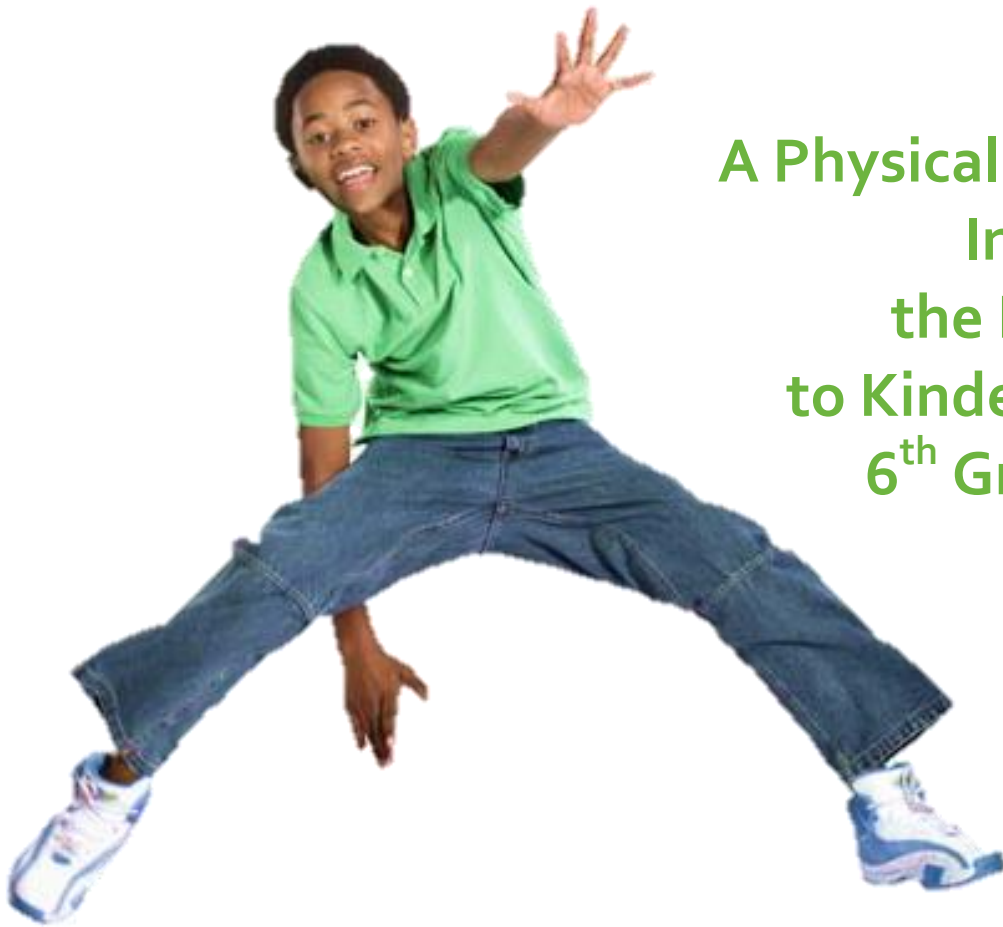


1-Minute Energizers



A Physical Activity Toolkit for
Introducing
the Human Body
to Kindergarten through
6th Grade Students



Acknowledgements

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Introduction

OVERVIEW

1-Minute Energizers are designed to increase kindergarten through sixth grade students' knowledge of various anatomical, physiological and nutritional concepts as well as to increase daily physical activity participation. Studies have shown that physical activity breaks throughout the school day help improve enjoyment, focus, and alertness. All 10 energizers can be performed in the classroom or outdoors with little to no equipment as a means to break up traditional teaching practices. Energizers are linked to California's Physical Education and Health Education Content Standards, as well as Nutrition Competencies.

USING 1-MINUTE ENERGIZERS

1-Minute Energizers are presented in a consistent, easy-to-follow format. Each energizer contains the following sections:

- **Prep Time.** The average amount of time needed to set-up for the energizer and explain instructions to students.
- **Activity Time.** The average amount of time needed to complete the energizer with your students.
- **Materials.** The materials you will need to complete the energizer and age group challenges.
- **Educational Objectives.** Human anatomy and physiological concepts covered in the energizer.
- **Physical Activity Objectives.** Physical fitness and motor skill concepts covered in the energizer.
- **Procedure.** Detailed step-by-step instructions to prepare and complete the energizer.
- **Challenges.** Suggestions for increasing the difficulty of each energizer appropriate for K-2, 3-4, 5-6 age groups.
- **Short on Space?** Suggestions for modifying the energizer if space is limited.
- **Resources.** Website links that can be referenced for additional information about the organ systems and physiological concepts covered in the energizer.
- **Related California Content Standards.** List of the specific content standards linked to the energizer.
- **Key Words.** Definitions for technical terms used in the energizer.
-   Energizer best performed outdoors (sun), indoors (desk), or both.

Introduction

APPENDICES

- **Appendix A.** Detailed background information for each of the organ systems and concepts covered in the Energizers.
- **Appendix B.** Classroom set-up and supplemental content images.

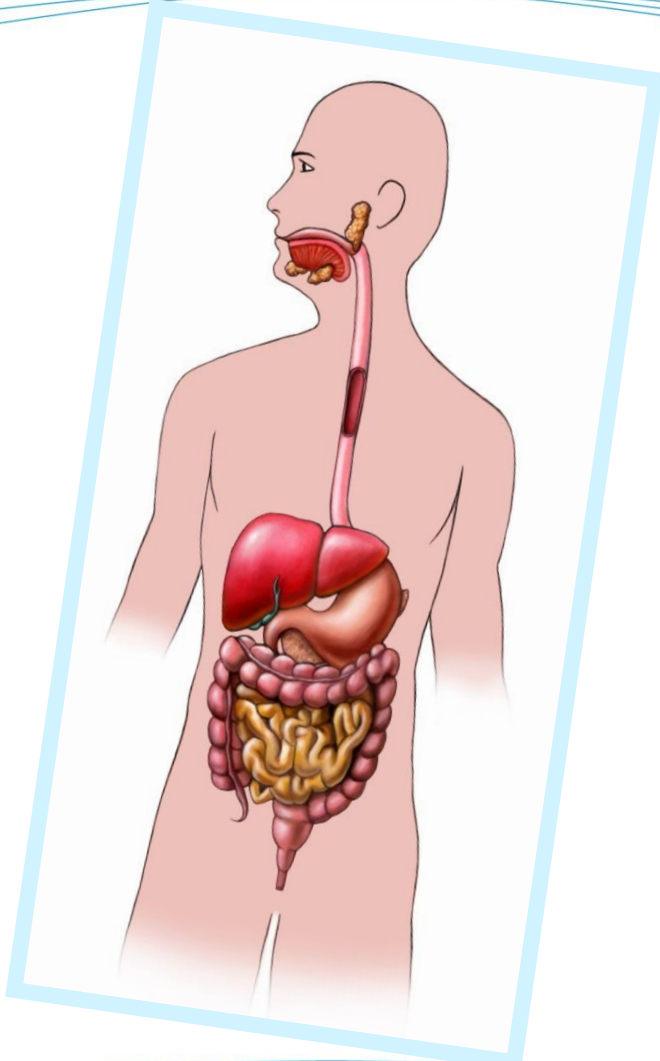
ADDITIONAL SUGGESTIONS

- Allow for extra time when the energizer is first introduced in the classroom so that the educational content and the physical activity form can be thoroughly explained to students. After initial exposure, activity time can be decreased to ≤ 5 minutes.
- Post visual aids of the organ systems on the walls of the classroom. This will allow students to make connections between the energizers and their own bodies.
- Age-group challenges can be incorporated after the class has mastered the initial procedure. You can assess student knowledge and understanding using the Body Facts Energizer. For 3-4 and 5-6 graders, it is recommended that you progress using lower grade challenges first.

*Now that you have all the tools you need, let's get your classroom
ENERGIZED!*

Swallow This!

THE DIGESTIVE SYSTEM



Prep Time: 1-2 minutes



Activity Time: 1-1.5 minutes

Materials: N/A

Educational Objectives:

1. To identify the basic anatomy of the digestive system
2. To list the sequential steps of digestion
3. To identify the macronutrient composition (calories, protein, fat, and carbohydrate) of different foods
4. To describe how macronutrient composition affects rate of digestion and where food is broken down in the gastrointestinal tract

Physical Activity Objectives:

1. To practice body movements involved in the improvement of cardiorespiratory fitness, muscular strength and power, and coordination

Swallow This!

PROCEDURE

1. Instruct class to stand next to their seats.
2. Recite the passage below and demonstrate stated moves with each step.
3. After introduction of energizer, pause during narrative and provide students time to call out the regions of the gastrointestinal tract and perform appropriate movements without instruction.

*Pretend you are a bite of food. All food travels through a very long tube in our body called the **DIGESTIVE SYSTEM**. What stops will you make along the way?*

- a) **Mouth** → "You are in the **MOUTH** being chewed. Jump up and down!" (students instructed to land in the same spot each time) (10 seconds)
- b) **Throat** → "Stop! You were swallowed. You slowly enter the **THROAT**. Move in slow-motion!" (students instructed to slowly lift arms from their sides to above their head and back down while slowly squatting lower and lower to the ground) (5 seconds)

- c) **Stomach** → "Stop! You just entered the **STOMACH**. You are getting thrown around as the stomach mixes the food. Jump and spin around!" (students instructed to land in the same spot each time) (10 seconds)
- d) **Intestines** → "Stop! Now you are in the **INTESTINES**. The intestines share food with other parts of the body. Jump like a rabbit over to the wall! (instruct students to jump as far as possible with each jump towards walls of classroom). If the body decides you are not helpful, you continue moving through the intestines. Jump from side-to-side as you move through the tube (instruct students to jump sideways with feet facing forward)" (15 seconds)
- e) **Rectum** → "Your journey is almost over. You are now in the **RECTUM**, where food leaves the body. As a group, take 5 hops towards the door. " (10 seconds)

Swallow This!

CHALLENGES

K-2 procedure:

1. Introduce speed of transit. "Different foods move through the digestive system faster than others. The faster something moves, the more energy we have and the slower something moves, the more sluggish we feel. For example, if it was a race, fruits and veggies would come in first, chicken and fish would come in second, and fatty foods like french fries and shakes would come in last. If I eat broccoli, I will feel energized, but if I eat a chocolate shake, I might feel tired."
2. Recite steps of digestion. Call out a food and instruct students to adjust their speed accordingly. For example – if you start with fish and then call out carrot, students would speed up the movements.

3-4 procedure:

1. Replace parts of body with anatomical terms and add more details (see next page).
2. Increase difficulty level of standard movements.
Ex.: Hop on one leg instead of two. In the mouth, instead of jumping up and down, do jumping squats (jump vertically, and upon landing, bend knees and assume squat position prior to propelling body vertically again).
3. Incorporate K-2 challenge.

Swallow This!

CHALLENGES (continued)

Pretend you are a bite of food. All food travels through a very long tube in our body called the **DIGESTIVE SYSTEM**. What stops will you make along the way?

- a) **Mouth** → "You are in the **MOUTH** being chewed. Jump up and down!" (10 seconds)
- b) **Pharynx** → "Stop! You were swallowed. You slowly enter the throat also known as the **PHARYNX**. Move in slow-motion!" (5 seconds)
- c) **Esophagus** → "You are falling and sliding down the **ESOPHAGUS**. Stand and wave your arms from side to side!" (10 seconds)
- d) **Stomach** → "Stop! You just entered the **STOMACH**. You are getting thrown around as the stomach mixes the food. Jump and spin around!" (10 seconds)
- e) **Small Intestine** → "Stop! Now you're in the **SMALL INTESTINE** where nutrients move into other parts of the body! This half of the class, jump like a rabbit over to the wall to enter the body! If the body decides you are not helpful, you continue moving through the intestines. This half of the class, do lunges to the other wall as you continue moving through the small intestine." (15 seconds)
- f) **Large Intestine** → "Stop! You have made your way to the **LARGE INTESTINE**, where you'll be boxed up to leave the body. Do the wave as a group as we move along the large intestine!" (10 seconds)
- g) **Rectum** → "Your journey is almost over. You are now in the **RECTUM**, where food leaves the body. As a group, take 5 hops towards the door. " (10 seconds)

Swallow This!

CHALLENGES (continued)

5-6 procedure:

1. Use script from 3-4 challenge.
2. Introduce the macronutrients. "Fruits, veggies, cereal, pasta, and bread contain **carbohydrates**. Chicken, fish, eggs, and beans contain **proteins**. Oil, butter, and cream contain **fats**."
3. Introduce concept of enzymes. "**Enzymes** are the scissors of our digestive system. They cut food we put in our mouths into many small pieces so our body's cells can take advantage of the nutrients in food. The enzymes needed to cut up carbohydrates are only found in the mouth and small intestine. The enzymes needed to cut up proteins are only in the stomach and small intestine. The enzymes needed to cut up fats are only in the small intestine. (If a digestive system visual is in the classroom, point to these regions as you explain).
4. Divide class into 3 groups. Assign each group a different food. Start the digestion narrative as a group. Students assigned to carbohydrates (see examples above) should freeze during the mouth and small intestine portion of the exercise, where carbohydrates have to be cut up before moving on, fats would freeze in the small intestine, etc. None of the groups would freeze in the pharynx, esophagus, or large intestine because no enzymes are found there.
5. Increase the level of difficulty of the standard movements. Ex.: During the freezing motion, instruct students to hold a lunge position or a stretch position.

Swallow This!

SHORT ON SPACE?

Adjust movements. Replace jumping with squats, lunges with high knees, and hopping for distance with hopping in place.

RESOURCES

1. <http://www.choosemyplate.gov>
2. http://kidshealth.org/kid/htbw/digestive_system.html
3. <http://digestive.niddk.nih.gov>

KEY WORDS

Macronutrient: Nutrients that the body uses in large amounts: protein, fat, and carbohydrate.

Gastrointestinal tract: The tube extending from the mouth to the anus, including organs like the stomach and intestine.

Cardiorespiratory fitness: A body's ability to supply oxygen to the muscles during physical activity. AKA aerobic fitness.

Enzymes: Proteins that speed up chemical reactions and are used to break bigger molecules into smaller parts.

RELATED CA CONTENT STANDARDS

Physical Education:

K. 1.1
K. 1.3
K. 4.10
1. 1.1
1. 1.3
1. 1.4
1. 1.5
1. 1.8
1. 4.12
1. 5.6
2. 1.5
2. 3.3
4. 4.4
5. 3.2

Health Education:

K. 1.5G
1. 1.2G
2. 1.1N
3. 1.3G
4. 1.1N
4. 1.3N
5. 1.3N
5. 1.8N

Nutrition Competencies:

K. 1b, 1c, 1f
1 – 2. 1e
3 – 4. 1a, 1e, 1f
5 – 6. 1e, 1f

The Bone Song

THE SKELETAL SYSTEM



Prep Time: 1-2 minutes



Activity Time: 1 minute

Materials: N/A

Educational Objectives:

1. To name the major bones in the skeletal system
2. To identify the location of different bones and parts of the body in relation to one another
3. To explain how movement at joints relates to movement of specific bones

Physical Activity Objectives:

1. To practice ipsi- and contra-lateral movements intended to increase muscular endurance and muscular strength

The Bone Song



PROCEDURE

1. Introduce the functions of the skeletal system. “Our bones protect our internal organs like our heart, stomach, and brain. They give our bodies shape and support. Bones make it possible for us to move and they help make our blood. Today we are going to learn the bones of our body.”
2. Teach students one verse of the song below (set to tune of “Wheels on the Bus”). At the end of the verse, perform the designated movement. Repeat the verse and encourage students to participate in the movement.
3. Progress by adding additional verses and exercises. Focus on one region of the body at a time (Ex. arms, legs) and emphasize the connections.
4. Instruct class to sing song with you and perform designated movements.

The Bone Song

The Bones in my body hold me up
hold me up,
hold me up,
The bones in my body hold me up
all day long
(class repeats)

My shoulder blade is connected to my upper arm
upper arm
upper arm
My shoulder blade is connected to my upper arm
Let's move them all around
(move arms up and down)

My upper arm and forearm meet at my elbow
my elbow
my elbow
My upper arm and forearm meet at my elbow
Let's bend them back and forth
(do bicep curls)

My forearm is above my five fingers
five fingers,
five fingers,
My forearm is above my five fingers
Let's shake them all about
(shake out arms)

My collarbone we call our clavicle
clavicle,
clavicle,
My collarbone we call our clavicle
Let's raise it up and down
(do shoulder shrugs)

My breast bone connects to pairs of ribs
pairs of ribs
pairs of ribs
My breast bone connects to pairs of ribs
Let's count all twenty-four
(twist side to side while counting to 24)

The Bone Song

The Bones in my body hold me up
hold me up,
hold me up,
The bones in my body hold me up
all day long

My spine is above my hip bone
hip bone
hip bone
My spine is above my hip bone
Let's stretch them out
(bend forward and round the back)

My hip bone connects with my upper leg
upper leg
upper leg
My hip bone connects with my upper leg
Let's shake it out
(shake out legs, one at a time)

My upper and lower legs meet at my kneecap
kneecap
kneecap
My upper and lower legs meet at my kneecap
Let's bend them back and forth
(march in place)

The lower leg connects to my five toes
five toes
five toes

The lower leg connects to my five toes
Let's shake them all about
(shake out feet)

The Bone Song

CHALLENGES

K-2 procedure:

1. Increase the number of verses the class can sing together at a given time.
2. Instruct students to point to the bones before beginning the designated movement.
3. Adjust speed and direction of movement with adjustments in speed of the song.

3-4 procedure:

1. Replace colloquial terms with scientific names in the song (see next two pages)
2. Sing each verse twice. Instruct students to perform movement on only 1 side of the body and switch during the repeat.

5-6 procedure:

1. Select student to lead activity using scientific names.
2. Add balance to designated movements (Ex. stand on one foot or assume squat position while performing upper body movements)

The Bone Song

CHALLENGES (continued)

The Bones in my body hold me up
hold me up,
hold me up,
The bones in my body hold me up
all day long

My scapula is connected to my humerus
humerus
humerus

My scapula is connected to my humerus
Let's move them all around
(move arms up and down)

My humerus is proximal to the radius and ulna
radius and ulna
radius and ulna

My humerus is proximal to the radius and ulna
Let's bend them back and forth
(do bicep curls, one arm at a time)

My elbow is proximal to my phalanges
phalanges,
phalanges,
My elbow is proximal to my phalanges
Let's shake them all about
(shake out arms one at a time)

My sternum is medial to my clavicle
clavicle,
clavicle,

My sternum is medial to my clavicle
Let's raise it up and down
(do shoulder shrugs one at a time)

My vertebrae are posterior to pairs of ribs
pairs of ribs
pairs of ribs

My vertebrae are posterior to pairs of ribs
Let's count all twenty-four
(twist from center to one side)

The Bone Song

CHALLENGES (continued)

The Bones in my body hold me up
hold me up,
hold me up,
The bones in my body hold me up
all day long

My vertebrae are superior to my pelvis
my pelvis
my pelvis
My vertebrae are superior to my pelvis
Let's stretch them out
(bend forward and round the back)

My pelvis is superior to my femur
my femur
my femur
My pelvis is superior to my femur
Let's shake it out
(shake out legs, one at a time)

The femur and tibia meet at the patella
patella
patella
The femur and tibia meet at the patella
Let's bend them back and forth
(perform squats)

The tibia is proximal to more phalanges
phalanges
phalanges
The tibia is proximal to more phalanges
Let's flex them now
(perform calf raises)

The Bone Song

RESOURCES

1. <http://kidshealth.org/kid/htbw/bones.html>
2. http://www.kidsbiology.com/human_biology/skeletal-system.php
3. <http://www.learnbones.com>

KEY WORDS

Ipsilateral: Occurring on the same side of the body.

Contralateral: Occurring on opposite sides of the body.

RELATED CA CONTENT STANDARDS

Physical Education:

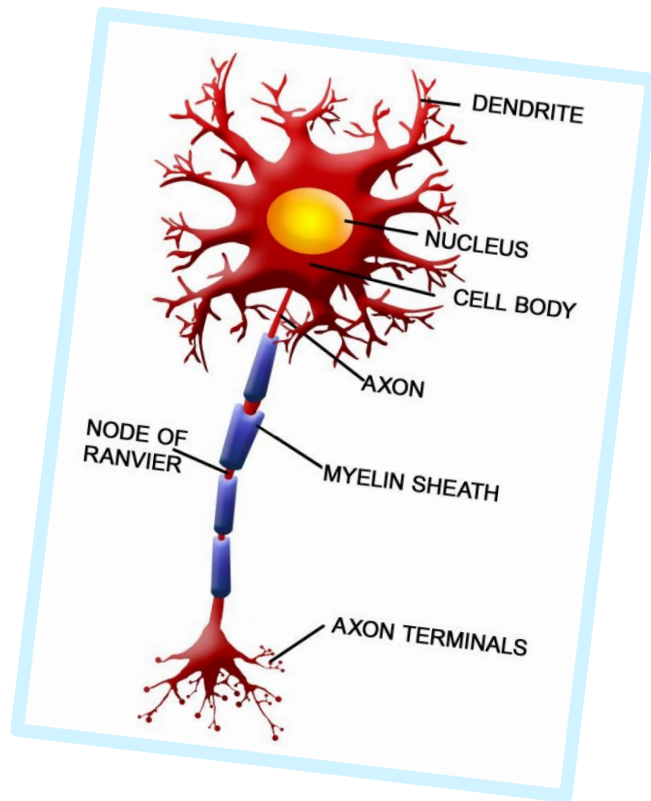
- K. 1.6
- K. 2.3
- K. 5.5
- 1. 1.22
- 1. 2.1
- 1. 4.12
- 2. 1.3
- 6. 1.8

Health Education:

- K. 1.5G
- 1. 1.2G
- 6. 1.3G

Information Relay

THE NERVOUS SYSTEM



Prep Time: 5-10 minutes



Activity Time: 1-2 minutes

Materials: chalk, chalk/whiteboard, poster board labeled "Brain," math flashcards

Educational Objectives:

1. To identify the different parts of a neuron
2. To describe how the nervous system relays information throughout the body

Physical Activity Objectives:

1. To cooperate with classmates in coordinated movement patterns
2. To practice motor skills which rely on agility, coordination, speed, and balance

Information Relay

PROCEDURE

1. Introduce the nervous system: "The **nervous system** uses roads to pass information from one part of your body to another. Your **brain** is like your house. It is connected to school with roads and you use a car to travel from home to school so you can learn. Today, we are going to pretend like we are cars passing information from your brain to parts of the body."
2. Divide class into two groups. Group #1 represents the cars carrying information from the brain to the body. Arrange Group #2 in two lines facing one another, forming a tunnel. Group #2 represents the road. Stand at the beginning of the two lines holding brain poster board (see page 20 for setup picture).
3. Acting as the brain, call out a math problem or provide "car" students with math flashcards.
4. Instruct the cars to gallop through the tunnel in pairs, starting at the brain. When these students get to the end of the tunnel, they write the answer to the math problem on the board. Once the answer has been written, they sprint to the beginning of the line through the outside of the pathway (one student on each side) in order to get more information from the brain.
5. As Group #1 students run the length of the road, students from Group #2 jump up, making a wave-like motion. These students should be marching in place until the information reaches them.
6. As an alternative movement to jumping, Group #2 students can start about two arm's length apart and perform a side slide to touch next student in tunnel when the information reaches them.

Information Relay

CHALLENGES

K-2 procedure:

1. Introduce concept of neural pathways. "Sometimes it takes more than one road to pass information from the brain to the body. There are gates that separate roads and we must open them before information can continue moving."
2. Repeat activity with two or more "roads" in series. To pass information from road 1 to road 2, the last pair of students in the tunnel of road 1 will clap the hands of the first pair of students in the tunnel of road 2 three times which will "open the gate" for the cars. The signal continues through road 2.
3. "Car" students will leap through tunnels and "Road" students will run in place before jumping to complete the wave.

3-4 procedure:

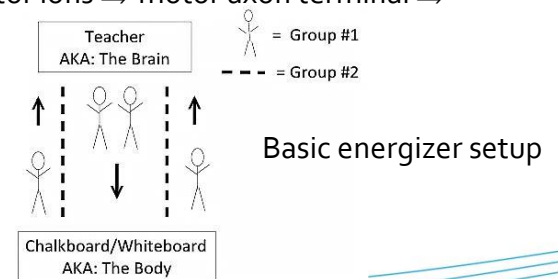
1. Introduce neuron anatomy. "The roads of the nervous system are called **neurons**. The two students closest to the brain are the **dendrites**, the two students farthest away from the brain are called **axon terminals** and the students between the dendrites and axon terminals are called **axons**. The cars that travel through the tunnel are called **ions**."
2. Arrange students as described in original procedure. Ask students to raise their hands as you call out the parts of a neuron listed in step #1.
3. Introduce neuron classification. "Similar to roads, not all neurons are the same. Some neurons are like dirt roads and information has to move more slowly while others are like freeways where information can move a lot faster. There are three types of neurons: **Type A** (fast), **Type B** (medium), **Type C** (slow). Announce neuron type and instruct students to adjust speed appropriately. Ex.: leaping for Type A neurons, hopping for Type B, bear

Information Relay

CHALLENGES (continued)

5-6 procedure:

1. Introduce motor and sensory pathways. "In the nervous system, information travels in two directions: 1- **motor neurons** pass information from the brain to the body and 2- **sensory neurons** pass information from the body to the brain. If you touch a hot stove, a sensory neuron passes information from your finger to your brain. A motor neuron then passes information from your brain to your hand so you can move your finger."
2. Arrange students into 2 tunnels and 2 sets of ions, one on either side of the brain. The axon terminals of the sensory neuron will stand next to the brain on one side and the dendrites of the motor neuron will stand next to the brain on the other side. Ions will stand next to the dendrites for both neurons. Ask students to raise their hands as you call out neuron type and part of neuron (see 3-4 procedure, step #1).
3. Place a stack of flashcards next to dendrites of sensory neurons. Dendrites will read problem to ions who will move through the sensory neuron axon tunnel as previously described and recite the problem to axon terminals of sensory neuron. Axon terminals recite problem to the brain as the ions walk back to the dendrites for another problem. The brain instructs motor neuron dendrites to write answer in a specific place on the chalkboard/whiteboard, who then give the same information to motor neuron ions. These ions move through the motor neuron axon tunnel until they reach the axon terminals. Ions give instruction to axon terminals before walking back to get more information from dendrites. Axon terminals write the answer on the board. The information travels as follows: sensory dendrites ⇒ sensory ions ⇒ sensory axon terminals ⇒ brain ⇒ motor dendrites ⇒ motor ions ⇒ motor axon terminal ⇒ chalkboard.



Information Relay

SHORT ON SPACE?

1. Divide students into groups of 6-8. These groups can spread out in the classroom and make smaller roads.
2. Designate one road group to answer the question on the board.
3. Instead of tunnels, compose roads of a single line of students.

RESOURCES

1. <http://www.brainpop.com/health/bodysystems/brain>
2. <http://www.enchantedlearning.com/subjects/anatomy/brain/Neuron.shtml>
3. <http://faculty.washington.edu/chudler/neurok.html>

KEY WORDS

Neuron: Main cell of the nervous system.

Agility: Ability to quickly change direction of the body.

Neural pathways: A network of interconnected, communicating neurons.

Dendrites: Extensions from the cell body of a neuron that receive information from the environment or other neurons.

Axons: Extensions from the cell body of a neuron that transport information from the environment to the brain or other neurons.

Axon terminals: The ends of axons which make contact with the brain or other neurons.

RELATED CA CONTENT STANDARDS

Physical Education:

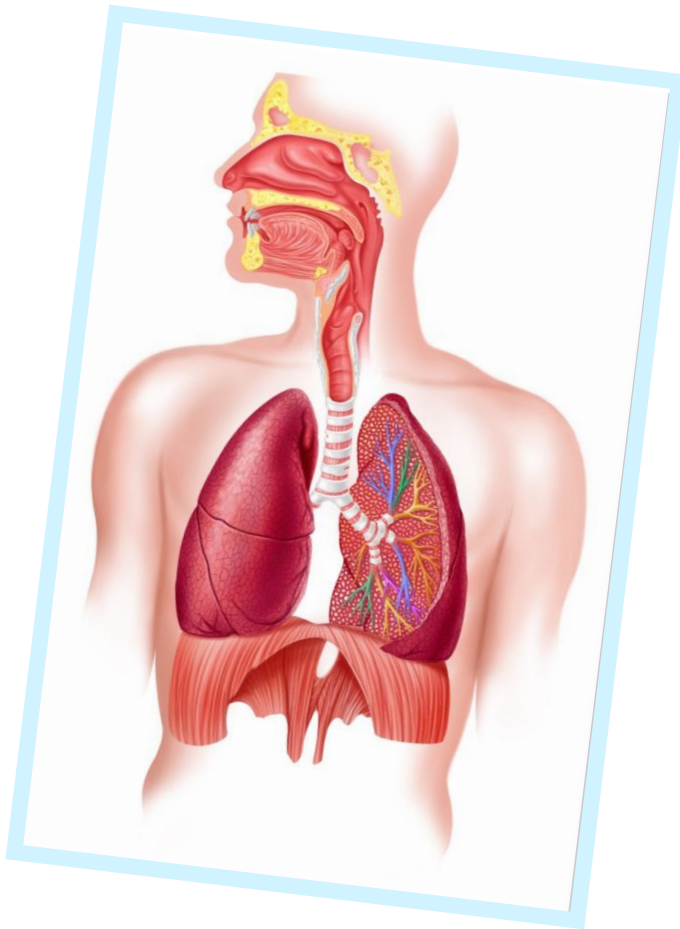
K. 1.1 1. 2.4
K. 4.10 2. 1.1
1. 1.1 2. 1.6
1. 1.2 5. 1.2
1. 1.18 6. 5.1

Health Education:

K. 1.5G
1. 1.2G

Rising with the Sun

THE RESPIRATORY SYSTEM



Prep Time: 5 minutes



Activity Time: 1-2 minutes

Materials: N/A

Educational Objectives:

1. To identify the basic anatomy and function of the respiratory system
2. To describe how breathing helps to facilitate survival

Physical Activity Objectives:

1. To perform sun salutations while practicing deep breathing in a coordinated manner
2. To practice yoga positions that will assist in the development of trunk, hamstring, hip-flexor, and calf strength and flexibility

Rising with the Sun

PROCEDURE

1. Assemble the class into a semi-circle.
2. Instruct the students to shadow your movement while completing sun salutations.
3. Recite the following while performing the corresponding movement. Once the class is familiar with the exercise, they will be able to complete the salutations without watching the teacher or fellow classmates.

We breathe in air from outside.

(Breathe in as we reach our hands over our heads)

The air goes down our windpipe and into our lungs.

(Exhale and touch our toes)

The lungs help spread the air throughout our body.

This air turns into energy.

If we don't breathe in this good air, our body can't move.

(Inhale and walk hands away from legs to down dog position)

Our bodies turn waste into bad air.

We must get rid of bad air to survive.

(Exhale and press stomach to floor to snake position)

As soon as the bad air is gone,

we can take in more good air.

(Inhale and press feet down to go back to down dog position)

And the process starts again.

(Exhale and walk hands back to return to starting position)

Rising with the Sun

CHALLENGES

K-2 procedure:

Instruct students to complete the sun salutations while you recite the script. The class should be able to get through 2-3 sun salutations in one minute. The students should be able to correctly link the actions with the breathing pattern without demonstration.

3-4 procedure:

Introduce the respiratory pathway and the function of oxygen in the body. Use new terminology on right.

5-6 procedure:

Instruct students to recite script while completing the entire sequence of a full sun salutation. They should be able to move fluidly through the sun salutation and link the actions with the given breathing pattern without prompting.

We inhale oxygen from air.

(Breathe in as we reach our hands over our heads)

The oxygen moves from our mouth and nose down our trachea and bronchi and into our lungs.

(Exhale and touch our toes)

Blood vessels transport oxygen from the lungs to the cells of our bodies. Inside our cells, oxygen is converted to energy. Without oxygen, we would not be able to move.

(Inhale and walk hands away from legs to down dog position)

Cells make waste called carbon dioxide. Carbon dioxide travels from our cells back to our lungs through blood vessels. When we exhale, carbon dioxide is released into the environment. If we don't rid our bodies of carbon dioxide our cells will die.

(Exhale and press stomach to floor to snake position)

As soon as carbon dioxide is exhaled, we can inhale oxygen.

(Inhale and press feet down to go back to down dog position)

And the process starts again.

(Exhale and walk hands back to return to starting position)

Rising with the Sun

RESOURCES

1. <http://www.yogasite.com/sunsalute.htm>
2. <http://www.fi.edu/learn/heart/systems/respiration.html>
3. <http://kidshealth.org/kid/htbw/lungs.html>

KEY WORDS

Sun salutations: A series of yoga poses coordinated with breathing patterns.

Respiratory pathway: A series of tubes that connects the nose and mouth with the lungs and assists the body with oxygen intake and carbon dioxide release.

RELATED CA CONTENT STANDARDS

Physical Education:

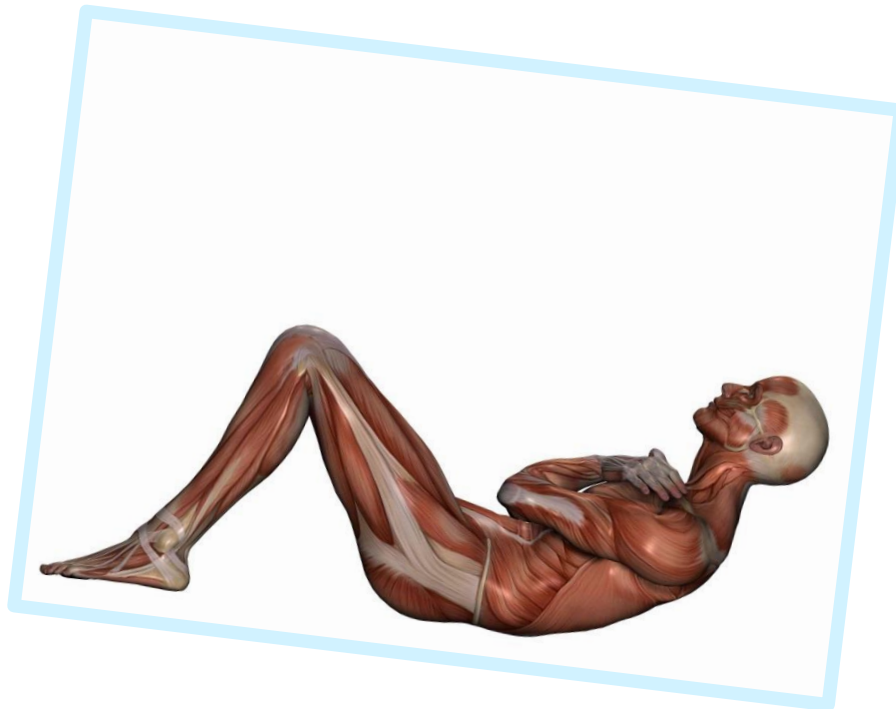
K. 1.6
K. 3.5
K. 3.6
K. 4.6
1. 1.6
1. 3.6
2. 1.3
3. 3.6
4. 4.1
5. 3.6

Health Education:

1. 1.2G

Simon Says...Work Your Muscles!

THE MUSCULAR SYSTEM



Prep time: 30 seconds



Activity time: 1-2 min

Materials: N/A

Educational Objectives:

1. To identify the basic anatomy of muscular system
2. To identify the muscles / muscle groups involved in specific strength training and flexibility exercises
3. To explain that working muscles makes them stronger

Physical Activity Objectives:

1. To practice both closed and open kinetic chain movements intended to improve muscular strength and endurance
2. To practice static stretches intended to improve flexibility

Simon Says...Work Your Muscles!

PROCEDURE

1. Lead a Simon Says game, telling students to either "stretch" or "strengthen" certain body parts/muscles. When the instruction is given, demonstrate the appropriate stretch or exercise. See examples and chart on page 29.

"Simon says, do heel raises to strengthen your **calves!**"
"Simon says, pull on your foot to stretch your **thighs!**"
"Do shoulder rolls or arm raises to strengthen your **shoulders!**"
2. Introduce method for safe stretching. "Safe stretching means you should feel a pull, but you should not feel pain. Do NOT bounce when stretching or you could hurt your muscles. When you stretch properly, you improve flexibility and decrease your risk for injury."
3. Introduce safe strength training. "When doing strength-training exercises, it is important to move the body in a slow and controlled manner from the beginning to the end of the exercise. When you perform strength-training properly, your muscles get bigger, stronger, and faster." Correct exercise form throughout the game.
4. Students continue performing repetitions or holding the stretch until the next command is given.

Simon Says...Work Your Muscles!

CHALLENGES

K-2 procedure:

1. Introduce alternative exercises for the strength training commands. See table on page 29.
2. Introduce right or left commands. Example: "Simon says do arm raises with your right arm to strengthen your right shoulder."

3-4 procedure:

1. Instruct students to strengthen/stretch a body part, but do not name or demonstrate the exercise. Ex.: "Strengthen your calves!" "Simon says strengthen your shoulders!"
2. Introduce exercises that are more challenging. Ex.: one-legged calf raises instead of double-leg calf raises. The number of repetitions may also be increased.
3. Select student to lead activity.

5-6 procedure:

1. Substitute basic body part names with muscle names. Ex.: "Strengthen your deltoids, also known as your shoulders!" "Stretch your quadriceps, also known as the front of your thigh!"
2. Once students master this phase, progress to anatomical names only. Examples: "Simon says, strengthen your deltoids!" "Simon says stretch your quadriceps!"

Simon Says...Work Your Muscles!

CHALLENGES (continued)

Body Part	Muscle	Stretch	Strength Exercise
front of thigh	quadriceps (rectus femoris)	balance on one leg, pull other foot towards buttocks	squat
back of thigh	hamstrings	sit on floor, extend one leg and bend other in butterfly position, reach toward toes of extended leg	standing leg curls, hip lift
inside of thigh	hip adductors	sit on floor, bend both legs and put soles of feet together, attempt to lower knees toward floor (butterfly)	standing leg crosses (balance on one leg, cross other leg in front of body)
outside of thigh	hip abductors	sit on floor, one foot flat on floor with bent knee, cross other leg over knee with ankle in contact with upper leg	leg raises while lying on the side
buttocks	gluteus maximus	lie on floor in supine position, keep shoulder blades on floor, pull one leg across body with knee slightly bent	lunge (forward and side)
calves	gastrocnemius	hands shoulder height on wall, extend one leg backwards and push heel to floor	calf raises
abdomen	abdominals	lie prone on floor with arms extended and push up curling lower back	crunches, V-sit, oblique curl ups
chest	pectoralis major	reach arms backward attempting to touch elbows behind back	chest press, push-up
back	rhomboids	perform bear hug on yourself	standing, bent over row
shoulders	deltoids	pull one arm across front of body at the level of the shoulders	arm raises (lateral, forward)
front of arm	biceps	put one hand on wall with fingers pointing backwards and rotate upper body away from wall	bicep curls
back of arm	triceps	point one elbow towards ceiling with fingers touching upper back, use other hand to push against bent elbow	standing tricep extensions, tricep push-ups against chair or table (modified dip)

Simon Says...Work Your Muscles!

RESOURCES

1. <http://publichealth.lacounty.gov/nut/Network/Docs/PU10-2011.pdf>
2. <http://www.human-body-facts.com/muscular-system.html>
3. <http://www.exercise.wsu.edu/flexibility>

KEY WORDS

Closed kinetic chain movements: Exercises that require movement at multiple joints.

Open kinetic chain movements: Exercises that isolate movement to one joint.

Static stretches: Holding a body part in a fixed, stationary position for a period of time to elicit a stretch.

Supine: Laying on one's back, front facing the ceiling.

Prone: Laying on one's front, with the back facing the ceiling.

RELATED CA CONTENT STANDARDS

Physical Education:

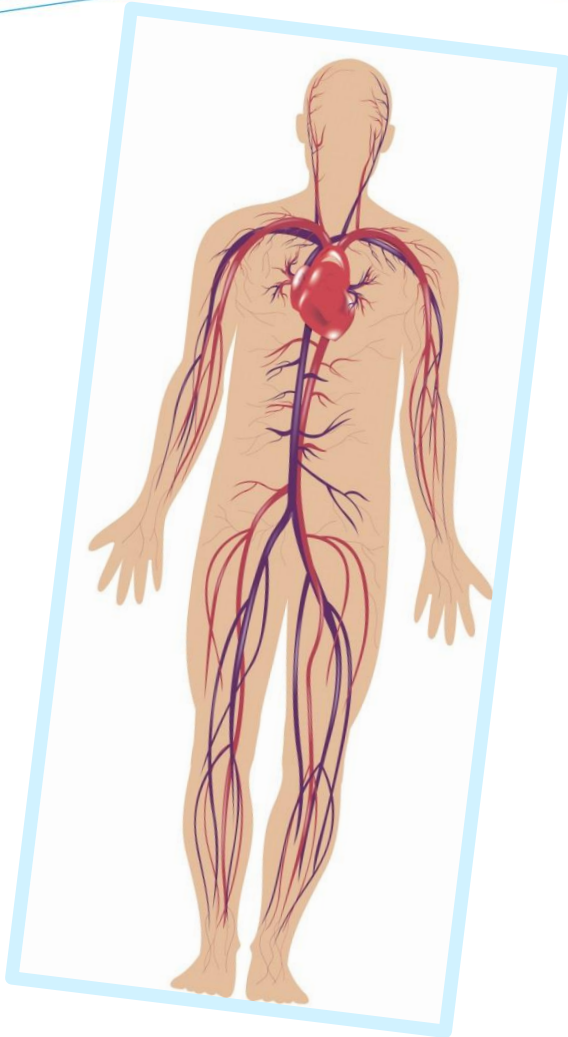
K. 1.6 2. 4.11
K. 3.5 2. 4.13
K. 4.9 3. 3.4
K. 5.5 3. 3.6
1. 1.6 3. 4.10
1. 3.3 3. 4.11
1. 3.6 4. 3.4
1. 4.8 4. 3.6
2. 1.3 4. 4.1
2. 3.3 5. 3.4
2. 3.5 5. 3.5
2. 4.10 5. 4.13

Health Education:

K.1.5G
2. 1.2G
3. 1.3G
5. 1.11N

More Oxygen Please!

THE CARDIOVASCULAR SYSTEM



Prep Time: 10 minutes



Activity Time: 1-2 minutes

Materials: 2 trash cans or baskets (one labeled heart, one labeled body), set of 5-10 activity balls, chalk, masking tape

Educational Objectives:

1. To identify the basic anatomy of the cardiovascular system
2. To describe that the cardiovascular system is responsible for circulating blood in the body and that red blood cells deliver oxygen to the body
3. To name a variety of lifestyle behaviors that can affect blood flow and the delivery of oxygen to the body cells

Physical Activity Objectives:

1. To perform basic and complex movement patterns with a ball
2. To rehearse various locomotor skills including coordination, agility, and reflex movements (reaction time)

More Oxygen Please!

PROCEDURE

1. Introduce cardiovascular system anatomy. "In the body, **red blood cells** are like little red wagons that hold nutrients and oxygen. The **heart** pushes the red blood cells to different parts of the body. The body takes the nutrients and oxygen from the red blood cells to make energy. Today, we are going to pretend that this basket is the heart (put one basket labeled heart on one side of the room), and that this basket is the body (put one basket labeled body on the other side of the room), you are the red blood cells, and the balls are oxygen. Your goal is to move oxygen from the heart to the body."
2. Line up students between baskets, 3-4 feet apart. Instruct students to start marching in place.
3. Instruct the student at the end of the line to grab a ball from the basket labeled "heart," call the name of the next student and perform underhand toss. Instruct students to continue passing the oxygen down the line toward the body.
4. After a student closest to the "heart" has passed the ball, he or she runs to the end of the line closest to the "body" and marches in place until he or she receives a pass. When the line reaches the body, the students continue marching in place and passing remaining oxygen to each other, but students near the heart will no longer run to the end of the line. Passing continues until all the oxygen has been placed in the basket.

CHALLENGES

K-2 procedure:

1. Introduce circulatory pathways. "There are many organs between the heart and other parts of the body. In order to reach parts of the body that are far away from the heart like the toes, red blood cells have to go around organs like the stomach that are in the way."
2. Make a chalk or tape line on the floor and label desks or other obstacles as organs of the body.
3. Substitute underhand passes and marching with more complex movements. Ex: chest pass, pass with one hand, dribble and then pass, bounce pass, jog in place.

More Oxygen Please!

CHALLENGES (continued)

3-4 procedure:

1. Introduce arteries and plaque accumulation. “Red blood cells move from the heart to parts of the body through tubes, called arteries. If **arteries** are big, red blood cells move easily from one place to another. However, if arteries are small, it takes longer for red blood cells and the oxygen and nutrients they are transporting to get to the destination. **Plaque** is a glue that clogs the arteries making the tubes smaller and red blood cells move slowly. If red blood cells move slowly, our hearts have to work harder and get tired.”
2. Announce “clogged artery, weak heart” or “unclogged artery, strong heart” and instruct students to move at the appropriate speed. Incorporate different passing mechanisms and movements to the end of the line that would slow transport of oxygen balls. Ex. pass ball between the legs or kick the ball (with inside of foot) and instruct receiver to stop ball before kicking it to next person, hop on one leg, move on all fours.

5-6 procedure:

1. Introduce heart healthy behaviors. “Physical inactivity and unhealthy diets lead to the buildup of plaque and the slower movement of your red blood cells. Exercising every day and eating healthy gives your heart a boost and your red blood cells move faster. When we exercise, we breathe faster, the heart pumps harder, and more oxygen is delivered to our cells to make energy.”
2. Announce a food to increase (vegetables, fruits, whole grains) or food to reduce (sugary drinks, salty foods). Instruct the students to change their movements and movement speeds accordingly.
3. Announce activities to do (jump rope, cycling, running) or activities to minimize/avoid (playing video games on the couch, smoking). Instruct the students to change their movements and movement speeds accordingly.

More Oxygen Please!

SHORT ON SPACE?

1. Instead of passing a ball, you can have the students pass an imaginary ball or tag each other to signify the passing of oxygen.
2. Instead of using a line made of chalk or tape, the line can go between rows of desks.

RESOURCES

1. <http://kidshealth.org/kid/htbw/heart.html>
2. <http://www.nhlbi.nih.gov/health/health-topics/topics/hd/>
3. <http://www.brainpop.com/health/bodysystems/circulatory-system>

KEY WORDS

Cardiovascular system: Organs and tissues involved in the circulation of oxygen and nutrients from the lungs to other parts of the body.

Circulatory pathways: Pathways that transport chemical likes nutrients, hormones, and blood throughout the body.

RELATED CA CONTENT STANDARDS

Physical Education:

K. 1.8	2. 1.10
K. 1.14	2. 1.11
K. 1.15	2. 1.14
K. 4.4	2. 1.15
K. 4.5	2. 4.7
1. 1.2	3. 1.8
1. 1.3	3. 1.11
1. 1.13	4. 1.3
1. 1.16	4. 1.9
1. 4.6	4. 1.19
1. 4.7	5. 1.16
2. 1.7	6. 1.6
2. 1.9	6. 1.6

Health Education:

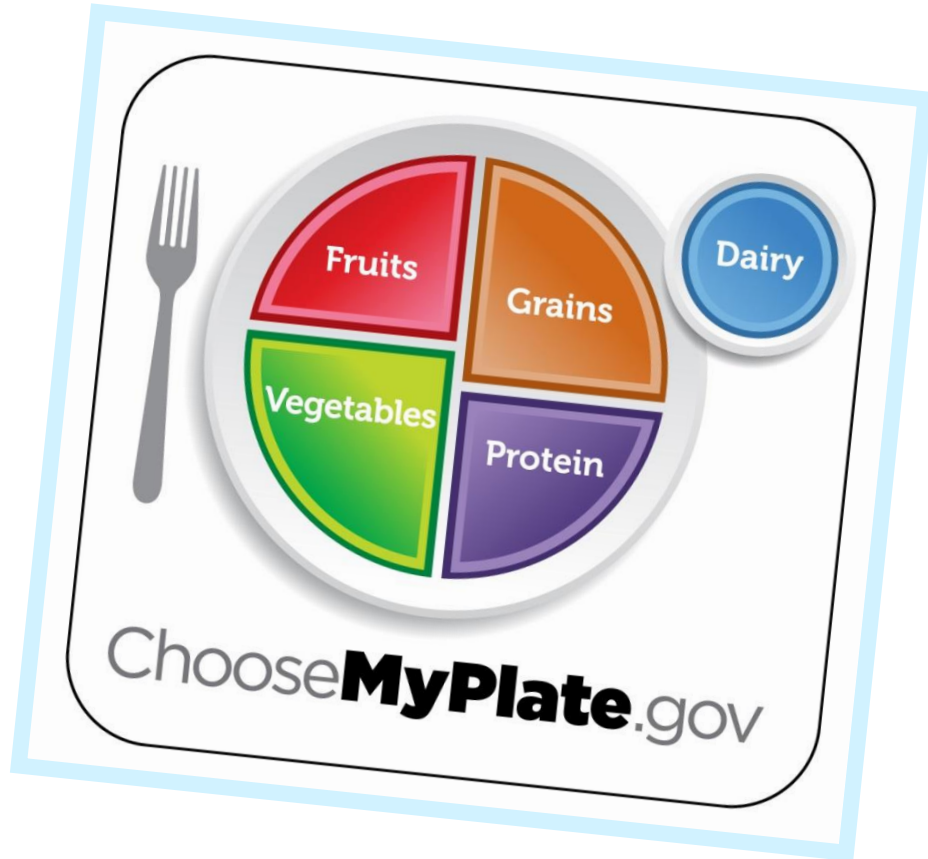
K. 1.1N
K. 1.2N
K. 1.3N
K. 7.1N
1. 1.2G
2. 1.4N
2. 1.9N
3. 1.3G
3. 1.3P
4. 1.7N
5. 1.6N
5. 1.9N
5. 1.11N

Nutrition Competencies

K. 1a, 1b, 1c
1 – 2. 1b, 1c, 1f
5 – 6. 1f

What's On My Plate?

NUTRITION



Prep Time: 3 min



Activity Time: 1-2 min

Materials: Diagram of MyPlate, Pictures of different plated meals

Educational Objectives:

1. To identify the different food groups
2. To describe how to make a balanced meal
3. To state the correct portion sizes for each food group

Physical Activity Objectives:

1. To practice specific exercises intended to improve cardiorespiratory fitness, muscular strength, and flexibility

What's On My Plate?

PROCEDURE

1. Introduce MyPlate. "There are 5 food groups: fruits, vegetables, grains, protein, and dairy. Fruits, vegetables, and grains give our bodies energy and help us fight disease. Protein helps us build tissues, like muscles and organs. Dairy gives us the nutrients we need for strong bones and teeth." Provide examples for each food group. See examples on right.
2. Instruct students to spread out through the room or stand next to chairs.
3. Call out a food from one of the food groups and instruct students to perform the appropriate movements:
 - **Dairy Dance:** shake the hips side to side
 - **Galloping Grains:** gallop in small circles
 - **Flowering Fruits:** perform calf raises and lift arms above head
 - **Pop-up Protein:** jump on two legs
 - **Stretchable Vegetables:** bend at waist and reach towards the toes
4. Wait a few seconds, announce the correct answer and give another example.

Food Group Examples:

- Dairy – Cheese, Yogurt, and Milk
- Grains – Pasta, Cereal, and Rice
- Fruits – Cherries, Apples, and Watermelon
- Protein – Chicken, Fish, Nuts, and Beans
- Vegetables – Broccoli, Lettuce, and Green Beans

What's On My Plate?

CHALLENGES

K-2 Procedure:

1. Announce food. Point to student who announces another food that belongs in that food group. Class continues movement.
2. Increase difficulty of movements.
 - **Dairy Dance:** shake the hips side to side while waving the arms above the head
 - **Galloping Grains:** gallop in small circle and switch directions, leading with the other foot
 - **Flowering Fruits:** perform calf raises while lifting arms above head and return to squat position
 - **Pop-up Protein:** jump on two legs in zig-zag pattern
 - **Stretchable Vegetables:** reach towards the ceiling before toe touch

3-4 Procedure:

1. Give example of a meal that has four of the food groups. Instruct students to decide which food group is missing and perform the corresponding movement.

5-6 Procedure:

1. Announce food group and meal (breakfast, lunch, or dinner). Point to students while they are performing the movement and ask them to call out a food appropriate for the food group and meal.
2. Introduce MyPlate themes. "When planning meals, it is important to follow a couple of guidelines. Make half of your plate fruits and veggies. Be sure to vary your veggies throughout the day so that you eat veggies of multiple colors and textures. Try to eat lean protein like lean beef and turkey and lowfat milk and yogurt. At least half of your grains during the day should be whole grains like whole wheat tortillas or whole grain cereal." Show students pictures of plates that violate one or more of the MyPlate themes. Instruct students to perform appropriate movement from K-2 procedure for the food group that is incorrect on the picture.

What's On My Plate?

SHORT ON SPACE?

Instruct students to gallop and jump in one place.

RESOURCES

1. <http://www.choosemyplate.gov>
2. <http://www.network-toolbox.net>
3. <http://www.schoolnutrition.org>

KEY WORDS

MyPlate: The United States Department of Agriculture's food icon is designed to remind Americans to eat healthy. MyPlate illustrates the five food groups using a familiar mealtime visual place setting.

RELATED CA CONTENT STANDARDS

Physical Education:

K. 2.5
K. 3.5
1. 2.4
2. 1.5
5. 1.2

Nutrition Competencies

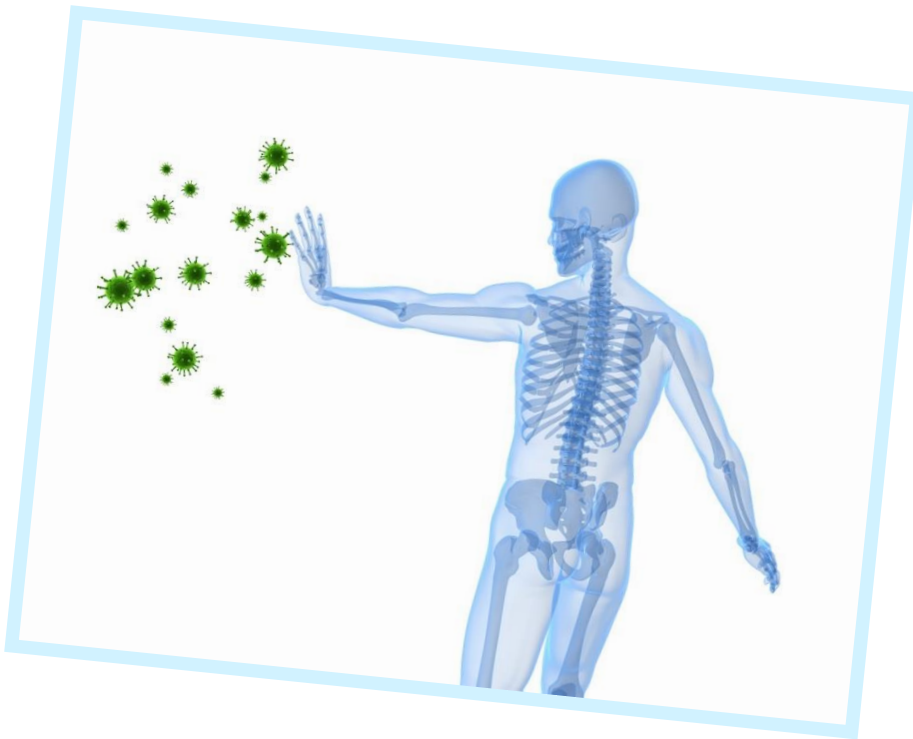
K. 1a
1 – 2. 1b, 7
3 – 4. 1b, 1f

Health Education:

K. 1.1N
K. 1.2N
K. 7.2N
2. 1.1N
2. 1.2N
2. 3.1N
2. 7.2N
4. 1.1N
4. 1.2N
5. 1.1N
5. 1.4N

Attack of the Germs

THE IMMUNE SYSTEM



Prep Time: 5-10 minutes

Activity Time: 1-2 minutes

Materials: colored vests or jerseys (optional)

Educational Objectives:

1. To identify basic characteristics of an immune response and describe how the body fights off infection at the cellular level

Physical Activity Objectives:

1. To perform complex movement patterns in coordination with other students
2. To practice movements intended to improve balance, coordination, and speed

Attack of the Germs

PROCEDURE

1. Introduce immune system: "The **immune system** keeps us healthy. It is made up of little superheroes that stop us from getting sick when **germs** get into the body. When the germs win the fight against the superheroes, you get sick. If the superheroes win the fight, you have lots of energy, feel strong, and stay healthy."
2. Divide students into two groups: 1) the germs start on one side of the room labeled "outside the body"; 2) the immune system or "superheroes" start on the other side of the room labeled "inside the body." The ratio should be approximately 1:2.
3. Start game of tag. Instruct germ students to move by hopping on one foot. Instruct superhero students to move by jumping up and down. The goal of the germs is to reach the other side of the classroom. The goal of the superheroes is to stop the germs by tagging them. Once tagged, germs must drop to floor for five seconds. After five seconds the tagged germs will stand up, walk back to outside of the body, and start hopping again.
4. By the end of the activity, the body is either sick (if one or more germs makes it to the wall on the body side of the room) or healthy (if all germs were tagged and kept outside of the body).

Attack of the Germs

CHALLENGES

K-2 procedure:

1. Introduce methods to increase or decrease power of the immune system. "Superheroes of the immune system get boosts of power when we eat fruits and vegetables, when we exercise, when we wash our hands, when we go to sleep at bedtime. If we are tired, if we forget to wash our hands before dinner, or if we don't cover our mouths when we sneeze, the germs get a boost of power."
2. Call out sanitary or non-sanitary behaviors and instruct students to change movements accordingly. Ex. If we drank orange juice with breakfast, the superheroes get stronger and students acting as superheroes can quickly slide towards the germ instead of jumping. If we drop an apple on the ground and eat it without washing, our germs get stronger and students acting as germs can now leap instead of hopping.

3-4 procedure:

1. Replace terms with scientific terms listed below and explain that white blood cells attack antigens.

Germ = **antigen**

Superheroes = **white blood cells**

Attack of the Germs

CHALLENGES (continued)

5-6 procedure:

1. Introduce the different parts of the immune system. “There are two types of white blood cells. They are called **T-cells** and **B-cells**. T-cells fight the antigens themselves while the B-cells make weapons called **antibodies** that fight the antigens. T-cells, B-cells, and antibodies play on the same team called the **immune system** against the antigens.”
2. Divide class into groups representing parts of the immune system and antigens: T-cells (2-3), B-cells (2-3), antibodies (10-12), antigens (4-5).
3. Start game of tag. Immune system team starts at “body” and the antigen team starts at “environment.” Members of the immune system team perform different functions.
 - a. Instruct T-cells to jump towards an antigen and tag the antigen. If an antigen has been tagged by a T-cell, the antigen and T-cell students must do 5 crunches together on the ground. This will slow the movement of the antigen towards the body. After the 5 crunches, the T-cells will stand back up and jump to another antigen and the antigens will stand up, walk to the wall on the “environment” side and hop on one foot towards the wall on the “body” side.
 - b. Instruct B-cells to join 3-4 students labeled antibodies and perform 10 jumping jacks together. Now the antibodies can walk to tag the antigens. Once an antibody has tagged an antigen, it must return to the “body” and get reenergized by the B-cells. B-cells waiting to energize antigens should perform alternating forward and backward lunges.

Attack of the Germs

SHORT ON SPACE?

1. Instruct students to stand next to their desks.
2. Introduce different behaviors that compromise or improve the immune system. Use examples from the K-2 challenge.
3. Students perform one movement if behavior is favorable for germs and a different movement if it is favorable for superheroes. Ex. Boosts the immune system = side-to-side slide in a steady rhythm to represent preparation for protecting the body. Weakens the immune system = jump rope motion as the germs get charged up and ready to attack the body.

RESOURCES

1. <http://kidshealth.org/kid/htbw/immune.html>
2. <http://www.cdc.gov/bam>
3. http://www.e-learningforkids.org/Courses/Liquid_Animation/Body_Parts/Immune_System

KEY WORDS

Immune response: The body's reaction to foreign substances.

Antigen: A foreign substance that, when introduced to the body, provokes a reaction by the immune system, especially the regeneration of antibodies.

T-cells: A white blood cell that participates in the immune response, helping the body fight infection.

B-cells: A white blood cell that helps the immune system by producing antibodies.

Antibodies: A blood protein that fights a specific antigen.

RELATED CA CONTENT STANDARDS

Physical Education:

K. 1.1, 1.2, 2.5, 5.5
1. 1.1, 2.4, 5.6
2. 1.6, 5.1, 5.7
3. 1.1, 2.1, 5.6

Health Education:

K. 1.3N
1. 7.2P
2. 1.4N
3. 1.3P
4. 1.3N

Nutrition Competencies:

1 – 4. 1g

On The Line

HOMEOSTASIS



Prep Time: 5-6 min



Activity Time: 1-2 min

Materials: masking tape, chalk

Educational Objectives:

1. To describe the concept of balance in the body
2. To describe how the body regulates normal function and maintains homeostasis
3. To describe how the energy from food can be used to maintain balance and temperature

Physical Activity Objectives:

1. To cooperate with classmates while completing physical movements and patterns
2. To practice balance and basic motor skills

On The Line



PROCEDURE

1. Introduce the concept of homeostasis. "**Homeostasis** is when all parts of the body work together to keep you balanced. When your body is balanced, you are healthy and live longer. If the body is not in homeostasis, the body is unbalanced and becomes weak.
2. Draw a line across the floor of the classroom using tape. If done outside, use chalk. Make sure that the line is at least the length of the classroom and has curves or sharp turns. Explain that the straight parts of the line represent when the weather is perfect, you got a good night's sleep, you had a healthy meal and staying balanced is easy. The curved parts of the line represent times when it is hard to stay balanced because it may be hot, there may be loud music, and you are hungry or tired.
3. Instruct students to line up at one end of the tape. One at a time have them walk across the line, heel to toe, trying to stay on the line and not fall off, keeping homeostasis.
4. If a student falls off the line, they must do a two-legged hop back to the start of the line.

On The Line

CHALLENGES

K-2 Procedure:

1. Incorporate different methods to walk the line including: side walking, walking backwards, one legged hopping, bear crawl, or crab walk.
2. Change the line to make it harder to walk along. Include sharper turns, weave through desks, or add breaks across the line that the students have to jump over.

3-4 Procedure:

1. Introduce cooperation among organ systems. "Often times, two different systems in the body have to work together to maintain homeostasis. For example, the skeletal system works with the muscular system so that we can move properly and maintain balance. Instruct students to walk across the line in pairs with their arms linked or over each other's shoulders.

5-6 Procedure:

1. Introduce specific examples of homeostasis that occur in the body on a regular basis. Ex. temperature and energy regulation. "If it is cold outside, we can get sick. That's why we start shivering, to help warm us up and maintain our normal body temperature = homeostasis. If it is hot outside, we start to sweat to help cool us down and maintain our normal body temperature = homeostasis. When we exercise, we get tired. Soon our bodies won't let us exercise anymore until we've rested for a while. This lets our bodies refuel so that we can be active again later = homeostasis."
2. Incorporate changes in movements along the line to illustrate these examples. Ex. When students come across a break in the line, tell them to imagine that this represents the body getting cold and to jump over the breaks in the line to shiver and keep the body warm; when students come to a sharp turn, tell them to imagine this represents the tiredness we feel after exercising and to take the turn slowly to get some rest and get the energy to keep going.

On The Line

RESOURCES

1. <http://www.brainpop.com/health/bodysystems/homeostasis/preview.weml>
2. <http://www.bioedonline.org/slides/slide01.cfm?q=%22homeostasis%22&pg=2>
3. http://www.biology4kids.com/files/systems_regulation.html

KEY WORDS

Homeostasis: The tendency of the body's internal environment to stay relatively stable and within certain limits.

RELATED CA CONTENT STANDARDS

Physical Education:

K. 1.6
K. 1.7
K. 1.10
1. 1.2
2. 1.3
3. 5.6

Nutrition Competencies:

1 – 2. 1C
5 – 6. 1C

Body Facts



Prep Time: 2-3 min



Activity Time: 1-2 min

Materials: jump ropes (optional)

Educational Objectives:

1. To review information from energizers 1 – 9 and assess retention
2. To demonstrate skill and knowledge level required for successful transition to energizer challenge
3. To identify various organ systems and the physiological mechanisms used to maintain health and performance

Physical Activity Objectives:

1. To practice fine and gross motor skills

Body Facts

PROCEDURE

1. Recite statements based on content from energizers 1-9. See examples on pages 50 - 51.
2. Instruct students to decide if the statement is true or false.
3. If students think the statement is false, instruct them to jump forward and backwards while using swinging arms to move their bodies as far as possible.
4. If students think the statement is true, instruct them to do side to side jumps over a line in the floor or a jump rope. Tell them to jump side to side as many times as possible before the next statement is read.

CHALLENGES

1. Increase difficulty of questions by adding proper names and scientific terminology.
2. Increase complexity of movements: If students think the statement is false, instruct them to complete side-to-side lunges with a slide step in between. If students think the statement is true, instruct them to complete crab kicks or star jumps for height.

Body Facts

STATEMENT EXAMPLES

Question	Easy (K – 2)	Medium (3 – 4)	Hard (5 – 6)
1	You breathe in oxygen from air using your stomach. (False)	You breathe in carbon dioxide and breathe out oxygen. (False)	Oxygen turns into carbon dioxide in the body and then our cells use the carbon dioxide as fuel. (False)
2	The upper arm bone is connected to the ribs. (False)	The humerus is connected to the ribs (False)	The humerus is connected to the sternum. (False)
3	Your mouth's main job is to move food through the body. (False)	Your esophagus transports food. (True)	Your esophagus transports food from your mouth to your stomach. (True)
4	When your body is balanced, you are healthy. (True)	Homeostasis is a condition when your body is balanced. (True)	When your body is in homeostasis, you are healthy. (True)
5	Blood helps transport oxygen from the lungs. (True)	Blood helps transport oxygen from the lungs to the heart. (True)	Red blood cells help transport oxygen from the lungs to the heart. (True)
6	The muscles on the front of your arms are called the rhomboids. (False)	Arm raises help strengthen the back. (False)	Arm raises mainly help strengthen the rhomboids. (False)
7	The immune system helps stop the body from getting sick. (True)	White blood cells help stop the body from getting sick. (True)	Antibodies help the body stop the body from getting sick. (True)
8	The heart is a muscle that pushes red blood cells to parts of the body. (True)	Plaque acts like a glue that clogs the arteries. (True)	Regular exercise decreases the amount of plaque in the arteries. (True)
9	The main food groups are grains, protein, and milk. (False)	The main food groups are grains, vegetables, protein, fats, and dairy. (False)	A glass of milk and an apple with a turkey, lettuce, and tomato sandwich is an example of a balanced lunch. (True)
10	The intestines share food with the other parts of the body. (True)	The rectum is where food leaves the body. (True)	The small intestine shares food with the rest of the body while the large intestine prepares food to leave the body. (True)

Body Facts

STATEMENT EXAMPLES

Question	Easy (K – 2)	Medium (3 – 4)	Hard (5 – 6)
11	The immune system's job is to pass information from one part of your body to another. (False)	The roads of the nervous system are called dendrites. (False)	All neurons travel at the same speed. (False)
12	The body fights off germs using muscles. (False)	The strength of our immune system does not change based on what we eat or drink. (False)	Drinking orange juice with breakfast helps the body to fight off antibodies. (False)
13	The brain passes information to the rest of the body. (True)	The brain is the control center for the body. (True)	If the nervous system was a road, ions could be cars. (True)
14	Reaching towards your toes stretches the front of your thighs. (False)	Reaching towards your toes stretches your hamstrings. (True)	The butterfly stretch stretches your hamstrings. (False)
15	Washing our hands strengthens the immune system. (True)	Watching TV strengthens the immune system. (False)	Watching TV helps the immune system fight antigens. (False)
16	Your breastbone connects to your upper arm. (False)	Shrugging your shoulders moves your clavicle. (True)	Your phalanges are connected to your ribs. (False)
17	Blood helps carry nutrients and oxygen. (True)	The heart only needs to be strong enough to send blood to nearby organs. (False)	Arteries help take blood away from the heart. (True)
18	Inhaling air helps our body to move. (True)	If we do not inhale oxygen, our cells will slowly begin to die. (True)	If we do not exhale carbon dioxide, our cells will slowly begin to die. (True)
19	Every type of food travels through the digestive system. (True)	All food travels through the digestive system at the same speed. (False)	Fats move faster through the digestive system than vegetables. (False)
20	The stomach mixes food. (True)	Food passes from the stomach to the intestines. (True)	Food passes from the pharynx to the esophagus. (True)

Body Facts

RESOURCES

See websites from energizers 1-9.

KEY WORDS

Fine motor skills: The coordination of movements in small muscles, like movement of the fingers.

Gross motor skills: The coordination of movements in large muscles, like running or jumping.

RELATED CA CONTENT STANDARDS

Physical Education:

K. 1.11
K. 4.3
K. 4.4
K. 4.6
1. 4.7
2. 3.3
2. 4.10
2. 4.13
3. 4.6
3. 4.7
3. 4.9
4. 4.1
5. 1.2

Health Education:

K. 1.2N
1. 1.2G
2. 1.1N
2. 1.2N
3. 1.3G
4. 1.1N
5. 1.1N
5. 1.6N

Nutrition Competencies:

K. 1a, 1b, 1c
1 – 2. 1b, 1c, 1e, 1g, 7
3 – 4. 1b, 1e, 1f, 1g
5 – 6. 1c, 1e, 1f

Appendix A

SWALLOW THIS: DIGESTIVE SYSTEM

The **digestive system** (A.K.A. gastrointestinal tract, GI tract) consists of a long tube located inside the body. It is responsible for breaking food down into smaller parts that can be used throughout the body for energy and to perform normal physiological functions. Digestion is performed by both mechanical (i.e.: chewing) and chemical means (i.e.: hydrochloric acid, enzymes). We consume **macronutrients** (protein, carbohydrate, and fat), vitamins, minerals, and water; all of which must be processed by the digestive system before the nutrient can be used by the body. In addition to mechanical chewing of food in the mouth, saliva, which contains enzymes, helps break bonds between bigger molecules via chemical means. Once we swallow, food enters the **pharynx** (throat) and then the **esophagus**. Muscles in the pharynx and esophagus help push food to the **stomach**. No mechanical or chemical digestion occurs in the pharynx or esophagus. In the stomach, food is mixed with hydrochloric acid. The hydrochloric acid (chemical digestion) helps to break bonds between molecules found in proteins. From the stomach, food enters the **small intestine**. The intestine contains enzymes for breaking down protein, carbohydrate, and fat into functional units that can be absorbed. Protein, carbohydrate, fat, vitamins, and minerals are all absorbed through the walls of the small intestine into blood vessels. After absorption, nutrients go through the bloodstream and are delivered to tissues of the body. Food that was not absorbed continues to the **large intestine** (i.e. the colon). The large intestine contains bacteria responsible for feces formation. Water and minerals can also be absorbed from the large intestine into the bloodstream. Once the feces has formed, it enters the rectum. The **rectum** is the last straight section of the gastrointestinal tract. Feces remain here until voluntary defecation.

Appendix A

BONE SONG: SKELETAL SYSTEM

The **skeletal system** consists of the bones of the body. It is responsible for protecting our internal organs and giving our body shape. Bone is a connective tissue comprised of a protein called collagen, polysaccharides, and calcium salts. The skeletal system can be divided into **axial** and **appendicular** sections. Bones of the axial skeleton include: the skull, ribs, sternum (A.K.A. breastbone), and vertebrae. Bones of the appendicular skeleton include: clavicle, scapula, pelvis, and all the bones of the upper and lower limbs. Bones are united with other bones at joints with connective tissue called **ligaments**. Muscles are attached to bones with connective tissue called **tendons**. During movement, muscles contract, pulling on bones via tendons.

INFORMATION RELAY: NERVOUS SYSTEM

The **nervous system** consists of the **brain, spinal cord**, and all of our **nerves**. It is responsible for receiving information, interpreting information, forming memories, initiating movement and other physiological functions. The nervous system can be divided into sensory and motor divisions. Both divisions contain specialized cells called **neurons**. Neurons transport information from the brain to other parts of the body (**motor neurons**) and from parts of the body back to the brain (**sensory neurons**). All neurons contain a **cell body**, a long projection called an **axon** that ends in several **axon terminals**, and short projections called **dendrites**. When neurons are activated, ions move through the neuron in the following path: dendrites \Rightarrow cell body \Rightarrow axon \Rightarrow axon terminals \Rightarrow brain (sensory) or muscles (motor). Another term for information transmission and ion transport is **action potential**.

Appendix A

RISING WITH THE SUN: RESPIRATORY SYSTEM

The **respiratory system** consists of organs in your body that help you to breathe. It is responsible for delivering **oxygen** to the blood and removing **carbon dioxide**. The air we breathe is composed of ~21% oxygen, 79% nitrogen, and 0.03% carbon dioxide. During inhalation, the **diaphragm** contracts, which decreases the pressure of the thoracic cavity (part of our trunk that holds the lungs and heart) and allows air to passively flow into the **oral** (mouth) and **nasal** (nose) cavities. From the oral and nasal cavities, air flows into a cartilaginous tube called the **trachea** (windpipe). The trachea splits into right and left sections at the level of the breastbone. These sections are called **bronchi**. The bronchi enter the **lungs**. Within the lungs, bronchi get smaller in diameter and continue to branch into more and more sections called **bronchioles**. Bronchioles branch into sacs called **alveoli**. Alveoli are structurally connected to capillaries and facilitate gas exchange. Oxygen inhaled travels through the respiratory pathway and is exchanged for carbon dioxide within alveoli. During exhalation, the diaphragm relaxes which increases the pressure inside of the thoracic cavity and forces air out of the lungs. Carbon dioxide from the blood stream, nitrogen, and the oxygen that was not exchanged exits the respiratory tract in the reverse direction and out of the oral and nasal cavities into the environment.

SIMON SAYS... WORK YOUR MUSCLES!: MUSCULAR SYSTEM

The **muscular system** consists of the muscles in the body attached to bones (A.K.A. skeletal muscle). It is responsible for moving the body. All skeletal muscles contract voluntarily and require input from the nervous system. When muscles contract, the muscle belly shortens and when a muscle relaxes, the muscle belly lengthens. **Exercise** or repeated bouts of contraction and relaxation induce adaptations that allow the muscle to generate more force (lift more weight) and to delay fatigue (hold weight for a longer duration).

Appendix A

MORE OXYGEN PLEASE!: CARDIOVASCULAR SYSTEM

The **cardiovascular system** consists of the **heart, blood, and blood vessels**. It is responsible for delivering oxygen and nutrients to parts of the body and transporting waste produced by cells of other tissues outside of the body. **Arteries** are blood vessels that transport blood away from the heart; **veins** are blood vessels that transport blood back to the heart; **capillaries** are small diameter blood vessels that are found between arteries and veins. Oxygen is transported through the arteries attached to **red blood cells**. Once the red blood cell reaches the capillaries, oxygen is released from the red blood cell and enters a tissue of the body. At the same time, the red blood cell picks up carbon dioxide, the primary waste product produced by our cells. Carbon dioxide is transported through the veins back to the heart. The heart pumps the carbon dioxide to the lungs and when we exhale, it is released into the ambient air. When we inhale, oxygen is picked up by red blood cells in the lungs. The blood in the lungs returns to the heart and the process starts again. The heart is located just left to the breastbone at the level of the chest.

WHAT'S ON MY PLATE?: NUTRITION

The United States Department of Agriculture in consultation with the National Institute of Health and the Center for Disease Control develop the **dietary guidelines for Americans**. The guidelines are designed to help the typical American plan meals that will result in the consumption of all the nutrients necessary for normal physiological functioning. The current guidelines are presented in a logo called **MyPlate**. The five food groups represented in MyPlate are fruits, vegetables, grains, protein, and dairy. Each food group should be consumed in one balanced meal. In addition to the food groups, MyPlate is divided into food group proportions. $\frac{1}{2}$ of the plate should be fruits and veggies, $\sim\frac{1}{3}$ of the plate should be grains, $\sim\frac{1}{6}$ of the plate should be protein and the meal should include one serving of dairy. The following recommendations accompany the MyPlate guidelines: 1) a minimum of $\frac{1}{2}$ of the grains consumed during the day should come from whole grain sources; 2) vary your veggies (different nutrients are found in vegetables of different colors and textures); 3) no more than $\frac{1}{3}$ of fruit consumed should come from juice; 4) choose lean protein; 5) choose non-fat or low-fat dairy (only nutritional difference is fat content).

Appendix A

ATTACK OF THE GERMS: IMMUNE SYSTEM

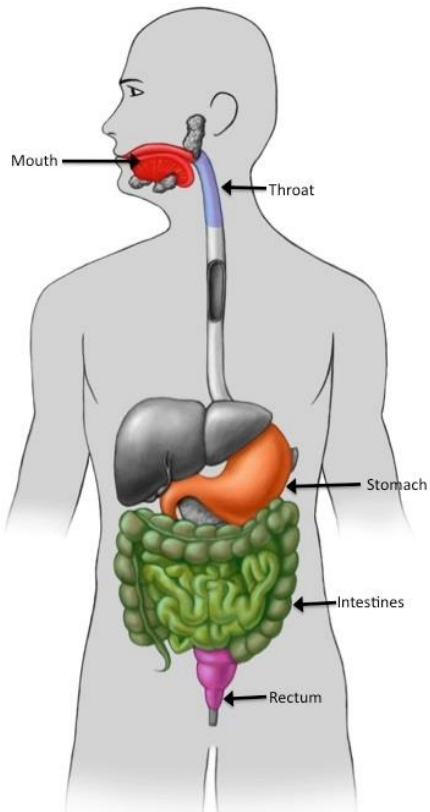
The **immune system** consists of organs and special cells found throughout the body. It is responsible for keeping the body healthy and preventing disease. Our body expresses both innate and adaptive immunity. **Innate immunity** is achieved with the first and second line of defense, skin and natural killer cells, respectively. The skin helps prevent germs called **antigens** from entering the body. **Natural killer** cells are found in the blood and special vessels called **lymphatic vessels**. If an antigen gets past the skin, the natural killer cells will attempt to destroy the antigen before it has a chance to induce illness. If the antigen gets past both the first and second line of defense, adaptive immunity takes over. In **adaptive immunity**, the body recognizes and destroys antigens and builds up a defense so that the next time the body is exposed to the same antigen, the body's response is stronger and faster. **White blood cells** called B and T cells are the main components of adaptive immunity. Similar to natural killer cells, B and T cells circulate in the blood and lymphatic vessels. **T cells** destroy antigens upon contact and **B cells** produce antibodies that subsequently destroy antigens. Each T cell and antibody is specific for a given antigen. After the first exposure, T cells and antibodies multiply. This is the purpose of vaccinations. A small amount of an antigen is introduced into the body so that the body can respond appropriately during the next exposure to the same antigen. Upon failure of adaptive immunity, the body becomes ill.

ON THE LINE: HOMEOSTASIS

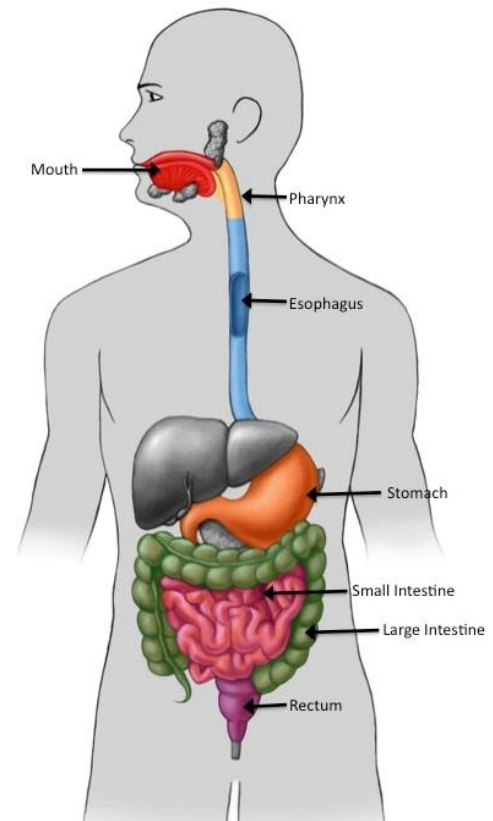
Homeostasis is defined as "the tendency of the body's internal environment to stay relatively stable and within certain limits." This stability is achieved when all parts of the body work together. For example, in order to maintain normal temperature, our body starts to sweat in the heat or shiver in the cold; if blood pressure is too high, the body attempts to decrease heart rate and increase urine production (decreasing body water); if we are dehydrated, the body stimulates a thirst mechanism. When your body is balanced, you are healthy and live longer. If the body is not in homeostasis, the body is unbalanced and becomes weak and/or ill (natural mechanisms cannot overcome the challenge to the internal environment).

Appendix B

SWALLOW THIS: BASIC PROCEDURE

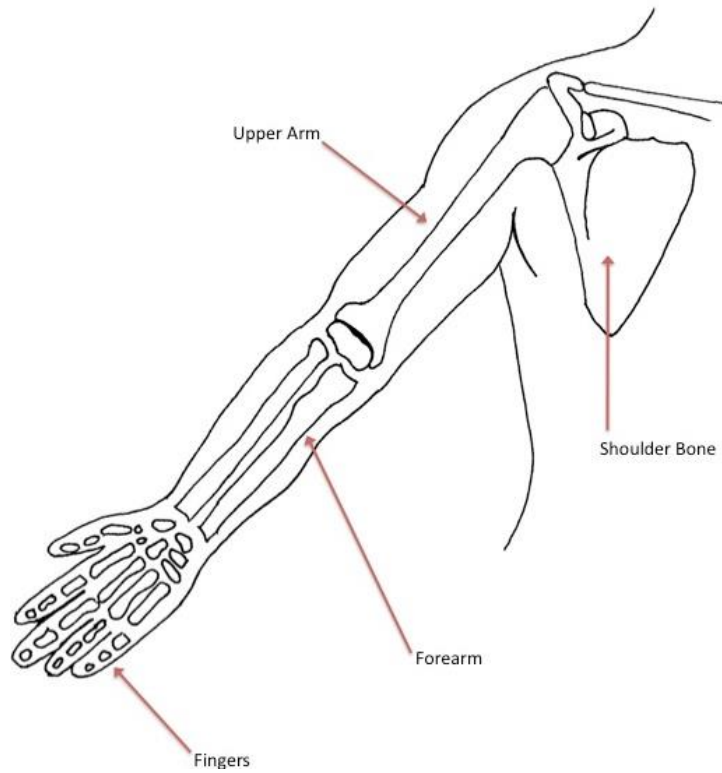


SWALLOW THIS: 3 – 4 CHALLENGE

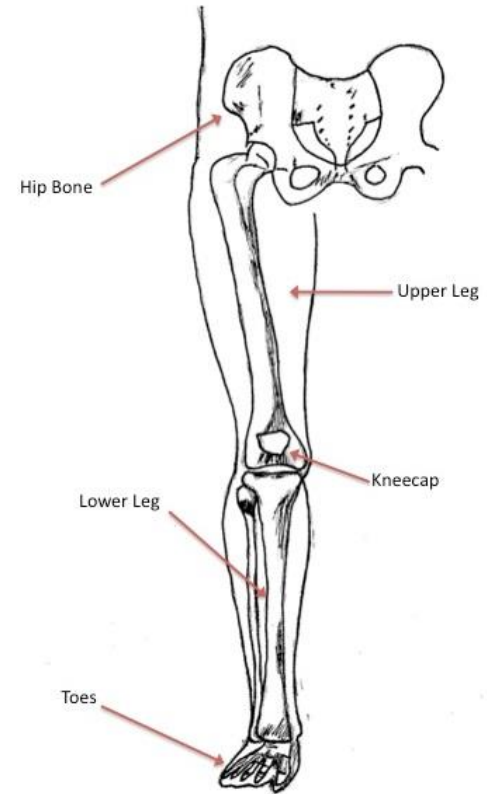


Appendix B

BONE SONG: BASIC PROCEDURE (ARM)

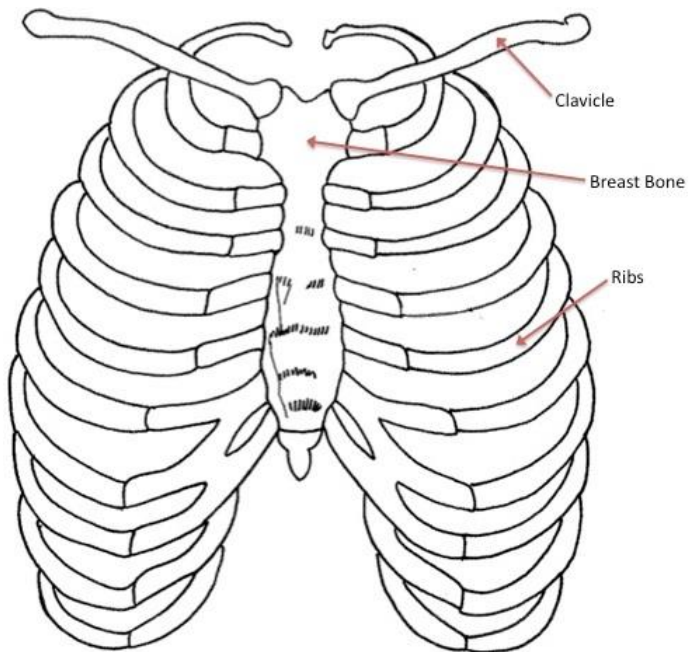


BONE SONG: BASIC PROCEDURE (LEG)

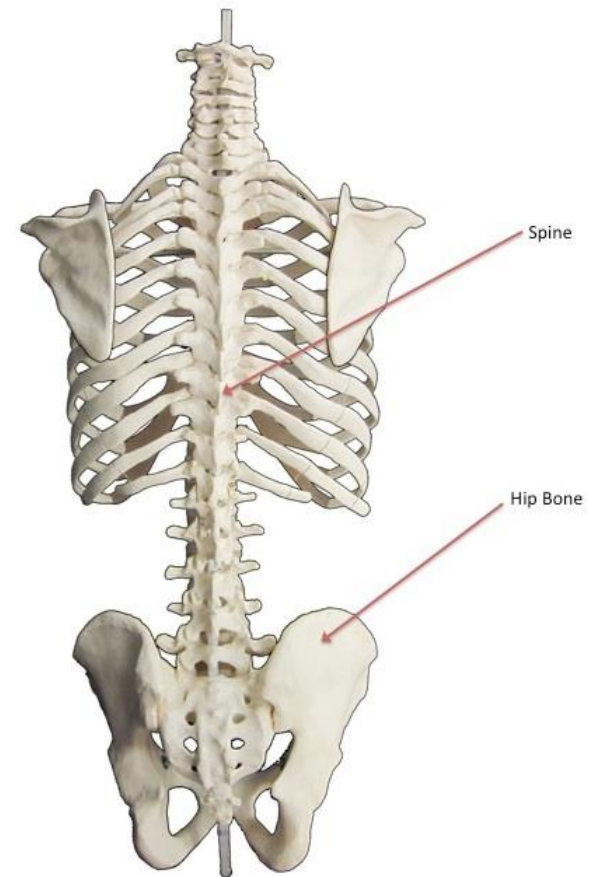


Appendix B

BONE SONG: BASIC PROCEDURE (RIBCAGE)

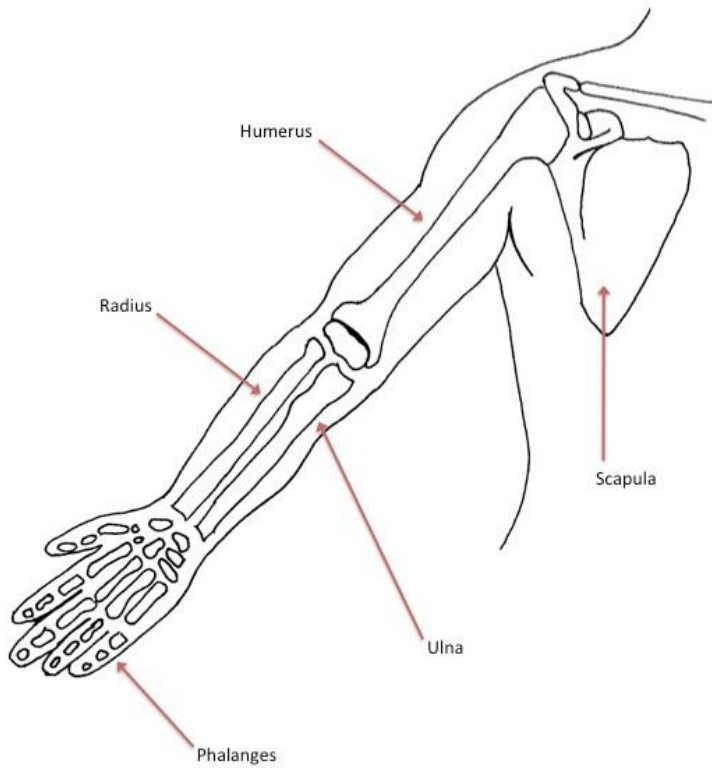


BONE SONG: BASIC PROCEDURE (SPINE)



Appendix B

BONE SONG: 3 – 4 CHALLENGE (ARM)

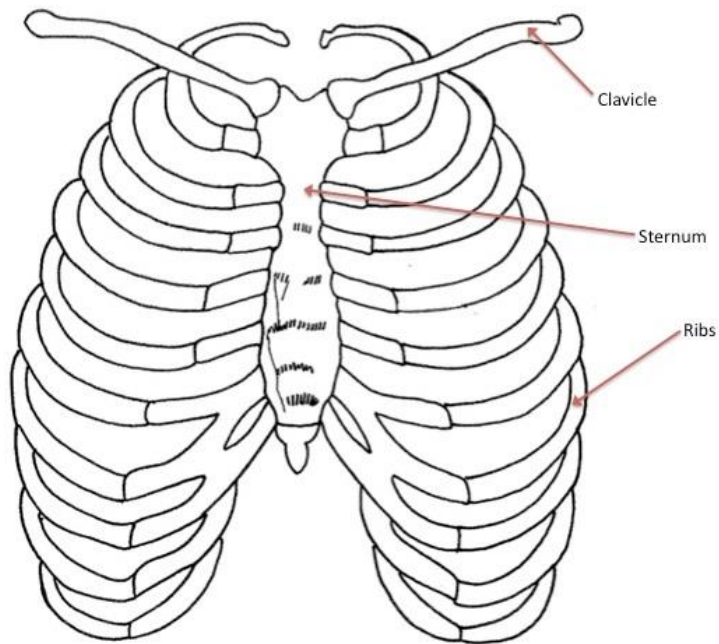


BONE SONG: 3 – 4 CHALLENGE (LEG)

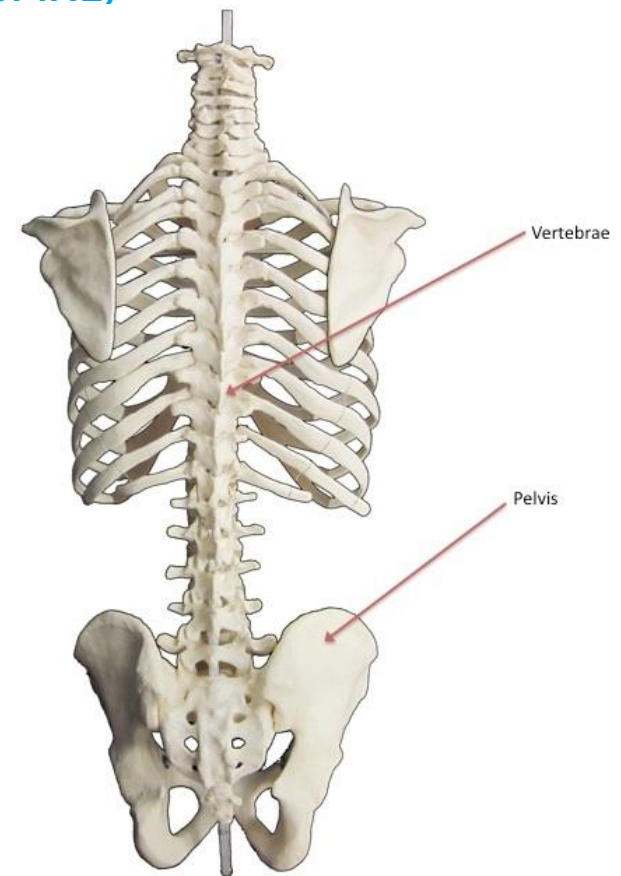


Appendix B

BONE SONG: 3 – 4 CHALLENGE (RIBCAGE)



BONE SONG: 3 – 4 CHALLENGE (SPINE)

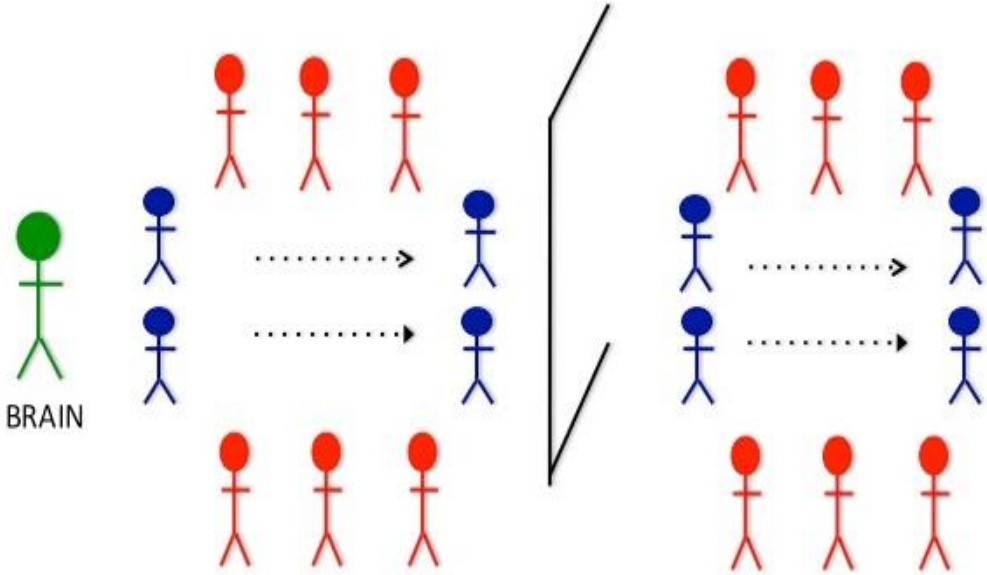


Appendix B

INFORMATION RELAY: THE BRAIN

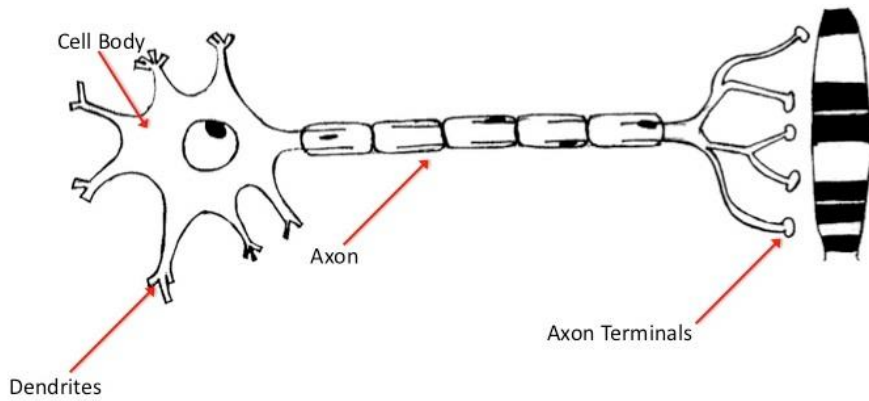


INFORMATION RELAY: K-2 CHALLENGE SETUP

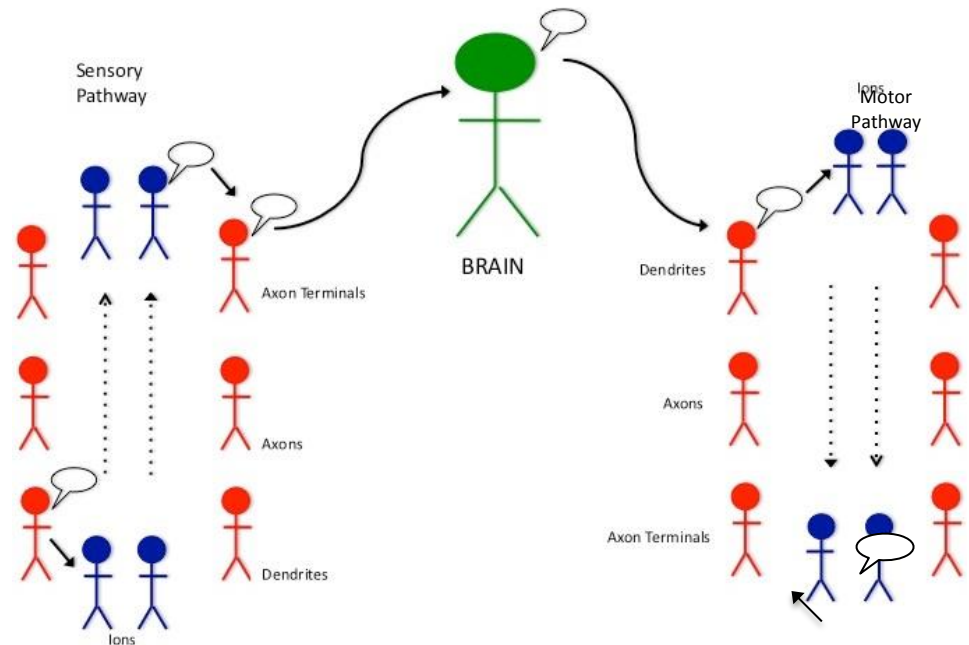


Appendix B

INFORMATION RELAY: 3 – 4 CHALLENGE (NEURON ANATOMY)

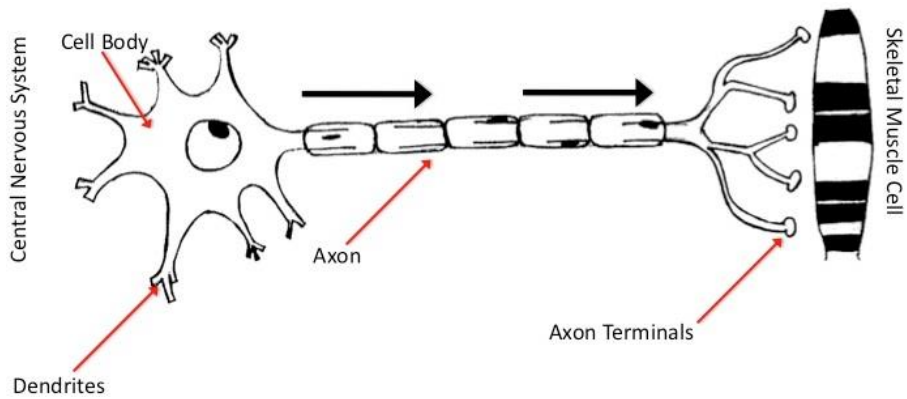


INFORMATION RELAY: 5 – 6 CHALLENGE (SETUP)

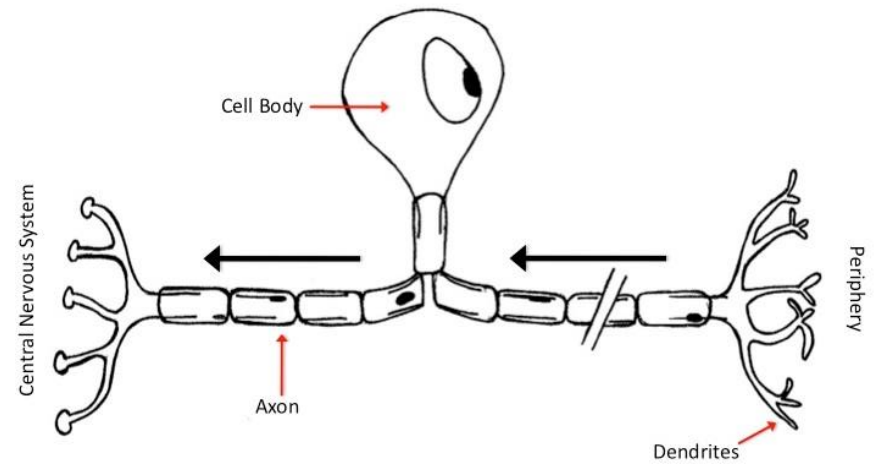


Appendix B

INFORMATION RELAY: 5 – 6 CHALLENGE (MOTOR NEURON)

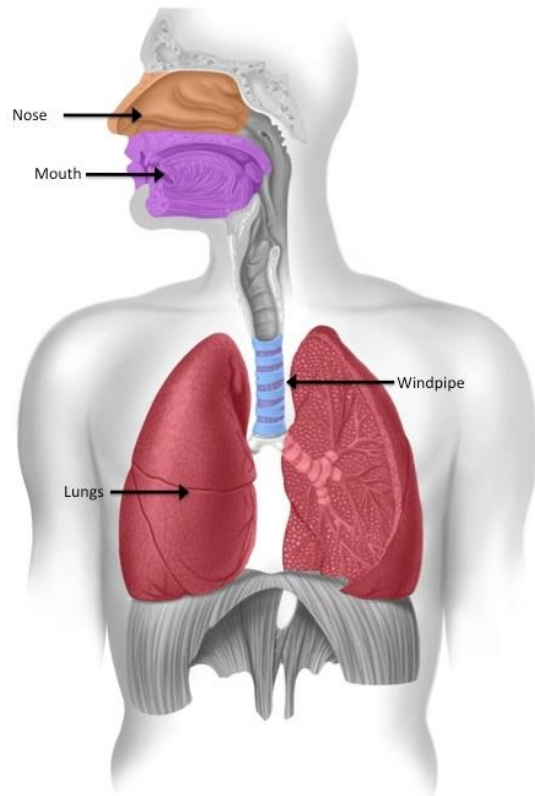


INFORMATION RELAY: 5 – 6 CHALLENGE (SENSORY NEURON)

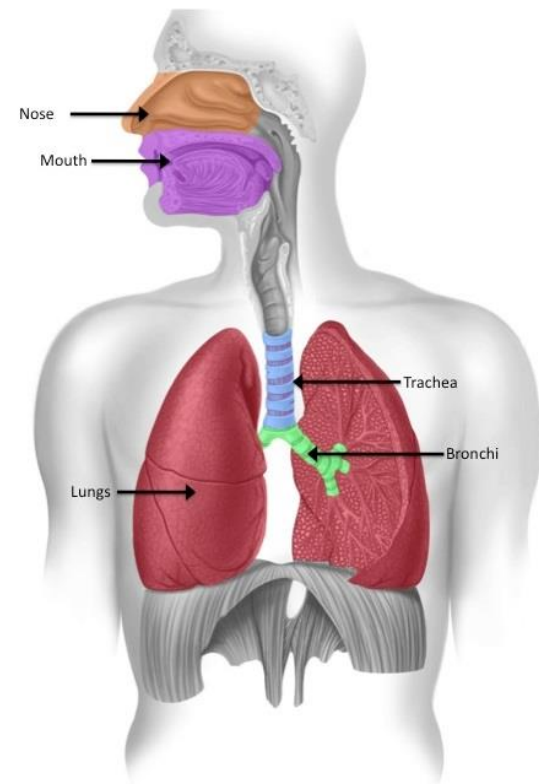


Appendix B

RISING WITH THE SUN: BASIC PROCEDURE



RISING WITH THE SUN: 3 – 4 CHALLENGE



Appendix B

RISING WITH THE SUN: SUN SALUTATIONS



Position 1: Reach Up



Position 2: Touch Toes



Position 3: Down Dog



Position 4: Snake



Position 5: Down Dog



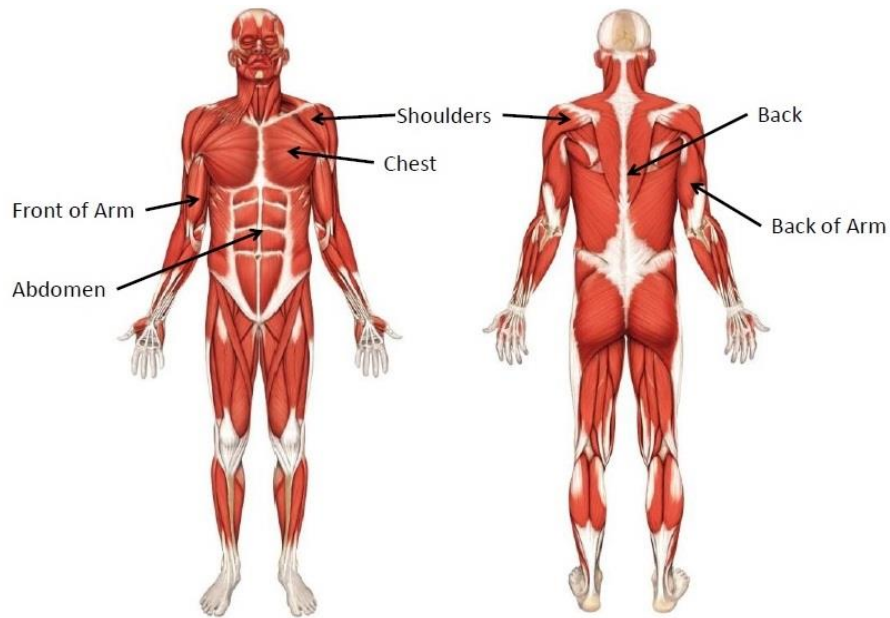
Position 6: Touch Toes



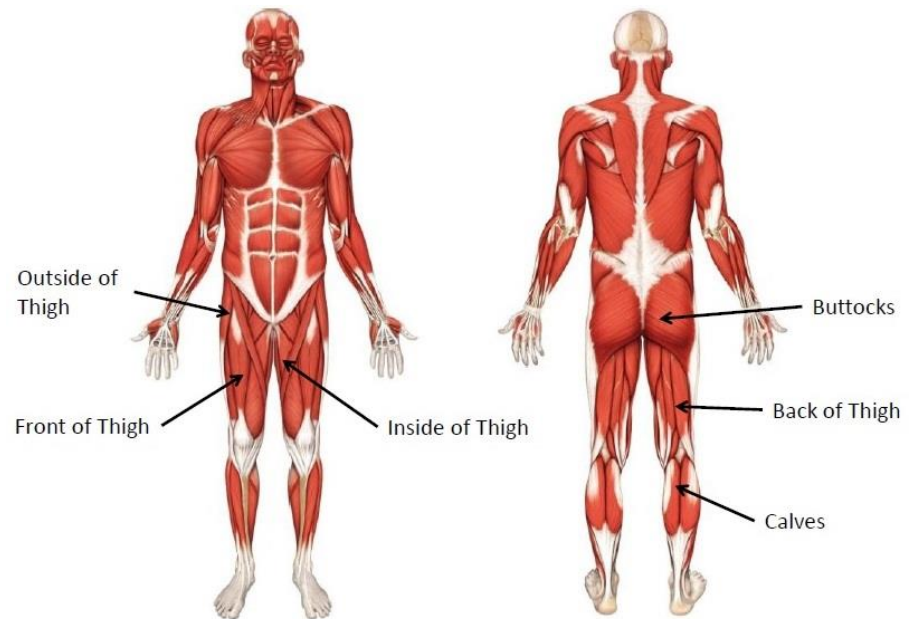
Position 7: Reach Up

Appendix B

SIMON SAYS...WORK YOUR MUSCLES!: BASIC PROCEDURE (UPPER BODY)

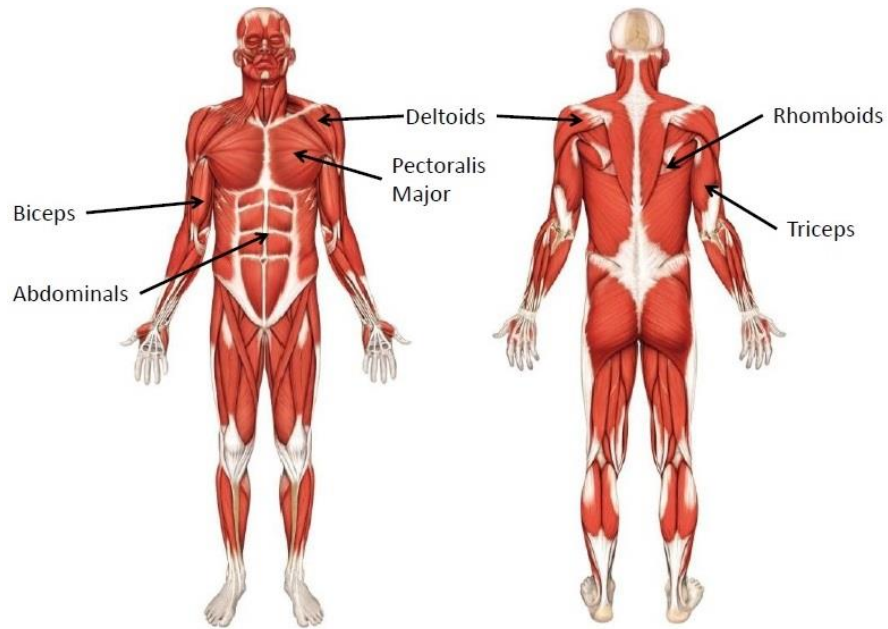


SIMON SAYS...WORK YOUR MUSCLES!: BASIC PROCEDURE (LOWER BODY)

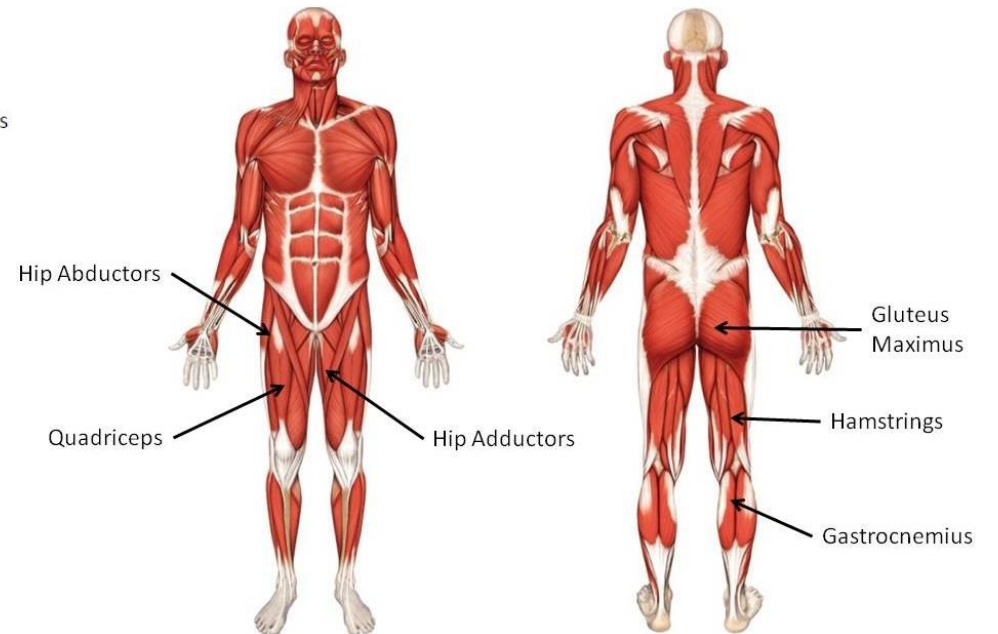


Appendix B

SIMON SAYS...WORK YOUR MUSCLES! 5 - 6 CHALLENGE (UPPER BODY)



SIMON SAYS...WORK YOUR MUSCLES! 5 - 6 CHALLENGE (LOWER BODY)



Appendix B

SIMON SAYS... WORK YOUR MUSCLES!: STRENGTH EXERCISES

1. Squat



Front of the Thigh
Quadriceps

2. Standing Leg Curls



Back of the Thigh
Hamstrings

2. Hip Lift



Back of the Thigh
Hamstrings

Appendix B

SIMON SAYS... WORK YOUR MUSCLES!: STRENGTH EXERCISES (CONTINUED)

3. Standing Leg Cross



Inside of Thigh
Hip Adductors

4. Leg Raises while lying on the side



Outside of Thigh
Hip Abductors

5. Forward Lunge



Buttocks
Gluteus Maximus

5. Side Lunge



Buttocks
Gluteus Maximus

Appendix B

SIMON SAYS... WORK YOUR MUSCLES!: STRENGTH EXERCISES (CONTINUED)

6. Calf Raises



Calves
Gastrocnemius

7. V-Sit



Abdomen
Abdominals

7. Crunch



Abdomen
Abdominals

7. Oblique Curl Ups



Abdomen
Abdominals

Appendix B

SIMON SAYS... WORK YOUR MUSCLES!: STRENGTH EXERCISES (CONTINUED)

8. Push-Up



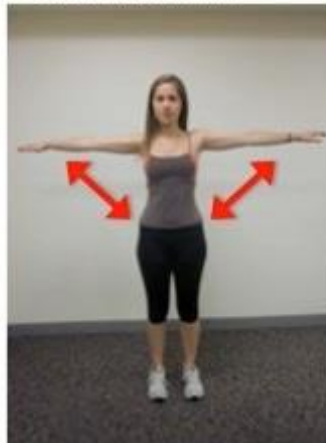
Chest
Pectoralis Major

9. Standing, bent over row



Back
Rhomboids

10. Lateral Arm Raises



Shoulders
Deltoids

10. Forward Arm Raises



Shoulders
Deltoids

Appendix B

SIMON SAYS... WORK YOUR MUSCLES!: STRENGTH EXERCISES (CONTINUED)

11. Bicep Curls



Front of Arms
Biceps

12. Standing Tricep Extensions



Back of Arms
Triceps

12. Tricep Push-Ups



Back of Arms
Triceps

Appendix B

SIMON SAYS... WORK YOUR MUSCLES!: STRETCHING EXERCISES

1. Front of thigh



Quadriceps
(rectus femoris)

2. Back of thigh



Hamstrings

3. Inside of thigh



Hip Adductors

4. Outside of thigh



Hip Abductors

5. Buttocks



Gluteus Maximus

Appendix B

SIMON SAYS... WORK YOUR MUSCLES!: STRETCHING EXERCISES (CONTINUED)

6. Calves



Gastrocnemius

7. Abdomen



Abdominals

8. Chest



Pectoralis Major

Appendix B

SIMON SAYS... WORK YOUR MUSCLES!: STRETCHING EXERCISES (CONTINUED)

9. Back



Rhomboids

10. Shoulders



Deltoids

11. Front of arm



Biceps

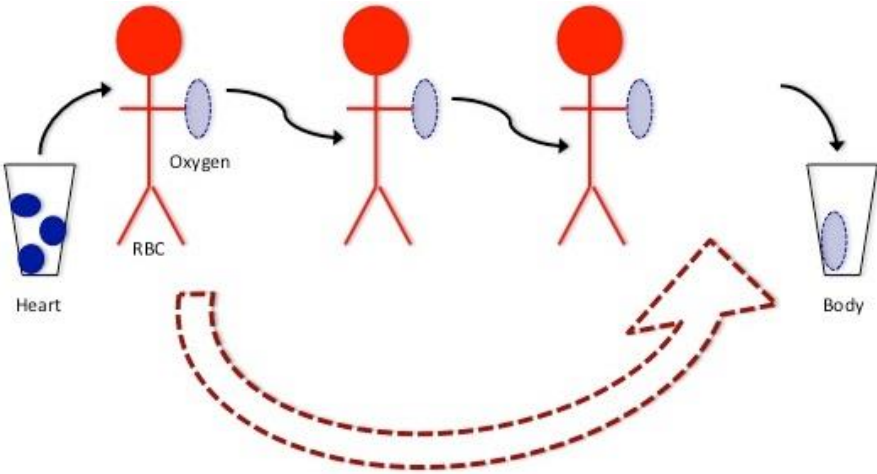
12. Back of Arm



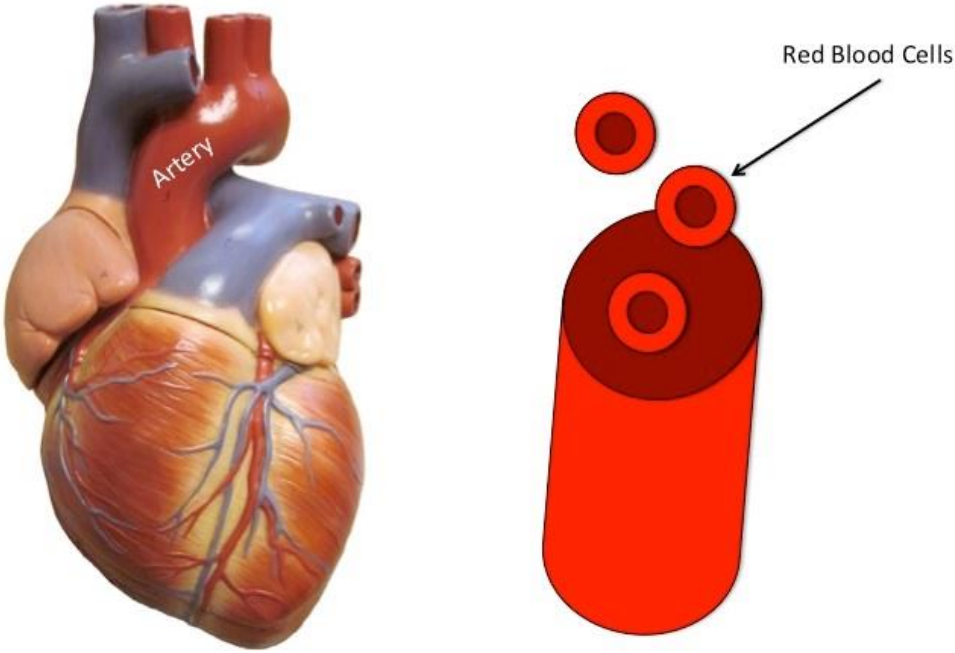
Triceps

Appendix B

MORE OXYGEN PLEASE!: BASIC PROCEDURE

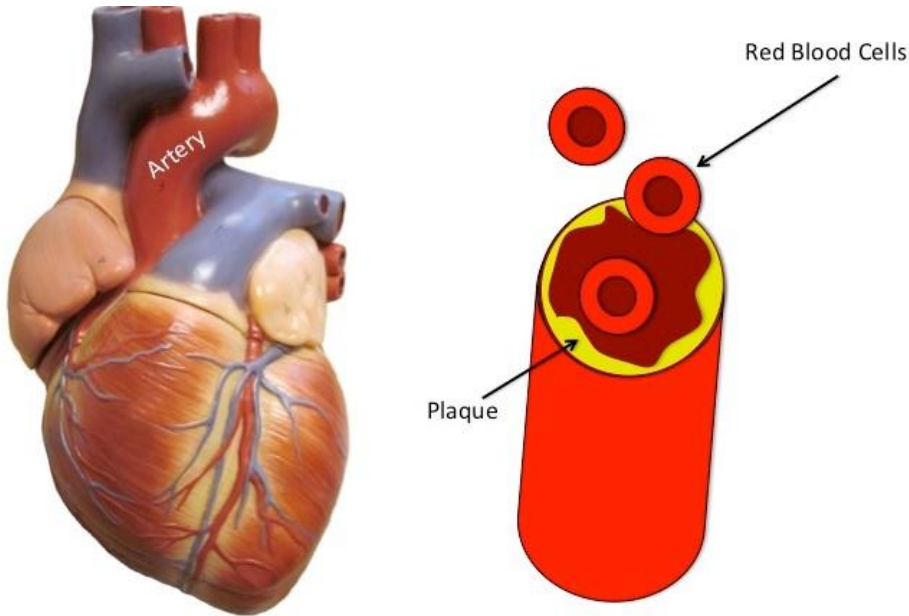


MORE OXYGEN PLEASE!: THE HEART AND ARTERIES

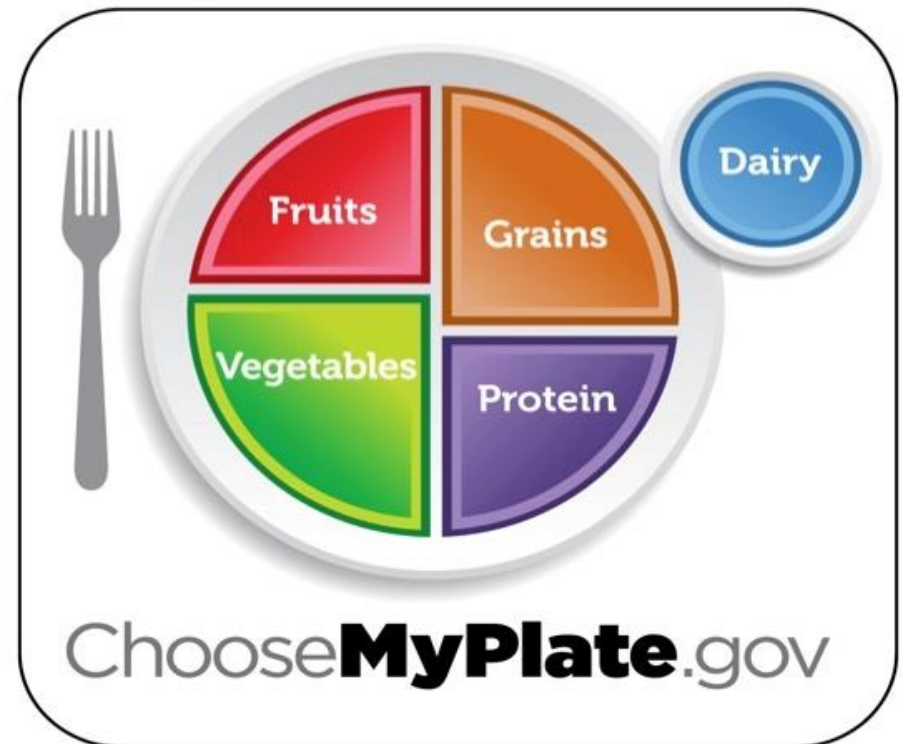


Appendix B

MORE OXYGEN PLEASE!: 3 – 4 CHALLENGE (THE HEART AND ARTERIES)



WHAT'S ON MY PLATE: MYPLATE



Appendix B

WHAT'S ON MY PLATE:
5 – 6 CHALLENGE



WHAT'S ON MY PLATE:
5 – 6 CHALLENGE



Appendix B

WHAT'S ON MY PLATE:
5 – 6 CHALLENGE

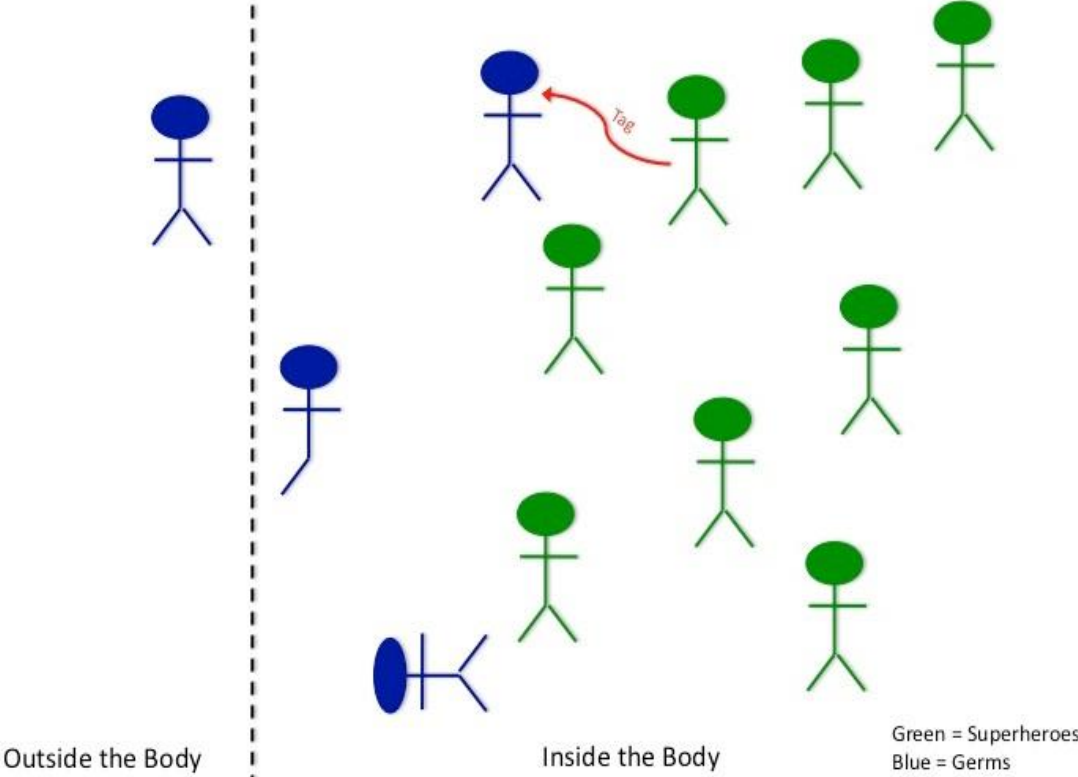


WHAT'S ON MY PLATE:
5 – 6 CHALLENGE



Appendix B

ATTACK OF THE GERMS: BASIC PROCEDURE (SETUP)



Appendix B

ATTACK OF THE GERMS: 5 – 6 CHALLENGE (SETUP)

