**Unit 1 What’s the Temperature?**

**Translate the sentences.**

1. Thermometers tell us when it is hot or cold.

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2. They tell us the exact temperature. We use them in our daily lives.

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3. How do they work? Can we make our own thermometer?

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4. Let’s make a thermometer with everyday materials.

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5. Step 1. Pour water into a small bottle and add a few drops of food coloring.

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6. Step 2. Poke a small hole in the lid.

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7. Step 3. Close the lid. Put the straw through the hole so it touches the water. Seal it with clay.

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8. Step 4. Draw horizontal lines on a piece of paper and put it on the straw.

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9. What did we see?

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10. When the temperature was warm, the water went up inside the straw.

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11. When the temperature was cold, the water went down into the bottle.

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12. How does it work? Liquids increase when they meet something warm.

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13. The water moves up the straw.

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14. Water decreases when it meets something cold. So, it moves down the straw.

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15. The thermometer showed us the change in temperature.

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**Unit 2 James Feels Hot**

**Translate the sentences.**

1. James coughs. He feels sick.

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2. “Mom, my forehead is too hot!” he says.

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3. Mom takes a thermometer out of a drawer.

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4. She checks his temperature. It’s normal.

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5. “You seem okay,” she says.

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6. James looks at the thermometer. “Mom, what’s the red stuff inside?”

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7. Mom says, “It’s alcohol. Alcohol changes its volume, so it goes up and down quickly.

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8. For this reason, alcohol is used in thermometers.

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9. There are many kinds of thermometers.

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10. This one measures your body temperature.

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11. I also use one in the kitchen for cooking.

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12. There are thermometers in botanical gardens and hospitals as well!”

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13. “Wow. Do we have any more thermometers at home?” “Let’s go and see!”

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**Unit 3 Melting Points**

**Translate the sentences.**

1. It was very cold. Mandy and Mark went to the movie theater.

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2. When the movie finished, they went out.

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3. “The ice on the street didn’t melt!” said Mandy.

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4. When they got home, Mark put some ice in a glass of water.

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5. It melted in five minutes!

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6. Does ice melt at a different speed in different liquids? Let’s see!

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7. Step 1. Pour cola, milk, and water into different bowls.

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8. Put an ice cube in each bowl at the same time.

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9. Step 2. See how long it takes for the ice to melt in each bowl.

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10. The ice melts in this order: first in water, then in cola, and then in milk.

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11. Ice melts fastest in pure water. But ice melts slowest in milk.

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12. The melting point is the temperature when a solid changes to a liquid.

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13. The melting point of water is higher than the other liquids.

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14. Water is a pure substance. Mixtures have lower melting points than pure substances.

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15. That is why ice melts the fastest in water.

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**Unit 4 The Case of the Disappearing Snowman**

**Translate the sentences.**

1. Emma woke up early on Christmas morning. Snow was everywhere!

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2. “Dad, let’s make a snowman!” she said. So they did.

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3. Then she went to her grandparents’ for a tasty meal.

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4. That evening, they came home.

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5. “Dad, the snowman ran away! Where is it?”

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6. “It was warm today,” said her dad. “The snow melted.

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7. Last night, the temperature was below zero degrees Celsius.

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8. The water vapor in the air froze. It turned to snow and fell from the clouds.

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9. Today, the temperature was warm. It was more than zero degrees Celsius.

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10. So the snow melted. Zero degrees Celsius is the melting point of water.

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11. Look, can you see the water where your snowman was?”

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12. “I see it! Can we make a snowman next time it snows?”

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13. “Of course! Now, who wants some ice cream?”

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**Unit 5 Wet and Dry**

**Translate the sentences.**

1. Do you know what high humidity is?

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2. It’s when there is a lot of water vapor in the air.

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3. When it’s hot and humid, you sweat a lot.

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4. The sweat stays on your body. You feel hotter.

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5. When it’s cold and humid, your clothes get wet.

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6. When cold wind blows on them, you feel colder.

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7. Let’s see how humidity works. Let’s make a hygrometer.

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8. Step 1. Make an arrow out of a straw. Make a hole in the arrow.

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9. It should be slightly larger than the size of a pin.

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10. Step 2. Put a pin through the hole, and pin it to the bottom of a thick piece of cardboard.

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11. Step 3. Take a long hair. Stick one end to the top of the cardboard.

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12. Stick the other end to the arrow.

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13. Step 4. Take a hairdryer and blow hot air on the hair.

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14. Step 5. Now, put the hygrometer in a bag with a wet sponge.

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15. Close the bag and wait.

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16. When we used the hairdryer on the hair, it got shorter, and the arrow moved.

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17. When we put the hygrometer in the bag, the hair got longer, and the arrow moved the other way.

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18. Why did this happen? The hairdryer dried out the air around the hair.

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19. It made the hair shrink.

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20. In contrast, hair expands when it’s wet or humid.

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21. Humidity can even make your hair curly!

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**Unit 6 Hot and Humid**

**Translate the sentences.**

1. It rained all day yesterday, but today it’s sunny.

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2. Mia goes to the park with her mom. It’s really hot and sticky.

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3. Mom says, “The weather today is really hot and humid.”

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4. “Humid? What’s that?” Mia asks.

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5. “Humidity is how much water vapor there is in the air.

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6. High humidity means there is a lot of water vapor in the air.

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7. Low humidity means there is little water vapor in the air.

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8. When the humidity is too high, like today, you feel hotter.

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9. You sweat more. And food goes bad quickly!”

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10. “So high humidity is harmful?” asks Mia.

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11. “Not at all. When the humidity is too low, the air is dry.

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12. It dries your skin and eyes. It can be hard to breathe.”

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. “Well, it’s too humid today. Let’s go home,” says Mia.

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**Unit 7 Heat Transfer**

**Translate the sentences.**

1. Leave a spoon in a hot pot of soup.

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2. When you touch it later, the spoon is hot!

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3. But the spoon handle wasn’t inside the soup.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Why did it get hot? Heat moved up the spoon.

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5. When you heat part of a solid material, that part gets hotter.

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6. Then the heat moves to the rest of the object.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. The whole object gets hot over time.

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8. Heat moves through solid materials. This is called “conduction.”

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9. Let’s watch it happen. This experiment involves fire, so be careful.

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10. Step 1. Prepare three different copper sheets.

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11. Step 2. Attach thermochromic adhesive labels to the three different copper sheets.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. Step 3. Heat a corner of each copper sheet and observe the color change on the labels.

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13. Step 4. Draw the direction the color changes when heating the copper sheets.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. The first part of the sheet to change color is the part near the fire.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. Then the rest of it changes.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16. Heat transfers from a high temperature to a low temperature.

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**Unit 8 Insulating Ice**

**Translate the sentences.**

1. Danny saw a picture of an igloo in a magazine.

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2. “Wow, Mom, look! A house made of ice! But isn’t it cold in there?”

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3. “No, not at all. The house is made of cold ice.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. But it isn’t cold inside because of insulation!” “What’s insulation?”

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. “Insulation stops heat escaping from an object or a place.

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6. Put a lid on a hot cup of tea. The tea stays hotter for longer.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Wear a jacket in winter. Hot air stays near your body.”

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8. “Oh, that’s why you tell me to close the windows in winter!

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. To keep the hot air in the house.” “That’s right.”

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. “I’m glad that even people at the North Pole can stay warm.”

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**Unit 9 Dissolving Substances**

**Translate the sentences.**

1. Put sugar in your tea. Put salt in your soup.

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2. They mix with the liquid. They seem to disappear.

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3. You can’t see them, but the sugar and the salt are still there.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Drink the tea. It tastes sweet. Try the soup. It tastes salty.

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5. The sugar and the salt mixed with the liquids.

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6. When a substance mixes with another substance, we call this “dissolution.”

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7. Step 1. Pour water in a beaker. Put the beaker on an electronic scale.

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8. Step 2. Put a sugar cube on the scale, too. Weigh them together.

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9. Step 3. Now, put the sugar cube in the beaker and dissolve it completely in the water.

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10. Step 4. Weigh the beaker again.

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11. The weight of the beaker doesn’t change.

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12. It is the same before and after dissolving the sugar cube in it.

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13. The sugar cube is still in the water.

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14. It dissolved in the water. It mixed with the water.

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**Unit 10 Solvents and Solutes**

**Translate the sentences.**

1. Today, some friends of Lisa’s mom came to visit her at home.

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2. They ate cookies and drank coffee.

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3. Lisa’s mom put sugar cubes in her bitter coffee. The sugar completely disappeared!

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4. Lisa wanted to ask what happened, but her mom was busy talking.

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5. So Lisa looked online. “Oh, the sugar didn’t disappear. It just dissolved.

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6. It got very small, and it mixed into the coffee.

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7. Now mom’s coffee is much sweeter!”

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8. Lisa saw that substances that dissolve in other substances are called “solutes.”

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9. Sugar and salt are solutes.

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10. The substance they dissolve in is called a “solvent.” Water and coffee are solvents.

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11. That’s why you can taste salt when you pour it on your food. But you can’t see it.

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12. Then Lisa mixed some substances together. Sugar dissolved in milk.

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13. But not everything worked. Water didn’t dissolve in oil!

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**Unit 11 All the Stars in the Sky**

**Translate the sentences.**

1. There are various stars in the night sky.

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2. People group the bright stars together into recognizable shapes called constellations.

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3. Some of them look like people or animals.

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4. Let’s make a light box and see the constellations at home.

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5. Step 1. Look at a map of the stars.

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6. Make holes in the lid of a box to match one constellation.

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7. Step 2. Make a large hole in the bottom of the box. Put a flashlight in the hole.

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8. Step 3. Show your friends the constellation light box that you made.

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9. Go to a dark room, shine the flashlight at the ceiling or the walls, and enjoy the constellation show.

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Constellations are different in summer and winter.

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11. This is because Earth moves around the sun.

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12. As Earth moves in space, we can see different stars.

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**Unit 12 Orion and the Big Dipper**

**Translate the sentences.**

1. Ryan went camping with his dad.

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2. They sat around the campfire at night.

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3. Ryan looked up at the night sky.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Wow! There were so many stars in the sky.

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5. Ryan couldn’t see that many in the city.

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6. In the city, fog, lights, and tall buildings hid the stars.

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7. Dad pointed to the sky. “Look! There’s Orion!” “Orion? What’s that?”

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8. “Orion is a man, but not a real man. It’s a constellation.

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9. That’s a group of stars that looks like something.

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10. It’s easy to spot Orion in the winter sky here.

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11. Just look for three stars that look like a belt.”

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12. “I see them!” says Ryan. “I can see Orion. Are there any more?”

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13. “Many more. Look over there. That one looks like a ladle.

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14. It’s called the Big Dipper.”

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**Unit 13 Water in the Air**

**Translate the sentences.**

1. Go outside early in the morning.

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2. Can you see drops of water on the grass or leaves? These drops are called dew.

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3. There are low and thick clouds close to the ground, making it difficult to see.

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4. That’s called fog. Fog and dew are different.

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5. But both are made by water in the air.

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6. Dew forms when water vapor meets cold leaves or branches.

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7. Then, the air cools down, and the water vapor in the air condenses.

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8. Let’s watch it happen.

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9. Step 1. Fill 2/3 of a jar with water and ice cubes.

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10. Step 2. Wipe the surface of the jar with a dry towel.

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11. Then, observe the changes on the surface of the jar.

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12. The vapor outside the jar condenses.

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13. It forms water drops on the surface of the cold jar.

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14. Fog forms from water vapor as well.

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15. Step 1. Fill up the jar with warm water to warm it up. Then pour out the water.

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16. Step 2. Put a lit incense stick into the jar for a minute. Then, take it out.

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17. Step 3. Place a dish with ice cubes on top of the jar. See what happens.

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18. The ice cools the warm water vapor.

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19. The water vapor condenses, and it makes fog inside the jar.

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**Unit 14 Steaming Hot Soup**

**Translate the sentences.**

1. Kevin is very hungry. Dad made carrot soup for dinner. Mmm!

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2. Dad puts the hot bowls on the table and starts to eat.

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3. Kevin starts laughing. “What’s funny?” asks his dad.

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4. “Your glasses are foggy! You look like Grandfather!”

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5. Kevin’s dad laughs. “That’s because of the steam,” he says.

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6. “Hot water vapor comes out from the soup, and it hits my cold glasses.

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7. The vapor cools down quickly and turns to liquid.”

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8. Kevin thinks about his morning shower.

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9. “That’s why the mirror steams up when I have a shower!”

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10. “Yes! That’s right,” says Dad. “Now eat your soup before it cools down.”

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11. Look for steam around you when you get home today.

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**Unit 15 Aerospace Engineers**

**Translate the sentences.**

1. Do you know about the Wright brothers?

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2. The Wright brothers invented the first airplane in 1903.

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3. It only flew for 12 seconds! It flew just 36 meters.

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4. Now, planes can fly from Asia to America.

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5. They can fly for 21 hours non-stop. Planes can fly over 15,000 km!

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6. Who made planes better? Aerospace engineers did.

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7. They keep designing better planes.

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8. They make planes faster, quieter, and safer.

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9. They make planes from better materials. They think of better shapes.

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10. They make planes better for the environment.

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11. Aerospace engineers don’t just design planes. They design drones and helicopters.

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12. They even design things that can travel in space, like satellites and space rockets.

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13. Would you like to design a rocket to visit the rest of the universe?

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14. Become an aerospace engineer!

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**Unit 16 3D Printing**

**Translate the sentences.**

1. We can print photos. We can print books.

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2. Can we print a pen? Or a cup? Or even a pizza? Yes, we can!

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3. 3D printers can print anything we can imagine.

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4. Special 3D printers can even print food!

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5. Install special software on your computer. Design anything you want.

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6. Your computer delivers the design to the 3D printer.

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7. The printer moves in all directions. It makes your design real.

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8. Mechanical engineers designed the first 3D printers 40 years ago.

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9. The printers used to be very big and very expensive.

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10. They couldn’t print many things.

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11. Now they are smaller and they are cheaper.

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12. They can print more and more things.

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13. Doctors can make artificial 3D-printed hearts.

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14. Artists can 3D-print their art. You can print your own toys.

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15. We can print anything we like thanks to 3D printers!

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