



NATIONAL  
GEOGRAPHIC

READING EXPEDITIONS™

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

外语教学与研究出版社

FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

(京)新登字 155 号

京权图字: 01 - 2003 - 3257

图书在版编目(CIP)数据

人体 人体机器/(美)斯蒂芬斯(Stephens, C.)著;马辰威注. —北京:外语教学与研究出版社, 2003. 10

(国家地理科学探索丛书·自然科学系列)

ISBN 7-5600-3775-5

I. 人… II. ①斯… ②马… III. 英语—语言读物, 人体学 IV. H319.4:Q

中国版本图书馆 CIP 数据核字(2003)第 096720 号

Copyright © (2002) National Geographic Society. All rights reserved.

Copyright © (2003) (in English-Chinese bilingual) National Geographic Society. All rights reserved.

国家地理科学探索丛书(英文注释版)由美国北极星传媒有限公司策划并授权出版。

人体

人体机器

CATHERINE STEPHENS (美) 著

马辰威 注

\* \* \*

责任编辑: 余 军

出版发行: 外语教学与研究出版社

社 址: 北京市西三环北路 19 号 (100089)

网 址: <http://www.fltp.com>

印 刷: 北京瑞宝画中画印刷有限公司

开 本: 740×975 1/16

印 张: 2

版 次: 2003 年 12 月第 1 版 2003 年 12 月第 1 次印刷

书 号: ISBN 7-5600-3775-5/H·1906

定 价: 5.90 元

\* \* \*

如有印刷、装订质量问题出版社负责调换

制售盗版必究 举报查实奖励 (010)68917826

版权保护办公室举报电话: (010)68917519

---

## 致读者

---

**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。

 NATIONAL  
GEOGRAPHIC

国 家 地 理

科学探索丛书

T H E H U M A N B O D Y

人 体

# The Human Machine

## 人体机器

CATHERINE STEPHENS (美) 著

马辰威 注

外语教学与研究出版社

FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

北京 BEIJING





## Contents 目录

### Introduction ..... 4

#### 引言

*Every Body Is a Winner*

每个身体都是赢家

### Chapter 1 ..... 6

#### 第一章

*The Inside Story*

身体内部的故事

### Picture This ..... 16

#### 读图地带

*Amazing Systems*

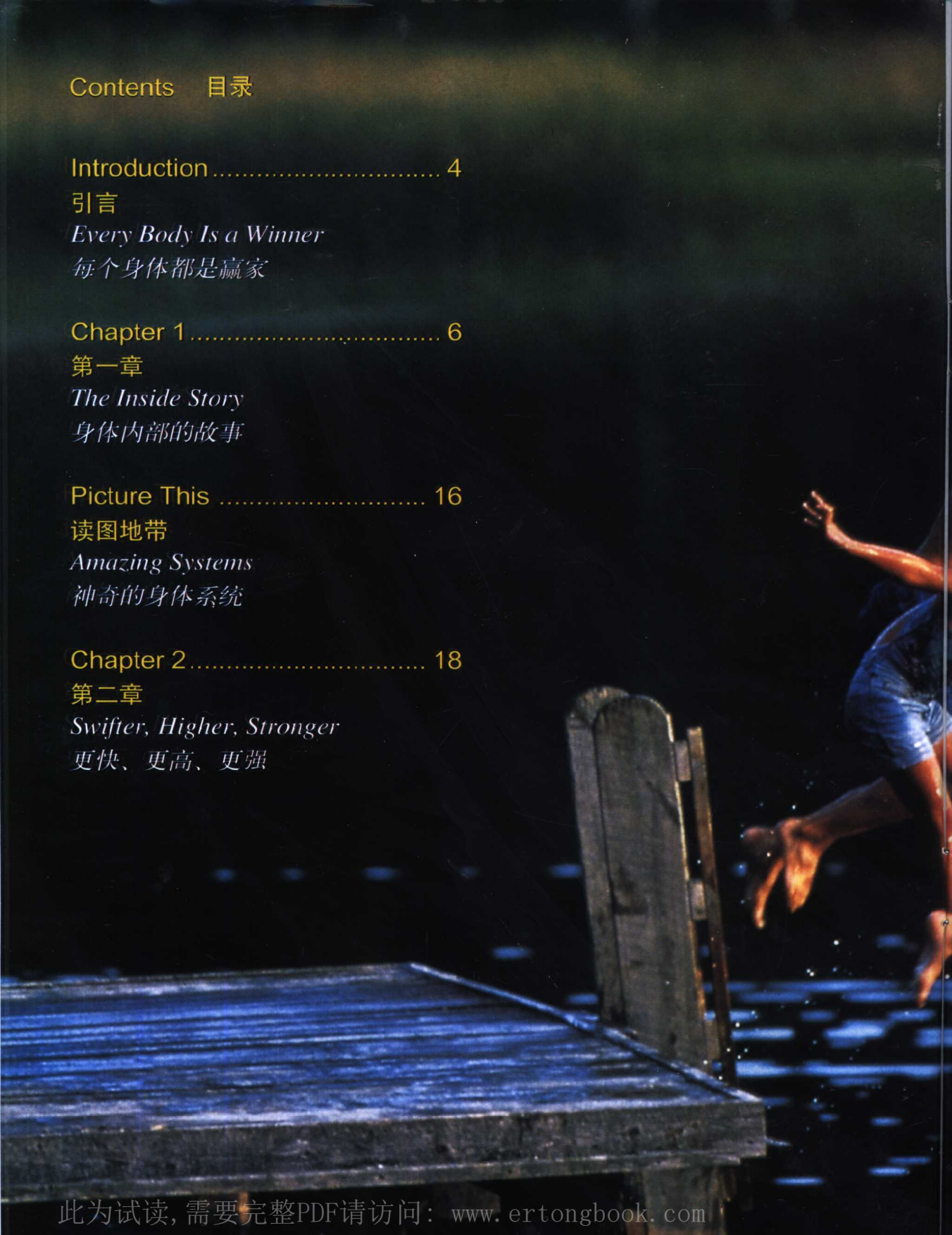
神奇的身体系统

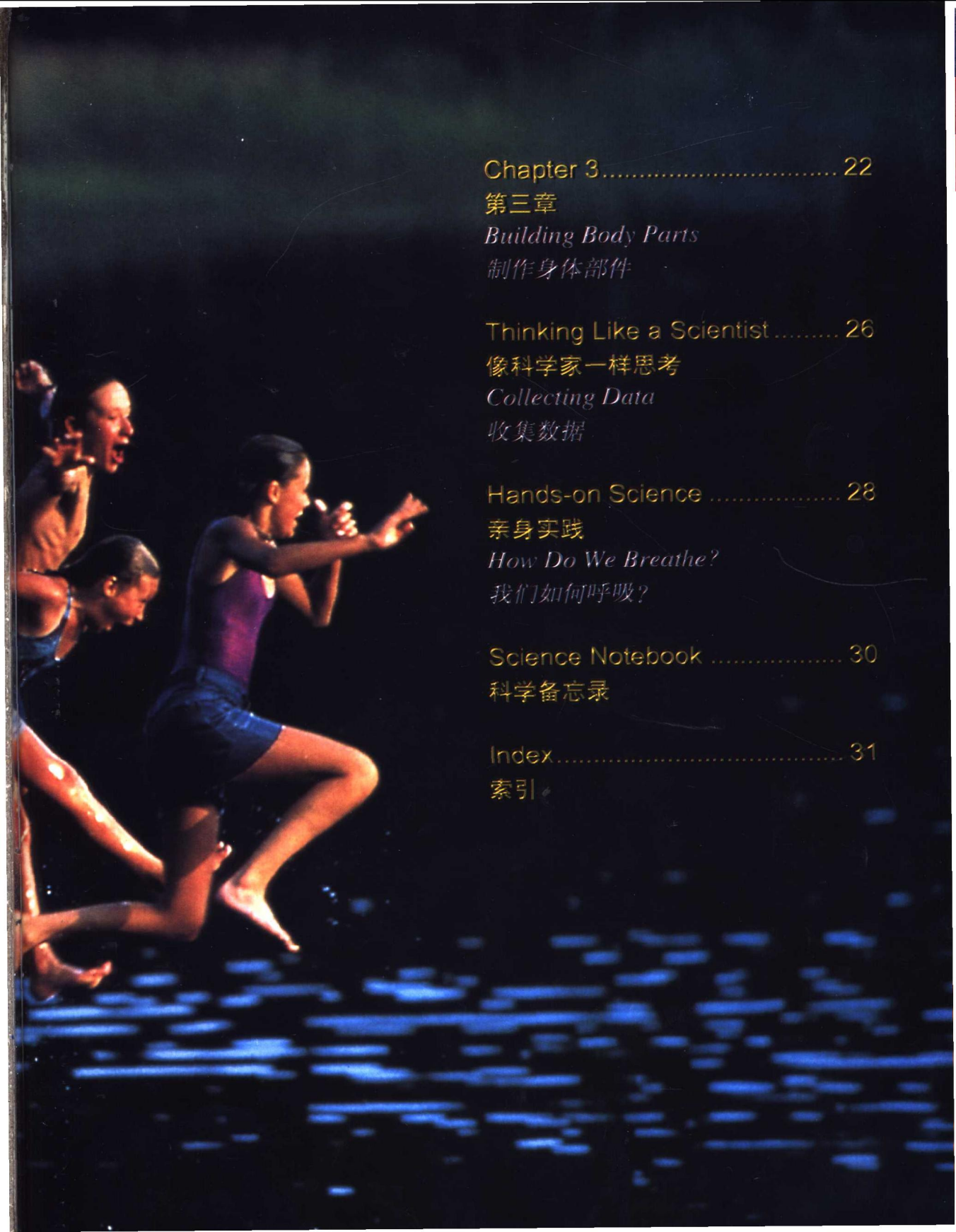
### Chapter 2 ..... 18

#### 第二章

*Swifter, Higher, Stronger*

更快、更高、更强





Chapter 3..... 22

第三章

*Building Body Parts*

制作身体部件

Thinking Like a Scientist..... 26

像科学家一样思考

*Collecting Data*

收集数据

Hands-on Science ..... 28

亲身实践

*How Do We Breathe?*

我们如何呼吸?

Science Notebook ..... 30

科学备忘录

Index..... 31

索引





## 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 line<sup>1</sup> first?**



The Olympic aquatic center<sup>2</sup> buzzed<sup>3</sup> with noise. The fans<sup>4</sup> were cheering<sup>5</sup>, but Megan focused on<sup>6</sup> her form<sup>7</sup>—stroke<sup>8</sup>, stroke, breathe<sup>9</sup>, stroke. This 100-meter breaststroke<sup>10</sup> race was her best event<sup>11</sup>.

At the 50-meter mark, Megan was in third place. But she swam a furious<sup>12</sup> final lap<sup>13</sup>, and then it was over. The race was so close that Megan didn't know the results until she looked up at the scoreboard<sup>14</sup>. It read: **1. Megan Quann, U.S.A.** She had won the gold medal<sup>15</sup>! Megan, a teenager<sup>16</sup> from Puyallup, Washington, had traveled to the 2000 Olympic Games to win a gold medal. She had trained hard and her body met the challenge<sup>17</sup>.

Whether you're winning Olympic medals, riding your bike, or simply sitting on the couch<sup>18</sup>, your body is at work. Like a complex<sup>19</sup> 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 planet<sup>20</sup>. 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

1. blood cell

血细胞

2. magnify

1x

放大

Blood cells<sup>1</sup>  
(magnified<sup>2</sup> 1,015 times)

**Imagine<sup>1</sup> you could peek<sup>2</sup> inside your body. What would you see? Bones<sup>3</sup> and blood? A beating heart? Yes. But there is more. Much more.**

Long ago, people could only guess at the inner<sup>4</sup> workings of the human body. The invention<sup>5</sup> of the microscope<sup>6</sup> helped to change that. Scientists began examining bits of<sup>7</sup> the body in detail<sup>8</sup>. One of the first things they discovered was that our bodies are made of tiny<sup>9</sup> parts called cells.

## Millions and Millions of Cells

The microscopic amoeba<sup>10</sup> that oozes<sup>11</sup> along the pond<sup>12</sup> floor has only one cell. Bigger creatures<sup>13</sup>, such as beetles<sup>14</sup>, 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, brain<sup>15</sup> 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 perform<sup>16</sup> a specific<sup>17</sup> job are called organs<sup>18</sup>. Your stomach and your heart, for example, are two organs in your body.

Organs that work together form a system<sup>19</sup>. Your body has many systems. Each system performs one major<sup>20</sup> job, such as breathing or moving. The systems in your body work to keep your body active<sup>21</sup> and healthy.

1. imagine	v.	想像; 设想
2. peek	v.	窥视
3. bone	n.	骨骼
4. inner	adj.	内部的
5. invention	n.	发明
6. microscope	n.	显微镜
7. bit	n.	一小部分
8. in detail		详细地
9. tiny	adj.	微小的
10. amoeba	n.	变形虫
11. ooze	v.	冒出

12. pond	n.	池塘
13. creature	n.	生物
14. beetle	n.	甲虫
15. brain	n.	脑
16. perform	v.	执行
17. specific	adj.	特定的
18. organ	n.	器官
19. system	n.	系统
20. major	adj.	主要的
21. active	adj.	活跃的

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 extra<sup>31</sup> saliva. In your lifetime, you’ll make enough saliva to fill about 200 bathtubs<sup>32</sup>.

**Q** My stomach makes a lot of noise. What’s all the rumbling<sup>33</sup>?

**A** Before and after you eat, gases<sup>34</sup> can be produced. These gases make noise as they gurgle<sup>35</sup> along.

**Q** Why do I burp<sup>36</sup>?

**A** Gases from digesting, as well as the air that you swallow while you eat, can build up<sup>37</sup> 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?

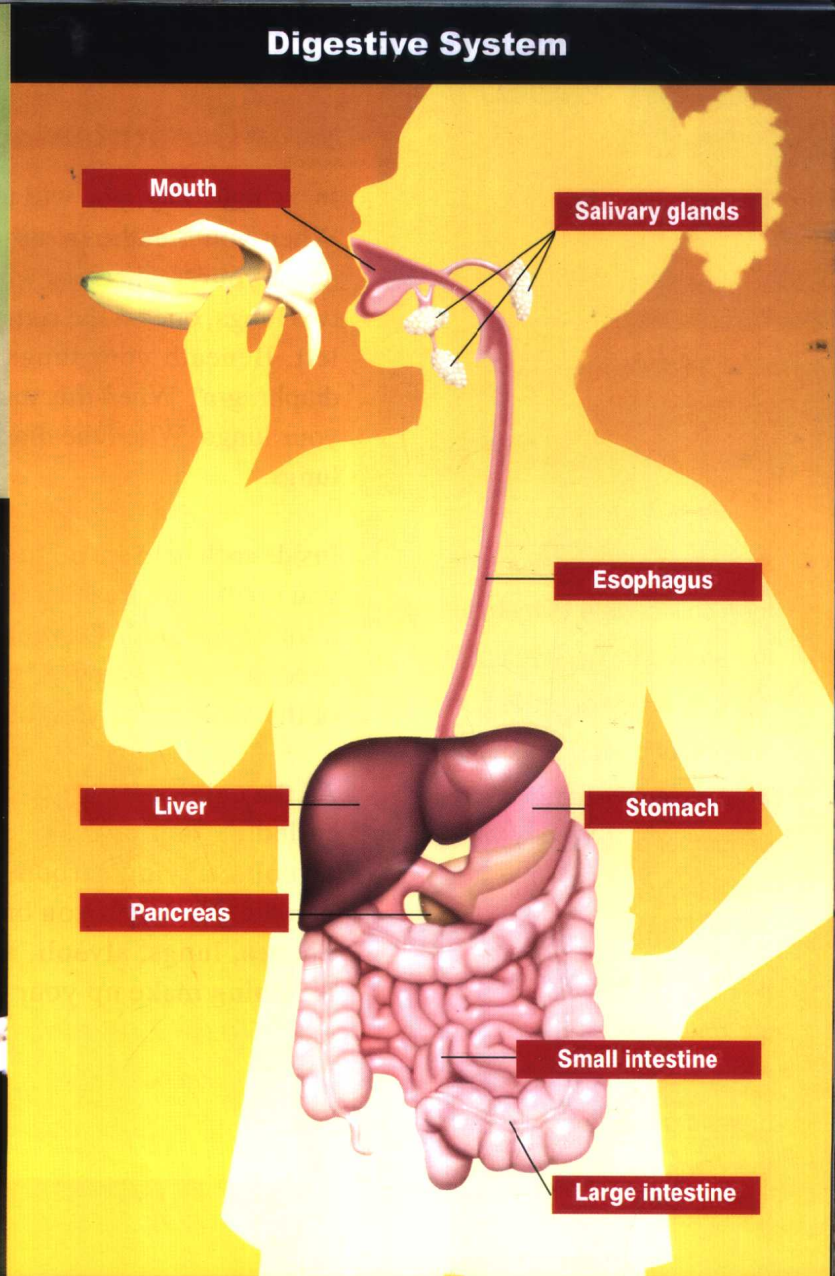
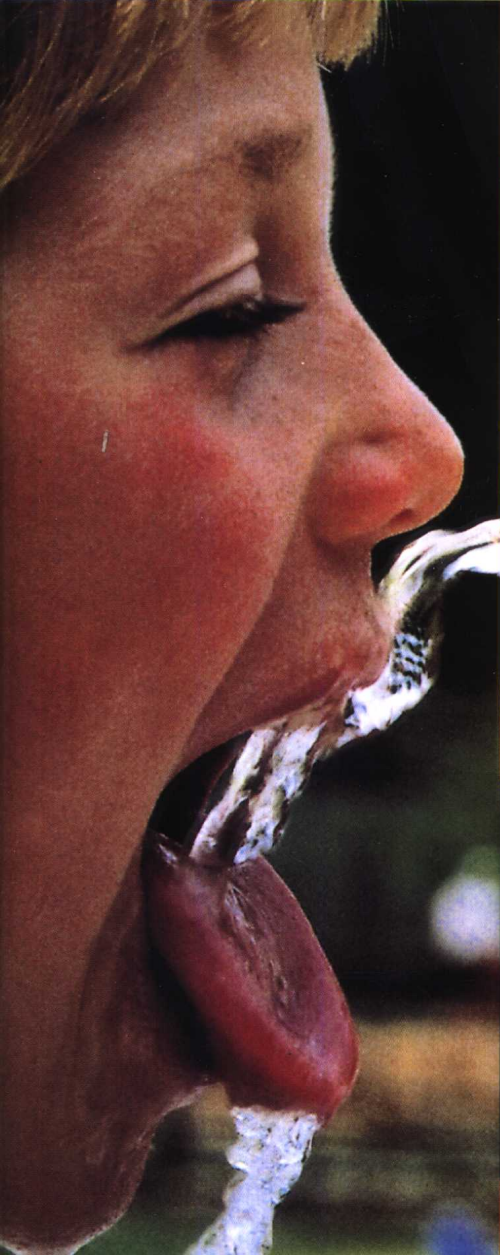
You’re sitting at lunch, finishing that last bit of sandwich and chomping<sup>1</sup> on your apple. Then you head outside to play. In a few minutes, you’re probably talking with friends and not thinking about the food you just ate. While you’ve moved on to other things, your body’s digestive system<sup>2</sup> is hard at work.

Digestion starts in the mouth, where your teeth cut and grind<sup>3</sup> food into small pieces. Saliva<sup>4</sup>, made by the salivary glands<sup>5</sup>, wets and softens<sup>6</sup> food. When you swallow<sup>7</sup>, the food squeezes<sup>8</sup> down a long tube<sup>9</sup>, called the esophagus<sup>10</sup>, into your stomach. The stomach churns<sup>11</sup> your food and adds a digestive juice that turns the food into a soupy<sup>12</sup> liquid<sup>13</sup>. Muscles<sup>14</sup> move the liquid into the small intestine<sup>15</sup>.

In the small intestine, more digestive juices break food into tiny particles<sup>16</sup> called nutrients<sup>17</sup>. These digestive juices are made by organs, such as the liver<sup>18</sup> and pancreas<sup>19</sup>, and delivered<sup>20</sup> to the small intestine. Lining<sup>21</sup> the small intestine are millions of fingerlike structures<sup>22</sup> called villi<sup>23</sup>. Villi capture<sup>24</sup> nutrients that are eventually<sup>25</sup> carried away to feed the cells in your body. Any undigested<sup>26</sup> food moves on to the large intestine where water is absorbed<sup>27</sup>. The remaining<sup>28</sup> material<sup>29</sup> leaves the body as waste<sup>30</sup>.

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			









## Thinking Like a Scientist: Collecting Data<sup>13</sup>

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 rate<sup>14</sup>, or number of breaths you take in a minute? To find out, count the number of times you exhale<sup>15</sup>, or breathe out, during one minute. This is your breathing rate. How does your breathing rate compare<sup>16</sup> with the rates of other animals in the chart<sup>17</sup>?

### Breathing Rates of Animals While at Rest

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

## Your Breathtaking<sup>1</sup> Body

In a single<sup>2</sup> day, you will take close to 20,000 breaths of air. When you breathe in, air travels into your mouth or nose, down your trachea<sup>3</sup>, or windpipe<sup>4</sup>, to your lungs<sup>5</sup>. 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 diaphragm<sup>6</sup>. 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 sacs<sup>7</sup> called alveoli<sup>8</sup>. When you breathe in, fresh air enters the alveoli. This air contains a lot of oxygen<sup>9</sup>. 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.

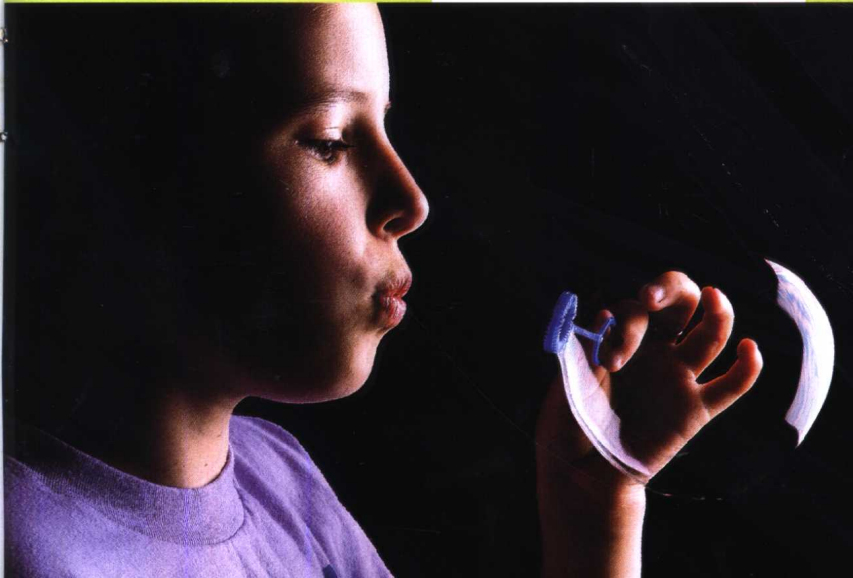
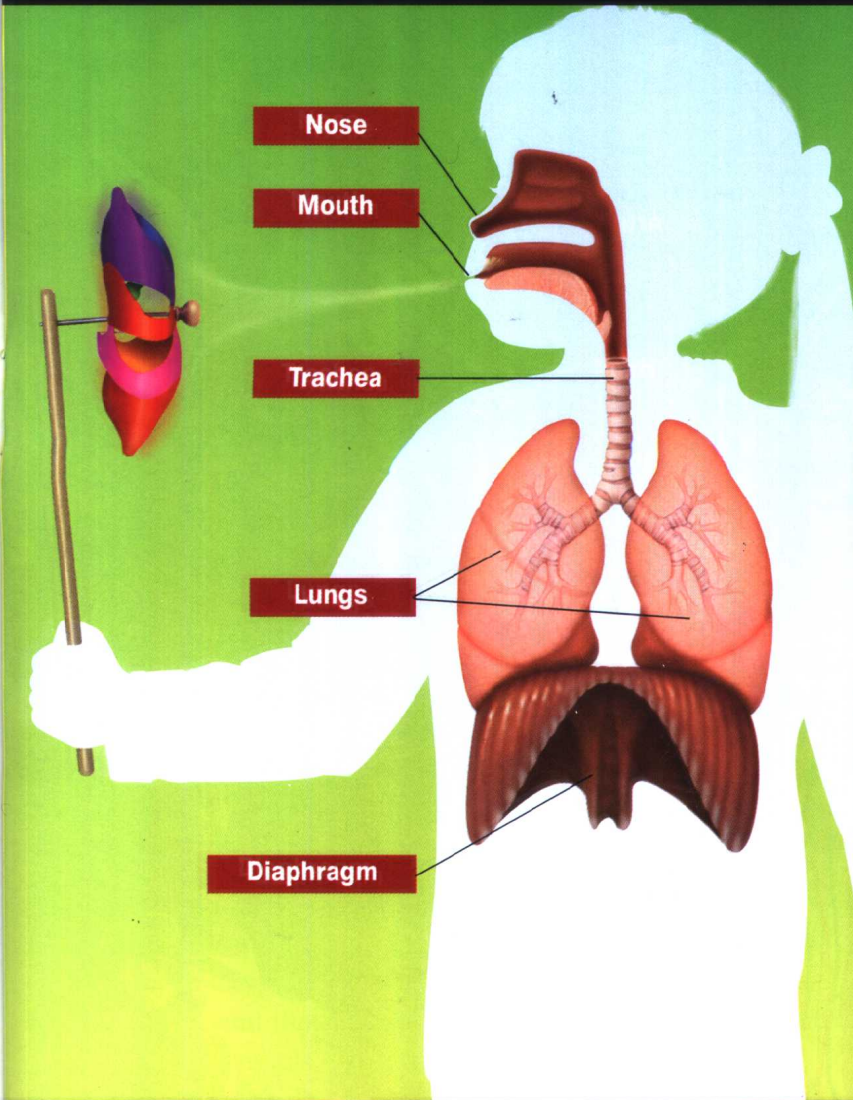
As the cells in your body use oxygen, they release<sup>10</sup> a gas called carbon dioxide<sup>11</sup>. Red blood cells return to your alveoli carrying carbon dioxide. You get rid of this carbon dioxide when you breathe out. Working together, the trachea, lungs, alveoli, and other body parts involved in breathing make up your respiratory system<sup>12</sup>.

1. breathtaking	adj.	惊人的; 非凡的
2. single	adj.	一个的
3. trachea	n.	气管
4. windpipe	n.	气管
5. lung	n.	肺
6. diaphragm	n.	隔膜
7. air sac		气囊
8. alveoli	n.	肺泡
9. oxygen	n.	氧气
10. release	v.	释放

11. carbon dioxide		二氧化碳
12. respiratory system		呼吸系统
13. datum	n.	(pl. data) 数据
14. rate	n.	频率
15. exhale	v.	呼气
16. compare	v.	比较
17. chart	n.	图表
18. blue whale		蓝鲸
19. chipmunk	n.	花鼠; 金花鼠
20. guinea pig		豚鼠; 天竺鼠



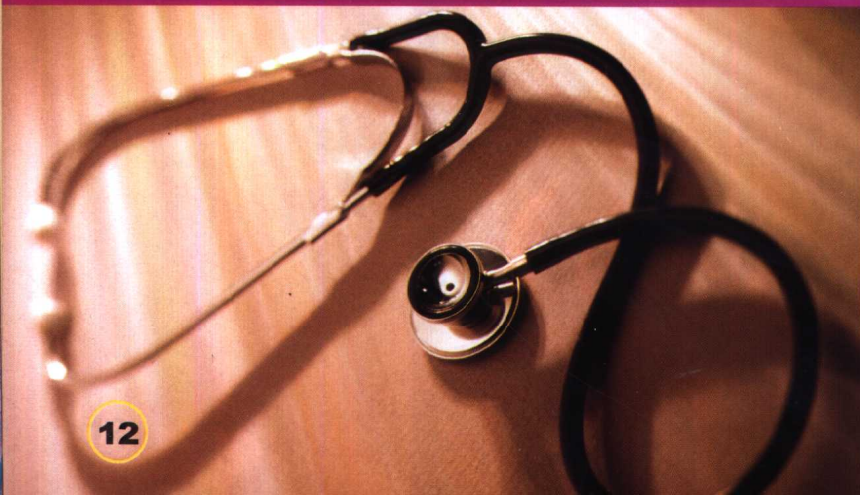
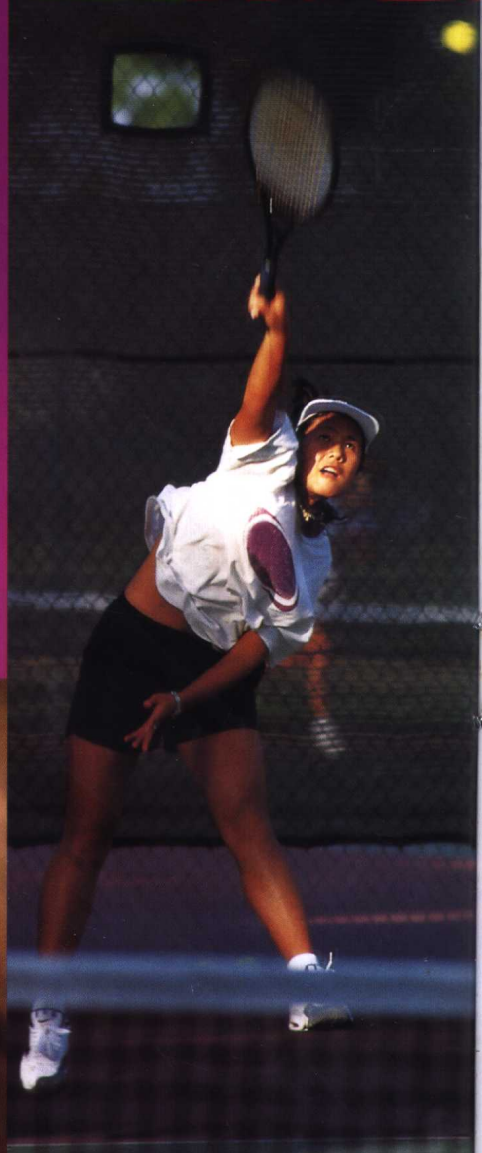
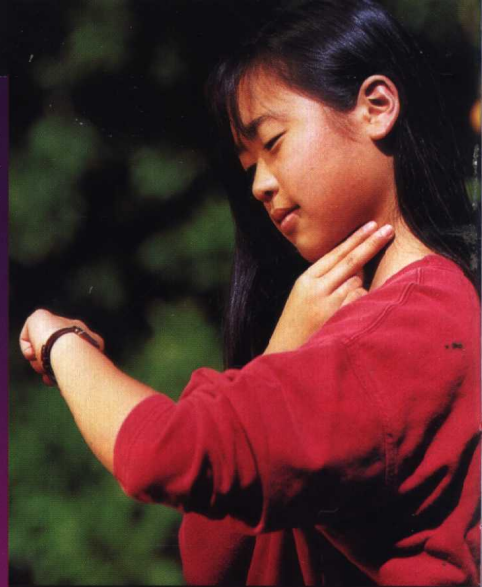
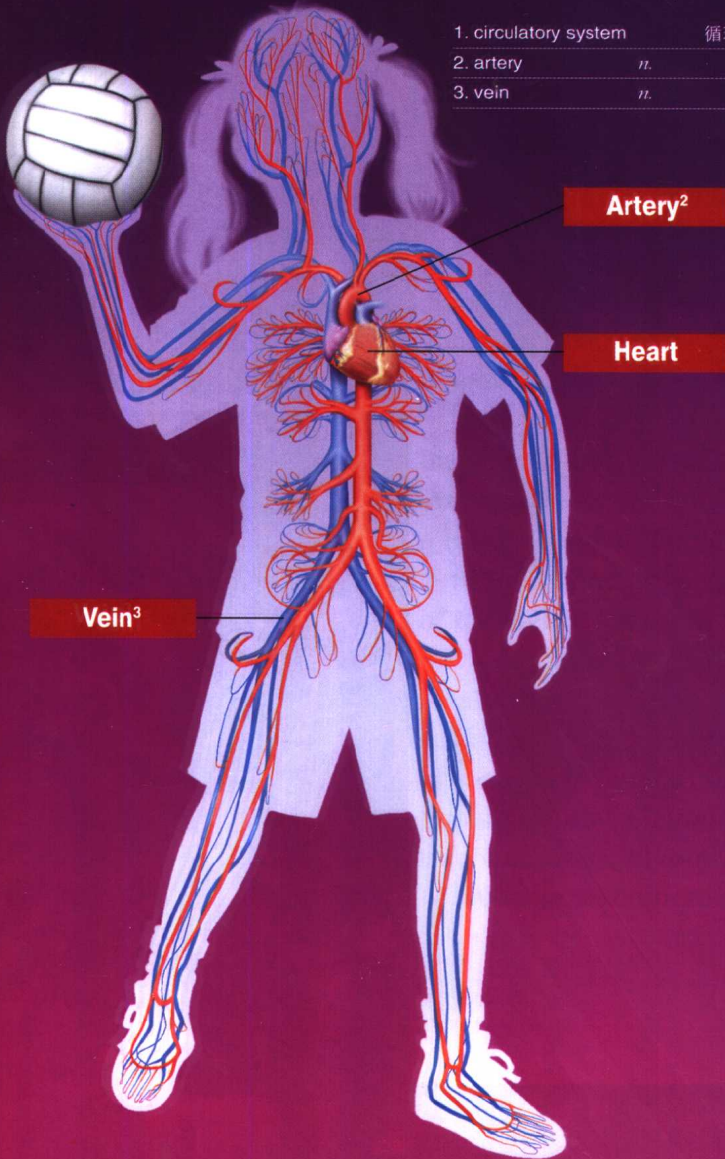
# Respiratory System





# Circulatory System<sup>1</sup>

1. circulatory system		循环系统
2. artery	11.	动脉
3. vein	11.	静脉





## Your Beating Heart

Make a fist<sup>1</sup> with your hand. This is about the size of your heart. Now clench<sup>2</sup> your fist and let go. Do this about 20 times. This action<sup>3</sup> is similar<sup>4</sup> to the way a heart beats. Is your hand tired? The cool<sup>5</sup> thing about a healthy heart is that it doesn't get tired. Day in and day out<sup>6</sup>, your heart keeps beating.

## How Blood Circulates<sup>7</sup>

Your heart pumps<sup>8</sup> blood throughout your body. With every heartbeat, blood surges<sup>9</sup> out of your heart and into tubes called blood vessels<sup>10</sup>. 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 capillary<sup>11</sup>. 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.

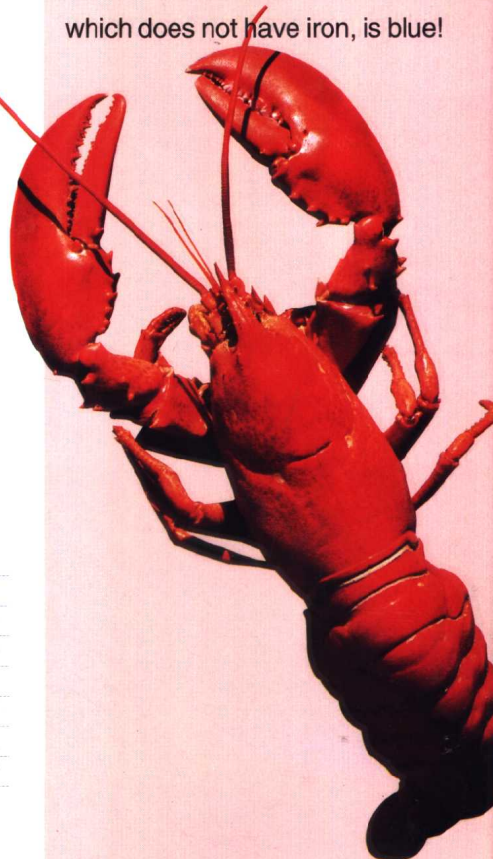
1. make a fist		攥拳
2. clench	<i>v.</i>	握紧
3. action	<i>n.</i>	动作
4. similar	<i>adj.</i>	类似的
5. cool	<i>adj.</i>	极好的; 绝妙的
6. day in and day out		天天
7. circulate	<i>v.</i>	流通
8. pump	<i>v.</i>	抽吸
9. surge	<i>v.</i>	涌动

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

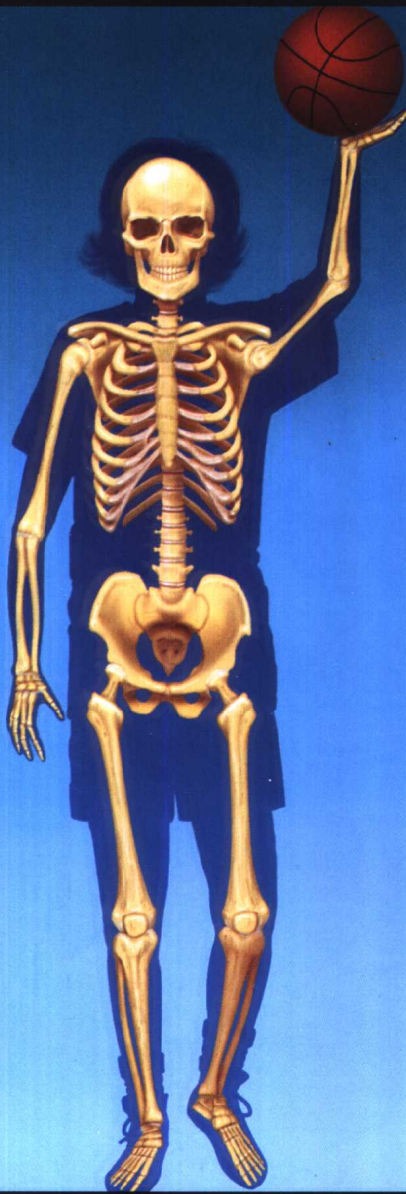
## Did you ever wonder...

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

About half your blood is water that contains<sup>12</sup> dissolved sugar<sup>13</sup>, salt, and other chemicals<sup>14</sup>. The rest is made up of mostly disease-fighting white blood cells, sticky<sup>15</sup> pieces of cells called platelets<sup>16</sup>, 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 lobster<sup>17</sup>'s blood, which does not have iron, is blue!







X-ray<sup>14</sup> of knee joint<sup>15</sup>

## 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 skin<sup>1</sup>—your bones.

## Job List for Bones

Your body has lots of bones. An adult<sup>2</sup> has 206 bones. And the bones in your body do many jobs.

**Support<sup>3</sup> the Body** Like the wooden beams<sup>4</sup> holding up a house, bones help support your body.

**Protect<sup>5</sup> the Inner Organs** Many of the bones in your body also protect your organs. The bones of the skull<sup>6</sup> protect the brain. The curved rib<sup>7</sup> bones form a protective cage<sup>8</sup> around the heart, lungs, and other organs in your chest.

**Grow Blood Cells** Inside your bones is a soft material called bone marrow<sup>9</sup>. It makes blood cells that carry nutrients to other cells in your body. It also makes other cells that fight harmful germs<sup>10</sup> that get into your body.

## Between the Bones

Most bones in your body connect<sup>11</sup> to other bones. Where bones meet, there is a joint<sup>12</sup>. Your body has different kinds of joints that let the body move in different ways.

1. skin	<i>n.</i>	皮肤	9. bone marrow	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	骨骼系统
6. skull	<i>n.</i>	头骨	14. X-ray	<i>n.</i> X射线
7. curved rib		肋	15. knee joint	膝关节
8. cage	<i>n.</i>	骨架构造		