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生命科学

# Animal Adaptations

## 动物的适应性

PETER WINKLER (美) 著



外语教学与研究出版社

FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

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本套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。



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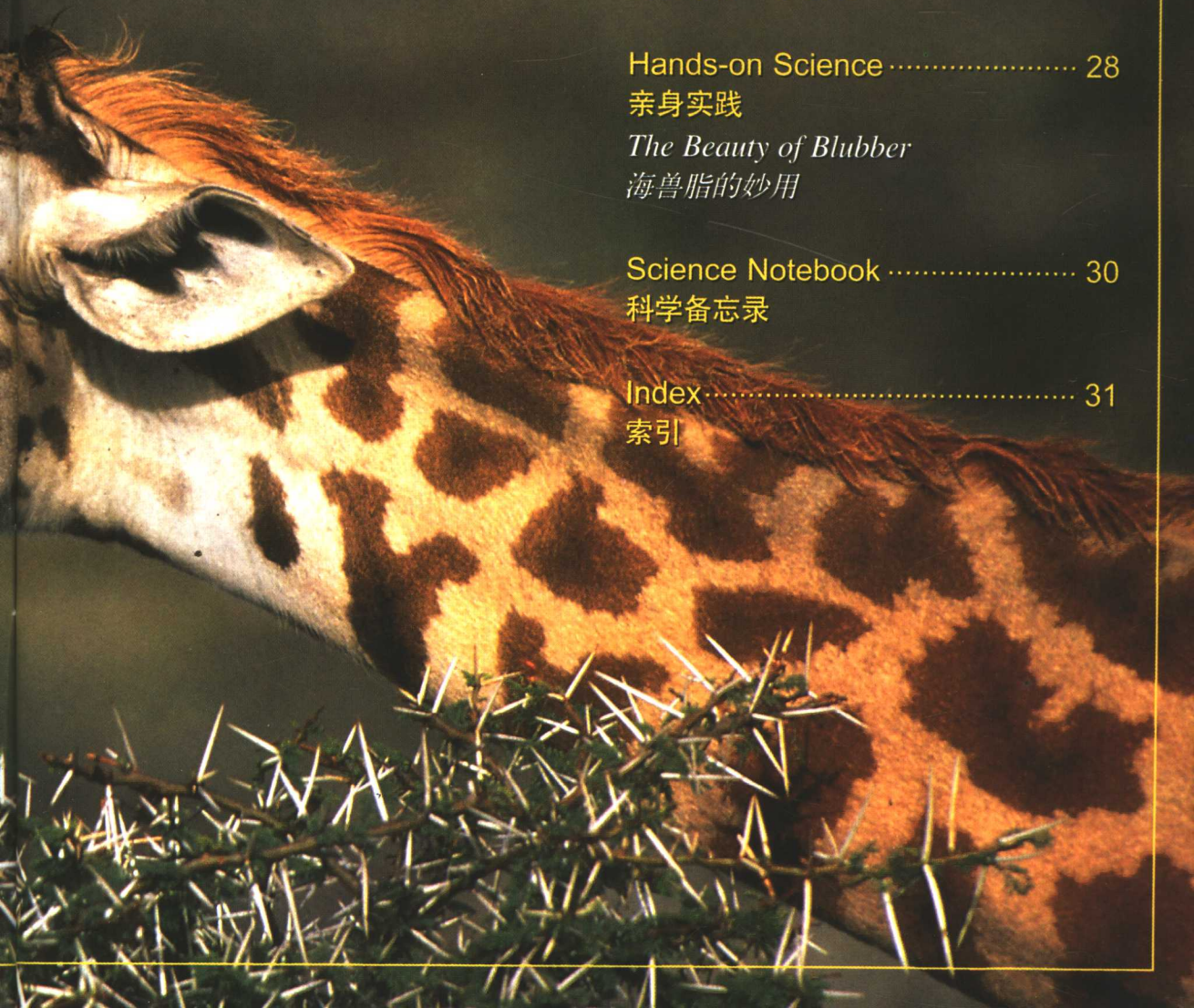
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# The Point of It All

生存之道



Inflated<sup>1</sup>  
porcupine fish<sup>2</sup>

1. inflated *adj.* 膨大的  
2. porcupine fish (密斑) 刺鲀



*Small and slow, a porcupine fish may look like an easy meal for predators<sup>1</sup>. But attackers<sup>2</sup> who come too close get a nasty<sup>3</sup> surprise.*

**T**he brownish-whitish<sup>4</sup> fish can't outswim<sup>5</sup> most predators. It doesn't even try. Instead the porcupine fish does something odd<sup>6</sup>. It gulps<sup>7</sup> water—mouthful<sup>8</sup> after frantic<sup>9</sup> mouthful. As the fish drinks, its skin stretches<sup>10</sup> and stretches.

Before long, the fish looks like a water balloon<sup>11</sup>. But the surface of this “balloon” is dotted<sup>12</sup> with quills<sup>13</sup>, or spikes<sup>14</sup>. They're sharp as needles<sup>15</sup>. No wonder people call this critter<sup>16</sup> a porcupine fish!

Suddenly the predator's meal doesn't look so tasty. Chomping<sup>17</sup> those quills could be painful—or worse. The porcupine fish could easily get stuck in the attacker's throat<sup>18</sup>. Unable to eat, the predator would starve<sup>19</sup>. Even mighty sharks have died that way.



**Uninflated porcupine fish**

So the predator speeds off<sup>20</sup>, looking for a snack<sup>21</sup> that can't fight back. And the porcupine fish survives<sup>22</sup> another day—thanks to some handy<sup>23</sup> adaptations. That's what scientists call the inherited traits<sup>24</sup> that help a creature survive in its wild world.

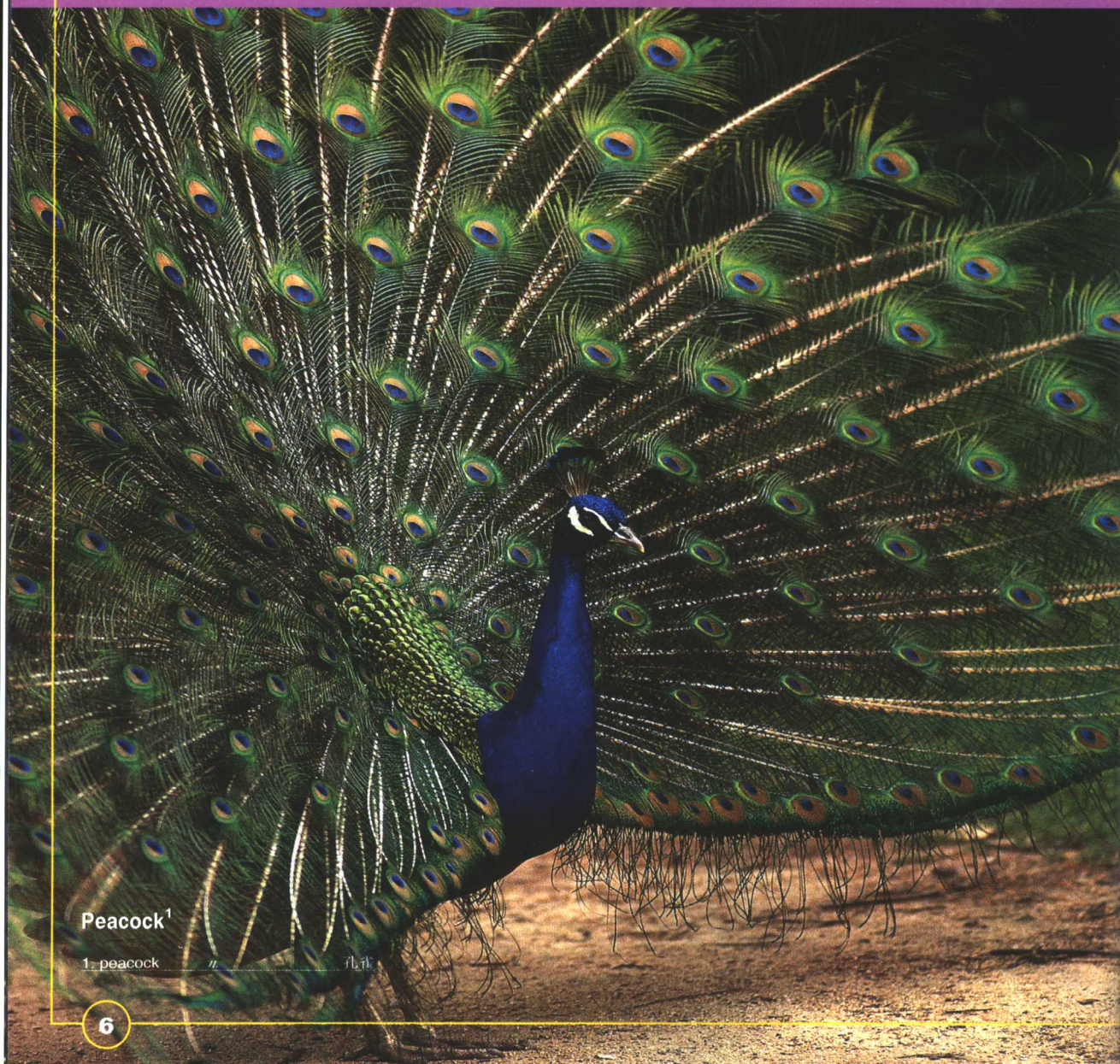
1. predator	<i>n.</i>	捕食者	13. quill	<i>n.</i>	刺
2. attacker	<i>n.</i>	攻击者	14. spike	<i>n.</i>	(某些鱼类的)骨状突出物
3. nasty	<i>adj.</i>	使人难受的	15. needle	<i>n.</i>	针
4. brownish-whitish	<i>adj.</i>	褐白相间的	16. critter	<i>n.</i>	生物；异常动物
5. outswim	<i>v.</i>	比……游得快	17. chomp	<i>v.</i>	格格地咬；用力咀嚼
6. odd	<i>adj.</i>	奇特的，古怪的	18. throat	<i>n.</i>	喉咙
7. gulp	<i>v.</i>	大口地饮	19. starve	<i>v.</i>	饿死
8. mouthful	<i>n.</i>	满口	20. speed off		迅速离开
9. frantic	<i>adj.</i>	发狂似的，紧张纷乱的	21. snack	<i>n.</i>	点心；小吃
10. stretch	<i>v.</i>	撑大	22. survive	<i>v.</i>	活下来
11. balloon	<i>n.</i>	气球	23. handy	<i>adj.</i>	简便的
12. dot	<i>v.</i>	(星星点点地)布满	24. inherited trait		遗传性状



The ABC's of Adaptation:

# Staying Alive

适应的基本知识：生存需要



Peacock<sup>1</sup>

1. peacock

孔雀



*Wild animals face one challenge<sup>1</sup> after another. Three of the most important are finding food, not becoming someone else's food, and fitting into a particular<sup>2</sup> habitat.*



Sloth

**A**n adaptation is an inherited trait that helps a living thing survive. Adaptations benefit<sup>3</sup> animals in all sorts of ways. Webbed<sup>4</sup> feet let ducks paddle<sup>5</sup> quickly through water. (Scuba divers<sup>6</sup> wear flippers<sup>7</sup> for the same reason.) Flashy<sup>8</sup> tail feathers<sup>9</sup> help peacocks catch the attention of peahens<sup>10</sup>. Moving ever so s-l-o-w-l-y keeps sloths<sup>11</sup> from being noticed by jaguars<sup>12</sup> and other predators. These are just three of countless<sup>13</sup> examples.

Two types of adaptations are structural<sup>14</sup> and behavioral adaptations<sup>15</sup>. Structural adaptations are body parts that help an animal in a special way. For example, hollow<sup>16</sup> bones make birds light. That helps them fly. Behavioral adaptations are helpful instincts<sup>17</sup>, or actions that the animal does automatically<sup>18</sup>. Learned behavior (as when a dog is trained to avoid cars) is not an adaptation.

Sometimes both kinds of adaptations work together. Think of the porcupine fish. Its stretchy<sup>19</sup> skin is a structural adaptation that lets the fish puff up<sup>20</sup> like a balloon. Gulping water when in danger is a behavioral adaptation. This combination<sup>21</sup> of adaptations confuses<sup>22</sup> the predator—and saves the porcupine fish's life.

1. challenge	<i>n.</i>	挑战	12. jaguar	<i>n.</i>	美洲豹 (又称美洲虎)
2. particular	<i>adj.</i>	特殊的	13. countless	<i>adj.</i>	多得数不清的
3. benefit	<i>v.</i>	对……有好处	14. structural	<i>adj.</i>	结构的
4. webbed	<i>adj.</i>	有蹼的	15. behavioral adaptation		行为适应
5. paddle	<i>v.</i>	涉水	16. hollow	<i>adj.</i>	中空的
6. scuba diver		戴水肺的潜水员	17. instinct	<i>n.</i>	本能; 天性
7. flipper	<i>n.</i>	(潜水时缚在脚上的) 脚蹼; 橡皮脚掌	18. automatically	<i>adv.</i>	自动地
8. flashy	<i>adj.</i>	华丽的	19. stretchy	<i>adj.</i>	有弹性的
9. tail feather		尾羽	20. puff up		膨胀
10. peahen	<i>n.</i>	雌孔雀	21. combination	<i>n.</i>	结合
11. sloth	<i>n.</i>	树懒	22. confuse	<i>v.</i>	迷惑



## Aardvarks<sup>1</sup> in Action

One way or another, all animals need to eat. So it's not surprising that many adaptations help animals find and consume<sup>2</sup> food. The aardvark, a mammal<sup>3</sup> that lives in African forests and grasslands<sup>4</sup>, provides great examples of food-related adaptations.

An aardvark eats insects<sup>5</sup>, especially termites<sup>6</sup>. To find termites, it prowls<sup>7</sup> by night, sniffing<sup>8</sup> the ground with its powerful, pig-like snout<sup>9</sup>. Sooner or later, the aardvark finds a termite mound<sup>10</sup>, or nest<sup>11</sup>. That's when things get interesting.

Termite mounds look like giant sand castles<sup>12</sup>. To build them, the insects use a mixture of soil, sand, and saliva<sup>13</sup>. When it dries, the mixture is hard as a brick<sup>14</sup>. The mound's sturdy<sup>15</sup> walls keep out most animals. But not aardvarks.

1. aardvark	<i>n.</i>	土豚 (又称非洲食蚁兽)
2. consume	<i>v.</i>	大口吞下
3. mammal	<i>n.</i>	哺乳动物
4. grassland	<i>n.</i>	草原
5. insect	<i>n.</i>	昆虫
6. termite	<i>n.</i>	白蚁
7. prowl	<i>v.</i>	(为觅食) 潜行
8. sniff	<i>v.</i>	嗅
9. snout	<i>n.</i>	(动物的) 口鼻部; 口吻
10. mound	<i>n.</i>	土墩; 高墩
11. nest	<i>n.</i>	巢; 穴
12. castle	<i>n.</i>	城堡
13. saliva	<i>n.</i>	唾液
14. brick	<i>n.</i>	砖
15. sturdy	<i>adj.</i>	坚固的

Termite mounds



Equipped with strong legs and sharp claws<sup>1</sup>, an aardvark rips<sup>2</sup> termite mounds right open. Bristles<sup>3</sup>, or stiff<sup>4</sup> hairs, in its nose keep the aardvark from breathing in dust<sup>5</sup> as it digs.

1. claw	<i>n.</i>	爪
2. rip	<i>v.</i>	撕破; 拆除 (顶部)
3. bristle	<i>n.</i>	刚毛; 刺毛
4. stiff	<i>adj.</i>	硬的; 挺的
5. dust	<i>n.</i>	灰尘
6. respond	<i>v.</i>	反应; 回应
7. demolish	<i>v.</i>	拆毁; 毁坏
8. soldier	<i>n.</i>	(无翅, 具有大头和大上顎的) 兵蚁
9. trap	<i>v.</i>	设陷阱捕捉
10. tasty	<i>adj.</i>	美味的
11. Afrikaans	<i>n.</i>	南非荷兰语

You can imagine how termites respond<sup>6</sup> when their home is demolished<sup>7</sup>. Special termites, called soldiers<sup>8</sup>, fiercely attack the aardvark. But the aardvark's tough skin protects it.

To eat, the aardvark relies on its tongue, which can stretch out more than a foot. The aardvark's sticky tongue traps<sup>9</sup> a tasty<sup>10</sup> serving of termites. Getting that meal took hard work—and many different adaptations.



Aardvark

### Word Power

**Aardvark** comes from Afrikaans<sup>11</sup>, a language spoken in South Africa. The word means “earth pig.”



## Diverse<sup>1</sup> Defenses<sup>2</sup>

Danger stalks<sup>3</sup> wild animals. Most creatures face the risk of becoming prey<sup>4</sup>, or food for another animal. Predators tend to<sup>5</sup> be larger and stronger than their prey, so escaping<sup>6</sup> an attacker is far from easy.

Animals often rely on a simple technique<sup>7</sup>—running away. But that doesn't always work. So prey animals need other ways of defending<sup>8</sup> themselves.

An Australian frilled lizard<sup>9</sup> uses both structural and behavioral adaptations for defense. When in danger, the lizard opens its mouth wide. That causes its frill, a flap<sup>10</sup>

of loose skin, to spread out. This makes the lizard look much larger. The lizard also hisses<sup>11</sup> nastily<sup>12</sup>. With luck, this bluffing<sup>13</sup> will drive off a predator.

1. diverse	<i>adj.</i>	多种多样的
2. defense	<i>n.</i>	防御
3. stalk	<i>v.</i>	悄悄地追踪（或靠近）
4. prey	<i>n.</i>	被捕食的动物；捕获物
5. tend to		往往会
6. escape	<i>v.</i>	逃脱
7. technique	<i>n.</i>	手段；方法
8. defend	<i>v.</i>	防御；保护
9. frilled lizard		斗篷蜥
10. flap	<i>n.</i>	拍打；摆动
11. hiss	<i>v.</i>	发出嘶嘶声
12. nastily	<i>adv.</i>	激烈地
13. bluff	<i>v.</i>	吓唬

Australian  
frilled lizard



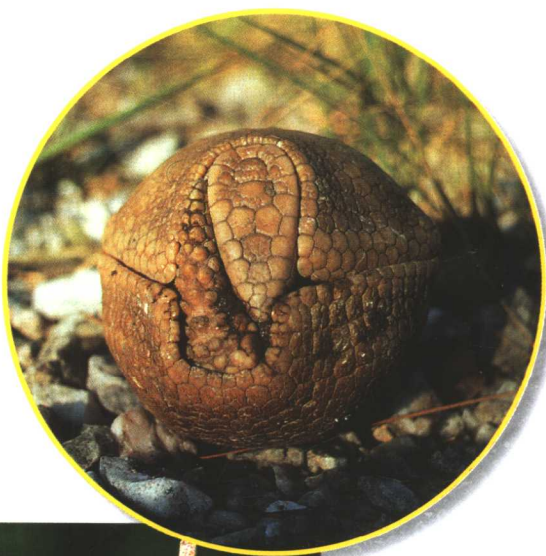


South America's three-banded armadillo<sup>1</sup> uses a different strategy<sup>2</sup>. This weird-looking<sup>3</sup> mammal curls up<sup>4</sup> into a tight, little ball. The surface of the ball is leathery<sup>5</sup> skin that acts like armor<sup>6</sup>. Not even a puma<sup>7</sup>, also known as a cougar<sup>8</sup> or mountain lion, can bite through it.

Sometimes animals work together for protection. When a predator comes too close to an elephant calf<sup>9</sup>, the adults<sup>10</sup> in the herd<sup>11</sup> gather quickly. They surround<sup>12</sup> the calf to defend it. The musk oxen<sup>13</sup> of the Arctic<sup>14</sup> use the same strategy. In both cases, the message is clear: Leave us alone!

## Devious<sup>15</sup> Disguises<sup>16</sup>

Perhaps the best defensive strategy is never having to fight in the first place. Some animals manage this through adaptations that allow them to avoid a predator's attention. That's where camouflage<sup>17</sup>, the ability to blend in, comes in handy. A clear example of this is the leaf butterfly<sup>18</sup> of Southeast Asia. It looks astonishingly<sup>19</sup> like—you guessed it—a leaf. Resting quietly on a branch<sup>20</sup>, this critter is all but impossible to spot<sup>21</sup>.



**A three-banded armadillo rolls into a tight ball for protection.**

**Leaf butterfly**

- |                           |             |                            |
|---------------------------|-------------|----------------------------|
| 1. three-banded armadillo |             | 三带犰狳                       |
| 2. strategy               | <i>n.</i>   | 策略; (生物体) 重大适应性变化          |
| 3. weird-looking          | <i>adj.</i> | 长相奇特的                      |
| 4. curl up                |             | 卷起; 蜷缩                     |
| 5. leathery               | <i>adj.</i> | 似皮革的; 坚韧的                  |
| 6. armor                  | <i>n.</i>   | 盔甲                         |
| 7. puma                   | <i>n.</i>   | 美洲狮                        |
| 8. cougar                 | <i>n.</i>   | 美洲狮                        |
| 9. calf                   | <i>n.</i>   | 仔; 幼兽                      |
| 10. adult                 | <i>n.</i>   | 成年动物; 成体                   |
| 11. herd                  | <i>n.</i>   | 兽群                         |
| 12. surround              | <i>v.</i>   | 围住; 围绕                     |
| 13. musk ox               |             | ( <i>pl.</i> musk oxen) 麝牛 |
| 14. Arctic                | <i>n.</i>   | 北极                         |
| 15. devious               | <i>adj.</i> | 欺诈的                        |
| 16. disguise              | <i>n.</i>   | 假扮; 伪装                     |
| 17. camouflage            | <i>n.</i>   | 伪装; 保护色                    |
| 18. leaf butterfly        |             | 木叶蝶                        |
| 19. astonishingly         | <i>adv.</i> | 令人惊讶地                      |
| 20. branch                | <i>n.</i>   | 树枝                         |
| 21. spot                  | <i>v.</i>   | 辨认; 看出                     |



Then there's the looper<sup>1</sup>, a kind of caterpillar<sup>2</sup>. It actually disguises itself. To avoid birds and spiders<sup>3</sup>, the looper pretends to be part of a flower. It does this by biting off pieces of the petals<sup>4</sup> and other flower parts. The looper then produces silk strings<sup>5</sup> to tie the flower pieces to its body.

Not all animal disguises are attempts<sup>6</sup> at camouflage, however. Some animals rely on a type of adaptation called mimicry<sup>7</sup>. That's the ability to look like another animal. Hover flies<sup>8</sup>, for instance, are harmless<sup>9</sup>. Yet predators avoid them.

Why? Well, the flies look alarmingly<sup>10</sup> like wasps<sup>11</sup>, which can sting<sup>12</sup>. Rather than risk getting stung, predators steer clear of<sup>13</sup> both insects.

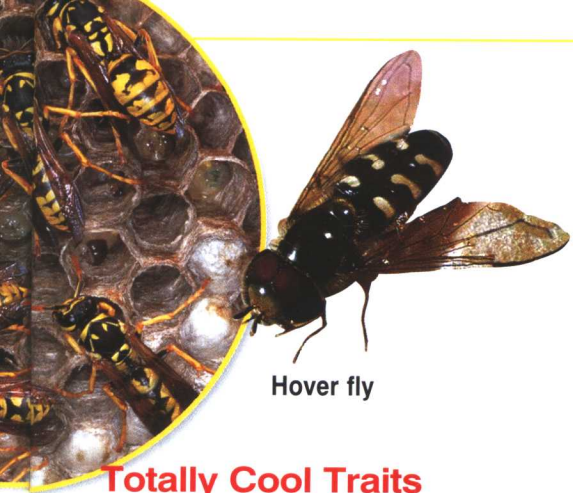


1. looper	<i>n.</i>	尺蠖
2. caterpillar	<i>n.</i>	毛虫
3. spider	<i>n.</i>	蜘蛛
4. petal	<i>n.</i>	花瓣
5. string	<i>n.</i>	线
6. attempt	<i>n.</i>	企图; 努力
7. mimicry	<i>n.</i>	拟态
8. hover fly		食蚜虻
9. harmless	<i>adj.</i>	无害的, 不致伤的
10. alarmingly	<i>adv.</i>	使人惊恐地
11. wasp	<i>n.</i>	黄蜂
12. sting	<i>v.</i>	蛰
13. steer clear of		绕开; 避开



Looper caterpillar





Hover fly

## Totally Cool Traits

Earth isn't an easy place to live. Some places feel like ovens<sup>1</sup>, others like freezers<sup>2</sup>. One region may get waves<sup>3</sup> of rain; another might thirst for even a few inches. Plants are abundant<sup>4</sup> here, scarce<sup>5</sup> there. You get the idea.

Yet animals live in even the harshest<sup>6</sup> environments. How? With help from adaptations that allow them to survive difficult and specific conditions. Desert toads<sup>7</sup> and frogs, for example, are adaptation aces<sup>8</sup>. They survive in dry environments by going dormant<sup>9</sup>, or inactive<sup>10</sup>, for long periods—sometimes years.

While dormant, the toad or frog sleeps underground. In some species, a special layer<sup>11</sup> of dead skin surrounds the animal. Like plastic wrap<sup>12</sup> around a piece of food, this layer of skin keeps moisture<sup>13</sup> from escaping. Other species seal<sup>14</sup> themselves into burrows<sup>15</sup> with a jellylike<sup>16</sup> substance<sup>17</sup>. Either way, the animal's body has enough water to survive.

When rain falls, the frog or toad awakes. It crawls to the surface where it eats and mates<sup>18</sup>. All too soon, however, the desert grows dry again. Frogs and toads escape underground once more.

1. oven	<i>n.</i>	烤箱
2. freezer	<i>n.</i>	冰箱
3. wave	<i>n.</i>	(情况的) 突发
4. abundant	<i>adj.</i>	丰富的
5. scarce	<i>adj.</i>	缺乏的
6. harsh	<i>adj.</i>	艰苦的
7. desert toad		沙漠蟾
8. ace	<i>n.</i>	佼佼者
9. dormant	<i>adj.</i>	休眠的
10. inactive	<i>adj.</i>	不活动的
11. layer	<i>n.</i>	层
12. wrap	<i>n.</i>	包装材料
13. moisture	<i>n.</i>	水汽
14. seal	<i>v.</i>	封; 密封
15. burrow	<i>n.</i>	地洞
16. jellylike	<i>adj.</i>	胶状的
17. substance	<i>n.</i>	物质
18. mate	<i>v.</i>	交配
19. desert spadefoot toad		尼氏架纹蟾
20. Alice Springs Desert Park		爱丽斯泉沙漠公园

*What adaptations help animals survive where you live?*



This desert spadefoot toad<sup>19</sup> burrowed into the sand in Australia's Alice Springs Desert Park<sup>20</sup> to wait for rain.





## Picture This

读 图 地 带

# Born to Run

## 生性善跑

Cheetahs<sup>1</sup> are the fastest animals on land. Sprinting<sup>2</sup> after prey, these spotted cats can go 105 kilometers (about 65 miles) an hour. How do they do it? Adaptations, of course!

1. cheetah	<i>n.</i>	猎豹
2. sprint	<i>v.</i>	冲刺; 用全速奔跑
3. facial	<i>adj.</i>	面部的
4. marking	<i>n.</i>	斑点, 斑纹
5. block	<i>v.</i>	遮拦
6. glare	<i>n.</i>	强光
7. muscle	<i>n.</i>	肌肉
8. nostril	<i>n.</i>	鼻孔
9. lung	<i>n.</i>	肺

Dark **facial<sup>3</sup> markings<sup>4</sup>** may block<sup>5</sup> glare<sup>6</sup>, helping the cat see where it's going.

Supersize **shoulders<sup>7</sup>** (both bones and muscles) help the cat move quickly.

Large **nostrils<sup>8</sup>** take in plenty of air to keep the cheetah's muscles working.

Long **legs<sup>9</sup>** cover lots of ground with each step.

Powerful **lungs<sup>9</sup>** make it easy to breathe deeply.

