

## Cross-Curricular Mini-Unit Plan

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### **Active Health: Exercise's Effects on the Heart & Cardiovascular System**

#### **Curriculum Connections:**

*BC Ministry of Education 2015 curriculum*

*(BI = Big Idea; CC = Curricular Competency; CO = Content)*

Physical Education:

- (CC) Apply methods of monitoring exertion levels in physical activity
- (CO) Know the effects of physical activity on the body

#### **Lesson 1: How does your Heart Respond to Activity?**

##### **Materials:**

- ✓ Stopwatch/timer
- ✓ Record sheet & pencil per student

*In the gym, during PE or DPA time, complete the following lesson:*

##### **Introduction:**

Teacher: "Take two fingers like this (*hold up index & middle finger together*) and place them on your neck, just beside your throat. Can you feel anything?"

*Students should be able to feel their heart beat – if they can't they may need to press a bit harder & check that their fingers are in the right place*

*Q: Why does your heart beat? What happens when it beats?*

- The heart beats to push (circulate) blood around the body
- Blood carries oxygen, which our muscles and organs need to work properly

*Q: When does our heart beat? Do we have to think about it for it to beat?*

- Our heart always beats, even when we're sleeping
- We don't have to think about our heart beating, it does it by itself

*Q: Does our heart always beat at the same speed? What might cause it to beat at different speeds?*

- This is the question we are going to answer by testing our heartbeats during PE!

You can use two fingers on your neck or on your wrist to find your heart beat

- *Allow students time to try both methods to find their heart beat – may need some help*

**Instruction/Learning Engagement:**

Students will be counting their heartbeats in a 15 second period at several times throughout the PE block: before activity, after warm up, after a game, and after cool-down. Students will record their heart rate on the worksheet, to use for analysis later.

| Activity   | Teacher Does  | Students Do   |
|--|---|---|
| <b>Check Heart Rate (Pre-activity)</b>   | **Allow students time to find heart beat before starting timer<br><br>Uses timer to time 15 seconds | Find their heart beat on their neck or wrist<br><br>Count the number of beats while the teacher times<br><br>Record the number of beats in the box on their worksheet |
| <b>Warm Up</b><br><i>Any warm up activity can be used; make sure that it is designed to gradually increase students' heart rates</i> |   |   |
| <b>Check Heart Rate (After warm up)</b>  | **Allow students time to find heart beat before starting timer<br><br>Uses timer to time 15 seconds | Find their heart beat on their neck or wrist<br><br>Count the number of beats while the teacher times<br><br>Record the number of beats in the box on their worksheet |
| <b>Main Activity</b><br><i>Any PE activity/game can be used</i>  |   |   |
| <b>Check Heart Rate (After main activity)</b>  | **Allow students time to find heart beat before starting timer<br><br>Uses timer to time 15 seconds | Find their heart beat on their neck or wrist<br><br>Count the number of beats while the teacher times<br><br>Record the number of beats in the box on their worksheet |
| <b>Cool Down</b><br><i>Any cool down activity can be used</i>  |   |   |
| <b>Check Heart Rate (After cool down)</b>  | **Allow students time to find heart beat before starting timer<br><br>Uses timer to time 15 seconds | Find their heart beat on their neck or wrist<br><br>Count the number of beats while the teacher times<br><br>Record the number of beats in the box on their worksheet |

**Closure:**

Q: Does our heart always beat at the same speed, or is it sometimes faster/slower? What might cause it to change speeds?

- Our heart beats at different speeds depending on our body's needs
- Activity/exercise makes our heart beat faster because our muscles need oxygen

## Lesson 2: How the Cardiovascular System Works

### Materials:

- ✓ At least 2 bean bags per student, more if possible
- ✓ 3 cones

### Introduction:

Remind students about the previous lesson where we measured heart rate.

Q: *Why does our heart beat?*

- To push blood around our body

Q: *Why is blood important?*

- Because it carries oxygen

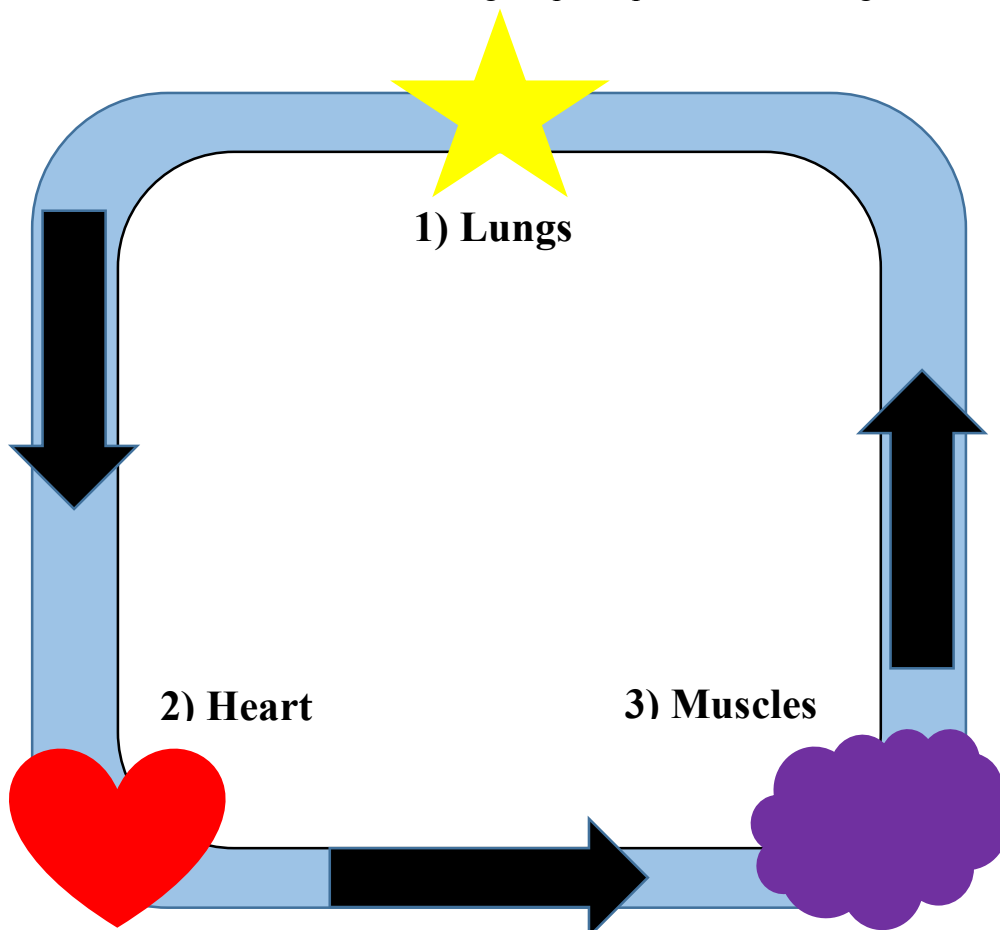
Q: *Why do we need oxygen?*

- Because our muscles and organs need it to work & survive

### Oxygen Cycle Game:

Set up 3 cones according to the diagram below. These will represent the lungs, heart, and muscles. Place the bean bags at the “lungs” cone – these represent oxygen. Students are the red blood cells, moving oxygen between the lungs, heart, and muscles.

- Students start at the “lungs” cone and pick up a bean bag (the “oxygen”).
- Then they run along the line (the “artery”) to the “heart”, where they perform 5 star jumps.
- Next, they run to the “muscles”, where they drop off the bean bag and perform 5 sit-ups.
- Then, students return to the lungs to pick up another bean bag.



**Closure:**

Review what we found out during the introduction:

- Our heart beats to move blood around our body
- Blood carries oxygen, which our muscles need

Review the oxygen cycle activity, highlighting that:

- Oxygen comes from our lungs, then travels through our heart to our muscles
- Blood goes back to our lungs to pick up more oxygen once it's dropped it off at our muscles

**Follow-Up Activities:****1. Heart Rate Math**

- Using the information recorded on the work sheets, students will find their heart rate in beats per minute (BPM)
  - Take the number of beats in 15 seconds and multiply by 4
  - *If this is too difficult for the students, allow them to use a multiplication table or manipulatives to find the answer*
- When did their heart beat the fastest? When did it beat the slowest? What does this tell us about exercise and our heart?

**2. Seeing your Heart Beat**

- Now that students can find their heart beat at their wrist (radial) using their fingers, they might be interested to see their heart beat as well
- Give each student a mini marshmallow and a toothpick. They will poke the toothpick into the middle of one of the flat sides of the marshmallow so that it sticks up straight out of it
- Students find their wrist (radial) pulse with their fingers, then gently place the marshmallow over that pulse point
- If they sit very still (resting their arm on their desk so it doesn't move) they should be able to see the toothpick twitching as their heart beats