



Heart Rate and Function

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Grade Level:

Elementary-High School

Heart Rate and Function

Purpose: The purpose of this activity is to discover and learn about heart rate and the function of the heart. This activity can be adapted for grade levels 3 and up.

Objectives:

Students will be able to:

- investigate whether their heart beats slower/faster at different times.
- develop an understanding of why their heart beats slower/faster at different times.
- use data to develop an explanation of why their heart beats slower/faster at different times.
- be aware of the effect of exercise on respiration.
- describe the major function of the heart.

Materials:

The students will work in pairs for this activity.

- stopwatch
- journal
- stethoscope

Procedure:

The teacher will direct the students' attention toward their heart rate. A good time to do this would be after recess. The teacher will ask a few questions on what they observed about their heart rate at that time. Then, tell them they will be getting into pairs. During the rest of the day they will be making observations and checking their heart rates. They will record their observations in their journals. At some point during the day give them a stopwatch and tell them to make some observations of their heart rate while they are in class. Also, take them outside and do an activity to get their heart rates up and have them make some observations of their heart rate.

After they have done the inquiry part, guide them through the rest. Have the students count their heart rate at different times. You should compare their heart rate while resting and after and during exercise.

If possible, have them get a resting heart rate when they wake up in the morning. You can also do it during other times (i.e. before and after lunch). Then, collect and write down the data and make conclusions. Finally, the teacher will introduce the function of the heart.

This is a very flexible activity, so the time spent on it is up to the teacher. The time also depends a lot on student observations/responses. The students may come up with another idea/approach and you may choose to let them observe/explore more. You will have to decide the best way to approach this activity according to your curriculum time constraints.

Day/Activity 1: The first day will be the inquiry part of the lesson. Direct the students' attention to their heart rate. A good time to do this would be right after recess. Ask them a few questions and see how they respond. Do not give them much information at this time. Have the students get into pairs and give them journals and a stopwatch. Tell them they will be making observations about their heart rate during different times of the day. Make sure you give them some class time to make some observations.

Also, take them outside and have them make some observations while exercising. Make sure each pair gets some time to use the stethoscope to make some observations. Finally, at the end of the day write down some of the observations the students have made. Talk to them about their observations and tell them they will continue observations tomorrow.

Day/Activity 2: The second day will consist of a more guided inquiry approach. This would be a good time to develop a question/hypothesis. Ask the students what they would like to find out. They may need some guidance. Guide the students toward developing a question about the affect of exercise on heart rate. Remember, the way you approach this activity will depend a lot on the first day observations and responses of the students. You may go in a different direction because of one of the student's responses, but eventually you will guide them through the rest of the activity. Show the students the correct way to check your pulse. You may choose not to use the neck pulse because of safety reasons. Some students may push too hard. At this time, have the students check their pulse for 1 minute. Do this until you feel they are getting fairly accurate results. This part of the activity is to make sure they know how to take an accurate count of their pulse. Once you believe that all the students can get an accurate count of their heart rate, then go to the next activity.

Day/Activity 3: The main purpose of this activity is to focus on why the heart beats slower/faster at different times. The main concern is that the students understand that the heart beats faster during exercise. This day/activity will consist of timing the students' heart rates before, during, and after exercise. Also, get a timed heart rate of each student while at rest. The teacher and student will record the results. The students will see that their heart beats faster during exercise. It is also important to notice that respiration increases during exercise.

Day/Activity 4: The teacher will record all the results of the students' heart rates on the board (i.e. resting heart rate and heart rate before, during, and after exercise). The teacher should present the results in a way that the students will be able to understand them. Have the students make observations and then make a conclusion about the results. The teacher may have to guide the students in making the conclusion, depending on student observations.

This entire activity can be very student generated, therefore you have to be very flexible. On the other hand, the activity can be more of a guided approach. The teacher decides how to guide the students and how structured they want the activity to be. The main conclusion for the students to notice is that heart rate goes up during exercise. However, this is not the only thing the students will learn from this. It all depends on how the

teacher approaches the activity. It also depends on the students' observations and the approaches they took in making their observations.

Safety:

The main safety concern for younger students is that they may push too hard on their neck while taking a neck pulse. The teacher should teach the students to use the wrist method in taking their pulse. Also, the teacher needs to choose safe exercise activities to do while checking the students' heart rates.

Questions to Ask:

- Does the heart beat slower or faster during exercise?
- When does your heart beat the slowest?
- When does your heart beat the fastest?
- Why do you think your heart beats faster sometimes?
- Why is it important to check your heart rate?
- Does your heart work harder when you are resting or exercising?
- What does your heart do?
- How can we tell our heart rate by checking our pulse in our wrist?
- How do we know our heart rate goes up when exercising?
- Why is it important to exercise?

Where to Go From Here:

First of all, it is very important to go into the function of the heart after this activity. Tie everything you did into the health aspect. Explain the importance of exercise to the students. Also, go into the function of the heart and where it is located in the body. You can make bar graphs of each student's heart rate at different times. The class can compare the heart rates of different animals. You can observe heart rates of animals that hibernate. There are many things you can do with this activity. Finally, the teacher should introduce all the other major organs of the body and their functions.

References:

All ideas found in this activity are original ideas designed by the author, Mike Peterson.

Possible Resources:

Target Heart Rate Web Page: <http://wsaz.webpoint.com/health/target.htm>

Heart Rate Lab Web Page: <http://www.abacon.com/>

The Circulatory System Web Page: <http://www.mnu.edu/>

COHIS Cardiovascular Diseases Web Page: <http://www.bu.edu/>

FAQ Heart Rate Web Page: <http://www.polarusa.com/faq>

Exercise and Heart Disease Web Page: <http://www.jhbmc.jhu.edu/>

Suggestions for Assessment:

The teacher will decide how to assess these activities. I teach third grade, and my assessment is based on participation. This activity can be adapted in many different ways, depending on your teaching approach and time. You can go into a very guided approach if you don't have much time. On the other hand, you can do a much more student

generated approach. It depends a lot on how the student observations and responses go and where the teacher wants to go with them. Eventually, the teacher will have to guide the students in the right direction to finish up the activity.