

# Human Body in Motion Unit

## Teacher Masters:

### Table of Contents

#### Introductory Letter to Families

Welcome to the Human Body in Motion Unit ..... 1–2

#### Teacher Masters

Request for Materials (Lessons 1 and 3) .....3  
What’s Inside the Human Body?—Initial (Lesson 1).....4-5  
Where’s This Joint? Answer Key (Lesson 2) .....6  
What’s Inside the Human Body?—Final (Lesson 12) .....7-8  
Setting Up a Fair Test (SBA 3) ..... 9-12

#### Family Links

Be Good to Your Joints (Lesson 2) ..... 13  
Moving Our Limbs (Lesson 3)..... 14  
Tracking Reflexes (Lesson 5)..... 15  
Calcium in Your Diet (Lesson 6)..... 16  
Breathing Matters (Lesson 9) ..... 17  
Building Blocks (Lesson 11)..... 18

2012 Edition Copyright © 2005, 2011 Chicago Science Group. All Rights Reserved

Printed in the United States of America. Except as permitted under the United States Copyright Act, no part of this publication may be reproduced or distributed in any form or by any means or stored in a database or retrieval system without the prior written permission of the publisher.

SCIENCE COMPANION®, EXPLORAGEAR®, the CROSSHATCH Design™ and the WHEEL Design® are trademarks of Chicago Science Group and Chicago Educational Publishing Company, LLC.

ISBN 10: 1-59192-279-8 ISBN 13: 978-1-59192-279-7

2 3 4 5 6 7 8 9 10-BK1, 0611, D7371

www.sciencecompanion.com Chicago Educational Publishing Company, LLC.

Dear Families,

In class, we are starting a science unit about the human body and how it moves.

The study of movement is an ideal vehicle to teach children how the body works as a whole. Like all functions of the body, movement requires the actions of many organ systems. As the class explores the skeletal, muscular, nervous, circulatory, respiratory, and digestive systems, they begin to appreciate the complex interactions and dependencies that exist between body parts and recognize the importance of protecting them.

During the Human Body in Motion Unit, the children will:

- Think up imaginary organs and cell types to reinforce how the human body is formed from cells which combine to form tissues, tissues which combine to form organs, and organs which combine to form organ systems.
- Experience muscle fatigue to learn that muscle contraction requires energy, and efficient energy production requires a rich supply of oxygen and nutrients from the blood.
- Discover that minerals in bones make the bones strong and understand the importance of including calcium-rich foods in their diets.
- Learn that the human skeleton moves at joints and that the design of these joints affects how bones are able to move.
- Build limb models to discover that the muscles of a limb work in pairs—one pulling the bones in one direction and the other pulling them back in the opposite direction.
- Explore reaction time and several common reflexes to appreciate how the nervous system controls movement.
- Recognize that when we exercise the heart pumps harder and faster to deliver more blood to active muscles—and to all parts of the body—bringing cells the oxygen and nutrients they need to create energy and function, and carrying away their waste.
- Learn that the lungs are where oxygen is delivered to the blood and carbon dioxide is removed.
- Simulate the airway obstruction characteristic of certain respiratory conditions such as asthma, bronchitis, and emphysema to understand how oxygen depletion affects people's ability to be active.
- Learn that their muscles—and all the parts of their body—depend on a healthy digestive system to provide the nutrients and water their cells need to produce energy and function.
- Experiment to discover that food needs to be digested before it can enter the bloodstream.

In addition to the work your child will do in class, you and your child can explore this rich topic together at home in the following ways:

- Reading a science book together that your child checks out from the class Science Center.
- Visiting the web site at [www.sciencecompanion.com/links](http://www.sciencecompanion.com/links) to find a list and descriptions of recommended web sites about the human body, if you have a computer at home with access to the Internet.
- Doing fun, physical activities together. If you are a role model for an active, healthy way of life, your children are more likely to be active and make healthy choices throughout their lives.
- Completing Family Links the teacher sends home after select lessons. Each handout should be added to the back of the Human Body in Motion section of the Family Link Notebook, so you, your child, or the teacher can refer to it any time.

The Human Body in Motion Unit will be fun! We hope the children will bring their discoveries and enthusiasm home, inviting you to learn alongside them—asking questions, discussing their work, and sharing their adventures in science.

Sincerely,

# Request for Materials

Dear Families,

Next week in science class we will be performing an exploration that requires the following materials:

If you can donate or lend any of these items, please send them in with your child

by \_\_\_\_\_.

(requested date)

Thank you for your support,

---

Name: \_\_\_\_\_ Date: \_\_\_\_\_

# What's Inside the Human Body?

## How Much Do You Already Know?

*Throughout this unit, as you learn about how the body moves, you'll also be learning about how your body works as a whole. How much do you already know about the human body and how it works?*

Use the first column of the table below to list as many parts of the body as you can. Describe what the parts do for the human body in the second column.

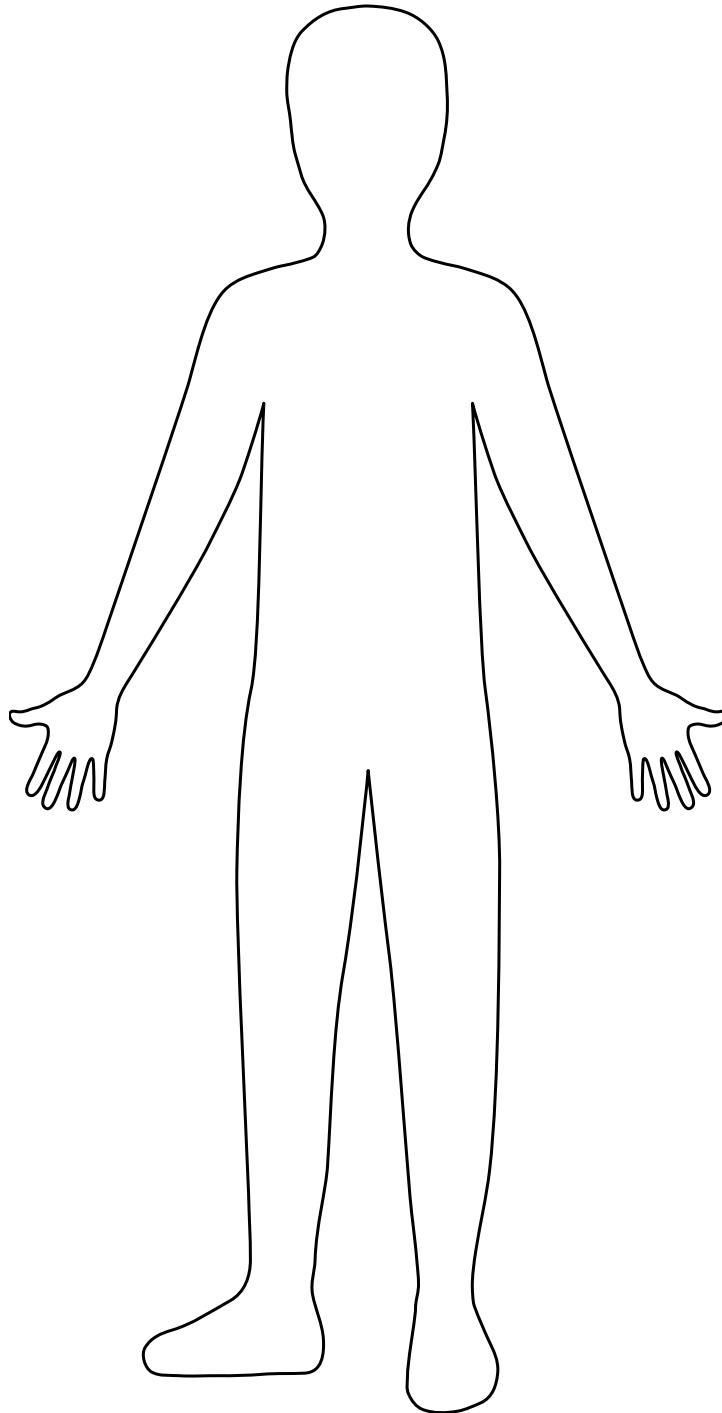
Parts of the Human Body	What the Parts Do for the Body

Name: \_\_\_\_\_ Date: \_\_\_\_\_

# What's Inside the Human Body?

## How Much Do You Already Know?

On the outline of the human body below, sketch the structures (body parts) you listed on the previous page. If the structure is involved in movement, draw a circle around it.



# Where's This Joint?

## Answer Key

**Joint A:** You will need to use these tiny hinge joints when you write down your answers to these riddles. (***Knuckle joints***)

**Joint B:** This ball-and-socket joint can move in a complete circle. It is your body's most flexible joint. If you throw, hit, or lift too hard, the bones in this joint can become disconnected (dislocated). In fact, this is the most likely joint in the body to be dislocated. (***Shoulder joint***)

**Joint C:** This hinge joint connects the lower ends of the tibia and the fibula. (***Ankle joint***)

**Joint D:** This is the largest—and heaviest—joint in the body. Every time you move from one place to another, this joint works like a hinge, moving up and down, but not side to side. This joint is often injured during sports, such as basketball and skiing. (***Knee joint***)

**Joint E:** You use this joint to talk and eat. It is the most active joint in your body. (***Jaw joint***)

**Joint F:** This joint has eight small bones that can move up and down, with some side-to-side motion. The scientific name for this joint is the radiocarpal joint because it involves the carpal bones and the radius bone. (***Wrist joint***)

**Joint G:** This ball-and-socket joint can move in a complete circle. It is stronger than the shoulder but not as flexible. When you walk, the force placed on this joint is three to four times your body's weight; when you run, it is five times your body weight. (***Hip joint***)

**Joint H:** You might use this pivot joint when you're startled by a sudden, loud sound or when you want to indicate "No" without speaking. (***Neck joint***)

**Joint I:** You can find the answer to this riddle by raising your hand to ask your teacher for help. Now put it down. You just exercised this hinge joint. (***Elbow joint***)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

# What's Inside the Human Body?

## How Much Do You Know Now?

*Throughout this unit, as you learned about how the body moves, you also learned about how your body works as a whole. How much do you know now about the human body and how it works?*

Use the first column of the table below to list as many parts of the body as you can. Describe what the parts do for the human body in the second column.

Parts of the Human Body	What the Parts Do for the Body

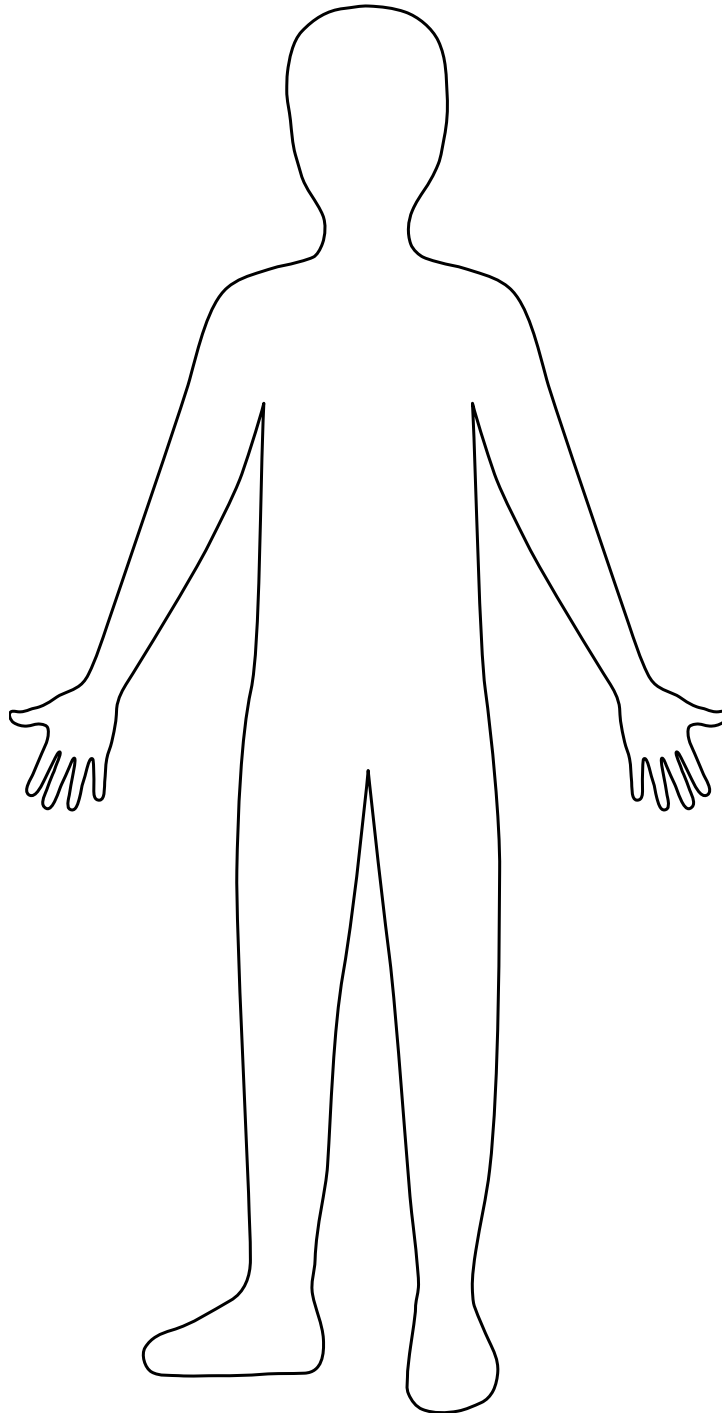


Name: \_\_\_\_\_ Date: \_\_\_\_\_

# What's Inside the Human Body?

## How Much Do You Know Now?

On the outline of the human body below, sketch the structures (body parts) you listed on the previous page. If the structure is involved in movement, draw a circle around it.



Name: \_\_\_\_\_ Date: \_\_\_\_\_

# Setting Up a Fair Test

## Investigative Question:

1. What are you trying to discover?

## Variables:

2. What is the one **variable** you will test?

3. How will you change that variable?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

# Setting Up a Fair Test

Use the chart and questions on this page to help you organize the fair test.

What variable are you going to change? _____	
What variables will you keep the same?	How will you keep the variable the same?

4. What are you going to measure?

5. How will you measure this?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

# Setting Up a Fair Test

## Materials:

6. What materials do you need?

## Procedure:

7. List the steps you will follow to do your experiment.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

# Setting Up a Fair Test

## Data:

8. Record observations and data in the space provided below.

## Conclusion:

9. What did you learn from your test?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Family Link with Science—Homework

# Be Good to Your Joints

Describe a perfect school day from the perspective of your body's joints.

- What are you eating, wearing, and carrying?
- Are you sitting, lifting things, or exercising? How?
- What simple changes can you make to your daily routine that will protect your joints?

*You can read about ten ways to be good to your joints on pages 6–7 of your reference book to assist you as you complete this assignment.*

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Family Link with Science—Homework

# Moving Our Limbs

Today you created a model limb in class to learn more about how bones move. Using your limb model, share what you learned with three family members or friends:

1. Point out what each part of your model represents.
2. Demonstrate how your limb model bends and straightens.
3. Explain the role that each part plays in your model's movement.
4. After you have demonstrated and explained how your model moves to each person, ask them to sign their name below.

**These three people listened to the explanation of how my model limb moved:**

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Family Link with Science—Home Activity

# Tracking Reflexes

You have been learning how the nervous system works to move muscles throughout our bodies. Today in class, we explored how the nervous system has built-in mechanisms, called reflexes, which protect the body from harm.

Use tally marks to keep track of how often each of the following reflexes occur for you during one evening.

Reflex	Number of Times this Reflex Happened
Yawning	
Coughing	
Sneezing	
Shivering	

1. Which reflex occurred most frequently? Why do you think this reflex occurred most often?
  
2. How easy or difficult was it for you to keep track of these reflexes? Why might it be difficult to track reflexes?
  
3. Do you think it would be possible to keep track of your blink reflex during an evening? Why or why not?





Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Family Link with Science—Homework

# Breathing Matters

Today in science class you breathed through straws to experience what it would be like if you couldn't breathe deeply or completely. Some people have medical conditions that affect their breathing in a similar way. Read the section titled "Diseases and Conditions of the Respiratory System" on pages 76–78 of your reference book. Then answer the questions below.

1. Pick one of these respiratory conditions and describe five things that would be different in your life if you had the condition.
  
  
  
  
  
  
  
  
  
  
2. Which of these respiratory conditions could you avoid? How could you avoid them?
  
  
  
  
  
  
  
  
  
  
3. (Optional) Do you know anyone with one of these conditions? How does it affect them?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Family Link with Science—Homework

# Building Blocks

Your body, like that of worms, plants, and all other living things, is made up of cells. Cells are the “building blocks” that make up all living organisms. In science class today you began thinking about how different kinds of cells join together to perform a variety of important jobs.

Lots of toys also have basic building parts that can be put together in many different ways. Think about a toy you have played with in the past that has lots of individual building parts and write its name below.

**Name of Toy:** \_\_\_\_\_

Compare the basic building parts of this toy to your cells:

1. Do the building parts of this toy all look the same? (Are they all the same size and color, or other characteristics.) Give examples.
2. Do the cells in your body all look the same?
3. Do the building parts of this toy all do the same thing, or can some parts do things that others cannot? Describe some examples.
4. Do the cells in your body all do the same thing or do some cells do things that other cells do not?
5. Do the building parts of this toy need anything to make them work, such as a battery? If so, what is this part and what does it do?
6. Do the cells in your body need anything to keep them “working”? Name some of the things your cells need.