Instructional Design Project

EDTL 7100

June 17, 2011

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**Rationale**

The topic for this instructional design is health-related fitness. Many physical education curriculums are moving away from instruction based strictly on sports and skill instruction and moving towards a curriculum that addresses the health benefits of engaging in regular physical activity while still providing instruction on motor skills to allow for successful participation in physical activity. Obesity is a hot topic in the United States, with good reason, as the prevalence of obesity for children and adolescents aged 2-19 years was estimated in a 2007-2008 NHANES study at 16.9%. (Ogden, 2010) Children in the United States lead more sedentary lives and that is often coupled with poor nutrition which contributes to the risk for being overweight and/or obese. Providing a physical education curriculum that focuses on teaching children how participating in regular physical activity can improve their quality of life physically, emotionally, and socially, and gives them the motor skills and fitness levels to be able to engage in physical activities successfully is a step toward battling the obesity crisis in the United States.

Chiarelott states in his text *Curriculum in Context,* “The balance between using effective behaviorist teaching strategies and effective constructivist teaching strategies is not so much an issue of right and wrong strategies as it is an issue of better and worse choices depending on the context.” (Chiarelott, 2006) The instructional model that I will use for this instructional design is based on a blend of both behaviorist and constructivist approaches. However, the constructivist model is more emphasized because it gives the students an opportunity to work collaboratively, and provides plenty of opportunity for hands-on activities to encourage exploration which fits very well to a physical education classroom setting. It is important for students to see the relevance of the concepts being taught and allowing them to experience the concepts through movement activities and real-life examples helps the students relate to the concepts and hopefully see their usefulness and relevance beyond the classroom and into the future. I chose to use the basic lesson planning model for this instructional design as is provided the most flexibility, and seemed the most appropriate for the physical education setting. I have included all the sub-units for Health-Related Fitness, and the pre-and post-assessments include questions to cover all the sub-units, but I have chosen to focus the lesson plans on just the Muscular Strength and Endurance sub-unit for this instructional design project.

**Unit Outcomes**

**Subunit One: Cardio-Respiratory Fitness**

* Student will be able to define cardio-respiratory fitness. (Knowledge)
* Student will be able to identify the body systems involved in cardio-respiratory fitness (heart, lungs, blood vessels). (Knowledge)
* Student will be able to identify activities that increase cardio-respiratory fitness.(Knowledge)
* Student will be able to categorize cardio-respiratory activities into aerobic and non-aerobic categories. (Application)
* Student will be able to describe how cardio-respiratory fitness benefits the body physically, mental-emotionally, and/or socially. (Application)
* Student will be able to describe methods for evaluating their cardio-respiratory fitness. (Application)
* Student will be able to determine their cardio-respiratory fitness level from the results of a Fitnessgram aerobic fitness test. (Evaluation)
* Student will understand how to apply the FITT principle and training principles to improve and/or maintain their cardio-respiratory fitness levels. (Knowledge)
* Student will be able to design a cardio-respiratory fitness program to accomplish a goal to increase their cardio-respiratory fitness levels. (Application)

**Subunit Two: Muscular Strength and Endurance**

* Student will be able to define muscular strength and endurance (Knowledge)
* Student will be able to identify the major muscles of the body (i.e. biceps, triceps, rectus abdominus, quadriceps) (Knowledge)
* Student will be able to identify exercises and activities that increase muscular strength and endurance. (Knowledge)
* Student will be able to explain how muscular strength and endurance benefits the body physically, mental-emotionally, and/or socially. (Application)
* Student will be able to describe methods for evaluating muscular strength and endurance. (Application)
* Student will be able to determine the strength of various muscle groups from results of Fitnessgram and/or other fitness tests. (Evaluation)
* Student will understand how to apply the FITT principle and training principles to improve and/or maintain their muscular strength and endurance levels.(Knowledge)
* Student will be able to design a muscular strength and endurance fitness program to accomplish a goal to increase muscular strength and endurance levels. (Application)

**Subunit Three: Flexibility**

* Student will be able to define flexibility. (Knowledge)
* Student will be able to identify exercises and activities that increase flexibility. (Knowledge)
* Student will be able to explain how flexibility benefits the body physically, mental-emotionally, and/or socially. (Application)
* Student will be able to describe methods for evaluating flexibility.(Application)
* Student will be able to determine the flexibility of various muscle groups from results of Fitnessgram and/or other fitness tests. (Evaluation)
* Student will understand how to apply the FITT principle and training principles to improve and/or maintain their flexibility. (Knowledge)
* Student will be able to design a flexibility fitness program to accomplish a goal to increase flexibility. (Application)

**Subunit Four: Body Composition**

* Student will be able to define body composition. (Knowledge)
* Student will be able to identify exercises and activities that positively effect body composition. (Knowledge)
* Student will be able to explain how appropriate body composition benefits the body physically, mental-emotionally, and/or socially. (Application)
* Student will be able to describe how nutrition and eating habits affect body composition. (Application)
* Student will be able to describe methods for evaluating body composition. (Application)
* Student will be able to determine their body composition from results of BMI, electrical impedance, skin folds, or other body composition tests. (Knowledge)
* Student will understand how to apply the FITT principle and training principles to improve and/or maintain their body composition levels. (Knowledge)
* Student will be able to design a fitness program to accomplish a goal to reach ideal body composition level. (Application)

**Pre-Assessment**

1. Cardio-respiratory fitness is the ability of the body to perform large muscle dynamic, moderate to vigorous exercise over a prolonged period of time.

True False

1. The heart, lungs, and kidneys make up the cardio-respiratory system.

True False

1. It is recommended that middle school students should be physically active 6 days per week.

True False

1. Physical activity includes play, games, sports, work, transportation, recreation, physical education and/or planned exercise.

True False

1. I can name at least three benefits of cardio-respiratory fitness.

True False

1. I know how to take my pulse to measure my heart rate.

True False

1. The Borg scale can be used to determine heart rate intensity.

True False

1. The muscle on the front of the thigh is the quadriceps.

True False

1. The sit-n-reach test is a measure of hamstring strength.

True False

1. Ballistic stretching is the best kind of stretching to improve flexibility.

True False

1. Flexibility is the ability to move a joint through its complete range of motion.

True False

1. It is important to warm-up before stretching.

True False

1. Body composition is the amount of lean body mass compared to the amount of body fat.

True False

1. A healthy range of body fat for females is 17%-32% body fat.

True False

1. Body mass index or B.M.I. uses a person’s height and weight to measure body composition.

True False

1. The overload principle states that a person must exercise at a level beyond what they normally do to improve their fitness levels.

True False

1. Frequency is how \_\_\_\_\_\_\_\_\_\_\_\_\_ a person exercises.
2. Intensity is how \_\_\_\_\_\_\_\_\_\_\_\_\_\_ a person exercises.
3. Time is how \_\_\_\_\_\_\_\_\_\_\_\_\_ a person exercises.
4. Type is the \_\_\_\_\_\_\_\_\_\_\_\_\_ of exercise a person chooses.

Pre-Assessment Answer Key:

1. T

2. F

3. T

4. T

5. Student-dependent

6. Student-dependent

7. T

8. T

9. F

10. F

11. T

12. T

13. T

14. T

15. T

16. T

17. Often

18. Hard

19. Long

20. Kind

**Lesson Plan One**

1. Concept: Health-Related Fitness Component -Muscular Strength and Endurance
2. Lesson Objective(s)
   1. Student will be able to identify the major muscles of the body (i.e. biceps, triceps, rectus abdominus, quadriceps) (Knowledge)
   2. Student will be able to identify exercises and activities that increase muscular strength and endurance. (Knowledge)
3. Materials:
   1. Video segment from “Biggest Loser”

<http://www.nbc.com/the-biggest-loser/video/ep_1120_week_20__final_four_workout/1328064>

* 1. Projector and Screen
  2. Circuit Equipment: Scooters, cones, theracords, medicine balls, mats
  3. Lap-Top Cart
  4. CD Player and Music
  5. Stopwatch
  6. Worksheet

1. Procedures
   1. Warm-up: (5 mins)
      1. Students will walk/jog/run through the aisles of the auditorium for 5 mins. And count the total number of laps they complete.
      2. At the end of 5 minutes the students report their lap #s to the teacher for recording in the grade book, and get a drink at the water fountain)
   2. Introductory Activity: (10 mins.)
      1. Show students a video segment from the television show “Biggest Loser” in which the shows personal trainers are working with the contestants in the gym.
      2. Ask students the following questions: What job do Brett and Cara have on “The Biggest Loser”? (personal trainers/ fitness instructors) What do Brett and Cara need to know to help the contestants meet their fitness goals? (training principles, anatomy, nutrition, exercises, safety, etc) What do you know about muscles? (what types: skeletal, smooth, cardiac, voluntary vs. involuntary, attach to bones via tendons, muscle contraction causes movement, muscles work in pairs, muscles must be worked harder than normal to get stronger = overload principle)
   3. Developmental Activity (25 mins.)
      1. Set-up a fitness circuit with the following activities
         1. Scooter Swim: 4 scooters by base line, 4 cones placed at half court, students lie on scooters and use their arms only to swim out and around the cone and back, repeat for 30 seconds.
         2. Bench Squats: students stand with back to bench, squat down keeping knees behind toes until buttocks touch bench, stand back up, Repeat x 30 secs.
         3. Plank Hold: students place feet on bench and hands on floor in a top-of-the-push-up position, keeping core tight and body straight, hold position x 30 secs.
         4. Seated Row: Theracords are looped around bench legs, students sit facing bench and grasp cord handles, keeping elbows up and back straight students pull back on cord handles while pinching shoulder blades together then relax slowly back to start position, repeat x 30secs.
         5. French Press: Students place one end of theracord on floor and step on it securely, the other end is brought up behind head with student holding handle with both hands and elbows bent, student straightens elbows and then slowly returns to start position, repeat x 30 secs.
         6. Medicine Ball Sit-Up: Students lie on mat and place medicine balls behind heads, students grasp medicine balls in hands and pick up balls as they do a curl-up touching medicine ball to the wall and then returning medicine ball to floor above their head as they lay back down, repeat x 30 seconds.
      2. Divide students up into six groups (there will be 3 to 4 students to a group)
      3. Each group will start at a different station of the circuit.
      4. Play music and time students for 30 seconds at each station using a whistle to indicate 30 second rotations.
      5. Have students rotate through the stations twice.
      6. Cool-down with stretching.
      7. At end of cool-down, give each group a worksheet and a laptop and have them complete the worksheet using their experience at the stations and an interactive muscle anatomy website to determine the muscles used at each station
   4. Concluding Activity (5 mins.)
      1. Each group will share their answer to one of the worksheet questions.
2. Assessment/Evaluation Strategy (2 – 4 mins.)

Exit Question: Ask students to identify a muscle on the muscle wall chart and name an exercise for it.

**Muscular Strength and Endurance Circuit Worksheet**

**Name(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Utilize your experiences at the stations and the following website to help you determine the major muscle or muscles used in each of the circuit stations.**

[**http://www.bbc.co.uk/science/humanbody/body/factfiles/muscle\_anatomy.shtml**](http://www.bbc.co.uk/science/humanbody/body/factfiles/muscle_anatomy.shtml) **(front view)**

[**http://www.bbc.co.uk/science/humanbody/body/factfiles/muscle\_anatomy\_back.shtml**](http://www.bbc.co.uk/science/humanbody/body/factfiles/muscle_anatomy_back.shtml) **(back view)**

**Station #1: Scooter Swim Station #2: Bench Squats**

**Station #3: Plank Hold Station #4: Seated Row**

**Station #5: French Press Station #6: Medicine Ball Sit-Ups**

**Lesson Plan Two**

1. Concept: Health-Related Fitness Component -Muscular Strength and Endurance
2. Lesson Objective(s)
   1. Student will be able to describe methods for evaluating muscular strength and endurance. (Application)
   2. Student will be able to determine the strength of various muscle groups from results of Fitnessgram and/or other fitness tests. (Evaluation)
3. Materials:
   1. Fitnessgram Healthy Fitness Zone Data Sheet

<http://www.cooperinstitute.org/documents/StandardsTable.pdf> (printable to make poster or placed on back of Test score sheets)

* 1. Overhead Projector
  2. Fitnessgram Testing CD and CD Player
  3. 6 Mats
  4. Test Score Sheets
  5. Pencils
  6. Laptop computer and Printer

1. Procedures
   1. Warm-up: (5 mins)
      1. Students will walk/jog/run through the aisles of the auditorium for 5 mins. And count the total number of laps they complete.
      2. At the end of 5 minutes the students report their lap #s to the teacher for recording in the grade book, and get a drink at the water fountain)
   2. Introductory Activity (10 mins)
      1. Teacher will display Healthy Fitness Zone data sheet using overhead projector.
      2. Ask students what Fitnessgram tests measure abdominal strength and upper body strength.
      3. Ask students to locate their age and gender on the poster and then determine the score they need to attain to be considered in the healthy fitness zone for abdominal strength (curl-ups) and upper body strength (90 degree angle push-ups).
      4. Discuss why it is important to perform fitness tests (they give you an idea of your fitness status, they provide a starting point for setting fitness goals, they help you measure progress towards a fitness goal)
   3. Developmental Activity (15 mins)
      1. Place mats on floor with side edge along sideline of basketball court and spaced about 2 feet apart.
      2. Divide students so that there are 4 students to each mat.
      3. Provide a score sheet and pencil to each student
      4. Review testing procedures for Curl-Ups
      5. Perform Curl-Up Test and have students record their scores.
      6. Review Testing Procedure for 90 degree angle push-ups
      7. Perform Push-Up Test and have students record their scores. (Note: This test should be administered one mat at a time so that the instructor can evaluate student form to ensure that elbows are reaching 90 degree angle and there are no other form breaks such as knees, stomach, or chest touching mat on down motion of push-up)
   4. Concluding Activity (10-15 mins depending on the number of available laptops)
      1. Students will record their scores for curl-ups and push-ups into the Fitnessgram software program and print out their results sheet.
2. Assessment/Evaluation Strategy (2-4 mins)
   1. Students will determine their fitness status based on their test results and inform teacher of their status on the test of their choice (curl-ups, push-ups) for their exit question from class.

Fitnessgram Score Sheet

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test | **Date** | **Date** | **Date** | **Date** | **Date** | **Date** | **Date** | **Date** | **Date** | **Date** |
|  |  |  |  |  |  |  |  |  |  |
| 1-mile run |  |  |  |  |  |  |  |  |  |  |
| Pacer |  |  |  |  |  |  |  |  |  |  |
| Curl-Ups |  |  |  |  |  |  |  |  |  |  |
| 90 deg. Push-Ups |  |  |  |  |  |  |  |  |  |  |
| Sit-n-Reach |  |  |  |  |  |  |  |  |  |  |
| Shoulder Reach |  |  |  |  |  |  |  |  |  |  |
| Trunk Lift |  |  |  |  |  |  |  |  |  |  |
| Height |  |  |  |  |  |  |  |  |  |  |
| Weight |  |  |  |  |  |  |  |  |  |  |

**Lesson Plan Three**

1. Concept: Health-Related Fitness Component -Muscular Strength and Endurance
2. Lesson Objective(s)
   1. Student will understand how to apply the FITT principle and training principles to improve and/or maintain their muscular strength and endurance levels.(Knowledge)
   2. Student will be able to design a muscular strength and endurance fitness program to accomplish a goal to increase muscular strength and endurance levels. (Application)
   3. ODE PE Standard #4: Students will achieve and maintain a health-enhancing level of physical fitness
3. Materials
   1. Worksheets from the Ohio Department of Education Physical Education Evaluation for Standard #4 Grade Band 6-8 Benchmark B
      1. [**http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=1793&ContentID=95532&Content=99525**](http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=1793&ContentID=95532&Content=99525) **(students will receive pages 17-21 of PDF file)**
   2. Student Fitnessgram score sheets
   3. Cones
   4. Posters with names of exercise principles
   5. Tape
4. Procedures
   1. Warm-up: (5 mins)
      1. Students will walk/jog/run through the aisles of the auditorium for 5 mins. And count the total number of laps they complete.
      2. At the end of 5 minutes the students report their lap #s to the teacher for recording in the grade book, and get a drink at the water fountain)
   2. Introductory Activity (10 mins)
      1. Review the FITT principle, the principle of overload, and the principle of specificity with students.
      2. Divide students into teams of four and have each team stand next to a cone along the baseline.
      3. Place posters with all the names of all the fitness principles at the opposite end of the gym.
      4. Each member of the team takes a turn trying to be the first person to race to the correct answer to the following questions:
         1. This is “how often you exercise”. (Frequency)
         2. Gradually increasing the amount of weight that you can lift relates to what principle? (Overload)
         3. This is how long you exercise. (Time)
         4. Choosing an activity that is appropriate to the goal you want to accomplish refers to what principle? (Specificity)
         5. This is how hard you exercise. (Intensity)
         6. Lifting weights three times per week (Frequency)
         7. Running to improve cardio-respiratory fitness (Type)
         8. Reaching further on a hamstring stretch (Intensity)
         9. Swimming faster. (Intensity)
         10. Biceps curls to improve upper arm strength.(Type)
         11. Increasing the number of sets or reps when weight-lifting. (Time)
         12. Two-a-Day Workouts for Football conditioning. (Frequency)
         13. Holding a stretch for 45seconds instead of 30 seconds (Time)
      5. The team member who reaches the correct answer first earns a point for their team.
   3. Developmental Activity (20 mins)
      1. Pass out students’ Fitnessgram score sheets
      2. Hand-out the ODE Standard #4 Benchmark B Worksheets
      3. Explain to the students that they will be using their Fitnessgram test scores to fill out the worksheet and design fitness programs.
      4. Have students fill out first three pages of worksheet packet.
      5. The students will track their activity using ODE activity logs for the next two weeks. Review process for recording activities on log.
      6. The final project will be due three weeks from today.
   4. Concluding Activity (10 mins)
      1. Review S.M.A.R.T. goal setting from worksheet packet. Ask students to share a goal that they created for their fitness plan.
5. Assessment/Evaluation Strategy
   1. Assessment will be based on the outcome of final project and scored using the ODE Evaluation Instrument.

[**http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=1793&ContentID=95532&Content=99525**](http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=1793&ContentID=95532&Content=99525) **(see pages 14-16 of PDF File for evaluation instruments)**

**Post-Assessment**

1. What are the components of health-related fitness?
2. What are three benefits of cardio-respiratory fitness?
3. According to the Centers for Disease Control, (a) how often, (b) how long, and (c) how hard should a middle school student exercise?



1. Describe two methods for measuring body composition and list a pro and con for each method.
2. Becky has started running to increase her fitness levels but the back of her thighs and calves are sore and tight. Recommend and describe some flexibility exercises for the back of her thighs and calves that may help Becky.
3. Describe the location on the human body for each of the following muscles and name an exercise that we use in class that strengthens that muscle:

Muscle Location Exercise

* 1. Biceps brachii
  2. Triceps
  3. Pectoralis Major
  4. Rectus Abdominus
  5. Trapezius
  6. Latissimus Dorsi
  7. Quadriceps
  8. Hamstrings
  9. Gastrocnemius
  10. Gluteus Maximus

1. What is the overload principal and how is it applied to exercise to develop fitness?
2. Your friend Pedro would like to improve his cardio-respiratory fitness. Using your knowledge of the FITT principle, outline an exercise program for Pedro.
   1. F:
   2. I:
   3. T
   4. T:

**Post Assessment Answer Key**

* + - 1. Cardio-Respiratory Fitness, Muscular Strength and Endurance, Flexibility, and Body Composition
      2. Decrease risk of heart disease, Decrease risk of some cancers, Increased ability to participate longer in aerobic activities, improved blood pressure, helps with anxiety and depression, decreased cholesterol
      3. A. 6-7 days per week B. 60 minutes C. Moderate to Vigorous Intensity
      4. 1. BMI, pro= easy to calculate, con= can be inaccurate for highly muscled individuals 2. Skin folds, pro= more accurate than other methods, con= must be done by someone experienced in performing skin fold tests. (Other answers could be electrical impedance, Bod Pod, Underwater Weighing)
      5. Hamstring Stretches, from a standing position bend over and reach for toes hold stretch for 15 to 30 seconds, repeat 2-3 times. Calf Stretch, stand on a stair step and allow heels to hang over edge, hold position with knees straight for 15-30 seconds and then with knees slightly bent for 15-30 seconds, repeat 2-3 times.
      6. A. biceps brachii, front of upper arm, biceps curls with dumbbell or theracord B. Triceps, back of upper arm, French press C. Pectoralis Major, Chest, Bench Press D. Rectus Abdominus, front of abdomen, curl-ups E. Trapezius, top of shoulders, shoulder shrugs F. Latissimus Dorsi, upper back, seated rows G. Quadriceps, front of thighs, lunges H. Hamstrings, back of thighs, leg curls I. Gastrocnemius, back of calves, heel raises J. Gluteus Maximus, buttocks, squats
      7. The overload principle states that a greater than normal stress must be placed on the body for a training adaptation to take place. In exercise that means that you must work your muscles harder than you normally would for them to get stronger and you must continue to gradually increase the work load to see continued improvement.
      8. F= three times per week, I= Heart Rate at 60-80% of Max Heart Rate, T= 30 – 60 minutes. T = choose an aerobic activity such as running, biking, or swimming. After 1-3 weeks Pedro can apply principle of overload by increasing the time of his exercise sessions or increasing his intensity by running faster.

References

Chiarelott, L. (2006). *Curriculum in context*. Belmont, CA: Wadsworth.

Ogden, C., & Carroll, M. (2010). Prevalence of obesity among children and adolescents: United states, trends 1963-1965 through 2007- 2008. *Health E-Stat*, Retrieved from <http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity> \_child\_07\_08.pdf

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