



Body in Balance

Adapted from *Exercise and Homeostasis Scientific Inquiry Lab*
By Jennifer Boessel & Crystal Taylor

Focus on Inquiry

Students will collect, graph, and evaluate data collected on changes to the various body systems during exercise.

Lesson Content Overview

Students will explore the impact that maintaining a stable body temperature has on homeostasis by exercising for several minutes and monitoring their effects on the body

Duration	85 minutes	Setting	Classroom	Grouping	2 students per group	PTI Inquiry Subskills	1.3, 2.5, 3.1, 3.2, 3.7, 4.2, 4.3, 5.3, 7.2, 7.3
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Lesson Components	Estimated Time	Inquiry Subskills Used	Technology Used	Level of Student Engagement	Brief Description
<i>Engage</i>	5 min	1.3	Laptop/ Video	2	Students will watch a short video of a man performing a balancing act on a trapeze and make connections between the video and balance within the human body.
<i>Explore</i>	30 min	1.3, 2.5, 3.1, 3.2, 3.7, 4.2, 4.3	Stopwatch App/ Thermometer	3	Students will work in pairs and perform exercise while monitoring changes in the body throughout the process.
<i>Explain</i>	15 min	5.3, 7.2, 7.3	None	2	Partners will pair up with another set of partners to compare results and will then share results as well as identify interactions in the body.
<i>Expand/Elaborate</i>	45 min		Computers or Tablets or BYOD	3	Students will complete a WebQuest further exploring how the body works to maintain homeostasis.
<i>Evaluate</i>	20 min	2.2, 7.3	Gradecam	1	Students will complete a short quiz to evaluate their understanding of homeostasis.

Level of Student Engagement

1	Low	Listen to lecture, observe the teacher, individual reading, teacher demonstration, teacher-centered instruction
2	Moderate	Raise questions, lecture with discussion, record data, make predictions, technology interaction with assistance
3	High	Hands-on activity or inquiry; critique others, draw conclusions, make connections, problem-solve, student-centered

Next Generation Science Standards – Inquiry

NGSS Practice 3: Planning and Carrying Out Investigations
 NGSS Practice 4: Analyzing and Interpreting Data
 NGSS Practice 6: Constructing explanations
 NGSS Practice 8: Obtaining, Evaluating and Communicating Information



Next Generation Science Standards – Life Science

MS-LS-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.



Florida Science Standards – Nature of Science

SC.6.N.1.1: Define a problem from the sixth grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data,

interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

Florida Science Standards – Life Science Content

SC.6.L.14.5: Identify and investigate the general functions of the major systems of the human body (digestive, respiratory, circulatory, reproductive, excretory, immune, nervous, and musculoskeletal) and describe ways these systems interact with each other to maintain homeostasis.

Materials and Advance Preparation

Materials List

Class set:

1. Temporal Thermometer – 1 per pair
2. Stopwatch or stopwatch app
3. Heartrate App (*Suggested: Instant Heart Rate, Azumio*) or stethoscope – 1 per pair

Student materials:

1. Exercise and Homeostasis Lab Worksheet (**Blackline Master #1**) – 1 per student
2. Homeostasis WebQuest Worksheet (**Blackline Master #2**) – 1 per student
3. Homeostasis Quiz (Evaluation) (**Blackline Master #3**) – 1 per student
4. GradeCam Sheets (**Blackline Master #4 - Optional**) – 1 per student

Blackline Masters

1. Exercise and Homeostasis Lab Worksheet (**Blackline Master #1**)
2. Homeostasis Scavenger Hunt Worksheet (**Blackline Master #2**)
3. Homeostasis Quiz (**Blackline Master #3**)
4. GradeCam Sheets (**Blackline Master #4**)

Advance Preparation

1. Teacher should get video ready before class. (It has been trimmed down to eliminate extra unneeded parts.)
2. Copies of all blackline masters should be made.
3. Teacher should have all lab materials set up and put at stations and ready for student use.
4. Teacher should plan for technology use for the WebQuest: Computer lab, Laptop/iPad cart, or students can use a smartphone.

Lesson Information

Learning Objectives

- The student will carry out an investigation and correctly collect, analyze and interpret data based on the results. (SC.6.N.1.1)
- The student will carry out an investigation and describe how different body systems work together to attempt to keep the body in homeostasis. (SC.6.L.14.5)

Prior Knowledge Needed by the Students

- Students should be able to identify organs in the human body and/or describe their functions.
- Students should be familiar with the vocabulary word **homeostasis** and its meaning.
- Students should also have a general knowledge of the body systems, including what the major organs of each system and the general function of each body system.
- Students should know how to construct and analyze line graphs.
- Students need to know how to multiply.

Background Information

- Homeostasis is the process by which the internal environment of the body is kept relatively stable despite changes in the external environment. Typically, we understand that our body's ability to regulate temperature is very important. Our body has a normal "set point" for its temperature, which varies slightly from person to person. We often forget that the body regulates its internal environment in many ways. The body senses changes in the environment and

responds by making changes in functions. This is a dynamic process that keeps the internal conditions of the body relatively stable. The body can adapt to many changing conditions, but there are limits to these conditions. The body's cells will not function well if they are too cold or too hot, our heart rates cannot endlessly increase and we cannot lose excessive water without putting our cells, tissues and organs at risk. As a result, reaching or exceeding these limits can be dangerous, so our body tends to function within certain normal ranges. Using temperature as an example, we know that the hypothalamus in the brain can act as a thermostat and control the body's functioning to regulate temperature to keep us from overheating or getting too cold. The hypothalamus causes changes in the size of blood vessels in the skin, which then has a direct impact on the amount of heat lost or retained by the body. Most systems of the body maintain homeostasis by means of negative feedback mechanisms, which reverse a response back to a normal state.

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- Wingerd, B. (2014) *The Human Body: Concepts of Anatomy and Physiology* (3rd ed). Lippincott, Williams, & Wilkins: Philadelphia, PA.

Lesson Procedure

Engage

1. Teacher will play this video and ask students to think what the concept of balance has to do with the human body.
 - a. Video found at (2:36): <https://edpuzzle.com/media/574def5ae37454f56e63ebed>
 - b. **NOTE:** EdPuzzle is a free service and NO login is required to watch this video.
 - c. **NOTE:** Make sure to fast forward past the advertisements and display the video "whole screen" so that the web page advertisements located on the right-hand side and underneath the video will not be seen. In addition, please be on the lookout for "pop up" ads while the video is playing
2. Teacher will ask students to THINK about the following question:
 - a. What is **one** word you would use to describe this video clip? *Student responses will vary but you are looking for the word "balance" to lead into a conversation about homeostasis.*
3. Teacher will give students think time (30 seconds).
4. Then teacher will ask the students to turn to their shoulder partner and share their answer to the prior question. Each partner will take a turn sharing their one word.
5. Teacher will start a short class discussion for students to share the word they chose and lead into the following questions.
 - a. What was he doing to maintain balance? *Student responses will vary but may include trying to keep all of his weight over the center of the platform.*
 - c. What interactions do you see him using to help get back to balance? *Student responses will vary but may include shifting weight from side to side.*
 - d. What do you think balance has to do with the human body? *Student responses will vary but might include that he is using his muscles and concentrating really hard with his mind.*

Explore

1. Teacher will distribute the Exercise and Homeostasis Lab worksheet (**Blackline Master #1**) to each student and read through directions and procedures.
2. Since there will be exercise and movement the teacher should review lab safety procedures pertaining to moving around the lab carefully. Teacher should also remind students that if at any time they feel faint, dizzy, or unwell that they should stop exercising immediately and inform the teacher.
3. Ask students to predict what will happen to their body as they exercise and as each minute passes.
4. Have students record their hypothesis on their lab worksheet (**Blackline Master #1**)
5. Students will work in pairs. Teacher may assign students to pairs or may use a strategy such as Stand-up/Hand-Up/Pair-Up (Kagan) to put students into pairs.
6. Students will follow the instructions on their lab worksheet (**Blackline Master #1**) and complete the lab activity.

7. Once students have completed the lab, they should return to their seats and create two line graphs to be able to analyze their breathing rate and heart rate during exercise.

Explain

1. Students will complete the post-lab questions.
2. Student will analyze their results compared to others. Students pairs will pair (Pairs-Pair/Kagan) with another group and compare results before sharing as a class. Teacher will provide the following questions as conversation starters, either verbally or on the Smartboard.
 - a. Look at your graph and the graph of the group you paired up with.
 - i. What do you notice? *Student responses will vary but should include that the heart rate increases with increased exercise.*
 - ii. Do you see similarities? Differences? *Student responses will vary*
 - b. After looking at the graph, look at your data tables.
 - i. Why do you think your heart rate or breathing rate is different than that of your partner? *Student responses will vary but could include that one person is more "in shape" than another person.*
 - c. Did your data support or disprove your hypothesis? *Student responses will vary*
 - d. We focused on mainly on the circulatory and respiratory systems, which other systems were involved as well? *Student responses will vary but could include the integumentary system (skin), the nervous system, the skeletal system, and the muscular system*
 - e. How are those systems interacting with one another? *Student responses will vary*
 - f. What happened to your body after you stopped exercising? *Student responses will vary but should include that their heart rate went down.*
 - g. Why do you think this happened? *Student responses will vary but could include that they weren't breathing as hard so their heart didn't have to work as hard to supply oxygen to the muscles.*
 - h. What is the significance of disrupting the 'balance' in one body system? *Student responses will vary but could include that all the other systems have to respond to the disruption in balance.*

Expand

1. Students will receive Homeostasis WebQuest Worksheet (**Blackline Master #2**)
2. Students may work individually to complete the WebQuest by visiting the websites listed and completing their worksheets.
 - a. The WebQuest can be found at:
http://www.kidsbiology.com/biology_basics/needs_living_things/homeostasis7.php
3. If computer limitations exist, this can be done as a station or done on a tablet or smartphone (if teacher feels comfortable) as an alternative.
4. The teacher can collect and use it as an additional evaluation tool.

Evaluate

FORMAL EVALUATION

1. Students will complete the Homeostasis Quiz (5 multiple choice questions) (**Blackline Master #3**) on their GradeCam sheet (**Blackline Master #4 - Optional**). Teacher and student will receive instant feedback.
2. Quiz Key: 1. B 2. C 3. B 4. A 5. B
3. If GradeCam is not available, students could answer on a small slip of paper, like an exit ticket. Senteos or other 'clicker' options would also work if available.

INFORMAL or OPTIONAL EVALUATIONS

1. Teacher will read and review the data tables, graphs and discussion questions of each student to evaluate understanding. Teacher will also use quiz results to assess student mastery of the standard and remediate/enrich as appropriate.

WRAP UP.

Blackline Master #1

- Bring the lesson to a conclusion by having students brainstorm other ways that the body works to maintain homeostasis and have them take turns sharing ideas with their face partner (not their lab partner) one at a time (Rally Robin/Kagan).

Supplementary Resources

Teachers

This reading passage from the CK-12 Foundation provides a great deal of background information that teachers may find useful in preparing themselves as well as students:

<http://www.ck12.org/biology/Homeostasis/lesson/Homeostasis-BIO/>

Students

- Students can review and quiz themselves on homeostasis:
<https://www.brainpop.com/health/bodysystems/homeostasis/>
- This interactive gives student's information on homeostasis while also letting them explore the impacts of certain activities on the body.
<http://www.think-bank.com/iwb/flash/homeostasis.html>

CITATION OF SOURCES.

Buckley, D. (2011). *Interactive science*. Boston, MA: Pearson.

Cavanaugh, T. (n.d.). CK-12 Foundation. Retrieved April 22, 2016, from
<http://www.ck12.org/user:c2hhzg93y2f2yw5hdwdogdtywlsImnvtbq.../book/Science-FCAT-2.0-Review-Middle-School-FlexBook/section/19.0/>

CK-12 Foundation. (n.d.). Retrieved April 28, 2016, from
<http://www.ck12.org/biology/Homeostasis/lesson/Homeostasis-BIO/>

Homeostasis Online Scavenger Hunt. (n.d.). Retrieved January 24, 2016, from
<https://www.teacherspayteachers.com/Product/Homeostasis-Online-Scavenger-Hunt-1043157>

Hua, D. (n.d.). Exercise and Homeostasis Scientific Inquiry Lab. Retrieved January 24, 2016, from
<https://www.teacherspayteachers.com/Product/Exercise-and-Homeostasis-Scientific-Inquiry-Lab-2109289>

Yes, I cited all materials and resources used in this lesson. *Jennifer Boessel & Crystal Taylor*
Lesson authors' signature

Names: _____

Exercise and Homeostasis Lab Worksheet

Problem

How does exercise affect a person's heart rate, breathing rate, perspiration level (sweat), and temperature?

Lab Safety

Be aware of how you are feeling during the lab. If you have any conditions that could cause you to be dizzy or lightheaded during exercise please inform the teacher. Any student who feels dizzy or otherwise unwell during the exercise should cease their activities.

Form a Hypothesis

If a person increases their activity level, then they will experience a(n) increase/decrease (Circle one) in their _____, because _____

Procedure

Read through directions carefully before you start

1. Work in pairs.

Partner A is the person whose birthday is coming next – Name _____

Partner B is the other person – Name: _____

2. Partner A will start the lab by doing jumping jacks (at a steady pace for 4 minutes).

Partner B will be the time keeper and the data recorder for Partner A.

3. Before the exercise record Partner A's *resting* body color (face/arms), perspiration level, breathing rate, pulse, and temperature in the data table.

**The temperature will only be taken once at rest and once after 4 minutes of exercise.

4. Then, during exercise record these variables **at one minute intervals** (see data table below). After each minute interval, you will record your observations for body color and perspiration level. Partner A will count the number of breaths they take in 15 seconds, and Partner B will record it. Then Partner A will take their pulse for 15 seconds, and Partner B will record it.

5. Repeat for 5 minutes.

Blackline Master #1

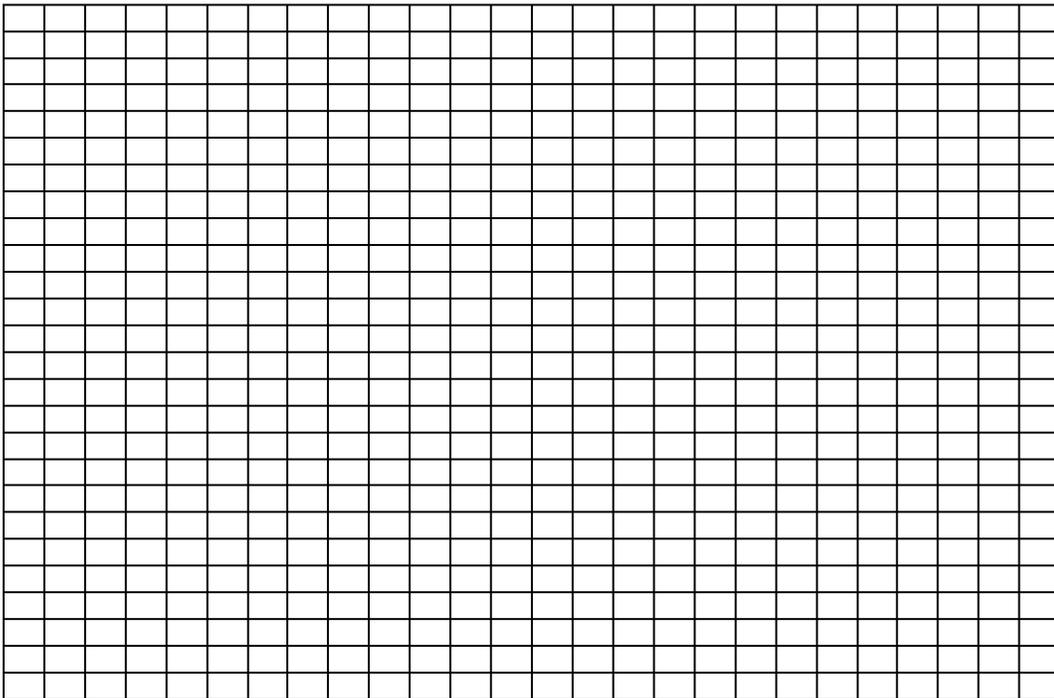
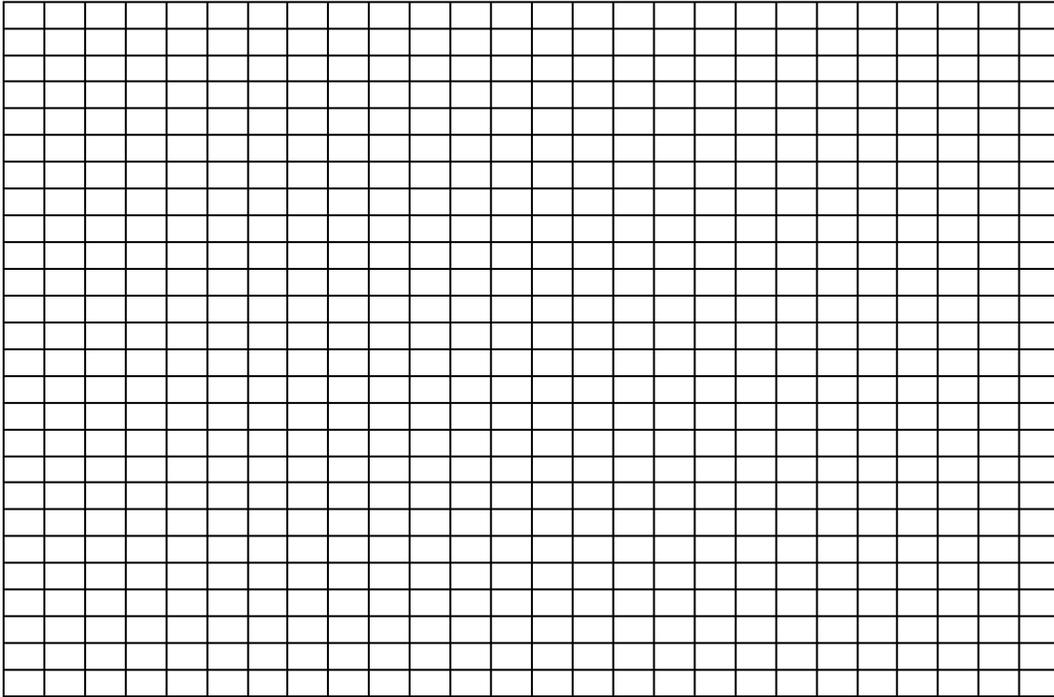
6. Calculate: (after exercise)
 - Multiply the number of breaths by four to get breaths per minute for each minute interval.
 - Multiply the number of heart beats by four to get beats per minute for each minute interval.
7. Switch Roles. (Partner B – doing jumping jacks, Partner A – time keeper and data recorder)
8. Graph your data using an appropriate scale. Remember to label the x and y axis. You will create two line graphs for your own data.

Data

Temperature at rest _____ After 4 minutes of exercise _____

Time Intervals	Body Color	Perspiration Level	Breathing Rate (breaths/min)	Heart Rate (beats/min)
Rest (0 Minutes)			$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$	$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$
1 Minute			$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$	$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$
2 Minutes			$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$	$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$
3 Minutes			$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$	$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$
4 Minutes			$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$	$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$
1 Minute Rest After Exercise 5 Minutes			$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$	$\frac{\quad}{(15 \text{ sec.})} \times 4 = \frac{\quad}{(\text{total})}$

Blackline Master #1



Discussion Questions

1. We are measuring the heart rate and respiratory rate. What are two body systems that work together in this exercise?

_____ & _____

2. How does the respiratory rate and heart rate change? Why do these changes accompany exercise?

3. How do they work together to maintain homeostasis during exercise?

4. Why do you think there is a change in body temperature, color change and perspiration level? In what ways does your body attempt to maintain homeostasis?

5. Draw a Conclusion: Do your results agree with your hypothesis? Why or why not? Cite specific evidence to support your conclusion.

Names: _____

Exercise and Homeostasis Lab Worksheet

Problem

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If a person increases their activity level, then they will experience a(n) increase/decrease (Circle one) in their _____, because _____

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**The temperature will only be taken once at rest and once after 4 minutes of exercise.

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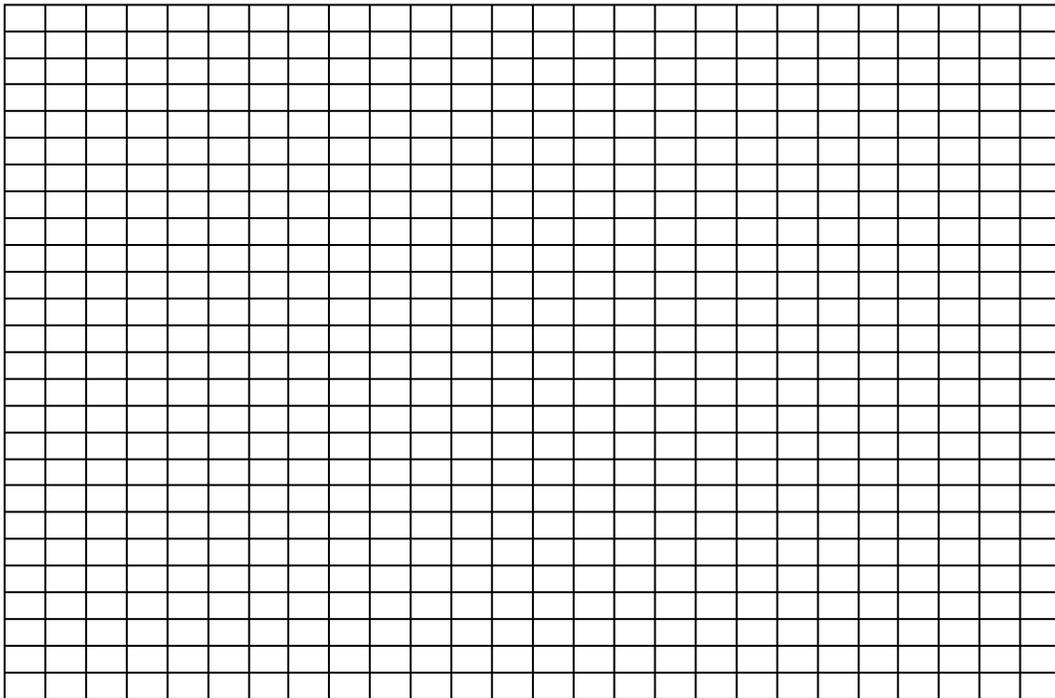
6. Calculate: (after exercise)

- Multiply the number of breaths by four to get breaths per minute for each minute interval.
- Multiply the number of heart beats by four to get beats per minute for each minute interval.

7. Switch Roles. (Partner B – doing jumping jacks, Partner A – time keeper and data recorder)

8. Graph your data using an appropriate scale. Remember to label the x and y axis. You will create two line graphs for your own data.

Heart Rate at Various Intervals of Exercise



Discussion Questions

1. We are measuring the heart rate and respiratory rate. What are two body systems that work together in this exercise?

_____ & _____

2. How does the respiratory rate and heart rate change? Why do these changes accompany exercise?

3. How do they work together to maintain homeostasis during exercise?

4. Why do you think there is a change in body temperature, color change and perspiration level? In what ways does your body attempt to maintain homeostasis?

5. Draw a Conclusion: Do your results agree with your hypothesis? Why or why not? Cite specific evidence to support your conclusion.

Homeostasis WebQuest

Directions: Go to the following websites and answer the questions below.

Website #1:

http://www.kidsbiology.com/biology_basics/needs_living_things/homeostasis7.php

Homeostasis is a big word that biologists use to indicate that an organism needs to keep conditions inside of itself the 1. _____, even though conditions outside are always 2. _____. One very important part of homeostasis is body 3. _____. In order for an organism's chemical reactions to continue as they should, the temperature on the inside of the organism needs to remain the same.

Website #2: http://www.biology4kids.com/files/systems_regulation.html

All of your body's systems work together maintain homeostasis inside of your body.

Homeostasis is achieved by making sure the temperature, pH (acidity), and

4. _____ levels (and many other factors) are set just right for your 5.

_____ to survive. Homeostasis levels are different for each species.

6. _____ is a process that happens when your systems need to slow down or completely stop a process that is happening. When you eat, food travels into your stomach, and digestion begins. You don't need your stomach working if you aren't eating.

Another example of negative feedback occurs when your 7. _____'s _____ begins to rise and a negative feedback response works to counteract and stop the rise in temperature. Sweating is a good example of negative feedback.

8. _____ is the opposite of negative feedback in that encourages a **physiological (body) process** or amplifies the action of a system. Positive feedback is a cyclic process that can continue to amplify your body's response to a stimulus until a negative feedback response takes over.

Website #3: <http://encyclopedia.kids.net.au/page/ho/Homeostasis>

Homeostasis means 9. _____ or equilibrium. Complex systems, such as a human body, must have homeostasis to maintain stability and to 10. _____.

Homeostasis in the human body:

All sorts of factors affect the suitability of our body fluids to sustain life; these include properties like temperature, 11. _____, acidity (carbon dioxide), and the concentrations of nutrients and wastes (urea, glucose, various ion, oxygen). This control is achieved with various organs in the body. For example: 12. _____

The skeletal muscles can shiver to produce heat if the body temperature is too low. Non-shivering thermogenesis involves the decomposition of fat to produce heat.

13. _____ cools the body with the use of evaporation.

Chemical regulation

The pancreas produces 14. _____ to control

blood-sugar concentration. The 15. _____ take in oxygen and give off carbon

Blackline Master #2 - KEY

dioxide. The kidneys remove urea, and adjust the concentrations of water and a wide variety of ions.

Homeostasis WebQuest Answer Key

Directions: Go to the following websites and answer the questions below.

Website #1:

http://www.kidsbiology.com/biology_basics/needs_living_things/homeostasis7.php

Homeostasis is a big word that biologists use to indicate that an organism needs to keep conditions inside of itself the 1. **same**, even though conditions outside are always 2. **changing**. One very important part of homeostasis is body 3. **temperature**. In order for an organism's chemical reactions to continue as they should, the temperature on the inside of the organism needs to remain the same.

Website #2: http://www.biology4kids.com/files/systems_regulation.html

All of your body's systems work together maintain homeostasis inside of your body. Homeostasis is achieved by making sure the temperature, pH (acidity), and 4. **oxygen** levels (and many other factors) are set just right for your 5. **cells** to survive. Homeostasis levels are different for each species.

6. **Negative Feedback** is a process that happens when your systems need to slow down or completely stop a process that is happening. When you eat, food travels into your stomach, and digestion begins. You don't need your stomach working if you aren't eating.

Another example of negative feedback occurs when your 7. **body's temperature** begins to rise and a negative feedback response works to counteract and stop the rise in temperature. Sweating is a good example of negative feedback.

8. **Positive Feedback** is the opposite of negative feedback in that encourages a **physiological (body) process** or amplifies the action of a system. Positive feedback is a cyclic process that can continue to amplify your body's response to a stimulus until a negative feedback response takes over.

Website #3: <http://encyclopedia.kids.net.au/page/ho/Homeostasis>

Homeostasis means 9. **balance** or equilibrium. Complex systems, such as a human body, must have homeostasis to maintain stability and to 10. **survive**.

Homeostasis in the human body:

All sorts of factors affect the suitability of our body fluids to sustain life; these include properties like temperature, 11. **salinity**, acidity (carbon dioxide), and the concentrations of nutrients and wastes (urea, glucose, various ion, oxygen). This control is achieved with various organs in the body. For example: 12. **Thermal regulation** The skeletal muscles can shiver to produce heat if the body temperature is too low. Non-shivering thermogenesis involves the decomposition of fat to produce heat. 13. **Sweating** cools the body with the use of evaporation.

Chemical regulation

The pancreas produces 14. **insulin and glucagon** to control blood-sugar concentration.

The 15. **lungs** take in oxygen and give off carbon dioxide.

The kidneys remove urea, and adjust the concentrations of water and a wide variety of ions.

Homeostasis Quiz

Answer the following questions on the GradeCam sheet provided to you. Don't forget to bubble in your ID number on the GradeCam sheet too!

1. In this activity you were required to exercise for five minutes, measuring your heart rate and breathing rate at one-minute intervals. What were your independent and dependent variables? (SC.6.N.1.1)
 - A. Independent: breathing and heart rate; Dependent: time exercising
 - B. Independent: time exercising; Dependent: breathing and heart rate
 - C.
 - D. Independent: time exercising; Dependent: number of jumping jacks
 - E. Independent: number of jumping jacks; Dependent: breathing and heart rate
2. During exercise, the heart beats faster. How does this help the body maintain homeostasis? (SC.6.L.14.5)
 - A. It lowers the blood pressure.
 - B. It helps the body digest more food.
 - C. It provides muscle cells with additional oxygen.
 - D. It carries digestive juices to cells in the small intestine.
3. Food gives the body energy, which helps the body maintain homeostasis. In the morning, an athlete eats a nutritious breakfast to get energy to exercise. What are the main organ systems involved in the process of food from the athlete's breakfast being broken down into nutrients and then delivered to the cells? (SC.6.L.14.5)
 - A. Digestive and excretory systems.
 - B. Digestive and circulatory systems.
 - C. Endocrine and excretory systems.
 - D. Respiratory and circulatory systems.
4. The skin helps regulate body temperature by perspiration, which allows excess heat to leave the body. If you lost the ability to sweat, what could happen to you if you were running a marathon? (SC.6.L.14.5)
 - A. The body would overheat.
 - B. The body would react slowly.
 - C. The body would start to shiver.
 - D. The body would need more energy.
5. In order to maintain homeostasis, the systems of the human body work together to keep a constant internal temperature. Which of the following best describes how the human body responds in a cold environment? (SC.6.L.14.5)
 - A. The digestive system produces more hormones to warm the body.
 - B. The nervous system signals the muscles of the muscular system to contract and warm the body.
 - C. The circulatory system delivers less carbon dioxide to the muscular system, resulting in stiffening of the muscles.
 - D. The skeletal system produces more blood cells that circulate through the blood vessels, increasing the warmth of the body.

Homeostasis Quiz – Answer Key

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 - The skeletal system produces more blood cells that circulate through the blood vessels, increasing the warmth of the body.

GradeCam Answer Sheets

GradeCam ID

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0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

1. A B C D E
2. A B C D E
3. A B C D E
4. A B C D E
5. A B C D E

GradeCam ID

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0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
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1. A B C D E
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GradeCam ID

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0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
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1. A B C D E
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GradeCam ID

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0	0	0	0	0	0
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GradeCam ID

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0	0	0	0	0	0
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GradeCam ID

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0	0	0	0	0	0
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1. A B C D E
2. A B C D E
3. A B C D E
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GradeCam ID

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0	0	0	0	0	0
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GradeCam ID

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0	0	0	0	0	0
1	1	1	1	1	1
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