Independent Learning Project: Electronic Monitors

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 In this essay I will describe how I plan to incorporate the use of electronic heart monitors in my physical education classes.

 The idea for this project came from one of the perennial challenges of teaching physical education (especially for one new to the discipline). That challenge: how does a teacher effectively and meaningfully assess students in a PE class? Sure, you can assess attitude and participation, but how do you really show growth? I am particularly conscious of the need to assess the essential questions of physical education, which must include a concrete picture of each student’s overall physical fitness.

 One way to do this involves the use of technology. What I propose is to incorporate the use of electronic monitors into my physical education curriculum. While chest strap monitors have been around for a while, the fairly recent development of monitors worn on the wrist will allow me to monitor students’ heart rate, activity, and even sleep patterns. A company called Polar is a leading purveyor of wrist monitors that do just that. They call it “[Polar personal teaching](http://www.polar.com/us-en/b2b_products/physical_education).” Polar wrist monitors have built-in accelerometers that activate whenever a student runs, jumps, throws, swims (they are waterproof), or plays. Using Polar’s web service, [www.polargofit.com](http://www.polargofit.com), I can register each student and track their progress.

 Using these electronic monitors will allow me to provide clear, objective formative assessment for each student. I can track their growth and help inspire them to make physical activity a foundational value for the rest of their lives, which is in keeping with the following Alaska Physical Education Standards:

 Standard C - Participate regularly in physical activity.

Standard D - Apply fitness concepts to achieve and maintain a health-enhancing level of personal fitness.

 Standard F - Value physical activity for health, enjoyment, challenge,

self-expression, and/or social interaction.

Vick Bonavito, a physical education teacher at Desert View Elementary School, describes how Polar monitors have benefited his students and his program:

 Having used Polar Heart Rate Monitors at my school for the past ten years has

brought many benefits to the Physical Education Program at Desert View Elementary School. The monitors are the cornerstone of my physical education program. My students understand how to exercise using a heart rate monitor and are aware of the advantages of their use, truly giving them a lifetime skill for assessing their fitness levels for the rest of their lives.

I look forward to modeling my curriculum after successful programs like this.

 I will introduce the concept of target heart rates via a circuit-based lesson (see Appendix below). This introductory lesson will use the Polar wrist monitors but not the online tracking system; instead, students will periodically check their heart rate and manually record it on a worksheet. Once students are familiar with the notion of target heart rates, I will utilize the online tracking system. I plan to assign the monitors to each group of students at least once per month throughout the school year. Students will wear the monitors for at least 24 hours, after which I will collect the monitors, hook them up to my computer, and log student results. By the end of the year, I can provide students and their parents with a clear, objective formative assessment of physical fitness and improvement.

 While my principal/superintendent has already approved my plans, the purchase is still pending school board approval. I am confident that, once approved, my plan will take Skagway’s physical education program to the next level.

Appendix

**Maintaining Target Heart Rates Using Electronic Monitors**

**Objectives**: As a result of this lesson students will be able to:

* Calculate target heart rate zones based on individual resting heart rate
* Maintain target heart rate zones while participating in various activities

**Grade Level**: 9-12

**Materials**: Polar wrist monitors, Dance Dance Revolution and practice pads, jump rope, flexibility cards, box step up, stop watch, students work sheet, pencils.

**Introduction**:

What does our heart rate tell us? Is our heart rate important and does it change? The heart rate tells us the amount of exertion that is being placed on the body at a given time. The heart rate is able to adapt over time from the demands it faces. It will increase in size and become more efficient with its contractions, thus circulating more blood with less effort throughout the body. Who knows what target heart rate (THR) means? Your target heart rate is the desired range of heart rate reached during exercise which enables your heart and lungs to receive the most benefit from a workout. It is the ideal intensity level at which your heart is being exercised but not overworked.

Today we will be participating in various activities, while learning the effect they have on your heart rate. In these various activities a different effort level and intensity will needed to maintain our heart rate in the THR zone in which you will be calculating.

**Activity**:

Each student will have a heart rate monitor, checked for accuracy before starting. If HR monitors are unavailable, then have students self-checking their individual heart rate by taking a manual pulse. Before beginning the activity, have the students sit quietly and determine their resting heart rate. Students will record this information on the worksheet provided to help determine their target heart rate zones. After the students have determined their resting heart rate, use the Karvonen formula (attached) to determine their individual target heart rate zone and record this information on their worksheet.

Students will participate in four, 10 minute stations rotating on the teacher’s prompt. Students will be asked to check their heart rate at least two times during each station and immediately following exercise at each station. Use the Dance Dance Revolution (DDR) music as a prompt. Each time a song ends the students will check and record their heart rates.

1. DDR station: Set the game in Free Play mode and allow students to choose their difficulty level based on individual ability levels. Students will rotate from live pads to practice pads following each song.

2. Box step up/ Run, Jog, Walk: Students will choose to step up and down from the box (bench) or participate in a run, jog, walk pace around the “gym” in order to maintain their heart rate stay in the zone.

3. Jump Rope/Flexibility: Students will alternate jumping rope and performing a variety of stretches from provided flexibility cards in order to maintain their heart rate in the zone.

4. Small-sided games: Students will choose to play small sided games of ultimate Frisbee or football, basketball, etc.

**Closure**: Have the students complete the students work sheet (below). Review the target heart rate zone and how to calculate it. Check for understanding from the students on why the target heart rate zone is important and how it helps with heart conditioning.

**Variations**: (Harder) Have students maintain their heart rate at the upper level of their THR zone for each station. Have the students perform the jump rope and box step ups to the beat of the music.

**Adaptations for Students with Disabilities**: (Easier) Have the students place the jump rope on the floor and practice foot drills.

**Student Worksheet: Target Heart Rate**

**Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Resting Heart Rate (RHR)**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Karvonen formula:**

(220-age) - RHR x .60 + RHR = Lower end of Target Heart Rate (THR) Zone

(\_\_\_\_\_\_) - \_\_\_\_\_\_ x .60 + \_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_

(220-age) - RHR x .80 + RHR = Higher end of THR Zone

(\_\_\_\_\_\_) - \_\_\_\_\_\_ x .80 + \_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_

**My THZ zone is between \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_.**

**Heart Rate Recordings**

Circle the recorded heart rates that were not in your THR zone and provide a brief comment of why you feel you were not exercising in the zone at that time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Stations | HR #1 | HR #2 | HR #3 | HR #4 | Comments |
| Dance Dance Revolution |  |  |  |  |  |
| Box Step UpsorRun/Jog/Walk |  |  |  |  |  |
| Jump Rope/Flexibility |  |  |  |  |  |
| Small Sided Games |  |  |  |  |  |