

LESSON 1: SETTING A FITNESS BASELINE

Grade-Level Outcomes

Primary Outcome

Fitness knowledge: Uses available technology to self-monitor quantity of exercise needed for a minimal health standard and/or optimal functioning based on current fitness level. (S3.M8.8)

Embedded Outcome

Rules & Etiquette: Applies rules and etiquette by acting as an official for modified physical activities and games and creating dance routines within a given set of parameters. (S4.M6.8)

Lesson Objective

The learner will determine the amount of exercise needed to attain a minimal health standard and/or optimal functioning level, based on her current fitness level.

Equipment and Materials

- Determining Physical Activity Goals for Adolescents handout, 1 per student (see handout)
- Pencils
- Clipboards
- Exercise Physiologist Worksheet handout (see handout)
- Ellipticals for one-quarter of class (with electronic readouts)
- Stationary cycles for one-quarter of class (with electronic readouts)

Introduction

Today, we will start a unit of study on using available technology to monitor how much physical activity you participate in. In doing so, you will use this technology to get an idea of how fit you are and determine how much physical activity you need. Eventually, you will use this knowledge and technology to self-monitor the amount of exercise you undertake and to make adjustments.

Instructional Task: Cycle or Elliptical

■ PRACTICE TASK

Students work in pairs for today's class. One partner will ride either a stationary cycle or an elliptical for 20 minutes. The other partner will record the exercising student's data as she performs her workout.

Your partner will serve as your exercise physiologist today, and you are the client.

Partners switch roles after 20 minutes.

EMBEDDED OUTCOME: S4.M6.8. Use the exercise physiologist role to teach students about the proper way to monitor activity for someone else. Remind students to be non-judgmental, accurate in recording, and encouraging of others.

Every 2 minutes, the partner will record the following:

- Speed
- Distance
- Level
- Calories
- RPMs
- Watts
- Heart rate

MONITORING PHYSICAL ACTIVITY WITH TECHNOLOGY

All information should come from the electronic display. Since the machines you are using measure work (watts), they are known as ergometers. Ergo = work, and meter = measure.

Be sure to use the manual setting and demonstrate that you can give yourself a proper warm-up (it should show in your data).

Extension

Students can graph the data collected. A line graph of the speed and watts should show a warm-up.

Refinement

Make sure students know the different measurements before starting the activity.

Student Choices/Differentiation

- Students select either a cycle or an elliptical.
- Students can choose to manipulate the following variables in order to use the principle of overload:
 - Keep the resistance level the same and attempt to maintain a slightly higher average speed.
 - Increase the resistance level and either expect to see a lower average speed or attempt to keep the average speed the same.
 - Attempt to maintain a higher average heart rate.
 - Attempt to maintain a higher average power (watts) by manipulating speed and resistance.

What to Look For

- “Exercise physiologists” are collecting data every 2 minutes.
- In examining the data, you should see students start off at lower levels and speeds in order to give themselves a proper warm-up.

Instructional Task: Demonstration on Determining Quantities of Exercise Needed

■ PRACTICE TASK

On a whiteboard, perform an example and the mathematics required to complete the handout Determining Physical Activity Goals for Adolescents.

Example: Determine the amount of exercise needed for a 60 kg person for a minimal health standard and optimal functioning. (Answer: $60 \text{ kg} \times 3\text{-}4 \text{ kcal}$ and $60 \text{ kg} \times 6\text{-}8 \text{ kcal}$)

DETERMINING PHYSICAL ACTIVITY GOALS FOR ADOLESCENTS

Name: _____ Date: _____

Introduction: Over the years, various fitness and health guidelines have been promoted. Many of these guidelines are general rules of thumb designed for the general public. You might see these guideline promoted in public service announcements (PSAs). Today, we often hear about 60 minutes of physical activity on television. A good example is the NFL Play 60 campaign.

Another general rule of thumb is to expend, at a minimum, 200 kilocalories from physical activity every day (or 1,000 to 1,400 kilocalories per week). Keep in mind, this is only a minimum.

For optimal health benefits and wellness, a person should expend 2,000 to 3,500 kilocalories per week. This rule of thumb is based on a person who weighs about 150 pounds (68 kg).

Many adults hire personal trainers at great expense to design these fitness programs for them. Because you are in a physical education class, you are developing the skills and knowledge to be a participant in physical activity for a lifetime. This means that you should be able to design a fitness program for yourself based on your needs, not a general rule of thumb. Also, if you acquire these skills and knowledge, it is likely that you won't need to hire a personal trainer to design a fitness program for you. So let's determine just how much physical activity you need.

Determining Physical Activity Levels

HEALTH STANDARD: A MINIMUM ACTIVITY STANDARD

Frequency	Daily. Frequent activity sessions (three or more) each day.
Intensity	Moderate. Alternating bouts of activity with rest periods as needed or moderate activity such as walking or riding a bike to school.
Time	Duration of activity necessary to expend 3 to 4 kcal per kilogram of body weight per day. Equal to Calorie expenditure in 30 minutes or more of active play or moderate sustained activity, which may be distributed over three or more activity sessions.

OPTIMAL FUNCTIONING STANDARD: A GOAL FOR ALL CHILDREN

Frequency	Daily. Frequent activity session (three or more) each day.
Intensity	Moderate to vigorous. Alternating bouts of activity with rest periods as needed or moderate activity such as walking or riding a bike to school.
Time	Duration of activity necessary to expend 6 to 8 kcal per kilogram of body weight per day. Equal to Calorie expenditure in 60 minutes or more of active play or moderate to sustained activity, which may be distributed over three or more activity sessions.

Directions: Follow the numbered steps below to determine the amount of physical activity that you need.

Step 1: Locate and circle your weight in pounds on the table below.

Pounds	Kilograms	Pounds	Kilograms	Pounds	Kilograms	Pounds	Kilograms	Pounds	Kilograms
40	18	95	43	150	68	205	92	260	117
45	20	100	45	155	70	210	95	265	120
50	22	105	47	160	72	215	97	270	122
55	24	110	49	165	74	220	99	275	124
60	27	115	52	170	77	225	102	280	127
65	29	120	54	175	79	230	104	285	129
70	31	125	56	180	81	235	106	290	131
75	34	130	58	185	83	240	108	295	133
80	36	135	61	190	86	245	111	300	136
85	38	140	63	195	88	250	113	305	138
90	40	145	65	200	90	255	115		

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Step 2: Now, convert your weight in pounds to kilograms by looking at the adjacent number on the table. If you are concerned about others knowing your weight, you can fold your paper in half to keep this information private. My weight in kilograms is: _____.

Determining the Health Standard: A Minimum Activity Standard

Step 3: Multiply your weight in kilograms by 3. My weight in kilograms $\times 3$ is _____.

Step 4: Multiply your weight in kilograms by 4. My weight in kilograms $\times 4$ is _____.

Determining an Optimal Functioning Standard: A Goal for All Children

Step 5: Multiply your weight in kilograms by 6. My weight in kilograms $\times 6$ is _____.

Step 6: Multiply your weight in kilograms by 8. My weight in kilograms $\times 8$ is _____.

Based on your physical activity log, are you able to determine the total number of kilocalories that you expended during the two weeks that you recorded? Circle: Yes No

If you answered no, what are some choices you could make that would help you better estimate this amount of exercise in the future?

What available technology options can help you determine how much physical activity you are getting?

What technology do you have at home that could help you determine how much physical activity you are getting?

Discuss how you could use that technology to better estimate the amount of exercise you engage in.

Reprinted from C.B. Corbin and R.P. Pangrazi, 1994, "Toward an understanding of appropriate physical activity for youth," *President's Council on Physical Fitness and Sports Series* 1(8).

From R.J. Doan, L.C. MacDonald, and S. Chepko, eds., 2017, *Lesson planning for middle school physical education* (Reston, VA: SHAPE America; Champaign, IL: Human Kinetics).

Extension

Ask for a student to volunteer his Exercise Physiologist Worksheet handout and show how a comparison can be made between these numbers and the data collected from the machines by comparing how many Calories were actually burned during the workout.

Student Choices/Differentiation

- Provide examples of the handout for students to view.
- Students can work in partners.

What to Look For

Students are filling out their worksheets correctly.

Formal and Informal Assessments

Exercise Physiologist Worksheet handout

Closure

Today, you used ellipticals and stationary bikes to monitor your quantity of exercise. These types of machines are commonly found in fitness centers, health clubs, hotels, people's homes, and sporting goods stores. You have now seen an example of how you can use these machines to monitor your quantities of exercise and get objective data from them. Combining this skill with the knowledge of how much exercise a person needs to be healthy can be a very powerful tool for your overall health and well-being. Throughout the module we will be exploring ways to increase and track physical activity with technology.

Reflection

- Are students able to work effectively together to collect the data from the machines?
- Do students seem to be better engaged in the activity due to the technology and feedback?

Homework

Complete the Determining Physical Activity Goals for Adolescents handout. You will compare how much exercise you obtained from this workout with the amount of exercise you determined you need from the worksheet.

Resources

Corbin, C., Pangrazi, R., & Welk, G. (1994). Toward an understanding of appropriate physical activity levels for youth. *Physical Activity and Fitness Research Digest*, 1(8), 1-8.

EXERCISE PHYSIOLOGIST WORKSHEET

Client: _____

Exercise physiologist: _____

Date: _____

Period (circle): 1 2 3 4 5 6

Type of ergometer (circle): Cycle Elliptical

Vocabulary:

ergo = work

meter = to measure

An **erg** is a unit of measuring work.

A **meter** is the SI unit of length.

Selected program (circle one):

Manual Interval training

Random Heart rate

Rolling hills Fat burn

Fitness test Constant watts

Instructions: Fill in the data table below. Record data every 2 minutes. Note: The Select button will let you change the displayed data.

Time (min)	Speed (kph)	Distance (km)	Level	Calories (kcal)	RPM	Watts	Heart rate (bpm)
2							
4							
6							
8							
10							
12							
14							
16							
18							
20							

From R.J. Doan, L.C. MacDonald, and S. Chepko, eds., 2017, *Lesson planning for middle school physical education* (Reston, VA: SHAPE America; Champaign, IL: Human Kinetics).