

# Part 4 Earth the Water Planet

Name: \_\_\_\_\_

Due: \_\_\_\_\_

## Part 4 Lesson 1

What % of the earth is covered with water? Answer=\_\_\_\_\_

High Specific Heat: Hydrogen bonds \_\_\_\_\_ heat when they break, and \_\_\_\_\_ heat when they form.

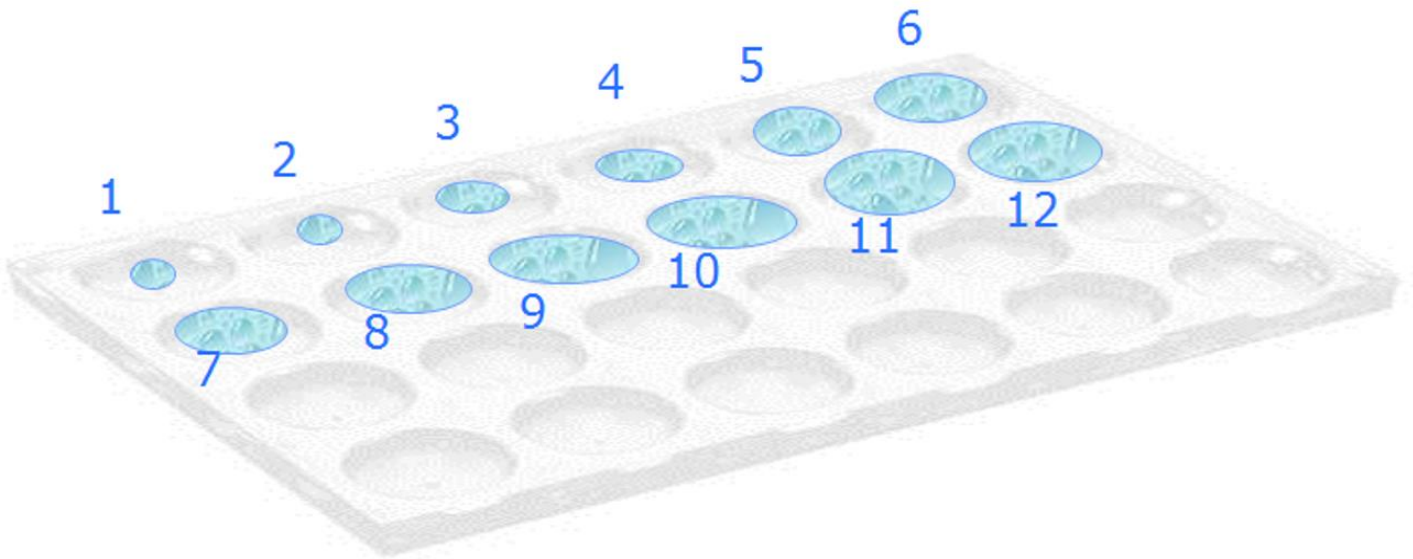
The high specific heat of water means that a lake won't freeze or heat up suddenly.

- This gives aquatic organisms a chance to adjust to temperature changes slowly.

It takes significant \_\_\_\_\_ to change the state of water.

\_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_  
 \_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_

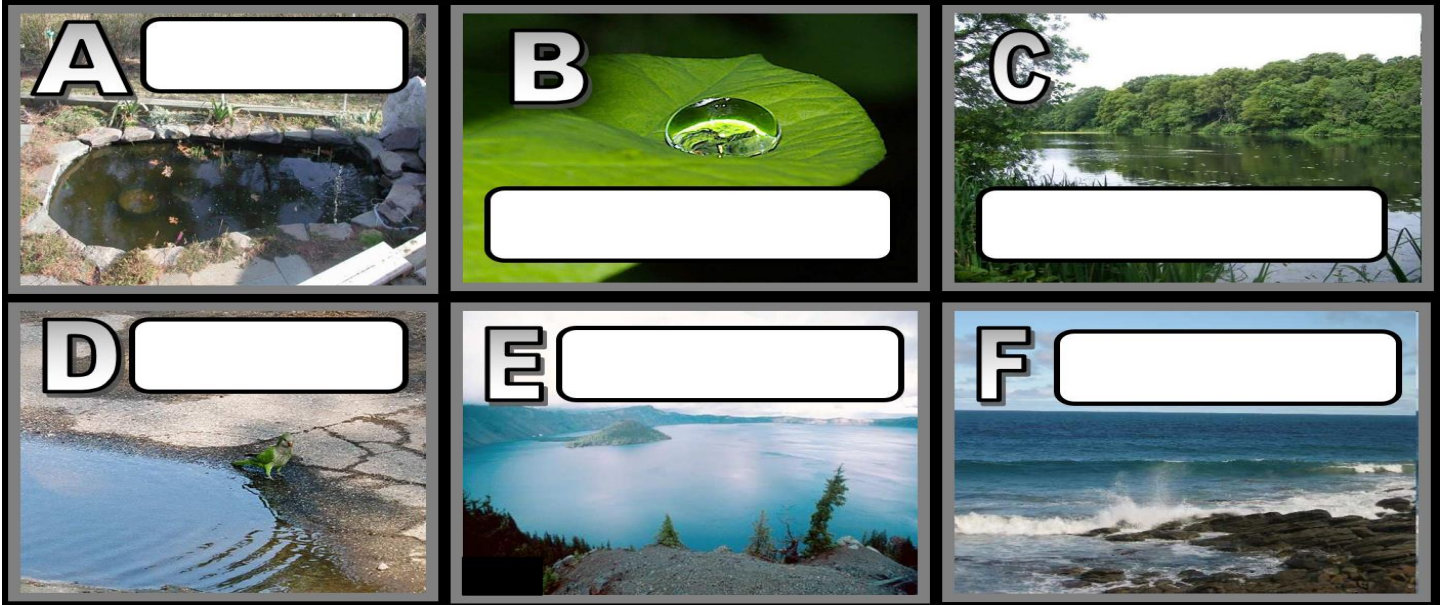
Which ones were frozen, and which were unfrozen after 15 minutes?



Why? How does this show waters high specific heat?

Blank lined writing area for student response.

Which of the following pictures will freeze first, second, third, fourth, fifth, and last?



### The Oceans

- \_\_\_\_\_ and \_\_\_\_\_ the earth.

-The oceans influence climate by absorbing solar radiation and slowly \_\_\_\_\_ heat needed to drive the atmospheric circulation. (High Specific Heat).

-Warm seas and wind are moved to the \_\_\_\_\_

-Humidify and \_\_\_\_\_ the planet.

-Control the \_\_\_\_\_ speed and direction.

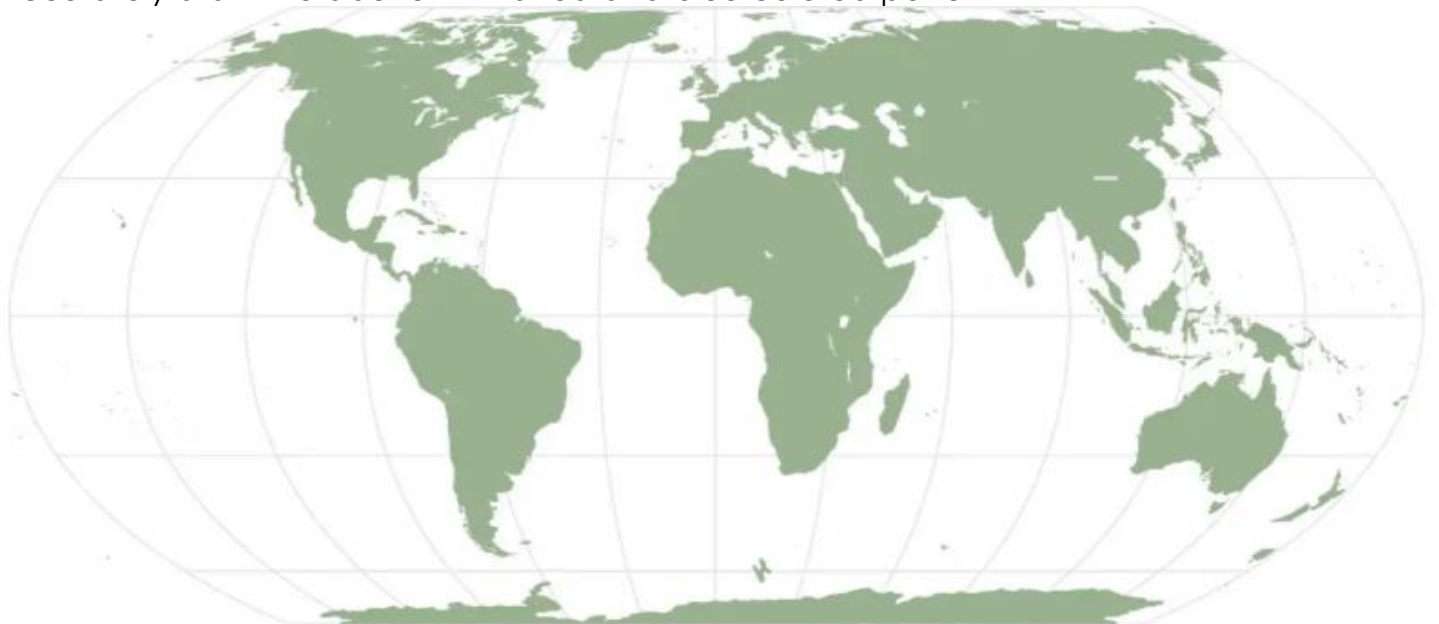
-Are a part of the \_\_\_\_\_ and \_\_\_\_\_ cycle

-Phytoplankton in ocean produces \_\_\_\_\_ for the planet.

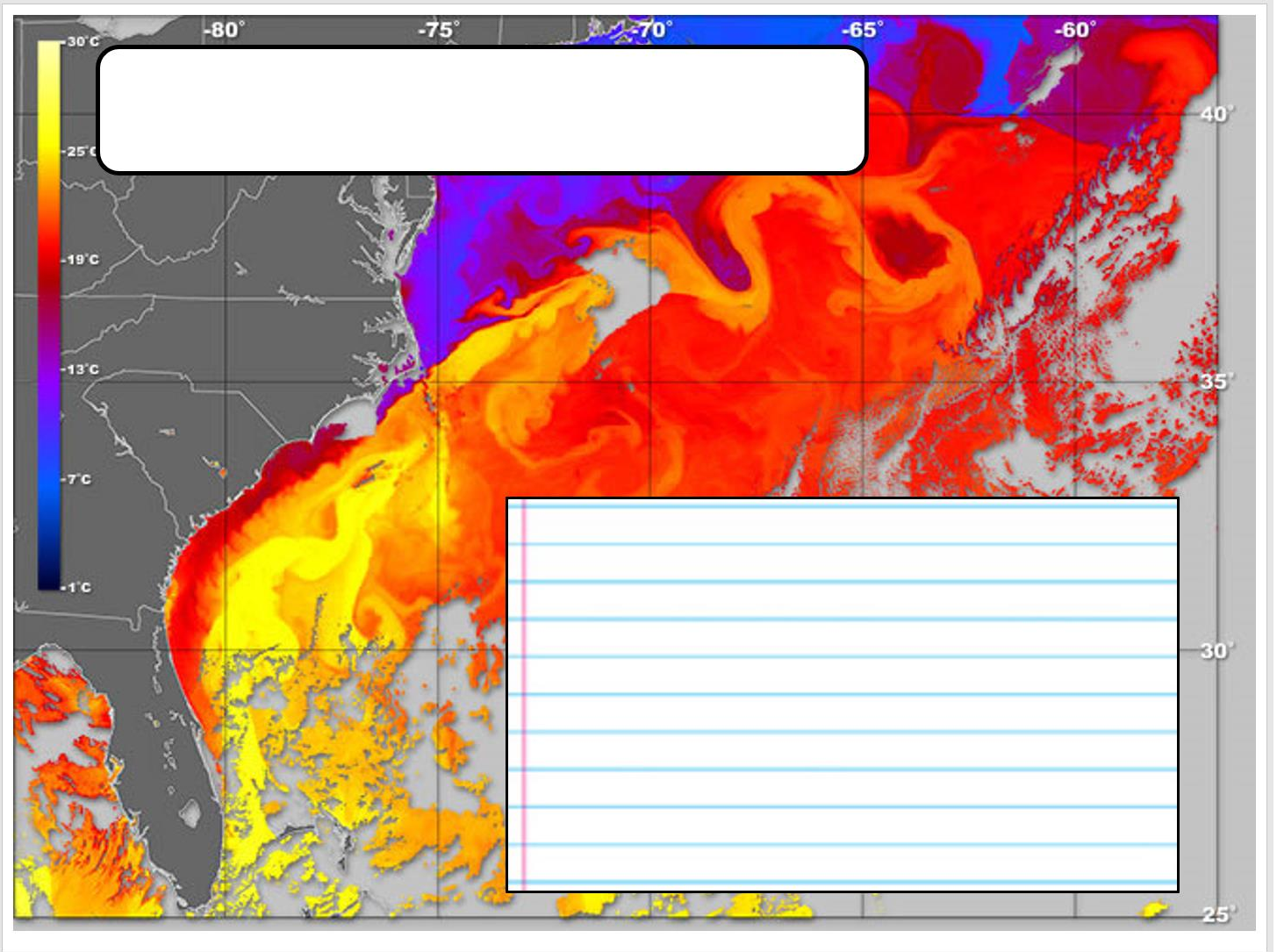
-Releases aerosols (small particles) that influence \_\_\_\_\_ cover, fall as rain, and absorbing carbon.

\_\_\_\_\_ also called the Global Ocean Conveyor, moves water between the deep and surface ocean worldwide.

Accurately draw the above with a red and blue colored pencil



What is the satellite image below? Why does Europe have such mild winters?



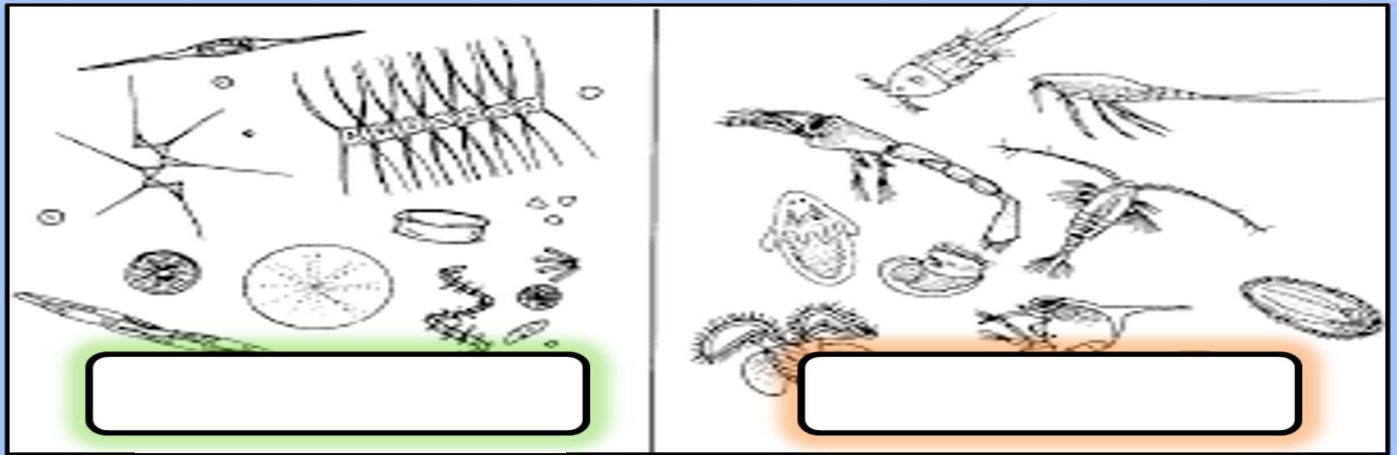
Which is bogus from the list below? Oceans...

- A.) Heat and cool the earth.
- B.) The oceans influence climate by not absorbing solar radiation and quickly releasing heat needed to drive the atmospheric circulation. (Low Specific Heat).
- C.) Warm seas and wind are moved to the icy poles
- D.) Humidify and dry the planet.
- E.) Control the wind speed and direction.
- F.) Part of the water and carbon cycle
- G.) Phytoplankton in ocean produces half the oxygen
- H.) Releases aerosols (small particles) that influence cloud cover, fall as rain, and absorbing carbon.

Which is bogus from the list below? Oceans...

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- F.) Part of the water and carbon cycle
- G.) Phytoplankton in ocean produces half the oxygen
- H.) Releases aerosols (small particles) that influence cloud cover, fall as rain, and absorbing carbon.

Which is zooplankton? And which is phytoplankton?



### Part 4 Lesson 2

El Nino: A \_\_\_\_\_ of the surface water of the eastern and central Pacific Ocean, occurring every \_\_\_\_\_ years and causing unusual global weather patterns.

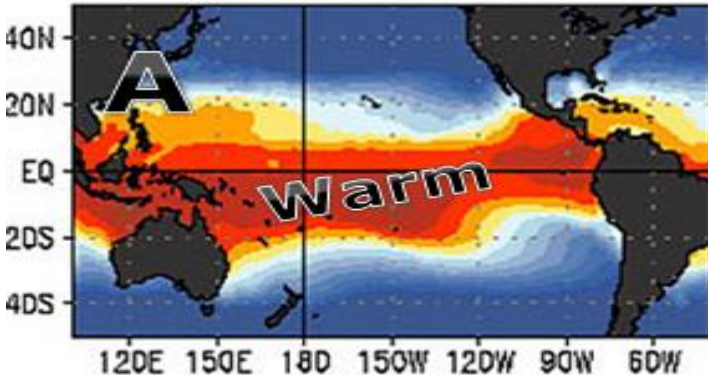
- Generally occurs in \_\_\_\_\_.
- Winds get weaker, thus ocean gets \_\_\_\_\_.
- Thunderstorms that normally occur on the equator move eastward.
  - Southwest U.S. gets more \_\_\_\_\_, Australia and Indonesia gets less (maybe).

La Niña is a weather pattern that occurs in the \_\_\_\_\_ Ocean. In this pattern, strong \_\_\_\_\_ blow \_\_\_\_\_ water at the ocean's surface from South America to Indonesia.

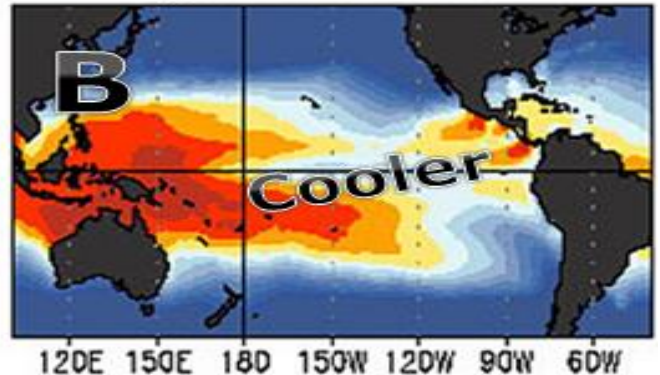
As the warm water moves west, \_\_\_\_\_ from the deep rises to the surface near the coast of South America.

Which is El Nino and which is La Nina? Explain.

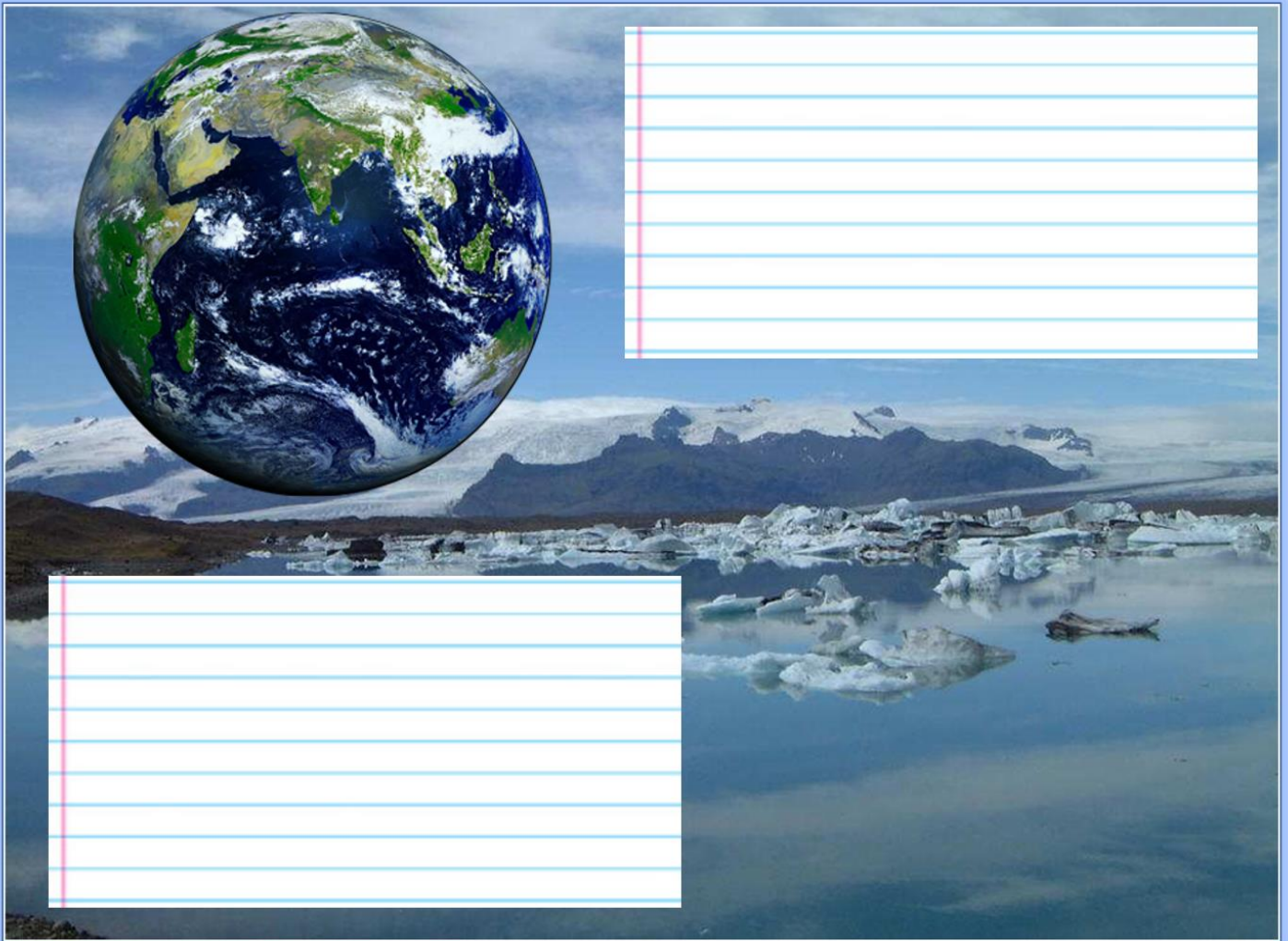
**Jan-Mar 1998**



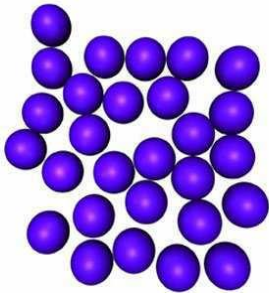
**Jan-Mar 1989**



What is so special about this photograph and planet earth?

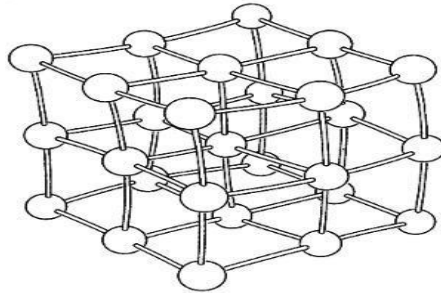


Name each state of matter on a molecular level. (Solid, Liquid, Gas)



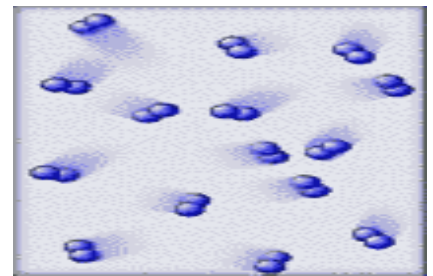
Semi Ordered

True or False? On earth water exists in all three states of matter?



Called a crystal \_\_\_\_\_

True or False? The lower density of ice causes it to float?



Moving fast!

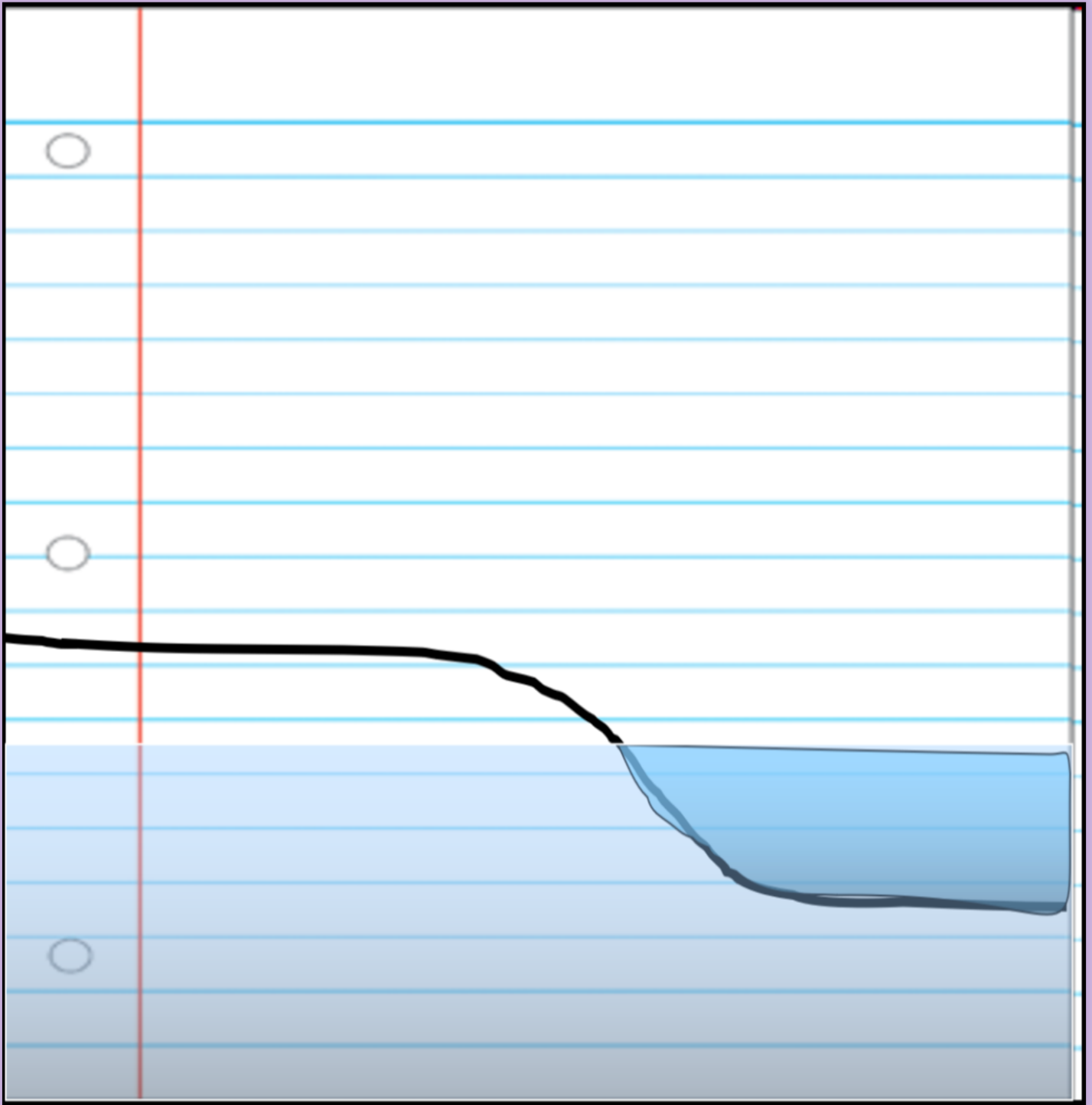
True or False? The oceans and atmosphere move heat around the planet?

## Part 4 Lesson 3 The Water Cycle

The Water Cycle also known as the hydrologic cycle  
Driven by the \_\_\_\_\_ and \_\_\_\_\_.

The hydrologic cycle (Water Cycle): The continuous movement of water \_\_\_\_\_, \_\_\_\_\_,  
and \_\_\_\_\_ the surface of the earth.

Please complete the diagram below on the water cycle as described in the slideshow



Evaporation – Substance changes from a \_\_\_\_\_ state to \_\_\_\_\_ state (requires energy).

Condensation – Water vapor (gas) turns back to a \_\_\_\_\_. (energy required/cold) -cloud formation.

Precipitation – Water that is so heavy it \_\_\_\_\_ as liquid / solid.

Sublimation – Solid state turns directly to a \_\_\_\_\_ state skipping liquid phase.

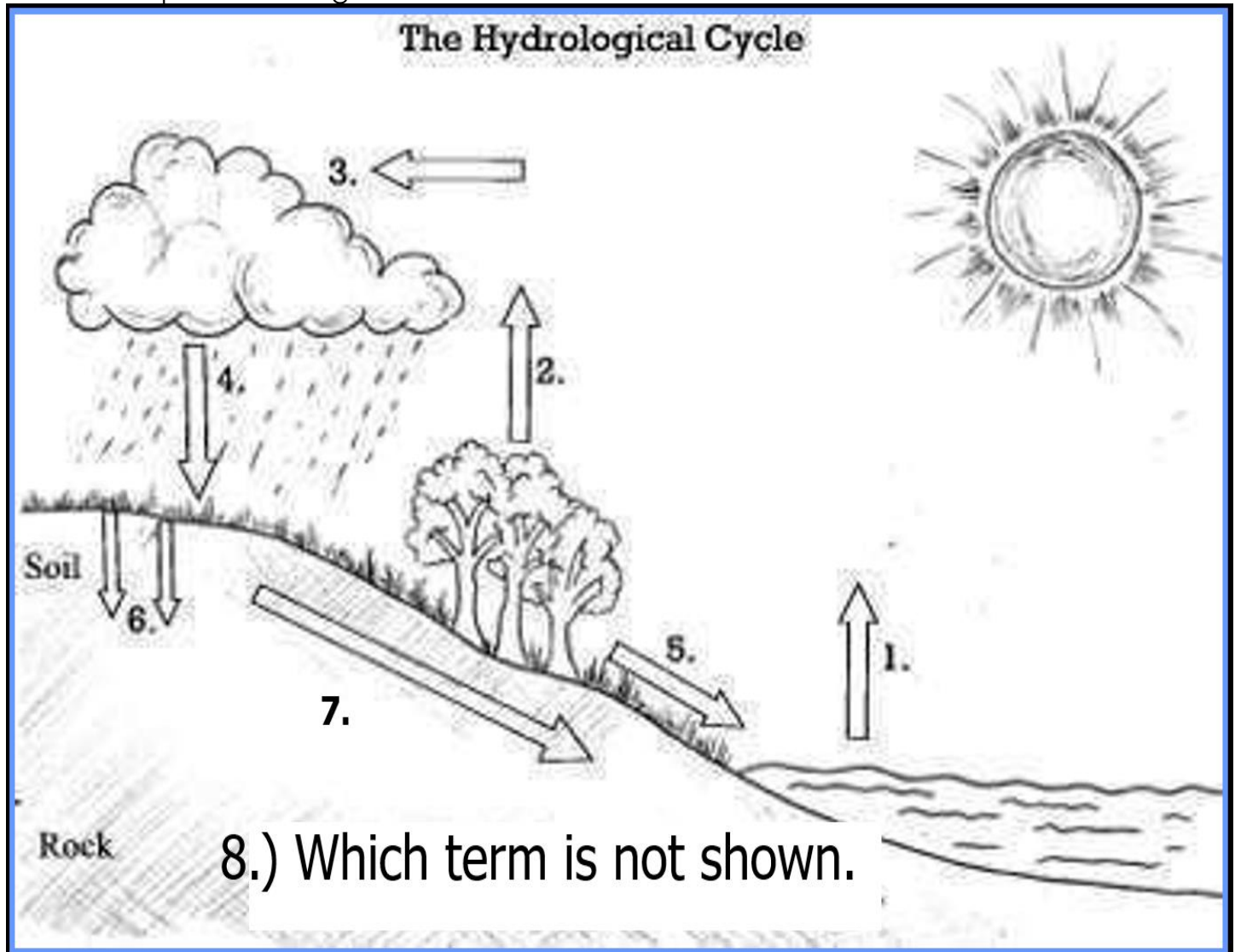
Evapotranspiration – Water released by \_\_\_\_\_ into air.  
Non-living to the living, and back again.

Surface run-off: The water flow which occurs when soil is full to capacity and excess water travels over the \_\_\_\_\_.

Percolation: The slow movement of water through the \_\_\_\_\_.

Groundwater discharge: Water that has been \_\_\_\_\_ seeps back into the oceans, or into rivers or lakes.

Please complete the diagram below.



**Part 4 Lesson 4 Clouds**

Cloud: A visible body of fine \_\_\_\_\_ droplets or \_\_\_\_\_ particles suspended in the atmosphere at different altitudes.

Fog: A cloud bank that is in contact with the \_\_\_\_\_.

The main types are

Cirrus (\_\_\_\_\_) sketch->  
A wispy white cloud (usually of fine ice crystals) at a high altitude.

Cumulus (\_\_\_\_\_) sketch->  
Middle elevation, white, puffy, and represents pleasant weather.

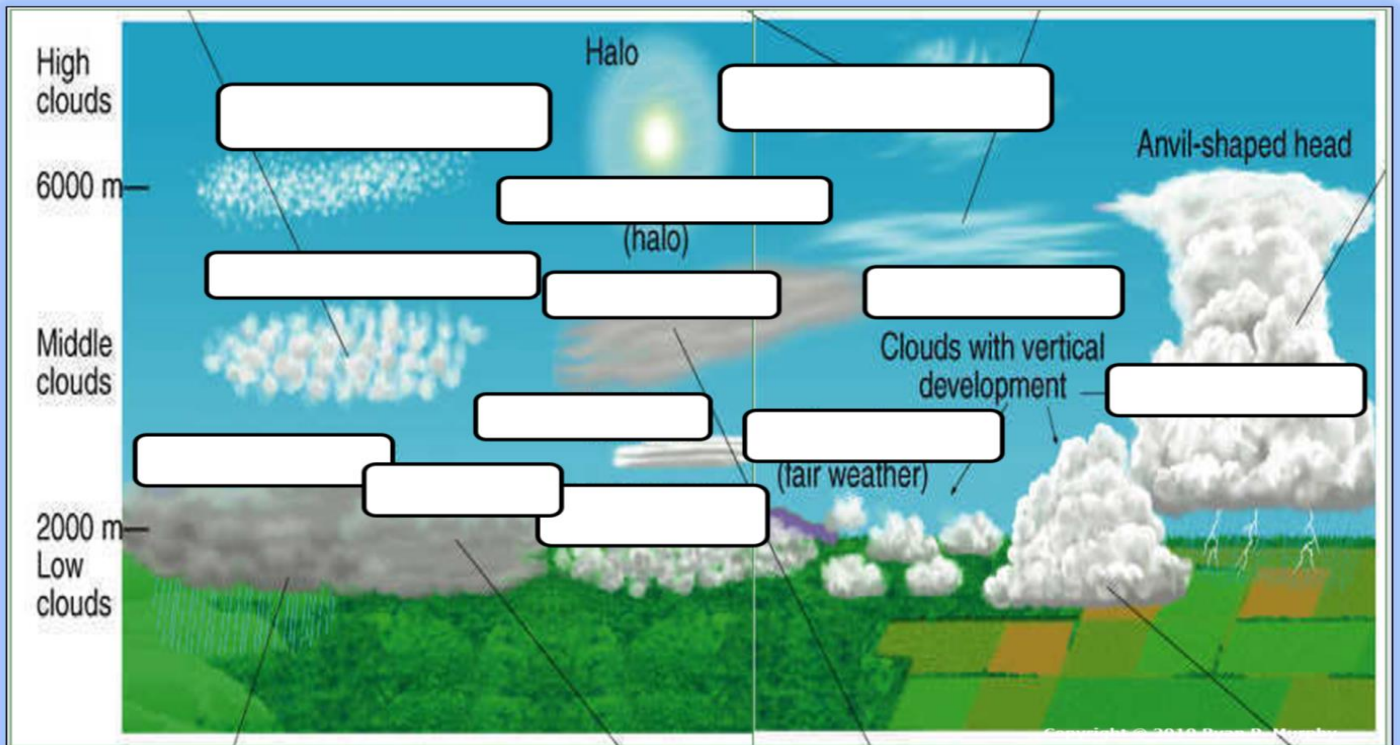
Stratus (\_\_\_\_\_) sketch->  
Low elevation, gray, precipitation.

Cumulonimbus sketch->  
Tall, \_\_\_\_\_ shaped  
Massive \_\_\_\_\_.

Cloud Prefixes

- Cirro - \_\_\_\_\_ Altitude
- Alto - Middle
- Nimbo - \_\_\_\_\_
- Strato - \_\_\_\_\_

Use the prefixes to name the clouds below and described in the slideshow.



Please complete the cloud observation outside as described in the slideshow.



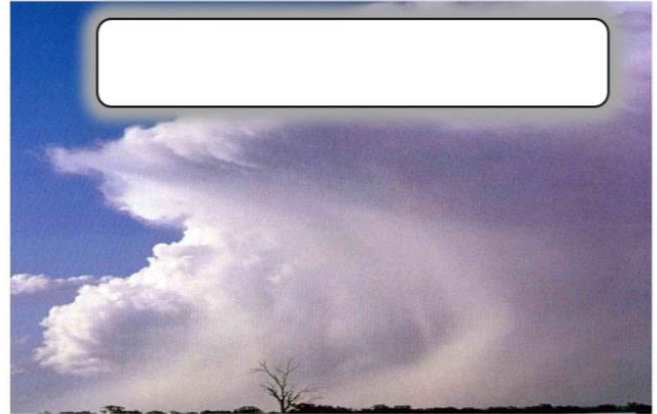


Activity! Quiz Wiz 1-20 Cirrus / Cumulus / Stratus / Cumulonimbus  
 + Prefixes (Cirro- High Altitude), (Alto- Middle), (Nimbo- Low), (Strato - Layered)

1) Strato_____	2)	3)	4)
5)	6) _____stratus	7)	8) Nimbo_____
9) _____stratus	10) Alto_____	11) Alto_____	12) _____stratus
13) Cirro_____	14)	15)	16)
17)	18) _____stratus	19)	20)

Bonus #21 \_\_\_\_\_ Bonus #22 \_\_\_\_\_

Please label the types of clouds in the boxes below.



### Ten basic cloud types

alto cumulus  
stratus  
cirrostratus  
cumulonimbus  
strato cumulus  
alto stratus  
cirro cumulus  
nimbostratus  
cirrus  
cumulus

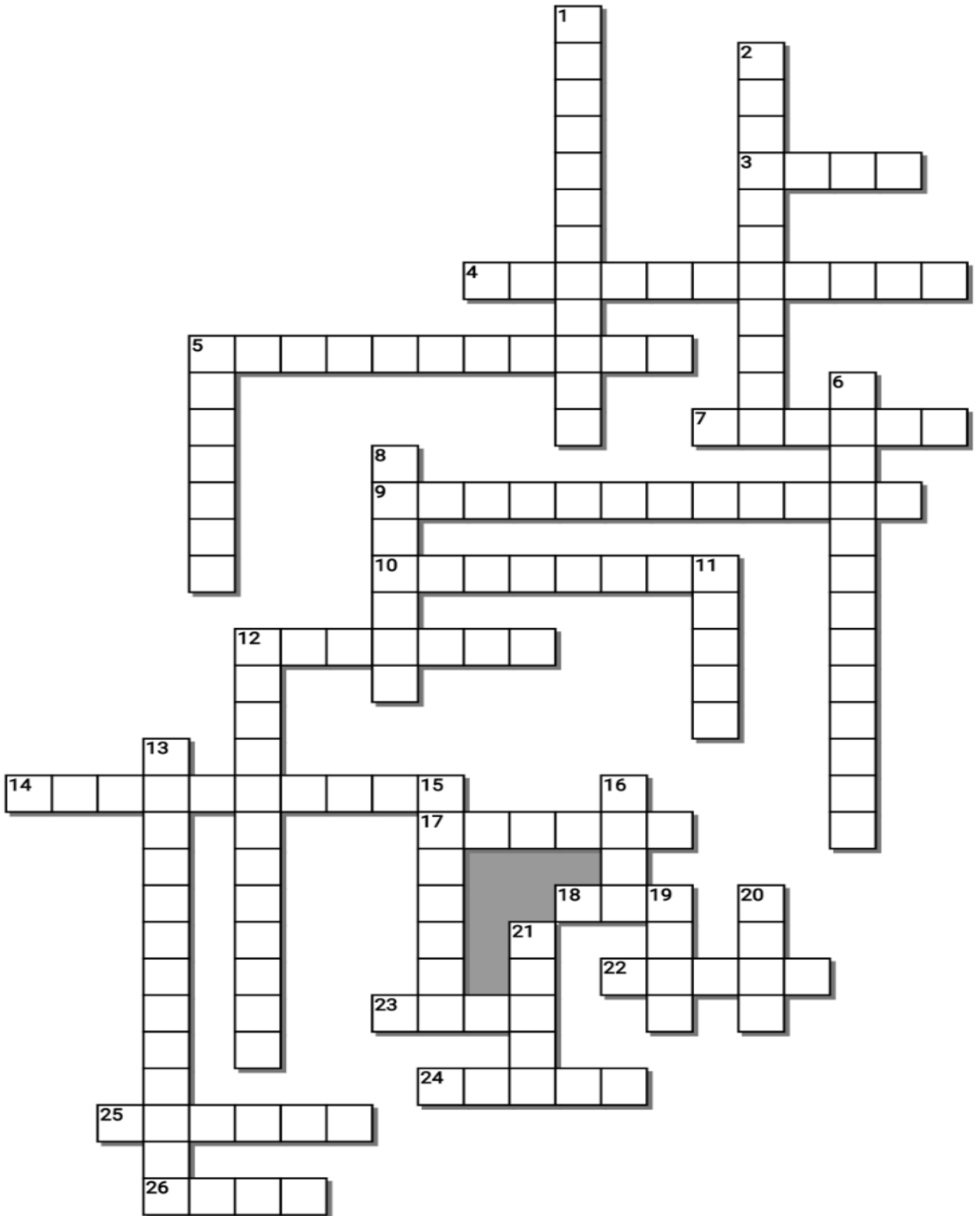
clouds are classified according to altitude

- ① alto = middle altitude
- ② cirro = high altitude

and appearance

- ③ strato or stratus = layer cloud
- ④ cumulo or cumulus = puffy cloud
- ⑤ nimbo or nimbus (precipitation)

Learn the 5 key words rather than memorizing the 10 cloud names.



Note: Number 12 Should be Tall not all -Oops, my bad.

### Across

3. Oceans Heat and \_\_\_\_\_ the earth.
4. Substance changes from a liquid state to gas state (requires energy).
5. Solid state turns directly to a gas state skipping liquid phase.
7. It takes significant \_\_\_\_\_ to change the state of water.
9. \_\_\_\_\_ circulation, also called the Global Ocean Conveyor, moves water between the deep and surface ocean worldwide.
10. Oceans release \_\_\_\_\_ (small particles) that influence cloud cover, fall as rain, and absorbing carbon.
12. Cloud that at Middle elevation, white, puffy, and represents pleasant weather.
14. The \_\_\_\_\_ cycle (Water Cycle): The continuous movement of water on, above, and below the surface of the earth.
17. Solid -> \_\_\_\_\_ -> Gas.
18. A cloud bank that is in contact with the ground.
22. A visible body of very fine water droplets or ice particles suspended in the atmosphere at different altitudes.
23. High Specific \_\_\_\_\_: Hydrogen bonds absorb heat when they break, and release heat when they form.
24. Water on \_\_\_\_\_ commonly exists as a solid liquid and gas
25. A wispy white cloud (usually of fine ice crystals) at a high altitude.
26. La\_\_\_\_\_: is a weather pattern that occurs in the Pacific Ocean. In this pattern, strong winds blow warm water at the ocean's surface from South America to Indonesia.

### Down

1. Water vapor (gas) turns back to a liquid. (Energy needs to be removed) Cloud formation.
2. The slow movement of water through the soil. Cleans and purifies.
5. \_\_\_\_\_ run-off: The water flow which occurs when soil is full to capacity and excess water travels over the land.
6. Water released by plants into air.
8. Low elevation cloud, gray, precipitation.
11. Gas -> Liquid -> \_\_\_\_\_
12. all cloud, anvil shaped Massive thunderstorms.
13. Water that is so heavy it falls as liquid / solid.
15. The oceans influence \_\_\_\_\_ by absorbing solar radiation and slowly releasing heat needed to drive the atmospheric circulation.
16. El \_\_\_\_\_: A warming of the surface water of the eastern and central Pacific Ocean, occurring every 4 to 12 years and causing unusual global weather patterns.
20. Earth is this color from space because of all of its water
21. Earth is the \_\_\_\_\_ Planet

-----Teacher can remove this word bank to make more challenging-----

BLUE, CIRRUS, CLOUD, CONDENSATION, COOL, CUMULONIMBUS , CUMULUS, EARTH, ENERGY, EVAPORATION, FOG, GULF, HEAT, LIQUID, NINO, NIÑA, PERCOLATION, PRECIPITATION, SOLID, STRATUS, SUBLIMATION, SURFACE, THERMOHALINE, TRANSPIRATION, WATER, AEROSOLS, CLIMATE , HYDROLOGIC

# Part 4 REVIEW GAME

Name: \_\_\_\_\_

Due: Today

1-20 = 5 pts

Part 4 Lesson 5

\*20-\*25 \* = Bonus + 1 pt,

(Secretly write owl in correct space +1 pt)

Score \_\_\_\_ / 100

Final Question = 5 pt wager

BIG BLUE	MALL LIKE YOU	LET'S DROP	CLOUDED JUDGEMENT	PUFF BALL Bonus round 1pt each
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

Final Question Wager \_\_\_\_ /5 Answer: \_\_\_\_\_

# Part 4 Earth the Water Planet

Name:

Due:

## Part 4 Lesson 1

What % of the earth is covered with water? Answer=**71%**

High Specific Heat: Hydrogen bonds **absorb** heat when they break, and **release** heat when they form.

The high specific heat of water means that a lake won't freeze or heat up suddenly.

- This gives aquatic organisms a chance to adjust to temperature changes slowly.

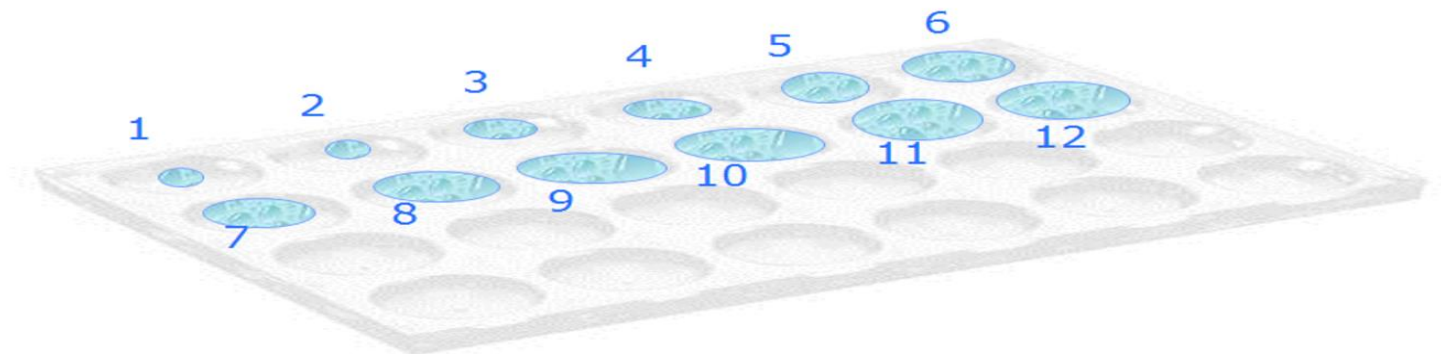
It takes significant **energy** to change the state of water.

**Solid → Liquid → Gas.**

**Gas → Liquid → Solid.**

Which ones were frozen, and which were unfrozen after 15 minutes?

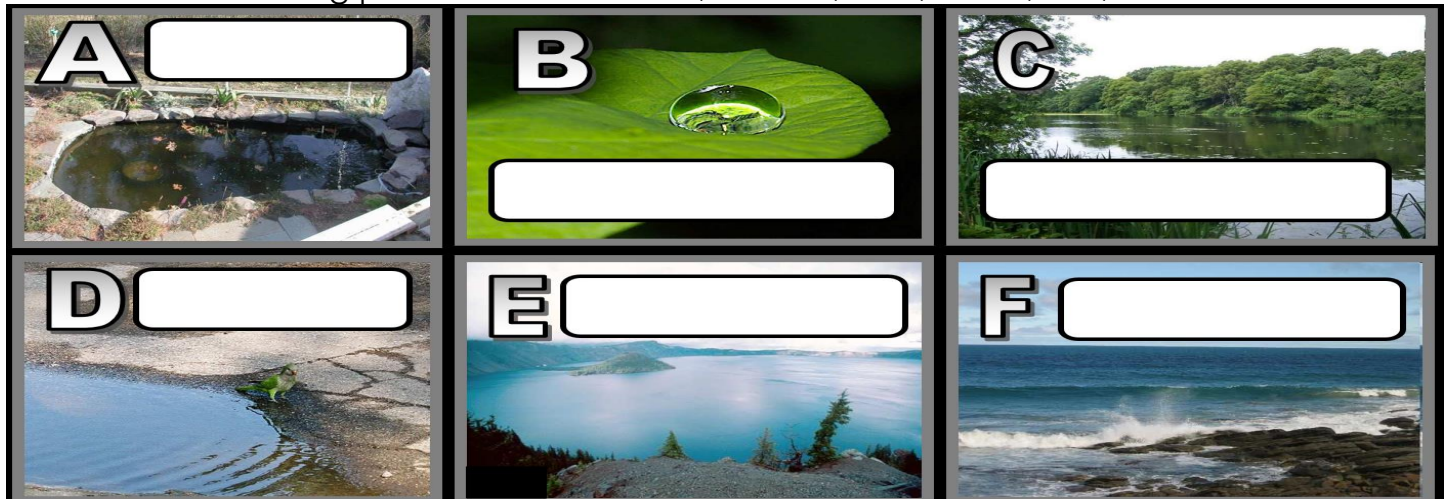
**The smaller amounts of water will freeze. The first to freeze will be the single drop, and the largest may not freeze.**



Why? How does this show water's high specific heat?

**This shows high specific heat because it took more energy to freeze the larger amounts of water.**

Which of the following pictures will freeze first, second, third, fourth, fifth, and last?



**A= Third**

**B= Freeze First**

**C= Fourth**

**D= Will Freeze Second**

**E= Fifth**

**F= Last / Rarely Freezes**

## The Oceans

- **Heat** and **Cool** the earth.
- The oceans influence climate by absorbing solar radiation and slowly **releasing** heat needed to drive the atmospheric circulation. (High Specific Heat).
- Warm seas and wind are moved to the **icy poles**
- Humidify and **dry** the planet.
- Control the **wind** speed and direction.
- Are a part of the **Water** and **Carbon** cycle
- Phytoplankton in ocean produces **oxygen** for the planet.
- Releases aerosols (small particles) that influence **cloud** cover, fall as rain, and absorbing carbon.

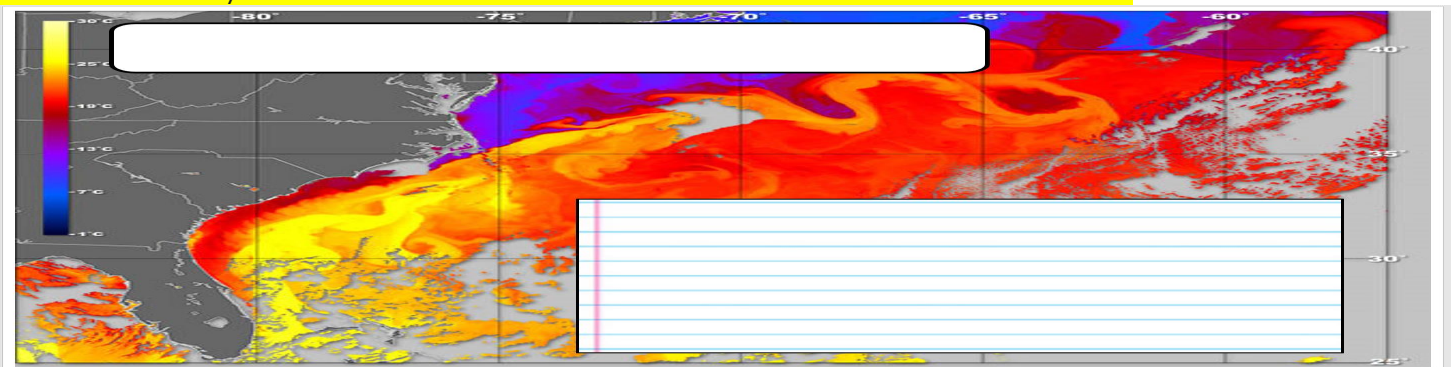
**Thermohaline Circulation** also called the Global Ocean Conveyor, moves water between the deep and surface ocean worldwide.

Accurately draw the above with a red and blue colored pencil



What is the satellite image below? Why is does Europe have such mild winters?

Europe is generally characterized by a temperate climate. ... The climate of western Europe is strongly conditioned by the Gulf Stream, which keeps mild air (for the latitude) over Northwestern Europe in the winter months, especially in Ireland, the United Kingdom and coastal Norway. Also warm air masses that move across the United States



Which is bogus from the list below? Oceans...

- A.) Heat and cool the earth.
- B.) The oceans influence climate by not absorbing solar radiation and quickly releasing heat needed to drive the atmospheric circulation. (Low Specific Heat).
- C.) Warm seas and wind are moved to the icy poles
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- G.) Phytoplankton in ocean produces half the oxygen
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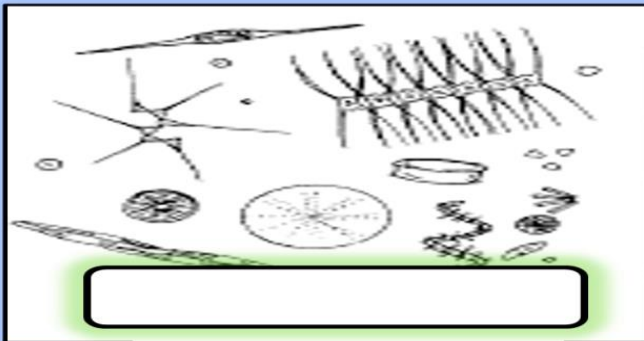
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- G.) Phytoplankton in ocean produces half the oxygen
- H.) Releases aerosols (small particles) that influence cloud cover, fall as rain, and absorbing carbon.

Which is zooplankton? And which is phytoplankton?

Phytoplankton

Zooplankton



## Part 4 Lesson 2

El Nino: A **warming** of the surface water of the eastern and central Pacific Ocean, occurring every **4 to 12** years and causing unusual global weather patterns.

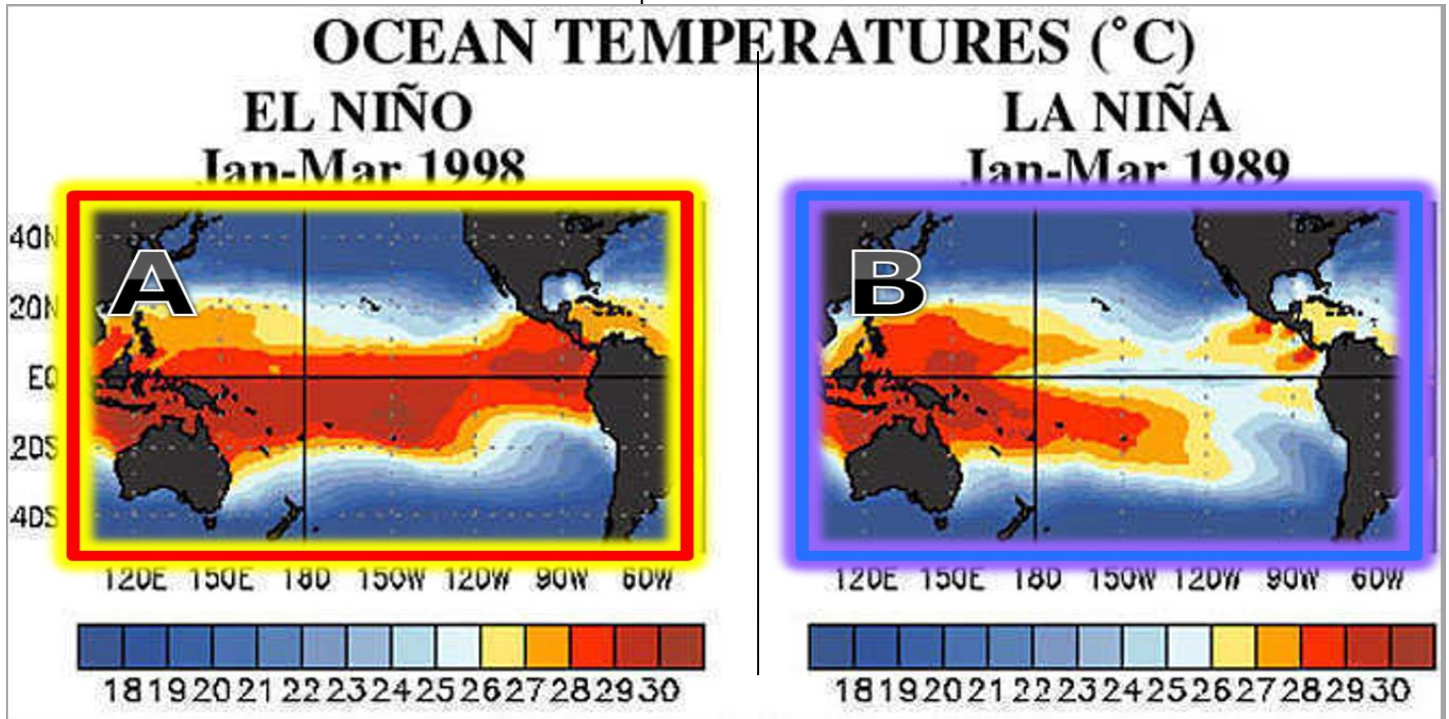
- Generally occurs in **winter**.
- Winds get weaker, thus ocean gets **warmer**.
- Thunderstorms that normally occur on the equator move eastward.
  - Southwest U.S. gets more **precipitation**, Australia and Indonesia gets less (maybe).

La Niña is a weather pattern that occurs in the **Pacific** Ocean. In this pattern, strong **winds** blow **warm** water at the ocean's surface from South America to Indonesia.

As the warm water moves west, **cold water** from the deep rises to the surface near the coast of South America.

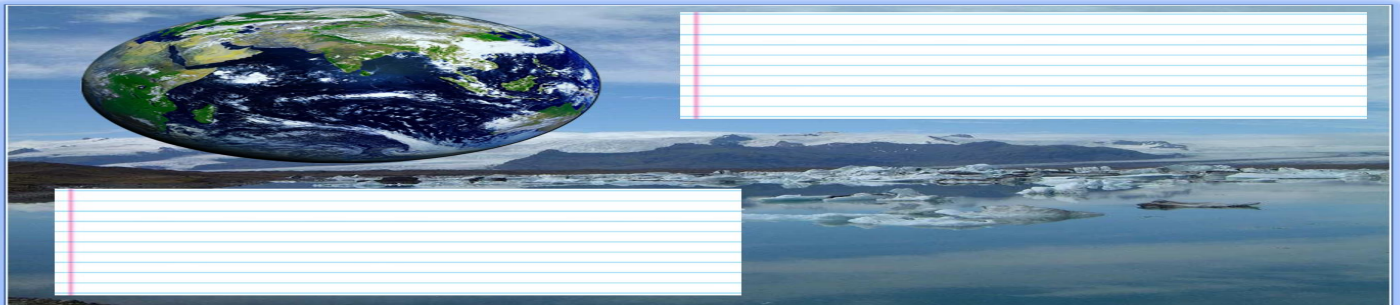


Which is El Nino and which is La Nina? Explain.

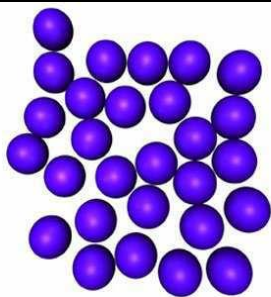


What is so special about this photograph and planet earth?

On earth, water can exist in all three states of matter, as a solid, liquid, and gas. Earth is the only planet in our solar system where water regularly exists in all three states of matter.

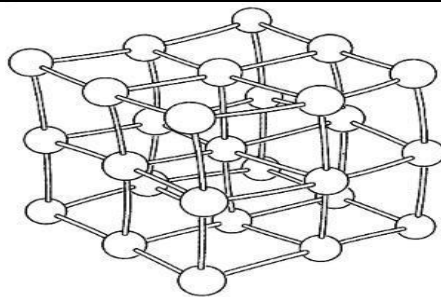


Name each state of matter on a molecular level. (Solid, Liquid, Gas)



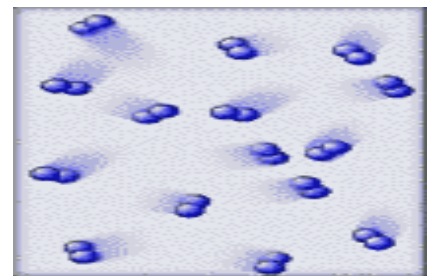
Semi Ordered  
Liquid

True or False? On earth water exists in all three states of matter?



Called a crystal lattice

True or False? The lower density of ice causes it to float?



Moving fast!  
Gas

True or False? The oceans and atmosphere move heat

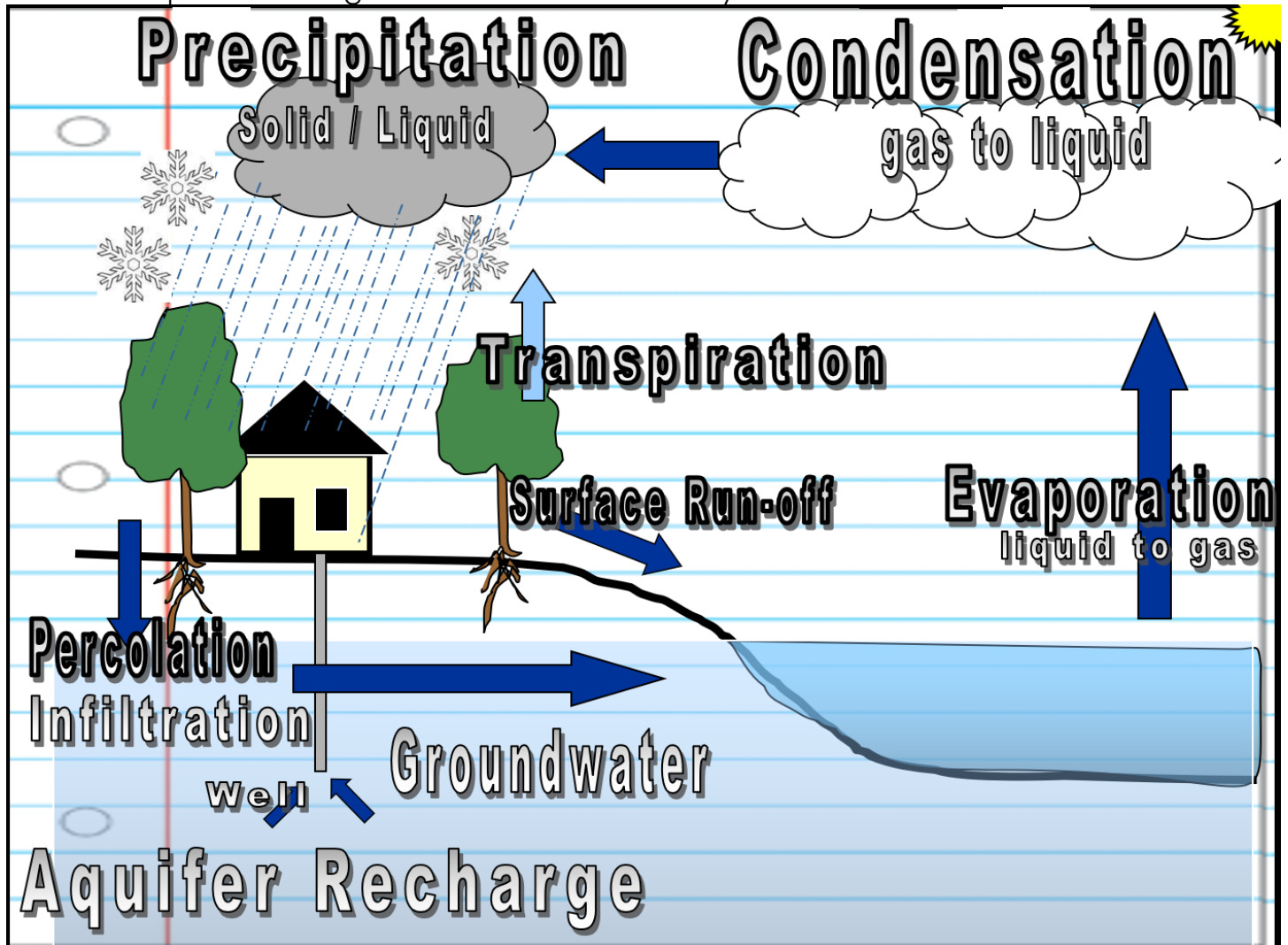
### Part 4 Lesson 3 The Water Cycle

The Water Cycle also known as the hydrologic cycle

Driven by the **gravity** and **the Sun**.

The hydrologic cycle (Water Cycle): The continuous movement of water **on, above, and below** the surface of the earth.

Please complete the diagram below on the water cycle as described in the slideshow



Evaporation – Substance changes from a **liquid** state to **gas** state (requires energy).

Condensation – Water vapor (gas) turns back to a **liquid**. (energy required/cold) -cloud formation.

Precipitation – Water that is so heavy it **falls** as liquid / solid. **Gravity**

Sublimation – Solid state turns directly to a **gas** state skipping liquid phase.

Evapotranspiration – Water released by **plants** into air.

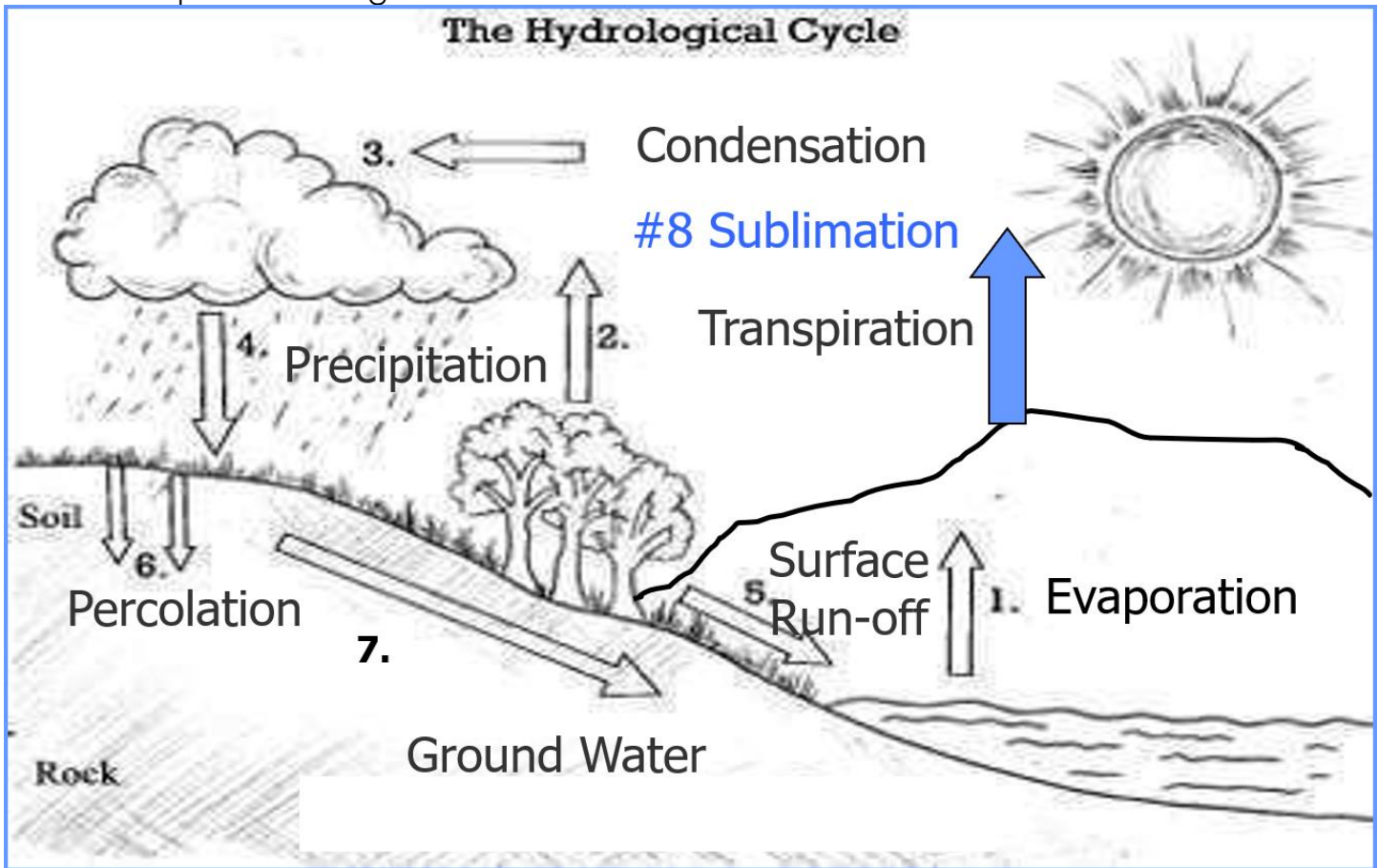
Non-living to the living, and back again.

Surface run-off: The water flow which occurs when soil is full to capacity and excess water travels over the **land / surface**.

Percolation: The slow movement of water through the **ground**.

Groundwater discharge: Water that has been **underground** seeps back into the oceans, or into rivers or lakes.

Please complete the diagram below.




#### Part 4 Lesson 4 Clouds

Cloud: A visible body of fine **water** droplets or **ice** particles suspended in the atmosphere at different altitudes.

Fog: A cloud bank that is in contact with the **ground**.

The main types are

Cirrus (  )  
A wispy white cloud (usually of fine ice crystals) at a high altitude.

Cumulus (  ) sketch->  
Middle elevation, white, puffy, and represents pleasant weather.

Stratus (layered and gray) sketch->  
Low elevation, gray, precipitation.

Cumulonimbus

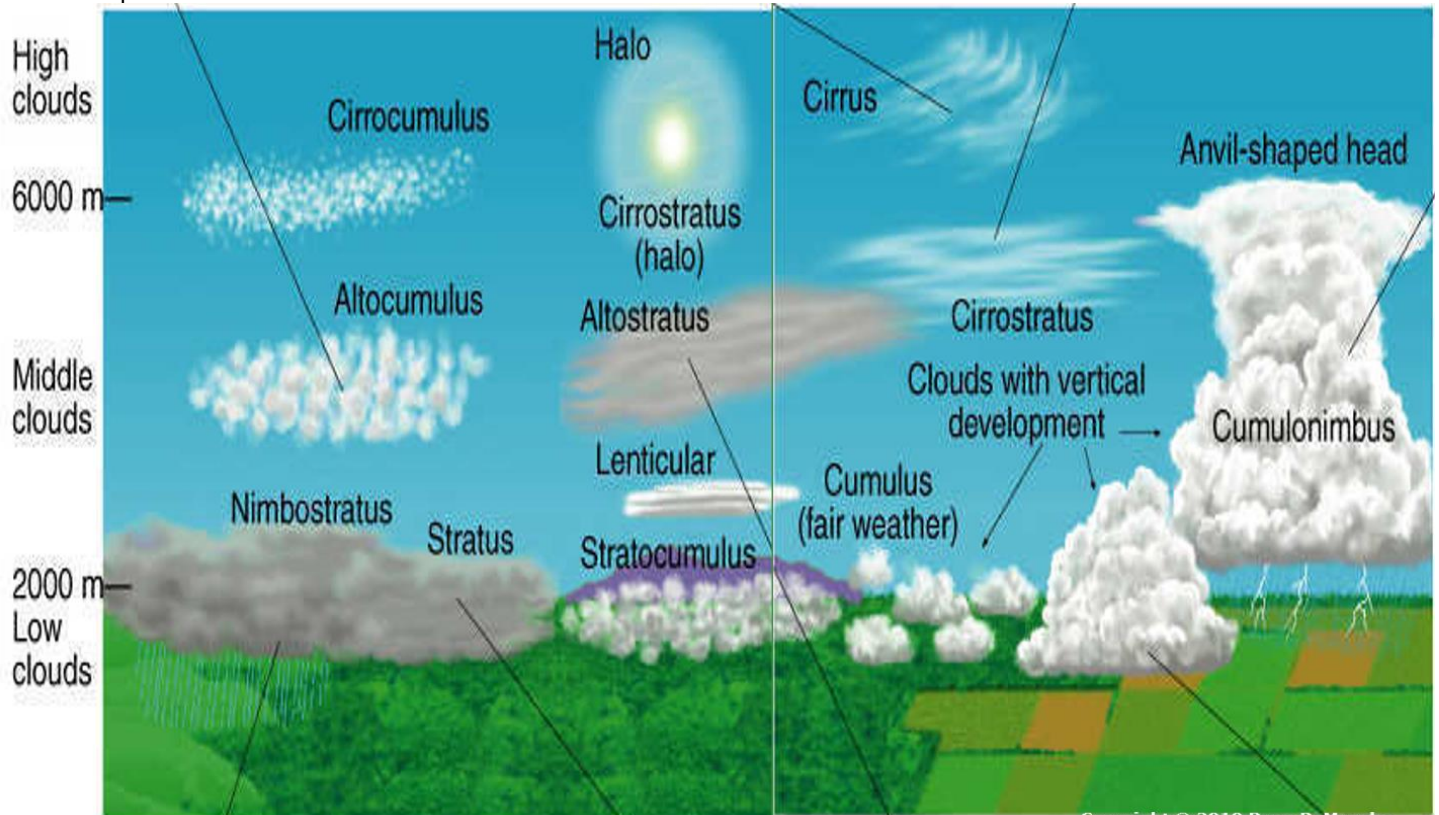
sketch->

Tall, **anvil** shaped  
Massive **Thunderstorms**.

Cloud Prefixes

Cirro - **High** Altitude  
Alto - Middle  
Nimbo - **low**  
Strato - **layered**

Use the prefixes to name the clouds below and described in the slideshow.

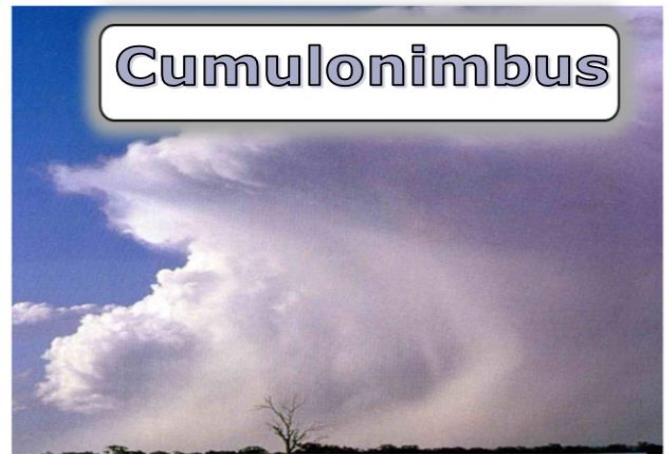


Activity! Quiz Wiz 1-20 Cirrus / Cumulus / Stratus / Cumulonimbus  
+ Prefixes (Cirro- High Altitude), (Alto- Middle), (Nimbo- Low), (Strato - Layered)

1) Strato <b>cumulus</b>	2) <b>Cirrus</b>	3) <b>Cumulus</b>	4) <b>Stratus</b>
5) <b>Cumulonimbus</b>	6) <b>Nimbostratus</b>	7) <b>Cirrus</b>	8) <b>Nimbostratus</b>
9) <b>Cirrostratus</b>	10) Alto <b>stratus</b>	11) Alto <b>stratus</b>	12) <b>Cirrostratus</b>
13) Cirro <b>cumulus</b>	14) <b>Cumulus</b>	15) <b>Cirrus</b>	16) <b>Cumulonimbus</b>

17) Cumulonimbus	18) Nimbostratus	19) Lenticular	20) Cumulonimbus
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Bonus #21 Super Mario Bros. Bonus #22 Cloud City/ Empire Strikes Back from Star Wars  
Please label the types of clouds in the boxes below.



## Ten basic cloud types

alto cumulus

stratus

Cirrostratus

Cumulonimbus

Strato cumulus

alto stratus

Cirrus cumulus

nimbostratus

cirrus

Cumulus

clouds are classified according to

[altitude]

① alto = middle altitude

② cirro = high altitude

and [appearance]

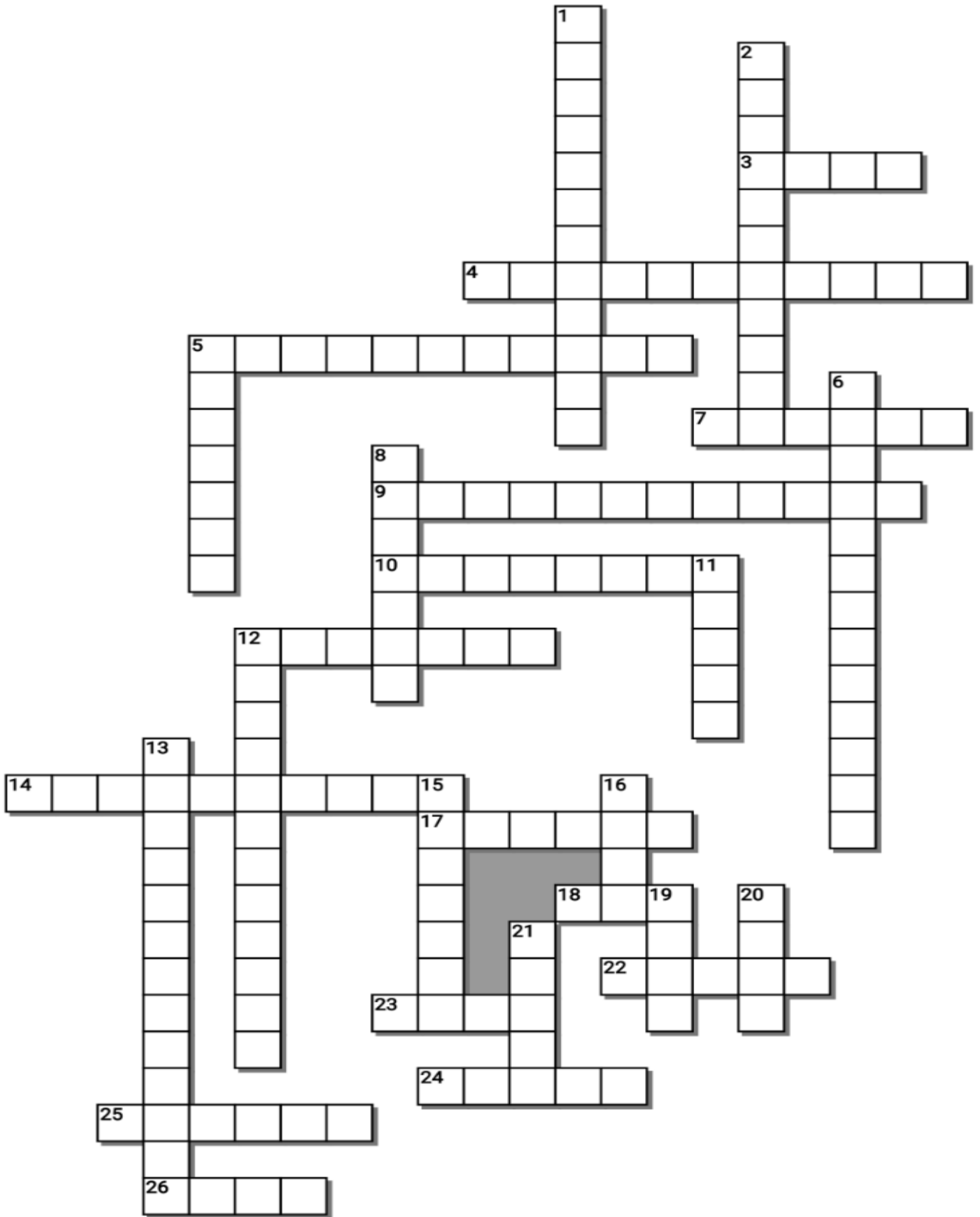
③ strato or stratus = layer cloud

④ cumulo or cumulus = puffy cloud

⑤ nimbo or nimbus (precipitation)

Learn the 5 key words rather than memorizing the 10 cloud names.





Note: Number 12 Should be Tall not all -Oops, my bad.

### Across

3. Oceans Heat and \_\_\_\_\_ the earth.
4. Substance changes from a liquid state to gas state (requires energy).
5. Solid state turns directly to a gas state skipping liquid phase.
7. It takes significant \_\_\_\_\_ to change the state of water.
9. \_\_\_\_\_ circulation, also called the Global Ocean Conveyor, moves water between the deep and surface ocean worldwide.
10. Oceans release \_\_\_\_\_ (small particles) that influence cloud cover, fall as rain, and absorbing carbon.
12. Cloud that at Middle elevation, white, puffy, and represents pleasant weather.
14. The \_\_\_\_\_ cycle (Water Cycle): The continuous movement of water on, above, and below the surface of the earth.
17. Solid -> \_\_\_\_\_ -> Gas.
18. A cloud bank that is in contact with the ground.
22. A visible body of very fine water droplets or ice particles suspended in the atmosphere at different altitudes.
23. High Specific \_\_\_\_\_: Hydrogen bonds absorb heat when they break, and release heat when they form.
24. Water on \_\_\_\_\_ commonly exists as a solid liquid and gas
25. A wispy white cloud (usually of fine ice crystals) at a high altitude.
26. La\_\_\_\_\_: is a weather pattern that occurs in the Pacific Ocean. In this pattern, strong winds blow warm water at the ocean's surface from South America to Indonesia.

### Down

1. Water vapor (gas) turns back to a liquid. (Energy needs to be removed) Cloud formation.
2. The slow movement of water through the soil. Cleans and purifies.
5. \_\_\_\_\_ run-off: The water flow which occurs when soil is full to capacity and excess water travels over the land.
6. Water released by plants into air.
8. Low elevation cloud, gray, precipitation.
11. Gas -> Liquid -> \_\_\_\_\_
12. all cloud, anvil shaped Massive thunderstorms.
13. Water that is so heavy it falls as liquid / solid.
15. The oceans influence \_\_\_\_\_ by absorbing solar radiation and slowly releasing heat needed to drive the atmospheric circulation.
16. El \_\_\_\_\_: A warming of the surface water of the eastern and central Pacific Ocean, occurring every 4 to 12 years and causing unusual global weather patterns.
20. Earth is this color from space because of all of its water
21. Earth is the \_\_\_\_\_ Planet

-----Teacher can remove this word bank to make more challenging-----

BLUE, CIRRUS, CLOUD, CONDENSATION, COOL, CUMULONIMBUS , CUMULUS, EARTH, ENERGY, EVAPORATION, FOG, GULF, HEAT, LIQUID, NINO, NIÑA, PERCOLATION, PRECIPITATION, SOLID, STRATUS, SUBLIMATION, SURFACE, THERMOHALINE, TRANSPIRATION, WATER, AEROSOLS, CLIMATE , HYDROLOGIC



# Part 4 REVIEW GAME

1-20 = 5 pts

Part 4 Lesson 5

\*20-\*25 \* = Bonus + 1 pt,

(Secretly write owl in correct space +1 pt)

Final Question = 5 pt wager

Name:

Due: Today

Score \_\_\_\_ / 100

BIG BLUE	MALL LIKE YOU	LET'S DROP	CLOUDED JUDGEMENT	PUFF BALL Bonus round 1pt each
1)  BLUE PLANET	6)  A=Solid B=Liquid C=Gas	11)  Transpiration	16)  Cumulus	*21)  Michelin Man
2)  71%	7)  A=Evaporation B=Condensation C=Precipitation	12)  Condensation Nuclei	17)  Cumulonimbus	*22)  Ghostbusters
3)  Gulf Stream, and warm air currents	8)  Transpiration and Precipitation Were switched	13)  A=Cumulus B=Cirrus C=Stratus	18)  Stratus	*23)  Casper
4)  Letter B	9)  Sublimation	14)  A and C are Switched	19)  Cirro	*24)  Snuggle
5)  A=El Nino B=La Nina	10)  Percolation	15)  FOG	20)  Alto	*25)  Monty Python

Final Question Wager \_\_\_\_ /5 Answer: Letter C