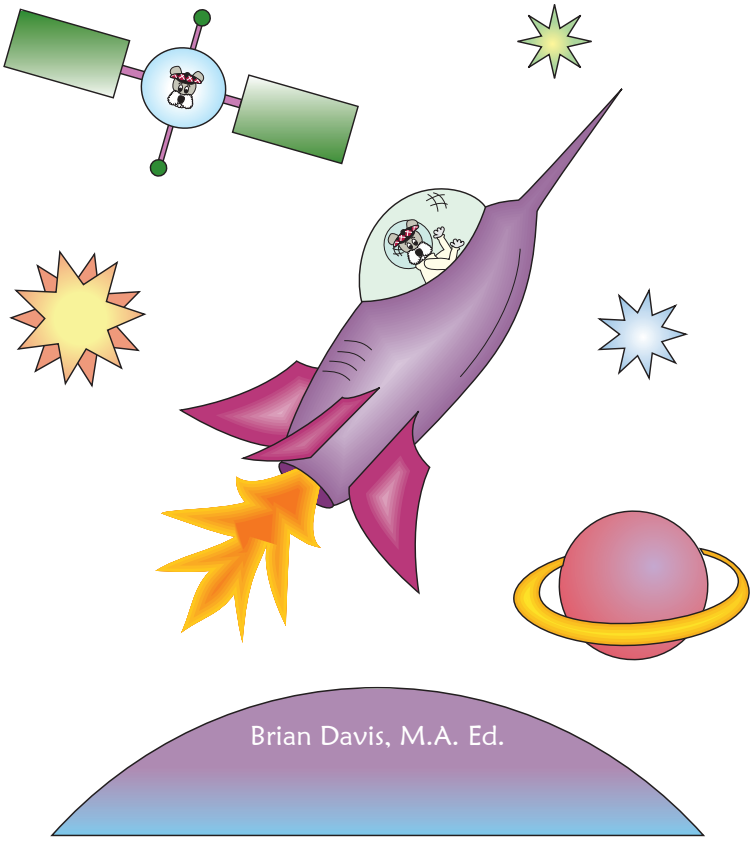
3rd Science

Samples from the

Teacher's Manual and Workbook

(Corresponding Workbook pages are after lesson plan samples)

Teacher's Manual ISBN 9781592691043
Workbook 9781592691524
Resource Pack 9781592691050
McRuffy 3rd Science Curriculum ISBN 9781592691036



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McRuffy 3rd Grade Science

The McRuffy Science series teaches scientific inquiry, life science, earth science, and physical science. The program is designed to be taught two lessons per week for 33 weeks. The curriculum may be supplemented with the many science books written for children that can be found in any library if you wish to have more science in a week. Nevertheless, the format easily meets many state standards for a complete year of science instruction.

A typical school year consists of 36 weeks. We have allowed three weeks for review, standardized testing, field trips, etc. that always seem to make it difficult to complete teaching a curriculum. Since, we believe the units at the end of the curriculum are as important as the units at the beginning of the curriculum; we wanted to give teachers ample time to complete instruction.

The third grade curriculum introduces many new topics not covered in the previous grade levels. Students will learn about the solar system, body systems, and many more concepts through experimenting, investigating, and reading. It also reviews and expands upon concepts taught in grades K to 2. For example, in previous levels students created circuits with batteries and bulbs. In the third grade level, students will create their own batteries to light bulbs.

The third grade also features several lessons that emphasize content reading skills. These are the skills that are useful in reading to learn (versus learning to read). The lessons and specific techniques used are noted in the lesson plans. These skills can be transferred to other subjects. They are written in such a way as to teach the teacher new instructional techniques.

The Curriculum consists of the Teacher's Manual, Student Workbook, and a Resource Packet featuring colorful picture cards, charts, games, and posters.

A Science Kit is also available separately.

A special note about Lesson 66: Lesson 66 is a science career game. It may be used earlier in the year. Please examine the cards and rules to determine when your students are able to handle the reading requirements and rules to play.

Scope and Sequence

The major emphasis of each unit is designated by a single letter in parenthesis:

I = Scientific Inquiry
L = Life Sciences
E = Earth and Space Sciences
P = Physical Sciences

Lesson 16

Objective

Students will learn about the skeletal system. (L)

Materials

* Workbook pages (3 pages)
* Toothpicks
* Glue
* Black construction paper

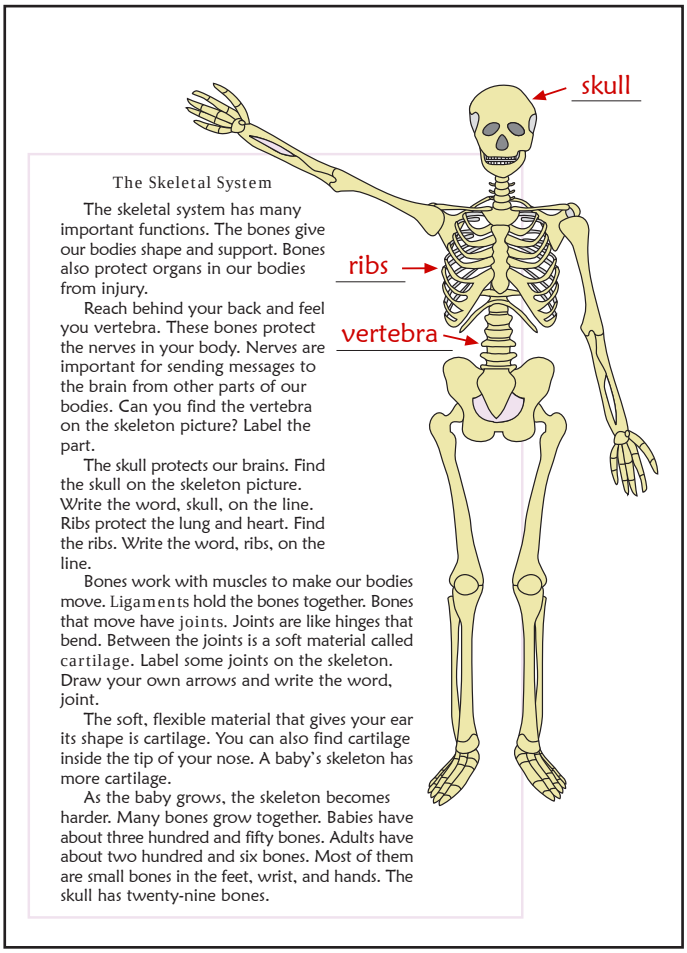
Preparation

None

Teaching

Review cells and tissue. **What are cells? What is tissue? What is a system? Today you are going to read about another system, the skeletal system. What do you know about the skeletal system?**

Have the students find the workbook pages for the skeletal system. **You'll read about the skeletal system to learn more. You'll read about four functions of the skeletal system. You'll learn what is inside a bone. You'll learn how bones are connected. You will learn about the largest and smallest bones in the human body, as well as the number of bones in the human body. Read the two pages about the skeletal system.**



The Skeletal System

The skeletal system has many important functions. The bones give our bodies shape and support. Bones also protect organs in our bodies from injury.

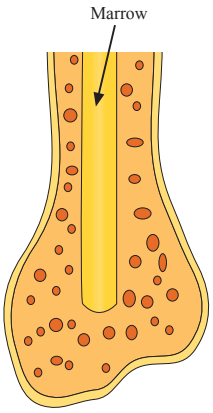
Reach behind your back and feel you vertebra. These bones protect the nerves in your body. Nerves are important for sending messages to the brain from other parts of our bodies. Can you find the vertebra on the skeleton picture? Label the part.

The skull protects our brains. Find the skull on the skeleton picture. Write the word, skull, on the line. Ribs protect the lung and heart. Find the ribs. Write the word, ribs, on the line.

Bones work with muscles to make our bodies move. Ligaments hold the bones together. Bones that move have joints. Joints are like hinges that bend. Between the joints is a soft material called cartilage. Label some joints on the skeleton. Draw your own arrows and write the word, joint.

The soft, flexible material that gives your ear its shape is cartilage. You can also find cartilage inside the tip of your nose. A baby's skeleton has more cartilage.

As the baby grows, the skeleton becomes harder. Many bones grow together. Babies have about three hundred and fifty bones. Adults have about two hundred and six bones. Most of them are small bones in the feet, wrist, and hands. The skull has twenty-nine bones.



Inside a bone

Inside The Skeletal System

The word skeleton comes from a Greek word meaning "dried-up body". Yet, the skeleton isn't dried-up at all. The outside of the bone is make up of cells that deposit minerals, like calcium. Foods that have calcium, including milk and cheese, help our bones to grow stronger.

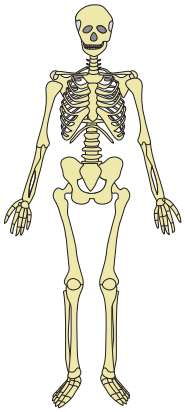
A soft bone material is under the hard layer. It has holes like a sponge. In the center of our bones is a material called bone marrow. This jelly-like substance makes millions of blood cells. It also stores calcium and other mineral.

Bones can heal if they break. Cells move to the injury. A soft tissue begins to form around the break. After about three months, the bone is usually completely healed.

The smallest bone in the human body is the stirrup. This is one of the bones in the inner ear. Ten of these would only stretch the length of one inch.

The femur is the longest and strongest bone in the body. This is the bone between your hip and your knee. Find the femur on the skeleton. Draw a line and label it.

It can support more weight than a steel rod the same size. The femur is slightly over 1/4 our height. Measure to find how tall you are. Divide that number by 4. How long is your femur?



Conclusion

Students will answer the questions on the third lesson 16 worksheet to summarize what they have learned.

Activity: Have students make a skeleton picture using toothpicks glued to black construction paper. Students may also cut out white paper for the wider parts such as the skull, pelvis, and shoulder blades.

Workbook Page Answers
Skeleton Review Lesson 16

1. What are four important purposes for our skeletal system?

   Give our bodies shape and support

   Protect parts of the body such as the brain and organs

   Help our bodies move

   Make blood cells

2. What holds bones together? ligaments

3. What allows bones to move and bend? joints

4. What is a soft bendable tissue that is found between bones? cartilage

5. What two things does bone marrow do?

   Make blood cells

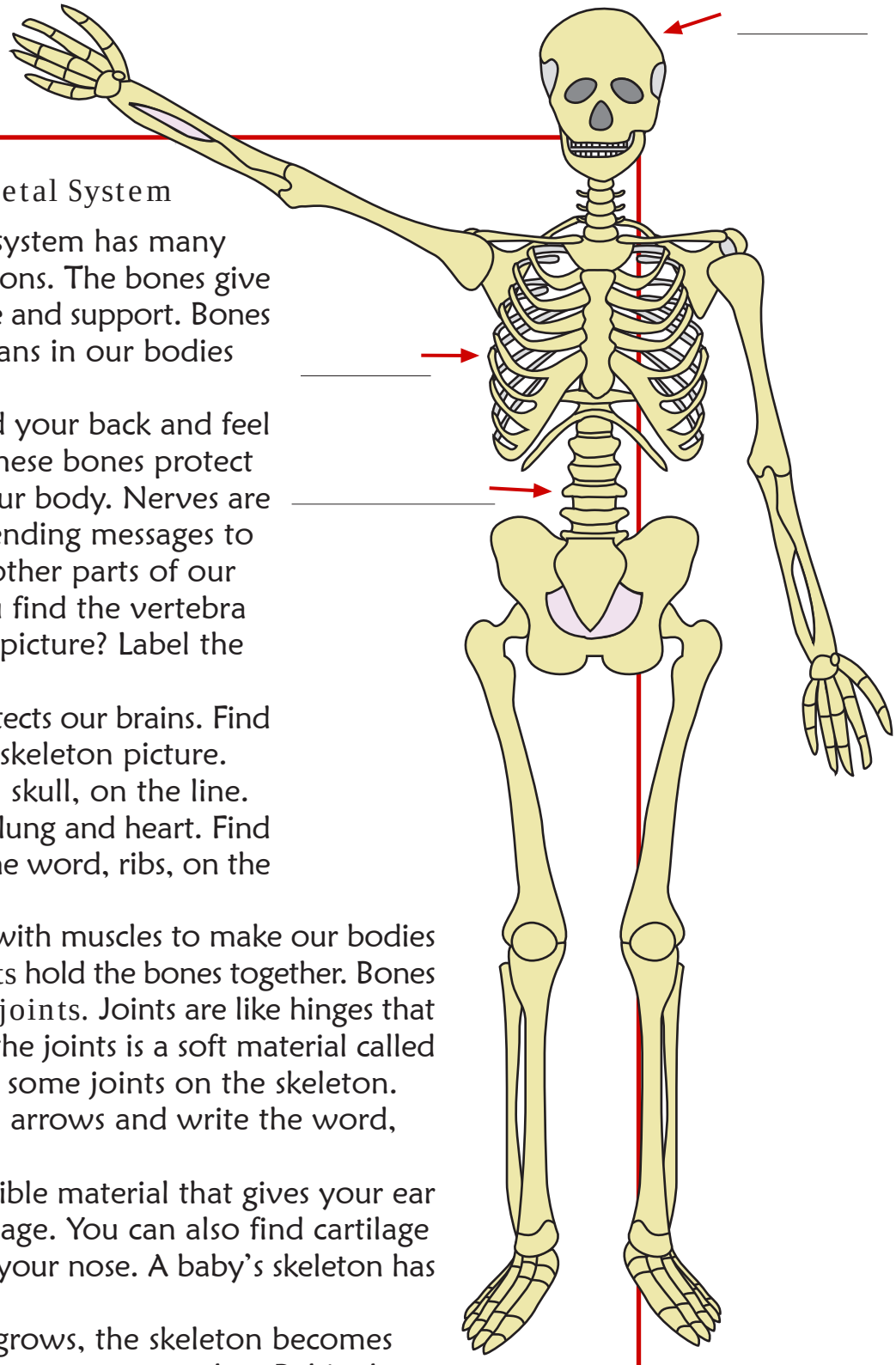
   Stores calcium and other minerals

6. What is the longest bone in the human body? femur

7. What is the shortest bone in the human body? stirrup

8. How many bones does the average adult have? 206

9. What happens to a bone if it breaks? Cells move to the injury, soft tissue forms, the bone heals



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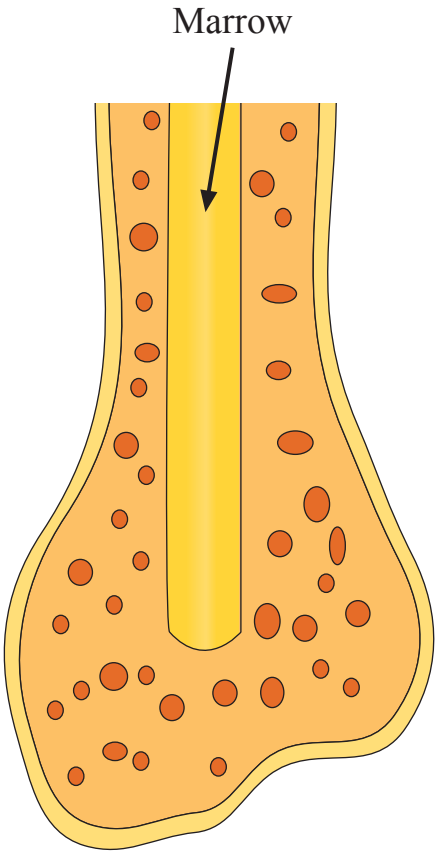

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A soft bone material is under the hard layer. It has holes like a sponge. In the center of our bones is a material called bone marrow. This jelly-like substance makes millions of blood cells. It also stores calcium and other mineral.

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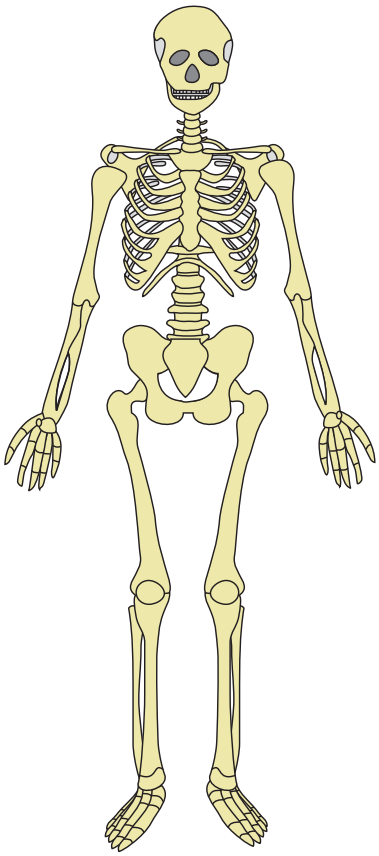


Skeleton Review Lesson 16

1. What are four important purposes for our skeletal system?

_____

_____

_____

_____

2. What holds bones together? _____

3. What allows bones to move and bend? _____

4. What is a soft bendable tissue that is found between bones? _____

5. What two things does bone marrow do?

_____

_____

6. What is the longest bone in the human body? _____

7. What is the shortest bone in the human body? _____

8. How many bones does the average adult have? _____

9. What happens to a bone if it breaks? _____

_____

Lesson 22

Objective

Students will learn about pulleys. (P)

Materials

* Workbook page
* Pulley
* String
* Styrofoam cup or other light container
* Paper clip
* Spring Scale
* Several grams of weight (about 100 grams)

Preparation

Materials will be needed for each student or group of students. Use a small pulley.

Teaching

What simple machine did you learn about in the last lesson? (lever) **Another kind of simple machine is the pulley. A pulley is a wheel with a groove that turns on an axle.**

Pulleys are used to lift things. The next time you see a flag pole, look up at the top. The flag is attached to a rope. The rope wraps around the wheel on the pulley. When the rope is pulled, the flag will be lifted. Look around the next few days. Maybe you'll see other pulleys.

Students will experiment with pulleys. Students will look at the workbook page and set up the pulley in various ways. Students can measure the effect of the pulley using the spring scale.

Conclusion

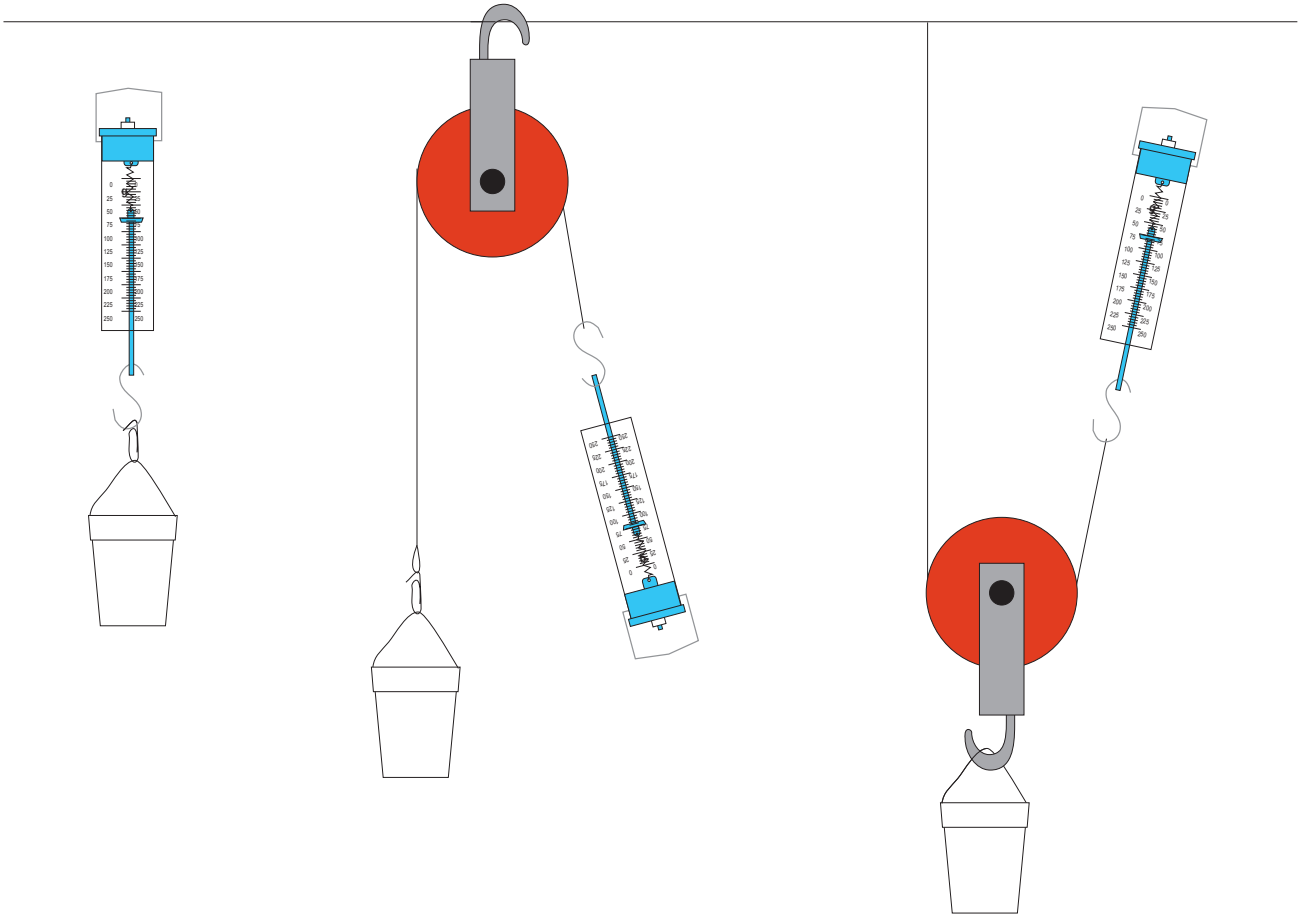
How did the pulley help to lift things?

What was the best way to set up the pulley to make the weight the lightest to pull?

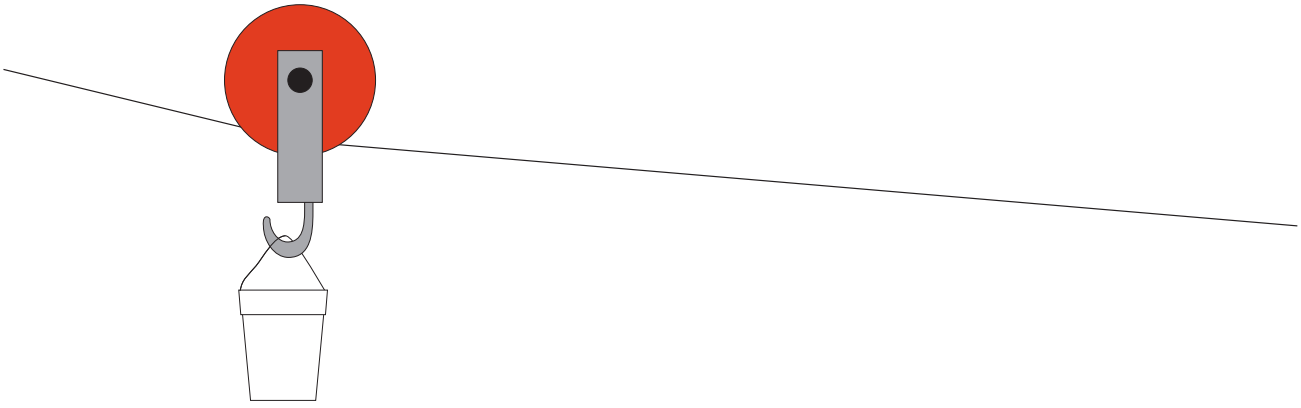
Can you think of some good uses for pulleys?

Workbook Page
Pulley Lesson 22

Hook pulleys up in different ways. Which way takes the least amount of force to lift the cup?



Which way will the cup move?



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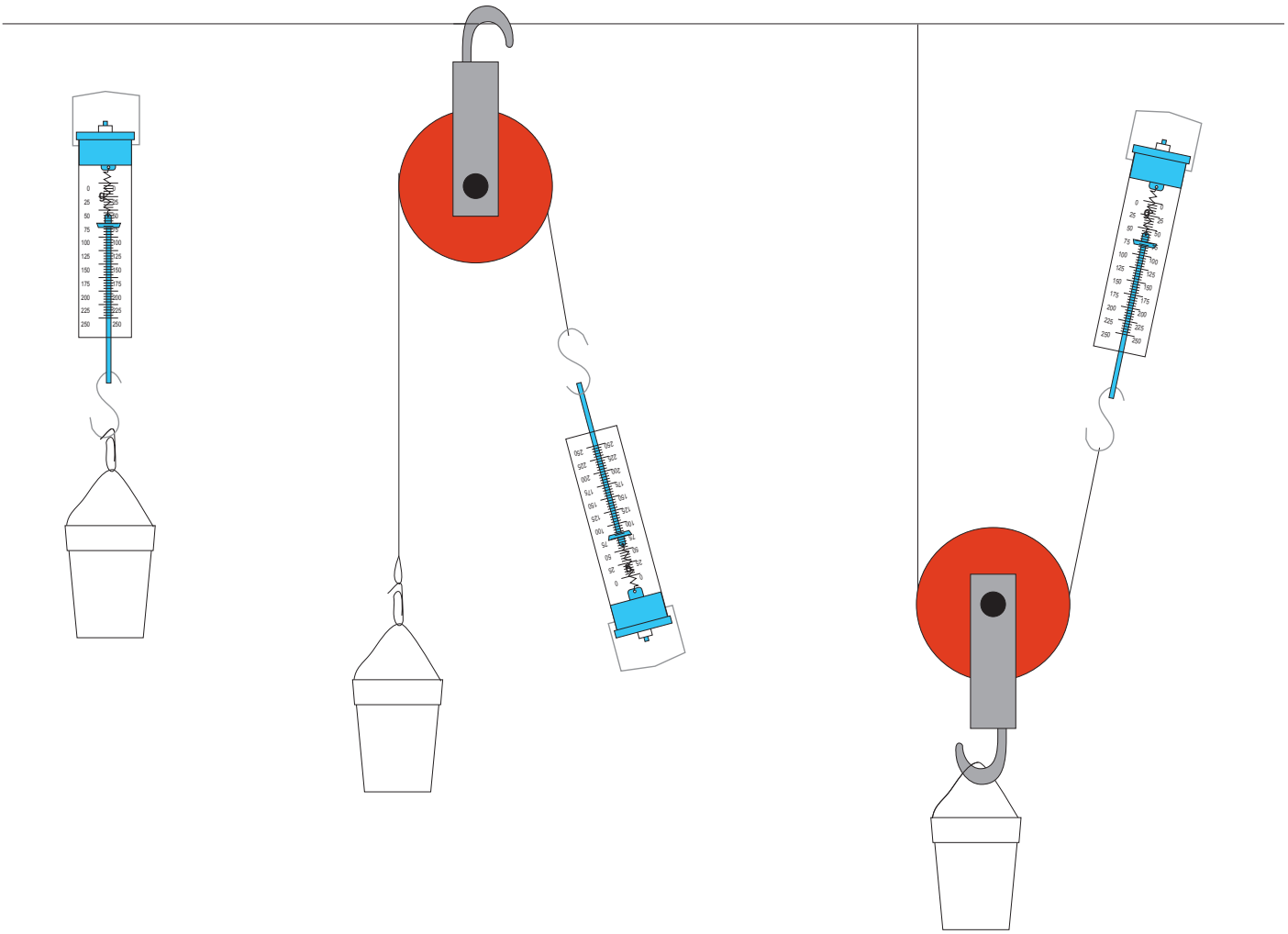

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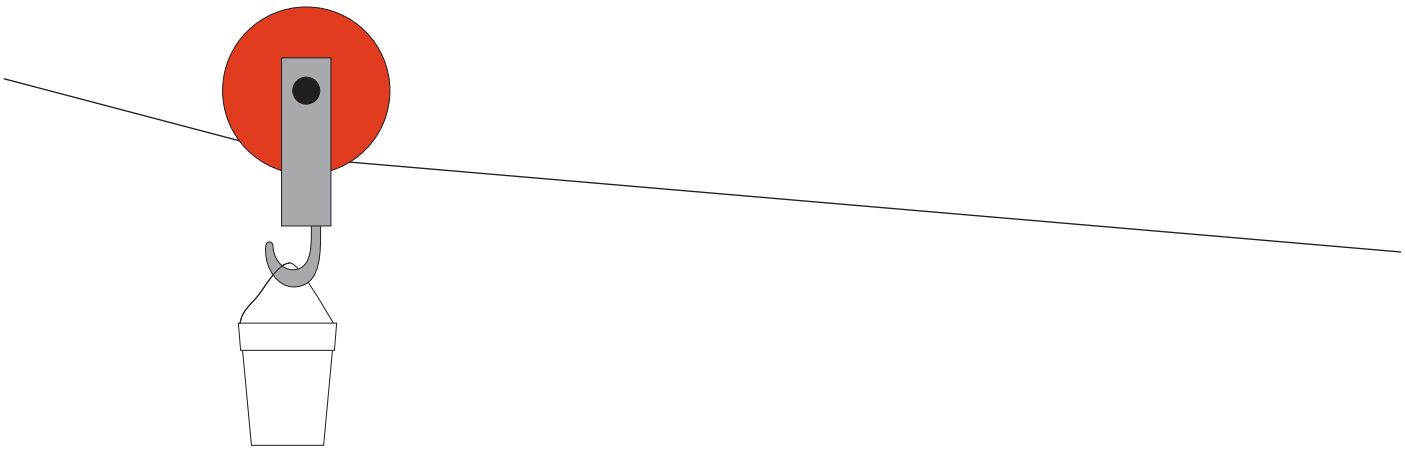


Lesson 41

Objective

Students will make and use an electromagnet. (P)

Materials

* Workbook page
* Paper clips
* Magnet
* Steel nails
* Magnet wire or bell wire
* Battery
* Sandpaper
* Pulley
* String

Preparation

About 5 feet of magnet wire is needed for each electromagnet. The magnet wire is in the lab kit.

Warning: The electromagnet will build up heat and could cause minor burns if the wires are connected too long. The wires, battery, or core may get warm. Disconnect a wire after about ten seconds. (Students can count to 10 and release). Students should **never** stick the wires into a wall outlet.

Instructions for building an electromagnet were presented in the Second Grade Science. They are repeated in this grade level, along with an additional activity.

Teaching

An electromagnet is made using a nail, coil of wire, and a battery.

The directions and diagrams are on the workbook page for making an electromagnet. The directions are reprinted on the following page.

Conclusion

Can you think of good uses for electromagnets?

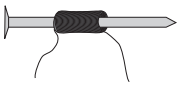
Electromagnets are used in lots of things. Have you seen a machine that dispenses soft drinks at a fast food restaurant? When the cup is pushed against the switch, an electromagnet opens a valve that lets the liquid out.

Car makers are using electromagnets in special cars called hybrids. These cars can run off of gasoline engines or electric motors. Electromagnets are used to generate electricity when the driver puts on the brakes. The electricity is stored in rechargeable batteries to be used by the electric motor.

Making an Electromagnet

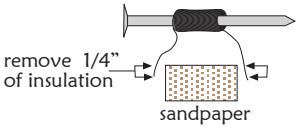
An electromagnet is one that uses electricity. You can turn a piece of steel into an electromagnet by wrapping a coil of magnet wire or bell wire around it. The steel magnet will only be a magnet when electricity is connected to the wires.

1. Use a nail and 2 to 5 feet of wire.



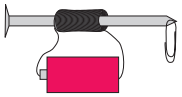
Wrap the wire around the nail.
Leave several inches of wire free at each end.

2. The wire will have insulation at each end. Remove about 1/4" so it can connect to a battery.



Have an adult cut off plastic insulation. Bell wire has a varnish finish. Sand it off with sandpaper.

3. Connect a battery.



1.5 volt battery

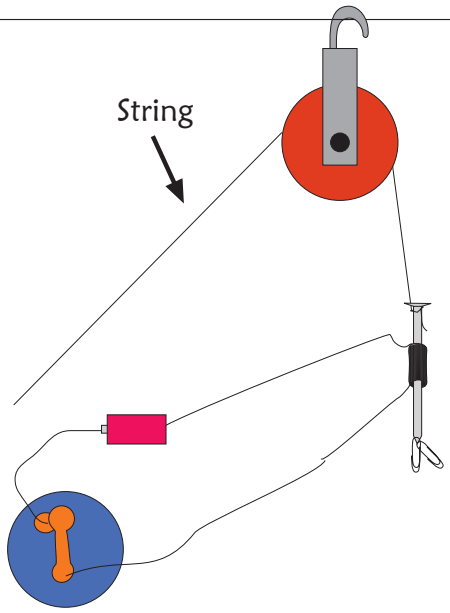
The nail will become a magnet.

Be careful.
The electromagnet can get hot.

Take a wire off the battery after about 10 seconds. Count to 10 and release.

Making an Electromagnetic Crane

Tie a string to the nail. Run the string over a pulley. Add a switch to the circuit and you've made an electromagnetic crane. Tug on the string to lift steel objects.



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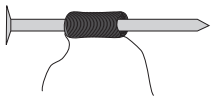

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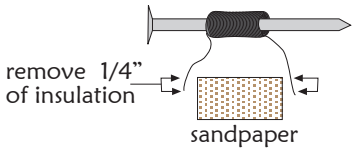

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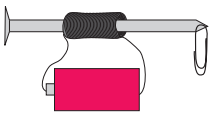

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