

Human Body in Motion Unit Posters:

Table of Contents

Posters

The Skeletal System and Movement (Lesson 2).....	Poster 1
The Muscular System and Movement (Lessons 3 and 7)	Poster 2
The Nervous System and Movement (Lessons 4 and 5).....	Poster 3
The Circulatory System and Movement (Lesson 8)	Poster 4
The Respiratory System and Movement (Lesson 9)	Poster 5
The Digestive System and Movement (Lesson 10)	Poster 6
How the Human Body is Organized (Lesson 11).....	Poster 7

2011 Edition Copyright © 2005 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.

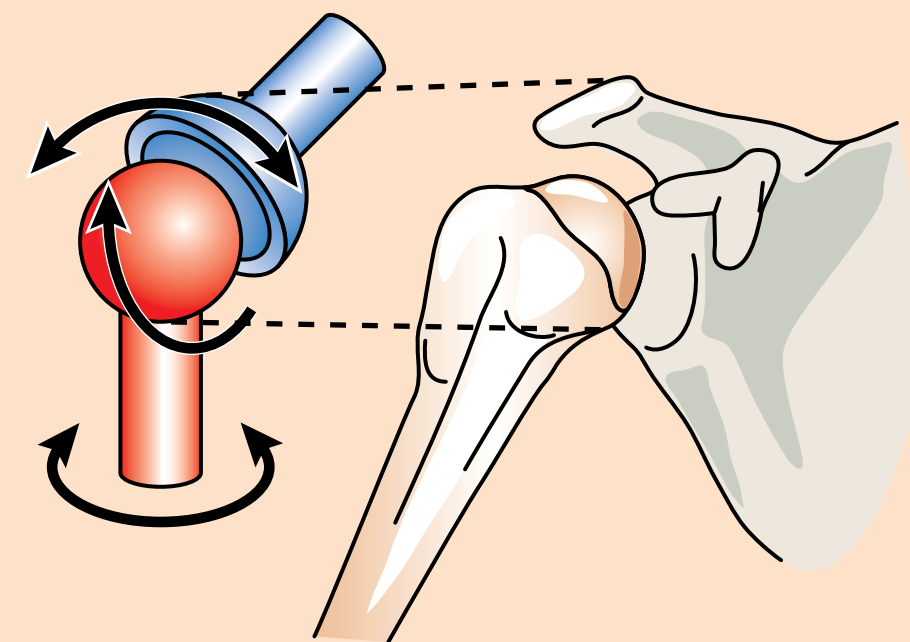
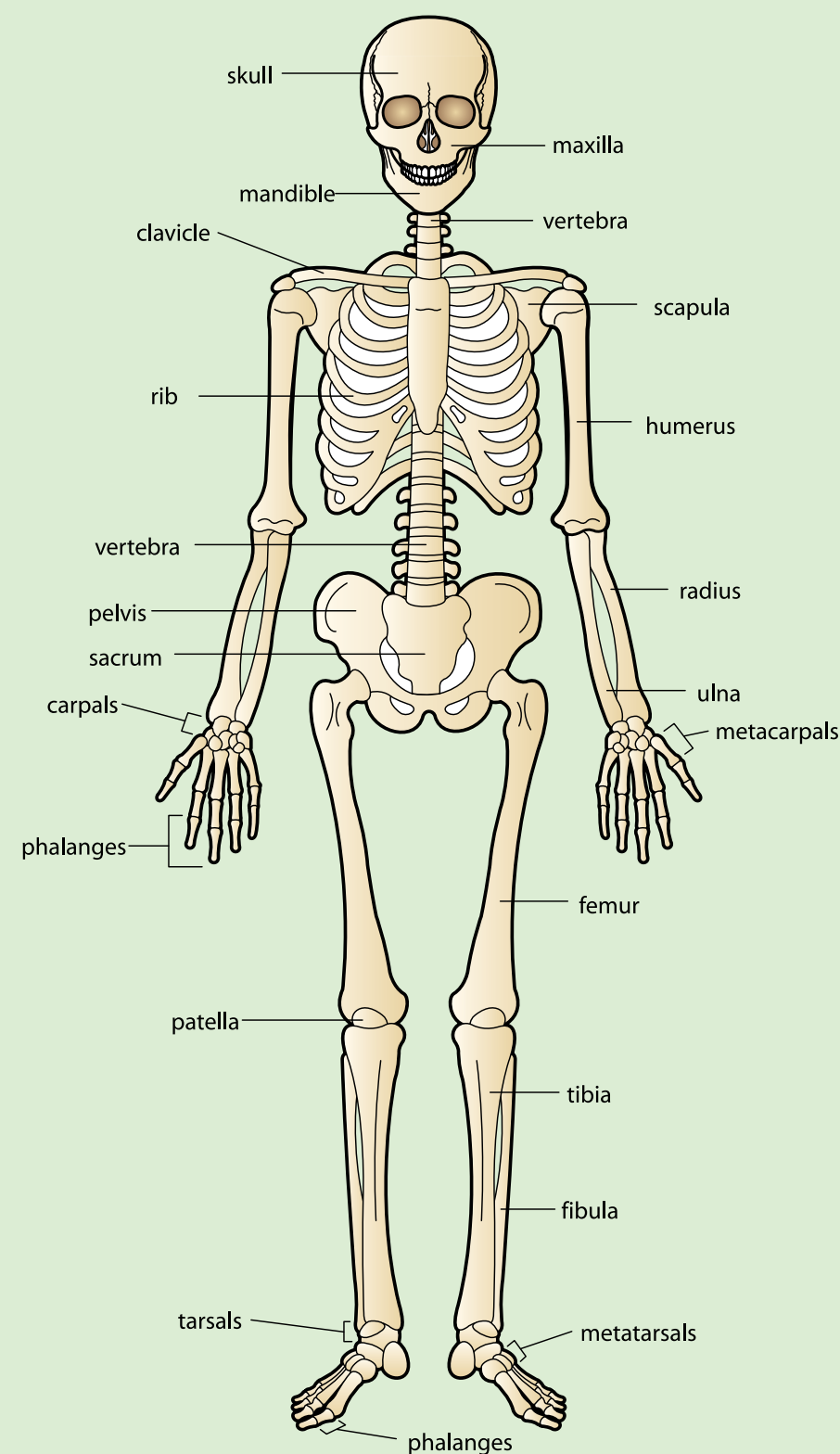
ISBN 10: 1-59192-281-X ISBN 13: 978-1-59192-281-0

1 2 3 4 5 6 7 8 9 10-BK1, 0810, D5948

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

The Skeletal System and Movement

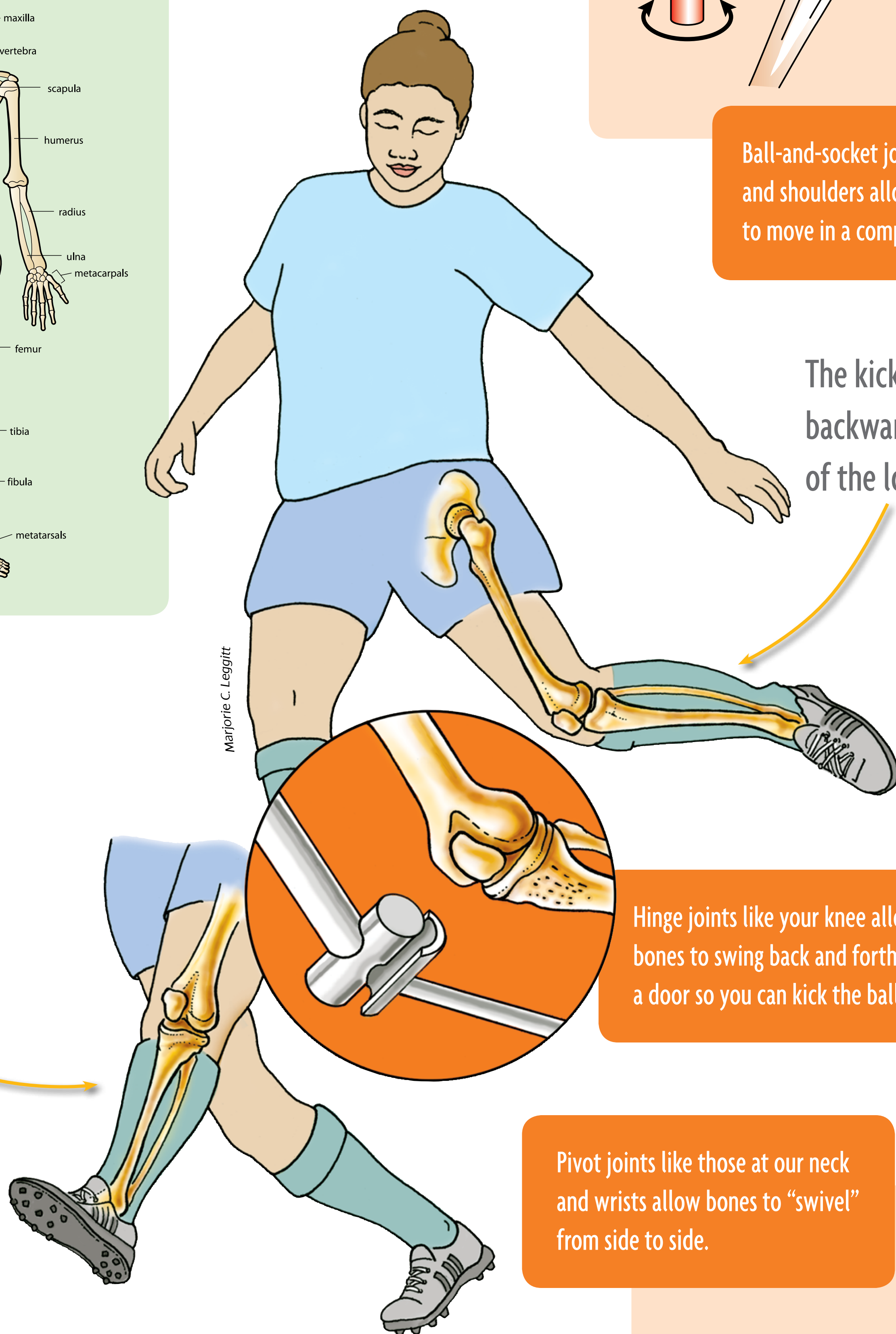
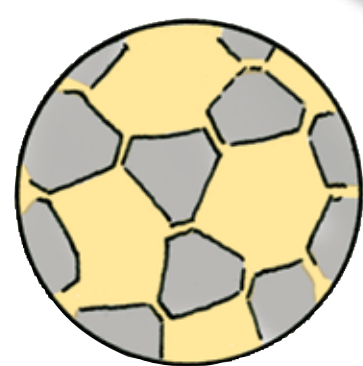
The Human Skeleton



Ball-and-socket joints like your hips and shoulders allow bones to move in a complete circle.

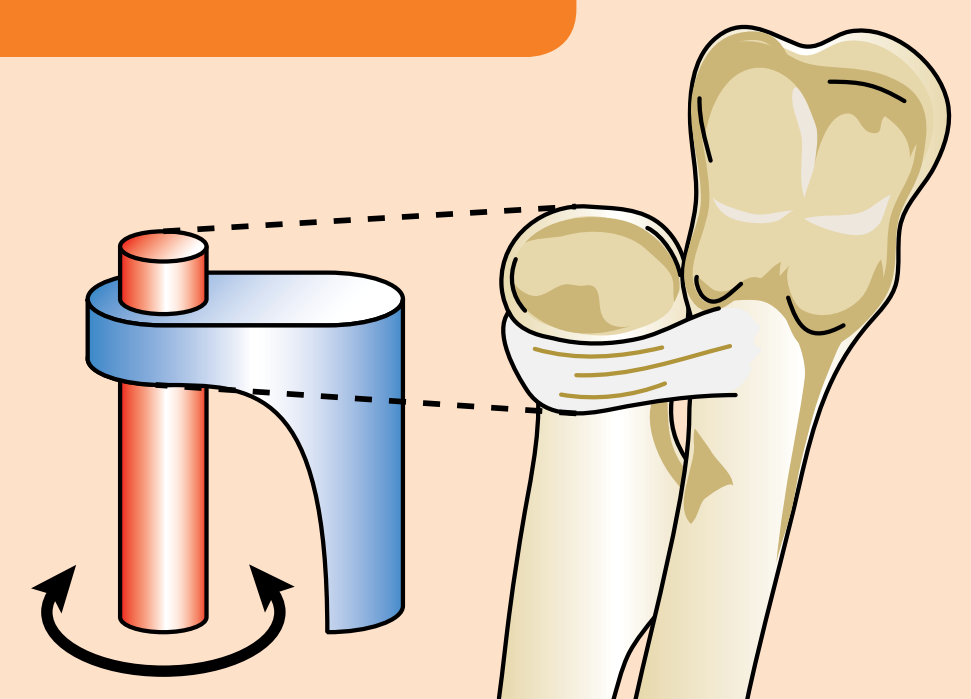
The kick starts with the backwards movement of the lower leg bones

Next, the lower leg bones move forward at the knee joint sending the ball flying

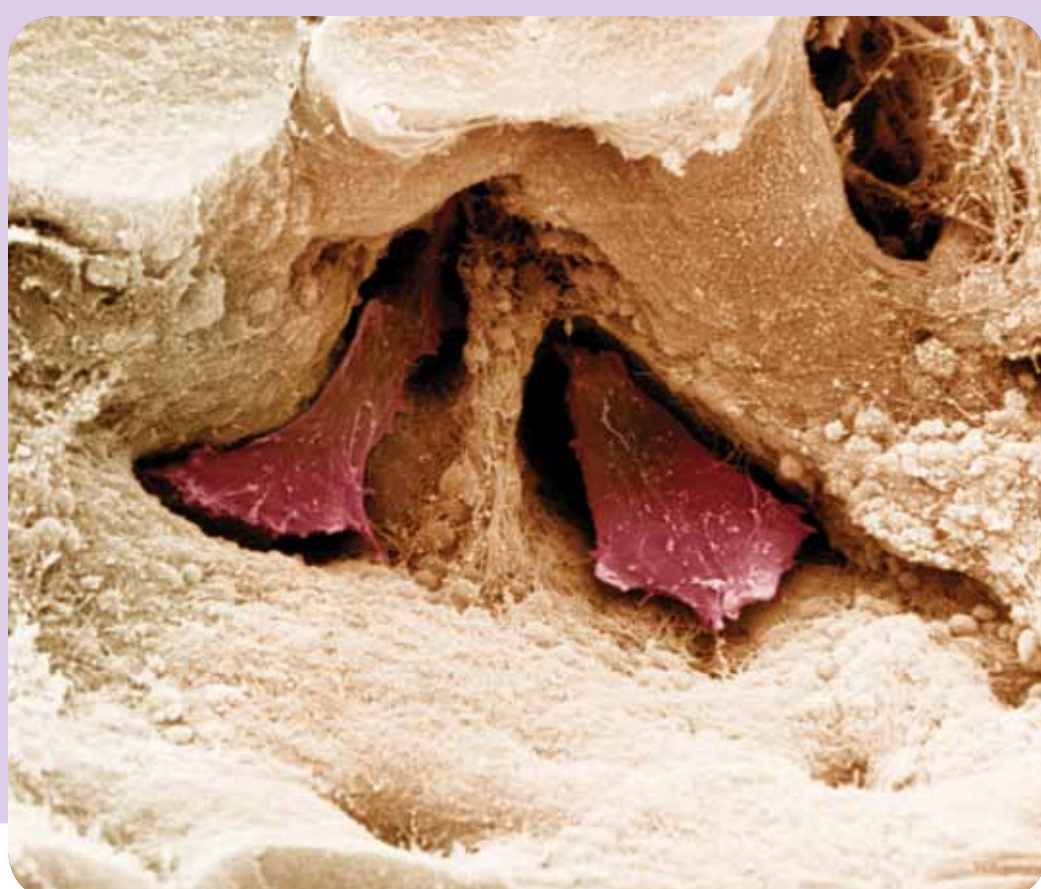
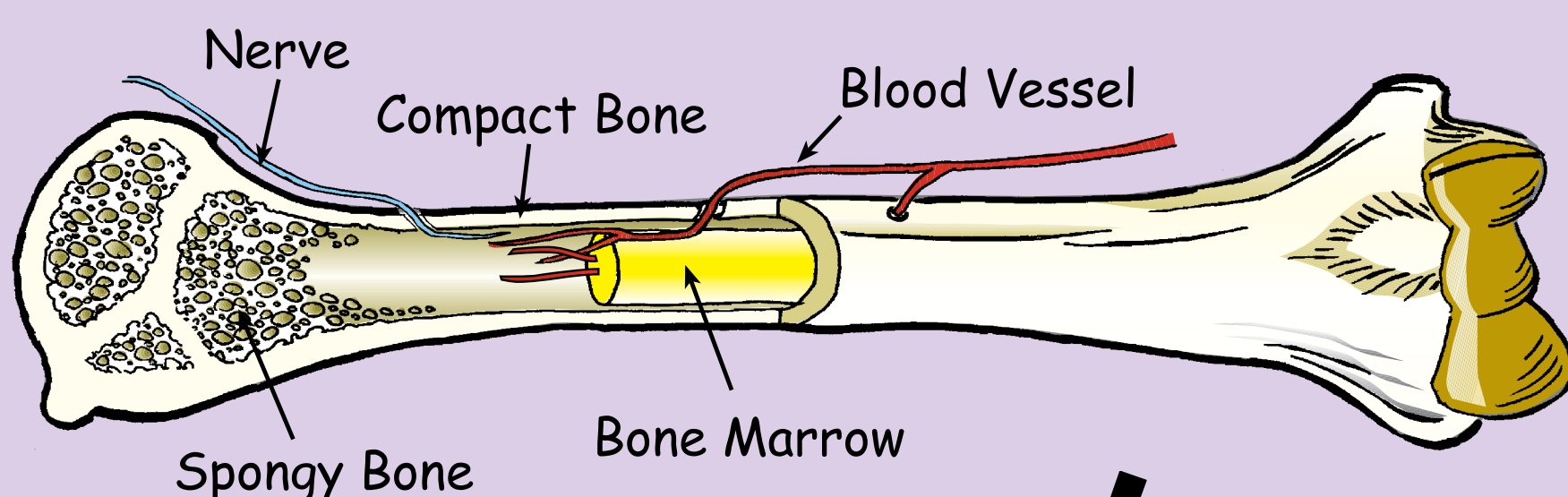


Hinge joints like your knee allow bones to swing back and forth like a door so you can kick the ball.

Pivot joints like those at our neck and wrists allow bones to “swivel” from side to side.



A Closer Look Inside Bone



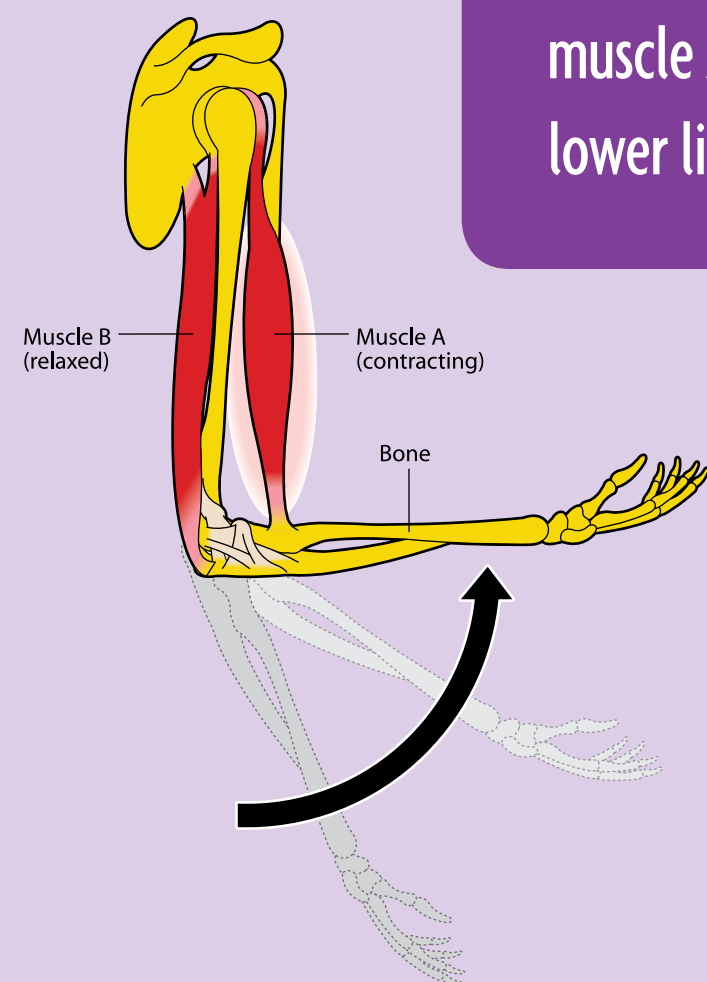
There are three main types of bone cells: osteoblasts (bone builders), osteoclasts (bone digesters), and osteocytes (bone directors). In this photograph two osteoclasts (shown in red) are “eating away” old, worn out bone.

ScienceCompanion®
CHICAGO SCIENCE GROUP

2011 Edition. Copyright © 2005 Chicago Science Group.
All Rights Reserved.
www.sciencecompanion.com

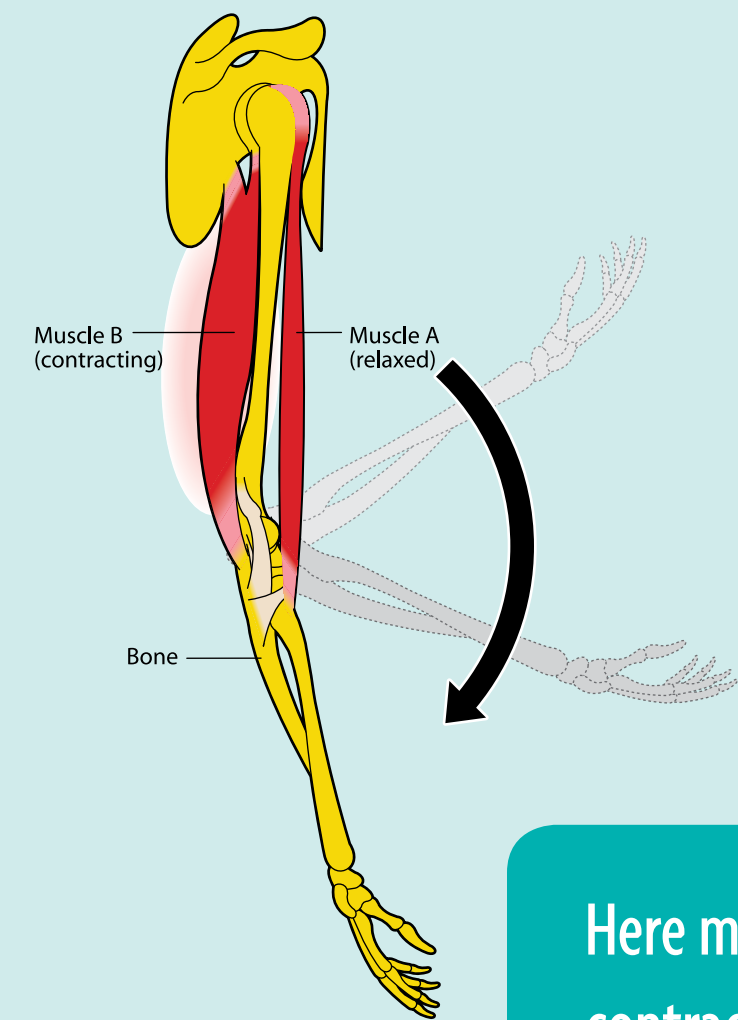
The Muscular System and Movement

Bending a Limb



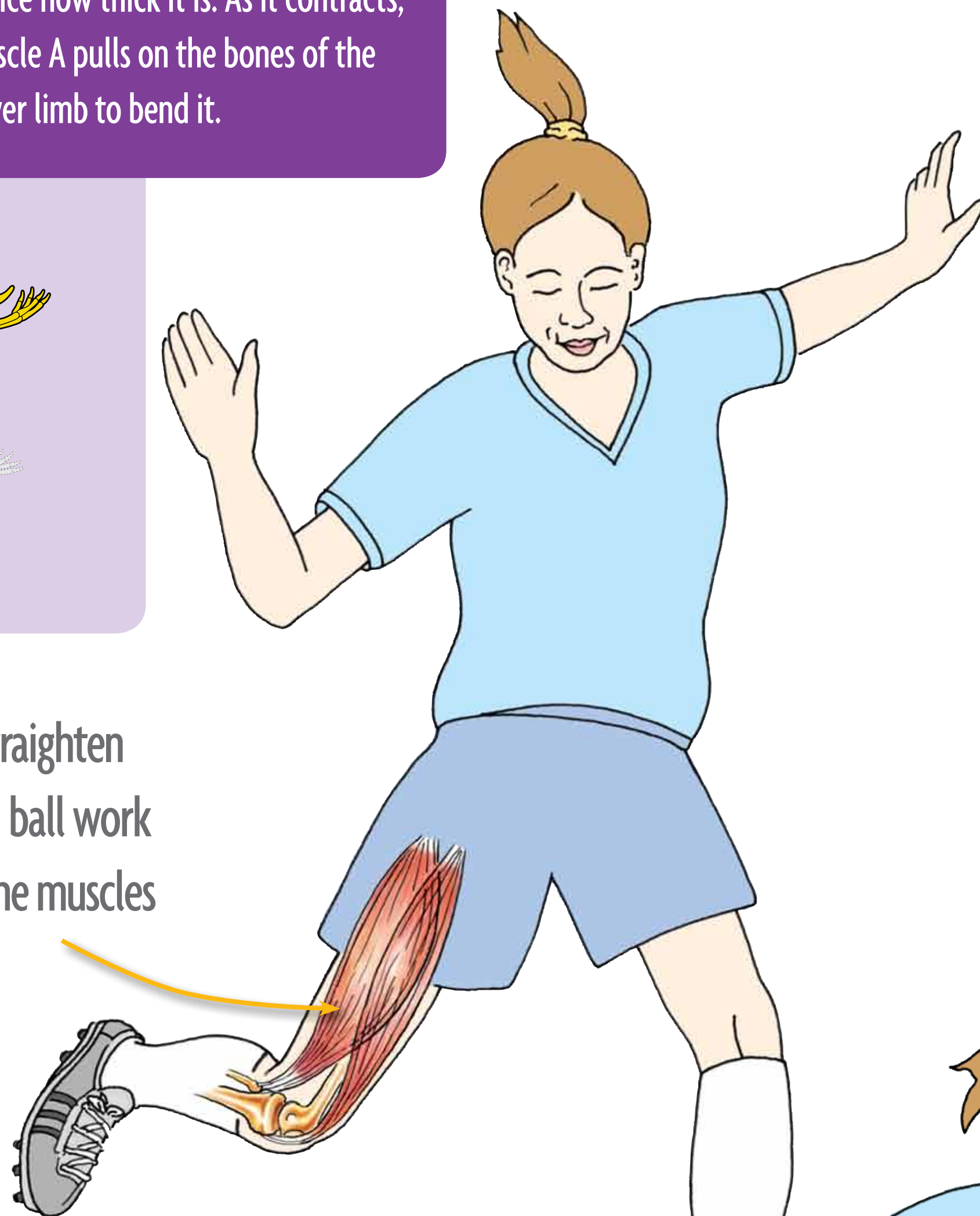
Here muscle A is contracting—notice how thick it is. As it contracts, muscle A pulls on the bones of the lower limb to bend it.

Straightening a Limb

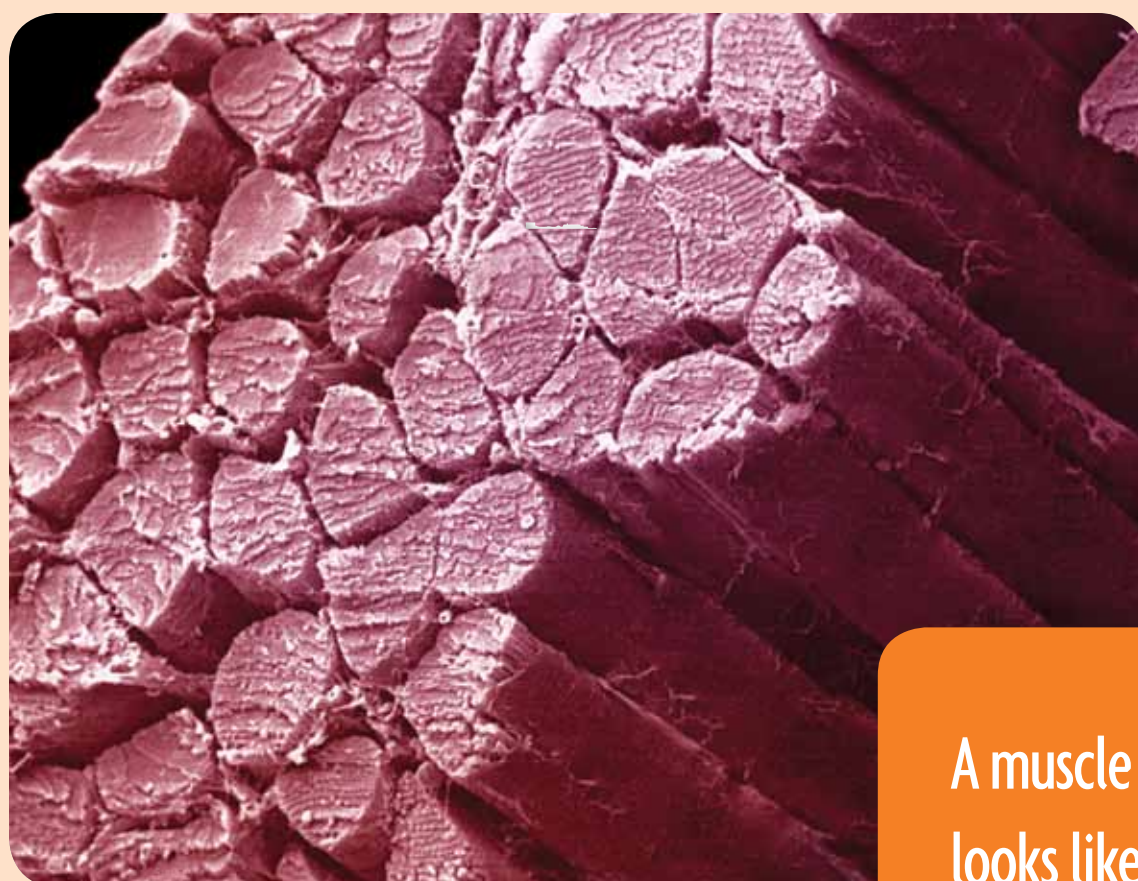


Here muscle B is contracting. (See how thick it is). As it contracts, muscle B pulls on the bones of the lower limb to straighten it.

The muscles that bend and straighten the leg so it can kick a soccer ball work in pairs. The hamstrings are the muscles that bend the leg. When the hamstrings contract, they pull the lower leg bones backwards



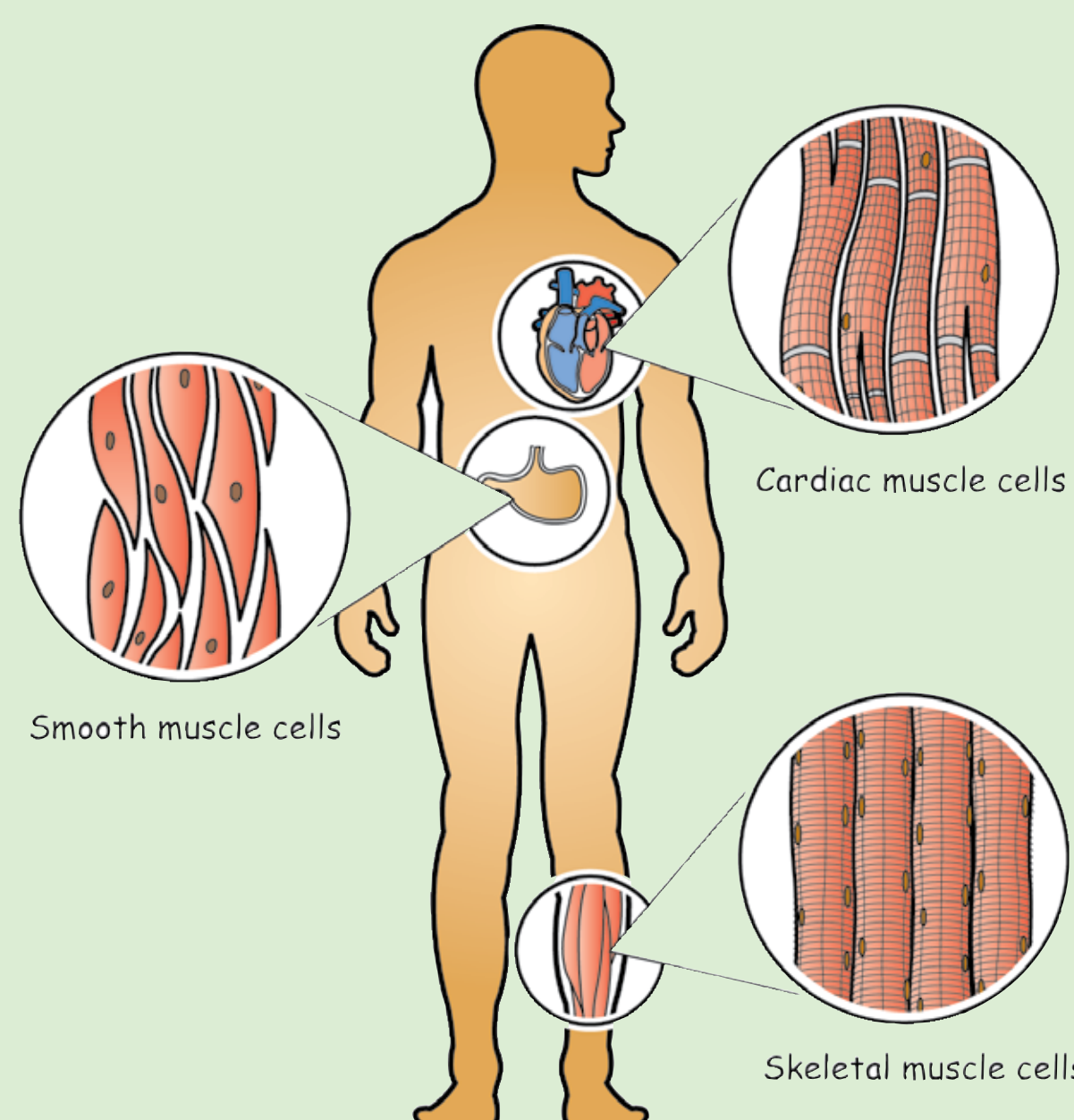
A Look Inside a Muscle



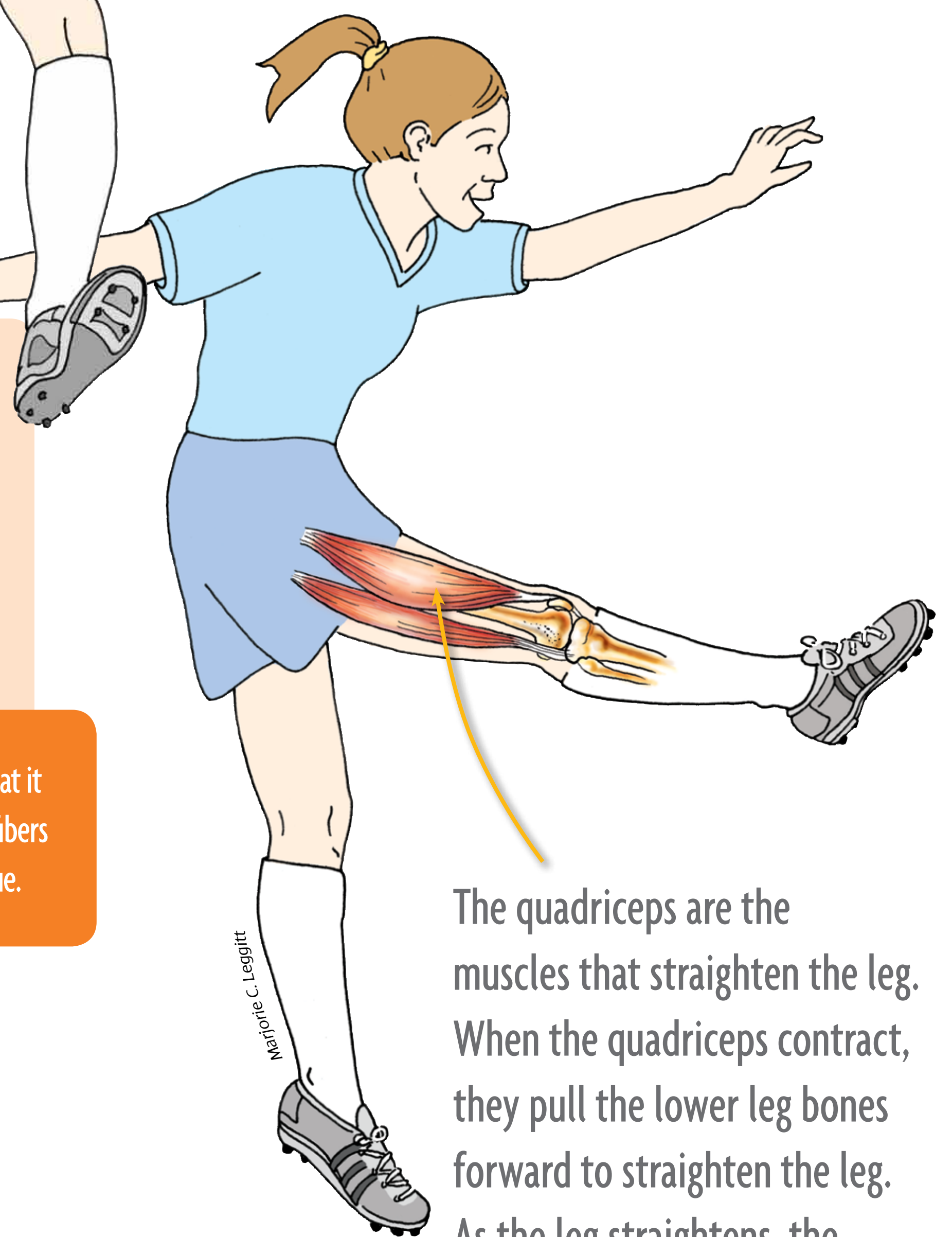
A muscle has been cut so you can see what it looks like inside. Lots of muscle cells or fibers are packed together to form muscle tissue.



A Closer Look at Muscle Cells



Not all muscle cells are the same. This diagram shows the three types of muscle cells found in the human body.



The quadriceps are the muscles that straighten the leg. When the quadriceps contract, they pull the lower leg bones forward to straighten the leg. As the leg straightens, the ball is sent flying

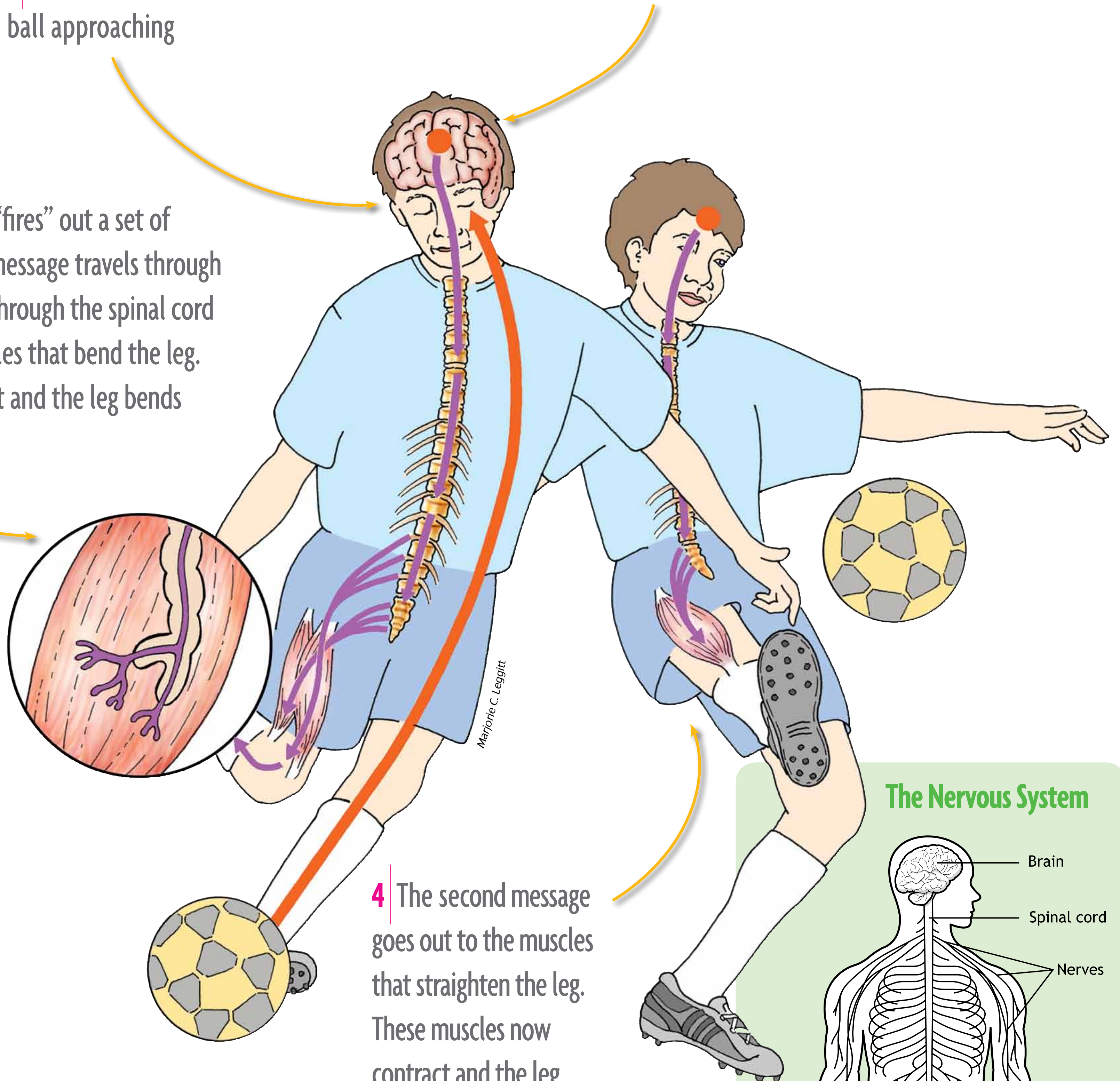
The Nervous System and Movement

1 The eyes see the soccer ball approaching

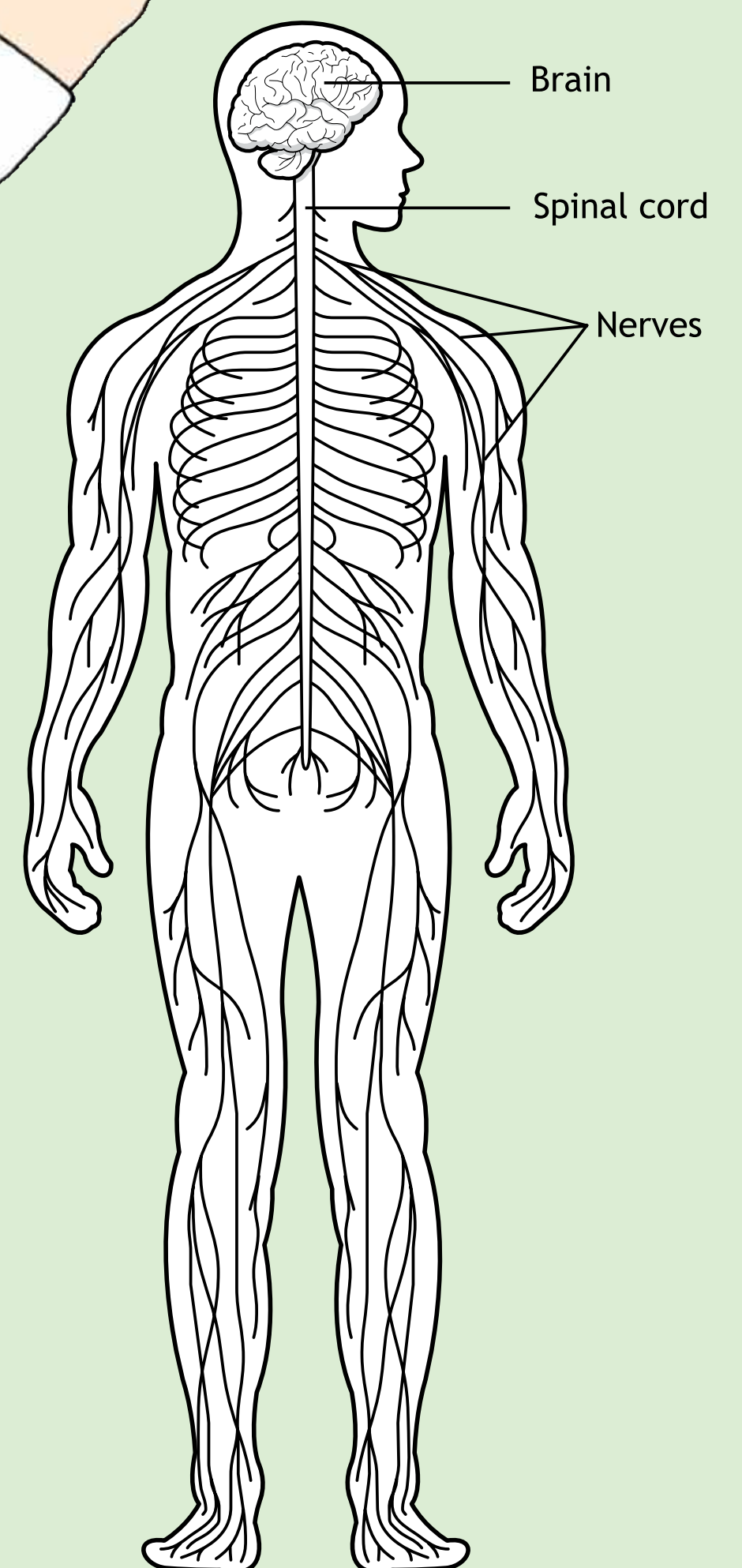
2 The eyes send a message through the optical nerve to the brain letting it know that the soccer ball is yours

3 The brain rapidly “fires” out a set of messages. The first message travels through nerves that extend through the spinal cord and out to the muscles that bend the leg. The muscles contract and the leg bends

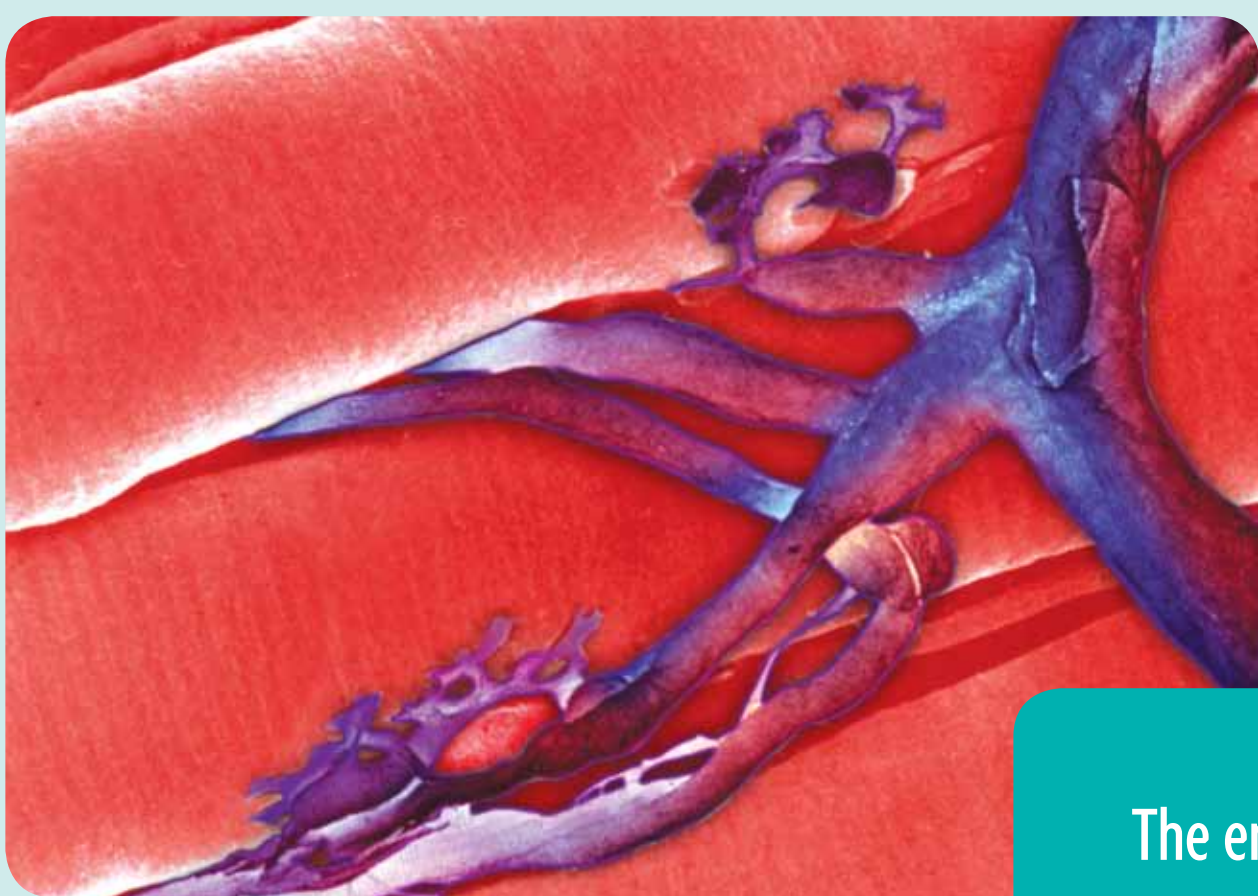
4 The second message goes out to the muscles that straighten the leg. These muscles now contract and the leg straightens—sending the ball flying towards the goal!



The Nervous System



Where Nerve Cells and Muscle Cells Meet



The end of a nerve cell (the branched structure) is sending the message to contract to a group of muscle cells.

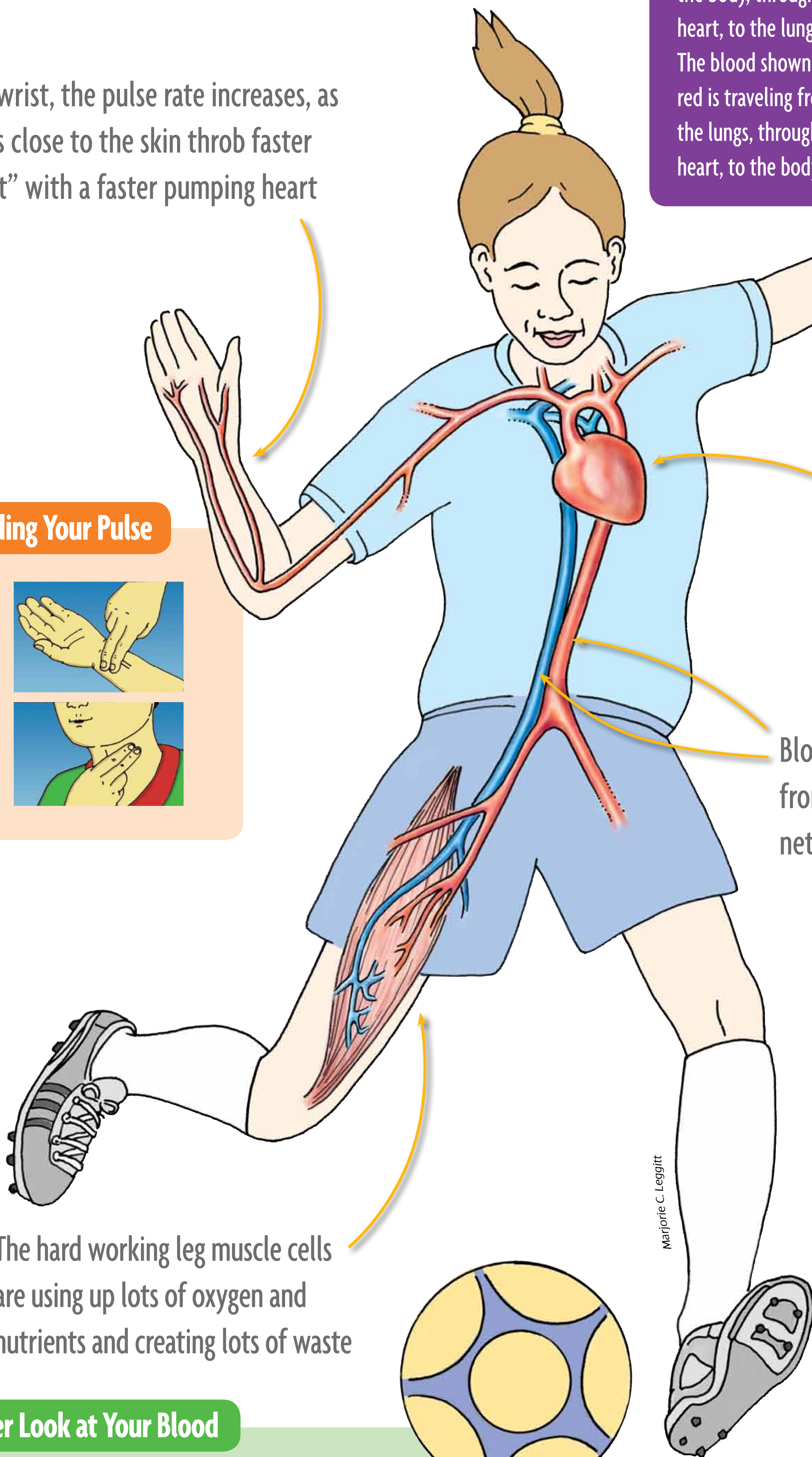
ScienceCompanion®
CHICAGO SCIENCE GROUP

2011 Edition. Copyright © 2005 Chicago Science Group.
All Rights Reserved.
www.sciencecompanion.com

The Circulatory System and Movement

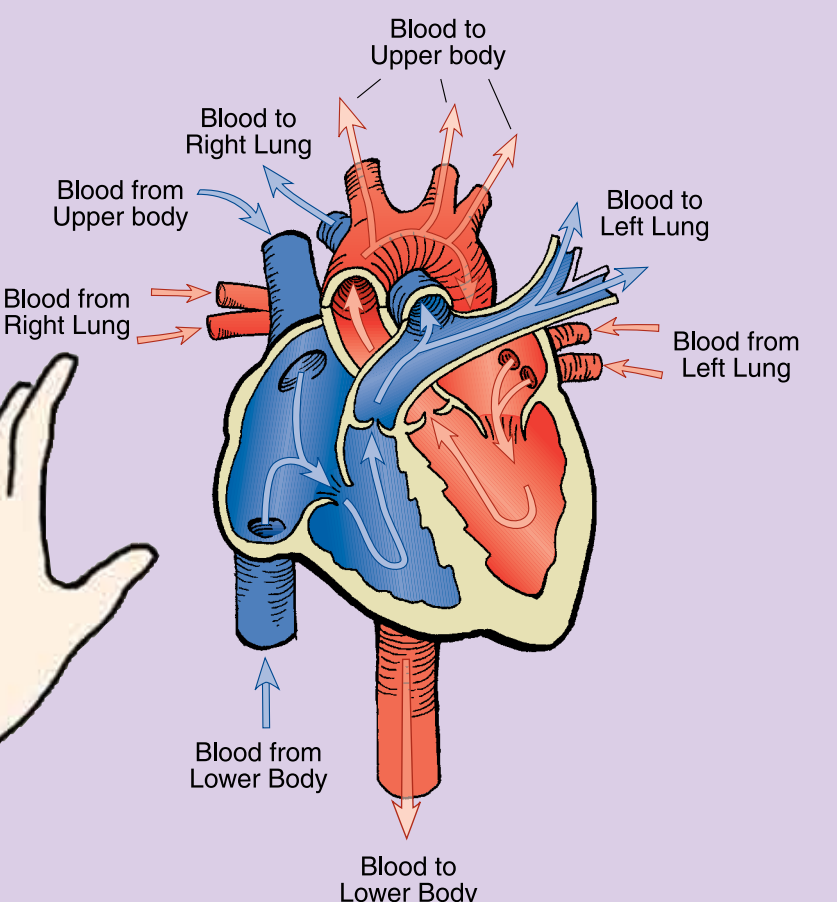
At the wrist, the pulse rate increases, as arteries close to the skin throb faster “in beat” with a faster pumping heart

Finding Your Pulse



The blood shown in blue is traveling from the body, through the heart, to the lungs. The blood shown in red is traveling from the lungs, through the heart, to the body.

A Look Inside the Heart

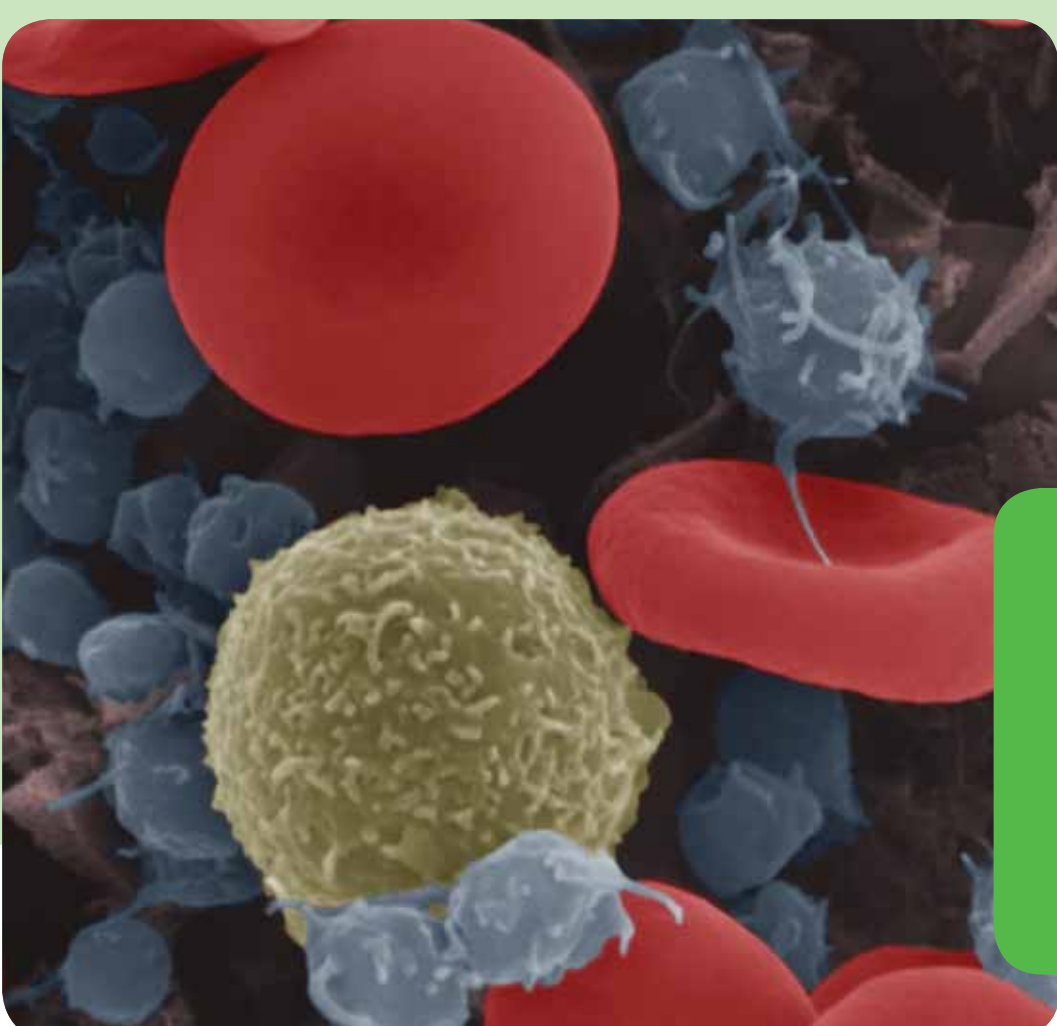


The heart pumps faster to deliver more oxygen and nutrient-rich blood to active muscle cells and carry away their waste

Blood is delivered to and carried away from the active muscle cells by a network of tubes called blood vessels

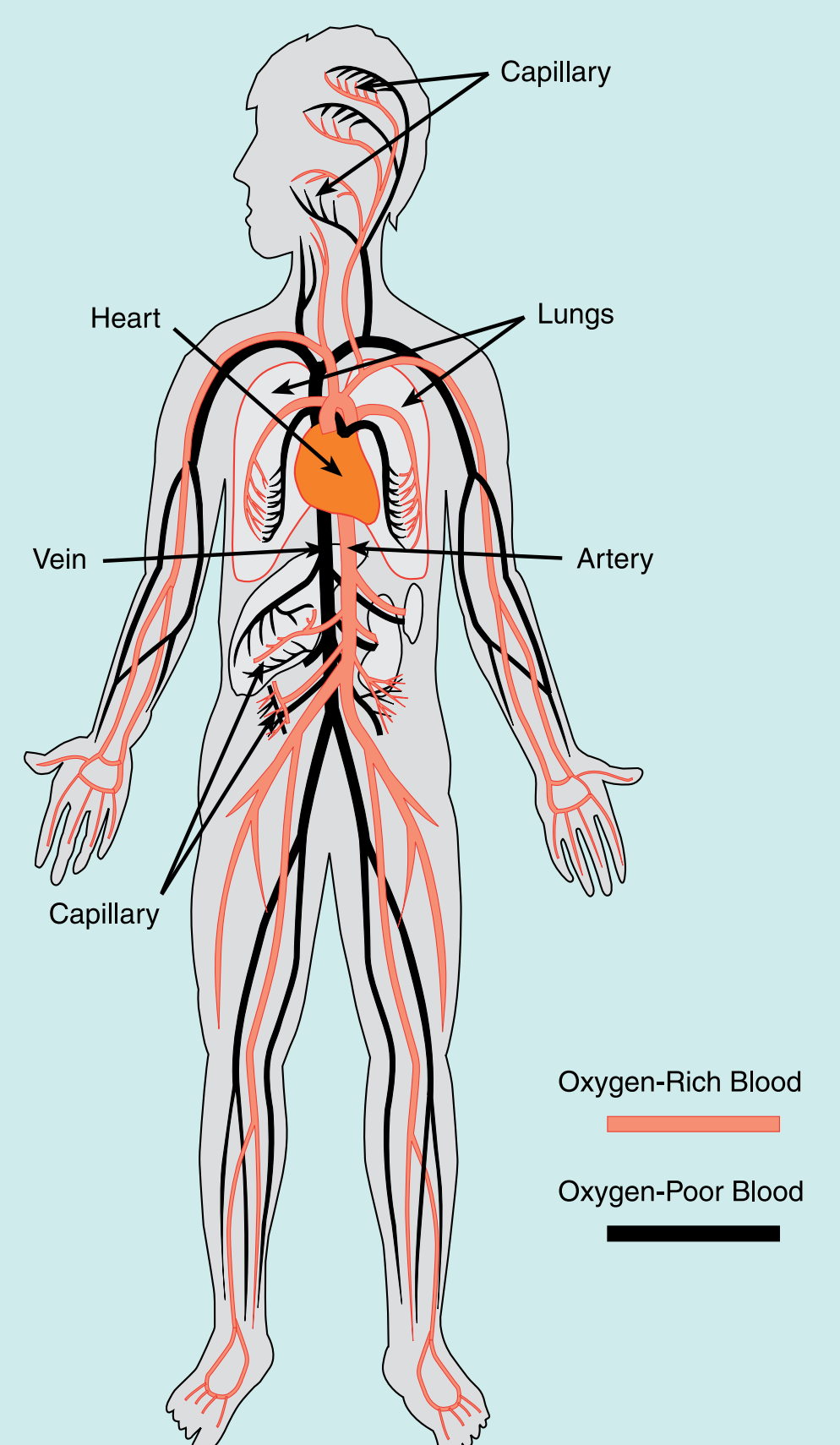
The hard working leg muscle cells are using up lots of oxygen and nutrients and creating lots of waste

A Closer Look at Your Blood



The red blood cells (carriers of oxygen) are shown in red; a white blood cell (disease fighter) is shown in white; and the platelets (blood clotting helpers) are shown in blue.

The Circulatory System

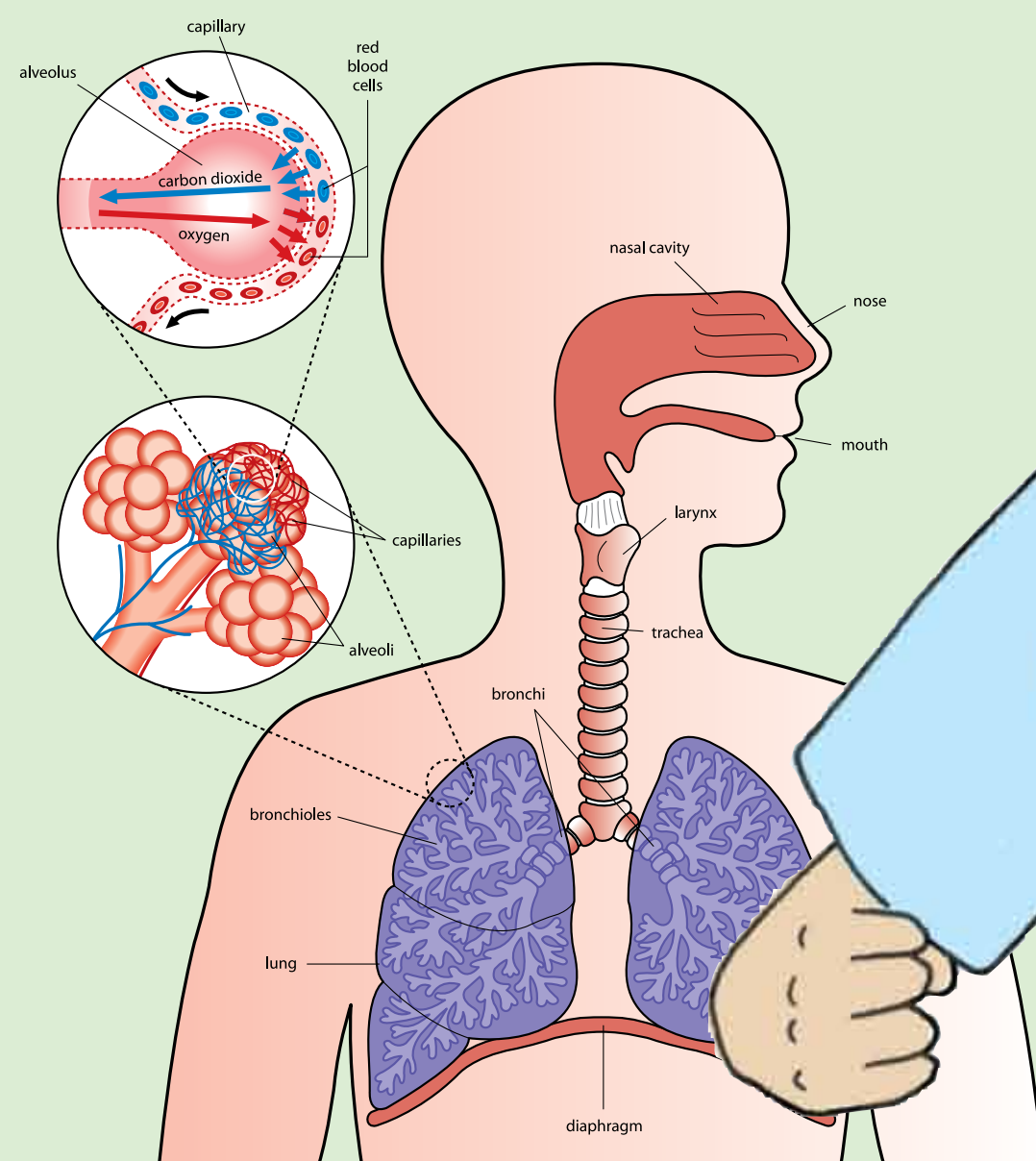


ScienceCompanion®
CHICAGO SCIENCE GROUP

2011 Edition. Copyright © 2005 Chicago Science Group.
All Rights Reserved.
www.sciencecompanion.com

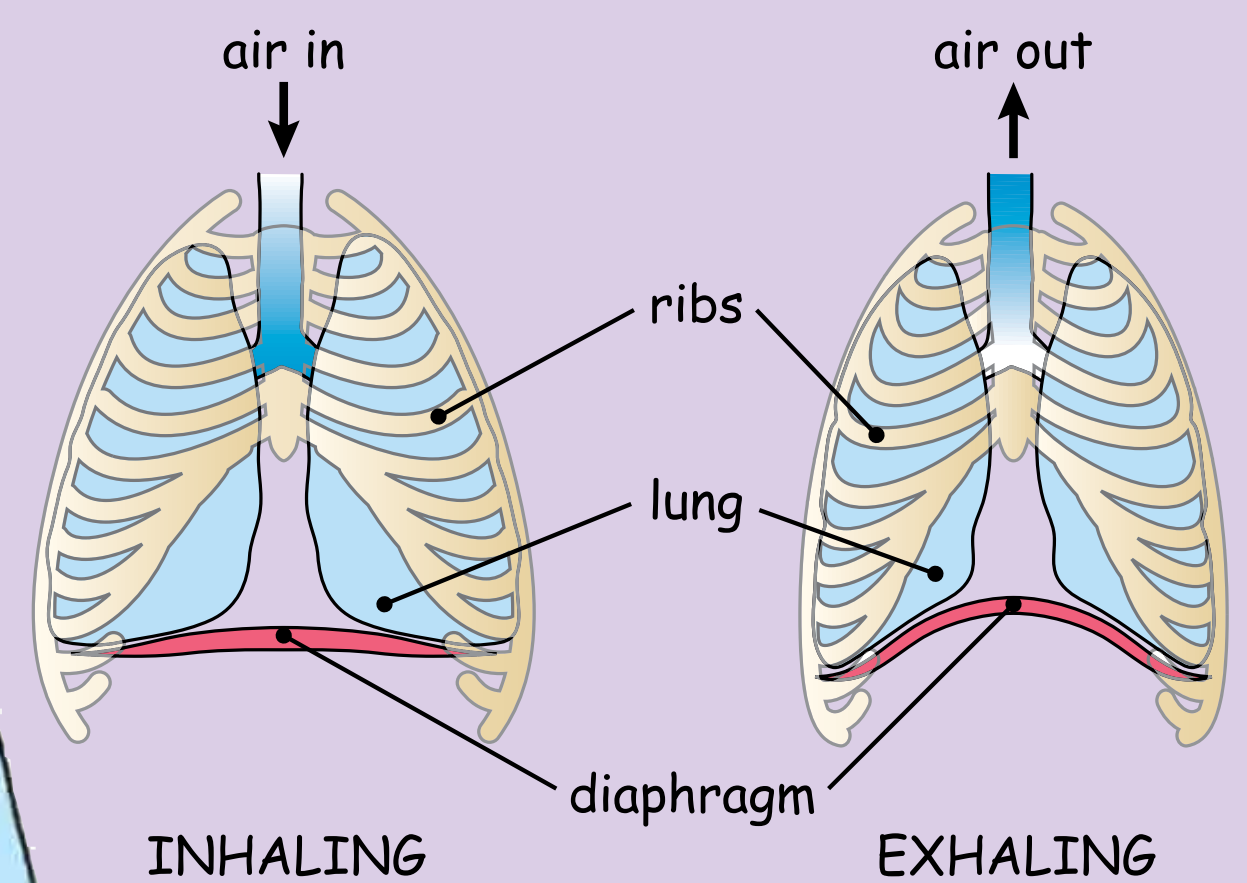
The Respiratory System and Movement

A Closer Look at Your Respiratory System



In the alveoli, blood cells “pick up” oxygen and “drop off” carbon dioxide waste.

Breathing In and Out

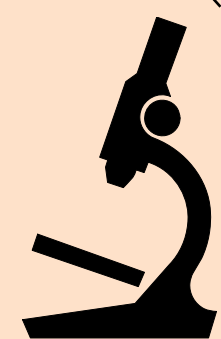


When you breathe, your ribs and diaphragm move, pulling air in, and pushing air out.

Breathing takes place harder and faster to bring in more oxygen for active muscle cells and remove their increased carbon dioxide waste

The hard working leg muscles are using up lots of oxygen and nutrients and creating lots of waste

How the Respiratory System Keeps Clean



Goblet cells lining your airways make and release lots of sticky mucus that traps harmful particles carried in the air.

Ciliated epithelial cells are cells with thousands of tiny finger-like structures on their surface that sweep “dirty” mucus (shown in blue) out of the respiratory airways.

ScienceCompanion®
CHICAGO SCIENCE GROUP

2011 Edition. Copyright © 2005 Chicago Science Group.
All Rights Reserved.
www.sciencecompanion.com

The Digestive System and Movement

1 | Mouth: Teeth grind food up into small pieces.

2 | Salivary Glands: Saliva flows from these glands into your mouth. Enzymes in the saliva start breaking down carbohydrates.

3 | Esophagus: The swallowed “ball” of food is squeezed from behind to push it towards the stomach.

4 | Stomach: Stomach enzymes, “turned on” by acids, begin breaking down proteins. Strong muscles “knead” the food, mixing in the enzymes and turning the food to mush.

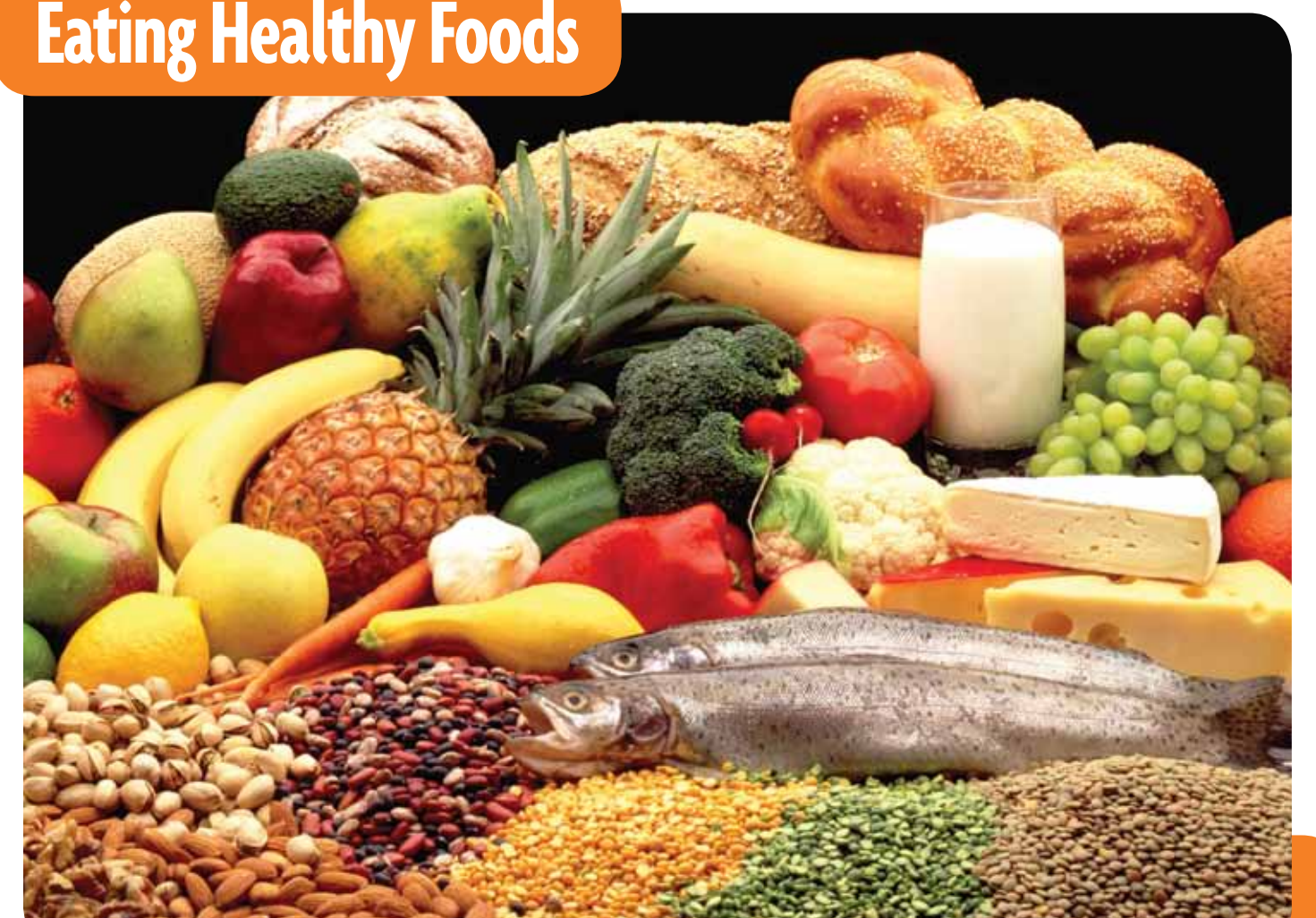
Liver
Gall Bladder
Pancreas

5 | Small Intestine: More enzymes and digestive juices are added to the mush (some of these come from the liver, gall bladder, and pancreas). Fats and the remaining proteins and carbohydrates are digested into simpler forms. The food is now in a form small and simple enough to pass into the blood.

6 | Large Intestine: Undigested food (such as fiber) becomes a stool as water is absorbed from it and passed to the blood.

7 | Rectum: The stool is stored here until its time to “go to the bathroom.”

Eating Healthy Foods

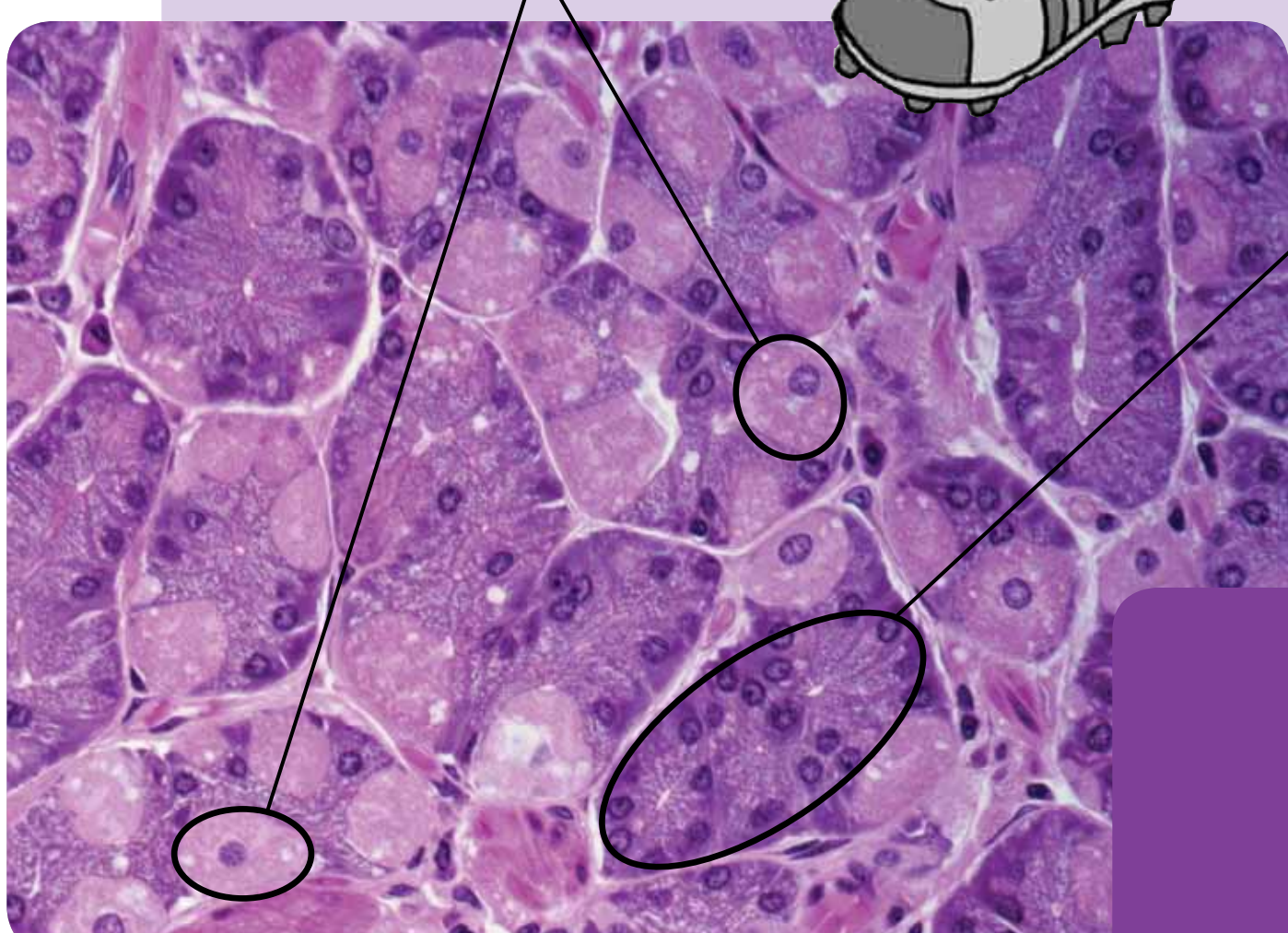


Choose from foods such as these to create healthy meals: whole grains, fruits, vegetables, proteins (fish and legumes), and dairy (milk and cheese).

A Closer Look Inside Your Stomach

Parietal cells

A group of chief cells



In this image, two cells that line the stomach are working together to help the body digest protein. The parietal cells, shown in pink, produce an acid that “turns on” the enzymes made by the chief cells, shown in purple.

ScienceCompanion®
CHICAGO SCIENCE GROUP

2011 Edition. Copyright © 2005 Chicago Science Group.
All Rights Reserved.
www.sciencecompanion.com

How the Human Body is Organized

