

LESSON 3: WALKING AND HEART RATE

Grade-Level Outcomes

Primary Outcomes

Fitness knowledge: Calculates target heart rate and applies that information to personal fitness plan. (S3.H10.L1)

Fitness activities: Demonstrates competency in 1 or more specialized skills in health-related fitness activities. (S1.H3.L1)

Fitness knowledge: Adjusts pacing to keep heart rate in the target zone, using available technology (e.g., pedometer, heart rate monitor), to self-monitor aerobic intensity. (S3.H10.L2)

Equipment and Materials

- Task sheets (1 per student)
- Pedometers (1 per student)
- Some calculators
- Stopwatches

Lesson Objectives

The learner will:

- calculate her or his moderate and vigorous target heart rate zones (using Karvonen formula).
- explore pace and heart rate related to walking intensity.
- self-regulate by working within her or his target heart rate zone.

Introduction

Who wants to share the number of steps he or she took from the log? In our previous class, you learned how pacing affects your step count and what happens to your heart rate as you increase your pace. You will continue to explore heart rate today while counting your steps and considering how you can get the most benefit from your walking. First, to find your personalized target heart rate zone, you must find your resting heart rate. Who can tell me when the best time is to find your resting heart rate? (Answer: in the morning when you wake before getting out of bed) That's right, but since you did not do that today, I want you all to rest for a few minutes and then take your resting heart rate.

Instructional Task: Resting Heart Rate and Calculating Target Heart Rate (THR)

■ PRACTICE TASK

Show students how to take their heart rates either at the wrist or neck. Have them practice for 30 seconds.

Next, students spread out and lie down on their backs for 2 to 4 minutes. When time is up, students take their 30-second resting heart rate, record it, and multiply by 2. (It is more accurate to take a longer heart rate than it is to take it for 6 seconds and multiply by 10.)

Show students the Karvonen equation for finding their THR zones. Go through a practice equation together. See the task sheet.

After reviewing the formula, students find both their moderate and vigorous THR zones.

Refinements

- Students use heart rate monitors.
- Students take their heart rates for a full 60 seconds.

The Karvonen formula is the most accurate, but you could calculate a percentage of the maximal heart rate to estimate target heart rate range. This simpler equation is less accurate.

Guiding questions for students:

- How can you use heart rate when out for a walk?
- What else might affect your heart rate when you are walking besides pace? (Answer: terrain, hills, heat, and so on)
- Why should you consider your heart rate when walking for physical activity?

Student Choices/Differentiation

- Students may take their heart rates at the neck or wrist.
- Give students a completed sample equation before finding their own so they have an example to go by.

What to Look For

- Students can find their pulse to take their heart rates.
- Students can find their 60-second resting heart rates by multiplying by 2 or taking their heart rates for 60 seconds.

Instructional Task:

Moderate and Vigorous Laps for Heart Rate and Steps

■ PRACTICE TASK

Have students walk one lap at a moderate pace and take a 15-second or 30-second heart rate at the end of the lap. They should record their heart rates and the steps. Remind students to reset their pedometers before starting each lap.

For the second lap, students run one lap at their own running pace and then record heart rate and steps. Repeat, with students walking another lap and then running another lap to compare heart rate, lap time, and steps.

After logging heart rate, time, and steps after completing the fourth lap, students take a cool-down lap at their own pace. They will again time the lap, take a step count, and measure heart rate at the conclusion of the cool-down lap.

Refinement

Check for changes in walking technique. Encourage students to maintain good technique regardless of pace.

Guiding questions for students:

- What happened to your step count when you ran compared to when you walked? Why might this be?
- Do you think the pedometer is accurate when you run? Why or why not?
- When walking at a moderate pace, were you within your moderate target heart rate zone? If you were not, how can you get there?
- How about running? Where were you in your target heart rate zone?

Student Choices/Differentiation

- Students may do more laps of either walking or running.
- Students may walk for 4 minutes, run for 4 minutes, and repeat, or select another time interval.
- Students may walk two, run one, walk two, run one, or walk two, run two, and so on.
- Students may use walking poles or sticks.

What to Look For

- Students can use their heart rates to pace.
- Students can change their pace to stay within their THR zones or recognize how it feels to be in their THR zones.

Instructional Task: Cool-Down Stretches

■ PRACTICE TASK

Have students put their pedometers away and come together as a class for a flexibility cool-down routine. Students hold each stretch for 15 to 20 seconds on both sides of the body.

- Quad stretch
- Calf stretch
- Achilles stretch
- Hamstring stretch
- Glute stretch
- Shoulder stretch
- Chest stretch
- Triceps stretch

Students record their heart rates at the conclusion of the stretching.

Refinements

- Make sure students hold their static stretches and do not bounce.
- Remind students about the importance of alignment and to stretch all major muscle groups.

Guiding questions for students:

- During your flexibility cool-down, what did your heart rate do?
- Why are you stretching after this walking activity?

Student Choices/Differentiation

Students can stretch on their own or with a partner.

What to Look For

- Students are doing the stretches with correct form and holding for an adequate amount of time.
- Students recognize the type of stretching they are doing (e.g., static, dynamic).

Formal and Informal Assessments

- Task sheets – heart rate
- Exit slip: compare your walking heart rate with your stretching heart rate.

Closure

- Today, you used both pedometers and target heart rate while walking. Can anyone tell me what the daily physical activity recommendations are for adults?
- How can you use target heart rate to gauge your daily physical activity?
- Do you know what your moderate heart rate feels like? Vigorous heart rate?
- Keep thinking about how you could use a pedometer or your target heart rate while walking to accumulate your daily physical activity minutes or steps.

Reflection

- Were students able to calculate the lower and upper limits of their target heart rate zones?
- Did students maintain technique regardless of pace?
- Do students understand heart rate and the effects of physical activity on heart rate?

Homework

- Now that you have used both pedometers and heart rate, think of how you can use both to increase your daily moderate to vigorous physical activity and daily step counts.
- Create a list of five places where you could walk outside of school to increase your daily steps and daily moderate physical activity.

Resources

Calculating target heart rates

CALCULATING HEART RATE

Find estimated max heart rate:

$$220 - \text{your age}$$

Find heart rate reserve (HRR):

$$\text{Max heart rate (MHR)} - \text{resting heart rate (RHR)} = \text{heart rate reserve (HRR)}$$

Find lower limit (50 percent) of moderate THR:

$$\text{HRR} \times .50 + \text{RHR} = \text{lower limit of target heart rate zone}$$

Find upper limit (70 percent) of moderate THR:

$$\text{HRR} \times .70 + \text{RHR} = \text{upper limit of target heart rate zone}$$

National Association for Sport and Physical Education. (2011). *The physical best teacher's guide: Physical education for lifelong fitness*. 3rd ed. Ayers, S.F., Sariscsany, M.J., eds. Champaign, IL: Human Kinetics, p. 83.

Tell students to round up or down.

Example: Joe is 15 and has a resting heart rate of 60.

$$\text{Max heart rate: } 220 - 15 = 205$$

$$\text{HRR: } 205 - 60 = 145$$

$$50\% = 145 \times .5 = 72.5 (73) + 60 = \mathbf{133} \text{ (lower limit)}$$

$$70\% = 145 \times .7 = 101.5 (102) + 60 = \mathbf{162} \text{ (upper limit)}$$

Moderate target heart rate zone is 133 to 162.

Now, students find Joe's vigorous THR zone (70 to 85 percent) and then do their own THR zones for both a moderate range and vigorous range.

Log Sheet

Lap 1 Heart rate: _____ Step count: _____

Lap 2 Heart rate: _____ Step count: _____

Lap 3 Heart rate: _____ Step count: _____

Lap 4 Heart rate: _____ Step count: _____

Total step count: _____

From L.C. MacDonald, R.J. Doan, and S. Chepko, eds., 2018, *Lesson planning for high school physical education* (Reston, VA: SHAPE America; Champaign, IL: Human Kinetics). Reprinted, by permission, from S.F. Ayers and M.J. Sarsiscsany, 2011, *The physical best teacher's guide: Physical education for lifelong fitness*, 3rd ed. (Champaign, IL: Human Kinetics), 83.