

## LESSON 6: MUSCULAR STRENGTH AND ENDURANCE

### Grade-Level Outcomes

#### Primary Outcomes

**Fitness knowledge:** Identifies each of the components of the overload principle (FITT formula: frequency, intensity, time, type) for different types of physical activity (aerobic, muscular fitness and flexibility). (S3.M11.6)

**Fitness knowledge:** Differentiates between aerobic and anaerobic capacity, and between muscular strength and endurance. (S3.M10.6)

#### Embedded Outcomes

**Fitness knowledge:** Identifies major muscles used in selected physical activities. (S3.M14.6)

**Engages in physical activity:** Participates in self-selected physical activity outside of physical education class. (S3.M2.6)

### Lesson Objectives

The learner will:

- continue her experience of the progressive overload principle through a walk/run progression.
- differentiate between muscular strength and muscular endurance.

### Equipment and Materials

- Beginner's 5K Training Schedule, 1 copy per group of 4 or 5 students (see lesson 2)
- Stopwatches (1 per group of 4 or 5 students)
- Whiteboard easel on casters
- Index cards
- Pencils
- Pedometers

### Introduction

*Today, we will continue our walk/run progression so that you can continue to experience the progressive overload principle. In addition, we will discuss the difference between muscular strength and muscular endurance.*

## Instructional Task: Warm-Up

### ■ PRACTICE TASK

Have students complete a brisk 5-minute walk in small groups of four or five, with one student in each group keeping time.

Have students discuss their understanding of the differences between aerobic and anaerobic.

#### Guiding questions for students:

- Which of these is quick-converting energy and which is slow-converting energy?
- What types of activities can we call aerobic and anaerobic?
- Are all activities purely aerobic or anaerobic? Is it possible that some are a combination of the two?

#### Student Choices/Differentiation

Students can choose a dynamic warm-up as an alternative.

## What to Look For

- Students walk briskly.
- Student groups time their 5-minute warm-ups precisely.
- Students know the basic differences between aerobic and anaerobic fitness.

## Instructional Task: Training (Week 2, Workout 2)

### ■ PRACTICE TASK

Have students alternate 90 seconds of jogging and 2 minutes of walking for a total of 20 minutes.

Leaders in each small group time the 90-second and 2-minute intervals; you keep track of the 20-minute duration.

Have students keep track of the distance traveled (e.g., how many laps they cover, how many steps they take) during the 20-minute walk/jog.

Have students use pedometers to track total number of steps taken.

### Student Choices/Differentiation

- Students can use pedometers or a running plan app.
- Allow students to take water breaks if needed.

Note: You can modify the Beginner's 5K Training Schedule to fit various school and class schedules (e.g., block schedule, shorter or longer class periods).

## What to Look For

- Students alternate 90 seconds of jogging with 2 minutes of walking.
- Students track distance traveled (e.g., laps around the school, field, track).

## Instructional Task: Review of Training Program

### ■ PRACTICE TASK

Define *progressive overload*, *frequency*, *intensity*, *time*, and *type* on the whiteboard.

Ask students how far they traveled today during the 20-minute walk/jog.

*We have been building our vocabulary on the whiteboard each day. Let's look closer at frequency, intensity, time, and type.*

Lead a class discussion on the FITT formula. Point out that it is often confused as a principle of exercise, but it simply is a formula that some people use to help them design structured exercise programs and to better use the principle of progressive overload. Progressive overload is the principle of exercise that students really need to understand.

### Guiding questions for students:

- How often (Frequency) do you think you need to exercise or participate in exercise or physical activity each week to make improvements in fitness?
- How often (Frequency) for maintaining fitness?
- What principle of exercise can you use to gradually increase the Intensity of exercise over time?
- How long (Time) would you need to spend on aerobic-type activities to see significant health benefits?
- Can you think of various activities (Type) that you could use as aerobic activities to see significant improvements or maintenance in health-related fitness?

## Student Choices/Differentiation

Let students review videos or handouts on material.

## What to Look For

- Students recognize that the FITT formula is not a principle of exercise.
- Students recognize that the FITT formula can help some people design an appropriate exercise program.
- Students are actively engaged in the discussion.

## Instructional Task: Muscular Strength Versus Muscular Endurance

### ■ PRACTICE TASK

Define *muscular strength* and *muscular endurance* on the portable whiteboard.

Lead a class discussion about the differences between these two components of fitness.

### Guiding questions for students:

- Do you think the walk/jog program contributes more to muscular strength or to muscular endurance?
- Can you identify the major muscles used in the walk/jog program?
- What are other activities that you could undertake to improve the endurance in these muscles?

**EMBEDDED OUTCOME: S3.M14.6.** Use the guiding questions to help students identify and understand the functions of muscles in the lower body.

### Extensions

- List several activities on the whiteboard and see if students can differentiate between activities that improve or maintain muscular strength or muscular endurance.
- Conduct an in-depth conversation about the relationship between muscular strength and endurance.

### Guiding questions for students:

- What are some fitness assessments that are commonly used in physical education to measure muscular strength and endurance?
- Which one (muscular strength or endurance) do you think is most important for your favorite sport?

## Student Choices/Differentiation

Let students review videos or handouts on material.

## What to Look For

- Students recognize that the walk/jog program is working primarily on their muscular endurance because, by definition, muscular strength is the maximum force that a muscle or group of muscles can produce one time.
- Students recognize that the walk/jog program is specific to running and walking more efficiently and that if they want to increase muscular strength, they would have to use resistance training instead.
- Students differentiate between activities that are specific to improving muscular strength and improving muscular endurance.

## Instructional Task: Pop Quiz

This is a formative assessment meant as a tool for feedback on students learning the material.

### ■ PRACTICE TASK

Administer a short pop quiz on the concepts previously taught to this point of the module.

### Student Choices/Differentiation

Provide any testing accommodations needed.

### What to Look For

Students demonstrate knowledge of material taught to this point of the module (FITT and progressive overload).

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## Formal and Informal Assessments

- Class discussions around muscular strength and muscular endurance concepts
- Teacher-created pop quiz

### Journal assignment:

- Which do you enjoy more, muscle-strengthening or muscle-endurance activities?
- Do you feel that you are growing stronger in this module, even if you are not using resistance training?

## Closure

- Discuss the answers of the pop quiz.
- Ask students to separate into small groups of four or five. Ask groups to volunteer something they learned today about muscular strength or muscular endurance. Dismiss groups as they provide sufficient answers.

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**EMBEDDED OUTCOME: S3.M2.6** *To increase overall fitness, try to participate in at least one physical activity outside of physical education class. Try to complete both muscle-strengthening and muscle-endurance activities.*

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## Reflection

- Do students seem to understand the difference between muscular strength and muscular endurance?
- Are students showing appropriate motivation during the training portion of the lesson?
- Are students working well in groups?

## Homework

*Participate in physical activity outside of class, and record in your physical activity log the physical activity and how long you participated in it.*

*Finish your journal assignment.*

## Resources

Corbin, C.B., & Lindsay, R. (2007). *Fitness for life*. Updated 5th ed. Champaign, IL: Human Kinetics.  
Internet keyword search: “5K running plans”