

## Check for Understanding

### Bionic Body Parts

#### Page 8

1. b 2. d 3. a 4. b 5. a 6. c 7. d 8. a 9. b 10. c

## Who You Callin' Ugly?

#### Page 12

1. i 2. d 3. e 4. c 5. h 6. j 7. f 8. b 9. g 10. a

## Mining Lithium for Your iPod

#### Page 16

1. Lithium-ion batteries are growing in importance because they are lightweight and long-lasting, so that manufacturers can pack more power into a smaller package to run portable devices.
2. The lithium triangle is in South America and surrounds the salt flats found in Chile, Argentina, and Bolivia.
3. People are staking claims to lithium around the world because this element is the key to making small, lightweight batteries. Demand for this element has skyrocketed over the last 20 years.
4. A lithium-ion battery consists of a positive terminal called an anode, a negative terminal called a cathode, and an electrolyte separator, through which electrons pass as the battery is used.
5. Brine is water saturated with salts and other elements, like lithium, potassium, and magnesium.
6. Lithium-rich brine is pumped from the ground and put into large, shallow evaporation ponds. The sun evaporates the water from the top while mineral impurities precipitate out as the brine is moved from pond to pond. Once the lithium content reaches 6 percent, the brine is sent to refineries on the coast.
7. It takes an average of 18 months to remove most of the impurities from the lithium brine at the lithium mines in the Salar de Atacama.
8. Neodymium is used in superstrong magnets that can be found in headphones, hybrid-car engines, and wind turbines.
9. The batteries in the new generation of electric and hybrid-electric cars contain about 9 kilograms (20 pounds) of lithium.
10. Answers will vary.

## Bonus Reproducible

### Build a Bionic Foot

#### Part 2: Test the Prosthesis

1. Answers will vary but should include: When the strings face me, I am looking at the bottom of the foot. This is because when I pull on the strings, the claws flex toward me, as if they are trying to grip a branch.
2. Answers will vary but should include: The bird's foot has two joints per claw; whereas a human's foot has three joints per toe. The bird's foot is also smaller and has only four digits, compared with a human foot, which is much bigger and has five digits.
3. Answers will vary but should include: The tendon running through toe 4 is separate from the other tendons because this digit is opposable, like the human thumb.