**McRuffy Press 3rd Grade Science Sample**

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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 Teacherís 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

| | |
|---|---|
| Unit 1 Inference & Observation (I) | Lessons 1-2 |
| Unit 2 Animal Groups (L) | Lessons 3-5 |
| Unit 3 Heat & Cold Transfer (P) | Lessons 6-8 |
| Unit 4 Changes in the Earthís Surface (E) | Lessons 9-11 |
| Unit 5 Systems and subsystems (I & P) | Lessons 12-14 |
| Unit 6 Body Systems (L) | Lessons 15- 20 |
| Unit 7 Simple Machines and Forces (P) | Lessons 21-24 |
| Unit 8 Earth Materials (E) | Lessons 25-26 |
| Unit 9 Position and motion (I & P) | Lessons 27-29 |
| Unit 10 Habitats (L) | Lessons 30-38 |
| Unit 11 Magnets & Electricity (P) | Lessons 39-43 |
| Unit 12 Cubes and Attributes | Lessons 44-46 |
| Unit 13 Scientists and Technological History (I) | Lessons 47-48 |
| Unit 14 Plants (L) | Lessons 49-50 |
| Unit 15 Sound (P) | Lessons 51-52 |
| Unit 16 Planets & the Sun (E) | Lessons 53-58 |
| Unit 17 Science Challenges (I) | Lessons 59-60 |
| Unit 18 Nutrition & Health (L) | Lessons 61-62 |
| Unit 19 Matter and Mixtures (P) | Lessons 63-64 |
| Unit 20 Science and Technology Today (I) | Lessons 65-66 |

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

## Materials

The McRuffy Science programs offer lots of hands-on, real-world learning experiences for children. This promotes exploration and discovery. We use a great variety of materials. Most of them are everyday, common items.

More difficult to find or specialized items are available as a kit from McRuffy Press. Itís highly suggested that you purchase the lab kit. It contains items that may be a bit more difficult to find. For those who purchased the 2nd grade kit, an upgrade featuring just the additional items is also available.

Many lessons use everyday items that can be collected from home or the classroom. We attempted to make these very common items. A positive thing about using everyday items is that it communicates to students that scientific discovery is all around them.

| Items in the Science Kit | Lessons |
|---|---|
| Battery holder (AA) | 7, 39, 40, 42, 43 |
| Bulb holder | 7, 39, 40, 42 |
| Bell wire | 41 |
| Switch | 39, 43 |
| Centimeter cubes | 44, 45 |
| Magnet Wand | 28, 39, 40, 41 |
| Magnifier | |
| Mini light bulb | 7, 39 |
| Mini Electric Motor | 42, 43 |
| Spring scale | 21, 22, 24, 64 |
| Wheeled cart | 24 |
| Tube Kit | 21, 27 |
| Balls | 29 |
| Marbles | 29 |
| Bell | 14 |
| Wires | 7, 39, 40, 42, 43 |
| Rubber mat (shelf liner) | 24 |
| Pulley | 22, 38, 41 |

Other materials (*Not included in the kit*):

The following basic items should be available: globe, glue, dice, cotton balls, drinking straws, scissors, rulers, tape, rubber bands, paper, box of toothpicks, small thermometer, measuring cup, aluminum foil, coins, plastic cups, string, food coloring, ice, measuring cup, battery (AA 1.5 Volt size used for the holder in the kit), paper clips, timer, play dough.

Alignment to National Science Education Standards Grade K to 4

**Standard A Science As Inquiry**
Developing abilities for scientific inquiry
*Units 1, 5, 7, 9, 12, 15, 17, 19*
Developing an understanding of scientific inquiry
*Units 1, 5, 7, 9, 12, 15, 17, 19*

**Standard B Physical Science**
Understanding of properties of objects and materials
*Units 1, 3, 5, 17, 19*
Understanding the position and motion of objects
*Unit 9*
Understanding light, heat, electricity, and magnetism
*Units 3, 11*

**Standard C Life Science**
Understanding the characteristics of organisms
*Units 2, 6, 10, 14, 18*
Understanding life cycles
*Unit 2*
Understanding organisms and environments
*Units 2, 10*

**Standard D Earth and Space Science**
Understanding properties of earth materials
*Units 8*
Understanding objects in the sky
*Unit 16*
Understanding changes in earth and sky
*Units 16*

**Standard E Science and Technology**
Developing the ability for technological design
*Units 7, 8, 17*
Understanding science and technology
*Units 13, 20*
Developing abilities to distinguish between natural objects and objects made by humans
*Unit 10, 16*
**Standard F Science in Personal and Social Perspectives**
Understanding about personal health
*Unit 18*
Changes in environments
*Unit 10*
**Standard G Sciences as a Human Endeavor**
*Units 13, 20*
**Standard U Unifying Concepts and Processes**
Understanding systems, order, organization
*Units 5, 6, 10, 11, 16*
Using evidence, models, explanations
*Units 1, 7, 9, 11, 12, 17, 19*
Understanding change, constancy, and measurement
*Units 3, 4, 9, 13, 19*
Understanding form and function
*Units 13, 17*

More detailed information about National Science Standards (*Content Standards)* can be found on the web at:

# Third Grade Science Lesson Plans

Lesson plans begin with a stated **objective**.

The next section is a **materials** list. Itís generally helpful to look ahead a few days to make sure you have all the materials you need to teach the lesson. It is assumed that basic supplies such as pencils, scissors, glue, etc. are available, and those items are not generally included in the list unless theyíre used for a special purpose.

The **preparation** section gives more details on the quantities of materials needed and any advanced preparation the materials might need. This section sometimes contains additional notes to the teacher that would be good to know before instruction begins. It may be helpful to read these sections at least a day before the lesson is taught.

The **teaching** section guides the teacher through the instructional process. The words in bold print can be read directly to students. Answers to questions are in parenthesis. Text copied from the student book (workbook) is italicized.

The **conclusion** section is used to review the material learned, discuss results of experiments and demonstrations, or assign independent practice exercises from the workbook.

At the end of each unit is an **evaluation** section. This summarizes what the students should have gained from the unit. The outcomes are generally stated in behavioral terms. These can be measured by performance on worksheet activities, ability to apply concepts through experiments, informal tests or quizzes that you might prepare, or simply observations of the students.

# Lesson 5

## Objective

Students will learn about fish. (L)

## Materials

* Workbook pages

## Preparation

This lesson is presented in a way to help students gain content reading skills as well as knowledge about fish. This lesson uses the KWL Plus procedure.

## Teaching

Begin by asking students to make a list of what they know about fish. This can be done in the first column of the first worksheet for the lesson. **Look at the workbook page. Youíll need to turn it sideways. Youíre going to use this chart to help you learn what you read. This is called a K-W-L chart. What do the letters K, W, and L stand for?** (know, want to know, learned)

**I want you to write everything you know about fish in the first column under the letter K. In the next column, write things youíd like to learn about fish. Write questions that you want answered about fish. Donít write anything under the L column yet.**

Students will begin reading the two pages about fish. As they read, students should pause to write the answers to any of the questions in the W list. These can be written in the L column. They should also list any other things they learn as they read.

After reading, discuss with students the items in the W and L column. Were their questions answered?

## Conclusion

Two additional workbook pages are included in the lesson. The first is a true-false quiz. The second is part of the KWL process. Students will summarize what they learned.

## Evaluation for Unit 2

Students should be able to classify common animals as reptiles, amphibians, birds, mammals, arthropods, and fish.

Students should be able to identify major characteristics of arthropods.

Students should be able to identify insects, arachnids, and crustaceans as arthropods.

Students should be able to identify major characteristics of fish.

# FISH

| K (Know) | W (Want to Know) | L (Learned) |
| --- | --- | --- |

Fish Lesson 5

Atlantic Sturgeon

## Fish Facts

There are over 20,000 kinds of fish. Some scientists think their may be around 40,000 kinds. Itís not always easy to study fish. Some live deep under the ocean.

The largest fish is the whale shark. It can grow to 50 feet long. The smallest is the goby. Itís only about 1/2 inch long when itís full grown.

Fish are cold blooded animals. They have scales. Most fish hatch from eggs. Some sharks and sea perches give birth to their offspring. Fish are vertebrates. Some fish like sharks have cartilage instead of bones. Feel your ears or the tip of your nose. Cartilage is the soft, bendable material that gives your ear its shape.

## The Fish Habitat

Fish live in water. There are two different kinds of water that fish live in. Some fish live in salt water. Salt water includes all the oceans. Some fish live in fresh water. Fresh water is found in lakes, ponds, and streams.

The American eel begins life in a salt water sea. It lives most of its life in fresh water streams and rivers.

Salmon swim upstream to spawn.

A few fish are hatched in fresh water, but live most of their lives in salt water. Salmon swim from the ocean up streams to lay eggs in fresh water. A few fish are hatched in salt water, but live in fresh water. Several kinds of eels do this. The fish return to the place where they hatched to spawn (lay eggs).

Most kinds of fish can only live in one kind of water. Salt water fish have less salt in their bodies than the water around them. Their bodies lose fresh water. Salt water fish have to drink often. They remove salt from their bodies through their gills and urine.

Fresh water fish have the opposite problem. They have more salt in their bodies than the water around them. This draws fresh water into the fish. If they didnít get rid of the water, they would swell up. Fresh water fish try to avoid drinking. Their gills absorb as much salt as they can from the water around them. They get rid of fresh water in their urine.

# Fish Questions

## How do fish breathe?

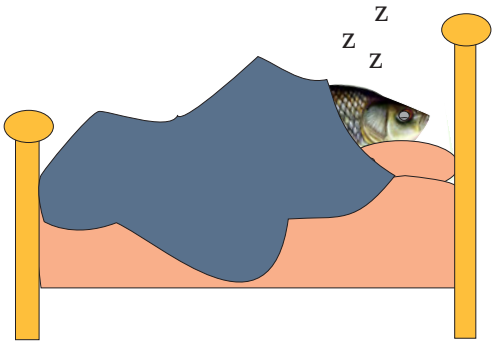
Fish breathe oxygen like people. We take oxygen from the air. Fish take oxygen from the water. As water passes through the gills, oxygen is pulled out of the water for the fish to breathe.


Big Mouth Buffalo

## Do fish sleep?

The only fish with eyelids are sharks. So, fish canít close their eyes. Most are always alert to any danger. Some kinds of fish, that live deep in the oceans, never stop moving. Other fish hardly move their entire lives.

Fish have been observed drifting like they are in a daydream. Some kinds of fish will hide in a rock or the mud and rest.




## How fast can fish swim?

The fastest fish are tunas, sharks, and billfish. They can swim up to 50 miles per hour. Most fish that are good swimmers can swim about 5 to 10 miles per hour.

The movement of the tail pushes fish forward. The fins help guide the fish and keep it upright.

Yellowfin Tuna

## Do fish have teeth?

Sharks have teeth for tearing apart their prey. Other fish have sharp barbs to grip food. Some grind their food in the back of their throats. This is past their gills. If they chewed in their mouths they wouldnít be able to breathe.

Shark

Name_____ Fish Lesson 5

Are the statements about fish true or false? Fill in the circles by the correct answers.

1. The smallest fish is the goby.

   ○ true ○ false

2. The largest fish is the blue whale.

   ○ true ○ false

3. Spawn means to lay eggs.

   ○ true ○ false

4. All salt water fish can also live in fresh water.

   ○ true ○ false

5. Fresh water fish try to remove salt from their bodies.

   ○ true ○ false

6. The American eel begins its life in salt water.

   ○ true ○ false

7. Fish breathe oxygen.

   ○ true ○ false

8. All fish have eyelids.

   ○ true ○ false

9. Fish chew their food carefully.

   ○ true ○ false

10. Gills can remove oxygen from water.

    ○ true ○ false

Name_____ Fish Lesson 5

Complete the chart for fish. Choose the answer thatís true for most fish.

| | Fish |
|---|---|
| Warm blooded | ◯ |
| Cold blooded | ◯ |
| Born | ◯ |
| Hatched | ◯ |
| Fur | ◯ |
| Feathers | ◯ |
| Scales | ◯ |
| Skin only | ◯ |
| Vertebrate | ◯ |
| Invertebrate | ◯ |

Complete the sentences. Write the words or numbers in the blanks.

1. The whale shark can grow to be _____ feet long. The goby grows to be _____ inch long.

2. The fastest fish can swim _____ miles per hour. _____, billfish, and sharks are the fastest fish. Most fish can swim _____ to _____ miles per hour.

3. There are over _____ kinds of fish.

4. _____ water fish have less salt in their bodies than the water around them.

5. _____ water fish have more salt in their bodies than the water around them.

# Lesson 17

## Objective

Students will learn about the muscular system. (L)

## Materials

* Workbook pages
* Paper fasteners (brads)
* Cardboard tubes
* String

## Preparation

Cardboard tubes found on toilet paper or paper towel rolls are needed for an activity. If none are available, roll thin cardboard or cardstock to make tubes. Each student will need two tubes, two strings, and two paper fasteners.

This lesson will use a reading comprehension front-loading procedure. Students will pre-read comprehension questions over the reading selection before reading. This prepares the student to find important points and ideas in the reading. The questions proceed the reading selection in the reading book.

## Teaching

Review the skeletal system. **What can you tell me about the skeletal system?**

**One of the things the skeletal system allows us to do is to move, but muscles are also needed for movement. Today youíre going to read about muscles. Youíll also write answers to questions about muscles.**

**Many books that you use in school have questions at the end of the chapter to help you remember important points. Itís helpful to read those questions before reading the chapter. This will help you to discover important ideas when you read.**

**Read the questions about muscles before reading about muscles.**

Next, students will read about muscles. The textbook text is reprinted in italics.

*The Muscular System*

*Muscles are made up of cells or fibers that are long and thin. They can be up to twelve inches long. The body has over 650 muscles. The muscles are about half our body weight.*

*Muscle cells can contract. That means they can get shorter. This is what causes movement. Muscles are attached to bones by tendons. Muscles can only pull and relax. Muscles work in pairs.*

*Raise your arm like the picture of the boy. See the word, biceps. Put your other hand where the arrow is pointing. The muscle your hand is on is called the bicep. Rock your hand back and forth by bending your elbow. You can feel your bicep contract and relax. Your bicep is contracting when you move your hand toward your body.*

*Biceps are paired with muscles called the triceps. These are under the arm. They contract when your hand moves away from your body. Put your hand on the bottom of your arm and bend your elbow. Can you feel your triceps move?*

*There are three types of muscles. Skeletal muscles are attached to bones. Skeletal muscles are striped. Smooth muscles are not striped. The muscle fibers are shorter than skeletal muscle. They are made to squeeze. When you swallow food, smooth muscles push the food to your stomach.*

*The third kind of muscle is the cardiac muscle. They are only found in the heart. These muscles move all the time. Do your legs get tired when you run? Your heart muscle never gets tired.*

*Skeletal muscles are voluntary muscles. That means you can move them when you want to. Involuntary muscles move automatically. The cardiac muscles are involuntary muscles. Other involuntary muscles are found in different organs in our bodies.*

## Conclusion

Students will answer questions on the first worksheet.

## Activity

Students will make a model that demonstrates how muscles pull bones. Diagrams are on

the third workbook sheet. The tubes will act as bones. Students will make a hinged joint with the tubes. The strings will act like muscles to pull the tube back and forth.

Notches are cut in the tubes to allow the tubes to flex like bones. The notches should be curved, about 1 and Ω inches wide and 1 inch deep.

Read all the questions before reading the page about muscles.

1. What are three different types of muscles?

_____

_____

_____

2. Is the heart a voluntary or involuntary muscle?_____

3. What kind of muscle is striped? _____

4. How many muscles are in the human body? _____

5. What muscle is on top of the arm?_____

6. What attaches muscles to bones? _____

7. Do muscles expand or contract? _____

8. Muscles are about _____ our body weight.

9. Write the names of two muscles in our arms. _____

_____

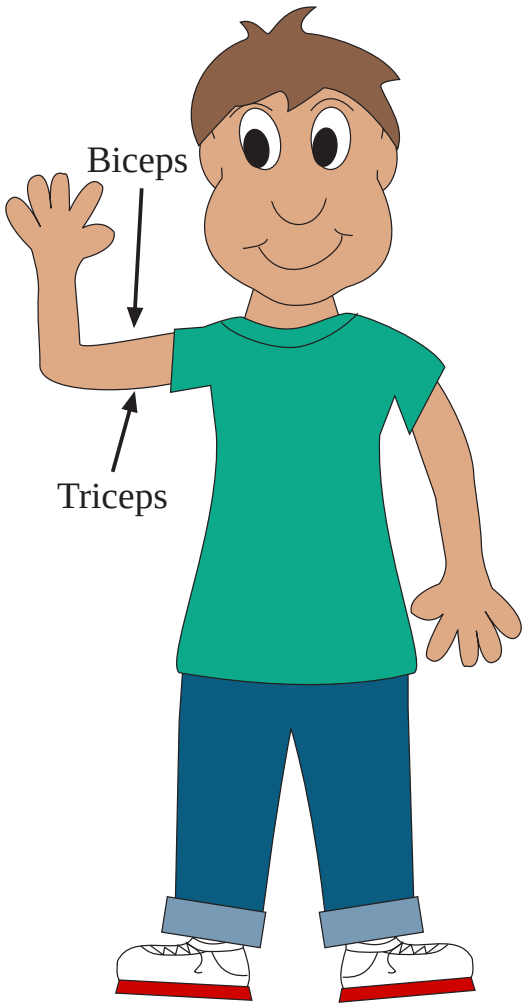
## The Muscular System

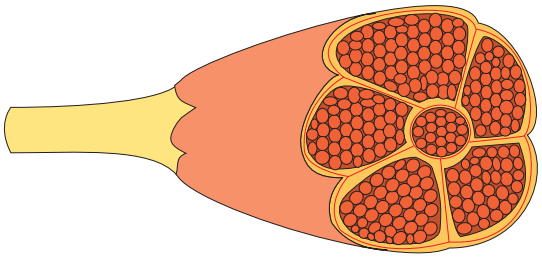
Muscles are made up of cells or fibers that are long and thin. They can be up to twelve inches long. The body has over 650 muscles. The muscles are about half our body weight.

Muscle cells can contract. That means they can get shorter. This is what causes movement. Muscles are attached to bones by tendons. Muscles can only pull and relax. Muscles work in pairs.

Raise your arm like the picture of the boy. See the word, biceps. Put your other hand where the arrow is pointing. The muscle your hand is on is called the bicep. Rock your hand back and forth by bending your elbow. You can feel your bicep contract and relax. Your bicep is contracting when you move your hand toward your body.

Biceps are paired with muscles called the triceps. These are under the arm. They contract when your hand moves away from your body. Put your hand on the bottom of your arm and bend your elbow. Can you feel your triceps move?



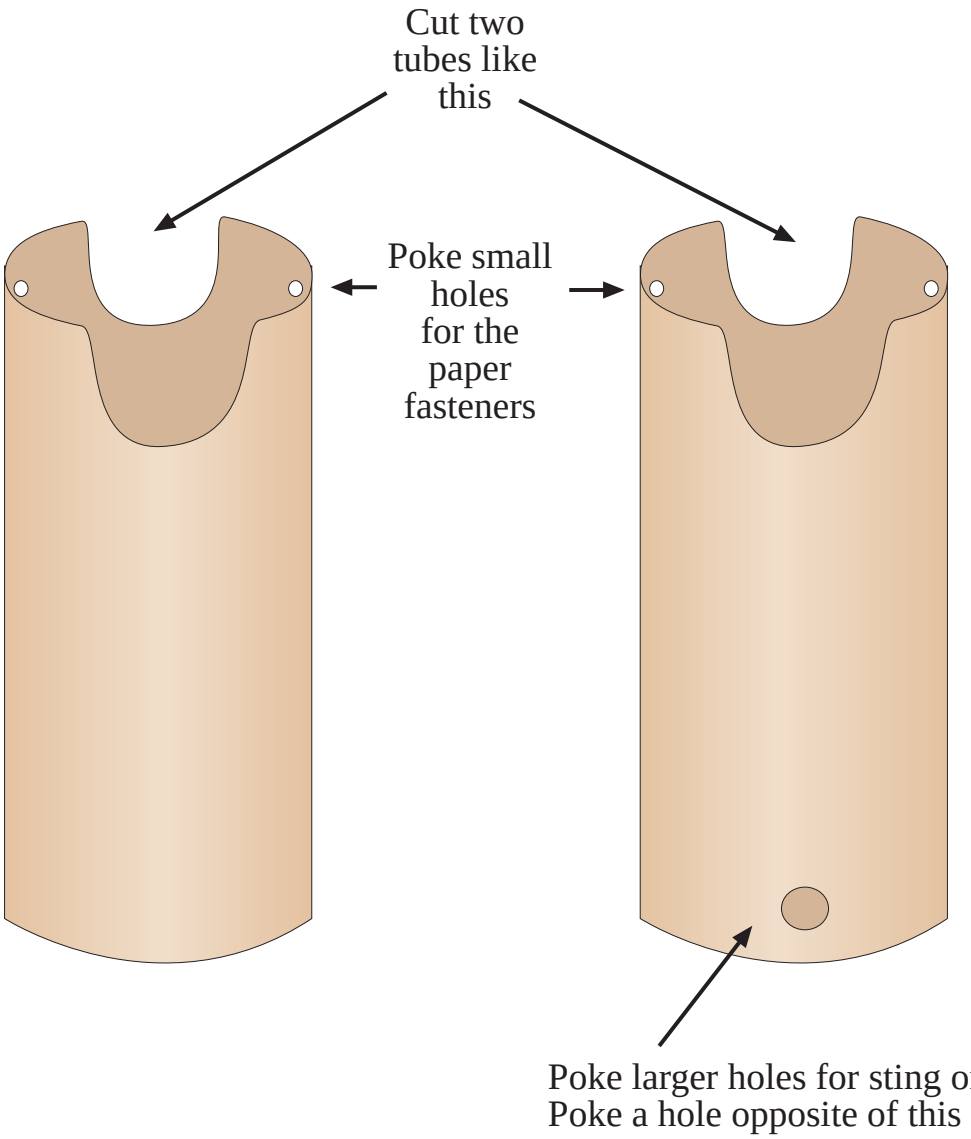
Inside a skeletal muscle

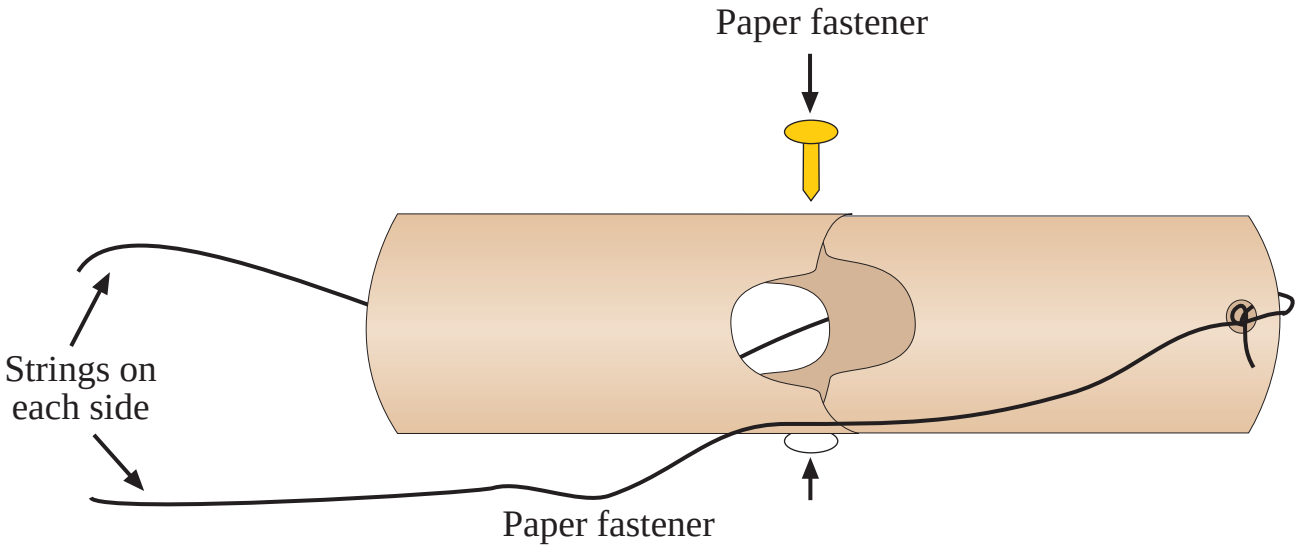
## Types of Muscles

There are three types of muscles. Skeletal muscles are attached to bones. Skeletal muscles are striped. Smooth muscles are not striped. The muscle fibers are shorter than skeletal muscle. They are made to squeeze. When you swallow food, smooth muscles push the food to your stomach.

The third kind of muscle is the cardiac muscle. They are only found in the heart. These muscles move all the time. Do your legs get tired when you run? Your heart muscle never gets tired.

Skeletal muscles are voluntary muscles. That means you can move them when you want to. Involuntary muscles move automatically. The cardiac muscles are involuntary muscles. Other involuntary muscles are found in different organs in our bodies.



# Unit 7 Simple Machines and Forces

## Lesson 21

### Objective

Students will learn about levers. (P)

### Materials

* Workbook page
* Tube Kit
* Spring scale
* String
* Styrofoam cup or other light container
* Paper clip
* Ruler
* Pencil
* Several grams of weight (about 100 grams)

### Preparation

The tube kit is a part of the third grade science lab kit. It can be made from PVC pipe, a block of wood, and lag screw. See the tube kit directions to make your own.

Thread the strings through the hole and around the end of the tube. Tie knots in the strings.

Each student or group of students will need a tube kit, spring scale, and about 100 grams of weight in a cup or other container that can be attached to the system.

Weights can include gram cubes, coins, washers, etc. About 34 pennies equal 100 grams. The weight does not need to be exact.

Caution: The pipes are not permanently attached to the joint. Students should not spin the pipes. They can fly off. Use only as directed in the lesson.

### Teaching

**Today weíre going to start learning about simple machines. A simple machine is one that has very few parts. More complex machines sometimes have simple machines as subsystems. There are six kinds of simple machines. Today weíre going to explore one called the lever.**

**Have you ever played on a teeter totter? It is a lever.** Make a model of a lever using a pencil and ruler. Place the pencil perpendicular to the ruler in the center of the ruler. **Describe how this simple machine works.**

**When I push down on one end of the ruler, what happens to the other end?** (It goes up.) **My finger applies a force going down. How could this be helpful?**

**The lever changes direction of the force. A lever does something else. Weíre going to build a system and measure how a lever changes the amount of force needed to move an object.**

Have students look at the diagram on the workbook page. Students will use the tube kit to explore leverage. Anchor the board on the edge of a table with books or other heavy objects. Have students measure and sort the pipes first. Students will push a ten inch pipe in one end of the fitting. Push a six inch pipe in the other end. The spring scale will be attached to it right before the students begin recording data in the charts.

A Styrofoam cup can be used to hold the weight. Poke holes about Ω inch from the rim on opposite sides. Tie an end of a string through each hole. Bend a paper clip slightly on one end to make a hook. Slip the paper clip onto the string. Hook the cup onto the spring scale. Students should add enough weight to the cup to equal about 100 grams. Students should write the weight in the big box at the bottom of the workbook page.

**Review**: Make sure students know how to read the scale. The spring scale in the science kit features a gram scale and a Newton scale. Students should use the gram scale, marked with the letter g. Each line represents 5 grams. Every 25 grams are marked with numbers on the scale.

The charts on the bottom of the workbook are to record results of different arrangements of pipes, the scale, and the weight. The pipe kit includes two ten inch pipes. One will be the constant on each chart. On the first chart, a ten inch pipe will be attached to the weight side. The spring scale side will vary. It is the opposite on the bottom chart.

Students will hold the scale during the exercise. The weights on the other side will hang freely.

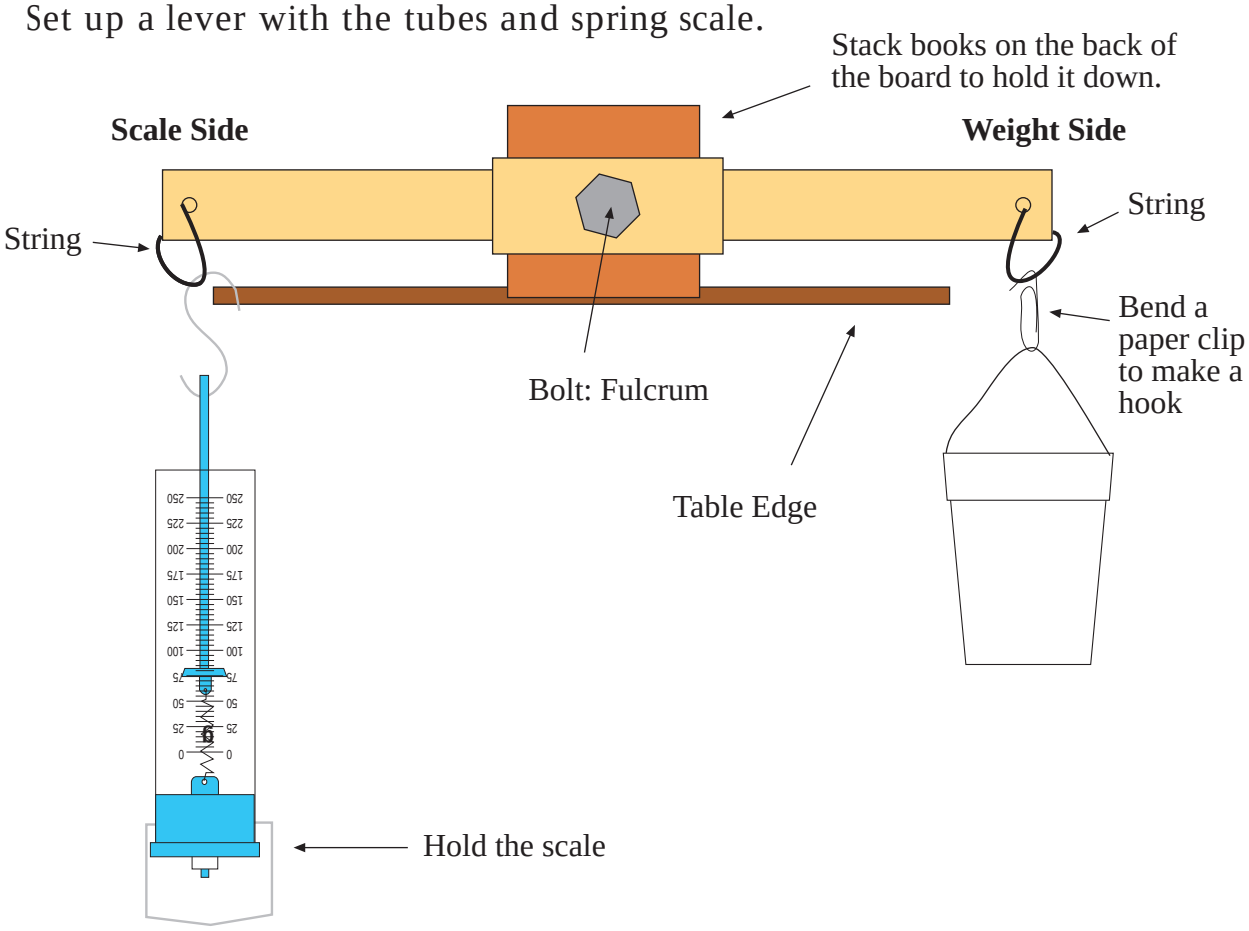
## Conclusion

**What happened when the length of the spring scale pipe increased?** (It took less force the lift the weight.)

**What happened when the length of the weight pipe increased?** (It took more force to lift the weight.)

Name_____ Levers Lesson 21

Set up a lever with the tubes and spring scale.




Record the results of levers in the tube kit.

| Weight of cup contents |
|---|
| |

Weight Side Pipe Length: 10 inches

| Scale Side Pipe Length | 6 | 8 | 10 | 12 | 14 |
|---|---|---|---|---|---|
| Scale Reading | | | | | |

Scale Side Pipe Length: 10 inches

| Weight Side Pipe Length | 6 | 8 | 10 | 12 | 14 |
|---|---|---|---|---|---|
| Scale Reading | | | | | |

# Unit 19 Matter
# Lesson 63

## Objective

Students will review matter. (P)

## Materials

* Workbook page
* Objects that have undergone a chemical change
* Optional: vinegar, baking soda, and balloon
* Paper clip

## Preparation

Objects that have undergone a chemical change may include burnt toast, a rusted bolt, or a tarnished penny. These will be used as examples in the lesson. All materials except the workbook page will be used for demonstrations or examples.

The lesson includes a review of material covered in other grade levels, plus an interactive listening exercise. Students will complete the workbook page as the lesson is taught.

## Teaching

Students should have workbooks opened to the page for the lesson and be ready to write answers to fill in the blanks at the beginning of the ten sentences.

**Look at the workbook page. It has a list of ten blanks followed by definitions of the words that will go in the blanks. You may remember some of the terms that will go in the blank from lessons in science from other grade levels.**

**Read the first definition.**

**I am going to talk. Listen for the word that will go in the blank. Iím not going to say exactly whatís on the page, so listen carefully for the key word that will fill in the blank.** *Anything that takes up space and can be weighed is matter.*

**What word will go in the blank?** (matter) **That was a little easier than some because I didnít change the words on the workbook page much.**

**Read number two.** Give students time to read, and then continue. **If I measure the mass of an object, I will find out how much matter is in the object. What word goes in the blank on line 2?** (mass)

**Read number three.** Give students time to read, and then continue. **To find out how heavy an object is, I would find its weight. Write the word that goes in the blank by number 3.** (weight)

**Read number 4.** Give students time to read, and then continue. **If I want to measure the volume of an object, I would have to find out how much space it takes up. Write the word that goes in blank number 4.**

**Read number 5.** Give students time to read, and then continue. **Matter has three different states. Matter that is solid has a defined shape and volume. The book youíre looking at, the pencil youíre using, and the chair you are sitting in are all solid. Write the word that goes in blank number 5.**

**Read number 6.** Give students time to read, and then continue. **If matter has a defined volume, but the shape changes with the container, it is a liquid. Write the word that goes in blank number 6.**

**Read number 7.** Give students time to read, and then continue. **If the matter doesnít have a defined shape or volume, it is a gas. Write the word that goes in blank number 7.**

**Read number 8.** Give students time to read, and then continue. **Matter can change from one state to another. When a gas changes into a liquid, we say it condensates. Water vapor can condensate on the outside of a cold drink on a humid day. The water that gathers on the outside of the cup is water vapor that condensates into a liquid. Write the word that goes in blank number 8.**

**Read number 9.** Give students time to read, and then continue. **Sometimes the opposite happens. A liquid can turn into a gas. When this happens we say it evaporates. Write the word that goes in blank number 9.**

**Read number 10.** Give students time to read, and then continue. **We can combine two or more kinds of matter. If the matter doesnít change, it is a mixture. Mixtures can be easily separated into the different kinds of matter that make up the mixture. Write the word that goes in blank 10.**

## Conclusion

**A mixture is one way to combine different kinds of matter. Read the rest of the page to learn about another way matter can change.**

The text is reprinted below in italics.

*Matter Can Change*

*The way we see matter can change. An ice cube looks different than a glass of water. Water vapor looks different from an ice cube. Still, whether itís a liquid, gas, or solid, the water will still be water. This is called a physical change. The form of the matter has changed, but it is still the same kind of matter.*

*Sometimes, different kinds of matter can combine to become something else. Hydrogen atoms and oxygen atoms combined to make water. This is called a chemical change. When two or more substances are combined to become something new, a chemical change has occurred. Substances that undergo a chemical change are hard to separate or change back to their original states.*

*Mix vinegar and baking soda. You will see a chemical change. If you mix them in a small closed container, such as a balloon, it will start to inflate. That is because gas is released in the chemical change. Sometimes heat is also produced during a chemical change.*

You may demonstrate the chemical change described in the paragraph using vinegar, baking soda, and a balloon.

Use the other objects as objects of chemical changes. The burnt toast underwent a chemical change that turned part of it into carbon. Heat was used to cause the change. The steal in the bolt underwent a chemical change when it combined with oxygen in the air to make iron oxide (rust). The penny tarnished from the air and oil in peopleís skin. Compare it to a new shiny penny.

Bend the paper clip to model a physical change. The shape has change, but the matter is still the same steel it was be

1. _____ Anything that takes up space and can be weighed.

2. _____ The measure of how much matter is in an object.

3. _____ The heaviness of an object.

4. _____ How much space an object takes up.

5. _____ Matter with a defined shape and volume.

6. _____ Matter with a defined volume, but the shape depends on the container.

7. _____ Matter without a defined volume or shape. Volume and shape depends on the container.

8. _____ When a gas turns into a liquid.

9. _____ When a liquid turns into a gas.

10. _____ Two or more kinds of matter that can be grouped together and then easily taken back apart.

## Matter Can Change

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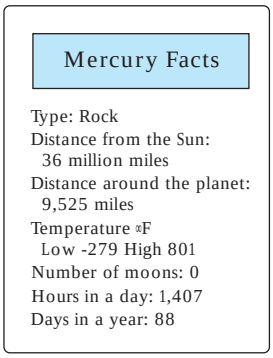
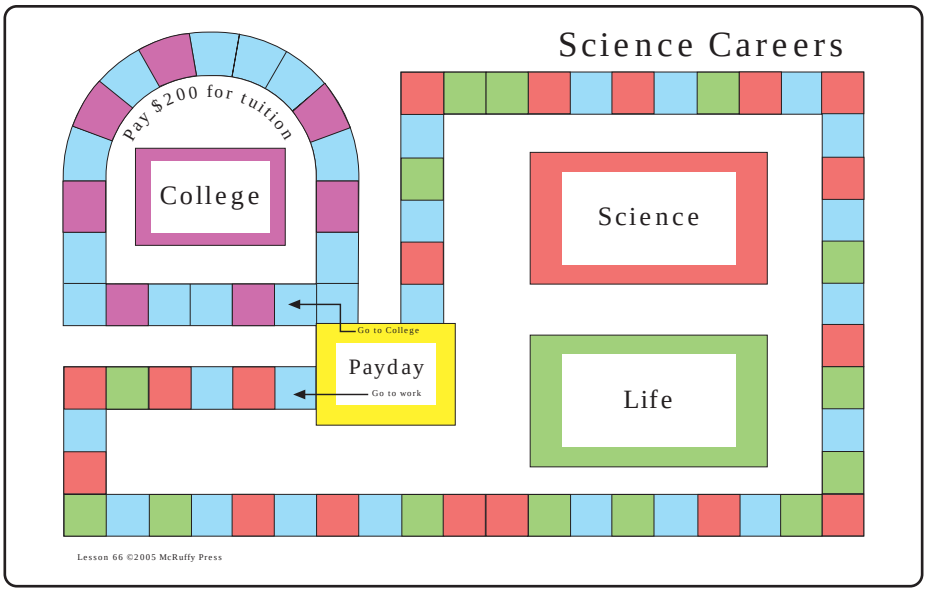
The curriculum also includes two games:

The Planet Hopping Game - Players travel through the solar system on a colorful 11 x 17 inch laminated game board. Students use reference cards to answer questions about each planet.




Reference Card
(smaller than actual size)

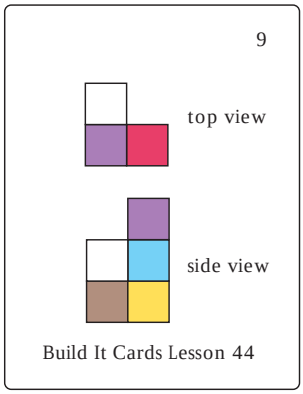
The Science Career Game - Players choose science careers, go to college, earn salaries, and learn facts about science careers. Includes four card sets, McRuffy money, and a colorful 11 x 17 inch laminated game board.



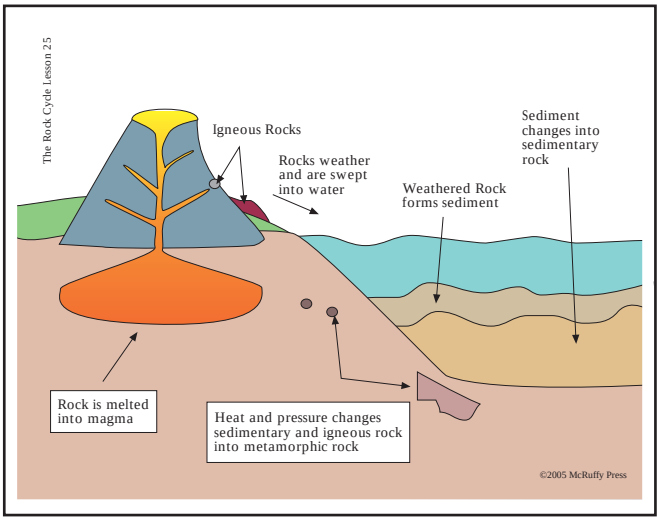

Game board smaller than actual size. The board is spiral bound in the center to allow the board to fold for stoarage.

The curriculum also includes many other color materials such as posters, card sets, and other activites.

Examples:




Students use plastic centimeter cubes to make models using diagrams. (Card shown smaller than actual size)




Posters for reference and teaching (Actual size 8.5î x 11î)