**Heart Rate Lab: Lesson Plan**

*Adapted from the American Heart Association*

**Resources**

* Stopwatch (or clock/watch with second hand)
* Pencil
* Student worksheet with graphs and discussion questions
* Physiology & Pathology by Visible Body

**Objectives**

1. Students will learn how to calculate their maximum heart rate and target heart rate zone.
2. Students will graph their heart rates while participating in a variety of physical activities.
3. Students can observe their various heart rates by using Physiology & Pathology by Visible Body.

**Introduction**

10 minutes: Begin by teaching students how to calculate their maximum heart rate and target heart rate zones using the following equations:

* Maximum Heart Rate (MHR) = 220 – age
* Target Heart Rate Zone (THRZ) = 50% to 85% of maximum heart rate
* Review with students how to find their heart beat and calculate their heart rate per minute:
* For more resources on calculating heart rate, see the following:
	+ <https://www.mayoclinic.org/healthy-lifestyle/fitness/expert-answers/heart-rate/faq-20057979>
	+ <https://www.health.harvard.edu/heart-health/want-to-check-your-heart-rate-heres-how>
	+ <https://www.heart.org/en/healthy-living/fitness/fitness-basics/target-heart-rates>

**Activity**

45 minutes: The activity consists of two parts. In the first part, students will count their heartbeat/take their pulse during a variety of activities and record it on the worksheet provided. In the second part, students will graph their heart rate on the worksheet and answer questions.

Note: After each physical activity, provide the students 1-2 minutes to sit down to let their heart rate recover before starting the next activity.

Points at which students will monitor their pulse and heart rate activities include:

1. Sitting in a chair for 3-5 minutes - relaxed
2. Standing for 3-5 minutes - relaxed
3. After walking at a leisurely pace for 3 minutes
4. After speed walking for 2 minutes
5. After 2 minutes of jogging in place
6. After doing 25 jumping jacks
7. After running in place as fast as possible for 1 minute

After students have recorded their heart rate as instructed, students will do a bar graph of the information. Once the bar graphs are completed, have a class discussion.

Direct your students to the My Heart Rate asset in the Cardiovascular unit of Visible Body’s Physiology & Pathology app.

* Students can select the heart icon to input their heart rate and see how the 3D beating heart shows the data they tracked. Note that the app will sync the lub-dub sound and ECG to match whatever heart rate the student adds.
* If your students have a smart watch and an iPhone, they can select the red heart icon in the app to automatically bring in their last recorded heart rate during three levels of activity—regular heart rate, resting heart rate, and exercise heart rate. (Smart watches like Apple Watch and Fitbit can be set up to feed heart rate data into the Health app on the iPhone.)
	+ Learn more about how personalized data works in the beating heart in Physiology & Pathology: <https://support.visiblebody.com/hc/en-us/articles/360042160373>
	+ Learn more about the features of the beating heart in Physiology & Pathology: <https://support.visiblebody.com/hc/en-us/articles/360038227894-Interacting-with-the-Beating-Heart>
	+ Read more about Apple Watch and heart rate tracking: <https://support.apple.com/guide/watch/heart-rate-apda88aefe4c/watchos>

**Discussion Questions**

1. In the Physiology & Pathology app, what observations did you make when looking at the beating heart model adjusted to your different heart rates?
2. Did anyone hit their maximum heart rate, if so, what activity were they doing?
3. What activities were you doing when you were within your target heart rate zone?
4. During the recovery time after an activity, did your heart rate drop below your target heart rate zone?
5. What physical activities do you think will get your heart beating at the maximum heart rate?
6. Could you tell when your heart rate was within your target heart rate zone?
7. Could you tell when your heart rate was at your maximum heart rate?
8. Why might your heart rate change with activity level?
9. Did everyone’s heart rate change by the same amount? Why would different people be different?