

Sun-Powered Cycle

Trace water and test sunlight's effect.

S6E3.b "Plan and carry out an investigation to illustrate the role of the sun's energy in atmospheric conditions that lead to the cycling of water."

NAME _____

DATE _____

1 LABEL THE MODEL _____ Word bank below

Write one word-bank process in each numbered box to show how water moves from one stage to the next. Then plan and carry out the sunlight investigation in Questions 1-3, using your measurements as evidence.

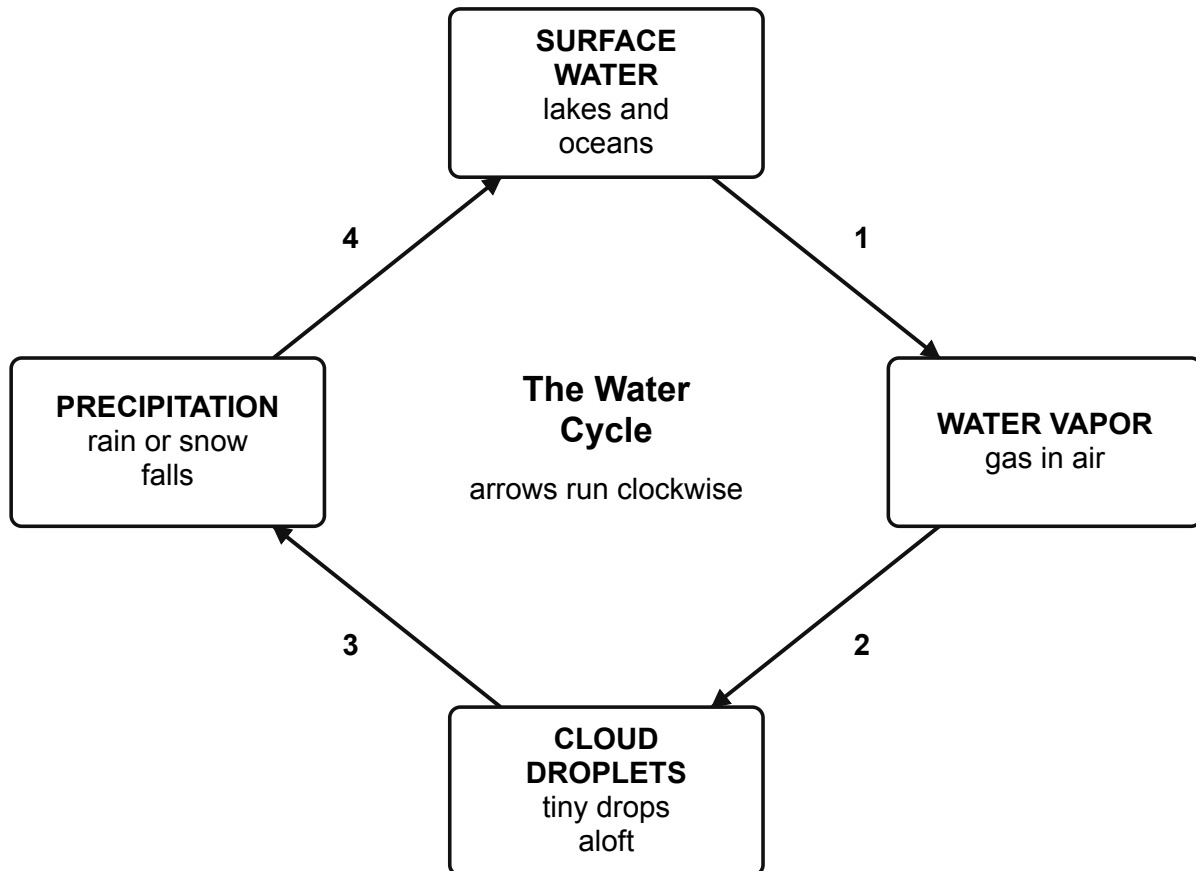
WORD BANK

collection

condensation

evaporation

precipitation



Arrow numbers match the response boxes on the next student section.

Label the arrows

Use the word bank to write the process for each numbered arrow.

Arrow 1

Arrow 2

Arrow 3

Arrow 4

2 RUN THE MODEL --- Use your finished diagram

- 1** Plan a fair test of sunlight's effect on water loss. Use two identical marked clear cups with equal starting water, place one in sunlight and one in shade for the same amount of time. What will you keep the same, and what will you measure before and after the test?

- 2** Carry out your test using the investigation record page. Record each starting and ending water level or volume, calculate each decrease, and identify which cup lost more water or whether the losses were equal.

- 3** Does your data support the prediction that sunlight increases water loss? Use your measurements. Then name the process from SURFACE WATER to WATER VAPOR and explain how the Sun helps it.



CHECK IT

Before you turn it in

- ☐ I filled in all four process boxes.
- ☐ I kept important test conditions the same.
- ☐ I used measurements as evidence.

TEST THE MODEL

What is one part of the real water system that this model leaves out?

Sunlight Investigation Record

NAME _____ DATE _____

Use identical cups with equal starting water and equal test times. Keep other conditions as similar as possible, including airflow and starting water temperature. Prevent spills and rain from changing the amounts.

Start time: _____ End time: _____ Duration: _____

Measure water level or volume. Use the same method and unit for both cups.

Method and unit (for example, level in mm or volume in mL): _____

Cup	Start	End	Decrease: start – end
Sun			
Shade			

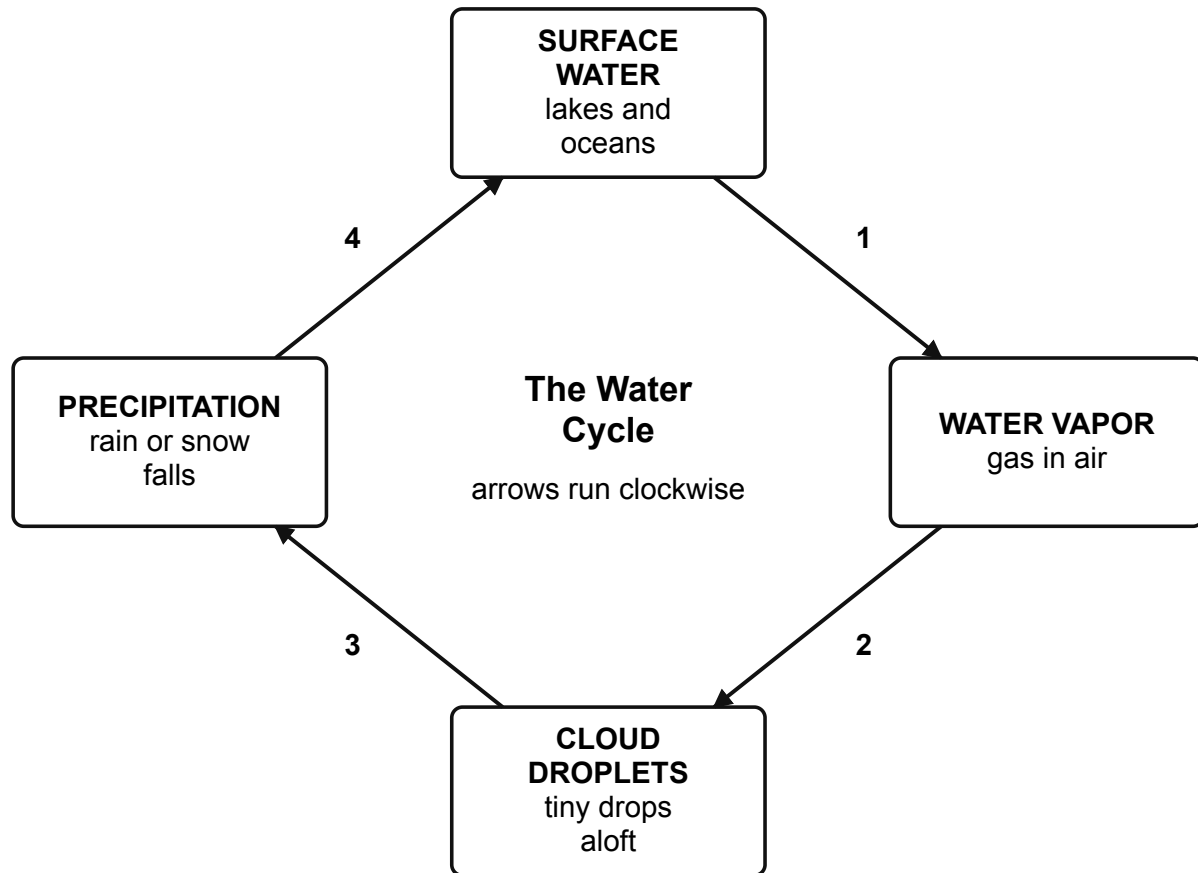
Show each subtraction, including units:

Which cup lost more water, or were the losses equal? Cite your measurements.

Record anything that could affect the result, such as different wind, a spill, or a change too small to measure. What would you improve in a repeat test?

Report what you measured, even if it differs from your prediction. No measurable change is also a result.

PART 1 • COMPLETED MODEL

**Arrow 1**

evaporation

Arrow 2

condensation

Arrow 3

precipitation

Arrow 4

collection

PART 2 • RUN THE MODEL

1. **Keep the cup type, starting water amount, and test time the same. Measure the water level or volume in each cup before and after.** (Plan a fair test of sunlight's effect on water loss. Use two identical marked clear cups with equal starting water, place one in sunlight and one in shade for the same amount of time. What will you keep the same, and what will you measure before and after the test?)
2. **Calculate start minus end for each cup. Compare the measured decreases; accept either cup losing more, equal losses, or no measurable loss.** (Carry out your test using the investigation record page. Record each starting and ending water level or volume, calculate each decrease, and identify which cup lost more water or whether the losses were equal.)
3. **Conclusions must match the data, including inconclusive results. Evaporation changes liquid water to vapor; sunlight supplies energy that warms surface water.** (Does your data support the prediction that sunlight increases water loss? Use your measurements. Then name the process from SURFACE WATER to WATER VAPOR and explain how the Sun helps it.)

TEST THE MODEL (SAMPLE ANSWERS)

- The model leaves out water soaking into the ground.
- The model leaves out wind moving water vapor and clouds.

Cycle: evaporation, condensation, precipitation, collection. Accept faithfully recorded data, not only greater loss in sun. Discuss differing wind, spills, rain or measurement limits; repeat if needed.