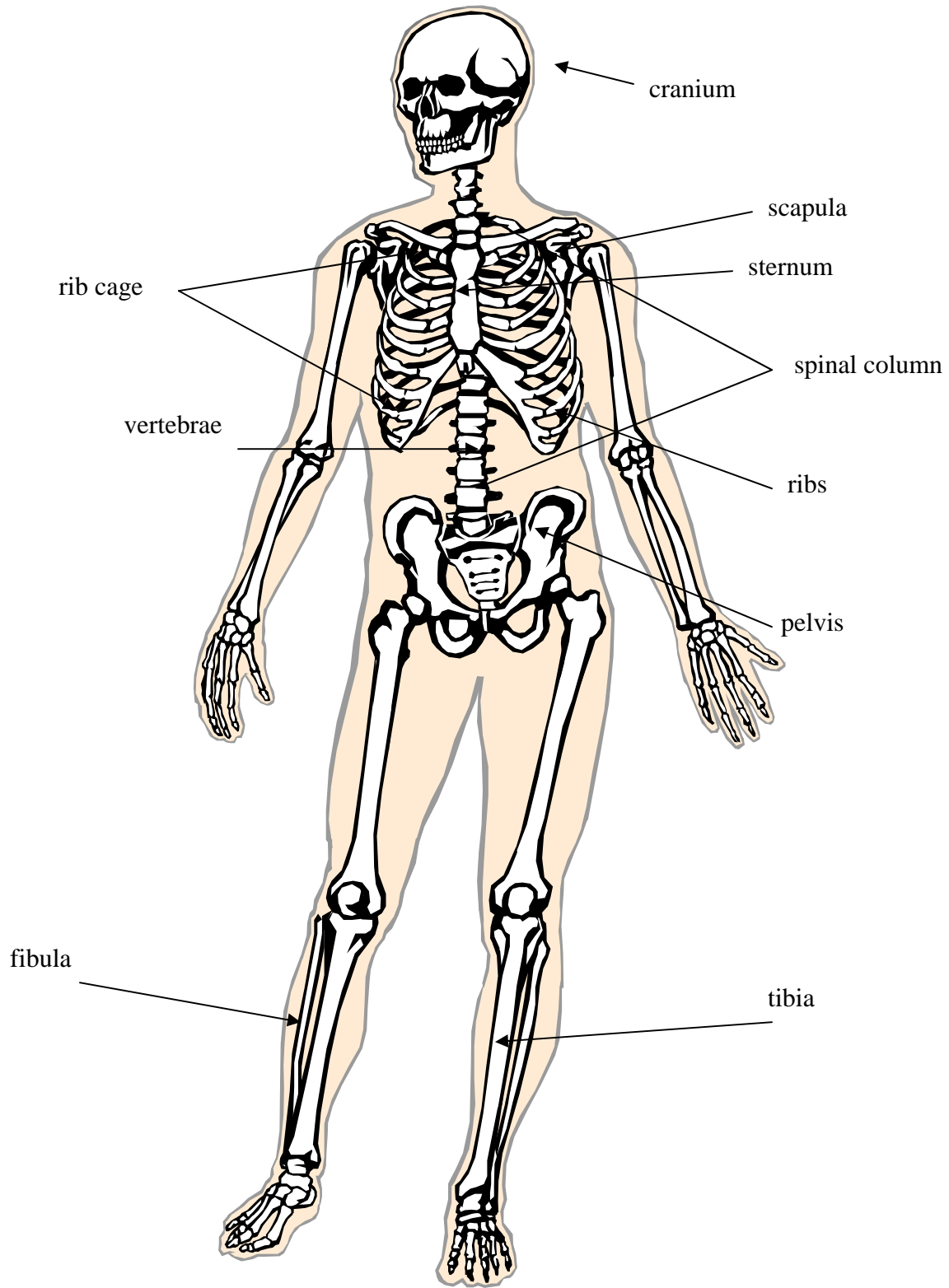
7c. Acceptable answers could include:
-soft tissue inside the bones
-where red blood cells are made

8a. b. ligaments; tendons
8b. d. ligaments; tendons
8c.



9a. b. Achilles tendon
9b. Achilles tendon
9c. Acceptable answers could include:
-named after the legendary Greek hero who could be wounded only in the heel
-a tendon connecting the heel bone with the calf muscle of the leg

10a.



- 10b. See 10a.
- 10c. See 10a.
 Acceptable answers could include (but must include at least three of these):
 -cranium-skull; protects the brain
 -spinal column-spine; backbone; protects the spinal cord
 -vertebrae-bone or cartilage segments forming the spinal column
 -ribs-series of curved bones in the chest attached to the spinal column
 -rib cage-bone structure formed by the ribs protecting the lungs and heart
 -sternum-breastbone
 -scapula-shoulder blade
 -pelvis-bowl-shaped group of bones connecting the trunk of the body to the legs and supporting the spine
 -tibia-inner, larger of the two bones in lower part of human leg, from the knee to the ankle
 -fibula-outer, smaller of the two bones in lower part of human leg, between the knee and ankle
- 11a. c, a, b
- 11b. cranium, spinal cord, lungs and heart
- 11c. Acceptable answers could include:
 -protection-each one protects certain organs in the body
- 12a. b. Vertebrae are bone or cartilage segments forming the spinal column.
- 12b. d. vertebrae
- 12c. Acceptable answers could include:
 -vertebrae are the bone or cartilage segments making up the spinal column
 -vertebrae help make up the spinal column
 -ribs are the curved bones in the chest
 -ribs are attached to the spinal column
- 13a. b. joint
- 13b. joint
- 13c. Acceptable answers could include:
 -joint-a place in the body where two bones meet
 -ball-and-socket
 -hinge
- 14a. a. Hinge; Ball and socket
- 14b. a, b, a, b
- 14c. Acceptable answers could include:
 -hinge; knees, elbows
 -ball-and-socket; shoulder, hip
- 15a. b. an x-ray
- 15b. c. an x-ray is the same as an ultra-violet ray

15c. Acceptable answers could include:
-doctors use x-rays to take pictures (also called x-rays) of the inside of the body so they can see things like broken bones

16a. a. broken bones

16b. broken bone

16c. Acceptable answers could include:

-wear a helmet

-wear knee and elbow pads

-buckle you safety belt

-eat healthy nutritious foods that contain calcium

17a. b. nerves

17b. c, d, e

17c. brain, spinal cord, nerve

18a. a. takes in all the information coming from the senses, and arranges it for us

18b. a. takes in all the information coming from the senses, and arranges it for us

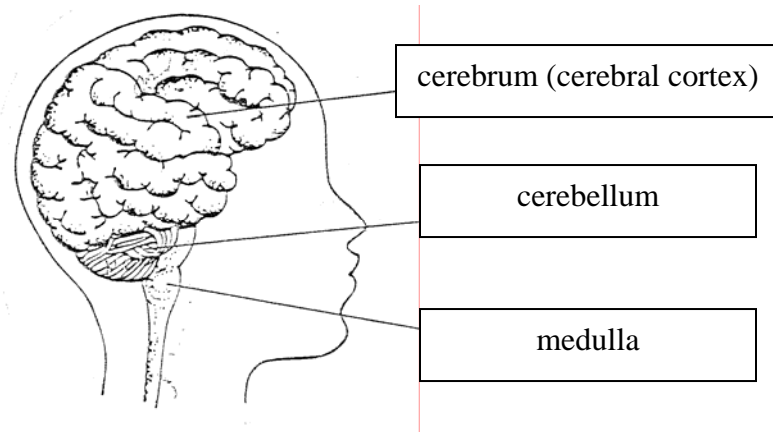
18c. Acceptable answers could include:

-information is constantly coming into and out of the control tower, or the brain

-the information goes down the main runway, or the spinal cord

-it goes down many other runways, or the nerves

19a.



19b. See 19a.

19c. See 19a.

Acceptable answers could include:

-medulla-brain stem (connects cerebrum with the spinal cord); works all the time; controls digestion, heartbeat, breathing, body temperature, and other body functions

-cerebellum-works all the time; controls balance, posture, and coordination

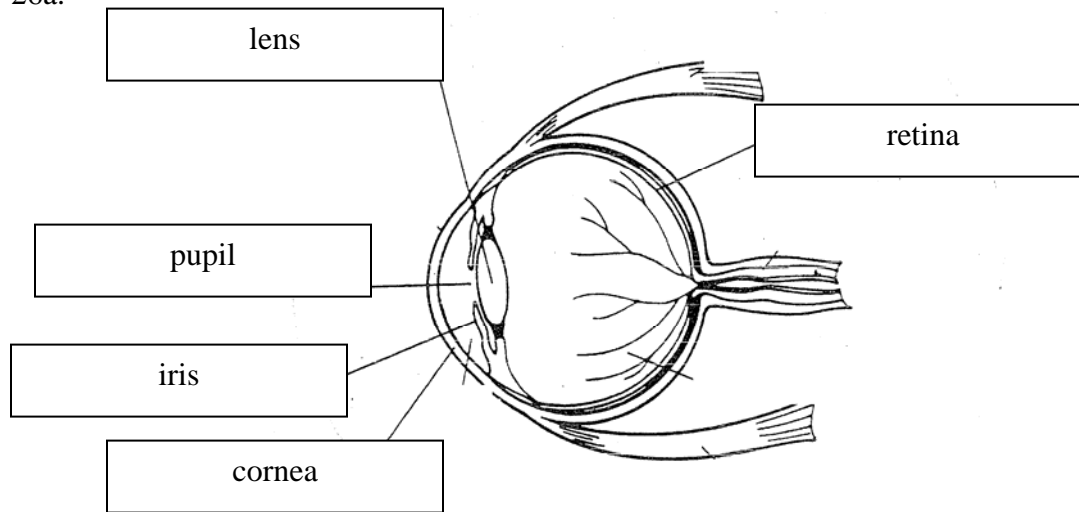
-cerebrum-largest part of the brain; controls thinking, sensing, and moving

20a. a. medulla; cerebellum

20b. c. medulla; cerebellum

- 20c. Acceptable answers could include:
 -similar-they work even when we don't know it
 -different-control different parts of the body; medulla controls various body functions, while the cerebellum controls balance and coordination
- 21a. a. cerebrum; cerebral cortex
 21b. a. cerebrum; cerebral cortex
 21c. cerebrum; cerebral cortex
- 22a. a, c, b, a, c
 22b. Acceptable answers could include:
 -cerebrum-smell a flower, do an addition problem, tell Mom that Grandma called, taste and orange, etc.
 -medulla-cause the heart to pump, breathe faster when jogging, make the stomach muscles work, etc.
 -cerebellum-balance on a bicycle, walk on a tightrope, etc.
- 22c. Acceptable answers could include:
 -medulla- controls digestion, heartbeat, breathing, body temperature, and other body functions
 -cerebellum- controls balance, posture, and coordination
 -cerebrum- controls thinking, sensing, and moving
- 23a. b. a long piece of nerve tissue that runs from the brain down through the backbone
 23b. spinal cord
 23c. Acceptable answers could include:
 -a long piece of nerve tissue that runs through the brain down through the backbone
 -one of the three major parts of the nervous system
 -comparable to the main runway at an airport
- 24a. a. tiny fibers found in the spinal cord and all over the body that send messages to the brain
 24b. c. Nerves are tiny fibers found in the spinal cord and all over the body that hold the bones in place.
 24c. Acceptable answers could include:
 -tiny fibers found in the spinal cord and all over the body
 -they send messages to the brain
- 25a. b. reflex
 25b. dodge a ball, pull your arm away from a hot iron, jump at the sound of thunder
 25c. Acceptable answers could include:
 -nerves in your spine and brain act really fast to protect yourself
 -you react before you have time to think
 -this is a reflex action

26a.



26b. b, e, a, c, d

26c. See 26a for correct labels.

Acceptable answers could include any three of the following:

- cornea-transparent, see-through covering on outside of eye
- iris-colored part of the eye
- pupil-dark opening in the eye through which light enters
- lens-part of the eye that focuses light rays onto the retina
- retina-a layer of tissue at the back of the eye

27a. 3, 1, 4, 2

27b. Acceptable answers could include:

- b. the light is focused on the retina, at the back of the eye, where it forms an upside-down picture
- d. the optic nerve sends the upside-down picture to the brain where it is turned right-side-up

27c. Acceptable answers could include:

- Light passes through the cornea, the pupil, and the lens.
- The light is focused on the retina where it forms an upside-down picture.
- The retina sends this picture to the optic nerve.
- The optic nerve sends the picture to the brain where it is turned right-side-up.
- We see.

28a. b. optic nerve

28b. d. The optic nerve carries messages all over the body.

28c. Acceptable answers could include:

- the optic nerve connects the eye to the brain
- the optic nerve carries messages from the eye to the brain
- the optic nerve receives messages from the retina

29a. a. bigger; smaller

29b. a. dim; bright

29c. Acceptable answers could include:
-the iris makes the pupil bigger when light is dim so we can see better in the dark
-the iris makes the pupil smaller when light is bright to protect our eye from too much light

30a. a. farsightedness; nearsightedness

30b. Farsightedness; nearsightedness

30c. Acceptable answers could include:

- nearsightedness-far objects are fuzzy while nearby objects are clear
- farsightedness-nearby objects are fuzzy while distant ones are clear

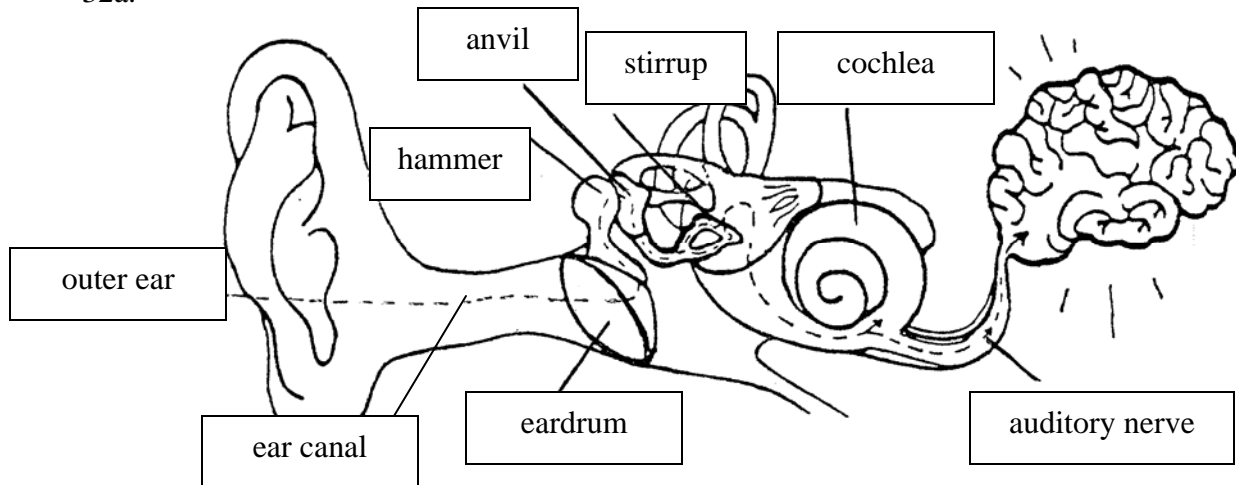
31a. b. vibration

31b. d. vibration

31c. Acceptable answers could include:

- sound is caused by vibration, which is fast movement back and forth

32a.



32b. d, b, e, a, f, c

32c. See 32a for correct labels.

Acceptable answers could include any of the three following:

- outer ear-opening of the ear through which sound waves enter the ear
- ear canal-passage that leads from the opening of the ear to the inner part of the ear
- eardrum-thin skin that stretches across inner end of the ear canal
- hammer, anvil, stirrup-ear bones inside the ear
- cochlea-spiral-shaped organ filled with liquid and small hairs which are sensitive to vibrations
- auditory nerve-nerve that connects inner ear to the brain and carries messages to the brain

33a. 1, 4, 6, 2, 5, 3

- 33b. Acceptable answers could include:
- b. The sound waves make the eardrum vibrate.
 - d. The vibrations in the little bones inside the ear vibrate the liquid and the little hairs found in the cochlea.
 - e. The auditory nerve sends a signal to the brain.
- 33c. Acceptable answers could include:
- Sound waves enter our ear through the outer ear and travel down the ear canal to the eardrum.
 - This starts the eardrum vibrating.
 - The vibrations of the eardrum cause vibrations in the hammer, anvil, and stirrup (the little bones in the ear).
 - These vibrations vibrate the cochlea and the liquid and hairs found inside there.
 - The vibrations in the hairs cause connections to be made with the auditory nerve.
 - The auditory nerve sends a signal to the brain.
 - We hear.