



Water Cycle Study Guide



From the game!

Test yourself or a young learner.

*Includes answer key

Water Cycle Quiz

22 facts · 66 questions · no answers marked — test yourself, then check the answer key at the end.

DID YOU KNOW? · TOPIC 1

The water cycle is the endless journey water takes — rising into the sky, forming clouds, falling, and flowing back, over and over.

1.1 Where does the water cycle begin?

- ☐ (A) At the ocean
- ☐ (B) In the clouds
- ☐ (C) No beginning

1.2 Water can naturally be...

- ☐ (A) Only liquid
- ☐ (B) Solid, liquid, AND gas
- ☐ (C) Only gas

1.3 🍷 The water you drank today may have once fallen as rain on...

- ☐ (A) Dinosaurs
- ☐ (B) Mars
- ☐ (C) The Moon

DID YOU KNOW? · TOPIC 2

Earth orbits in the Sun's “Goldilocks zone”, the habitable just-right zone where it's neither too hot nor too cold, so water can exist as solid, liquid, and gas.

2.1 Another name for water?

- ☐ (A) Wetness
- ☐ (B) H₂O
- ☐ (C) Pop

2.2 Some of Earth's water may have first arrived on...

- ☐ (A) Comets & asteroids
- ☐ (B) Airplanes
- ☐ (C) Moonbeams

2.3 🍷 Across the universe, water takes on all kinds of forms. Deep inside Uranus and Neptune, water becomes “superionic ice”, ice that is...

- ☐ (A) Solid and scorching hot (thousands of degrees) at the same time
- ☐ (B) So cold it stops time
- ☐ (C) Buttery soft. You could spread it on toast!

DID YOU KNOW? · TOPIC 3

The water cycle doesn't just move water — it redistributes the Sun's energy and moisture all around the planet, evening out hot and cold regions.

3.1 The whole water cycle is powered mainly by...

- ☐ A The Moon
- ☐ B Wind
- ☐ C The Sun

3.2 The Sun's energy travels 93 million miles through empty space to reach Earth as...

- ☐ A Gravity
- ☐ B Electromagnetic waves (light)
- ☐ C Sound

3.3 🍌 Warm, higher energy, wet air always drifts toward cooler, drier places until things balance out. Zoomed way out, the whole water cycle works like...

- ☐ A Diffusion — stuff spreading from where there's a lot to where there's little
- ☐ B Osmosis — water crossing through a membrane
- ☐ C Friction — things rubbing together and slowing down

DID YOU KNOW? · TOPIC 4

Evaporation is when the Sun's heat turns liquid water into invisible water vapor that floats up into the air.

4.1 Evaporation turns liquid water into...

- ☐ A Ice
- ☐ B Invisible vapor
- ☐ C Rock

4.2 Most water vapor in the air comes from...

- ☐ A Oceans
- ☐ B Houseplants
- ☐ C Volcanoes

4.3 🍌 Ribbons of water vapor in the sky called “atmospheric rivers” can carry more water than...

- ☐ A A Lake
- ☐ B The Amazon — Earth's biggest river
- ☐ C The Pacific Ocean

DID YOU KNOW? · TOPIC 5

Condensation is when rising vapor cools and gathers into tiny droplets — that's how clouds are made.

5.1 When vapor condenses into a cloud, the heat it absorbed during evaporation is...

- ☐ A Released back into the air
- ☐ B Destroyed forever
- ☐ C Turned into gravity

5.2 A cold drink “sweats” on the outside because...

- ☐ A Water leaks out through the glass
- ☐ B Warm air touching the cold glass cools, and its vapor condenses into droplets
- ☐ C The glass is slowly melting

5.3 🍌 Most cloud droplets can't form on their own — each one usually needs a tiny...

- ☐ A Light wave
- ☐ B Sound wave
- ☐ C Speck of dust or salt to grow on

DID YOU KNOW? · TOPIC 6

A fluffy cloud looks light as cotton, but it's actually made of countless tiny water droplets and ice crystals — and can add up to over a million pounds.

6.1 What are clouds actually made of?

- ☐ (A) Fluffy, cotton-candy-like water
- ☐ (B) Tiny droplets of liquid water and ice
- ☐ (C) Water vapor

6.2 Why doesn't the liquid water and ice in a cloud just fall straight down?

- ☐ (A) Each droplet is so tiny and light that it floats on the air
- ☐ (B) It's glued to the sky
- ☐ (C) It likes being closer to the Moon

6.3 🍌 All the droplets together in a big storm cloud can weigh as much as...

- ☐ (A) A car
- ☐ (B) A whale
- ☐ (C) Hundreds of jumbo jets

DID YOU KNOW? · TOPIC 7

Precipitation is water falling back to Earth from clouds as rain, snow, sleet, or hail.

7.1 Precipitation falls from...

- ☐ (A) Space
- ☐ (B) Heaven
- ☐ (C) Clouds

7.2 Which falls faster — rain or snow?

- ☐ (A) Rain
- ☐ (B) Snow
- ☐ (C) Exactly the same

7.3 🍌 A drifting snowflake can take how long to reach the ground?

- ☐ (A) A split second
- ☐ (B) Many minutes to an hour
- ☐ (C) A whole day

DID YOU KNOW? · TOPIC 8

A rainbow isn't an arc but a full circle of light! The ground blocks the bottom half, so we only see the top — but from an airplane, you can sometimes see the whole ring!

8.1 A rainbow forms when sunlight passes through a raindrop and...

- ☐ (A) Bounces off the outside only
- ☐ (B) Bends, reflects inside, then bends again on the way out
- ☐ (C) Melts the raindrop into vapor

8.2 Two people standing side by side looking at the same rainbow are actually...

- ☐ (A) Seeing the exact same rainbow
- ☐ (B) Each seeing their own personal rainbow, made from different raindrops
- ☐ (C) Seeing an illusion

8.3 🌙 Under a bright enough full moon, you can sometimes see a real rainbow at night, called a...

- ☐ (A) Moonbow
- ☐ (B) Night-glow
- ☐ (C) Starcurve

DID YOU KNOW? · TOPIC 9

Auroras aren't just shifting curtains of light — seen from space, they form a complete glowing ring called the auroral oval, circling Earth's magnetic pole. From the ground, you only ever see your own small slice of that ring.

9.1 Auroras happen when...

- ☐ (A) Moonlight bounces off polar ice
- ☐ (B) Charged particles from the Sun collide with gases in Earth's atmosphere
- ☐ (C) Lightning reflects off clouds

9.2 An aurora's most common color, green, comes from charged particles striking...

- ☐ (A) Oxygen, about 60–150 miles up
- ☐ (B) Nitrogen at ground level
- ☐ (C) Ice crystals in clouds

9.3 🌌 Earth isn't the only planet with auroras — they've also been spotted on...

- ☐ (A) Jupiter and Saturn
- ☐ (B) Only the Moon
- ☐ (C) Nowhere else

DID YOU KNOW? · TOPIC 10

Collection is when fallen water gathers in oceans, lakes, rivers, and underground — ready to rise again.

10.1 About how much of Earth's surface is covered by water?

- ☐ A About 30%
- ☐ B About 50%
- ☐ C About 70%

10.2 Water stored underground is called...

- ☐ A Mudwater
- ☐ B Groundwater
- ☐ C Earthwater

10.3 🍷 Most of Earth's FRESH (non-salty) water is stored as...

- ☐ A Ice in glaciers and ice caps
- ☐ B Rain in clouds
- ☐ C Steam

DID YOU KNOW? · TOPIC 11

The ocean is salty because rivers constantly wash dissolved minerals and salts into it — and when seawater evaporates into clouds, the salt gets left behind, so the sea only grows saltier over time.

11.1 About how much of Earth's water is salty seawater?

- ☐ A About half
- ☐ B About 97%
- ☐ C About 10%

11.2 On average, how long does a water molecule stay in the ocean before evaporating back into the sky?

- ☐ A About 9 days
- ☐ B About 3 years
- ☐ C About 3,000 years

11.3 🍷 Salt is sodium + chlorine. Our oceans are full of salty water — but pure sodium metal, on its own, reacts with water by...

- ☐ A Bursting into flames and exploding
- ☐ B Turning into sugar
- ☐ C Freezing instantly

DID YOU KNOW? · TOPIC 12

A sleeping human releases nearly a cup of water into the room's air over a single night — through breathing and invisible perspiration through the skin. You're quietly feeding the water cycle even in your sleep.

12.1 Humans use the water cycle to cool down. What's the name of the process when sweat dries off your skin?

- ☐ (A) Condensation
- ☐ (B) Evaporation
- ☐ (C) Precipitation

12.2 Every breath you exhale is at nearly 100% humidity. Compared with the air in a steamy tropical jungle, your breath is...

- ☐ (A) 25% Drier
- ☐ (B) About the same
- ☐ (C) Even more moisture-rich

12.3 🍷 The water vapor in the breath you just exhaled was, moments earlier, part of your...

- ☐ (A) Blood and saliva
- ☐ (B) Bones
- ☐ (C) Hair

DID YOU KNOW? · TOPIC 13

Most of Earth's water is billions of years old — but brand-new water is being made all the time, and your own body produces a little of it every day!

13.1 What part of a cell acts as a “water factory,” chemically fusing the food you eat to the air you breathe to make brand-new water molecules?

- ☐ (A) The cytoplasm
- ☐ (B) The mitochondria
- ☐ (C) The Golgi apparatus

13.2 Your body is about 60% water, and every cell needs a steady supply. About how much of your daily water needs do your own cells provide?

- ☐ (A) About 10%
- ☐ (B) About 40%
- ☐ (C) About 75%

13.3 🍷 The water inside your body is most similar to...

- ☐ (A) Fresh river water
- ☐ (B) Cloud water
- ☐ (C) Ocean water

DID YOU KNOW? · TOPIC 14

Earth may hide an entire ocean's worth of water deep inside it — not sloshing in a cave, but chemically locked inside crystals in the mantle.

14.1 Deep inside Earth's mantle, a mineral called ringwoodite may hold as much water as...

- ☐ (A) The Indian Ocean
- ☐ (B) Possibly all the surface oceans combined
- ☐ (C) All the polar ice caps

14.2 It's believed some of this deep water is recycled surface water, carried down into the mantle by which part of the deep water cycle?

- ☐ (A) Subduction
- ☐ (B) Convection
- ☐ (C) Evaporation

14.3 🍌 Volcanoes release recycled deep water — but also brand-new water, formed by heat and pressure that reaches the air for the very first time. What is volcanic water called?

- ☐ (A) Juvenile water
- ☐ (B) Magmatic water
- ☐ (C) Both A & B

DID YOU KNOW? · TOPIC 15

The water cycle is the largest water purifier on Earth — a giant, solar-powered distiller. Every time the Sun evaporates seawater, the salt and impurities are left behind, so only pure water rises to form clouds and fall as fresh rain.

15.1 Evaporating water and letting it re-condense to leave salt and impurities behind is a purification method called...

- ☐ (A) Distillation
- ☐ (B) Filtration
- ☐ (C) Fermentation

15.2 Because evaporation leaves the salt and minerals behind, the rain that falls from clouds is essentially...

- ☐ (A) Most similar to urine
- ☐ (B) Naturally distilled, nearly pure water
- ☐ (C) Tap water

15.3 🍌 Rainwater starts out pure — but by the time it lands, it's turned slightly acidic. Why?

- ☐ (A) It picks up salt from the ocean
- ☐ (B) Clouds are made of lemon juice
- ☐ (C) It dissolves carbon dioxide from the air, forming a weak acid

DID YOU KNOW? · TOPIC 16

Snow is nature's greatest atmospheric scrubber! As snowflakes drift down, their intricate branching shapes act like tiny nets — scrubbing the air and catching dust, pollution, and even microplastics on the way to the ground.

16.1 Why do no two snowflakes look exactly alike?

- ☐ (A) Each one takes a completely unique path through ever-changing temperature and humidity as it falls
- ☐ (B) A tiny snow artist carves each one
- ☐ (C) They actually are all identical

16.2 About how many water molecules make up a single snowflake?

- ☐ (A) About a thousand
- ☐ (B) About a million
- ☐ (C) About a quintillion — a 1 followed by 18 zeros

16.3 🤖 Here's the flip side: on a single snowflake, why do all six arms look nearly identical to one another?

- ☐ (A) They're glued together
- ☐ (B) All six share the exact same journey, so they grow in sync
- ☐ (C) They try to copy their neighbor

DID YOU KNOW? · TOPIC 17

Hail is built inside towering thunderstorms, where powerful updrafts hurl ice up again and again until it grows heavy enough to fall.

17.1 Hail forms inside tall thunderstorm clouds, lifted up and down by strong...

- ☐ (A) Updrafts (rising air)
- ☐ (B) Rainbows
- ☐ (C) Ocean waves

17.2 A hailstone grows as it collides with “supercooled” water droplets — water that is...

- ☐ (A) Filled with aura
- ☐ (B) In vapor form
- ☐ (C) Still liquid even though it's below freezing

17.3 🤖 Cut a big hailstone in half and you'll see...

- ☐ (A) Solid gold
- ☐ (B) Onion-like rings, one for each trip through the cloud
- ☐ (C) Iron flecks

DID YOU KNOW? · TOPIC 18

Wind is just air moving from high-pressure areas to low-pressure areas — and the greater the pressure difference, the faster the wind blows!

18.1 Which famous air current picks up moisture near Hawaii and drops it on the U.S. West Coast?

- ☐ (A) The Midway Runway
- ☐ (B) The Tropic Highway
- ☐ (C) The Pineapple Express

18.2 Warmer air carries more energy, letting it hold far more water vapor than cold air. This warm, moisture-heavy air then flows toward areas of...?

- ☐ (A) Lower pressure (less dense air)
- ☐ (B) Higher pressure (denser air)
- ☐ (C) Lots of people

18.3 🍌 Scientists studying some of the most remote, untouched places on Earth were stunned to find microplastics in...?

- ☐ (A) The center of the Earth
- ☐ (B) Fresh Arctic snow, far from any city
- ☐ (C) Inside volcanoes

DID YOU KNOW? · TOPIC 19

About 10% of all the moisture in the air comes directly from plants — rain they soak up from the soil and breathe back out through their leaves. Scientists call this soil-and-plant water “green water.”

19.1 Plants release water through their leaves in a process called...

- ☐ (A) Digestion
- ☐ (B) Transpiration
- ☐ (C) Hibernation

19.2 A single large oak tree can release how much water in a day?

- ☐ (A) About a cup
- ☐ (B) About a bucket
- ☐ (C) Over 100 gallons

19.3 🍌 Big forests like the Amazon release so much water vapor that they can...

- ☐ (A) Create their own clouds and rain
- ☐ (B) Make the sky turn green
- ☐ (C) Stop the wind

DID YOU KNOW? · TOPIC 20

Frost forms when it's so cold that water vapor turns directly into ice — skipping the liquid stage completely in a process called deposition.

20.1 The reverse of deposition — when ice turns straight into vapor without melting first is called...

- ☐ (A) Sublimation
- ☐ (B) Melting
- ☐ (C) Freezing

20.2 Which of these can sublimate?

- ☐ (A) Glass
- ☐ (B) Sand
- ☐ (C) Snow

20.3 🧊 Dry ice (frozen CO₂) sublimates into a spooky, rolling fog. How does that fog actually form?

- ☐ (A) The CO₂ itself turns bright white
- ☐ (B) The freezing-cold CO₂ gas makes the surrounding air's moisture instantly condense into tiny droplets
- ☐ (C) It ignites like a fire, causing the smoke to release

DID YOU KNOW? · TOPIC 21

When you take a hot shower, you can create your own micro-clouds! Hot water evaporates into warm, moisture-packed air; when that humid air hits the cooler air and surfaces of the room, its vapor condenses into countless tiny droplets — the very same way a real cloud forms, just in your bathroom.

21.1 Clouds that form at ground level are called...

- ☐ (A) Steam
- ☐ (B) Fog
- ☐ (C) Spooky air

21.2 Why does fog form low, near the ground, instead of high in the sky?

- ☐ (A) Ground-level air cools to its dew point
- ☐ (B) The ground pushes clouds down
- ☐ (C) Fog isn't really water

21.3 🕸 Some dry desert areas string up giant nets to collect...

- ☐ (A) Sand
- ☐ (B) Bugs
- ☐ (C) Fog

DID YOU KNOW? · TOPIC 22

The science of weather and the atmosphere is called meteorology — and by reaching the end, you've explored most of its biggest ideas!

22.1 Which list contains ONLY real water-cycle processes?

- (A) Evaporation, gravity, sunshine, erosion
- (B) Evaporation, condensation, precipitation, collection
- (C) Melting, digestion, condensation, hibernation

22.2 Gravity and pressure both shape the water cycle and weather. Which of these affects BOTH?

- (A) Human events, like big football games
- (B) Wi-Fi
- (C) The Moon

22.3 🍪 Aside from Earth, what is the only other world in our solar system with stable, long-term liquid lakes and a three-phase weather cycle on its surface?

- (A) Titan — Saturn's moon, using liquid methane
- (B) Venus, which has vast oceans of sulfur
- (C) Jupiter — its Red Spot is a giant hurricane of rain

Answer Key

Every question, its correct answer, and the after-answer explanation.

#	QUESTION	CORRECT ANSWER	EXPLANATION
1.1	Where does the water cycle begin?	C · No beginning	<i>It's a loop with no start or end — it just keeps going.</i>
1.2	Water can naturally be...	B · Solid, liquid, AND gas	<i>Ice, water, and vapor — all three states happen naturally on Earth.</i>
1.3	The water you drank today may have once fallen as rain on...	A · Dinosaurs	<i>Earth's water keeps recycling, so it has likely rained on dinosaurs long ago.</i>
2.1	Another name for water?	B · H₂O	<i>Scientists call water H₂O — two hydrogen atoms and one oxygen.</i>
2.2	Some of Earth's water may have first arrived on...	A · Comets & asteroids	<i>Scientists think icy comets and asteroids delivered water long ago.</i>
2.3	Across the universe, water takes on all kinds of forms. Deep inside Uranus and Neptune, water becomes “superionic ice”, ice that is...	A · Solid and scorching hot (thousands of degrees) at the same time	<i>Ice XVIII forms around 5,000 °C under millions of pressure. It's solid, hot, and conducts electricity! It may actually be the most common form of water in the universe!</i>
3.1	The whole water cycle is powered mainly by...	C · The Sun	<i>The Sun's heat drives the evaporation that lifts water into the sky.</i>
3.2	The Sun's energy travels 93 million miles through empty space to reach Earth as...	B · Electromagnetic waves (light)	<i>Space is a vacuum, so heat can't be carried by air or touch — only light waves cross it.</i>
3.3	Warm, higher energy, wet air always drifts toward cooler, drier places until things balance out. Zoomed way out, the whole water cycle works like...	A · Diffusion — stuff spreading from where there's a lot to where there's little	<i>The cycle carries heat and moisture from surplus (the warm, wet tropics) toward deficit (the cool, dry poles), always nudging the planet toward balance.</i>
4.1	Evaporation turns liquid water into...	B · Invisible vapor	<i>Heat turns water into an invisible gas called water vapor.</i>
4.2	Most water vapor in the air comes from...	A · Oceans	<i>Evaporation from oceans, lakes, and rivers supplies most airborne moisture.</i>
4.3	Ribbons of water vapor in the sky called “atmospheric rivers” can carry more water than...	B · The Amazon — Earth's biggest river	<i>The strongest atmospheric rivers move about twice the flow of the Amazon — through the sky.</i>
5.1	When vapor condenses into a cloud, the heat it absorbed during evaporation is...	A · Released back into the air	<i>That “latent heat” comes back out — which is what powers storms.</i>
5.2	A cold drink “sweats” on the outside because...	B · Warm air touching the cold glass cools, and its vapor condenses into droplets	<i>The same thing clouds do, just on your cup!</i>
5.3	Most cloud droplets can't form on their own — each one usually needs a tiny...	C · Speck of dust or salt to grow on	<i>Vapor condenses onto microscopic specks called condensation nuclei — perfectly clean air barely rains.</i>
6.1	What are clouds actually made of?	B · Tiny droplets of liquid water and ice	<i>Most people think clouds are water vapor — but vapor is invisible! A cloud only appears once that vapor has condensed into liquid droplets and ice crystals.</i>
6.2	Why doesn't the liquid water and ice in a cloud just fall straight down?	A · Each droplet is so tiny and light that it floats on the air	<i>Measured all together a cloud can weigh a million pounds, but a single cloud droplet is millions of times lighter than a raindrop — so light that the gentlest rising air keeps it aloft. Only when droplets collide and merge into heavy enough drops do they fall as rain.</i>
6.3	All the droplets together in a big storm cloud can weigh as much as...	C · Hundreds of jumbo jets	<i>Each droplet is still nearly weightless on its own, but multiplied across the countless droplets inside a storm, it adds up to something this massive.</i>
7.1	Precipitation falls from...	C · Clouds	<i>It's water falling from clouds as rain, snow, sleet, or hail.</i>
7.2	Which falls faster — rain or snow?	A · Rain	<i>Compact raindrops fall much faster — about 20 mph — while feathery snowflakes drift down at just 1–4 mph.</i>
7.3	A drifting snowflake can take how long to reach the ground?	B · Many minutes to an hour	<i>Falling at just 1–4 mph, a snowflake can take many minutes — sometimes up to an hour — to reach the ground.</i>
8.1	A rainbow forms when sunlight passes through a raindrop and...	B · Bends, reflects inside, then bends again on the way out	<i>Light refracts entering the drop, reflects off the back, then refracts again exiting — splitting white light into all its colors.</i>

#	QUESTION	CORRECT ANSWER	EXPLANATION
8.2	Two people standing side by side looking at the same rainbow are actually...	B · Each seeing their own personal rainbow, made from different raindrops	<i>A rainbow isn't a fixed object — it's light reaching your eyes at a precise 42° angle from your own shadow's point. Move a few feet and you're seeing different raindrops entirely.</i>
8.3	Under a bright enough full moon, you can sometimes see a real rainbow at night, called a...	A · Moonbow	<i>Moonlight is just reflected sunlight, so it can make rainbows too — though it's usually too faint for our eyes to see color, so they often look silvery-white.</i>
9.1	Auroras happen when...	B · Charged particles from the Sun collide with gases in Earth's atmosphere	<i>Solar wind funnels down Earth's magnetic field lines and slams into oxygen and nitrogen high in the atmosphere, making them glow.</i>
9.2	An aurora's most common color, green, comes from charged particles striking...	A · Oxygen, about 60–150 miles up	<i>Higher-altitude oxygen glows red; nitrogen lower down adds blue and purple fringes.</i>
9.3	Earth isn't the only planet with auroras — they've also been spotted on...	A · Jupiter and Saturn	<i>Any planet with a magnetic field and atmosphere can have auroras — Jupiter's are hundreds of times more powerful than Earth's!</i>
10.1	About how much of Earth's surface is covered by water?	C · About 70%	<i>Water covers roughly 71% of the planet's surface.</i>
10.2	Water stored underground is called...	B · Groundwater	<i>Water soaks into the ground and is stored as groundwater.</i>
10.3	Most of Earth's FRESH (non-salty) water is stored as...	A · Ice in glaciers and ice caps	<i>About 68% of Earth's fresh water is frozen in ice caps and glaciers.</i>
11.1	About how much of Earth's water is salty seawater?	B · About 97%	<i>Roughly 97% of Earth's water is salty ocean — only about 3% is fresh.</i>
11.2	On average, how long does a water molecule stay in the ocean before evaporating back into the sky?	C · About 3,000 years	<i>A water molecule spends only ~9 days in the atmosphere, but once it reaches the ocean it can stay ~3,000 years before cycling out — the ocean is the water cycle's slow lane.</i>
11.3	Salt is sodium + chlorine. Our oceans are full of salty water — but pure sodium metal, on its own, reacts with water by...	A · Bursting into flames and exploding	<i>Drop pure sodium in water and it fizzes, ignites, and can even explode — yet the ocean is perfectly safe, because every sodium atom there is locked to chlorine as salt.</i>
12.1	Humans use the water cycle to cool down. What's the name of the process when sweat dries off your skin?	B · Evaporation	<i>Sweat doesn't cool you just by sitting on your skin — the cooling happens when that sweat absorbs your body heat and evaporates, carrying the heat away into the air. You're a tiny weather system!</i>
12.2	Every breath you exhale is at nearly 100% humidity. Compared with the air in a steamy tropical jungle, your breath is...	C · Even more moisture-rich	<i>Exhaled air leaves your lungs fully saturated at body temperature (~37°C / 98.6°F), so it actually carries more water vapor than the air of a rainforest.</i>
12.3	The water vapor in the breath you just exhaled was, moments earlier, part of your...	A · Blood and saliva	<i>That moisture was circulating in your blood and saliva just minutes before it left as vapor. Every exhale, you give water, energy, and bits of your DNA to the atmosphere!</i>
13.1	What part of a cell acts as a "water factory," chemically fusing the food you eat to the air you breathe to make brand-new water molecules?	B · The mitochondria	<i>Deep in your mitochondria, the electron transport chain fuses hydrogen from your food with the oxygen you breathe — producing brand-new H₂O called metabolic water.</i>
13.2	Your body is about 60% water, and every cell needs a steady supply. About how much of your daily water needs do your own cells provide?	A · About 10%	<i>Your mitochondria make roughly 250–350 mL a day — about 10% of your daily water needs — chemically identical to what you drink, but built fresh inside your cells.</i>
13.3	The water inside your body is most similar to...	C · Ocean water	<i>Your blood and body fluids are salty — full of sodium and other electrolytes, like a diluted ocean. That dissolved salt is exactly what lets your body conduct electricity, so your nerves and heart can fire their signals. Some scientists say our salty insides echo the ancient sea where life began.</i>
14.1	Deep inside Earth's mantle, a mineral called ringwoodite may hold as much water as...	B · Possibly all the surface oceans combined	<i>Scientists confirmed it after finding a fleck of water-rich ringwoodite trapped inside a diamond that a volcano had spat up from deep below — its water chemically locked into the crystal.</i>
14.2	It's believed some of this deep water is recycled surface water, carried down into the mantle by which part of the deep water cycle?	A · Subduction	<i>As ocean plates dive beneath others — subduction — they drag water-bearing minerals hundreds of miles down into the mantle, feeding the deep water cycle.</i>
14.3	Volcanoes release recycled deep water — but also brand-new water, formed by heat and pressure that reaches the air for the very first time. What is volcanic water called?	C · Both A & B	<i>Water from magma is called magmatic water; the portion that has never been in the atmosphere before is called juvenile water. Volcanoes deliver both — genuinely new water joining Earth's ancient supply.</i>

#	QUESTION	CORRECT ANSWER	EXPLANATION
15.1	Evaporating water and letting it re-condense to leave salt and impurities behind is a purification method called...	A · Distillation	<i>The water cycle is nature's giant distiller: the Sun boils off pure water and leaves the salt, dirt, and minerals behind — exactly how a distillery works, but planet-sized.</i>
15.2	Because evaporation leaves the salt and minerals behind, the rain that falls from clouds is essentially...	B · Naturally distilled, nearly pure water	<i>Fresh rain is about as pure as distilled water — one reason rainwater feels "soft." The salt and minerals never make it up into the clouds.</i>
15.3	Rainwater starts out pure — but by the time it lands, it's turned slightly acidic. Why?	C · It dissolves carbon dioxide from the air, forming a weak acid	<i>As raindrops fall, they absorb a little CO₂, making a weak carbonic acid (about pH 5.6). This is completely natural and harmless — different from pollution-driven "acid rain" — and it's how rain slowly dissolves rock to carve caves over thousands of years.</i>
16.1	Why do no two snowflakes look exactly alike?	A · Each one takes a completely unique path through ever-changing temperature and humidity as it falls	<i>As a snowflake drifts down, every tiny shift in temperature, humidity, and air it passes through nudges how it grows. No two flakes follow the same path, so no two grow the same way.</i>
16.2	About how many water molecules make up a single snowflake?	C · About a quintillion — a 1 followed by 18 zeros	<i>Over 1,000,000,000,000,000,000 molecules, and each can lock into one of six orientations. The number of possible snowflake patterns is even greater than the number of atoms in the universe!</i>
16.3	Here's the flip side: on a single snowflake, why do all six arms look nearly identical to one another?	B · All six share the exact same journey, so they grow in sync	<i>A snowflake is so tiny all six arms pass through the exact same conditions at the same moments — growing in near-perfect sync.</i>
17.1	Hail forms inside tall thunderstorm clouds, lifted up and down by strong...	A · Updrafts (rising air)	<i>Updrafts carry ice back up into freezing zones over and over.</i>
17.2	A hailstone grows as it collides with "supercooled" water droplets — water that is...	C · Still liquid even though it's below freezing	<i>Supercooled droplets freeze onto the hailstone in layer after layer.</i>
17.3	Cut a big hailstone in half and you'll see...	B · Onion-like rings, one for each trip through the cloud	<i>Each ring records another lap up and down inside the storm.</i>
18.1	Which famous air current picks up moisture near Hawaii and drops it on the U.S. West Coast?	C · The Pineapple Express	<i>The "Pineapple Express" is an atmospheric river — a ribbon of moisture-laden air that streams from near Hawaii to the West Coast, dumping heavy rain and snow.</i>
18.2	Warmer air carries more energy, letting it hold far more water vapor than cold air. This warm, moisture-heavy air then flows toward areas of...?	A · Lower pressure (less dense air)	<i>Warm tropical oceans load the air with vapor; because warm air holds more moisture, it becomes heavy with water — and as wind pushes it from high pressure toward low pressure, it gets funneled into long, narrow "atmospheric rivers" that can travel thousands of miles before releasing their rain.</i>
18.3	Scientists studying some of the most remote, untouched places on Earth were stunned to find microplastics in...?	B · Fresh Arctic snow, far from any city	<i>Carried by wind and captured by snow, microplastics have turned up in the Arctic, on remote mountaintops, and in the deepest ocean trenches brought there by our air currents.</i>
19.1	Plants release water through their leaves in a process called...	B · Transpiration	<i>Plants pull water up from the soil and release it as vapor through tiny pores in their leaves — a process called transpiration.</i>
19.2	A single large oak tree can release how much water in a day?	C · Over 100 gallons	<i>A big oak can transpire more than 100 gallons a day — around 40,000 gallons a year.</i>
19.3	Big forests like the Amazon release so much water vapor that they can...	A · Create their own clouds and rain	<i>The Amazon transpires so much moisture that it generates much of its own rainfall — vast "flying rivers" of vapor drift off the forest, form clouds, and fall back as rain.</i>
20.1	The reverse of deposition — when ice turns straight into vapor without melting first is called...	A · Sublimation	<i>Sublimation skips the liquid stage entirely, so it takes a lot of energy — about as much as melting the ice and then boiling it, combined.</i>
20.2	Which of these can sublime?	C · Snow	<i>Snow and ice can vanish straight into vapor without melting first.</i>
20.3	Dry ice (frozen CO ₂) sublimates into a spooky, rolling fog. How does that fog actually form?	B · The freezing-cold CO₂ gas makes the surrounding air's moisture instantly condense into tiny droplets	<i>When dry ice is opened to the atmosphere, super cold CO₂ chills nearby air so fast its water vapor condenses into a cloud. The fog isn't the CO₂ itself (that gas is invisible). Dry ice skips liquid entirely because CO₂ can't be a liquid at our air pressure.</i>
21.1	Clouds that form at ground level are called...	B · Fog	<i>Fog is simply a cloud that forms right down at ground level.</i>
21.2	Why does fog form low, near the ground, instead of high in the sky?	A · Ground-level air cools to its dew point	<i>Fog forms when moist air near the ground cools to its dew point — the temperature where it's so full of water vapor it can't hold any more. Calm winds, high humidity, and cool, clear nights all help it form.</i>

#	QUESTION	CORRECT ANSWER	EXPLANATION
21.3	Some dry desert areas string up giant nets to collect...	C · Fog	<i>In Chile's Atacama — the driest nonpolar desert on Earth — giant mesh “fog catchers” trap the thick coastal fog (the camanchaca); droplets run down into pipes. Communities harvest it for drinking water and to grow crops — and one local brewery even uses it to make beer!</i>
22.1	Which list contains ONLY real water-cycle processes?	B · Evaporation, condensation, precipitation, collection	<i>Water evaporates, condenses, precipitates, and collects — over and over.</i>
22.2	Gravity and pressure both shape the water cycle and weather. Which of these affects BOTH?	C · The Moon	<i>The Moon's gravity pulls on Earth's oceans to create the tides — and it even tugs on the atmosphere itself, creating tiny “atmospheric tides” that nudge air pressure up and down.</i>
22.3	Aside from Earth, what is the only other world in our solar system with stable, long-term liquid lakes and a three-phase weather cycle on its surface?	A · Titan — Saturn's moon, using liquid methane	<i>Venus is a scorching furnace (~465°C) cloaked in sulfuric-acid clouds — far too hot for any ocean, and there's no “sulfur sea.” Jupiter is a giant ball of gas with no solid surface at all; its Great Red Spot is a centuries-old storm, but it's not rain. Titan, Saturn's moon actually has methane clouds, rain, and lakes — explore it in the next world!</i>