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Project-Based Units for STEM

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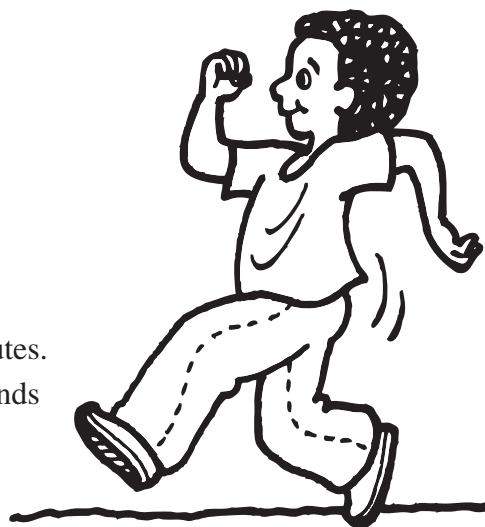
Healthy Hearts (cont.)

Station 2 – Healthy Hearts: Walking – Science/Technology/Engineering/Math Tools

- *Healthy Hearts* recording sheet (for each student)
- stopwatch, or watch with second hand
- stethoscope
- disinfectant wipes
- timer (for 5 minutes)
- pencils

Procedure

1. You will count your heartbeats after walking for 5 minutes.
2. Predict how many times your heart will beat in 10 seconds after walking. Record your predictions.
3. Set the timer for 5 minutes.
4. Walk for 5 minutes.
5. Take turns using the stethoscope. Listen and count your heartbeats for 10 seconds. Your partner will time you using a stopwatch or watch with a second hand. Then switch.
6. Record the actual number of heartbeats you heard. Circle whether your prediction was $<$ $>$ or $=$ the actual number of heartbeats in 10 seconds after walking for 5 minutes.



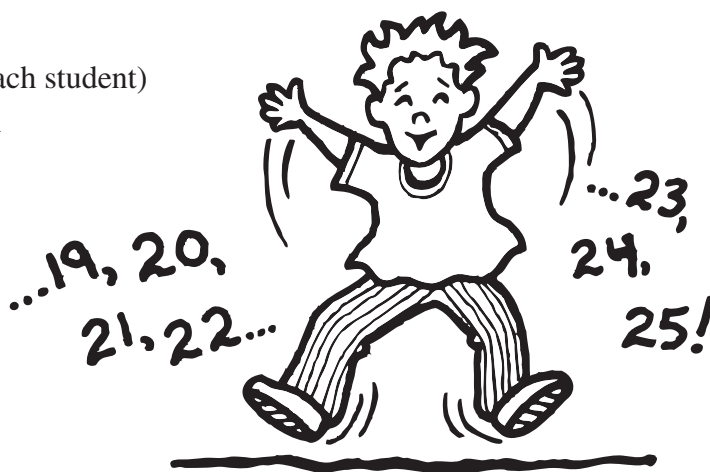
Station 3 – Healthy Hearts: Jumping Jacks – Science/Technology/Engineering/Math Tools

Tools

- *Healthy Hearts* recording sheet (for each student)
- stopwatch, or watch with second hand
- stethoscope
- disinfectant wipes
- timer (for 5 minutes)
- pencils

Procedure

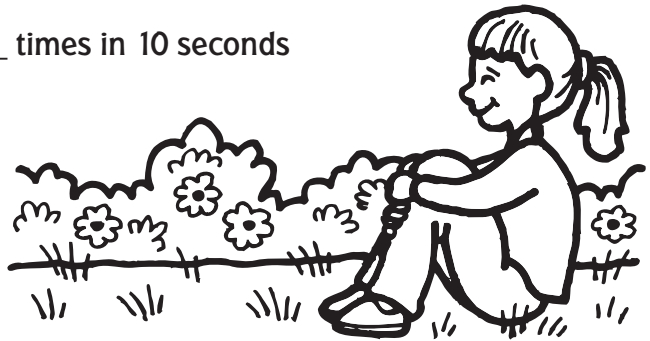
1. You will count your heartbeats after doing 25 jumping jacks.
2. Predict how many times your heart will beat in 10 seconds after doing the jumping jacks. Record your predictions.
3. Take turns using the stethoscope. Listen and count your heartbeats for 10 seconds. Your partner will time you using a stopwatch or watch with a second hand. Then switch.
4. Record the actual number of heartbeats you heard. Circle whether your prediction was $<$, $>$, or $=$ the actual number of heartbeats in 10 seconds after doing 25 jumping jacks.



Healthy Hearts

I predict that my heart will beat _____ times in 10 seconds after **sitting** for 5 minutes.

I counted _____ heartbeats in 10 seconds.



My prediction was < > = the actual number of heartbeats I counted.

I predict that my heart will beat _____ times in 10 seconds after **walking** for 5 minutes.

I counted _____ heartbeats in 10 seconds.



My prediction was < > = the actual number of heartbeats I counted.

I predict that my heart will beat _____ times in 10 seconds after **doing 25 jumping jacks**.

I counted _____ heartbeats in 10 seconds.



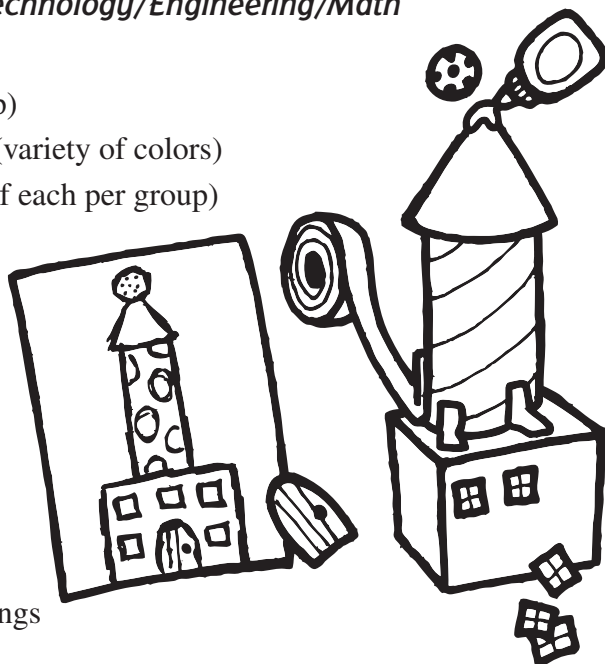
My prediction was < > = the actual number of heartbeats I counted.

Three-Dimensional Designs (cont.)

Activity 3: Construction Day – Science/Technology/Engineering/Math

Tools

- 3-D shapes cardstock patterns (one set per group)
- 9" x 12" cardstock or heavy construction paper (variety of colors)
- masking tape and clear adhesive tape (one roll of each per group)
- crayons, colored pencils, pencils
- empty boxes, cardboard tubes, and containers
- measuring tape, rulers, yardsticks
- permanent markers (variety of colors)
- scissors (one per student)
- white glue, Tacky Glue, and glue sticks
- *3-D Designs* notebooks



Procedure

1. Combine the found materials to construct buildings based on your sketches and plans.
2. Assemble 3-D cardstock shapes if needed for more building details.
3. Attach buildings to the marked section on the poster board.

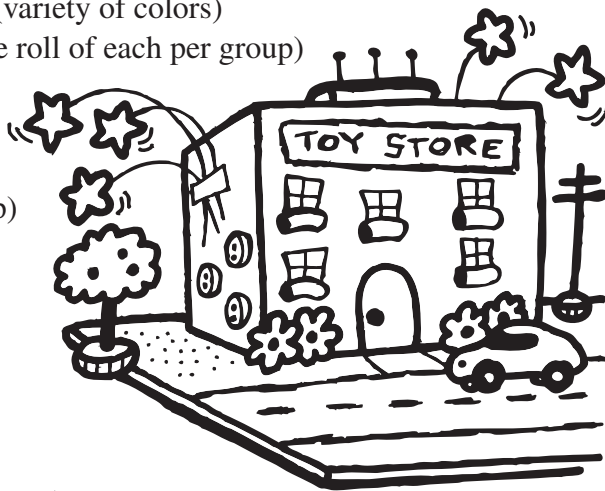
Activity 4: Final Details Day – Science/Engineering/Math

Tools

- items to add details to buildings—buttons, sequins, beans, pasta, rice, ribbon, yarn, string, straws, toothpicks, chenille sticks, wire, labels, etc.
- fiction and nonfiction books about communities and 3-D shapes
- 9" x 12" cardstock or heavy construction paper (variety of colors)
- tape—masking tape and clear adhesive tape (one roll of each per group)
- empty boxes, cardboard tubes, and containers
- white glue, Tacky Glue, and glue sticks
- permanent markers (variety of colors per group)
- 3-D shapes cardstock patterns (one set per group)
- measuring tapes, rulers, yardsticks, scissors
- crayons, colored pencils, pencils
- *3-D Designs* notebooks

Procedure

1. Add details to buildings and surrounding area.
 - Include electric wires, cell towers, roads, etc.
 - Add landscaping including lawns, plants, trees, etc.
 - Add signs and label the buildings.
2. Draw the finished building on page 5 of the notebook, or take a picture of it and glue it to page.



Three-Dimensional Designs (cont.)



Culminating STEM Activities

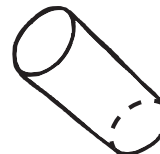
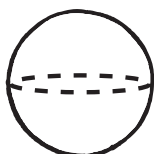
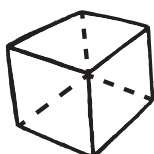
1. Encourage the groups to collaborate and determine how to arrange each group's property to create the community.
 - Do additional roads or bridges need to be added to connect the community?
 - Are there neighborhoods? Are there any farms or gardens?
 - Is there room for a park? a bike path?
 - Is there enough parking?
 - Are there hills, mountains, lakes, rivers, or a beach in the community?
 - Are there any landmarks or statues?
2. Allow time to add more signage and details to the completed community.
3. Go on another walking tour of your neighborhood and film buildings. Have the students tally the 3-D shapes that they find along the way. Were more discoveries made? Can they spot 2-D shapes?
4. If possible, plan a field trip to a construction site to observe construction firsthand.
5. See if any parents are contractors, architects, city planners, or construction workers and could come in to the classroom and discuss their jobs and the importance of shapes in design.
6. Share the student-made community with guests. Implement additional suggestions.
7. Take photos of the completed community to add to the pictures already displayed documenting the process of creating the community.
8. Invite families and/or other classes into the classroom to view the community.



3-D Designs

Name: _____

Draw a line from the 3-D shape to its name.



cube

cone

sphere

triangular prism

pyramid

cylinder

rectangular prism

