

Mini Grant Lesson Plan Template

Title:	<p>TECHNO-FITNESS</p> <p>After researching human body systems, students will conduct a month-long monitoring of 5 essential health areas (cardiac, respiration, muscle strength, temperature, pressure) before and after physical activity to determine an answer to "<u>How</u> does exercise impact my health?" using handheld data collection devices.</p>		
Content Area:	Grade: 7	Duration: Duration: 3-4 weeks if comparing but can be done in 1 week if just using the equipment to record data	
SCIENCE/MATH			
Standards (ICT and Content)	<p>Science standards:</p> <p>S :SPS1:6:2.2 Identify and utilize appropriate tools/technology for collecting data in designing investigations</p> <p>S:SPS1:6:4.3 Compare and display data in a variety of student or computer generated formats (such as diagrams, flow charts, tables, bar graphs, line graphs, scatter plots, and histograms).</p> <p>LS1.2.1 ~ LIVING THINGS & ORGANIZATION- Identify the functions of the human body's systems, including digestion, respiration, reproduction, circulation, excretion, movement, control and coordination and protection from disease, and describe how they interact with one another.</p> <p>LS4.2.4 ~ Use data and observations to support the concept that environmental or biological factors affect human body systems</p> <p><u>MathStandards:</u> compare graphs daily ,chart progress across one month; use student level data to compile and analyze at both class and team levels.</p> <p>M.04.DSP.07.01 ~ Interprets a given representation (circle graphs, scatter plots that represent discrete linear relationships, or histograms) to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.</p> <p>M.04.DSP.07.02 ~ Analyzes patterns, trends, or distributions in data in a variety of contexts by solving problems using measures of central tendency (mean, median, or mode), dispersion (range or variation), or outliers to analyze situations to determine their effect on mean, median, or mode; and evaluates the sample from which the statistics were developed (bias).</p> <p>M.04.DSP.07.03 ~ Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the</p>		

representations required in M.DSP.07.01

M:CCR:8:3 Students will recognize, explore, and develop mathematical connections and be able to:

Understand that many real-world applications require an understanding of mathematical concepts

Health Standards:

Students need to know:

4.2 How energy is expended during exercise/activity

1. Healthful Physical Activity

1.5 physiological responses to physical activity (energy expenditure, heart rate, respiratory rate, resting heart rate)

Physical Education Standards: Compare results of data across a month and create a personal fitness plan.

Curriculum Guideline 1: Engages in a physically active lifestyle

3. Identify long-term benefits that may result from regular participation in physical activity

Curriculum Guideline 2: Achieves and maintains a health enhancing level of physical fitness.

3. Identify effects of activity on stress levels

4. Use personal fitness assessment data to enhance his/her understanding of fitness.

9. Use a beginning level of technology to analyze, assess and improve one's fitness

	<p><u>Writing :</u></p> <p>W:IW:7:1.1: Using an organizational text structure appropriate to focus/controlling idea (State) EXAMPLES (of text structures): description, sequence, chronology, proposition/support, compare/contrast, <u>problem/solution</u></p> <p>W:IW:7:3.2: Including sufficient details or facts for appropriate depth of information: naming, describing, explaining, comparing, using visual images (State)</p> <p>W:IW:7:3.4: <u>Commenting on the significance of information, when appropriate</u></p> <p>ICT Standards: Ed 306.42 <u>Information and Communication Technologies Program.</u></p> <p>(2) Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of:</p> <ul style="list-style-type: none"> b. Mathematics; d. Science; <p>(3) Use 21st century tools to develop cognitive proficiency in:</p> <ul style="list-style-type: none"> b. Numeracy; c. Problem solving; d. Decision making; and e. Spatial / visual literacy
Objectives:	<p>Students will be able to</p> <ul style="list-style-type: none"> ● properly operate the LabQuest data collection unit ● accurately use 3 different sensors to record data ● interpret the data collected and hopefully observe small improvements ● recognize that a habit of daily exercise will improve their health ● draw conclusions on effects on their body ● understand how the major human body systems function ● identify which body systems are affected by exercise ● make connections regarding how each system cannot operate on its own but needs the other systems
Resources: (web sites, books, other)	<p>Interactive whiteboard sites:</p> <ul style="list-style-type: none"> • How the body works videos/quizzes: http://kidshealth.org/kid/htbw/htbw_main_page.html • Interactive diagrams: http://www.smm.org/heart/heart/top.html • Discovery kids: http://yucky.discovery.com/noflash/body/pg000138.html • Vernier emulator: http://www.vernier.com/labquest/updates/

<p>Equipment: Hardware/software:</p>	<p>5 Vernier LabQuest handheld data collector, 1 for each station</p> <p>1 Vernier CO₂ Gas Sensor -measure amount of CO₂ released after exercise</p> <p>1 Vernier Hand Dynamometer - measures grip strength</p> <p>1 Vernier Respiration Monitor Belt -measures breathing rate</p> <p>1 Vernier Hand-Grip Heart Rate Monitor - measures pulse from fingers</p> <p>1 Vernier Blood Pressure Sensor - measures blood pressure</p> <p>1 Vernier Small Blood Pressure Cuff XSCUFF</p> <p>1 Vernier Surface Temperature Sensor- measures body temp.</p> <p>1 Hitachi StarBoard FX-77-DUOInteractive whiteboard</p> <p>1 Floor Stand for FX77, to make board portable between classrooms</p> <p>1 DLP projector with cart, needed to project onto interactive whiteboard</p> <p>1 RM classpad- remote control board to allow freedom of movement around classroom</p> <p>1 Easyteach software with 4 content area toolbars- works with classpad and any brand IW</p>
<p>Preparing Students for the Lesson:</p>	<p>I incorporated the fitness aspect of this project into a month-long project on the human body called "Code Blue" by Interact. This is a simulation where the students form clinics, each takes on the role of a specialty doctor (cardiologist, etc.), they become experts in their field then teach the others in their clinic. As "doctors" they must pass medical boards and a physiology test before being allowed to diagnose cases to be presented during Grand Rounds. I added a component to the simulation that doctors take care of themselves and will go to the gym to workout daily. As in real life, the doctor gets a physical (base readings before exercise) before starting an exercise program.</p>
<p>Teaching the Lesson (Lesson Sequence/</p>	<p>The sequence below does NOT include the details of the "Code Blue" project since it is a purchased product. I do make reference to parts of "Code Blue" where my project</p>

<p>Activities):</p>	<p>fits within it.</p> <p>Week 1- students learn about the different body systems following "Code Blue" format</p> <p>Week 2: (this is the actual using the LabQuest)</p> <ul style="list-style-type: none"> • Day 1-introduce the Vernier LabQuests, demo how to use, identifying all the buttons and how to connect sensors. I used a document camera to project for all to see but Vernier has LabQuest Emulator that can work with Windows only • Day 2 -3-students handle LabQuests learning how to operate and use each sensor; I formed student groups and rotated the 5 sensors; I also provided a checklist for the LabQuest Practical test so they could practice their skills • Day 4-LabQuest Practical test; students were in 3 groups: 1 practicing/catching up on paperwork, 1 testing, 1 using Interactive Whiteboard; I was able to test 3-4 students at once by giving them each a LabQuest and saying "show me....." as I went down the skills list. Once completed they moved to the Interactive Whiteboard and went to the kids Health website to view different body system videos and answer the review quiz associated with each (they shared stylus control so everyone learned how to use the Interactive Whiteboard). • Day 5 - Yearly Physical: take base readings on all sensors and save the files • Day 6/7- exercise for 5 minutes then take sensor readings, 1st exercise is always squeeze a tennis ball for 1 minute followed by jog in place (after depositing tennis ball in box) for 1 minute and then each minute I changed their exercise with at least 1 other aerobic (like jumping jacks). I staggered students exercise start time by 2 minutes so no one was standing still waiting to take a reading. • This took too long and resulted in 3 days to get the recordings. Plan B for recording was to have 1 group have all 3 sensors and as each student stops exercising, all 3 readings are taken. This worked better and took less time but I recommend in my reflections that 1 or 2 students only are designated for official recordings (everyone was measured) • Week 3/4- exercise daily for 5 minutes at the start of the class while we continue with the "Code Blue" Project. I had students bring in exercise ideas for variety. Due to time constraints we limited the "after exercise measurements" to the first and last days. • Week 4- I allowed 2 days for taking the final readings and using "Plan B" method. I assigned the students to research a disease and make a brochure on the computer. I booked the library and a computer room for 3 different days. Students used the 1st day as a whole class researching their diseases. On the next 2 days, I split the class: half went to the library with an assistant to continue research or start brochure, the other half stayed in class to take final readings on the LabQuest. This worked very well with minimal down time. • Week 5- Interpreting the data in Math Class. Using the Interactive Whiteboard, students analyzed the data collected by several peers and stored on the Vernier LabQuests. Data is initially presented as rough double-line graphs. After interpreting the results of each collection of data, students determine how to
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	<p>improve the effectiveness of the graph including: adding a descriptive title, properly naming the x and y axes, adding color to delineate before and after exercise data points, and experimenting with other types of graphs, such as bar graphs and histograms. These improvements that follow the analysis challenge students to learn more about the many functionalities of the Hitachi StarBoard when designing high-quality graphs.</p>
<p>Culminating Activity:</p>	<ul style="list-style-type: none"> • Production of a slideshow or video explaining the benefits of exercise • Setting a goal to increase stamina • Creating a 1 week long exercise program to achieve goal • Designing a 1 week healthy snack plan
<p>Assessment:</p>	<ul style="list-style-type: none"> • LabQuest Practical test • Proper use of Interactive Whiteboard using RM classpad • Creation of bar/line graphs to interpret comparative data • Assessment of Culminating project
<p>Optional: Handouts, worksheets, checklists for students or teacher</p>	<p>Vernier LabQuest Skills Assessment</p> <p>Students must be able to demonstrate proper use and care of the LabQuest unit. The following is a checklist of skills you must demonstrate:</p> <ol style="list-style-type: none"> _____ 1) Turn on unit _____ 2) Get Stylus _____ 3) Open lab instructions file _____ 4) Display keyboard then close it _____ 5) Display stopwatch then close it _____ 6) Display calculator then close it _____ 7) Demonstrate how to take notes _____ 8) Show how to save this file _____ 9) Connect a sensor _____ 10) Zero the sensor _____ 11) Show 2 ways to collect data _____ 12) Set up a second run _____ 13) Display all runs on 1 graph _____ 14) Use the analyze function to display statistics _____ 15) Properly shut down LabQuest <p>----- -----</p>

	<p>Improving Our Health Slideshow</p> <p>As a final project your group will create a slideshow that ties together everything you have learned about the human body systems, nutrition and exercise. Below are the guidelines to create an incredible project. Everyone in the group needs to create at least 2 pages, which will then be merged into 1 slideshow. Choose a leader who will oversee that each page uses a similar style and everyone has the correct information.</p> <p>Our Group 3 _____ Team Leader: _____ Team Members: _____ My assigned pages are _____ Due Date: _____</p> <p>_____ 1) Title page, catchy title phrase, all group names, color and group # _____ 2) Circulatory system page- include 1 diagram, explain how exercise affects and helps this system _____ 3) Respiratory System page- include 1 diagram, explain how exercise affects and helps this system _____ 4) Nervous System page- include 1 diagram, explain how exercise affects and helps this system _____ 5) Digestive system page- include 1 diagram, explain how exercise affects and helps this system _____ 6) Skeletal/Musculatory System- include 1 diagram, explain how exercise affects and helps this system _____ 7) Exercise Benefits page- explain the different types of exercise we did (aerobic, strengthening, stretching) and explain which systems they impact _____ 8) Exercise plan page- create a daily exercise plan, include a 1 week plan showing variety _____ 9) Nutrition page- list the different food types (fats, proteins, carbohydrates, sugars) and explain how the body needs and uses them, include food sources to get these _____ 10) Nutrition Plan – develop a healthy nutrition plan including a source for all the basic groups _____ 11) Big Idea page- be creative with pictures and phrases that ties all this together. Show me you understand the importance of exercise, nutrition and the health of your body _____ 12) Bibliography page- cite your sources properly</p>
Notes & Reflections:	<p>-Still keep exploration days to learn the use of sensors but instead of taking readings on every student on every sensor, I would have each group do 1 sensor and measure just 1 or 2 students</p> <p>-Labquest also allows several sensors to be used simultaneously, recording under the same file (a student discovered this on the last day). This would have saved lots of time</p> <p>-Due to immaturity of students I determined that pump up sensors (blood pressure/respiratory) could not be used properly and safely by most students</p>