

## LESSON 3: ESTIMATING PHYSICAL ACTIVITY AND CALORIES EXPENDED

### Grade-Level Outcomes

#### Primary Outcomes

**Fitness knowledge:** Participates in moderate to vigorous aerobic physical activity that includes intermittent or continuous aerobic physical activity of both moderate and vigorous intensity for at least 60 minutes per day. (S3.M6.6)

**Dribbling/ball control:** Dribbles with dominant hand using a change of speed and direction in a variety of practice tasks. (S1.M8.6)

#### Embedded Outcomes

**Fitness knowledge:** Describes the role of warm-ups and cool-downs before and after physical activities. (S3.M12.6)

**Fitness knowledge:** Sets and monitors a self-selected physical-activity goal for aerobic and/or muscle- and bone-strengthening activity based on current fitness level. (S3.M8.6)

### Lesson Objectives

The learner will:

- participate in moderate to vigorous basketball activities that are intermittent or continuous in nature.
- dribble with preferred hand using different speeds.
- estimate how much physical activity she performed and how many Calories (kcal) she expended.

### Equipment and Materials

- Basketballs of various sizes (1 basketball per 2 students)
- Pedometers
- Pencils
- Clipboards
- Handouts: Calories Used for Activities by Weight Categories
- Cones
- Basketball courts
- Stopwatch (for you to time basketball practice)
- 3 × 5 cards (1 per student)

### Introduction

*Today we will explore the quantities of physical activity using a table of various physical activities that also takes into consideration your weight. We will do this through practice tasks designed to make you more skilled at dribbling with your preferred hand.*

## Instructional Task: Dynamic Warm-Up

### ■ PRACTICE TASK

Place four large cones in a rectangle or square on the basketball courts.

Students perform a variety of dynamic warm-up movements that are based on locomotor movements. You can call out these movements periodically, or you can ask students what movements they think should be performed based on the day's activities.

**EMBEDDED OUTCOME: S3.M12.6.** This is a great opportunity to teach students the importance of warming up muscles that they will use in the planned activity.

## Guiding questions for students:

- What movements do you think would work best for the lesson today? (Answer: Because today's learning experience involves basketball drills with changes in speed and direction, students should choose locomotor skills that will warm up muscles in the legs that they will use to change direction.)
- Describe the role that the warm-up plays before physical activity.
- Is static stretching a warm-up?

## Student Choices/Differentiation

- This warm-up can be performed in small groups with a lead student who directs the warm-up.
- Adjust the warm-up space, speed, and equipment according to students' skill levels.

## What to Look For

- Students are participating in a dynamic warm-up before physical activity.
- Students are performing fundamental movement patterns.
- Students are maintaining a low center of gravity when sliding on defense.
- Students are engaged in the warm-up and not just "going through the motions."

## Instructional Task: Focus on Muscle- and Bone-Strengthening Activities With a Basketball

### ■ PRACTICE TASK

This task assumes that the class has been working on a variety of muscle- and bone-strengthening activities over the course of the school year.

Students work in pairs on upper-body exercises such as various plank exercises and push-ups. They also work in pairs on various abdominal exercises.

Note: Students should have participated in a scientifically based fitness assessment earlier in the year so that they have some idea of their current fitness levels.

### While in push-up position:

- Low-fives. (Students assume a push-up position, each facing a partner. On your command, students touch the partner's wrist with the hand: right hand to partner's left wrist and then left hand to partner's right wrist.)
- Students are able to give a high five to a partner. (Students assume a push-up position, each facing a partner. On your command, students touch the partner's opposite shoulder with the hand: right hand to partner's left shoulder and then left hand to partner's right shoulder.)
- Roll a basketball back and forth with a partner about 12 feet (3.5 m) apart. (Working in pairs, one student is in a push-up plank position and the other is standing behind the first student's feet. The standing partner rolls a basketball to the right of the partner, who stops the ball with the right hand, transfers it to the left hand, and rolls it back to the standing partner.)

### While in curl-up position:

Toss a basketball back and forth with a partner (like a medicine ball). Make sure that you are in a curl-up and not a sit-up to avoid injury to the tailbone.

### Extension

Have each student come up with at least one goal for muscle- and bone-strengthening activities.

**EMBEDDED OUTCOME: S3.M8.6.** Students create and monitor a self-selected physical activity goal for aerobic and/or muscle and bone-strengthening activity based on current fitness level.

## **Student Choices/Differentiation**

- Students choose number of repetitions based on fitness level.
- Students choose their own partners.
- Skills can be modified based on students' skill levels.

## **What to Look For**

- Students are participating in the push-up and curl-up exercises in a safe and controlled manner.
- Students are self-selecting exercises based on their perceptions of current fitness level.
- Students are choosing exercises that provide a challenge (overload).

## **Instructional Task: Basketball Dribbling and Passing**

### **■ PRACTICE TASK**

Use a stopwatch for the next three practice tasks. Students practice the tasks for a total of 10, 20, or 30 minutes, depending on class time available.

#### **Basketball Tag**

- Students dribble in open space around the courts (determine number of courts based on number on students). Partner follows dribbling partner ready to take a chest pass, overhead pass, or bounce pass when the teacher blows a whistle.
- On the whistle, dribbling partner jump stops, pivots toward partner, and performs the pass. Partner begins to dribble around the courts.
- Rotate again on teacher whistle.

## **Student Choices/Differentiation**

- Students use various types of passes according to skill level.
- Students may choose the size of the basketball and the speed of the activity.

## **What to Look For**

- Students are dribbling with preferred hand.
- Students are changing direction while dribbling to avoid other students.
- Students are changing speed based on other students on the court.
- Students are pivoting toward partner.

## **Instructional Task: Dribbling Using Change of Speed and Direction**

### **■ PRACTICE TASK**

#### **Dribbling While Guarded**

- Students form short lines at the baseline of the courts (avoid excessive wait time).
- In pairs, one student dribbles down the court while the other student guards. The guarding partner is to maintain an athletic stance and essentially provide an obstacle.
- The student dribbling can attempt to dribble around the defender, while the defender attempts to stay in front of the student dribbling.
- At the baseline, the student dribbling performs a chest pass to the partner, and they switch roles.
- Defenders should be semi-active.

## Extension

Students who can perform Outcome S1.M8.6 (dribbles with dominant hand using a change of speed and direction in a variety of practice tasks) can “level up” to dribbling with the non-dominant hand using change in speed and direction.

## Student Choices/Differentiation

- Students choose partners based on who they feel comfortable with (e.g., if they play club basketball, they find someone who plays basketball all the time; if they are just learning, they find someone else who is just starting to learn).
- Students may choose the size of the ball.
- Students create their own rules for a small-sided game.

## What to Look For

- Students are changing speed based on movements of the defender.
- Students are changing direction based on movements of the defender.
- Students are changing both speed and direction at the same time.
- Students are maintaining an athletic stance.
- Students are positioning one hand down to guard the ball and the other hand up over the shoulder and to the side to protect against a pass while maintaining a defensive position.
- Students are correctly performing a jump stop.
- Students are performing the chest pass with full extension of the elbows.
- Students are stepping toward the target with one foot while performing the chest pass.

## Instructional Task: Frogger Basketball

### ■ PRACTICE TASK

This is a variation of dribble maze as described in Kleinman (2001, pp. 328-329).

Form groups of students in line at the baseline and sidelines.

Students dribble perpendicular to each other so that they are forced to change speed and direction and look where they are going, not at the ball.

## Extensions

- Students dribble with preferred and non-preferred hand using a change of speed and direction in small-sided game play.
- If students are able to demonstrate the skill with both hands, they can level up to a small-sided game and work independently. This allows you to provide more effective feedback and teaching of students who have not demonstrated proficiency yet.

## Student Choices/Differentiation

- Students may choose the size of the ball.
- Students create their own rules for a small-sided game.
- If students are unable to perform tasks, they move back to the practice tasks with the rest of the class.

## What to Look For

- Students are dribbling the ball around waist height.
- Students are looking toward the intended direction.
- Students are changing direction and speed without a double dribble.

## Instructional Task: Estimating Physical Activity and Calories

### ■ PRACTICE TASK

Students distribute the clipboards and handouts (Calories Used for Activities by Weight Categories).

- Tell students the length of time they participated in basketball drills.
- Have them estimate how many Calories (kcal) they expended, or “burned,” by playing basketball.
- They need to find this estimate based on their weight and time.

Students write the number of Calories used and the exercise time on a 3 × 5 card to take home.

### Student Choices/Differentiation

- Provide examples if needed.
- Students can work in pairs or groups if they are having a difficult time.

### What to Look For

- Students are using the table by both time and weight.
- Students are recognizing that the table is based on 10 minutes of activity time.
- Students are multiplying Calories (kcal) out to 20 or 30 minutes if they were active for longer than 10 minutes.
- Students are estimating the Calories (kcal) based on the information provided when their exact weight is not listed.

## Formal and Informal Assessments

Informal assessment: dribbling skills

### Closure

- Think, pair, share—Discuss if you think this table is an accurate estimation of how many Calories (kcal) you burned, or expended, today. (Answers may differ based on whether they were in a game versus being in the basketball drills.)
- Think about the strength and conditioning we did at the beginning of class. Are the push-up and plank exercises easily measured in Calories (kcal)? Are they listed anywhere on the table?
- What is your guess about the quantity of Calories (kcal) used for aerobic-type activities versus muscle- and bone-strengthening activities such as strength training or weightlifting?

### Reflection

- How are students progressing in dribbling?
- Are students able to demonstrate the proper use of the table for determining Calories (kcal) expended?

### Homework

Students fill out their one-day (weekday) physical activity logs.

Instruct students to include today’s physical activity (recorded on their 3 × 5 cards) in their logs.

### Resources

Hichwa, J. (1998). *Right fielders are people too: An inclusive approach to teaching middle school physical education*. Champaign, IL: Human Kinetics.

Kleinman, I. (2001). *Complete physical education plans for grades 7-12*. Champaign, IL: Human Kinetics.

Sound Body Sound Mind Foundation. (2014). *Sound body sound mind: Teaching the basics of movement and physical activity—high school & middle school curriculum*. Los Angeles: Sound Body Sound Mind Foundation.

## Calories Used for Activities by Weight Categories

Body weight in pounds (this has been converted from kilograms)										
	44 lb.	55 lb.	66 lb.	77 lb.	88 lb.	99 lb.	110 lb.	121 lb.	132 lb.	143 lb.
Activity	Calories (kcal) for 10 minutes									
Basketball (game)	35	43	51	60	68	77	85	94	102	110
Calisthenics	13	17	20	23	26	30	33	36	40	43
Cross-country skiing (leisure)	24	30	36	42	48	54	60	66	72	78
Cycling (6 mph; 9.7 km/h)	15	17	20	23	26	29	33	36	39	42
Cycling (9 mph; 14.5 km/h)	22	27	32	36	41	46	50	55	60	65
Field hockey	27	34	40	47	54	60	67	74	80	87
Figure skating	40	50	60	70	80	90	10	110	120	130
Horseback riding -canter	8	11	13	15	17	19	21	23	25	27
-trot	22	28	33	39	44	50	55	61	66	72
-gallop	28	35	41	48	50	62	69	76	83	90
Ice hockey (on-ice time)	52	65	78	91	104	117	130	143	156	168
Judo	39	49	59	69	78	88	98	108	118	127
Running (5 mph; 8.0 km/h)*	37	45	52	60	66	72	78	84	90	95
Running (6 mph; 9.7 km/h)	48	55	64	73	79	85	92	100	107	113
Running (7.5 mph; 12.1 km/h)	—	—	76	83	91	99	107	115	125	130
Running (9 mph; 14.5 km/h)	—	—	—	—	—	113	121	130	140	148
Snowshoeing	35	42	50	58	66	74	82	90	98	107
Soccer (game)	36	45	54	63	72	81	90	99	108	117
Squash	—	—	64	74	85	95	106	117	127	138
Swimming, front crawl (30 m/min)	25	31	37	43	49	56	62	68	74	80
Swimming, breast-stroke (30 m/min)	19	24	29	34	38	43	48	53	58	62
Swimming, back-stroke (30 m/min)	17	21	25	30	34	38	42	47	51	55
Table tennis	22	28	33	39	44	50	55	61	66	72
Tennis	22	28	33	39	44	50	55	61	66	72
Volleyball (game)	20	25	30	35	40	45	50	55	60	65
Walking* (2.5 mph; 3.2 km/h)	17	19	21	23	26	28	30	32	34	36
Walking* (4 mph; 6.4 km/h)	24	26	28	30	32	34	37	40	43	48

\*Note: The transition from walking to running occurs between 4 and 5 mph (6.4 and 8.0 km/h). Walking at 2.5 mph (4 km/h) is a slow walk. Walking at 4 mph is a fast walk and is almost running.

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). Adapted from O. Bar-Or and T. Rowland, 2004, *Pediatric exercise medicine: Physiological principles to health care application* (Champaign, IL: Human Kinetics).