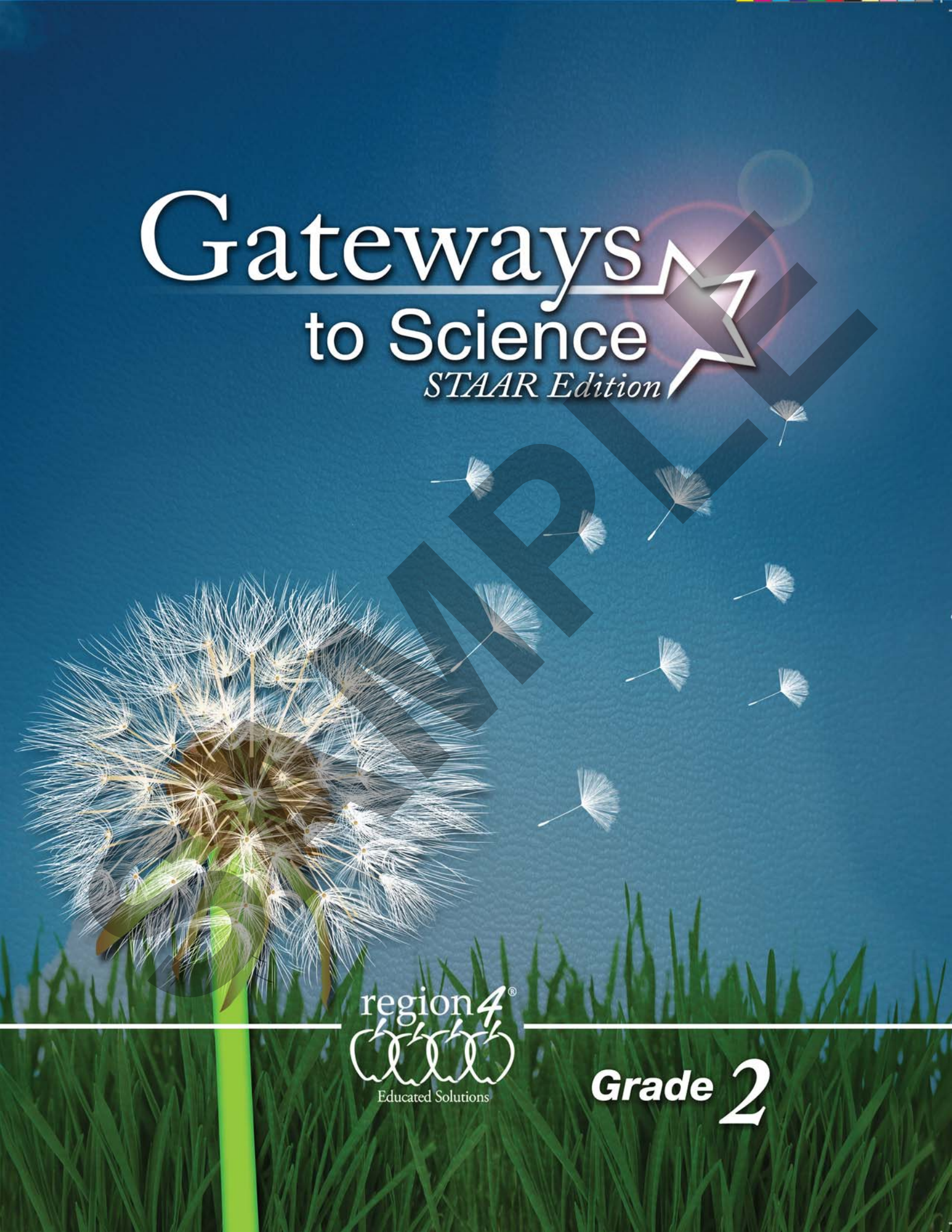
Gateways to Science

STAAR Edition



region4®
Educated Solutions

Grade 2

UNIT 4: Earth Science, Part 2

Lesson 1: Water Cycle

Learning Goal

Explore the processes of the water cycle.

Materials

For teacher
- access to a freezer or ice chest with ice

For each student
- 1 clear plastic cup (3 oz, 5 oz, or 9 oz)

Engage

Advance Preparation

- Place the cups in the freezer or on ice to chill. Do not allow the inside of the cups to get wet.

Teacher Instruction

- Provide a chilled cup to each student.
- Instruct each student to immediately place the cup over his or her mouth and to breathe one breath into the cup.
- Instruct each student to remove the cup from his or her mouth and to observe the inside of the cup.

Facilitation Questions

- What happened inside the cup? *Answers may include that the sides were foggy; it looked wet and then it looked dry.*
- Where have you seen this before? *Answers will vary and may include on car windows when it is cold outside, on the shower door, on the bathroom mirror, or on the bus windows.*

Materials

For teacher
- chart paper
- marker

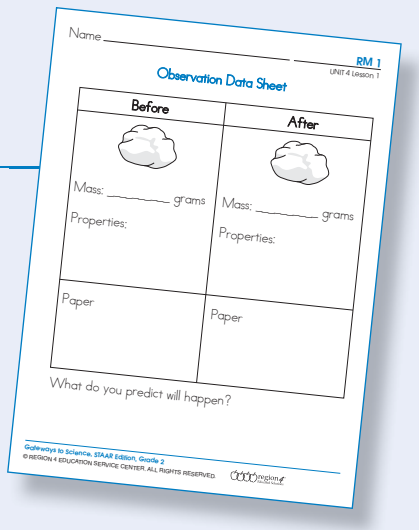
For each student
- RM 1 or science notebook

For student pairs
- 1 large cotton ball
- 1 pan balance with known masses
- 1 pencil or crayon
- 1 sheet of brown construction paper
- 1 small plastic plate with sides or small pie tin
- water

Explore

Advance Preparation

- Fill the bottom of each plate with cold water just before class begins.


Name _____ RM 1
UNIT 4 Lesson 1
Observation Data Sheet

Before	After
Mass: _____ grams	Mass: _____ grams
Properties:	Properties:
Paper	Paper

What do you predict will happen?

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Teacher Instruction

- Provide *RM 1: Observation Data Sheet* or project *RM 1* so that students can copy it into their science notebooks.
- Provide a plate of water, a cotton ball, a balance, and known masses to student pairs.
- Instruct students to measure the mass of the cotton ball and to record the measurement in the "Before" column of *RM 1* or their science notebooks.

- Instruct students to observe the cotton ball and record its properties in the "Before" column of *RM 1* or their science notebooks. Observations may include white, soft, fluffy, lightweight, and dry.
- Instruct students to hold the cotton ball above the water and lower it so that the cotton ball barely touches the surface of the water. The cotton ball should gradually absorb water.

Facilitation Questions

- What do you see? *The cotton ball is getting wet; it is soaking up the water and looks darker.*
- How does it feel? *The cotton ball feels wet and cold.*
- What are the properties of the cotton ball now? *The cotton ball is white, soft, mushy, heavier, wet, and cold.*
- What does the wet cotton ball remind you of when looking at the sky? *Answers may vary and could include a rain cloud.*

Teacher Instruction

- Record the properties of the wet cotton ball on chart paper.
- Instruct students to measure the mass of the wet cotton ball using the balance and to leave the cotton ball on the balance for now.
- Instruct students to record their measurements and observations of the wet cotton ball in the "After" column of *RM 1* or in their science notebooks.
- Provide a sheet of brown construction paper to each pair of students.
- Instruct students to record their observations of the construction paper in the "Before" column of *RM 1* or in their science notebooks. *Observations may include that the paper is brown, long, dry, grainy, and smooth.*
- Instruct students to do the following:
    - Place the brown paper flat on the table in front of them.
    - Hold the wet cotton ball from the pan over the paper and squeeze the water out of it.
    - Record their observations of the brown paper in the "After" column of *RM 1* or in their science notebooks.
- Discuss what each material represents: cotton ball = cloud; water = rain and wet; brown paper = mud.
- Instruct students to outline the puddle and place their papers in a sunny or brightly lit location.

Facilitation Questions

- What did you make on the paper? *We made a puddle on the paper.*
- How did the paper change after the water drops fell on it? *The paper appeared darker brown where the drops touched it, it had a puddle of water on it, and it was wet.*
- What do you predict will happen to the puddle? *It may dry up or disappear.*

Teacher Instruction

- Allow time for the water to evaporate (one or two days depending on climate conditions) and instruct students to observe their papers and share their observations.
- Record student observations on chart paper and discuss.

Materials

For teacher
- class science notebook
- markers

For each student
- student reader
- science notebook

Explain

Teacher Instruction

- Read aloud "Can You See the Water Cycle?" on pages 96–102 in the student reader as students follow along.

Facilitation Questions

- What is evaporation? *When the Sun warms Earth, the water evaporates and changes from a liquid to a vapor.*
- Which lines of the story describe evaporation? *"The water is then heated by the Sun. That is what it takes!" "Evaporation moves the water as vapor through the air."*
- What is condensation? *When the warm, moist air cools, it condenses and forms a cloud of tiny water droplets.*
- Which lines of the story describe condensation? *"The vapor cools and condenses, making water droplets there." "The water droplets condense, making clouds up in the sky."*
- What is precipitation? *Precipitation can be rain, snow, or hail; precipitation is water falling from the clouds.*
- Which lines of the story describe precipitation? *"Big drops and little drops leave their wet marks where they land."*

Lesson 1: Water Cycle

Teacher Instruction

- Gather students to make an entry about the water cycle in the class science notebook.
- Possible science notebook entry:

Water is everywhere. It is in the air, in the clouds, and on the ground, too. The water cycle recycles water over and over again. Precipitation, evaporation, and condensation are all part of the water cycle.

- Allow time for students to make an entry in their own science notebooks.

Elaborate

Teacher Note

RM 2 can be printed or projected in color or black and white.

Materials

Activity 1

For teacher
- RM 2
- chart paper or large piece of flannel
- 4 pieces of masking tape or Velcro®

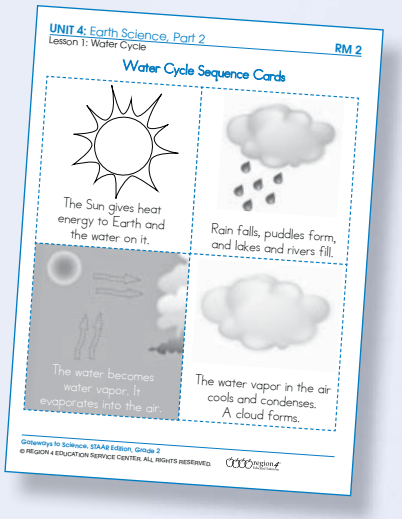
For each student
- RM 2
- crayons
- glue
- large paper plate
- scissors

For student groups
- RM 2

Activity 1

Advance Preparation

- Find a poster-size piece of flannel or chart paper before class to use during the lesson.
- Prepare for yourself one set of cards from *RM 2: Water Cycle Sequence Cards* to model the water cycle.
- Put masking tape or Velcro® strips on the back of each card so it will stick to the poster.
- Laminate and cut out the cards of *RM 2* and place them in a resealable plastic bag for each group.


UNIT 4: Earth Science, Part 2
Lesson 1: Water Cycle
RM 2
Water Cycle Sequence Cards
The Sun gives heat energy to Earth and the water on it.
Rain falls, puddles form, and lakes and rivers fill.
The water becomes water vapor. It evaporates into the air.
The water vapor in the air cools and condenses. A cloud forms.
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Teacher Instruction

- Place students in groups of 3–5.
- Display the blank poster in a central area of the classroom for easy viewing.
- Provide a set of prepared cards from *RM 2* to each group.
- Instruct students to sequence the water cycle cards in a circle to show the water cycle.
- Ask student volunteers to help read and place the cards in the proper sequence on the class poster.
- Label each stage of the water cycle (precipitation, evaporation, condensation).
- Provide an uncut copy of *RM 2* and a paper plate to each student. (The cards will fit on a dinner-size plate.)
- Instruct students to color, cut out, and paste their cards in the proper sequence on the paper plate.

Materials

Activity 2
For teacher
- permanent marker
- rock
- transparent wide-mouth jar
- water

Activity 2

Teacher Demonstration

- Fill the jar half full with water.
- Drop the rock in the water and mark the water level and the date on the outside of the jar as students observe. *Note: The rock will remain and the water will eventually evaporate. This demonstration lays the foundation for introducing states of matter.*
- Place the jar in a sunny location.
- Observe the change in water level as a class once a week for 1 month.
- Mark the water level and the date on the jar each time.
- Utilize the facilitation questions to discuss the changes.

Facilitation Questions

- Why has the water level gone down? *The water has evaporated over time.*
- Where has the water gone? *The water has evaporated into the air.*
- What stage of the water cycle does this show? *This shows the evaporation stage of the water cycle.*
- What caused the water to evaporate? *Heat from the Sun caused the water to evaporate.*
- Why is the rock not evaporating? *The rock is a solid and will not evaporate.*

Evaluate

Materials

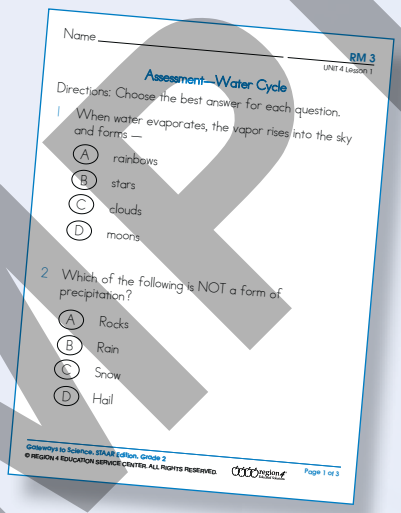
For each student
- RM 3
- science notebook

Teacher Instruction

- Instruct students to complete *RM 3: Assessment—Water Cycle*.
- Instruct students to illustrate and describe in their science notebooks the water cycle.

RM 3 Answer Key

1. C
2. A
3. A
4. B



Name _____ RM 3

UNIT 4 Lesson 1

Assessment—Water Cycle

Directions: Choose the best answer for each question.

1. When water evaporates, the vapor rises into the sky and forms —
   - (A) rainbows
   - (B) stars
   - (C) clouds
   - (D) moons

2. Which of the following is NOT a form of precipitation?
   - (A) Rocks
   - (B) Rain
   - (C) Snow
   - (D) Hail

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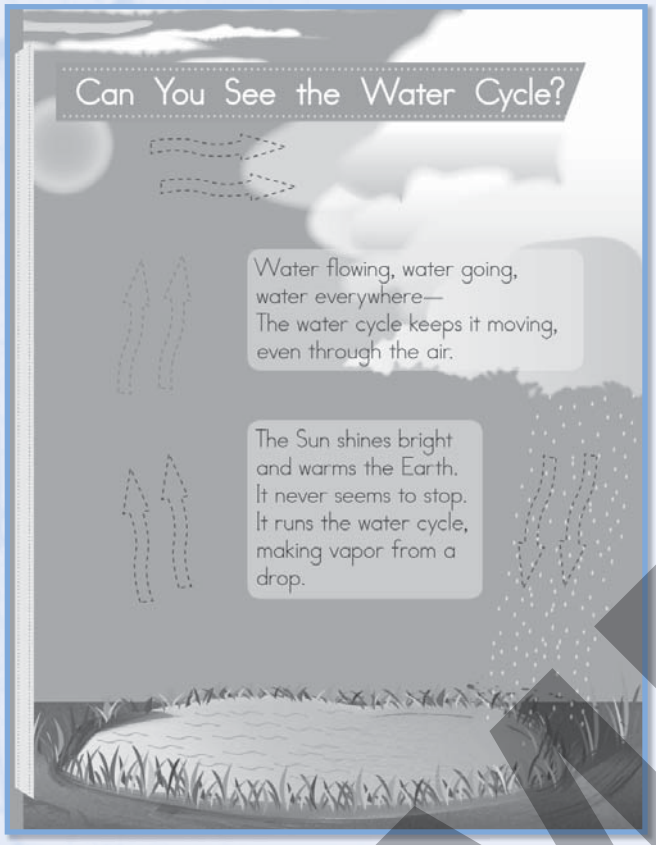
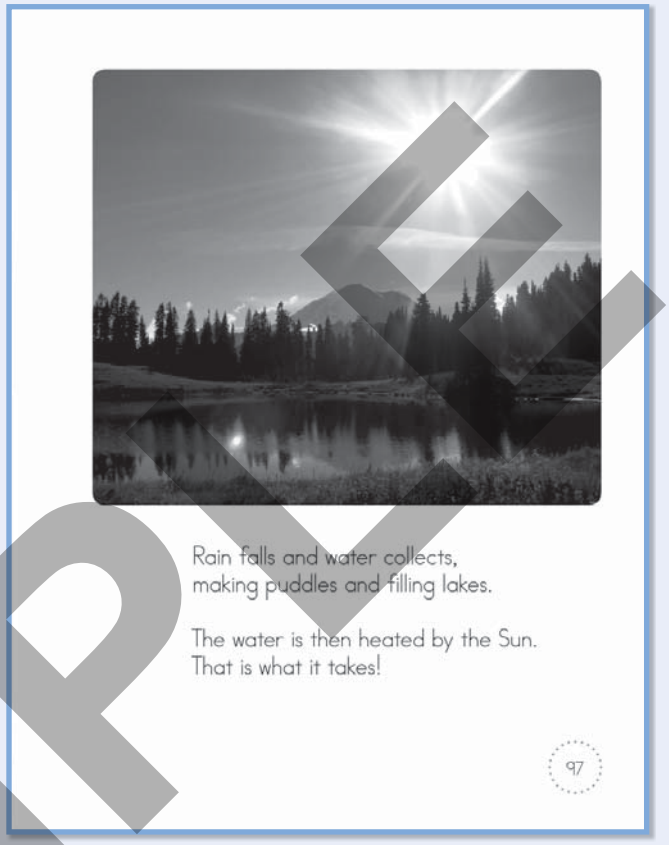
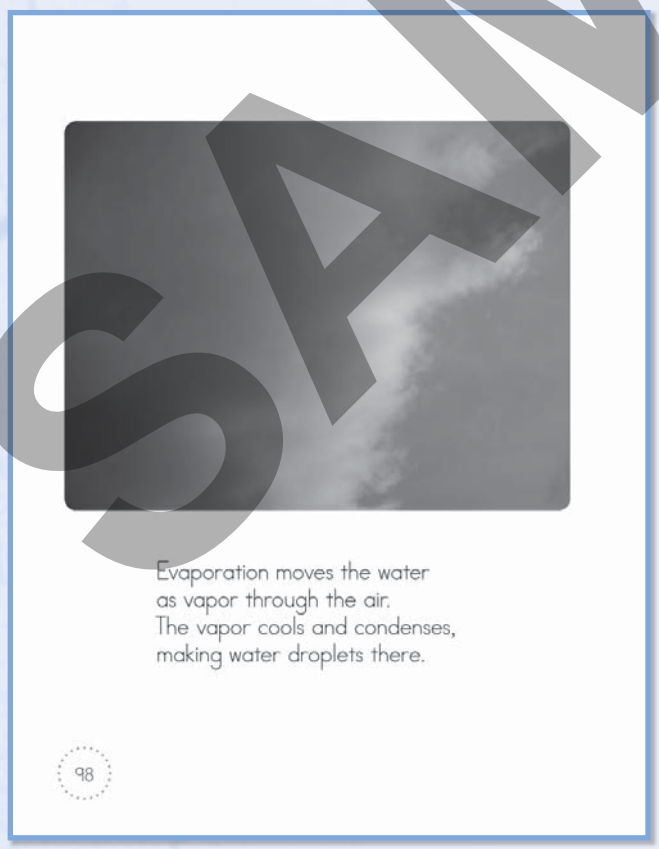
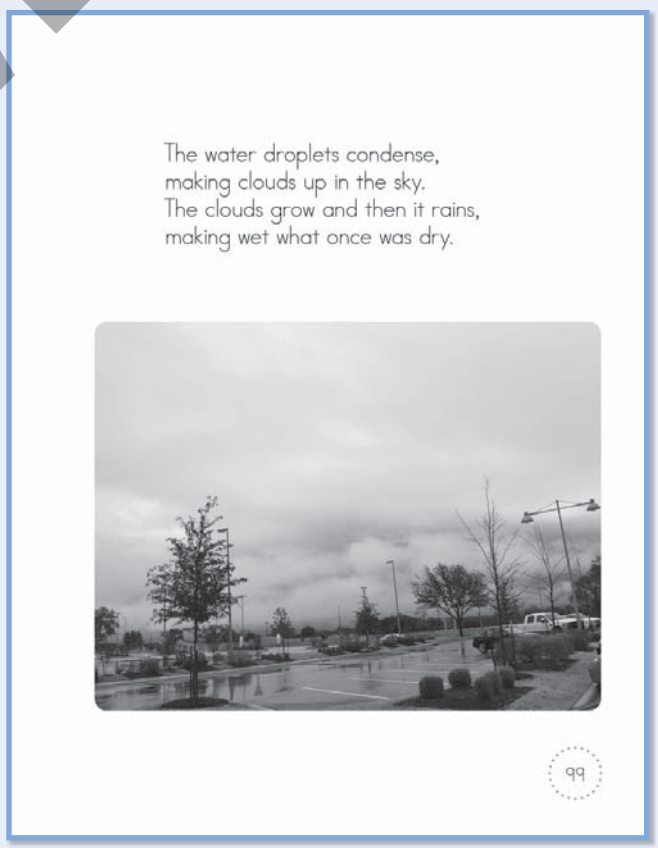
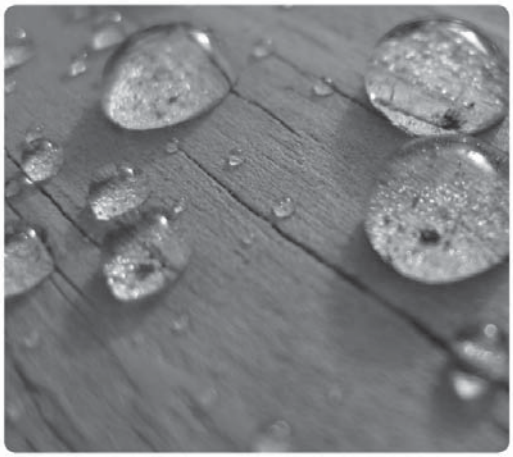

Can You See the Water Cycle?
Water flowing, water going,
water everywhere—
The water cycle keeps it moving,
even through the air.
The Sun shines bright
and warms the Earth.
It never seems to stop.
It runs the water cycle,
making vapor from a
drop.


Rain falls and water collects,
making puddles and filling lakes.
The water is then heated by the Sun.
That is what it takes!
97

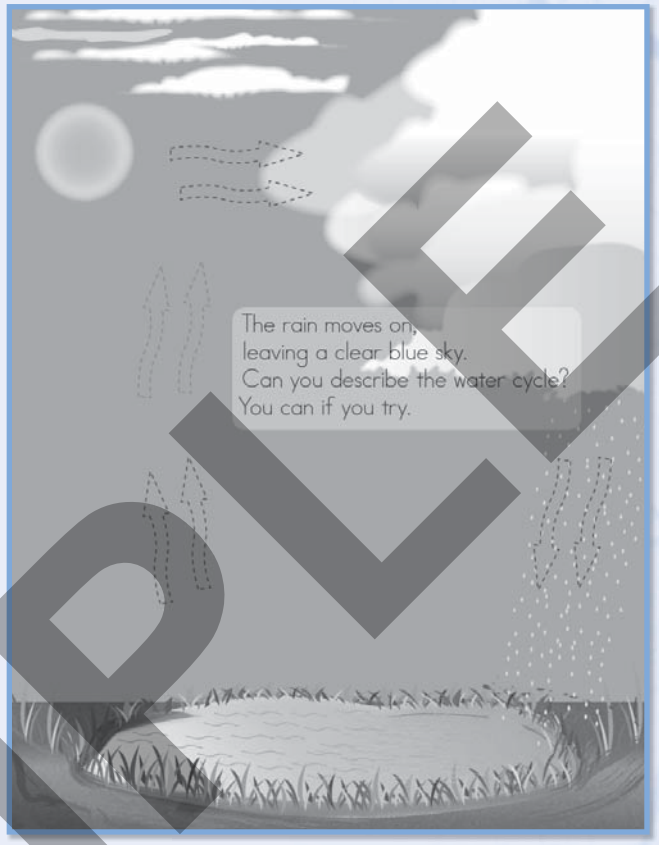

Evaporation moves the water
as vapor through the air.
The vapor cools and condenses,
making water droplets there.
98


The water droplets condense,
making clouds up in the sky.
The clouds grow and then it rains,
making wet what once was dry.
99



Big drops and little drops
leave their wet marks where they land.
Rivers, oceans, streams, and lakes
think rain is oh, so grand.

100



Do you remember?

What is evaporation?

On what page did you read about evaporation?

What happens when water condenses?

On what page did you read about condensation?

What is precipitation?

On what page did you read about precipitation?

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