**Unit 1 Muscles Move Our Bodies**

**Translate the sentences.**

1. Write a letter to a friend. Run fast to catch the bus for school.

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2. Stand up and stretch after watching too much TV.

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3. What’s the connection between these actions? They all use our bones and muscles!

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4. The bones and muscles which help us move are called “locomotive organs.”

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5. Bones form the structure of our body. They support our body, too.

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6. They also protect important organs like our heart, lungs, and brain.

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7. Muscles surround the bones. They extend and flex to make the body move.

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8. Let’s see how muscles work to move bones.

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9. Step 1. Flatten two straight straws using a pencil.

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10. Push a paper fastener through one end of each straw.

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11. Step 2. Put a bendy straw into a plastic bag.

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12. Tie the opening of the bag to the straw so no air can get out.

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13. Step 3. Tape both sides of the bag to both straws, front and back.

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14. You can tape a drawing of a hand to the front straw.

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15. Step 4. Blow air into the plastic bag through the bendy straw. What happens?

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16. When you blew air, the plastic bag swelled up.

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17. It got thicker and shorter, and it made the front straw lift up. This is how arms move.

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18. Our muscles are connected to our bones.

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19. When the muscles in our arms flex, they get thicker and bend our arms.

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20. When our muscles extend, they get flatter and straighten our arms again.

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21. Thanks to our bones and muscles moving together, we are able to move.

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22. Without them, we wouldn’t be able to do simple things, like turn the pages of this book!

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**Unit 2 Amazing Bones**

**Translate the sentences.**

1. Jessie was playing soccer with her little brother Pete when he fell and hurt himself.

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2. “Ow!” He held onto his leg. “Are you okay?” asked Jessie. “I think so,” said Pete bravely.

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3. He wanted to keep playing, but Jessie wanted to make sure his bones weren’t hurt.

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4. “What are bones?” asked Pete.

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5. “Bones are hard substances inside our bodies.

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6. They help us walk and run. They protect our organs.”

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7. “Do all bones look the same?”

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8. “No, they don’t. Your skull is round. It protects your brain.

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9. Your ribs are curved like a banana. They protect your heart and lungs.

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10. Your spine looks like a long stick of bamboo. It helps you stand up and lie down.”

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11. “Wow, I have so many bones,” said Pete.

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12. “You do. You have over 200! Now, you might have hurt your leg bone.

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13. We should go to the orthopedic doctor to check. That’s a bone doctor.”

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14. Pete had an x-ray.

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15. The orthopedic doctor said Pete had a crack in his leg bone and recommended lots of calcium.

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16. Pete drank milk and thought about his amazing bones.

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**Unit 3 Light Energy**

**Translate the sentences.**

1. Sunlight is very important to our world. We know that plants need sunlight to grow.

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2. How do they do it? Plants convert light energy into chemical energy.

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3. This chemical energy makes the plants big and strong.

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4. Solar batteries convert light energy into electric energy. They make electrical things work.

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5. Let’s see how light energy is converted into electric energy.

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6. Step 1. Tear or cut a thin piece of paper into long pieces.

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7. Attach it to the blades of a propeller using double-sided tape.

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8. Step 2. Connect a solar battery to a motor with wires and crocodile clips.

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9. Step 3. Put the propeller on the axis of the motor.

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10. Step 4. Place the solar battery facing the sun.

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11. What did you see? You saw the propeller turn.

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12. How did it work? Light from the sun shone on the battery.

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13. The battery converted this light energy into electric energy.

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14. The electric energy from the battery powered the motor.

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15. The electric energy became kinetic energy when the propeller turned.

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16. So, light energy turns into electric energy. Then electric energy turns into kinetic energy.

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17. We can’t see the energy change forms because it happens so quickly.

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**Unit 4 Roller Coaster Cars**

**Translate the sentences.**

1. Mike went to an amusement park with his dad. They had fun on some small rides.

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2. They sat down to eat some lunch. Mike heard some happy screams.

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3. He turned and saw a huge roller coaster.

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4. “Dad, look at that!” he shouted.

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5. The cars on the roller coaster came flying down a hill and went up another.

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6. “How do the roller coaster cars go so fast?” Mike asked.

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7. “Do they have an engine like a bus?”

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8. “No, they don’t. The track pulls the cars up a big hill.

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9. As they go up, they create potential energy. Then they go down the other side.

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10. Gravity pulls them downward. The potential energy becomes kinetic energy.

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11. This energy pulls the cars fast around the track.” “Wow, that’s amazing!”

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12. “Yes, potential energy gets converted to kinetic energy all the time.

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13. When you drop a ball, it has potential energy.

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14. As it hits the ground, that is turned into kinetic energy, and it bounces up.

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15. So, would you like to ride the roller coaster?”

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16. “Maybe not, Dad. Let’s just go on the merry-go-round again!”

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**Unit 5 Our Hearts Pump Blood**

**Translate the sentences.**

1. We breathe air into our lungs. Our lungs extract oxygen.

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2. We swallow food. The stomach breaks it down and our intestines turn it into nutrients.

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3. We need oxygen and nutrients to live. They need to move around our body.

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4. Blood delivers nutrients and oxygen to all cells in the body.

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5. The heart pumps blood through the body.

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6. If the heart stops, the body can’t get the oxygen and nutrients it needs.

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7. The heart and blood vessels are called “circulatory organs.” Let’s see how they work.

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8. Step 1. Prepare a hand pump and pipe, a big bucket of water, and some red ink.

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9. Step 2. Put the pipe in the water and squeeze it quickly.

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10. Check the speed and amount of flowing water.

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11. Step 3. Now, check the speed and amount of flowing water when you press the pump slowly.

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12. In the experiment, the pump is the heart.

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13. The pipe is a blood vessel, and the red water is blood.

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14. When the heart beats fast, blood flows fast. More blood can move around the body.

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15. When the heart beats slowly, blood flows slowly.

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16. Only a small amount of blood can move.

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17. Look after your heart. A healthy heart moves faster.

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18. It moves blood from the heart all through the body and back again.

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19. Blood keeps flowing round and round.

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20. Your blood is flowing as you read this!

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**Unit 6 Blood Moves All Around**

**Translate the sentences.**

1. Oh, no! Alex accidentally cuts himself with his scissors.

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2. Mom comes and puts a bandage on the wound.

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3. As she treats it, Alex asks where blood comes from.

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4. “Blood comes from the heart. It moves all around inside your body.”

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5. “Even my fingers and toes?”

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6. “Everywhere! There’s blood under the skin all over your body.

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7. Blood contains essential nutrients and oxygen.

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8. The heart is a powerful pump that moves blood around inside the body through our blood vessels.”

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9. “Are all blood vessels the same?”

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10. “No, there are three kinds of blood vessels: arteries, veins, and capillaries.

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11. Arteries push blood away from the heart. Veins bring blood back to the heart.

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12. Capillaries connect the two. They are very small and carry blood to the tips of your fingers.

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13. You cut a capillary on your finger, so it bled.”

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14. “My blood vessels must be very long!” says Alex.

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15. “You have 120,000 km of blood vessels in your body!” says Mom.

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16. “Now, let’s look after your heart with a tasty salad for lunch.”

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**Unit 7 Making Magnetic Fields**

**Translate the sentences.**

1. We know how electric currents work. We know how magnets work.

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2. Did you know that electric currents can make magnets move?

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3. It’s true! Electricity creates magnetism. Let’s take a look.

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4. Step 1. Make an electronical circuit using a battery, wires, and a switch.

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5. Step 2. Put the compass under one of the wires.

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6. Make sure the wire is parallel to the needle of the compass.

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7. Step 3. Press the switch. See the needle move.

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8. Step 4. Now, put the battery the other way around.

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9. Put the wire parallel to the needle like before.

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10. Step 5. Press the switch. See which way the needle moves now.

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11. How did the electric current move the needle of the compass?

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12. Compasses use magnets to work. Earth’s poles are like giant magnets.

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13. The needle of a compass is a small magnet.

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14. The south pole of the compass needle points toward Earth’s north pole.

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15. When we pressed the switch, the electric current created a magnetic field.

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16. The wire was now magnetic. Electricity always flows from positive to negative.

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17. The needle of the compass pointed toward the flow of electricity in the wire.

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18. We turned off the switch. The wire wasn’t magnetic anymore. The needle pointed north again.

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19. We then moved the battery the other way around.

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20. We moved the direction of the electrical flow.

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21. The needle of the compass pointed in the new direction.

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22. Add more batteries in a serial connection or put the wires and compass closer.

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23. The movement of the needle will be bigger.

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**Unit 8 Earth Is a Magnet**

**Translate the sentences.**

1. Bella went camping with her family. She went to get wood with her dad.

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2. They saw a squirrel in the trees. They followed it for a while but soon realized they were lost.

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3. “Dad? Where are we?” “Don’t worry, Bella. We’ve been walking south.

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4. The campsite is to our north. We can use a compass to get back.”

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5. Following the compass north, they soon found their campsite.

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6. Mom started a fire with the wood.

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7. “Wow, this tiny compass really knows the way. How does it work?”

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8. “Good question, Bella!” said Dad. “You learned about magnets in school, didn’t you?”

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9. “Yes! The same poles repel, and opposite poles are attracted to each other.”

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10. “Correct! Earth is like an enormous magnet. It has a north and south pole.

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11. The needle of a compass is a tiny magnet.”

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12. “Let me guess. The south pole of the magnet points to the north pole of Earth.

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13. That’s why compasses always point north!”

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14. “That’s right!” said Dad. “Explorers used compasses to travel around the world.”

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**Unit 9 Bacteria vs. Fungi**

**Translate the sentences.**

1. Bacteria and fungi are living things that are all around us.

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2. You probably have yogurt, made by bacteria, and mushrooms, a type of fungi, in your fridge at home.

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3. Yogurt is made from milk. Bacteria in the milk create lactic acid.

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4. They turn the liquid milk into thick yogurt. Mushrooms are a type of fungi.

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5. Of course, we know we can eat some kinds of mushrooms!

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6. Mold is another type of fungi. Like bacteria, mold can make new foods.

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7. This process of making new foods is called fermentation.

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8. Milk turns to yogurt because of fermentation.

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9. Other fermented foods include kimchi, cheese, and soy sauce.

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10. While bacteria are very small, fungi grow large enough to see with our bare eyes.

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11. Let's make our own mold and watch it grow.

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12. Step 1. Spray a little water on a slice of bread.

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13. Step 2. Put the bread in a zipper bag and seal it.

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14. Step 3. Put the zipper bag in a warm and humid place.

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15. Step 4. Observe the mold over about 7 to 10 days.

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16. Leave the bread inside the bag and don’t forget to wash your hands properly afterward.

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17. Fungi need somewhere warm and humid to grow.

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18. They can’t get nutrients alone, so they get them from other things.

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19. These things can include animals or plants.

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20. It can include old food like the bread we used.

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21. Now you know why old fruit gets moldy if you leave it too long!

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22. Some bacteria can produce their own nutrients.

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23. Unlike fungi, bacteria are made of only a single cell.

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**Unit 10 Strange Smells**

**Translate the sentences.**

1. Dad is back from playing tennis. But... what’s that smell?

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2. Mark says, “Dad, your feet smell bad! Is it because of athlete’s foot?”

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3. Dad looks embarrassed. He goes to wash.

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4. Mom explains, “Bacteria make feet smell bad, and fungi cause athlete’s foot.”

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5. “Oh,” says Mark, “are bacteria and fungi different?”

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6. “They are. Bacteria and fungi are both very small, and they do a lot of work.

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7. Both of them can make food go bad and sometimes cause illnesses.”

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8. “Bacteria and fungi are very scary, aren’t they?” asks Mark.

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9. “They’re not all bad.

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10. Because of their hard work, rotten food, dead animals, and dead plants become nutrients.

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11. Mold and mushrooms are both types of fungi.”

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12. “Wow, mushrooms are tasty and cool.”

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13. “Yes, they are! Bacteria and mold both cause fermentation as well.

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14. This helps make the bread and soybean paste you and Dad like so much.

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15. Bacteria in the yogurt you have in the morning strengthen your body!” explains Mom.

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16. “Wow! They do so many things! It would be a whole different world if they didn’t exist.”

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**Unit 11 62 Degrees in the Morning?**

**Translate the sentences.**

1. It’s a very hot summer morning.

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2. You decide to check the latest weather conditions on some weather sites.

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3. Wait, this can’t be right. Is it really 62 degrees in the morning, and 80 degrees in the afternoon?

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4. Oh, is it 86 degrees on Thursday? How can the temperature be this high? That’s far too hot!

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5. Well, it’s quite simple. There’s no need to worry at all.

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6. There are two common ways to measure temperature: Celsius and Fahrenheit.

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7. What’s the difference between them?

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8. Step 1. Find a weather chart which describes the degrees with Fahrenheit.

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9. Step 2. Find Celsius degrees using a formula changing Fahrenheit to Celsius.

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10. First, subtract 32 from the Fahrenheit temperature.

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11. Step 3. Next, multiply the result by 5/9.

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12. (Fahrenheit degrees – 32) x 5/9 = Celsius degrees

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13. You can always change Fahrenheit into Celsius with this formula.

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14. Let’s take an example. One weather site says it’s 62°F in the morning.

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15. First, subtract 32, which is the freezing point of Fahrenheit temperature, from 62.

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16. That gives us 30. Next, multiply the result by 5/9. That’s 50/3.

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17. The result of that is about 16.7, which means that 62°F is 16.7°C.

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18. That’s not very hot, is it?

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19. Why don’t you try to turn more Fahrenheit temperatures into Celsius?

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20. Try some different numbers. What Fahrenheit temperature is 25°C?

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**Unit 12 Different Temperatures**

**Translate the sentences.**

1. Emma goes on a trip to the U.S. with her family.

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2. After a day of fun, they come back to their accommodations.

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3. Dad watches the weather forecast on television.

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4. Wait, it will be 77 degrees tomorrow!

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5. “Dad, how can it be so hot?” asks Emma.

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6. “Don’t worry, Emma. That’s the temperature in Fahrenheit. 77°F is 25°C.”

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7. “What’s the difference, Dad?” “Fahrenheit measures temperature a bit differently.

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8. 0°F is the freezing point of salt water.” “Why salt water?”

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9. “Because that was the coldest thing a human could make at that time.

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10. 32°F is the freezing point of pure water. 212°F is the boiling point of water.”

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11. “Then what is Celsius?” asks Emma.

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12. “Another scientist proposed Celsius temperature in 1742. It adopted the unit of °C.

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13. He set the freezing point of water as 0°C and the boiling point of water as 100°C.

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14. Except for the U.S. and a few other countries, most places in the world use Celsius.

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15. Why don’t you find an American weather forecast and see what degrees look like in Fahrenheit?

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**Unit 13 The Wonder of Rainbows**

**Translate the sentences.**

1. Refraction and reflection are two ways of moving light.

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2. Look at a bird with binoculars. It looks close even though it’s far away.

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3. That’s because of refraction. Binoculars bend and focus the light.

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4. The birds fly over a lake. You can see them in the water.

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5. The light bounces off the water and is reflected.

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6. Let’s look at reflection and refraction at the same time. We will make our own rainbow!

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7. Step 1. Fill a transparent glass with water. Put the mirror in the water at an angle.

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8. Step 2. Place the glass near a window so the sun can shine on the mirror.

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9. Step 3. Check the reflection on the wall.

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10. Control the angle of the glass to make a rainbow on the wall.

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11. How did this work? The sunlight was refracted as it entered the water.

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12. It slowed down and changed direction. Then the light hit the mirror. It was reflected.

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13. It bounced off the mirror and came back. As it left the water, it was refracted again.

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14. Light is made of many colors. We usually see it as only white.

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15. When the light hit the mirror and left the water, the light was split up into different colors.

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16. We saw a rainbow. In nature, we only see rainbows when the sun shines after it rains.

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17. There are water droplets in the air. Light is refracted and reflected like in the experiment. Aren’t rainbows amazing?

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**Unit 14 All the Colors of the Rainbow**

**Translate the sentences.**

1. Noah and his mom are caught in a heavy shower on the way to town.

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2. They run inside a cafe. They order some hot chocolate.

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3. It soon stops raining, and the sun comes out.

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4. “Wow, Mom, look at that! It’s a rainbow!

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5. Let’s go and find the end. I want to touch the rainbow.”

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6. Mom laughs. “You can’t touch a rainbow, Noah. Rainbows are made of light.”

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7. “Oh, I think we learned about it in school. Is it because of light reflection?”

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8. “Yes, and light refraction. Because it rained, there are still raindrops in the air.

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9. The sun shines on the drops. When the light enters the drops, it is refracted.”

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10. “It bends!” “That’s right. It then hits the back of the water drop and is reflected.”

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11. “It bounces back!” “Correct. As it leaves the drop, it is refracted again.”

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12. “So the light is refracted twice and reflected once? All inside a tiny raindrop?” asks Noah.

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13. “Yep. As it exits the droplet, the light is split into many wavelengths.”

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14. “And the wavelengths are all different colors?”

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15. “That’s right! All the colors of the rainbow.”

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**Unit 15 Creating Organs and Limbs**

**Translate the sentences.**

1. Your body consists of many organs all working together.

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2. It is like a wonderful and complicated machine.

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3. However, they don’t always work properly. Hearing can become very bad.

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4. Hearts stop working properly. Limbs can be lost in an accident.

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5. What can people do?

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6. They might be able to get an artificial organ to do the work of their real organs.

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7. Doctors can give you an artificial limb. It might be an arm with fingers that can really move.

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8. Doctors can replace a damaged heart with an artificial one.

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9. They can replace your inner ear so you can hear better.

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10. Artificial organ producers design and make artificial organs.

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11. They look at our real organs and try to copy them.

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12. They make them from plastics and metals. They test them over and over.

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13. There is still a lot of work to do, though. Artificial organs are not as good as real ones.

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14. They are often very expensive. They don’t look the same.

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15. There are also some organs that humans cannot yet create.

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16. But artificial organ producers keep trying.

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17. They do all they can to help people who need artificial organs and limbs.

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**Unit 16 Online Doctors**

**Translate the sentences.**

1. You start to feel sick. You don’t know what’s wrong. You need to speak to a doctor.

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2. But the doctor’s office is too far away. Or maybe there’s a bad storm outside.

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3. How can you speak to a doctor? You can try telemedicine.

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4. Telemedicine allows people to speak to their doctor without leaving the house.

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5. You may have used video software for school or to speak with family.

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6. But you can use it with your doctor, too.

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7. Talk to an online doctor on the computer or the phone.

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8. The doctor can check your medical records. They can see what’s wrong with you.

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9. They can prescribe medicine and tell you what to do next.

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10. Not everyone likes online doctors, however.

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11. Some people prefer to see doctors face-to-face.

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12. Others think online doctors could miss something important.

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13. However, it can help many people.

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14. Disabled people or people in the countryside might prefer online doctors.

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15. People can even speak to an online doctor from another country.

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16. Telemedicine can make many lives easier. Online doctors can change people’s lives.

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