

CURRENT SCIENCE

ASIA EDITION

2010 • Issue 4

Supplements for Science and Geography needs in school



THIS ISSUE AT A GLANCE

PHYSICAL SCIENCE

Faire Play

Pages 4–5

Critical Thinking

■ In what widely used devices are electromagnets found? (*loudspeakers, motors, electric bells, generators, tape recorders, video cassette recorders*)

■ *Transfer of energy:* electrical circuits

■ *Understandings about science and technology:* creativity and imagination

HEALTH SCIENCE

Photo Matt

Pages 6–7

Critical Thinking

■ What is the origin of the term *cerebral palsy*? (*Cerebral* is an adjective that means “of or relating to the brain or the intellect.” *Palsy* is a noun that means “a disorder of movement.”)

■ *Structure and function in living systems:* the human nervous and musculo-skeletal systems; disease

See more of Matt Milligan's photos on his Web site:

www.mattmilliganphotography.com

HEALTH SCIENCE

Second Opinion

Pages 8–9

Critical Thinking

■ Why might Jessica Terry's doctor have failed to diagnose her condition?

■ If the hygiene hypothesis is correct, how might children be exposed to the kinds of microbes that strengthen the immune system?

■ *Structure and function in living systems:* the immune system

■ *Personal and community health:* disease

EARTH SCIENCE

Fire Fight

Pages 10–11

Critical Thinking

■ Describe some ways in which people who live outside the tropical rain forests might help to conserve them.

■ Are there rain forests in North America? If so, where are they? (*yes, in Alaska and the Pacific Northwest*)

■ *Natural and human-induced hazards:* changes to the environment

■ *Energy in the Earth system:* global climate

LIFE SCIENCE

Sniff Test

Pages 12–13

Critical Thinking

■ In what other ways might a dog's superior sense of smell be put to use?

■ Taste and smell are forms of chemoreception. What form is sight? (*photoreception*)

■ *Structure and function in living systems:* sensory organs

■ *Natural hazards:* human activities

LIFE SCIENCE

Sporting Chance

Pages 14–15

Critical Thinking

■ Would you have yourself tested for the ACTN3 gene? Would the test results persuade you to devote your efforts to a certain athletic pursuit? Would the test results persuade you to pursue a sport you don't enjoy? Explain your answers.


■ *Structure and function in living systems:* muscles and movement

■ *Molecular basis of heredity:* genes, DNA

Current Science

Online

You can find Student's worksheet and online resources at our web site: <http://www.nurturecraft.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.

Mystery Photos Wanted

Most of the Mystery Photos featured in Current Science are taken by student photographers. For each photo published in the magazine, the photographer receives a gift.

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SKILLBUILDERS

Issue 4 2010

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

- | | |
|--------------------------------|---|
| 1. electromagnet () | A. a machine that makes electricity |
| 2. Maker Faire () | B. a measure of how difficult it is for electricity to flow through something |
| 3. bubble nucleation sites () | C. a device that stores an electric charge |
| 4. motor effect () | D. a temporary magnet created when electricity moves through a coil of wire |
| 5. frequency () | E. a force that causes an electric motor to spin |
| 6. generator () | F. a type of gas that gives cola its fizz |
| 7. resistance () | G. a rapid fire weapon |
| 8. Gatling gun () | H. a wacky hybrid of a country fair and a science fair |
| 9. carbon dioxide () | I. places where bubbles can form |
| 10. capacitor () | J. pitch |

Photo Matt (Page 6)**Short Answer**

1. What is cerebral palsy (CP), and how has it made photography a particular challenge for Matt Milligan?

2. What percent of cases of CP result from the same cause that seems to have been responsible for Matt's CP? _____

3. Describe the device—its function and its appearance—that Matt uses when he takes photographs.

4. What is a congenital condition? _____

5. What factor is responsible for most cases of CP? _____

SKILLBUILDERS

Issue 4 2010

**CURRENT
SCIENCE®****Second Opinion** (Page 8)**Vocabulary Challenge***Match each numbered word or phrase with its correct description. Write the letter of the description in the bracket provided.*

- | | | |
|------------------------|-----|---|
| 1. phlebitis | () | A. a tiny ball of immune cells that forms when the body is fighting diseases |
| 2. hygiene hypothesis | () | B. a scientist who identifies diseases by studying cells and tissues under a microscope |
| 3. serosa | () | C. a drug that reduces swelling and inflammation |
| 4. autoimmune disorder | () | D. the notion that exposure to certain microbes is good for the human immune system |
| 5. ecosystem | () | E. a condition in which the immune system attacks the body instead of protecting it |
| 6. steroid | () | F. an incurable inflammation of the bowels |
| 7. granuloma | () | G. an inflammation of the veins |
| 8. Crohn's disease | () | H. a long tube below the stomach that digests food |
| 9. small intestine | () | I. the outer layer of the small intestine |
| 10. pathologist | () | J. a community of organisms and their interactions |

Fire Fight (Page 10)**Multiple Choice***Choose the response that best completes each statement or answers each question. Write the letters in the spaces.*

- Which is not a fossil fuel? (A) coal, (B) natural gas, (C) wood ()
- The total mass of living things in an area is called the area's (A) biodiversity, (B) biomass, (C) biome. ()
- Which of these countries is the Amazon rain forest not in? (A) Brazil, (B) Peru, (C) Paraguay ()
- Which areas flank either side of the equator? (A) the temperature zones, (B) the tropics, (C) the polar regions ()
- Which of these sources has added the most extra carbon to the atmosphere? (A) deforestation, (B) industry, (C) transportation ()
- Which of the following is not a sustainable crop? (A) cacao, (B) coffee, (C) oil palm ()
- Life on Earth is said to be based on which element? (A) carbon, (B) nitrogen, (C) oxygen ()
- Tropical regions are typically (A) cold and dry, (B) warm and dry, (C) warm and wet. ()
- Indonesia is located in (A) Africa, (B) Southeast Asia, (C) South America. ()
- Which country lies south of Paraguay? (A) Argentina, (B) Bolivia, (C) Peru ()

SKILLBUILDERS

Issue 4 2010

**CURRENT
SCIENCE®****Sniff Test** (Page 12)**Fill in the Blanks**

Write the word or words that best complete each sentence.

1. People who have _____ are unable to regulate their blood sugar levels.
2. Hematophagous organisms feed on the _____ of warm-blooded animals.
3. _____ are animals with backbones.
4. The scientific name for bedbug is _____.
5. When a bedbug is sucking blood, it excretes a liquid that keeps the blood from _____.
6. The _____ is tissue in the nose that contains millions of nerve cells that are sensitive to odors.
7. Gustation is the sense of _____.
8. Nothing evaporates from a _____ substance.
9. Bedbugs are attracted by the _____ that people exhale.
10. Bedbugs smell like _____.

Sporting Chance (Page 14)**Short Answer**

1. What are skeletal muscles and what do they do? _____

2. A person who has two X copies of the ACTN3 gene might be more likely to succeed at which of the following athletic pursuits? *weight lifting, shot put, cross-country skiing, javelin, racewalking, bicycle racing*

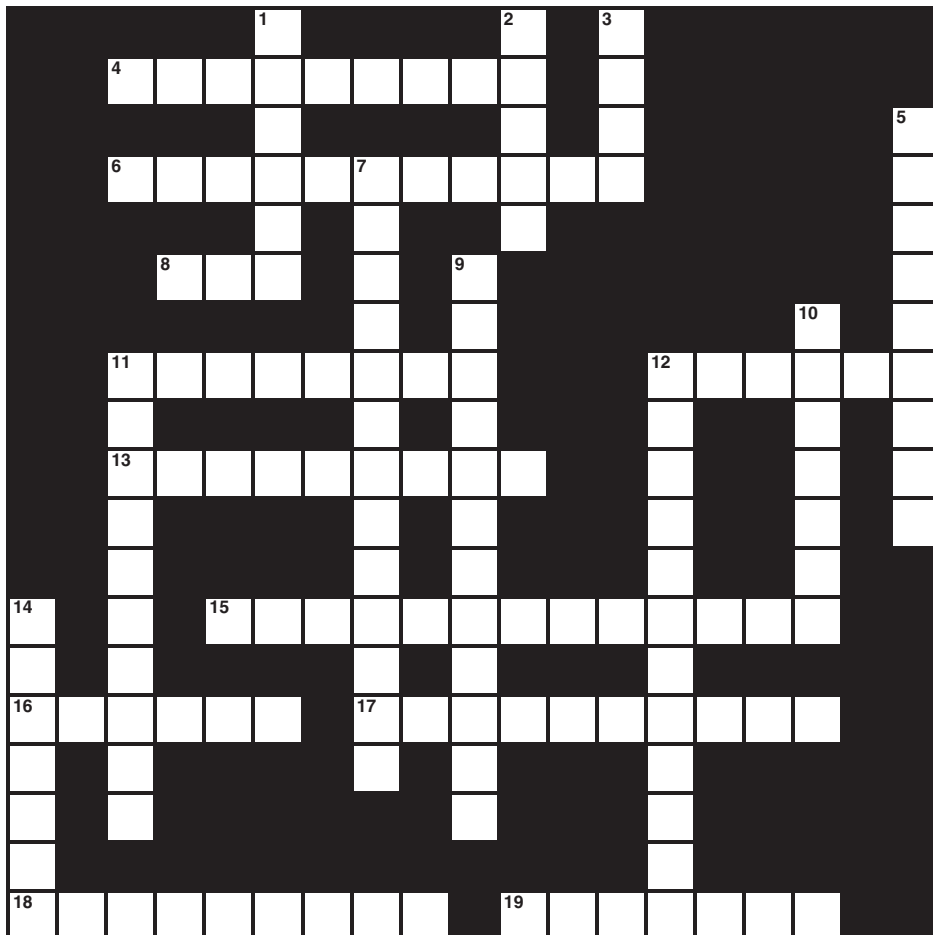
3. Is Ava Anderson's ACTN3 profile more similar to her mother's profile or her father's profile?
Explain your answer. _____

4. A person who has more fast-twitch than slow-twitch muscle fibers might be more likely to achieve success at which athletic pursuits? *bodybuilding, discus, marathon running, hammer throwing, boxing*

5. How does aerobic exercise differ from anaerobic exercise? _____

SKILLBUILDERS

Issue 4 2010

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

4. working model
6. It has endangered the gray nurse shark.
8. peripheral nervous system (abbr.)
11. African country where the Ol Doinyo Lengai volcano is located
12. a person whose body has electronic or mechanical parts
13. a type of cancer treatment
15. the most common cancer in young children
16. the layer that lies beneath Earth's crust
17. artificial
18. minerals found in most lavas
19. a type of plastic

Down

1. a hollow organ in which a fetus develops
2. a thick, sticky plant secretion
3. a force that impedes motion
5. a type of shark
7. a type of treatment that enhances the immune system's ability to fight a disease
9. a type of tree that grows on 10 Down (two words)
10. an island in the Arabian Sea
11. instability in the air
12. cancer drugs
14. tiny craters on a golf ball

Sci-Triv Game (Page 2)

Answers

Health Science

1. False. Though the rare color-blind person sees only black and white, the majority of those who are color-blind cannot tell certain colors apart. The most common form is *red-green color blindness*, an inability to distinguish red from green. 2. C, 3. anemia, 4. lice, 5. A plantar wart is a wart that occurs on the sole of the foot or the toes. It is caused by a highly contagious virus that is often contracted by walking on the moist surfaces at public showers and swimming pools.

Earth Science

1. True, 2. C, 3. Dorothy Gale. A gale is a wind of 63 to 87 kilometers (39 to 54 miles) per hour. 4. fossil, 5. An aquifer is a porous layer of underground sand or rock that holds water that has seeped down from the surface or nearby bodies of water.

Mathematics

1. True. Inverse mathematical operations are operations whose natures or effects are the opposite of each other. 2. B. There is no such number as a bajillion or a zillion. But a nonillion is equal to 10^{30} . 3. 200 percent, 4. mixed, 5. An incircle is a circle that lies inside a triangle and touches all three sides. Its center is the incenter of the triangle.

Life Science

1. True. Silk moth caterpillars upchuck a foul-smelling and foul-tasting fluid that wards away their enemies. The caterpillars also make a clicking noise before they vomit. Enemies learn to associate the clicking noise with the vomit and will skedaddle at the sound of the first click. 2. C. A wader is a long-legged bird with a long pointed beak that wades in the water in search of food. 3. An allomother is a female or male organism that provides care

to another female's infant. 4. bipedal, 5. A feral animal is a wild animal. It often specifically refers to a domestic animal that has escaped and taken up a wild existence.

Physical Science

1. True, 2. B, 3. A ramp is a type of *inclined plane*, a slope that reduces the effort needed to move something. Pushing a cart up a ramp to a higher level is easier than lifting the cart vertically. 4. fluid, 5. Sugar glass is a mixture of sugar, corn syrup, and water that looks like glass when it hardens.

Optricks (Page 24)
Mystery Photos:
Top: the flap of cartilage in the outer ear
Middle: accordion
Bottom: shopping carts
Bend Your Mind:
 four perfect circles
Whatizit? vitamin D

SKILLBUILDERS ANSWER KEY

Page 2

Faire Play

- 1. D, 2. H, 3. I, 4. E, 5. J,
- 6. A, 7. B, 8. G, 9. F, 10. C

Photo Matt

- 1. Cerebral palsy (CP) is a form of brain damage that makes the muscles difficult to control. It is a challenge for Matt because he needs a steady hand to take photos.
- 2. 9 percent
- 3. Matt uses a *monopod*, a steadying device that is similar to a tripod but is more compact and has one leg instead of three.
- 4. A congenital condition is one that is present at birth.
- 5. low birth weight

Page 3

Second Opinion

- 1. G, 2. D, 3. I, 4. E, 5. J,

- 6. C, 7. A, 8. F, 9. H, 10. B

Fire Fight

- 1. C, 2. B, 3. C, 4. B, 5. B,
- 6. C, 7. A, 8. C, 9. B, 10. A

Page 4

Sniff Test

- 1. diabetes, 2. blood, 3. Vertebrates,
- 4. *Cimex lectularius*, 5. clotting,
- 6. olfactory epithelium, 7. taste,
- 8. nonvolatile, 9. carbon dioxide,
- 10. onions

Sporting Chance

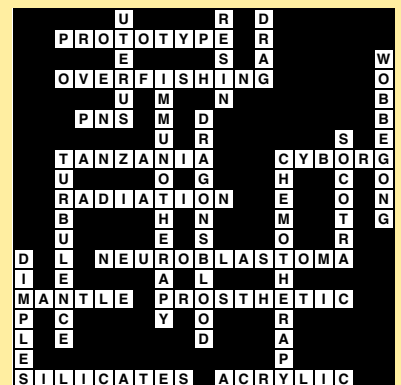
- 1. Skeletal muscles are muscles attached to the skeleton. They create movement by contracting and relaxing.
- 2. cross-country skiing, racewalking, bicycle racing
- 3. Ava Anderson is more like her father. She has one X and one

R form of the ACTN3 gene.

- 4. bodybuilding, discus, hammer throwing, boxing
- 5. Aerobic exercise requires oxygen to fuel the muscles; anaerobic exercise doesn't.

Page 5

Discoveries



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