PowerPlay

PRE-VISIT

Activity 1 and Exercise

Students practice jumping rope for a week and measure any improvements in their performance. They also predict their levels of "perceived exertion" during physical exercise.

TIME

- **50 minutes the first day**
- **10 minutes on each of the next three days**
- **50 minutes on the final day**

MATERIALS

PER GROUP OF STUDENTS

- Chart paper
- Markers
- Stopwatch

PER STUDENT

- One jump rope for each student (or have students share ropes and work in groups)
- Student notebook to record data

Regular exercise and physical fitness are vital for health and wellbeing, and for building and maintaining healthy bones and muscle. Lack of exercise, especially when combined with poor eating habits, can lead to obesity—a factor known to increase the likelihood of developing type 2 diabetes—as well as elevated cholesterol levels, high blood pressure, heart disease, asthma, arthritis, and overall poor health. Studies from the United States Centers for Disease Control and Prevention (CDC) indicate that almost half of all Americans between the ages 12 and 21 do not engage in vigorous exercise. Additional reports note that one out of every three American children is overweight or obese, and that the prevalence of obesity in children aged 6-11 more than doubled in the past 20 years (from 6.5% to 17%). In addition to these physical concerns, obesity can contribute to low self-esteem and negative body image.

Many students know that exercise is "good for you," but it can be difficult for them to understand how or why. One strategy is to help students realize that exercise can be fun, and that improvement can be measured.

The Children's Museum of Houston's PowerPlay exhibit is designed to help young people discover new ways to be physically active, and also to reinforce healthy behaviors. As students progress through the exhibit and participate in various PowerPlay activities, they will be able to measure strength, examine performance levels and track heart rate. In addition, children will be able to track their improvement over time.

During their visit, students will engage in an activity called Jump It Up, using a virtual jump rope. To prepare for their visit to the Children's Museum, they will examine, in class, different ways to jump rope and chart their performance over the course of a week. Students should complete this activity before the visit.

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS (TEKS) OBJECTIVES

SCIENCE

3.2.A; 4.2.A; 5.2.A
Student uses scientific inquiry methods during laboratory and outdoor investigations.

3.4.A; 4.4.A; 5.4.A
Students know how to use a variety of tools, materials, equipment, and models to conduct science inquiry.

HEALTH

3.1.A; 4.1.F; 5.1.E
Students will recognize and explain ways to enhance and maintain health and recognize and perform behaviors that reduce health risks throughout their lifespan.

ENGAGE

1. Begin class by jumping rope or having a volunteer student jump rope in the front of the class. Ask, *Do you think jumping rope could be a form of exercise? Do professional athletes jump rope for training? Why or why not?*
2. Discuss how jumping rope involves muscle movement, coordination and balance. Ask students if practice could improve their performance. Discuss the role of practice.

   When a movement is repeated frequently over time, a long-term

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muscle or "motor" memory for the movement is created in the brain. This motor memory allows the movement to be carried out without conscious effort, and increases efficiency. Many kinds of activities are improved with practice. Examples include riding a bicycle, typing on a keyboard, or learning to play a musical instrument. Practice of physical activities also contributes to improved physical fitness and strength.

3. There are many different types of jumps, such as the basic double bounce, basic single bounce, alternate footstep, side straddle, heel exchange, etc. You can find a variety of ideas at the following websites: Children's Heart Center (childrensheartcenter.com/pdfs/JumpRope.pdf) and the American Heart Association (heart.org/HEARTORG/Educator/FortheGym2/JumpRopeSkills/Jump-Rope-Skills_UCM_001270_Article.jsp).
4. Have students investigate and list as many types of jumps as they can find. Create a class list.

EXPLORE

1. Divide students into groups of 4. Clear a space in the classroom or find an area in the school or playground that has enough room for at least one student to jump rope safely.
2. Instruct each group to lay one jump rope flat on the floor in a straight line.
3. Have students take turns jumping forward and backward across the rope. Next, have each student stand with his/her side to the rope and jump from side to side across the rope.
4. Ask students to practice hopping back and forth across the rope to a drumbeat (or clap). Begin with a slow tempo and speed up gradually.
5. Direct all student groups to practice jumping rope. After they have warmed up, clap your hands and have students jump in time to the rhythm you provide.
6. Instruct students to predict the number of successful jumps they will be able to perform in 15 seconds, and to write down their predictions.
7. Ask students to predict how strenuous (level of exertion) the activity will be, using a scale of 1 ("little or no effort") to 10 ("extreme effort") and record their response in their notebook.
8. Have students count the number of jumps they can do in 15 seconds. If a student misses, tell him or her to keep going for the full 15 seconds.
9. Ask the class, *Was the activity easier or harder than you predicted?*
10. Finally, have students jump as many times as they can without missing, and then record the number of jumps in their notebooks. Also have students rate how much effort they expended during the activity, using a scale of "1" (little or no effort) to "10" (extremely high effort). Ask, *Do you think that practice can increase the number of jumps you can make without a miss?* Have students record their daily predictions and actual results.
11. Have students practice the jump rope exercises in steps 9 and 10 each day for the next three days.

EXPLAIN

1. Tell students that they soon will visit the Children's Museum of Houston. Explain that the Museum has an exhibit, called PowerPlay, which provides a fun way for students to measure their strength, speed and endurance. During their visit to the Museum, students will try a number of activities, including Jump It Up.
2. Have student groups visit the PowerPlay section of the Museum's website, or show the site to the entire class (www.cmhouston.org/powerplay).
3. Explain that the Children's Museum has a number of activity stations, where students can monitor their performance on different exercises. Before beginning some activities, students will be asked to predict how difficult or easy they think the activities will be (perceived level of difficulty).
4. At the educator's request, each student will receive an electronic card with which to track his or her performance at various stations. While at the Museum, each student also may create a username and password that will allow him or her to view his/her record later, from any computer.
5. After their visit, students may access the PowerPlay website to view their results and keep track of other activities they do outside the museum experience.

ELABORATE

1. Explain to students that different physical activities can benefit the body in different ways. Go to the Children's Museum's PowerPlay website (www.cmhouston.org/powerplay) and show students the symbols for a) Cardiovascular, b) Lower Body Strength, c) Flexibility, d) Upper Body Strength, and e) Balance (see illustrations, page 3).

2. Ask students why cardiovascular fitness, strength, balance and flexibility are important to their health.
3. Have students suggest other physical activities that would be appropriate to exercise the body parts represented by each symbol. Create a class list.

EVALUATE

1. On the final day of the activity, have students repeat the jump rope challenge that they began during the Explore phase of this lesson. Once again, have students take turns jumping rope, and have them count the number of jumps they can do in 15 seconds. If a student misses, tell him or her to keep going for the full 15 seconds.
2. Ask the class, *Was the activity easier or harder this time than before?*
3. Finally, have students jump as many times as they can without missing, and then record the number of jumps in their notebooks. Also have students rate how much effort they expended during the activity, using a scale of "1" (little or no effort) to "10" (extremely high effort).
4. Ask the class, *Were you able to beat the number of jumps you performed on the first day of this activity?* Discuss students' responses as a class. Hopefully, most students will have improved with practice. Ask students if jumping rope got easier or harder over time. Discuss the importance of practice.
5. Have student groups create their own "jump-rope rhymes" or demonstrate some of the different types of jumps they discovered on the first day of the activity. Then, allow groups to demonstrate their rhymes or sample jumps for the rest of the class.

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Look for these symbols to see how the challenges benefit your body.

< Cardiovascular

Lower Body Strength >

< Flexibility

Upper Body Strength >

< Balance

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For more information about PowerPlay and additional classroom activities on other topics, please visit www.bioedonline.org.

Teacher Tips

Follow these guidelines when your students visit the PowerPlay exhibit at the Children's Museum of Houston (CMH).

- Students must wear tennis shoes.
- The CMH's PowerPlay exhibit is on three levels, connected by the Power Tower. Level 2 of the Power Tower is on the main entry level of the Museum. It is suggested that teachers have a chaperone on each level of the Power Tower or have a chaperone accompany each group.
- An elevator for handicapped children is available (CMH guide will have key). It is suggested that you inform CMH officials about any special needs your students may have before you arrive at the museum.
- Before your visit, help students understand the difference between heart rate while resting and after exertion, (see "Activity 3. Heart Rate and Exercise").
- Also before your visit, explain to students that they will rate (on a 1–10 scale) the amount of effort they expend during some of the activities in the exhibit. This is known as "perceived exertion rate."
- Ask the CMH guide for a "Kid Card" (Power Tracker) for each student. To set up a card, each student will need the information below before visiting the Museum (see "Kid Card" video). Please make sure your students are ready to enter the following information (or have a chaperone assist).

  Username (numbers and letters only)
  Password
  Male or female
  Birthday (numerical date)
  E-mail (optional)

  As a final step, have students measure their baseline heart rates.

IDEAS FOR TEACHERS WITHOUT ACCESS TO THE CHILDREN'S MUSEUM OF HOUSTON

- Incorporate any of the lessons into your regular curriculum.
- Plan a special "field day" at your school. Prior to the event, conduct the Pre-visit lessons. After the event, use the Post-visit lessons.
- Create a classroom fitness plan that provides one month of activities. Help students plan a calendar with different fitness activities for each day.
- Participate in the President's Challenge for fitness (www.presidentschallenge.org).

Exhibit Key

	Cardiovascular	Strength	Flexibility	Balance
Power Tower: Climb, leap and jump in a 3-story climbing structure that takes you to other parts of PowerPlay.				
Dance Mania: Listen to music and follow along with different dance moves. Record your heart rate after you play.				
Match My Moves: Capture images of your own body in action and follow the poses you've set through a sequence of quick movements, testing your endurance and raising your heart rate.				
Light Chase: Race around an interactive game board, while increasing your speed and raising your heart rate.				
Jump It Up: Get your heart pumping as you jump over a glowing, virtual rope, which gets faster and faster the more you jump!				
Blast Off: Crank hand pedals as fast as you can to race flying superheroes across the exhibit.				
Adventure Course: Run through a course of climbing and crawling activities along padded, sloping surfaces! Slap each hand whacker along the way and record the level you achieve.				
Mt. Boulder: Face three challenges on a climbing wall and measure how far you've climbed, your grip strength, reach, flexibility and coordination.				
Grip It: Measure your grip strength and record this measurement using your Kid Card.				
Power Course: Grab a scoot and use your upper body strength to push or pull yourself along this wheelchair accessible course.				

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CCIT The Center for Collaborative and Interactive Technologies

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