

## LESSON 3: COMPARING AND REVIEWING DATA

### Grade-Level Outcomes

#### Primary Outcomes

**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)

**Fitness knowledge:** Uses the overload principle (FITT formula) in preparing a personal workout. (S3.M11.8)

#### Embedded Outcome

**Fitness knowledge:** Designs and implements a warm-up/cool-down regimen for a self-selected physical activity. (S3.M12.8)

### Lesson Objectives

The learner will:

- use available technology to self-monitor the amount of physical activity needed for attaining a minimal health standard and/or level of optimal functioning.
- use the overload principle with available technology to increase his amount of exercise.

### Equipment and Materials

- Pencils
- Clipboards
- Exercise Physiologist Worksheet handout, 1 per student (see handout from lesson 1)
- Completed Exercise Physiologist Worksheet handouts from Lesson 1
- Fitness center:
  - Ellipticals (with electronic readouts) for one-quarter of class
  - Stationary cycles (with electronic readouts) for one-quarter of class

### Introduction

*Today, you will use the overload principle to increase the quantity of exercise you can undertake. To do that, you will use technology and also examine the data you collected the other day when you used either an elliptical or stationary cycle. You will remember that these machines are called ergometers. Ergo means “work” and meter means “to measure.” In other words, ergometers are work-measuring machines. We can use these to our advantage because they provide objective data and because we can control the resistance on them. Once again, we will use “exercise physiologist” and “client.”*

## Instructional Task: Cycle or Elliptical

### ■ PRACTICE TASK

Provide students with their Exercise Physiologist Worksheet handouts from Lesson 1. Have students examine their data.

#### Guiding questions for students:

- What columns of data on your sheet give you an idea of the intensity you were working at last time?
- To increase the total number of Calories (kcal) you burn, what principle of exercise can you use?
- What variable can you manipulate to effectively use the principle of overload and to increase the number of Calories (kcal)?

# MONITORING PHYSICAL ACTIVITY WITH TECHNOLOGY

One partner (“client”) will ride either a stationary cycle or an elliptical for 20 minutes. The other partner (“exercise physiologist”) will record the exercising student’s data as she performs her workout.

Note: Since you are comparing scores across lessons, students should use the same piece of exercise equipment (stationary cycle or elliptical) they used from Lesson 1.

*Since we are trying to increase the work you perform today, you will need to decide if you are going to increase the resistance or the speed to create your overload.*

Every 2 minutes, have partners record the following:

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

All information should come from the electronic display.

*Note: Because the machines you are using measure work (Watts), they are known as ergometers (ergo = work; meter = measure).*

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**EMBEDDED OUTCOME: S3.M12.8.** Be sure to use the manual setting and demonstrate that you can give yourself a proper warm-up (it should show in your data) by starting off easy and gradually increasing the intensity.

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## 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: Review of Data

### ■ PRACTICE TASK

Have students compare their two sets of data (Lessons 1 and 3).

## Guiding questions for students:

- Is there evidence of a warm-up that consisted of a lower intensity at the start?
- Is there evidence that the principle of overload was effectively used to obtain a higher number of Calories expended?

## Extension

Students can graph the two sets of data to create a visual comparison.

## Student Choices/Differentiation

Students can review similar data for an example.

## What to Look For

- Students recognize that a gradual increase in the intensity of the exercise provides a good warm-up.
- Students recognize that manipulation of any combination of speed, level, watts, and heart rate will result in a higher number of Calories burned.

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## Formal and Informal Assessments

- Exercise Physiologist Worksheet handout (evidence of a warm-up)
- Exercise Physiologist Worksheet handout (evidence of overload principle being used)

## Closure

*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. In addition, you have now seen how you can use these machines to your advantage since you can precisely control the resistance level to help you use the principle of exercise called overload. The principle of overload is also known as progressive overload. Imagine how fit you could get if you were able to progressively overload your training like this several times per week.*

- Could you use this principle of exercise to efficiently obtain the quantities of exercise you need for optimal functioning?
- Could you do this ever so gradually, letting the body get gradually stronger while preventing injury?

## Reflection

- Based on the student data collected, are students able to effectively use the principle of overload?
- Are students warming up and cooling down correctly?
- Are students correctly performing the roles of clients and exercise physiologists?

## Homework

*Finish graphing your two sets of data so you can see a good visual of how you successfully used the overload principle. If you were unable to accomplish more Calories burned, look for where you made a mistake or reasons why and think about what you could do differently next time. For example, perhaps you went too hard by setting the level too high. Or perhaps you did not eat properly this morning or you have a cold.*

## 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.