Lesson Fifteen
Cardiorespiratory Health: Learning about Heart Rate Zones

Objectives

After participating in this lesson students will
• Learn the five heart rate zones.
• Understand that the heart works harder at different intensity levels.
• Practice taking their heart rate while exercising.
• Track progress on their healthy eating and physical activity goals.

Time

50 minutes            Prep Time: 25 minutes

Activities

15.1 Review and Plan for the Day       3 minutes
15.2 Heart Rate Zones                  5 minutes
15.3 Finding Your Heart Rate           18 minutes
15.4 Exercising in Heart Rate Zones    14 minutes
15.5 Tracking Progress                 5 minutes
15.6 Closure                           5 minutes

Key Terms

• Heart Rate
• Resting Heart Rate
• Heart Rate Zones
• Aerobic
• Anaerobic

Materials

☐ Heart Rate Zones poster
☐ How to Take Your Heart Rate poster
☐ Heart Rate (Activity Sheet 15.3)
☐ Calculators
☐ Resistance bands
☐ Jump ropes

Teacher Preparation

• Write Plan for the Day and Objectives on chart paper or board.
• Make Heart Rate Zones poster. (See Activity 15.2.)
• Make How to Take Your Heart Rate poster. (See Activity 15.3.)
• Make transparency (1) and copies of Heart Rate (Activity Sheet 15.3), 1 for each student, and place in portfolios.
15.1 Review and Plan for the Day  3 minutes

Materials: Plan for the Day and Objectives

Write the Plan for the Day and Objectives on the board before class, listing all of the activities students will be doing.

Plan for the Day:
- Heart Rate Zones
- Finding Your Heart Rate
- Exercising in Heart Rate Zones
- Tracking Progress

Review the previous class. Ask students to name a way that they were aware of body image since the last class.

Explain that today they will be learning about the different heart rate zones that their heart works at when exercising at different intensities. Explain that they will learn how to take their heart rate while they are exercising. They will also be looking at their progress on their healthy eating and physical activity goals.

Review the Objectives with students.

15.2 Heart Rate Zones  5 minutes

Materials: Poster of the 5 Heart Rate Zones

Tell students that today’s lesson is focused on heart rate zones (each zone accesses a different intensity level), which has to do mostly with the cardiorespiratory component of fitness. Ask them if they remember the 4 components of fitness, including cardiorespiratory. Direct their attention to the Key Terms chart to help them if they don’t remember.

Acknowledge that when working in different zones they are also having an effect on the other three fitness components (muscular strength, muscular endurance and flexibility). We are always using the cardiorespiratory system at some level as long as we are alive and breathing.

Show the poster of the 5 Heart Rate Zones. Explain that these 5 zones represent a percentage of your maximum heart rate. They require progressively more exertion.

1. Weight Management Zone (40-50% of max. heart rate)
2. Healthy Heart Zone (50-70% of max. heart rate)
3. Aerobic (muscle working with oxygen) Zone (70-85% of max. heart rate)
4. Anaerobic (muscle working without oxygen) Zone (80-95% of max heart rate)
5. Red Zone (90-100% of max. heart rate)
15.3 Finding Your Heart Rate 18 minutes

Materials: How to Take Your Heart Rate poster, pencils, calculators, Heart Rate (Activity Sheet 15.3)

Explain that students will be working on finding their heart rate (the number of heart beats per unit of time, usually expressed as beats per minute) in the different zones. Therefore, the first thing they are going to do is take their heart rate. This heart rate will be considered a resting heart rate (the heart rate when a person is resting).

- Teach students how to take their heart rate by following the steps on the How to Find Your Heart Rate poster. (Write the following instructions on a piece of chart paper before class.)
  - Press your first two fingertips lightly against the side of your neck, just below the jawbone, halfway between your ear and your chin, until you feel a strong beat.
  - Count the number of beats for 1 minute.

- Have students write the number they get on the Heart Rate activity sheet on line 2, Resting Heart Rate (RHR).

Now that students know how to take their heart rate, direct their attention to the instructions on the Heart Rate activity sheet. Explain that they will be finding their heart rate for the different zones. Students can find their target heart rate range by doing the calculations on the activity sheet.

- Have students begin filling out the activity sheet by calculating their Heart Rate Reserve. (See Karvonen Method below for directions.) Give each student a calculator in order to do the calculations. Walk them through the steps of finding this calculation, checking their work to ensure that they do it correctly. Show a transparency of the Heart Rate activity sheet so you can work along with the students. When working through the activity sheet as an example use the age that is most prevalent in the class.

  The basic calculation for Heart Rate Reserve is called the Karvonen Method:
  1. Subtract age from 220. (220 – 15 = 205)
  2. Measure resting heart rate. (70)
  3. Subtract resting heart rate from the maximum heart rate. (205 – 70 = 135)

- This completes the first section of the activity sheet. The students now have their heart rate reserve and their resting heart rate. Once students have this calculation, they can go on to calculate their heart rate in the different zones. Direct students to the boxes on the activity sheet that say Weight Management Zone, Healthy Heart Zone and Aerobic Zone. Tell them they can go ahead and fill in the numbers for the Heart Rate Reserve (HRR) and their resting heart rate (RHR).
• They will now do some more calculations using these numbers to find their heart rate for these different zones. Go through steps 4 through 6 to complete the activity sheet. Again, walk students through the first equation, ensuring they are putting the correct numbers in the appropriate place.

4. Multiply the number from step 3 by the intensity percentage desired. (.75 x 135 = 81.25)
5. Add the resting heart rate to the number calculated in step 4. (70 + 81 = 151)
6. The target heart rate for a 15 year old person to achieve 75% of their maximum heart rate would be 151 beats per minute.

Explain to students that they will now be participating in some exercises that will get their heart rate into some of these zones, depending on how hard they are working and maintaining their heart rate.

15.4 Exercising in Heart Rate Zones 14 minutes

Materials: Heart Rate (Activity Sheet 15.3), pencils, resistance bands, jump ropes

Explain that students will be doing some exercises now in order to bring their heart rate into some of the different heart rate zones.

• As a class they will be participating together in the activities. Explain that they are to use the heart rate finding method they learned earlier in class to keep track of their heart rate throughout the activities.

• Students will be writing down their heart rates on the activity sheet on the lines that say Stretching, Resistance Bands, Jumping Rope and Cool Down. (The cool-down can be any kind of activity that will gradually slow the heart—slow walking, stretching, etc.)

• Have students stand in a circle and lead them in some stretches. Make sure the students have their activity sheets and a pencil. You can have the students lead the class in stretches or do it yourself.

• After a few stretches, have students take their heart rate for 1 minute. Then have them record their heart rate on the Stretching line on the activity sheet.

• Give each student a resistance band. Do bicep curls with the students. Do 3 sets of 10 repetitions. Have them record their heart rate on the Resistance Band line.

• Next have students jump rope for about 1 minute continuously. Have them record their heart rate on the Jumping Rope line.

• At the end of the exercise, have students cool down by walking or doing some stretches. Have them record their heart rate on the Cool Down line.
**15.5 Tracking Progress**  
5 minutes

**Materials:** Tracking My Progress (Activity Sheet 15.5)

Remind students of the goals that they wrote for themselves. Remind them that once a week the whole class has been looking at how they did on achieving their goals.

- Refer students to the Tracking My Progress activity sheet in their portfolios. Have them write in their goals for both healthy eating and physical activity.

- Then have them fill out the rest of the sheet, choosing one of their goals to focus on.

Ask students to share with a partner how they did on their goal this past week. What were the challenges? What did they do to meet their goal? How did they feel about working toward their goal?

**15.6 Closure**  
5 minutes

Ask students what each exercise activity felt like. Relate their answers to the information on the Heart Rate Zones poster, making the point that as the heart works harder so does the rest of the body. Ultimately, students will feel the effects of the different zones as they increase in cardio-vascular intensity.

Have students choose one of the heart rate zones that they will commit to working out in for a half hour in the coming week. Have them each tell a classmate what activity they will do to achieve this.

**Resources**

The Fitness Education Pyramid, 2nd ed. by Donna Terbizan, Bradford Strand, Karen Roesler, Lois Mauch and Janelle Schumacher. Copyright 2001, F. E. P. Sales and Consulting. PO Box 201, West Fargo, ND.

Activity 15.3 Finding Your Heart Rate: collaboration with All 4 You 2! curriculum Lesson 9, Activity 4.
Heart Rate

Finding Your Target Heart Rate Zone

To calculate your Target Heart Rate Zone, use the following formula:

1. \[220 - \text{(your age)} = \text{Max Heart Rate (MHR)}\]
2. Measure your resting heart rate (RHR).
3. \[\text{MHR} - \text{RHR} = \text{Heart Rate Reserve (HRR)}\]—The difference between your resting and maximum heart rates.
4. \[\text{HRR} \times \% \text{ of intensity} = \text{Training Range} \%\]
5. \[\text{Training Range} \% + \text{RHR} = \text{Target Heart Rate}\]

Let’s break the formula apart. First, find your Maximum Heart Rate and your Resting Heart Rate:

1. \[220 - \_\_\_ = \_\_\_\]
   \[\text{AGE} \quad \text{Max. Heart Rate (MHR)}\]
2. \[\text{Resting Heart Rate (RHR)} \_\_\_\]
3. \[\_\_\_ - \_\_\_ = \_\_\_\]
   \[\text{MHR} \quad \text{RHR} \quad \text{Heart Rate Reserve (HRR)}\]

Now that you have your Maximum Heart Rate and your Heart Rate Reserve you can calculate your Heart Rate for the following zones.

Weight Management Zone

\[\text{40\% of Target Heart Rate Zone}\]
\[\_\_\_ \times 0.40 = \_\_\_\]
\[\text{HRR} \quad \text{Training Range 45\% (TR \%)}\]
\[\_\_\_ + \_\_\_ = \_\_\_\]
\[\text{TR\%} \quad \text{RHR} \quad \text{HR at low end of Weight Management Zone}\]

\[\text{50\% of Target Heart Rate Zone}\]
\[\_\_\_ \times 0.50 = \_\_\_\]
\[\text{HRR} \quad \text{Training Range 50\% (TR \%)}\]
\[\_\_\_ + \_\_\_ = \_\_\_\]
\[\text{TR\%} \quad \text{RHR} \quad \text{HR at high end of Weight Management Zone}\]
Heart Rate (continued)

Healthy Heart Zone

50% of Target Heart Rate Zone

_____
HR at low end of Healthy Heart Zone

70% of Target Heart Rate Zone

____ x .70 = ______
HRR   Training Range 70% (TR %)
____ + _____ = ______
TR%  RHR  HR at high end of Healthy Heart Zone

Aerobic Zone

70% of Target Heart Rate Zone

_____
HR at low end of Aerobic Zone

85% of Target Heart Rate Zone

____ x .85 = ______
HRR   Training Range 85% (TR %)
____ + _____ = ______
TR%  RHR  HR at high end of Aerobic Zone

1. Stretching______________
2. Resistance Bands________
3. Jumping Rope____________
4. Cool Down______________
**Tracking My Progress**

My **healthy eating** goal:

My **physical activity** goal:

### Date: __________

**What I did to meet my goal:**

> __________________________________________
> __________________________________________
> __________________________________________
> __________________________________________
> __________________________________________
> __________________________________________

**What I learned this week:**

*Benefits* I enjoyed this week: __________________________________________

> __________________________________________

*Challenges* I had: ______________________________________________________

> __________________________________________

Possible ways to *deal with challenges* if they come up again: ________________

> __________________________________________

What am I going to do toward my goal *next week*: __________________________

> __________________________________________

Who could *help* me with my goal if I need support: _________________________

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