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| **Title:** Listen to Your Heart **Subject:** Science **Time:** 1 hour  **Strand:** Understanding Life Systems – Human Organ Systems **Grade:** 5 |
| **Lesson Description:** This lesson looks at the rate our hearts beat per minute while doing a range of physical activities. Students will learn how their pulse changes and how the heart relates to overall health. |
| **Stage 1: Desired Results** |
| **Fundamental Concepts/Skills:** The heart is a very important organ within the human body. The function of the heart can be monitored and can provide clues about overall health. |
| **Big Ideas:** Children are developing skills to make informed decisions in their lives. The choices they make can affect their organ systems and their overall health. As teachers we need to give children the skills to make healthiest choice. |
| **Ontario Curricular Overall Expectation:** (1) “By the end of grade 5, students will analyse the impact of human activities and technological innovations on human health”(The Ontario Curriculum Grades 1-8: Science & Technology, 2007, p.98) |
| **Ontario Curricular Specific Expectation:**   1. (2.2) “By the end of Grade 5, students will use scientific inquiry/experimentation skills to investigate changes in body systems (e.*g., heart rate, breathing, body temperature*) as a result of physical activity. (*e.g., exercise, resting, eating*)” (The Ontario Curriculum Grades 1-8: Science & Technology, 2007, p.99) 2. (2.4) “By the end f Grade 5, students will use appropriate science and technology vocabulary, *including circulation, respiration, digestion, organs* and *nutrients*, in oral and written communication” (The Ontario Curriculum Grades 1-8: Science & Technology, 2007, p.99) |
| **Learning Objectives:**   1. Students will develop an appreciation for their healthy heart and think about the importance of living a healthy lifestyle 2. Students will record data in a graphic organizer 3. Students will analyze the results and draw conclusions 4. Students will be engaged and full participate in activity |
| **Key Concepts and Skills to be learned and applied:**   * Students will learn techniques for checking their own pulse. * The mathematical formula for calculating number of beats per minute based on a ten second count * How our pulse changes throughout the day and while we do different activities |
| **Background Knowledge:**   * Students have to have some experience or knowledge of how a stethoscope works and why doctors use them. * The heart works by pumping out oxygenated blood through blood vessels, which carries the blood to different parts of the body. |
| **Stage 2: Planning learning experience and instruction** |
| **Student Groupings:** mixture of individual, partners, class |
| **Instructional Strategies:** use of visual cues and kinesthetic modeling, allow for peer and teacher assessments |
| **Materials:** poster or diagram of human organ system, worksheet template that has outline for recording heart rate and activity (See Appendix A), stop watches, calculators, clear space within classroom that allows for movement (hallway may be used if space is unavailable in classroom) |
| **Considerations:** Students with preexisting heart conditions may feel that this activity excludes or disadvantages them. Therefore, the teacher must know about the health of the class before orchestrating this lesson so no ones feelings are hurt.  **Accommodations:**   * Size: The content of the activity can be adapted for students with LD. They may only measure the heart rate for walking and jogging. * Level of Support: The teacher can increase the amount of personal assistance and monitoring with specific students. * Output: Students can have the choice of communicating their findings by discussing with their partner or preparing a written summary. |
| **Stage 3: Learning Experience and Instruction** |
| **Motivational Hook** (5 minutes):   * State the purpose of what they will learn: The teacher explains that todays lesson will teach them to monitor their heart rate and that they will get a chance to observe how physical activity influences heart rate. * Elicit students prior experiences: Teacher will ask students to find a turn-and-talk partner to discuss how they incorporate physical activity and exercise into their daily routine and what affects they believe this has on their overall health. Three to four minutes are given for students to discuss. *(ie: Students may talk about sport teams they are on or about the rewarding feeling they get after winning a sports game.)* |
| **Open** (10 minutes):   * The teacher will present verbally and through visual representations: The function of the heart and its role of pumping oxygenated blood to the rest of the body using a diagram or model of the human organ systems as a visual aid. * Modeling: The teacher will demonstrate how to check one’s own pulse on the neck or on the wrist. * The students are asked to check their own pulse while seated. * Only the first 10 seconds immediately after stopping physical activity are measured because the heart rate returns to normal so quickly. The teacher asks how could we find out the number of beats per minute if we only counted for 10 seconds. * The teacher gives a few minutes for students to turn to their partners to discuss the problem if no correct response is given. The teacher can try other strategies like using the board to write out the formula, if students do not solve the math problem after turning-and-talking. They should come up with “heart rate=(number of beats per second) x 6” |
| **Body** (20 minutes):  (*part 1- 10 min)*   * Using the stopwatch and worksheet provided the students work in pairs to measure their heart rate while walking slowly on the spot for one whole minute. * One partner will hold the stopwatch and monitor the time. * Data is recorded by the students on a worksheet. * Then pairs repeat the procedure but this time for running briskly on the spot for one whole minute. * Pairs come up with their own creative idea of an activity to do for measuring their heart rate (*ie: reading a book, washing their hands, putting on their coat, etc).* The partners measure the heart rate per minute doing this activity and record the data.   *(part 2- 10 min)*   * The teacher calls the students back together and explains that now they will sit and discuss with their partner the following questions: (these questions should also be written on the board or posted so students can refer back) * What effects does physical activity and exercise had on their heart rates? * How did this activity demonstrate how the heart pumps blood? * What range of heart beats occur in a healthy person?   How do you think the results would differ if your mom or dad, or a  Grandparent did the activity? |
| **Close & Consolidation** (10 minutes):   * Ask students to state something that they learned: The teacher will ask the pairs to stop talking and come together to have a class discussion on their findings. The teacher will pose the discussion questions again to the class and ask for responses in a sort of round-table informal format. |
| **Links to Future Lessons:** As systems in the body work together to meet our basic needs, understanding of the function of the heart will lead into future lesson on organ systems the heart interacts with, which is a part of the curriculum expectations in this strand. (*ie: circulation, respiration, etc)* |
| **Assessment:** Students will be assessed on the quality of their responses, full participation in the activity, and on the completion of the worksheet |
| **Extension Activity:** For students, who complete the exercise quicker than others, have them think of other activities they can do and measure the change in heart rate. Have the students observe other physiological changes in their bodies as a result of physical exercise. *(i.e. sweat, deeper breathing)* What do these changes tell us about our state of health? |
| **Homework:** Ask students to try the same activity at home with a family member and to compare the results. |