# TEACHERS ACTIVITIES

## Theme:

It's amazing how something as common and uncomplicated as wire can be used to create complicated and interesting things.

## Topics For Discussion:

Discuss why other villagers laughed or shook their heads when Kondi said he planned to make a galimoto. Invite students to share their experiences of occasions when others thought they couldn't do something, but they proved them wrong in the end.

Talk about the qualities that Kondi possessed that enabled him to successfully make his galimoto. For example, he was persistent (he never gave up trying to obtain materials), resourceful (he saw possible uses in different types of materials), and creative.

Although students will be able to identify many ways in which their lives are different from Kondi's, also discuss the similarities between Kondi and themselves. Ensure that students realize that the story is set in contemporary Africa.

## Curriculum Extension Activities:

Before viewing the program, brainstorm a list of items that are made of wire or that have wire as a part. Retain the list to refer to after watching so that students may add to it.

Go on a classroom scavenger hunt looking for everyday items that utilize wire in some form. Collect as many of these items as possible on a table and discuss the differences in the way the wire is used. Also notice the differences in wire thickness and malleability.


Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

Obtain some samples of different types of wire (a local electrical supply company may have some scraps) and have students examine them. Some wires are actually made up of smaller wires.

In the story, Kondi collected scrap wire and made a toy vehicle—a "galimoto." Have students use all sorts of recyclable materials to create their own galimoto. Collect materials such as styrofoam containers, cardboard rolls, toothpicks, popsickle sticks, film canisters, twisty ties, lids from milk jugs and other containers, packing material, and the like, for students to use. Display all the creations and provide time for students to demonstrate what they have made.

Work with the physical education teacher to provide students with the opportunity to use a balance beam. After they have had some practice, discuss difficulties they might have had in keeping their balance. Have them imagine what walking a tightrope must be like in comparison to walking on a balance beam.

Have students pantomime walking a tightrope. Provide a small umbrella, a pole, and other props for them to use in their pantomime.

Invite an electrician into the class to discuss the importance of safety around electrical appliances, wiring, and electricity in general.

Kondi is a contemporary African boy. Locate Africa on a world map. On a map of Africa, locate Malawi, the setting for this story. Discuss the great variety in the geographical regions of Africa, i.e., desert, rain forests, Nile River valley, etc. To lead the students into some research, make a K-W-L chart with them about Africa. Start with a brainstormed list of what they know (K) about the continent. Have them think of the questions they have about Africa (W) and record them on the chart. After the students have completed their research, record what they have learned (L) on the chart. Work with the media specialist to find both fiction and nonfiction books about Africa to assist students with their research. Students may wish to do a creative project that shows what they learned through their research.


Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

Give students a length of wire and have them make a wire sculpture. Stipulate that they may bend, twist, or shape the wire in any way they choose, but they may not cut it. Display their creations. (Eighteen-gauge aluminum wire is easy for students to manipulate. Galvanized or annealed steel—also 18-gauge—is somewhat stiffer, but may also be handled fairly easily.)

**SUPPLEMENTARY BOOKLIST:**

FLYAWAY GIRL
by Ann Grifalconi (Little, Brown)

COUNT YOUR WAY THROUGH AFRICA
by Jim Haskins, illus. by Barbara Knutson (Carolrhoda)

AT THE CROSSROADS
by Rachel Isadora (Greenwillow)

MASAI AND I
by Virginia Kroll, illus. by Nancy Carpenter (Four Winds)

the JAFTA series
by Hugh Lewin, illus. by Lisa Kopper (Carolrhoda)

MIRETTE ON THE HIGH WIRE
by Emily Arnold McCully (Putnam)

STARRING MIRETTE & BELLINI
by Emily Arnold McCully (Putnam)

BIG BOY
by Tololwa Mollel, illus. by E. B. Lewis (Clarion)

EMEKA'S GIFT: AN AFRICAN COUNTING STORY
by Ifeoma Onyefulu (Cobblehill/Dutton)


Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

OGBO: SHARING LIFE IN AN AFRICAN VILLAGE
by Ifeoma Onyefulu (Gulliver/Harcourt Brace)

MALAWI IN PICTURES
by Thomas O'Toole (Lerner)

CHARLIE'S HOUSE
by Reviva Schermbrucker, illus. by Niki Daly (Viking)

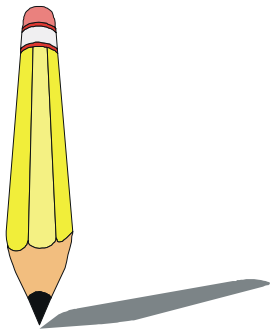
WHEN AFRICA WAS HOME
by Karen Lynn Williams, illus. by Floyd Cooper (Orchard Books)


Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

Distributed by:
GPN
P.O. Box 80669
Lincoln, NE 68501-0669
Phone: 800-228-4630
Fax: 800-306-2330
Email: gpn@unl.edu
Web site: gpn.unl.edu

• ***Geometric shapes.*** Make shapes with wire. Have students design shapes first on a geoboard with rubber bands, then transfer the shape to wire. (See geoboard pattern on next page.) Discuss characteristics of different shapes and the names of the shapes. Working with partners or small groups, students can think of ways they can combine their individual shapes to form an object. Have students describe how the parts of the object fit together, using the names of the shapes and their characteristics.

• ***Perimeter and area.*** Give each student a piece of wire that is the same length. Ask them to make a closed shape that has the largest amount of space inside the wire (area). Working with an alternative measurement tool, such as pinto beans, have them estimate the perimeter and then measure it. Have them compare their estimates with the actual measurements and compare their measurements with each other. What can they conclude about the perimeter and the shape? Have them estimate how many beans will fill the inside of the shape. Then fill the shape with beans and count them. Compare estimates with actual count. Again, what do they notice about the number of beans (the area) in the different shapes they created? (For students who are not yet working with subtraction, they might designate "higher" or "lower" or "same" when comparing their estimates with actual measurements.)



• ***Problem solving.*** Give individual students a single length of wire and have them fashion something out of it. Stipulate that they may bend, twist, or shape it in any way, but they may not cut it. Display the creations. *Note*: Eighteen-gauge aluminum wire is easy for students to manipulate. Galvanized or annealed steel (also 18-gauge) is somewhat stiffer, but may also be handled fairly easily.

# Do-At-Home Activity

• ***Send the family on a wire scavenger hunt.*** Have them search for as many different types of wire as they can find in and around the house and make a list. In addition to obvious wires, remind parents of such items as paper clips, twisty ties, staples, earring wires, and the like. Encourage them to discuss attributes of the wires they find, including thickness and length. Have the children bring one piece of wire to school.


Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

# Classroom Follow-up to Do-At-Home Activity

Using the pieces of wire that each student brought from home, assemble a *galimoto*. Inventory the pieces before the students brainstorm possible creations. Question the students on how the wire pieces might be sorted, e.g., thick and thin, crooked and straight, long and short, etc., and then place the wires into categories. After they have decided what their *galimoto* is to be, have them start making the parts and problem solving how to assemble them.

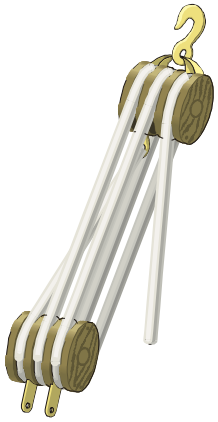

Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

Distributed by:

P.O. Box 80669
Lincoln, NE 68501-0669
Phone: 800-228-4630
Fax: 800-306-2330
Email: gpn@unl.edu
Web site: gpn.unl.edu

# All Together Now

**Key Words**: experimentation, wire, combined strength, cable



**Concept**: Cable is made by twisting wire strands together which increases their strength.

In this episode, LeVar takes a ride on the world's longest cable tramway located in Albuquerque, New Mexico. The tramway is supported and pulled by cable wire. Even a thin wire can be quite strong, but the kind of wires used for this tramway have to be extremely strong. That's why they used cable wire made from several thick wires twisted together. See how twisting strands of thread together can increase their strength. (Thread is used in place of wire because it can take close to 100 lbs. to break even a thin wire.)

**Materials:** Spool of cotton-covered polyester thread, empty 1-gallon plastic milk jug with a screw-on lid, sand, a table with legs or other heavy furniture to which thread can be tied.

1. To make a model tram, fill a 1-gallon milk jug about half full of sand. Screw the lid back on the jug tightly and secure it with tape.

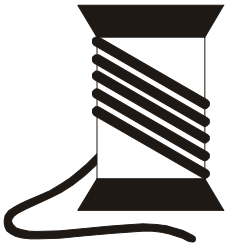
2. To make a model tramway, tie one end of a long thread to a table leg, then push the other end of the thread through the handle on the milk jug and tie it to another table leg 1 or 2 inches lower than the first end. Tie the thread so that it is taut, but not stretched too tight. It should be at least 3 feet from the floor since the string will stretch. You will need at least 2 people to do this, as one needs to hold the milk jug up, while the other ties the thread.

3. Before releasing the milk jug have students predict whether or not the thread will break. Then have a student pull the jug near the higher end of the thread and release it. If the thread can support the tram, it will travel down the thread to the other end.

READING RAINBOW®
Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

4. If the thread breaks (it should) repeat Steps 2 and 3, but using a double strand of thread (twist 2 strands together). If the double strand breaks have students try again with 3 strands twisted together, and if necessary 4 or 5. Each time ask students to make a prediction.

# Rubbing It In



**Key words**: metal, wire, ductile

**Concept**: Metal, including wire, is ductile.In addition to being strong, wire is very bendable, or ductile. Something is ductile if it can be easily bent or shaped. Wire is ductile because it is made of metal and most metals are ductile. Explore the ductility of aluminum foil and wire.

**Materials:** Thin wire (different types if possible) cut into pieces about 12" long (Choose soft wires that will not make a sharp point when cut. Check the ends after cutting and if necessary use sand paper to smooth them.), construction paper, tape, table or other flat surface, aluminum foil, paper towels, cardboard (optional).

1. Have each student arrange pieces of thin wire on a 8 1/2" x 11" sheet of construction paper that has been taped down to a table. Have students bend and arrange the wire to make an appealing design or a picture, like a forest or a face.

Encourage them to try overlapping some of the wires. Some of the wires may need to be taped down to hold everything in place. Also, have students tape down the ends of the wires so they don't poke through the aluminum foil when they make their rubbings.

2. Have students place a sheet of aluminum foil that is about 8 1/2" x 11" over the sheet of construction paper. Tape down the edges of the foil. Then students use a crumpled paper towel to gently rub across the surface of the foil. As they rub the foil, the foil will bend to match the shape of the wire. When finished have them remove the foil rubbing. The rubbings can be mounted onto cardboard for display.

READING RAINBOW®
Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

3. Ask students the following questions about their rubbings:

- What did you do to the wire? (*Bent them into shapes*.) to the foil? (*Shaped it into a picture*.)

- Which kinds of wire were easier to bend? Which were difficult?

- What was similar about the wires and the foil? (*They are all made of metal. They can all be bent or molded into new shapes*.)

**Teacher Note:** Introduce students to the word "ductile." Explain that most metals are ductile meaning that they can be molded, bent, or shaped. Ask students to name some things that are ductile. (*Clothes hangers, pipe cleaners, paper clips.*) Ask them to name some things that are not ductile. (*String, dry sticks, shoe laces.*) As an extension ask students what it might mean if some said that another person was ductile. Explain that it doesn't mean that their body can be bent but that their ideas can be easily molded or changed.

READING RAINBOW®
Reading Rainbow® and logos are registered trademarks of GPN / University of Nebraska-Lincoln and WNED-TV, Buffalo, NY. © 2001 GPN / WNED-TV.

Distributed by:
GPN
P.O. Box 80669
Lincoln, NE 68501-0669
Phone: 800-228-4630
Fax: 800-306-2330
Email: gpn@unl.edu
Web site: gpn.unl.edu