

CURRENT SCIENCE

ASIA EDITION

2010 • Issue 2

Supplements for Science and Geography needs in school



THIS ISSUE AT A GLANCE

HEALTH SCIENCE

Defaced

Pages 4–5

Critical Thinking

■ Teens and twenty-somethings are now getting Botoxed to eliminate lines and wrinkles. Would you undergo such treatments? Explain your answer.

■ What other muscle ailments might be treated with Botox or similar muscle-relaxing drugs?

■ *Structure and function in living systems*: the human nervous and musculoskeletal systems

HEALTH SCIENCE

Helping Hand

Pages 6–7

Critical Thinking

■ How might bone marrow transplants that give people two immune systems help medical researchers conquer diseases?

■ Do you plan to donate your body parts to science and medicine? Explain your answer.

■ *Structure and function in living systems*: protection from disease

■ *Science and technology in society*: quality of life

EARTH SCIENCE

Lost & Found

Pages 8–9

Critical Thinking

■ Give some other examples of environmental determinism and the structure of societies around the world.

■ What were the infectious diseases that European explorers and settlers introduced to the Americas? (*bubonic plague, smallpox, typhus, measles, influenza, mumps, yellow fever*)

■ *Diversity and adaptation of organisms*: ancient life and early cultures

EARTH/PHYSICAL SCIENCE

House of Straw

Pages 10–11

Critical Thinking

■ Who formulated the equation $F=ma$, and what do physicists call it? (*Isaac Newton [1642–1727], an English physicist and mathematician. The equation is often called Newton's second law of motion.*)

■ What other structures or types of technology might a shake table be used to test?

■ *Structure of the Earth system*: earthquakes

■ *Motion and forces*: tension, compression

LIFE SCIENCE

Cold Comfort

Pages 12–13

Critical Thinking

■ How should a person who is suffering from prolonged exposure to freezing temperatures be helped until emergency aid arrives? (*Remove the person's clothes if he or she is wet, and wrap the individual in blankets or dry clothes.*)

■ How might scientists benefit from studying Wim Hof?

■ *Structure and function in living systems*: tissues in the human body

LIFE SCIENCE

Tag Team

Pages 14–16

Critical Thinking

■ If you were an epigenetics researcher, what variables would you test for their potential ability to change epigenetic tags? Explain your answer.

■ In what ways might epigenetics be employed to treat diseases?


■ *The molecular basis of heredity*: DNA, genes, the genome, mutations

■ *Personal and community health*: disease prevention

Current Science

Online

You can find Student's worksheet and online resources at our web site: <http://www.naturecraft.com/html/currentscience.htm>

Readers, look for the book  throughout this issue to guide in learning Physics, Chemistry, Biology & Geography in line with the MOE curriculum.

NOVA

Warriors of the Amazon

("Lost & Found," p. 8)

www.pbs.org/wgbh/nova/teachers/viewing/2309_shaman.html

Explore the impact of European contact on the Amazon people and culture.

The Day the Earth Shook

("House of Straw," p. 10)

www.pbs.org/wgbh/nova/teachers/activities/2302_shook.html

Learn about structural engineering through three design challenges.

Epigenetics

("Tag Team," p. 14)

www.pbs.org/wgbh/nova/sciencenow/3411/02.html

Watch a video on how even identical twins become distinct as they age.

SKILLBUILDERS

Issue 2 2010

**CURRENT
SCIENCE®****Defaced** (Page 4)**Vocabulary Challenge***Match each numbered word with its correct description. Write the letter of the description in the bracket provided.*

- | | |
|----------------------|--|
| 1. hyperhidrosis () | A. muscles that control the up-and-down and side-to-side movements of the eyes |
| 2. respiratory () | B. without oxygen |
| 3. acetylcholine () | C. a sudden, involuntary contraction of a muscle or a group of muscles |
| 4. spasm () | D. excessive sweating |
| 5. extraoculars () | E. a condition in which the eyes don't point in the same direction |
| 6. botulism () | F. having to do with breathing |
| 7. strabismus () | G. an illness that causes muscle paralysis |
| 8. anaerobic () | H. a type of neurotransmitter |

Helping Hand (Page 6)**Short Answer**

1. What is the immune system's function, and why does the immune system attack transplanted organs?

2. What is protective sensation? _____

3. Josh Maloney received two transplants. Why? _____

4. Why do transplant patients take immunosuppressants, and what are the risks of taking them?

5. What is the major benefit of Maloney's two transplants? _____

SKILLBUILDERS

Issue 2 2010

**CURRENT
SCIENCE®****Lost & Found** (Page 8)**Short Answer**

1. What is an archaeologist?

2. What types of technology did archaeologist Michael Heckenberger use to locate the garden cities along the Xingu River?

3. What kind of society would a scientist expect to find inhabiting a rocky, mountainous region heavily populated by carnivorous wildcats?

4. What is an anthropologist?

5. The Amazon region has lush rain forests. Why is it a poor area for growing crops?

House of Straw (Page 10)**Fill in the Blanks**

Write the word or words that best complete each sentence.

1. _____ is a force that squashes a material inward.

2. An accelerating object is changing in _____.

3. In the equation $F=ma$, the F means _____.

4. A _____ is a fracture in Earth's crust.

5. _____ is a force that stretches a material outward.

6. Most buildings are vulnerable to the destructive impact of seismic waves called _____ waves.

7. Darcey Donovan's straw-bale houses are earthquake-proof partly because they are less _____ than the houses made of rock in Pakistan.

8. Donovan tested the sturdiness of her straw-bale house design on a _____ at the University of Nevada.

SKILLBUILDERS

Issue 2 2010

**CURRENT
SCIENCE®****Cold Comfort** (Page 12)**Fill in the Blanks***Write the word or words that best complete each sentence.*

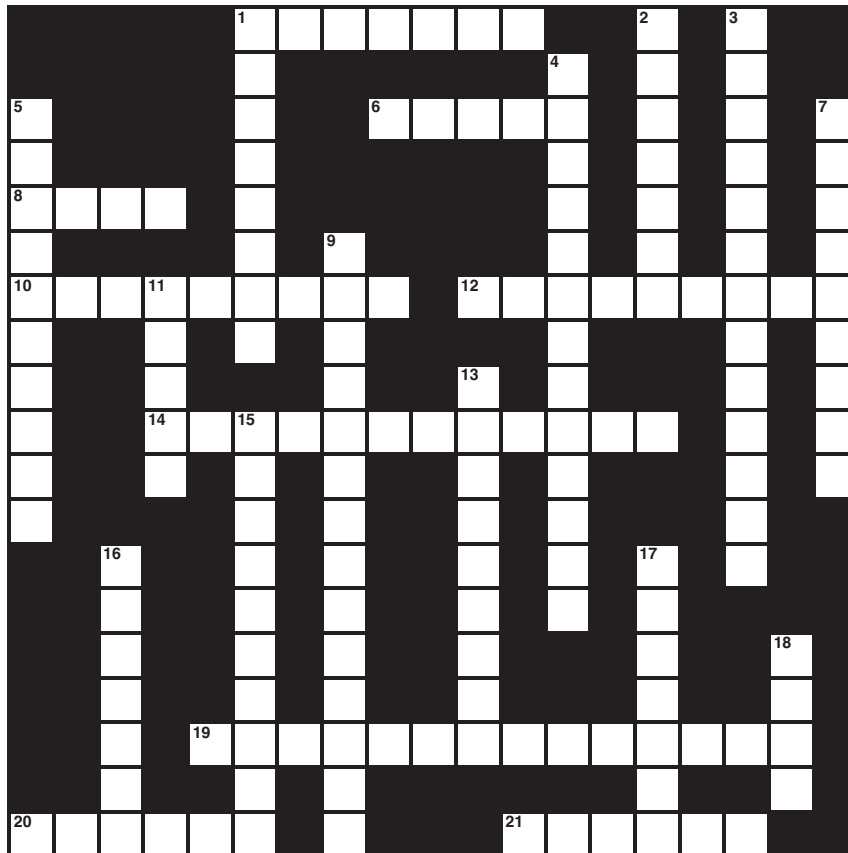
1. Some Buddhist monks perform _____, a form of meditation that is said to enable them to control the flow of blood in their bodies and stay warm in frigid environments.
2. When skin is exposed to extreme cold, it becomes vulnerable to _____.
3. When the body is exposed to frigid water, it experiences a _____ - _____.
4. Normal human body temperature is said to be 98.6 degrees Fahrenheit. Hypothermia sets in when the body temperature drops _____ degrees below normal.
5. When people are cold, their muscles shiver to generate _____.
6. When Buddhist monks practice the meditation described in question 1, they imagine _____ and _____.
7. When people experience hypothermia, their pulse rate _____.
8. The brain, kidneys, heart, liver, and lungs are considered _____ organs.

Tag Team (Page 14)**Multiple Choice***Choose the response that best completes each statement. Write the letters in the brackets.*

1. A permanent change in a gene is called (A) epigenetics. (B) methylation. (C) a mutation. ()
2. A swelling of tissues in response to infection and injury is called (A) inflammation. (B) inflation. (C) infliction. ()
3. Every cell in the body has exactly the same set of (A) genes. (B) histones. (C) proteins. ()
4. The entire collection of genes in a cell is called the (A) DNA. (B) epigenome. (C) genome. ()
5. The entire collection of tags attached to the genes in a cell is called the (A) DNA. (B) epigenome. (C) genome. ()
6. Myelodysplastic syndrome is a type of cancer of the (A) blood. (B) brain. (C) genes. ()
7. Some of the tags that attach themselves to the genes in a cell are (A) ethyl groups. (B) methanol groups. (C) methyl groups. ()
8. DNA molecules wrap themselves around proteins called (A) histones. (B) tags. (C) tails. ()

SKILLBUILDERS

Issue 2 2010

**CURRENT
SCIENCE®****Discoveries** (Page 16)**Crossword****Across**

1. a hard protein that human fingernails are made of
6. a swelling of tissue under the skin
8. a type of 21 Across
10. a tropical storm that happened in July 2008
12. to narrow
14. the study of the incidence of diseases in a population
19. a type of amphibian that spends all its life in the water (two words)
20. to widen
21. a bird with a large beak

Down

1. a type of 13 Down (two words)
2. a narrow, blue-colored fountain of light that bursts from the top of a thunderhead (two words)

3. an opera written by Mozart (three words)
4. an atmospheric gas whose rise most scientists blame for global warming (two words)
5. a novel by Kurt Vonnegut (two words)
7. an animal that is able to maintain a fairly constant body temperature regardless of the temperature of its environment
9. a process in which food is heated to kill microbes
11. a type of bacterial infection
13. a device that uses the sun's energy to cook food (two words)
15. an upper layer of the atmosphere
16. having to do with heat
17. a type of plastic
18. a body part that extracts oxygen from water

Sci-Triv Game (Page 2)

Answers

Health Science

1. True. *Inspire* is a synonym for *inhale*.
2. B.
3. A fever is an abnormally high body temperature.
4. Canines.
5. Doctors would prescribe it to relieve pain.

Earth Science

1. False. Meteoric water is water that has fallen as rain, snow, or other forms of precipitation.
2. C. Selenography is the study of the surface and physical features of the moon.
3. the troposphere.
4. Maelström. A maelstrom is a very powerful whirlpool. The huge maelstrom described in the story exists northwest of mainland Norway in the Norwegian Sea. It is also mentioned by Captain Ahab in Herman Melville's *Moby Dick* and is featured in the climax of Jules Verne's *20,000 Leagues Under the Sea*.
5. magma

Mathematics

1. True.
2. B.
3. 60 percent.
4. mixed.
5. *Radii* is the plural of *radius*, which is half the diameter of a circle.

Life Science

1. True. Camels can go for a week without water and lose 40 percent of their body weight in that time. When they finally get a chance to drink, they really go for it.
2. A. The throat of a blue whale has a (relatively) small diameter—about the width of a salad plate. A blue whale eats tiny, shrimplike crustaceans called *krill*. Although a blue whale eats 3 tons of krill a day when it's hungry, the krill slide down its throat like honey.
3. A coccus is a round bacterium.
4. tortoise.
5. A ponderosa pine is a tall type of pine tree that is found in western North America.

Physical Science

1. True. By volume, the now-closed Fresh Kills Landfill on Staten Island in New York is bigger than the Great Wall of China, according to *The Book of General Ignorance*, by John Lloyd and John Mitchinson.
2. B. Prometheus was named after Prometheus, the Greek god who stole fire from the gods and gave it to humans. Krypton comes from the

Greek word *kryptos*, which means "hidden." Thorium was named after Thor, the Norse god of war.

3. Spontaneous combustion is burning that starts without heat from an external source. Some materials, such as wet hay, can get hot enough internally to catch fire, even if they are not lit by flames.
4. strength. Tensile strength is measured by the amount of force needed to pull a substance apart.
5. Reduction is a reaction in which a substance loses oxygen.

Optricks (Page 24)

Mystery Photos:

Top: sliced bread

Middle: nail clippers

Bottom: ladybug

Bend Your Mind: triangle, square, pentagon, circle

Whatizit? Pele is the Hawaiian goddess of fire, lightning, dance, volcanoes, and violence.

SKILLBUILDERS ANSWER KEY

Page 2

Defaced

1. D.
2. F.
3. H.
4. C.
5. A.
6. G.
7. E.
8. B

Helping Hand

1. The immune system defends the human body against foreign entities, such as viruses and bacteria. It attacks transplanted organs because it views them as foreign entities.
2. Protective sensation is the body's ability to feel heat, cold, and sharpness to protect the body from injury.
3. Josh Maloney received a new hand plus bone marrow cells from the same donor. The bone marrow cells were transplanted so that they would produce immune cells that would protect the transplanted hand.
4. Immunosuppressants keep the patient's immune system from rejecting a transplanted body part. Immunosuppressants have serious side effects, however. They put the patient at risk of serious infections and can

also lead to high blood pressure, diabetes, and some forms of cancer.

5. Instead of taking three immunosuppressants, Maloney needs to take only a low dose of one immuno-suppressant.

Page 3

Lost & Found

1. An archaeologist is a scientist who studies ancient cultures by examining their material remains.
2. satellite imagery and ground-penetrating radar
3. The scientist would expect to find a simple, sparsely populated society of small settlements.
4. An anthropologist is a scientist who studies the development of human cultures.
5. The Amazon region's soil lacks the nutrients that crops need.

House of Straw

1. Compression.
2. velocity.
3. force.
4. fault.
5. Tension.

6. shear.
7. massive.
8. shake table

Page 4

Cold Comfort

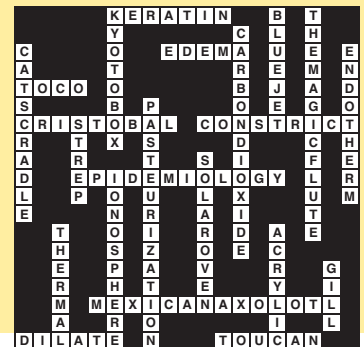
1. tummo.
2. frostbite.
3. cold-shock response.
4. 3.6.
5. heat.
6. fire, heat.
7. drops.
8. vital

Tag Team

1. C.
2. A.
3. A.
4. C.
5. B.
6. A.
7. C.
8. A

Page 5

Discoveries



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