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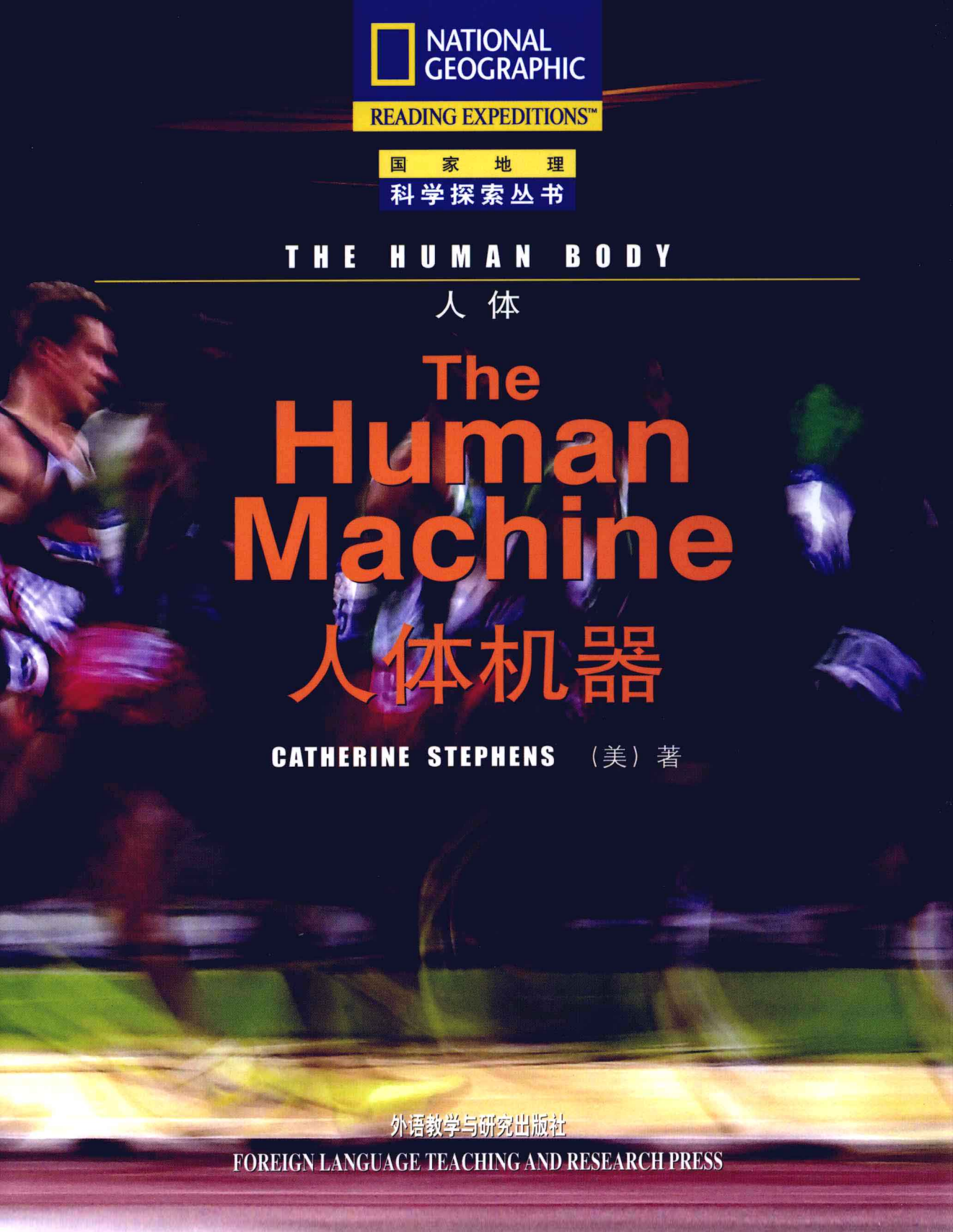
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国家地理

科学探索丛书

THE HUMAN BODY

人体



The
Human
Machine

人体机器

CATHERINE STEPHENS (美) 著

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马辰威 注

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如果你希望读到地道的英语，在享受英语阅读乐趣的同时又能增长知识、开拓视野，这套由外语教学与研究出版社与美国国家地理学会合作出版的“国家地理科学探索丛书”正是你的选择。

“国家地理科学探索丛书”分为9个系列，内容涉及自然科学和社会研究，秉承《国家地理》杂志图文并茂的特色，书中配有大量精彩的图片，文字通俗易懂、深入浅出，将科学性和趣味性完美结合，称得上是一套精致的小百科。

这套丛书以英文注释形式出版，注释由国内重点中学教学经验丰富的英语教师完成。特别值得推荐的是本套丛书在提高青少年读者英语阅读能力的同时，还注重培养他们的科学探索精神、动手能力、逻辑思维能力和沟通能力。

本丛书既适合学生自学，又可用于课堂教学。丛书各个系列均配有一本教师用书，内容包括背景知识介绍、技能训练提示、评估测试、多项选择题及答案等详尽的教学指导，是对课堂教学的极好补充。

本套丛书是适合中学生及英语爱好者的知识读物。

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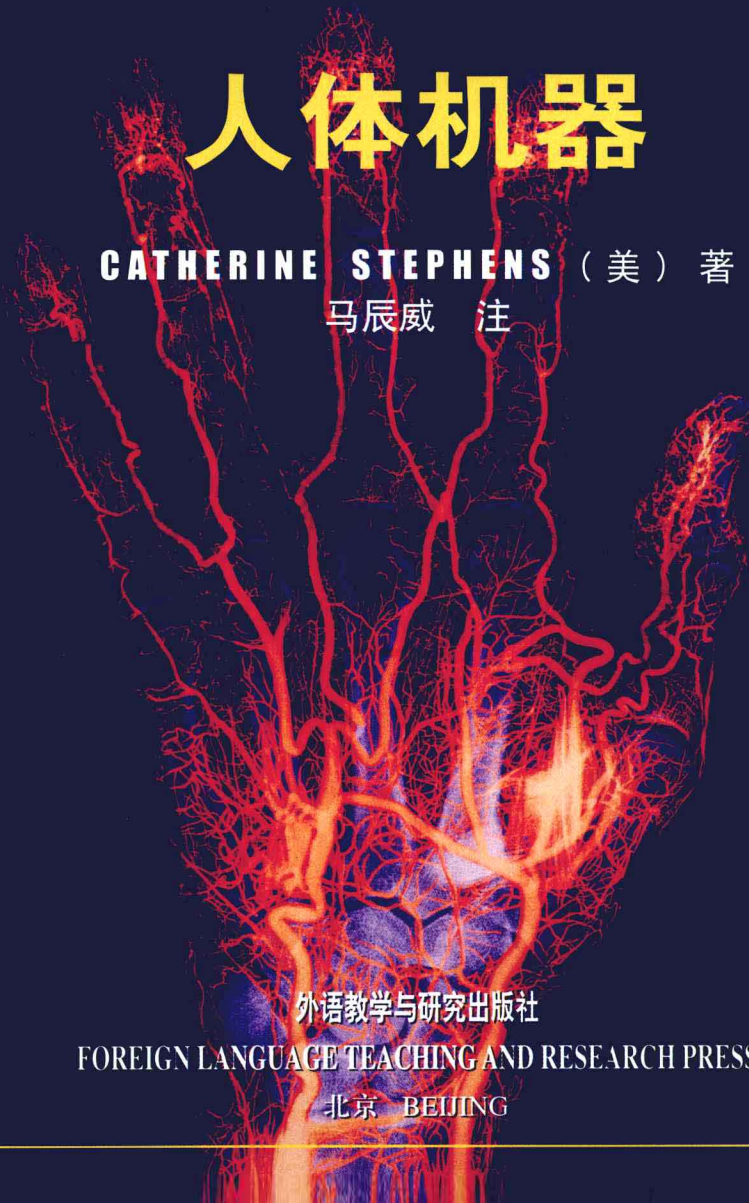
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更快、更高、更强



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Introduction

引言

Every Body Is a Winner

每个身体都是赢家



The seconds were flying by ... 30 seconds ... then 45.... Megan Quann was swimming as fast as she could. Would it be fast enough? Would she reach the finish line¹ first?



The Olympic aquatic center² buzzed³ with noise. The fans⁴ were cheering⁵, but Megan focused on⁶ her form⁷—stroke⁸, stroke, breathe⁹, stroke. This 100-meter breaststroke¹⁰ race was her best event¹¹.

At the 50-meter mark, Megan was in third place. But she swam a furious¹² final lap¹³, and then it was over. The race was so close that Megan didn't know the results until she looked up at the scoreboard¹⁴. It read: **1. Megan Quann, U.S.A.** She had won the gold medal¹⁵! Megan, a teenager¹⁶ from Puyallup, Washington, had traveled to the 2000 Olympic Games to win a gold medal. She had trained hard and her body met the challenge¹⁷.

Whether you're winning Olympic medals, riding your bike, or simply sitting on the couch¹⁸, your body is at work. Like a complex¹⁹ machine, your body parts work together to keep you breathing and moving.

This is a book about the body—the human machine. It's about Megan's body, your body, and every human body on the planet²⁰. Because on the inside, our bodies all work pretty much the same way.

1. finish line	终点线	11. event	<i>n.</i>	(运动)项目
2. Olympic aquatic center	奥林匹克水上运动中心	12. furious	<i>adj.</i>	飞快的
3. buzz	<i>v.</i> 噉噉噉噉	13. lap	<i>n.</i>	一个来回
4. fan	<i>n.</i> 狂热爱好者; 迷	14. scoreboard	<i>n.</i>	计分板
5. cheer	<i>v.</i> 欢呼	15. gold medal		金牌
6. focus on	专注于	16. teenager	<i>n.</i>	13 – 19 岁的青少年
7. form	<i>n.</i> 动作	17. challenge	<i>n.</i>	挑战
8. stroke	<i>v.</i> 划水	18. couch	<i>n.</i>	长沙发
9. breathe	<i>v.</i> 呼吸	19. complex	<i>adj.</i>	复杂的
10. breaststroke	<i>n.</i> 蛙泳	20. planet	<i>n.</i>	行星(此处指地球)

Chapter 1

第一章

The Inside Story

身体内部的故事



Blood cells¹
(magnified² 1,015 times)



1. blood cell

血细胞

2. magnify

v.

放大

Imagine¹ you could peek² inside your body. What would you see? Bones³ and blood? A beating heart? Yes. But there is more. Much more.

Long ago, people could only guess at the inner⁴ workings of the human body. The invention⁵ of the microscope⁶ helped to change that. Scientists began examining bits of⁷ the body in detail⁸. One of the first things they discovered was that our bodies are made of tiny⁹ parts called cells.

Millions and Millions of Cells

The microscopic amoeba¹⁰ that oozes¹¹ along the pond¹² floor has only one cell. Bigger creatures¹³, such as beetles¹⁴, have tens of thousands of cells. All living plants and animals are made of many cells.

Your body has millions and millions of cells, but they're not all the same. There are bone cells, blood cells, brain¹⁵ cells, and cells for every part of your body. Each kind of cell has a certain job to do. Groups of different kinds of cells that work together to perform¹⁶ a specific¹⁷ job are called organs¹⁸. Your stomach and your heart, for example, are two organs in your body.

Organs that work together form a system¹⁹. Your body has many systems. Each system performs one major²⁰ job, such as breathing or moving. The systems in your body work to keep your body active²¹ and healthy.

1. imagine	v.	想像; 设想	12. pond	n.	池塘
2. peek	v.	窥视	13. creature	n.	生物
3. bone	n.	骨骼	14. beetle	n.	甲虫
4. inner	adj.	内部的	15. brain	n.	脑
5. invention	n.	发明	16. perform	v.	执行
6. microscope	n.	显微镜	17. specific	adj.	特定的
7. bit	n.	一小部分	18. organ	n.	器官
8. in detail		详细地	19. system	n.	系统
9. tiny	adj.	微小的	20. major	adj.	主要的
10. amoeba	n.	变形虫	21. active	adj.	活跃的
11. ooze	v.	冒出			

Red and white blood cells

Q When I think about food, my mouth waters. Why?

A Your brain is “telling” your salivary glands to make extra³¹ saliva. In your lifetime, you’ll make enough saliva to fill about 200 bathtubs³².

Q My stomach makes a lot of noise. What’s all the rumbling³³?

A Before and after you eat, gases³⁴ can be produced. These gases make noise as they gurgle³⁵ along.

Q Why do I burp³⁶?

A Gases from digesting, as well as the air that you swallow while you eat, can build up³⁷ in your stomach. When there’s no room left, some of the gas can come back up in the form of a burp.

Where Does It Go?

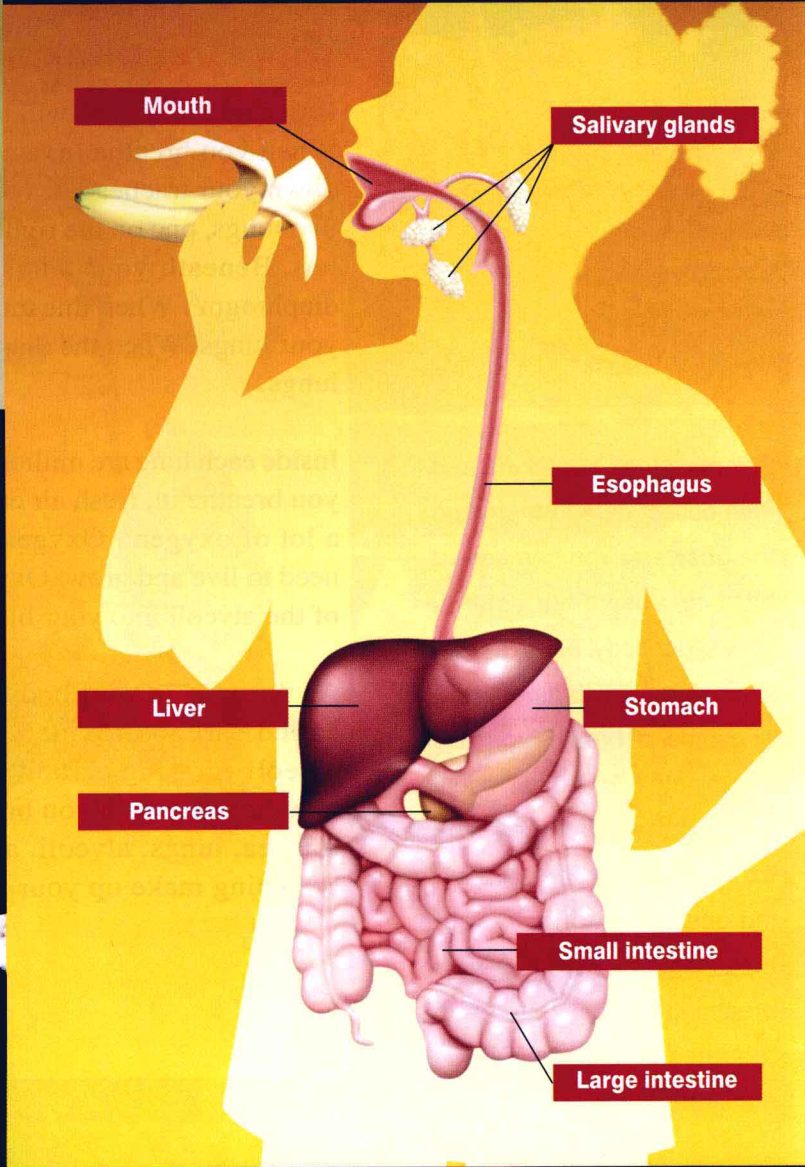
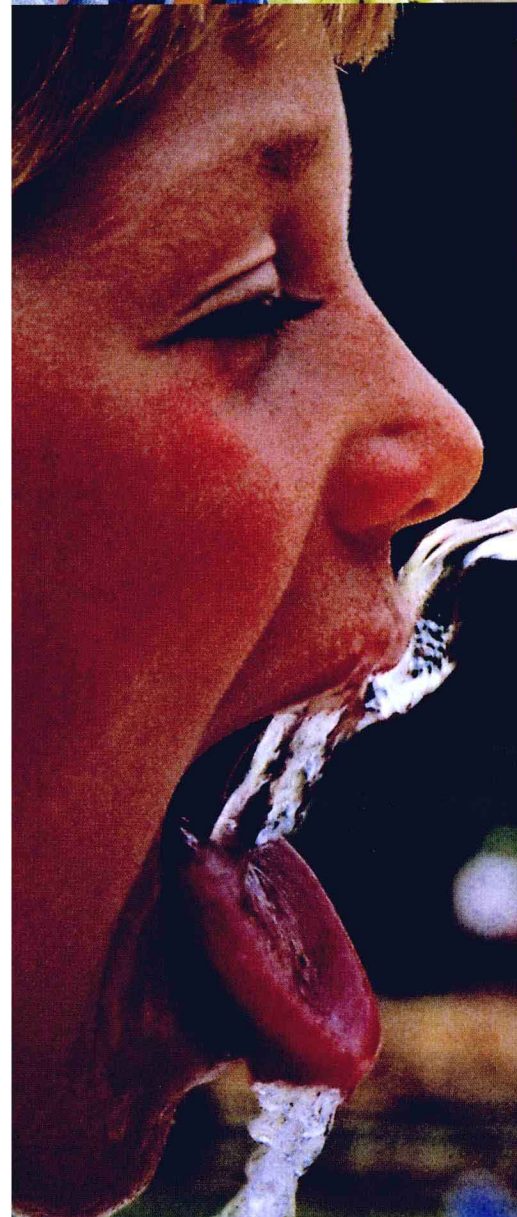
You’re sitting at lunch, finishing that last bit of sandwich and chomping¹ on your apple. Then you head outside to play. In a few minutes, you’re probably talking with friends and not thinking about the food you just ate. While you’ve moved on to other things, your body’s digestive system² is hard at work.

Digestion starts in the mouth, where your teeth cut and grind³ food into small pieces. Saliva⁴, made by the salivary glands⁵, wets and softens⁶ food. When you swallow⁷, the food squeezes⁸ down a long tube⁹, called the esophagus¹⁰, into your stomach. The stomach churns¹¹ your food and adds a digestive juice that turns the food into a soupy¹² liquid¹³. Muscles¹⁴ move the liquid into the small intestine¹⁵.

In the small intestine, more digestive juices break food into tiny particles¹⁶ called nutrients¹⁷. These digestive juices are made by organs, such as the liver¹⁸ and pancreas¹⁹, and delivered²⁰ to the small intestine. Lining²¹ the small intestine are millions of fingerlike structures²² called villi²³. Villi capture²⁴ nutrients that are eventually²⁵ carried away to feed the cells in your body. Any undigested²⁶ food moves on to the large intestine where water is absorbed²⁷. The remaining²⁸ material²⁹ leaves the body as waste³⁰.

1. chomp	v.	咀嚼; 咬	20. deliver	v.	输送
2. digestive system		消化系统	21. line	v.	加衬里
3. grind	v.	磨(碎); 碾(碎)	22. structure	n.	结构
4. saliva	n.	唾液; 口水	23. villi	n.	绒毛
5. salivary gland		唾液腺	24. capture	v.	捕获
6. soften	v.	使……变软	25. eventually	adv.	最后
7. swallow	v.	吞咽	26. undigested	adj.	未消化的
8. squeeze	v.	挤	27. absorb	v.	吸收
9. tube	n.	管道	28. remaining	adj.	剩下的
10. esophagus	n.	食道	29. material	n.	物质
11. churn	v.	搅动	30. waste	n.	粪便
12. soupy	adj.	汤状的	31. extra	adj.	额外的
13. liquid	n.	液体	32. bathtub	n.	浴缸
14. muscle	n.	肌肉	33. rumble	v.	咕噜声
15. small intestine		小肠	34. gas	n.	胃气; 肠气
16. particle	n.	微粒	35. gurgle	v.	汩汩地流
17. nutrient	n.	营养物	36. burp	v.	打嗝
18. liver	n.	肝脏	37. build up		积累
19. pancreas	n.	胰腺			

Digestive System





Thinking Like a Scientist: Collecting Data¹³

Scientists ask questions and then collect data to try to find the answers. You can collect data to answer questions about your body. For example, what is your breathing rate¹⁴, or number of breaths you take in a minute? To find out, count the number of times you exhale¹⁵, or breathe out, during one minute. This is your breathing rate. How does your breathing rate compare¹⁶ with the rates of other animals in the chart¹⁷?

Breathing Rates of Animals While at Rest

Animal	Breathing Rate (breaths per minute)
Blue Whale ¹⁸	4
Cat	26
Chipmunk ¹⁹	65
Guinea Pig ²⁰	90
Horse	10
Mouse	135

Your Breathtaking¹ Body

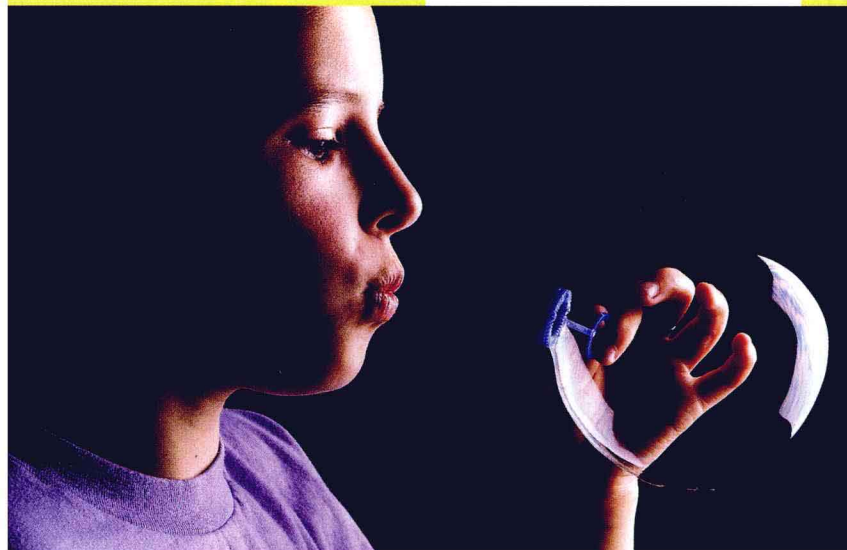
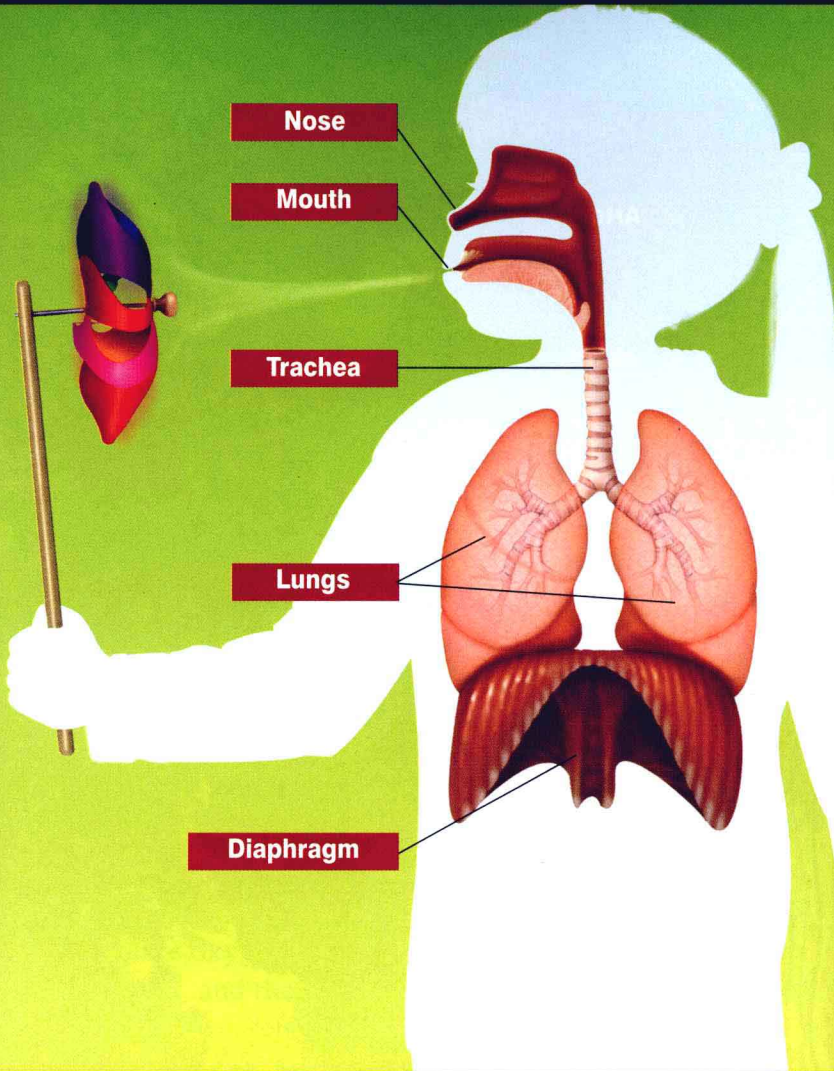
In a single² day, you will take close to 20,000 breaths of air. When you breathe in, air travels into your mouth or nose, down your trachea³, or windpipe⁴, to your lungs⁵. You have two lungs, one on the right side of your body and one on the left. Beneath your lungs is a sheet of muscle called the diaphragm⁶. When this muscle moves down, air moves into your lungs. When the diaphragm moves up, air leaves your lungs.

Inside each lung are millions of air sacs⁷ called alveoli⁸. When you breathe in, fresh air enters the alveoli. This air contains a lot of oxygen⁹. Oxygen is a gas that cells in your body need to live and grow. Oxygen passes through the thin walls of the alveoli into your blood.

As the cells in your body use oxygen, they release¹⁰ a gas called carbon dioxide¹¹. Red blood cells return to your alveoli carrying carbon dioxide. You get rid of this carbon dioxide when you breathe out. Working together, the trachea, lungs, alveoli, and other body parts involved in breathing make up your respiratory system¹².

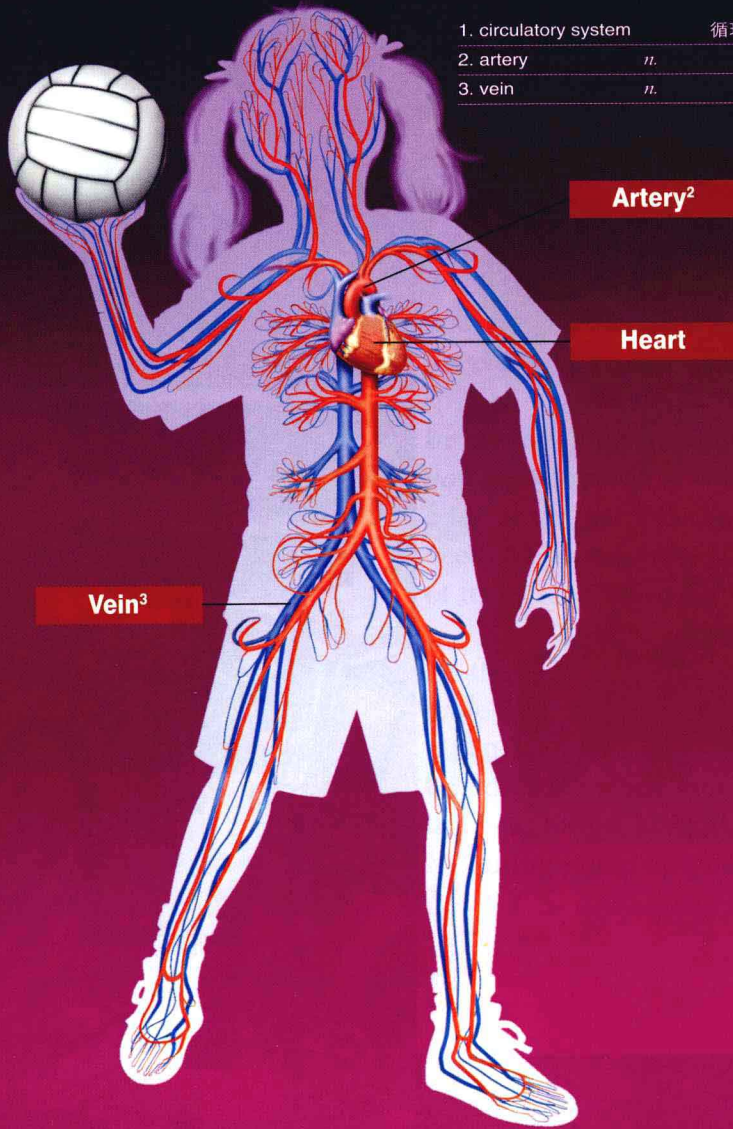
1. breathtaking	adj.	惊人的; 非凡的	11. carbon dioxide	二氧化碳
2. single	adj.	一个的	12. respiratory system	呼吸系统
3. trachea	n.	气管	13. datum	n. (pl. data) 数据
4. windpipe	n.	气管	14. rate	n. 频率
5. lung	n.	肺	15. exhale	v. 呼气
6. diaphragm	n.	膈膜	16. compare	v. 比较
7. air sac		气囊	17. chart	n. 图表
8. alveoli	n.	肺泡	18. blue whale	蓝鲸
9. oxygen	n.	氧气	19. chipmunk	n. 花鼠; 金花鼠
10. release	v.	释放	20. guinea pig	豚鼠; 天竺鼠

Respiratory System



Circulatory System¹

- | | | |
|-----------------------|-----------|------|
| 1. circulatory system | <i>n.</i> | 循环系统 |
| 2. artery | <i>n.</i> | 动脉 |
| 3. vein | <i>n.</i> | 静脉 |



Your Beating Heart

Make a fist¹ with your hand. This is about the size of your heart. Now clench² your fist and let go. Do this about 20 times. This action³ is similar⁴ to the way a heart beats. Is your hand tired? The cool⁵ thing about a healthy heart is that it doesn't get tired. Day in and day out⁶, your heart keeps beating.

How Blood Circulates⁷

Your heart pumps⁸ blood throughout your body. With every heartbeat, blood surges⁹ out of your heart and into tubes called blood vessels¹⁰. When blood leaves the heart, it enters blood vessels called arteries. The arteries divide into smaller and smaller blood vessels that carry blood to all parts of your body. The smallest kind of blood vessel in your body is the capillary¹¹. Capillaries are so small that you need a microscope to see them. Blood vessels called veins carry blood back to your heart.

Blood always circulates around your body in the same direction. Blood leaves the heart, travels to each of the cells in your body, and returns to the heart with much less oxygen. The heart then pumps this blood to the lungs to get more oxygen. The oxygen-rich blood travels back to the heart, and the cycle begins all over again. Your heart and blood vessels make up your circulatory system.

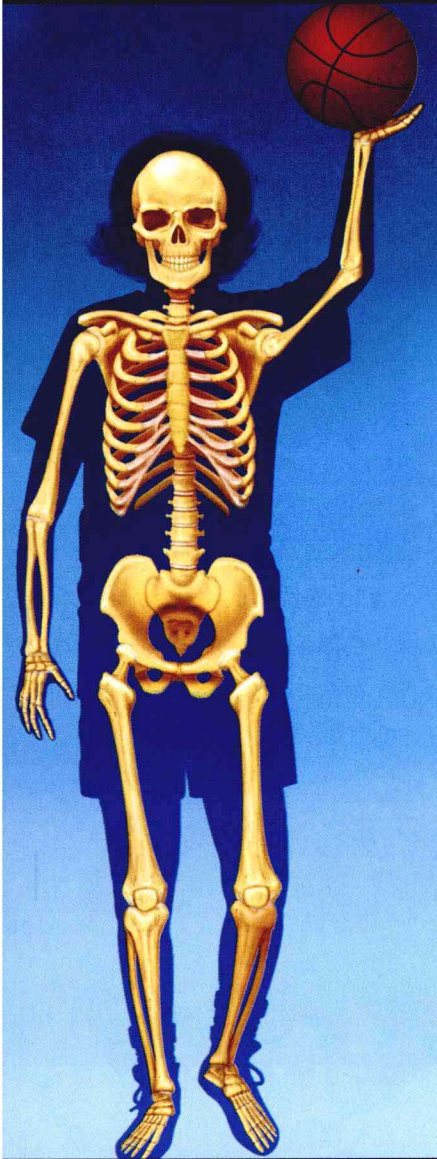
...what's in blood, and why it's red?

About half your blood is water that contains¹² dissolved sugar¹³, salt, and other chemicals¹⁴. The rest is made up of mostly disease-fighting white blood cells, sticky¹⁵ pieces of cells called platelets¹⁶, and many millions of red blood cells. Iron in red blood cells gives human blood its red color. But not every animal has red blood. A lobster¹⁷'s blood, which does not have iron, is blue!



1. make a fist		攥拳
2. clench	v.	握紧
3. action	n.	动作
4. similar	adj.	类似的
5. cool	adj.	极好的; 绝妙的
6. day in and day out		天天
7. circulate	v.	流通
8. pump	v.	抽吸
9. surge	v.	涌动

10. blood vessel		血管
11. capillary	n.	毛细血管
12. contain	v.	包含
13. dissolved sugar		溶解糖
14. chemical	n.	化学物
15. sticky	adj.	黏性的
16. platelet	n.	血小板
17. lobster	n.	龙虾



Body of Bones

Now you know how your body digests food and circulates blood. But what makes your body move? Part of the answer lies under your skin¹—your bones.

Job List for Bones

Your body has lots of bones. An adult² has 206 bones. And the bones in your body do many jobs.

Support³ the Body Like the wooden beams⁴ holding up a house, bones help support your body.

Protect⁵ the Inner Organs Many of the bones in your body also protect your organs. The bones of the skull⁶ protect the brain. The curved rib⁷ bones form a protective cage⁸ around the heart, lungs, and other organs in your chest.

Grow Blood Cells Inside your bones is a soft material called bone marrow⁹. It makes blood cells that carry nutrients to other cells in your body. It also makes other cells that fight harmful germs¹⁰ that get into your body.

Between the Bones

Most bones in your body connect¹¹ to other bones. Where bones meet, there is a joint¹². Your body has different kinds of joints that let the body move in different ways.

X-ray¹⁴ of knee joint¹⁵



1. skin	<i>n.</i>	皮肤	9. bone marrow	<i>n.</i>	骨髓
2. adult	<i>n.</i>	成年人	10. germ	<i>n.</i>	病菌；细菌
3. support	<i>v.</i>	支撑	11. connect	<i>v.</i>	连接
4. beam	<i>n.</i>	横梁	12. joint	<i>n.</i>	关节
5. protect	<i>v.</i>	保护	13. skeletal system	<i>n.</i>	骨骼系统
6. skull	<i>n.</i>	头骨	14. X-ray	<i>n.</i>	X射线
7. curved rib	<i>n.</i>	曲肋	15. knee joint	<i>n.</i>	膝关节
8. cage	<i>n.</i>	骨架构造			