



**MOUNTAINS**



A



**MOUNTAINS**



A



**MOUNTAINS**



A



**MOUNTAINS**



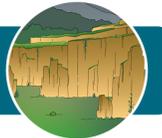
A

You see dust buried beneath rocky soil on the mountain.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Loess Plateau



You see dust buried beneath rocky soil on the mountain.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Loess Plateau



Eroding rocks create dust that is rich in iron. Living things need iron to grow and survive.

**Fe**

**MARK ONE IRON SQUARE ON YOUR TRACKING SHEET**

**DRAW AGAIN**

Eroding rocks create dust that is rich in iron. Living things need iron to grow and survive.

**Fe**

**MARK ONE IRON SQUARE ON YOUR TRACKING SHEET**

**DRAW AGAIN**



**MOUNTAINS**



A



**MOUNTAINS**



A



**MOUNTAINS**



A



**MOUNTAINS**



A

Eroding rocks create dust that is rich in **iron**. Living things need iron to grow and survive.

**Fe**

MARK ONE IRON SQUARE ON YOUR TRACKING SHEET

**DRAW AGAIN**

You see dust buried beneath rocky soil on the mountain.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Atmosphere



You see dust buried beneath rocky soil on the mountain.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Atmosphere



You see dust that has piled up over many years, forming a **Loess Plateau**.

**MOVE TO**  
the Loess Plateau





**MOUNTAINS**



A



**MOUNTAINS**



A



**MOUNTAINS**



A



**MOUNTAINS**

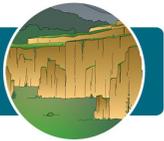


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You see dust that has piled up over many years, forming a Loess Plateau.

MOVE TO  
the Loess Plateau



You see dust that has piled up over many years, forming a Loess Plateau.

MOVE TO  
the Loess Plateau



You see dust being carried high into the atmosphere by winds.

MOVE TO  
the Atmosphere



You see dust being carried high into the atmosphere by winds.

MOVE TO  
the Atmosphere





**MOUNTAINS**



A



**MOUNTAINS**



A

You see rain wash dust down  
from the mountains into **lakes**  
and **rivers**.

MOVE TO  
the Lakes & Rivers



You see rain wash dust down  
from the mountains into **lakes**  
and **rivers**.

MOVE TO  
the Lakes & Rivers





**LOESS PLATEAU**



A



**LOESS PLATEAU**



A



**LOESS PLATEAU**



A



**LOESS PLATEAU**



A

Loess deposits are made of dust from the mountains. Dust contains lots of iron.

Fe

MARK ONE IRON SQUARE ON YOUR TRACKING SHEET

DRAW AGAIN

Loess deposits are made of dust from the mountains. Dust contains lots of iron.

Fe

MARK ONE IRON SQUARE ON YOUR TRACKING SHEET

DRAW AGAIN



You see plants growing on the loess plateau. Roots stop the dust from blowing away.

DRAW AGAIN  
to look for more nutrients

OR

MOVE TO  
the Lakes & Rivers



You see plants growing on the loess plateau. Roots stop the dust from blowing away.

DRAW AGAIN  
to look for more nutrients

OR

MOVE TO  
the Lakes & Rivers





**LOESS PLATEAU**



A



**LOESS PLATEAU**



A



**LOESS PLATEAU**



A



**LOESS PLATEAU**



A



You see dust buried in the loess plateau. It is buried deeper and deeper over many years.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**GO BACK TO**  
the Mountains 



You see dust buried in the loess plateau. It is buried deeper and deeper over many years.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**GO BACK TO**  
the Mountains 



You see people carving into loess deposits to build their homes.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Atmosphere 



You see people carving into loess deposits to build their homes.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Atmosphere 



**LOESS PLATEAU**



A



**LOESS PLATEAU**



A



**LOESS PLATEAU**



A



**LOESS PLATEAU**



A

You see dust swept away  
by the rain that falls on the  
loess plateau. The dust flows  
into a river.

MOVE TO  
the Lakes & Rivers



You see dust swept away  
by the rain that falls on the  
loess plateau. The dust flows  
into a river.

MOVE TO  
the Lakes & Rivers



You see dust carried into the  
**atmosphere** by the wind.

MOVE TO  
the Atmosphere



You see dust carried into the  
**atmosphere** by the wind.

MOVE TO  
the Atmosphere





**LOESS PLATEAU**



A



**LOESS PLATEAU**



A



You see dust caught up in a strong storm that carries it back to the **mountains.**

GO BACK TO  
the Mountains



You see dust caught up in a strong storm that carries it back to the **mountains.**

GO BACK TO  
the Mountains





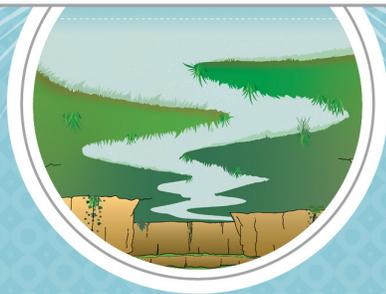
LAKES & RIVERS



A



LAKES & RIVERS



A



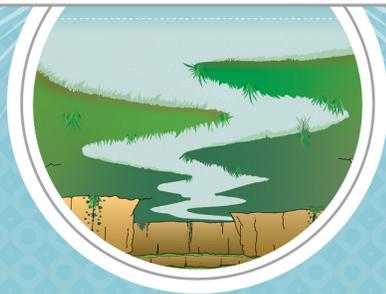
LAKES & RIVERS



A



LAKES & RIVERS



A

You see dust floating  
in the river.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Upper Ocean Layer



You see dust floating  
in the river.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Upper Ocean Layer

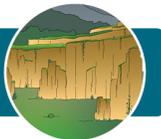


You see dust that settled at  
the bottom of a lake.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Loess Plateau



You see dust that settled at  
the bottom of a lake.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Loess Plateau





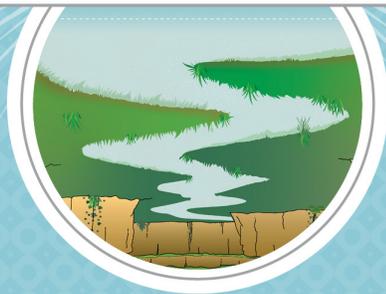
LAKES & RIVERS



A



LAKES & RIVERS



A



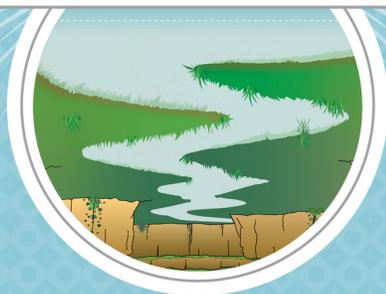
LAKES & RIVERS



A



LAKES & RIVERS



A



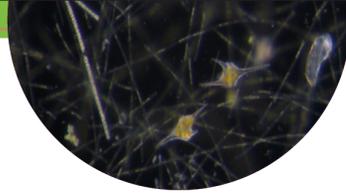
You see dust carried by a river wash into the ocean.

MOVE TO  
the Upper Ocean Layer



You see dust carried by a river wash into the ocean.

MOVE TO  
the Upper Ocean Layer



You see phytoplankton in lakes and rivers using the iron-rich dust to live and grow.

**DRAW AGAIN**  
to look for more nutrients

**OR**

MOVE TO  
the Atmosphere



You see water vapor and nitrogen gas moving from lakes and rivers into the atmosphere.

MOVE TO  
the Atmosphere





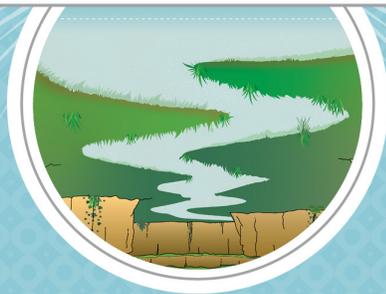
LAKES & RIVERS



A



LAKES & RIVERS



A



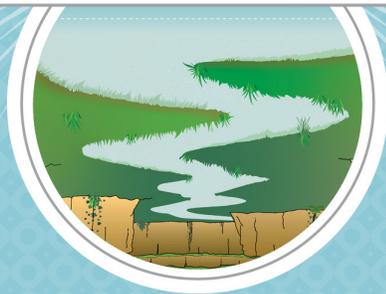
LAKES & RIVERS



A



LAKES & RIVERS



A

You see water vapor and nitrogen gas moving from lakes and rivers into the atmosphere.

MOVE TO  
the Atmosphere



Plants and animals living in the rivers release **nitrogen** into the water after they die.

N

MARK ONE NITROGEN SQUARE  
ON YOUR TRACKING SHEET

DRAW AGAIN

Plants and animals living in the rivers release **nitrogen** into the water after they die.

N

MARK ONE NITROGEN SQUARE  
ON YOUR TRACKING SHEET

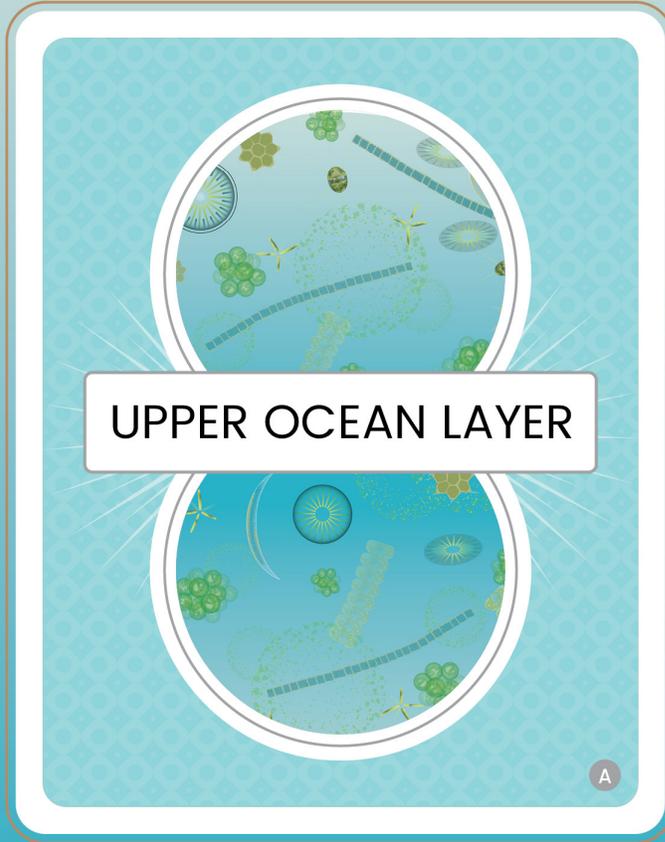
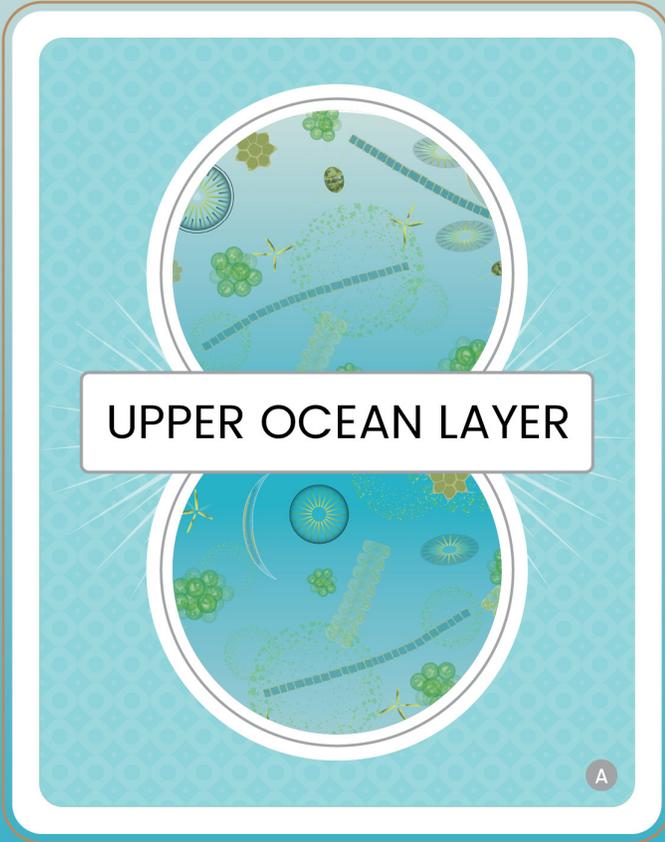
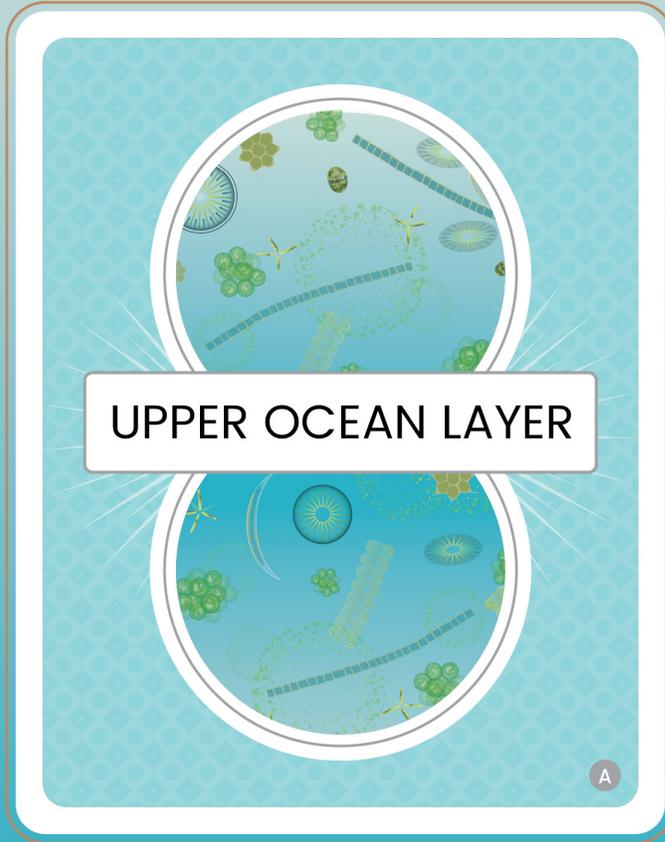
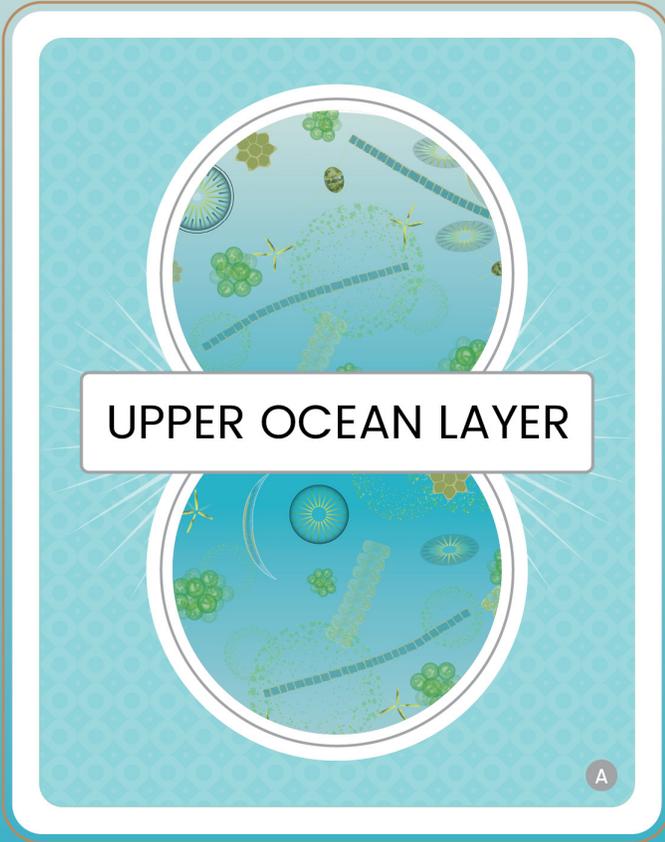
DRAW AGAIN

Plants and animals living in the rivers release **nitrogen** into the water after they die.

N

MARK ONE NITROGEN SQUARE  
ON YOUR TRACKING SHEET

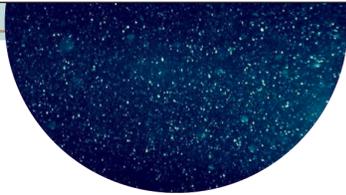
DRAW AGAIN





You see dead plants and animals sinking down deeper in the ocean. Iron and other nutrients within them are carried to the **middle ocean layer.**

**MOVE TO**  
the Middle Ocean Layer



You see dead plants and animals sinking down deeper in the ocean. Iron and other nutrients within them are carried to the **deep ocean layer.**

**MOVE TO**  
the Deep Ocean Layer

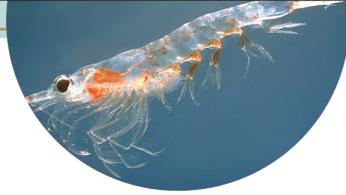


You see krill eating phytoplankton. The iron that was in the phytoplankton is now a part of the krill.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Deep Ocean Layer



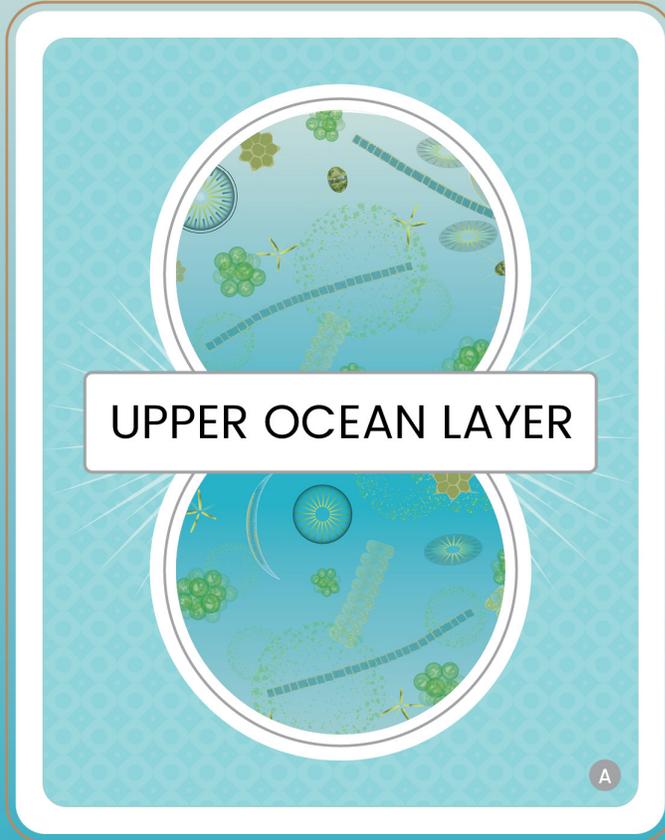
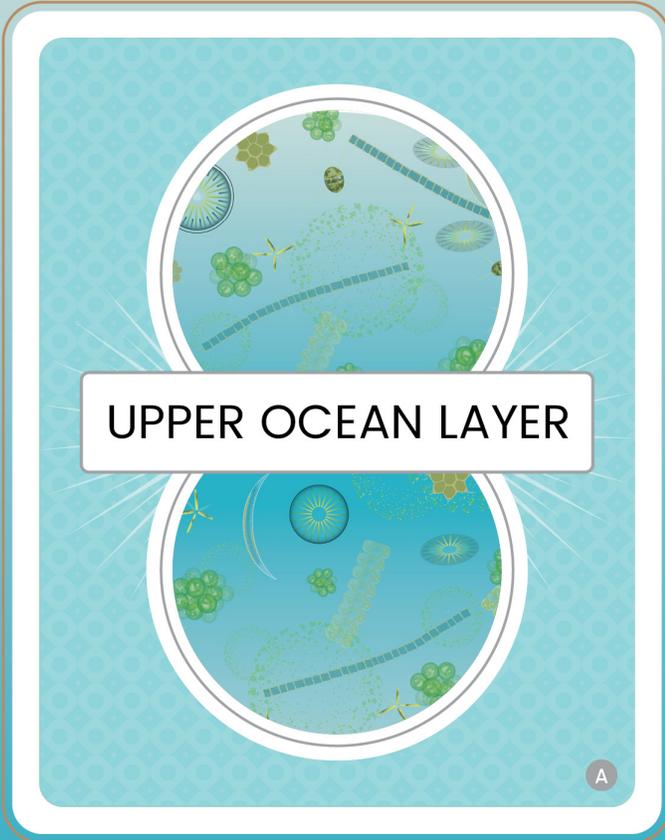
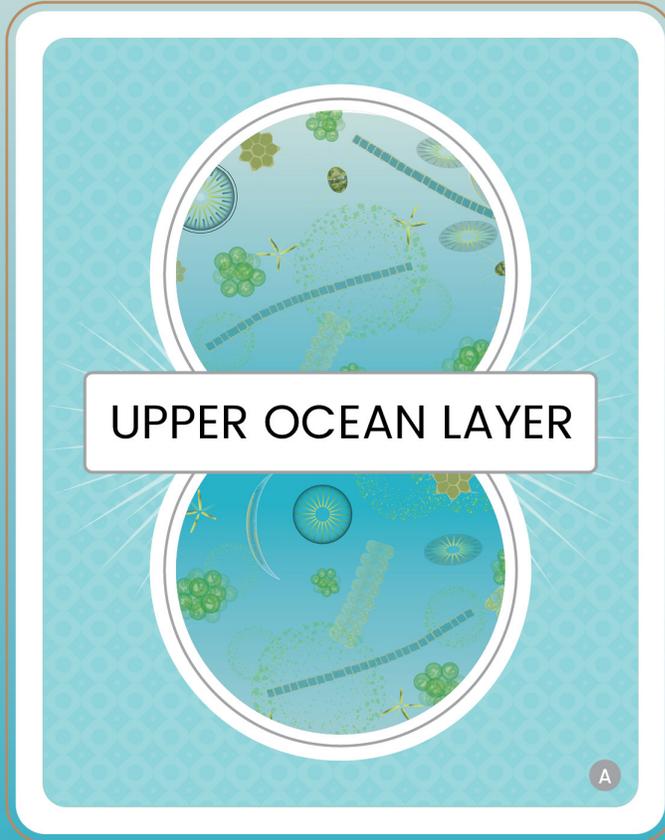
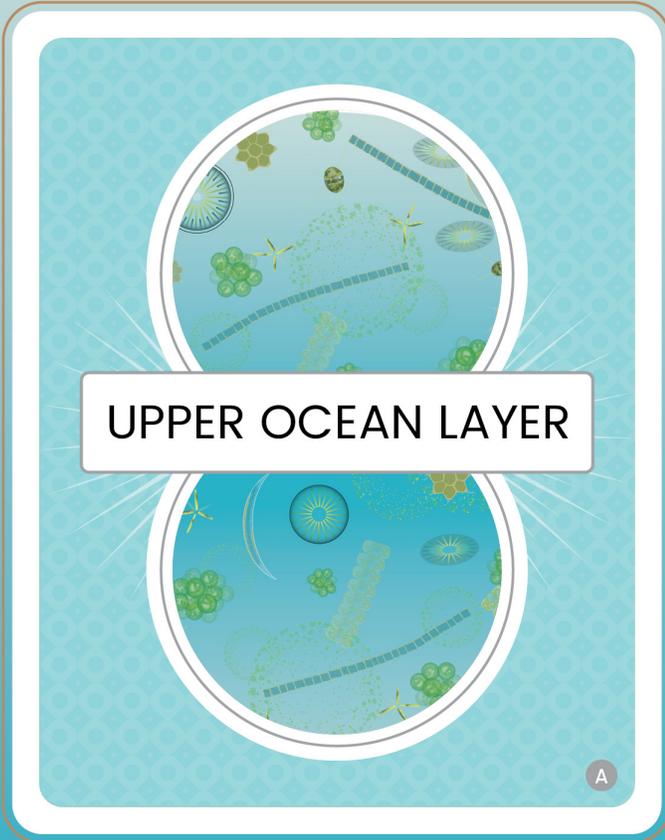
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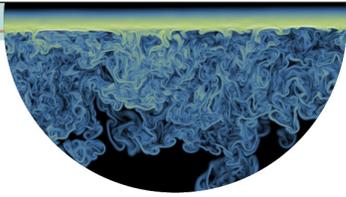
**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Deep Ocean Layer







You see ocean currents mixing the waters, sending surface water down to the middle ocean layer.

MOVE TO  
the Middle Ocean Layer



You see water vapor and nitrogen gas moving from the ocean's surface into the atmosphere.

MOVE TO  
the Atmosphere



You see water vapor and nitrogen gas moving from the ocean's surface into the atmosphere.

MOVE TO  
the Atmosphere

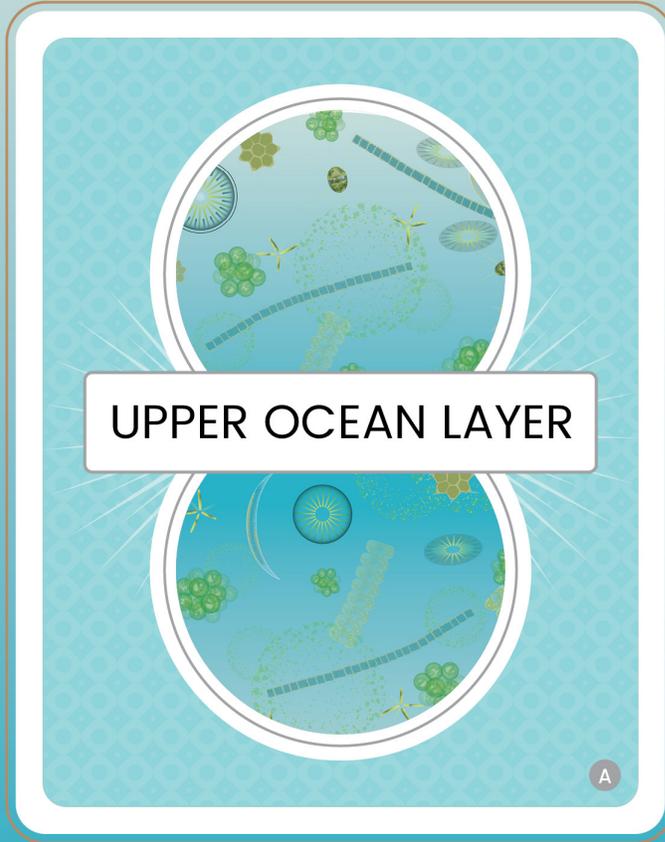
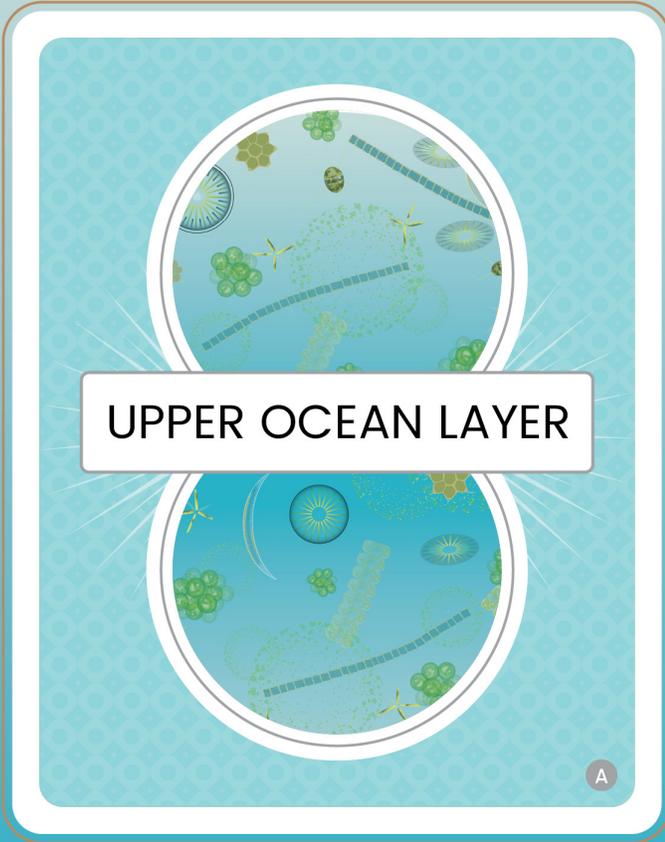
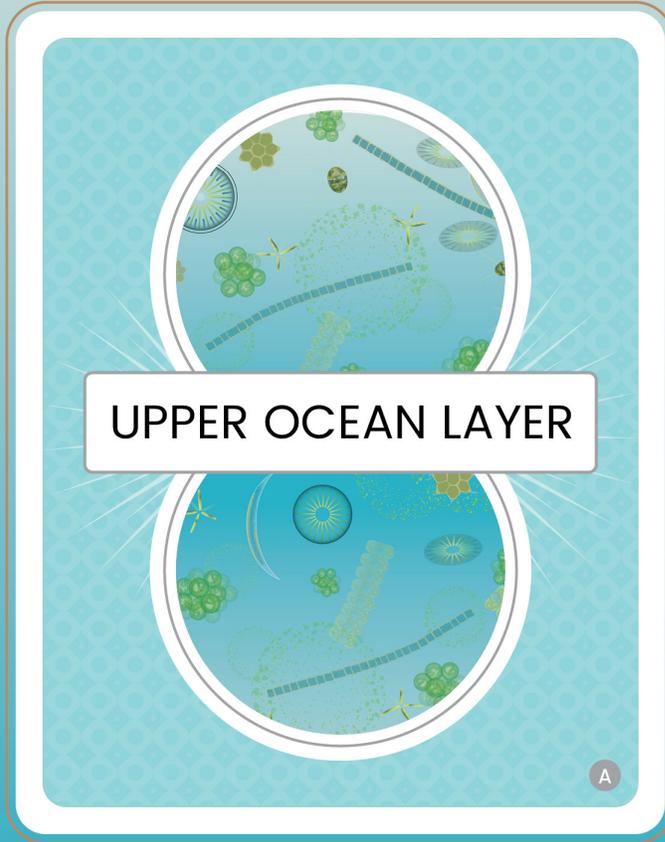
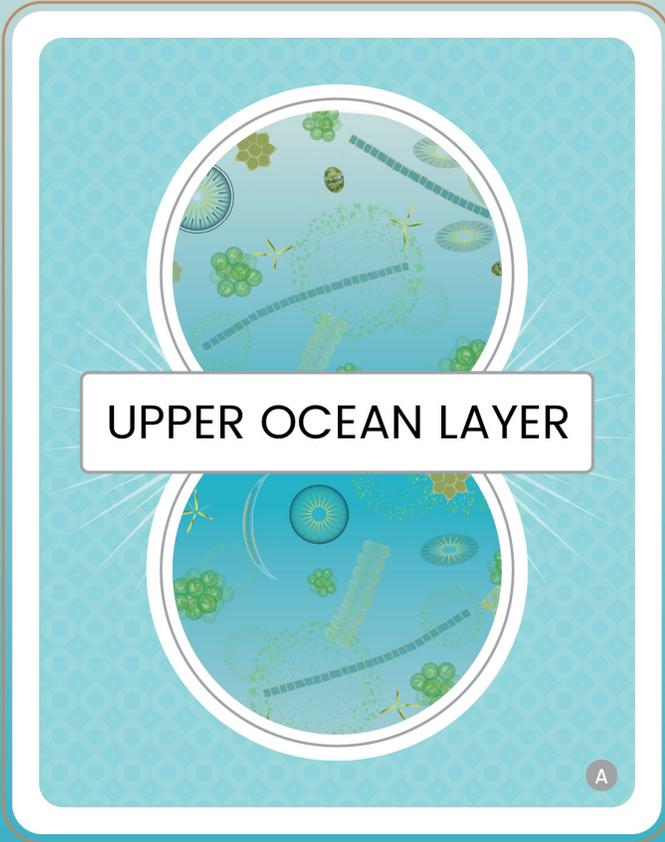


In the surface waters, there is lots of light. Phytoplankton use **sunlight** to make energy in a process called photosynthesis.



MARK ONE SUNSHINE SQUARE  
ON YOUR TRACKING SHEET

DRAW AGAIN



In the surface waters, there is lots of light. Phytoplankton use **sunlight** to make energy in a process called photosynthesis.



MARK ONE SUNSHINE SQUARE ON YOUR TRACKING SHEET

**DRAW AGAIN**

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MARK ONE SUNSHINE SQUARE ON YOUR TRACKING SHEET

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In the surface waters, there is lots of light. Phytoplankton use **sunlight** to make energy in a process called photosynthesis.



MARK ONE SUNSHINE SQUARE ON YOUR TRACKING SHEET

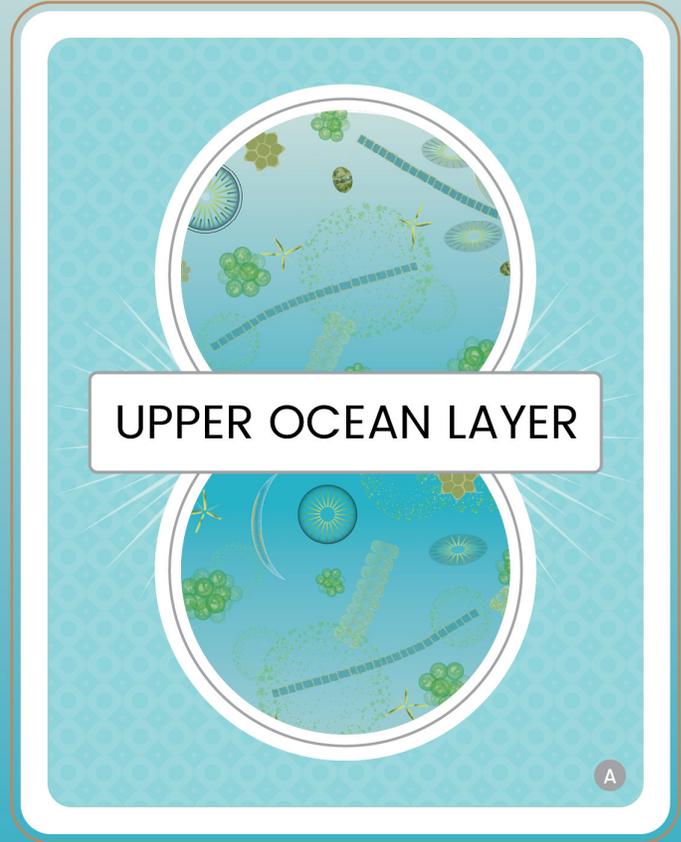
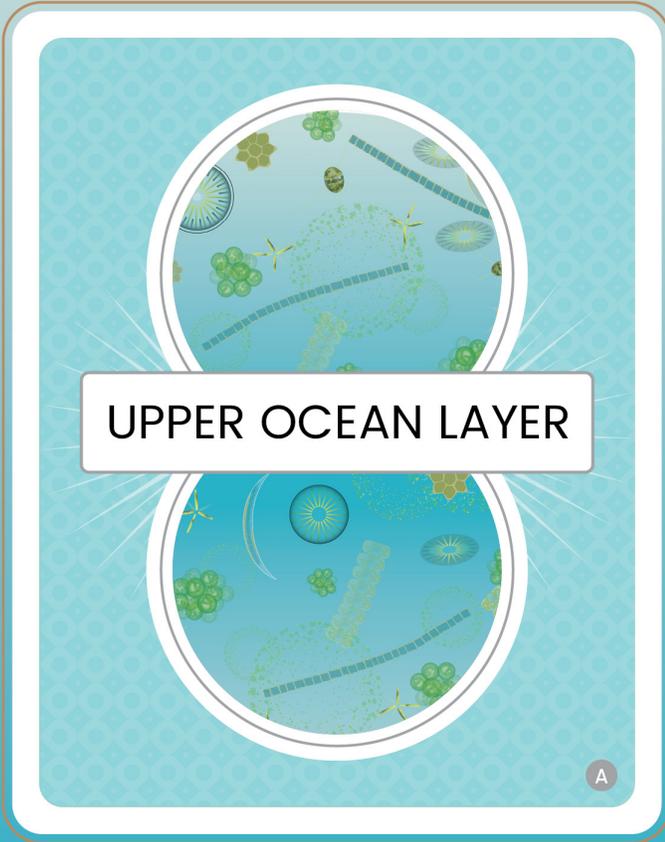
**DRAW AGAIN**

In the surface waters, there is lots of light. Phytoplankton use **sunlight** to make energy in a process called photosynthesis.



MARK ONE SUNSHINE SQUARE ON YOUR TRACKING SHEET

**DRAW AGAIN**





A cloud of **iron-rich** dust settles in the ocean from the atmosphere.

**Fe**

MARK ONE IRON SQUARE ON YOUR TRACKING SHEET

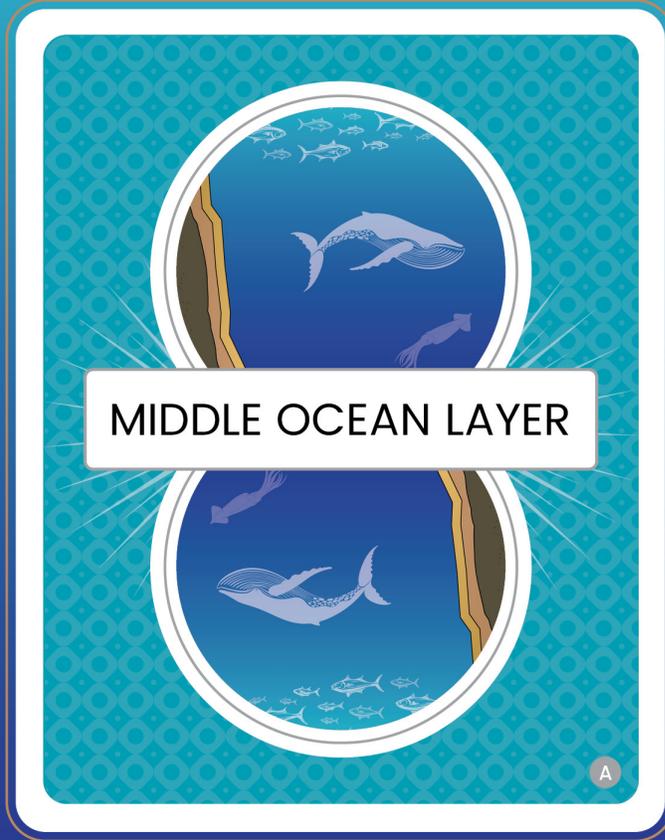
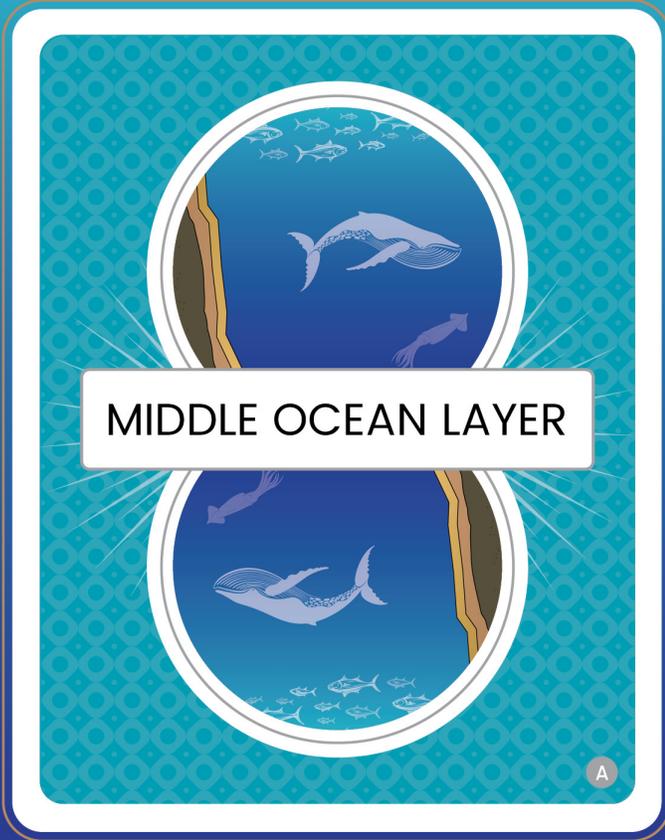
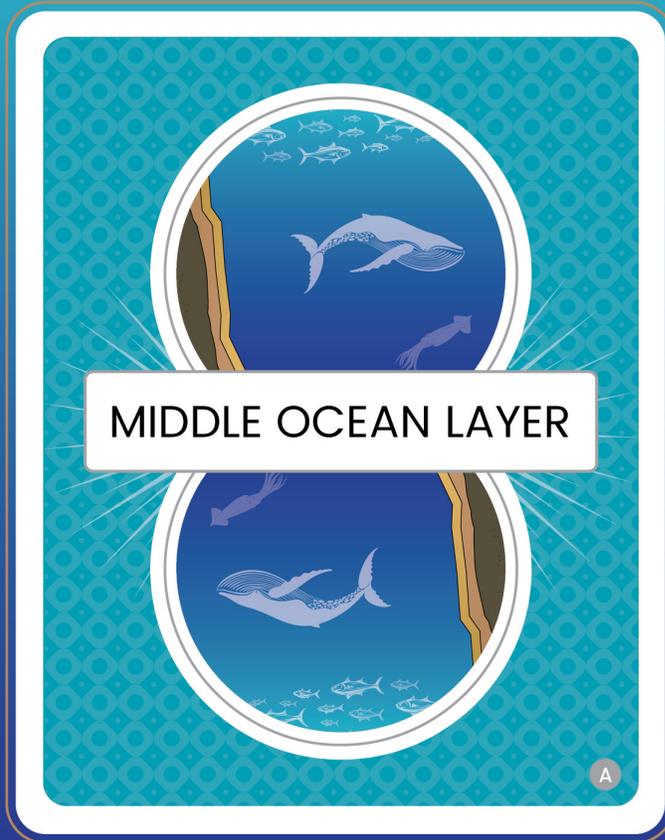
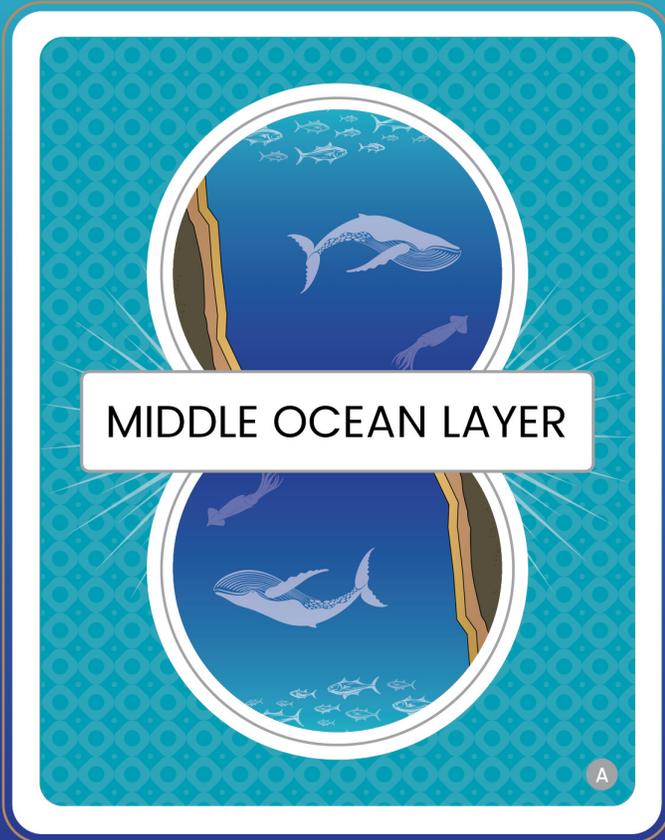
**DRAW AGAIN**

Ocean life releases **nitrogen** into the water after it dies.

**N**

MARK ONE NITROGEN SQUARE ON YOUR TRACKING SHEET

**DRAW AGAIN**





You see bacteria breaking down dead plants and animals. This releases iron and other nutrients back into the ocean.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Upper Ocean Layer



You see bacteria breaking down dead plants and animals. This releases iron and other nutrients back into the ocean.

**DRAW AGAIN**  
to look for more nutrients

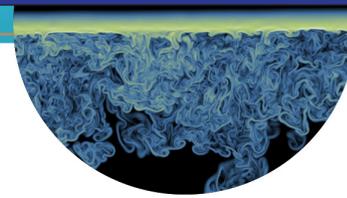
**OR**

**MOVE TO**  
the Upper Ocean Layer



You see dead plants and animals sinking all the way down to the ocean floor. Iron and other nutrients within them are carried into the **deep ocean**.

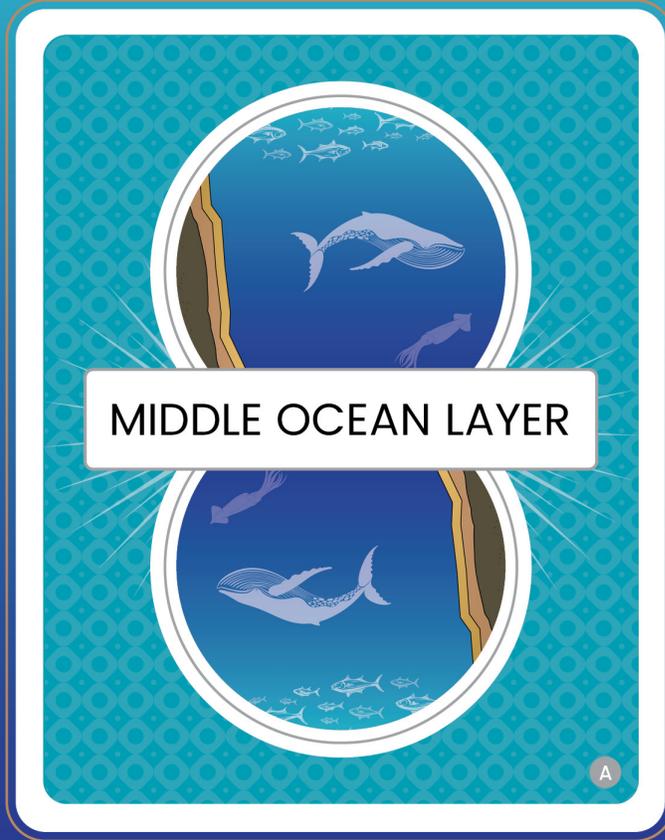
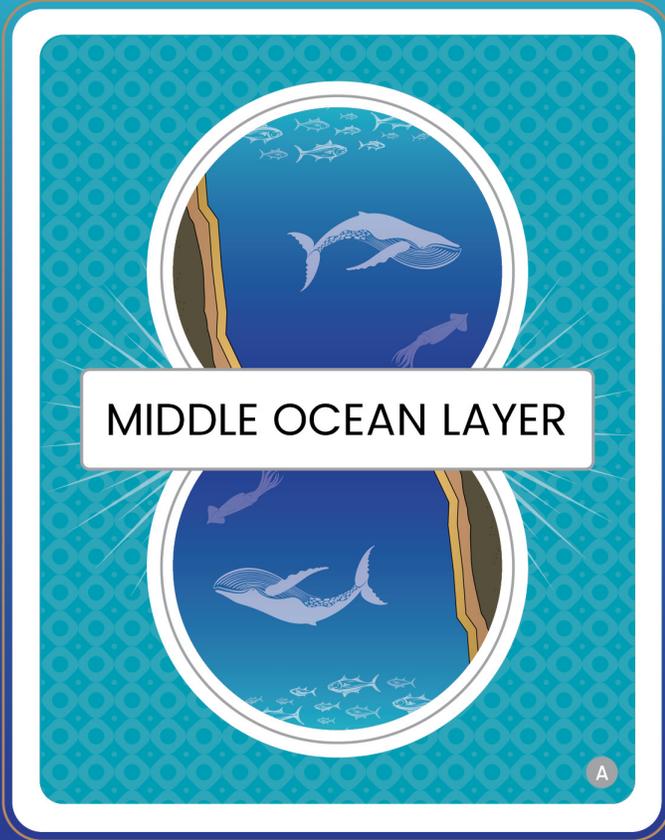
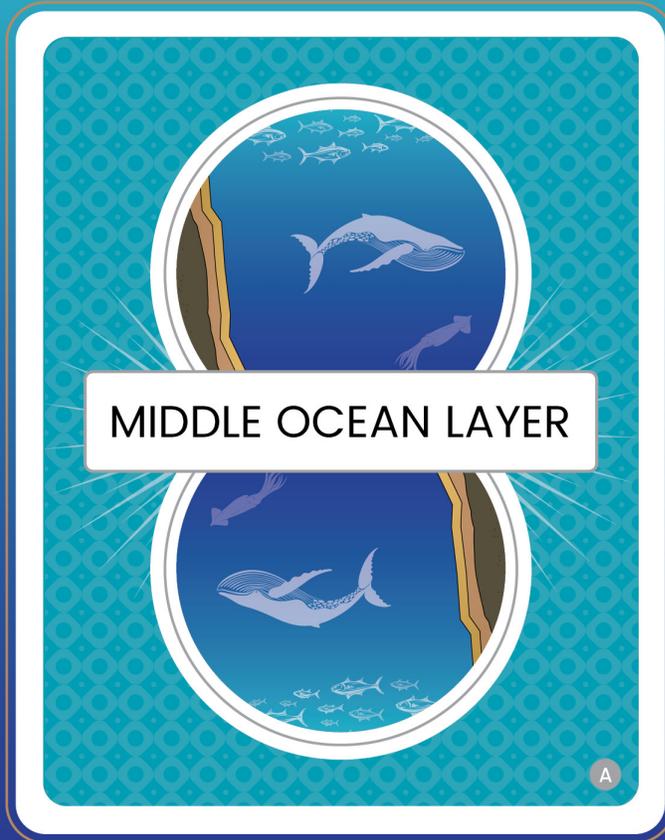
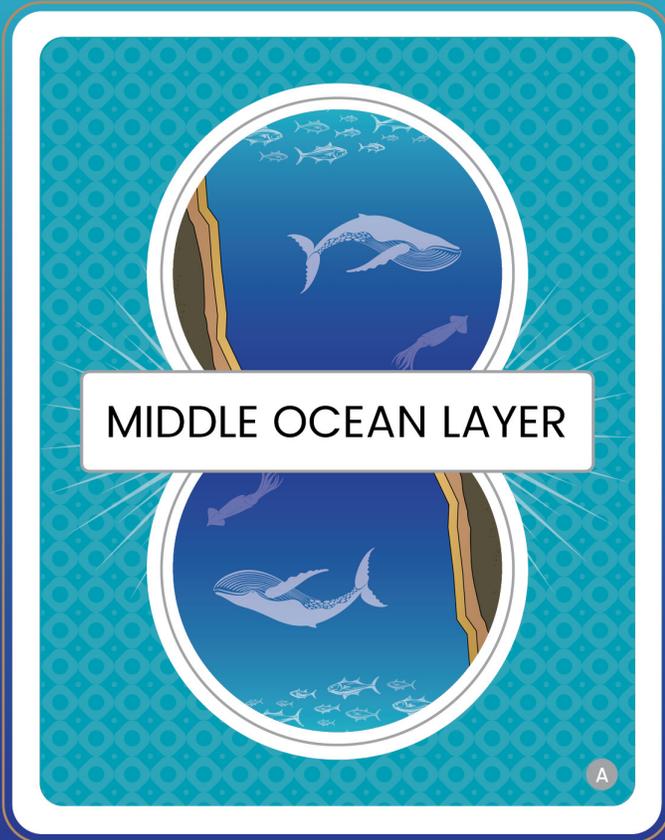
**MOVE TO**  
the Deep Ocean Layer



You see ocean currents mixing the waters, sending nutrients back to the **upper ocean layer**.

**MOVE TO**  
the Upper Ocean Layer





You see nutrients carried back up to the surface by ocean currents and then moving into the **atmosphere** as gas molecules.

MOVE TO  
the Atmosphere

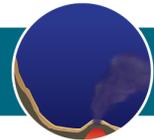


You see a whale eating phytoplankton. The phytoplankton contain iron, and that iron is released back into the ocean in whale poop.

**DRAW AGAIN**  
to look for more nutrients

**OR**

MOVE TO  
the Deep Ocean Layer



You see a squid eating phytoplankton. Phytoplankton contain iron, and that iron is released back into the ocean in squid poop.

**DRAW AGAIN**  
to look for more nutrients

**OR**

MOVE TO  
the Deep Ocean Layer

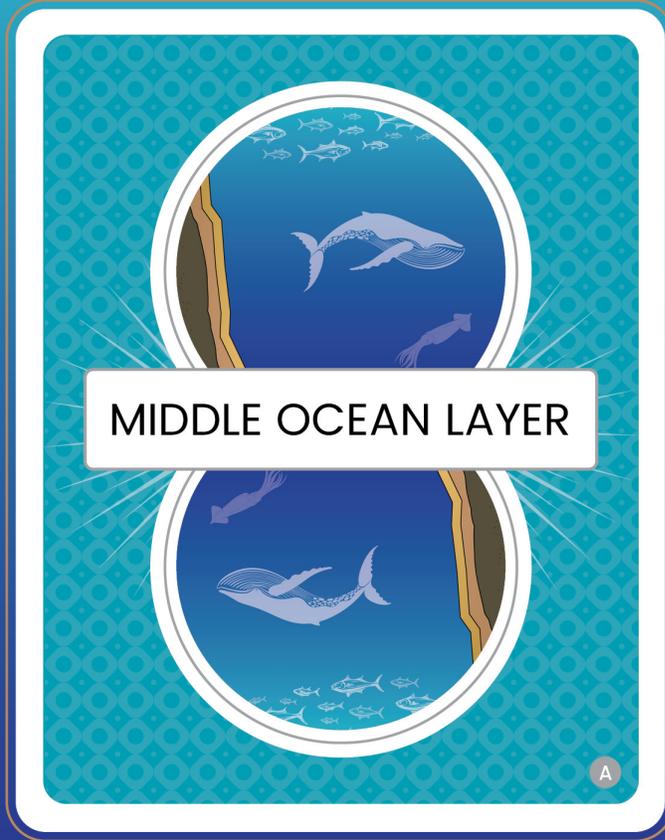
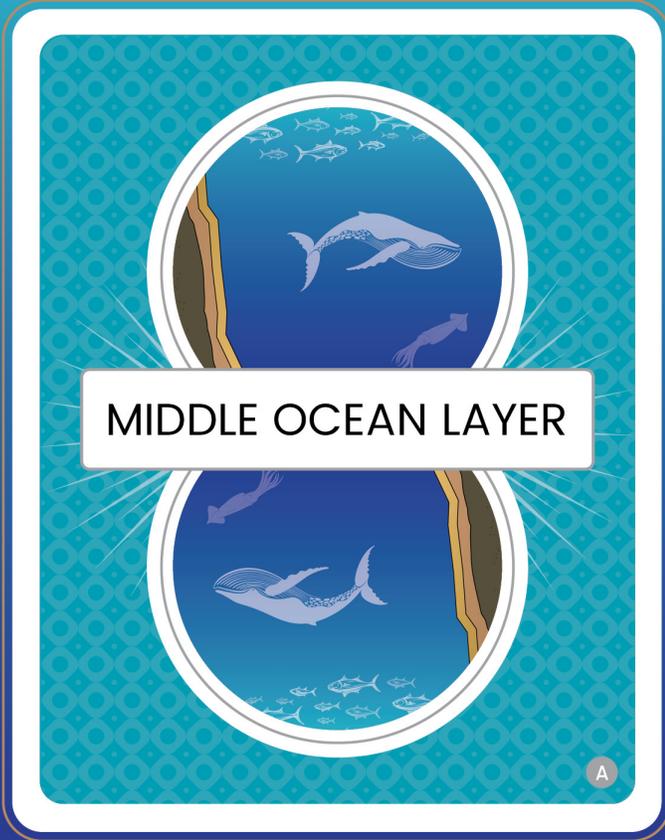
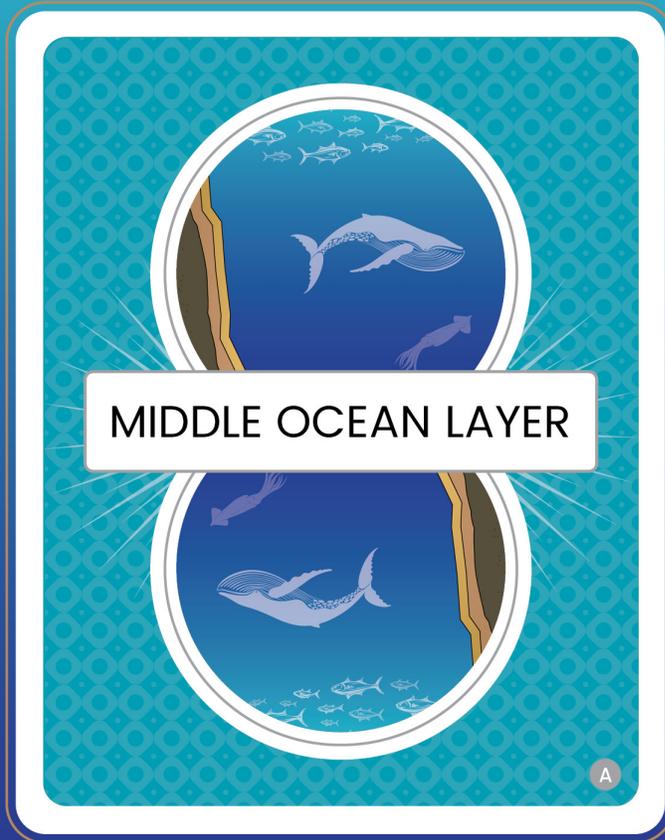
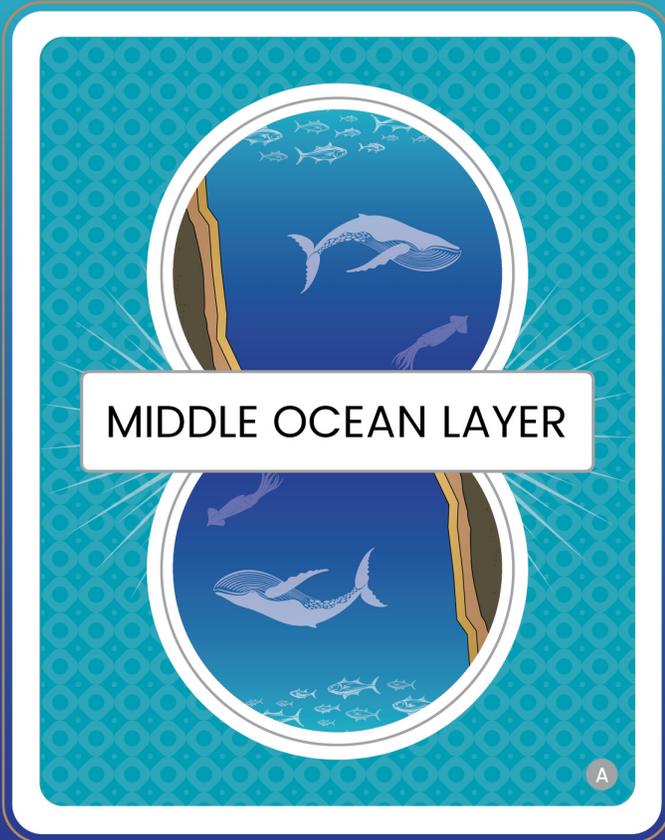


You see pieces of rock break off from the edges of the underwater continent. This rock is rich in iron.

**Fe**

MARK ONE IRON SQUARE ON  
YOUR TRACKING SHEET

**DRAW AGAIN**



You see pieces of rock break off from the edges of the underwater continent. This rock is rich in iron.

Fe

MARK ONE IRON SQUARE ON YOUR TRACKING SHEET

DRAW AGAIN

You see pieces of rock break off from the edges of the underwater continent. This rock is rich in iron.

Fe

MARK ONE IRON SQUARE ON YOUR TRACKING SHEET

DRAW AGAIN

Sometimes, a small amount of **sunlight** can reach down more than 200 meters to the middle layer of the ocean.



MARK ONE SUNSHINE SQUARE ON YOUR TRACKING SHEET

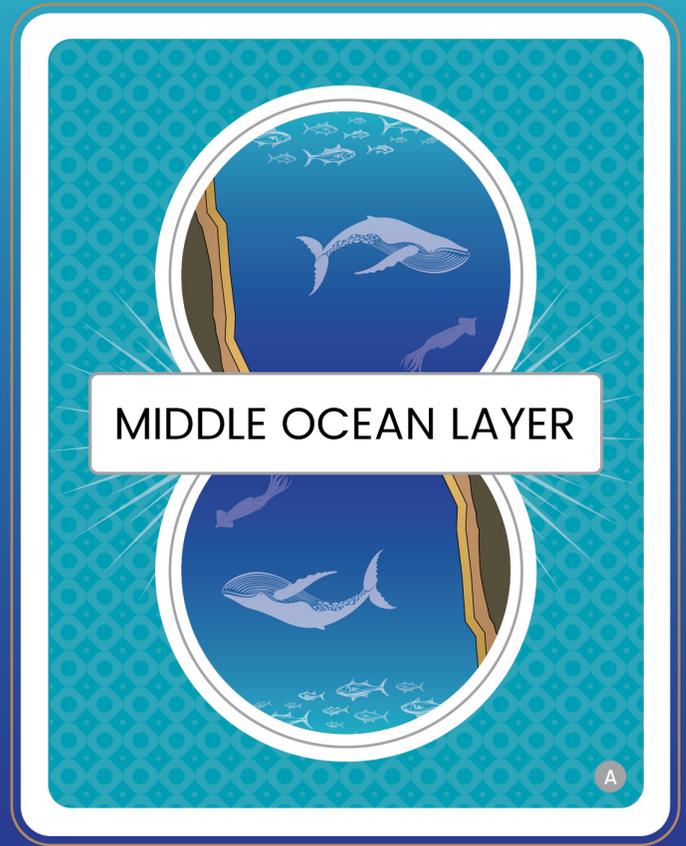
DRAW AGAIN

Ocean plants and animals release **nitrogen** into the water after they die.

N

MARK ONE NITROGEN SQUARE ON YOUR TRACKING SHEET

DRAW AGAIN

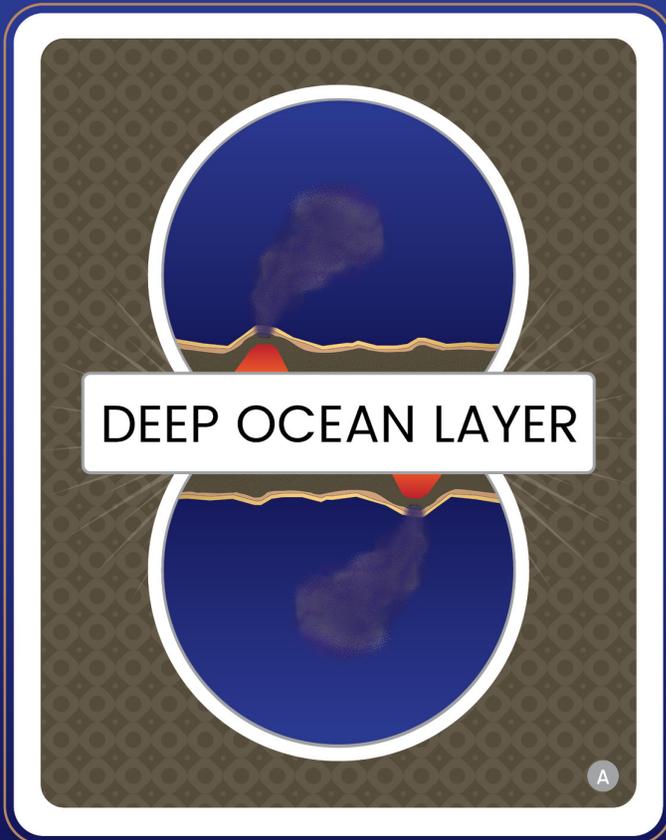
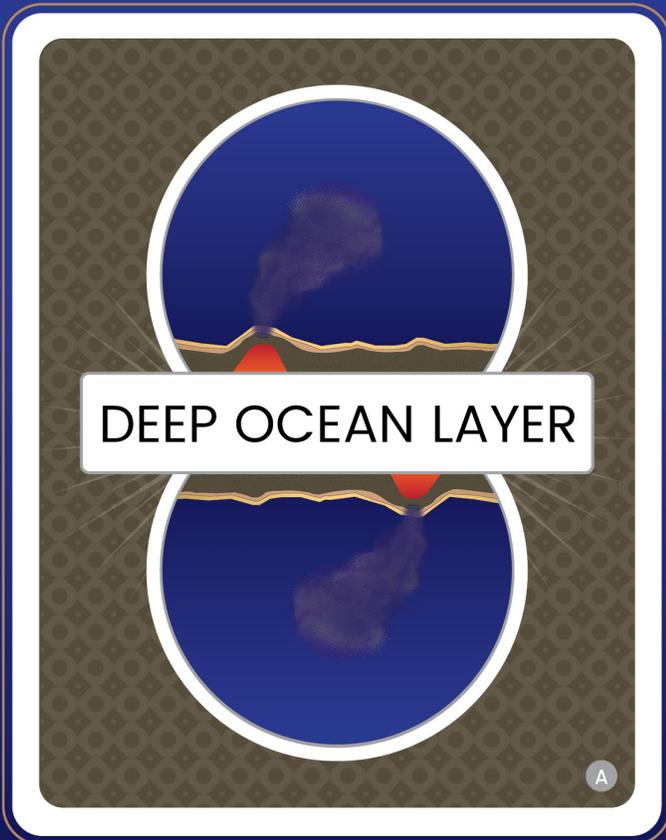
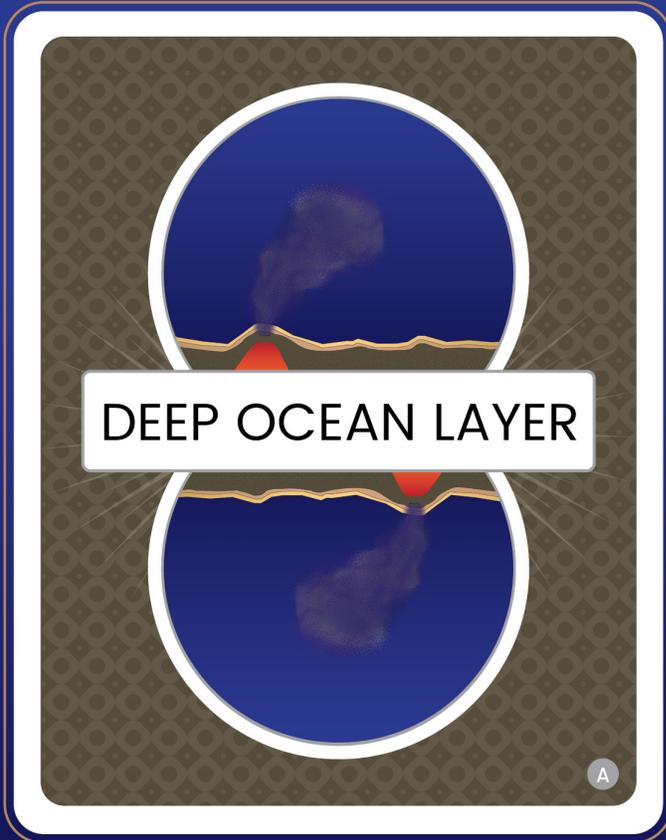
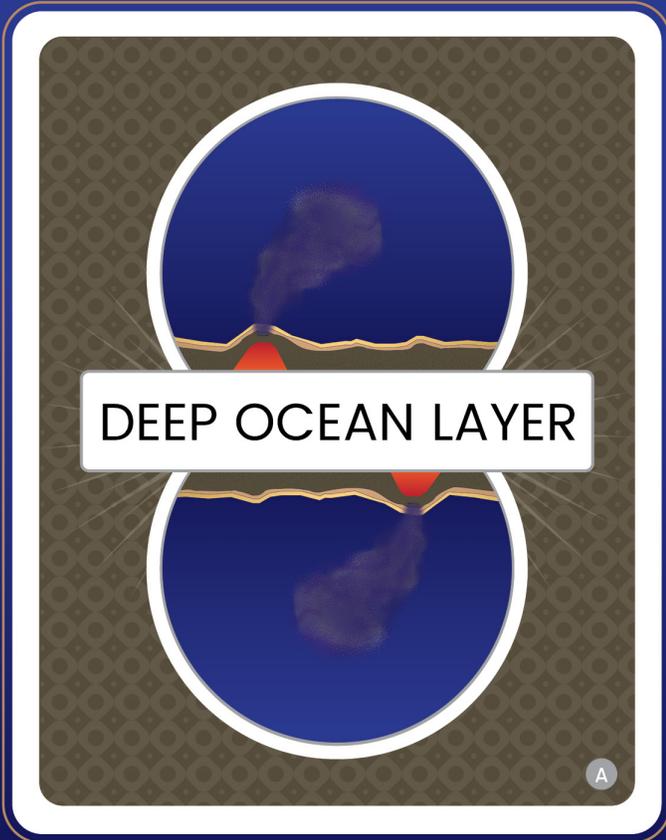


Ocean plants and animals  
release **nitrogen** into the  
water after they die.

N

MARK ONE NITROGEN SQUARE  
ON YOUR TRACKING SHEET

DRAW AGAIN





Hydrothermal vents on the ocean floor release hot gases, iron, and other minerals into the deep ocean.

Fe

MARK ONE IRON SQUARE ON YOUR TRACKING SHEET

DRAW AGAIN

Ocean plants and animals release **nitrogen** into the water after they die.

N

MARK ONE NITROGEN SQUARE ON YOUR TRACKING SHEET

DRAW AGAIN

Ocean plants and animals release **nitrogen** into the water after they die.

N

MARK ONE NITROGEN SQUARE ON YOUR TRACKING SHEET

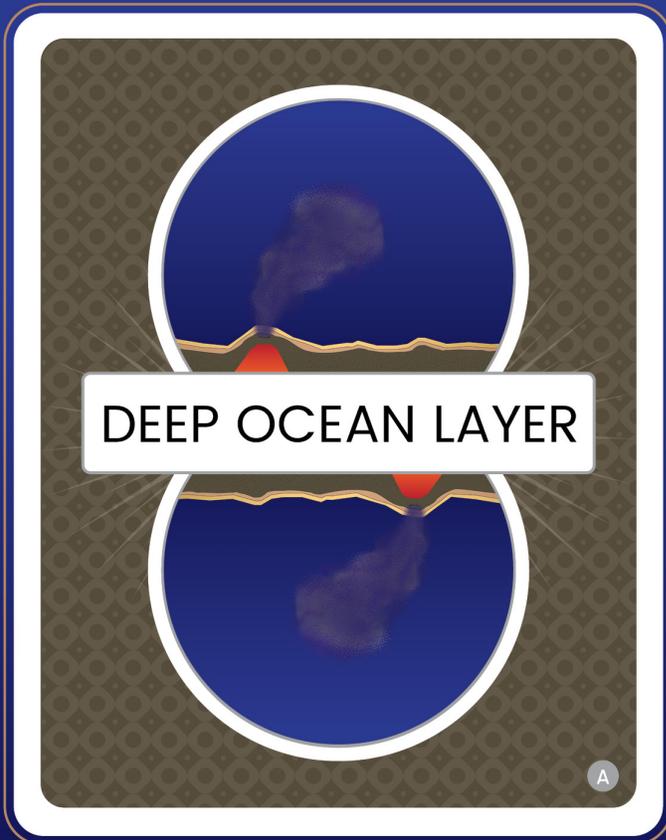
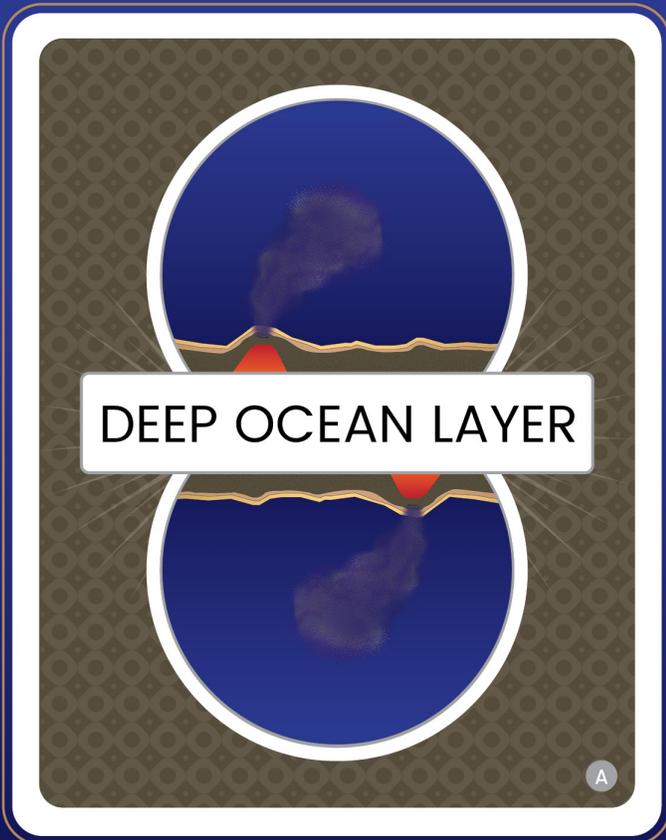
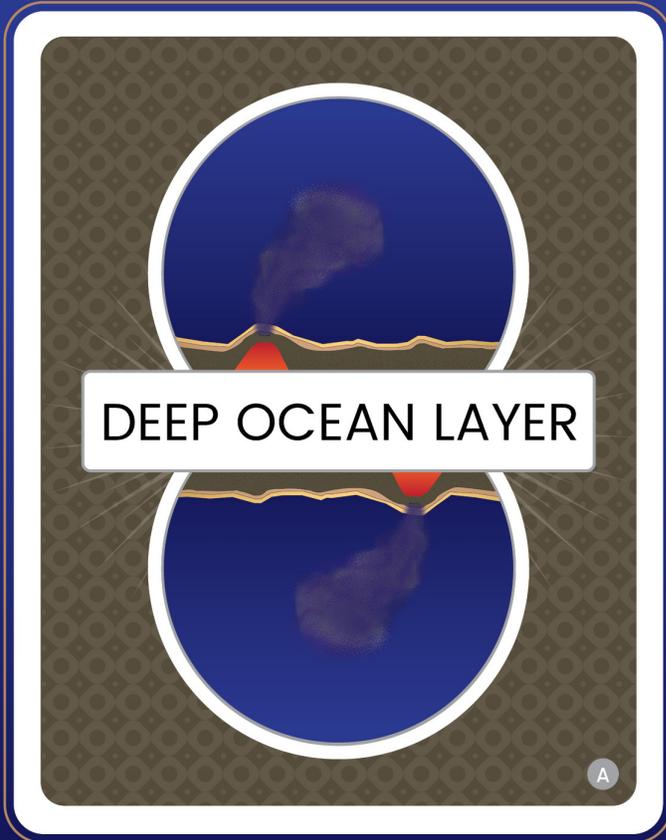
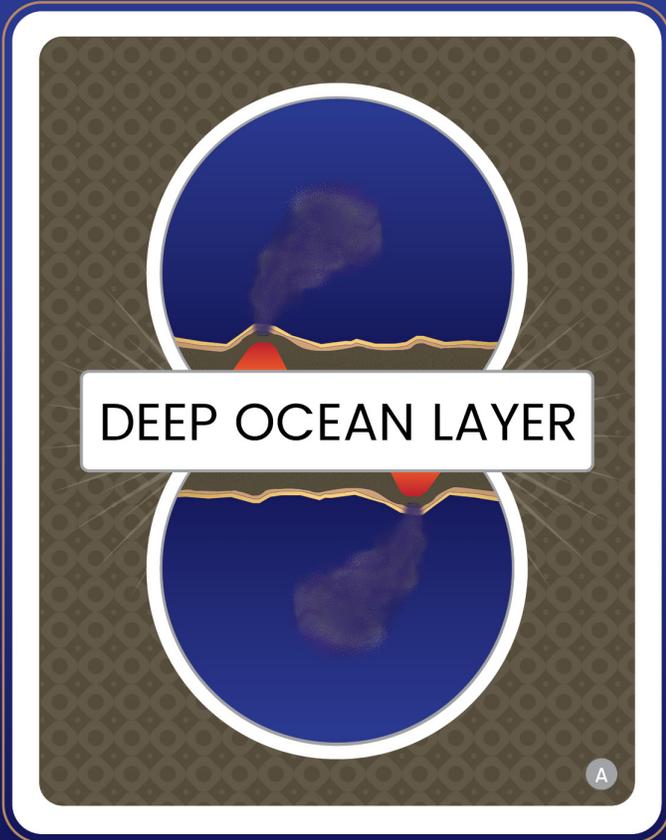
DRAW AGAIN

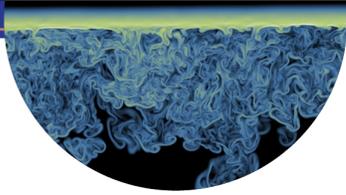
Ocean plants and animals release **nitrogen** into the water after they die.

N

MARK ONE NITROGEN SQUARE ON YOUR TRACKING SHEET

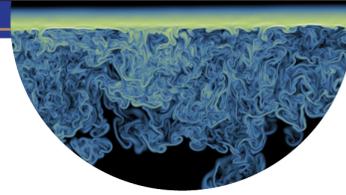
DRAW AGAIN





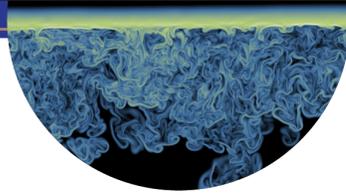
You see deep ocean currents carrying nutrients from the ocean floor up to the middle ocean layer.

MOVE TO  
the Middle Ocean Layer



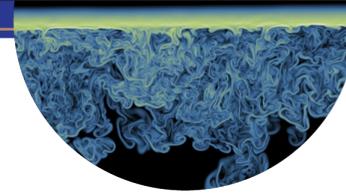
You see deep ocean currents carrying nutrients from the ocean floor up to the middle ocean layer.

MOVE TO  
the Middle Ocean Layer



You see deep ocean currents carrying nutrients from the ocean floor to the upper ocean layer.

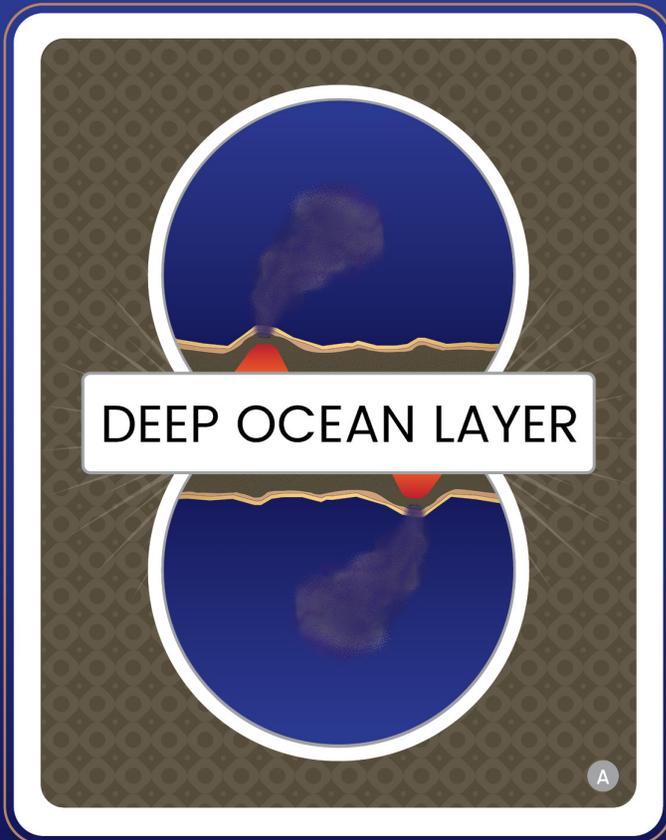
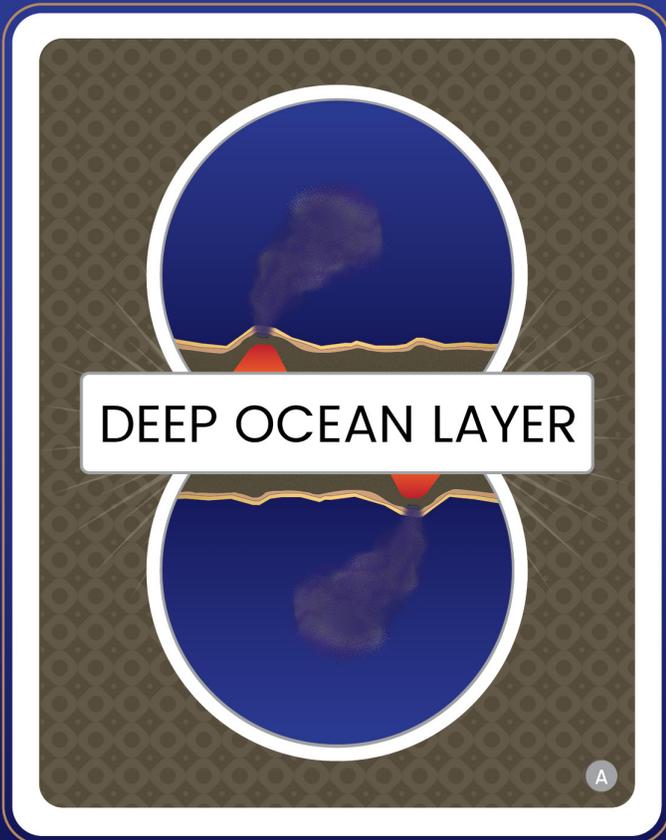
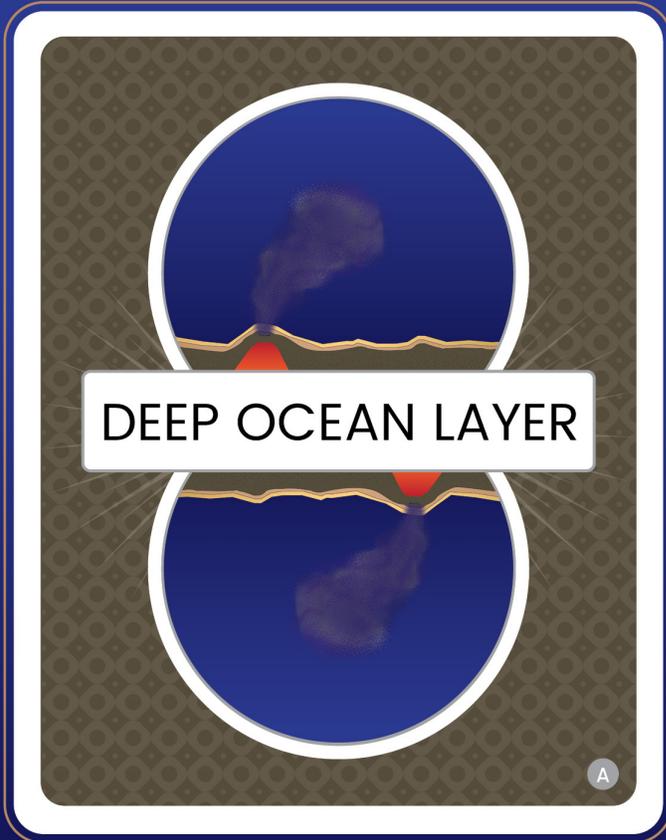
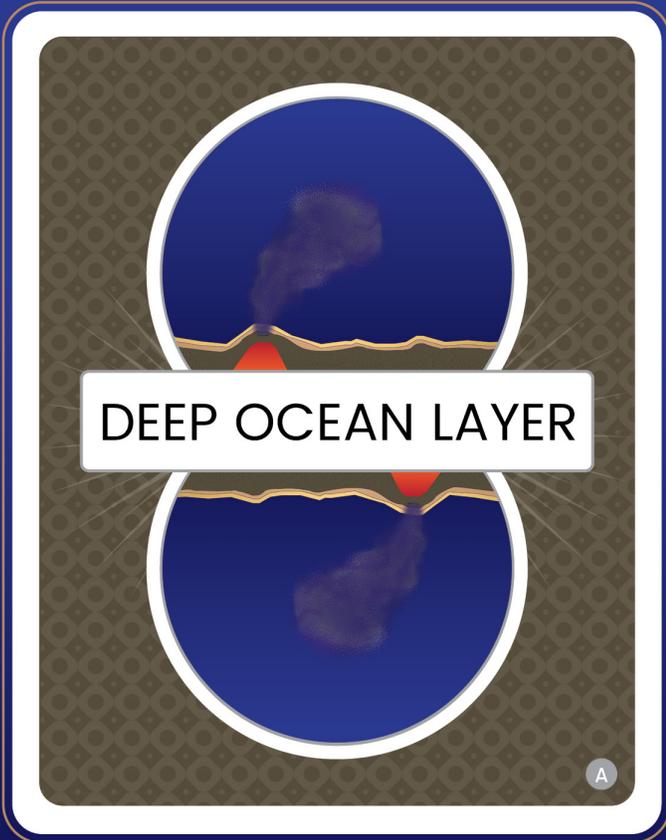
MOVE TO  
the Upper Ocean Layer



You see deep ocean currents carrying nutrients from the ocean floor to the upper ocean layer.

MOVE TO  
the Upper Ocean Layer





You see nutrients buried in sediments on the ocean floor for a very, very long time.

**DRAW AGAIN**

nutrients are trapped in the deep ocean!

You see nutrients buried in sediments on the ocean floor for a very, very long time.

**DRAW AGAIN**

nutrients are trapped in the deep ocean!



You see so many particles floating down from the ocean above that it looks like it is snowing in the lower ocean! The nutrients settle on the ocean floor.

**DRAW AGAIN**

to look for more nutrients

**OR**

**MOVE TO**  
the Middle Ocean Layer



You see nutrients on the ocean floor dissolving into the water.

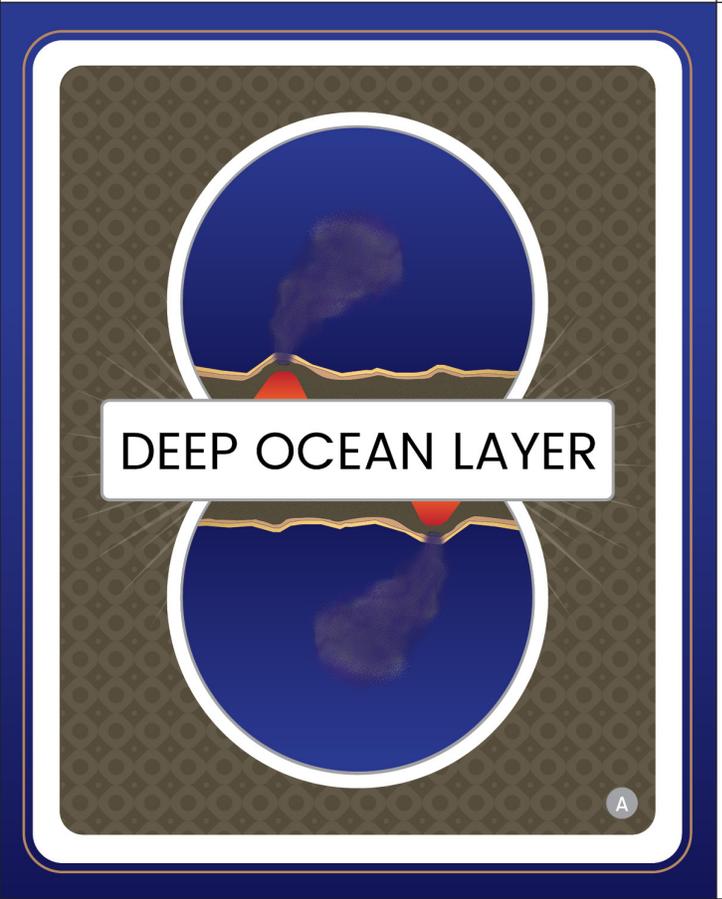
**DRAW AGAIN**

to look for more nutrients

**OR**

**MOVE TO**  
the Upper Ocean Layer





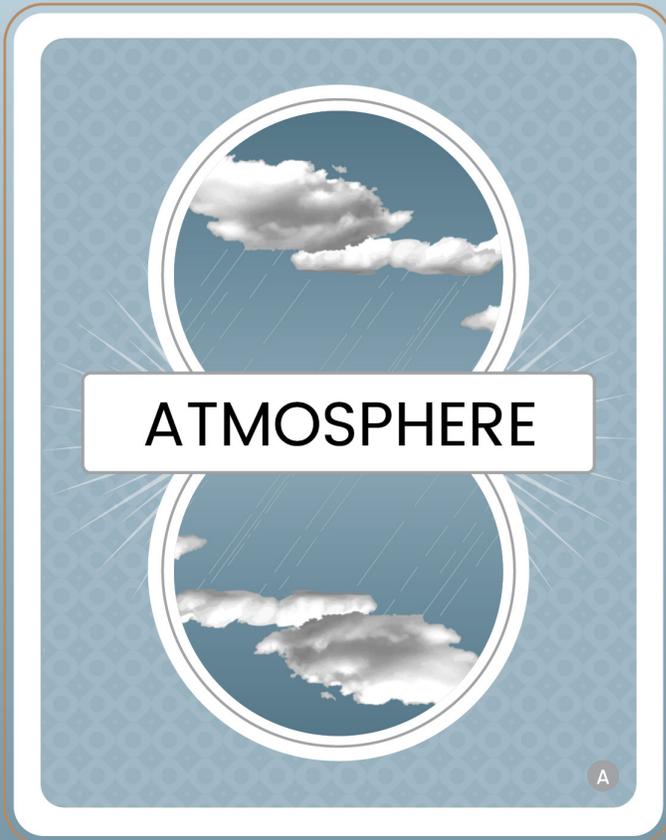
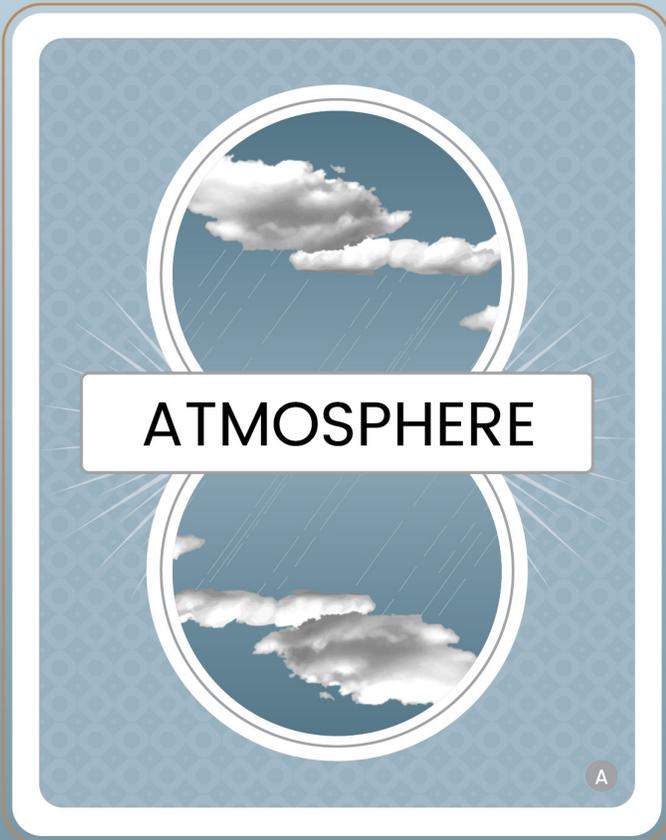
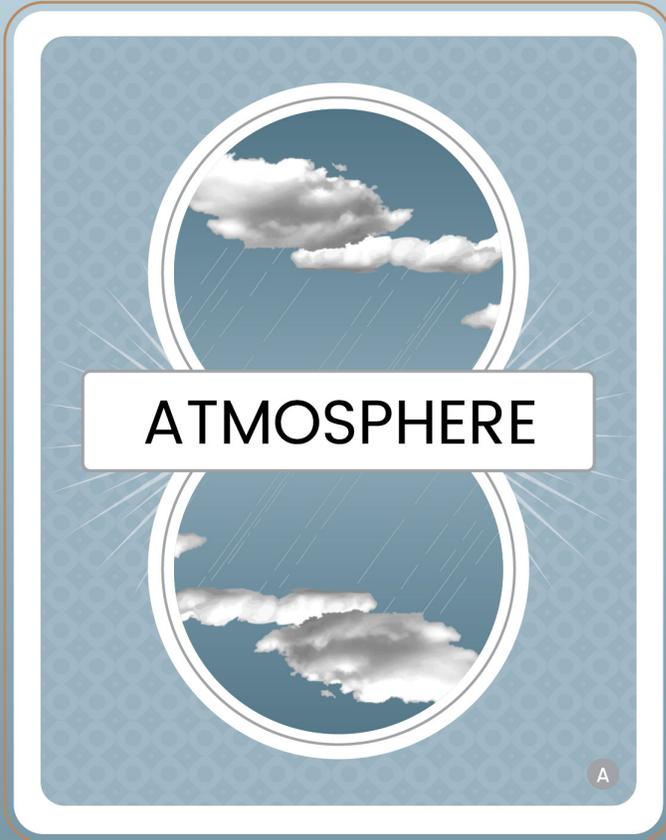
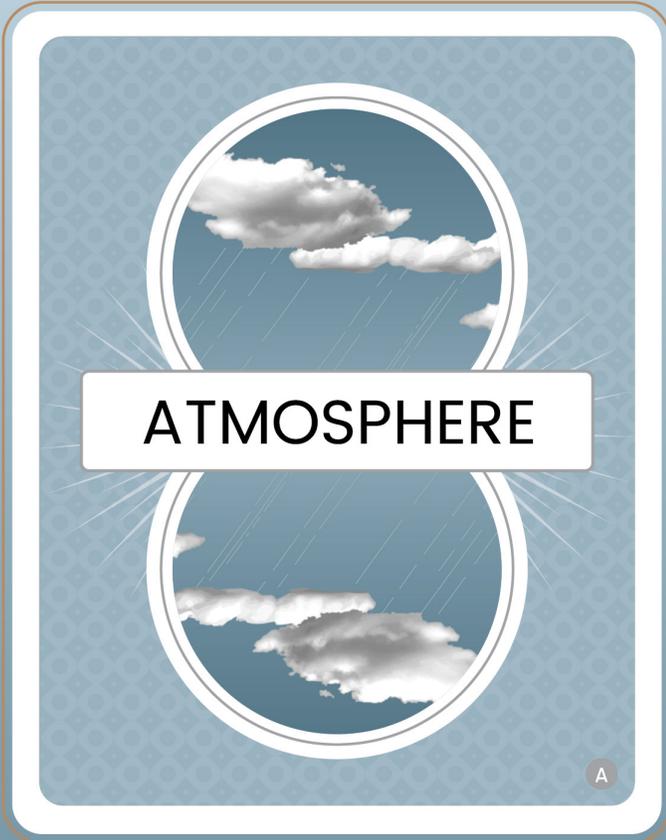
You see nutrients buried in  
sediments on the ocean floor  
for a very, very long time.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Mountains





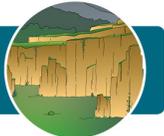


You see dust in a cloud.  
Tiny particles of dust help  
clouds form.

**DRAW AGAIN**  
to look for more nutrients

**OR**

**MOVE TO**  
the Loess Plateau



You see dust in a cloud.  
Tiny particles of dust help  
clouds form.

**DRAW AGAIN**  
to look for more nutrients

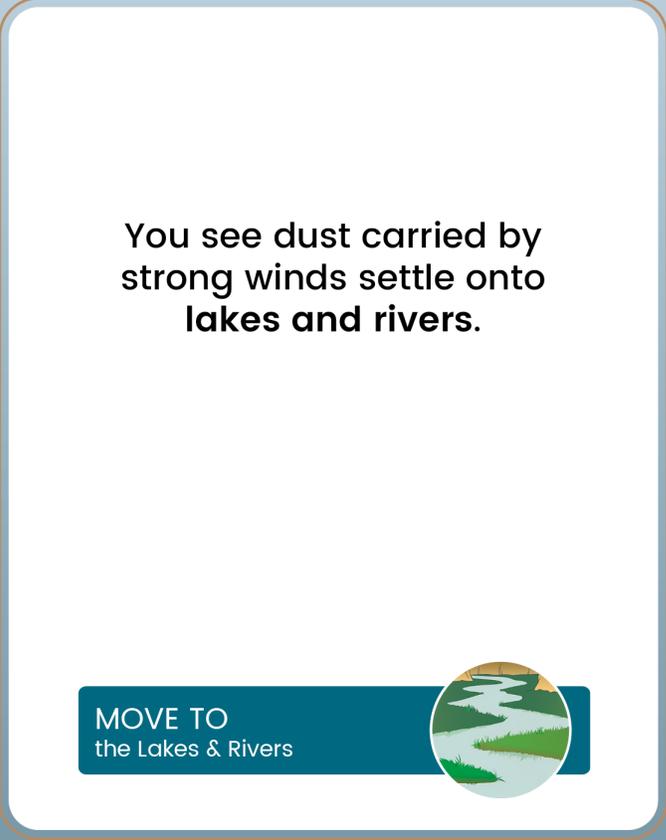
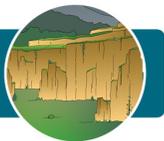
**OR**

**MOVE TO**  
the Loess Plateau



You see dust within  
raindrops falling onto the  
**Loess Plateau.**

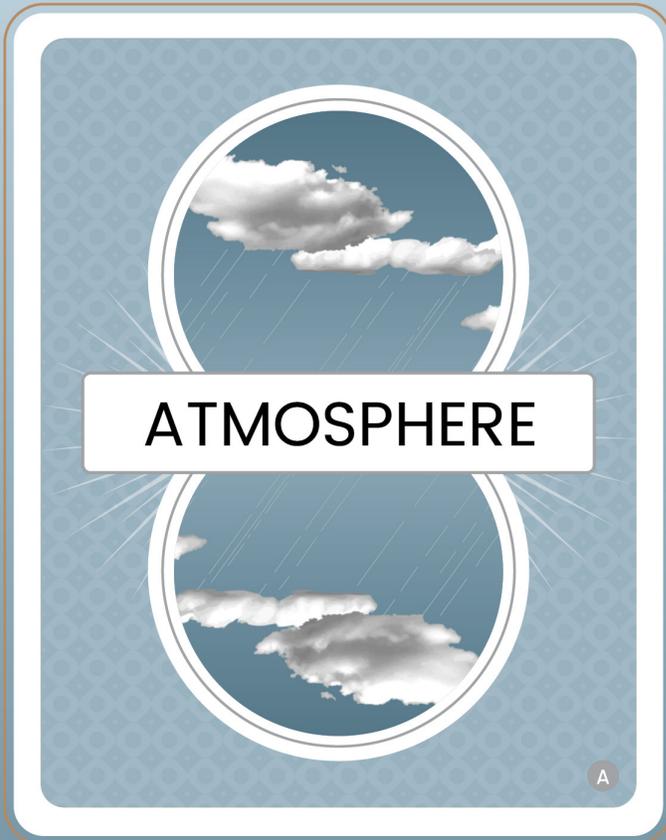
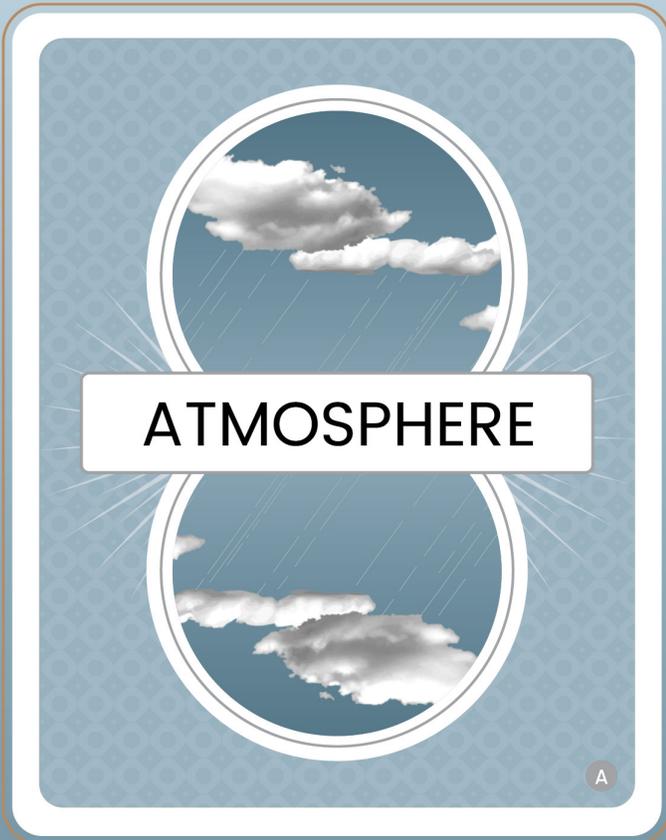
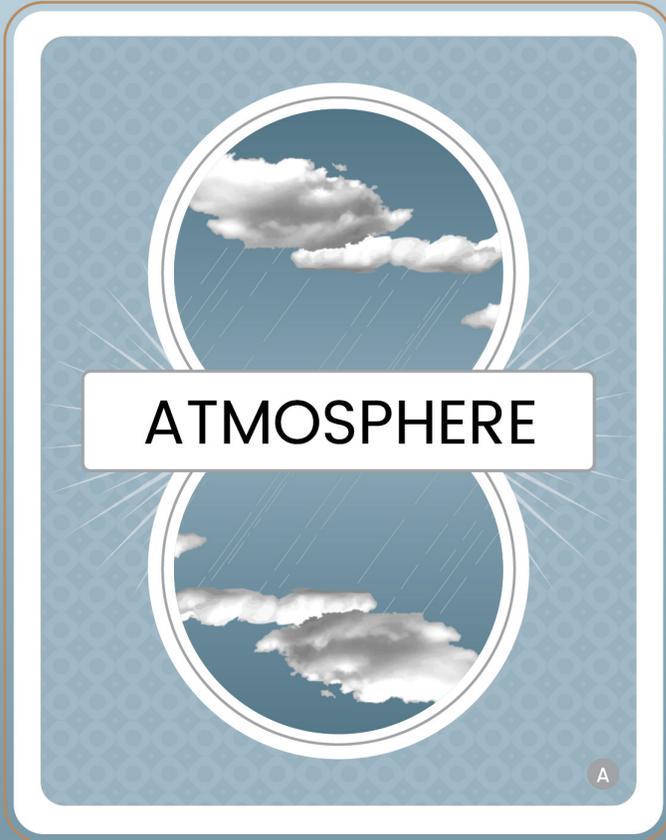
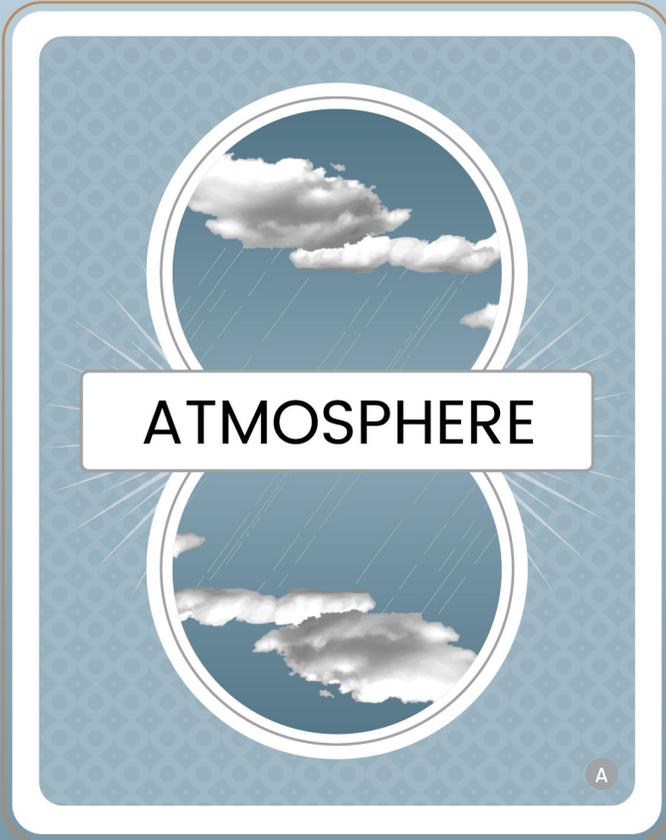
**MOVE TO**  
the Loess Plateau



You see dust carried by  
strong winds settle onto  
**lakes and rivers.**

**MOVE TO**  
the Lakes & Rivers





You see dust carried by strong winds settle onto lakes and rivers.

MOVE TO  
the Lakes & Rivers



You see a cloud of dust settle into the ocean.

MOVE TO  
the Upper Ocean Layer



You see dust in raindrops falling into the ocean.

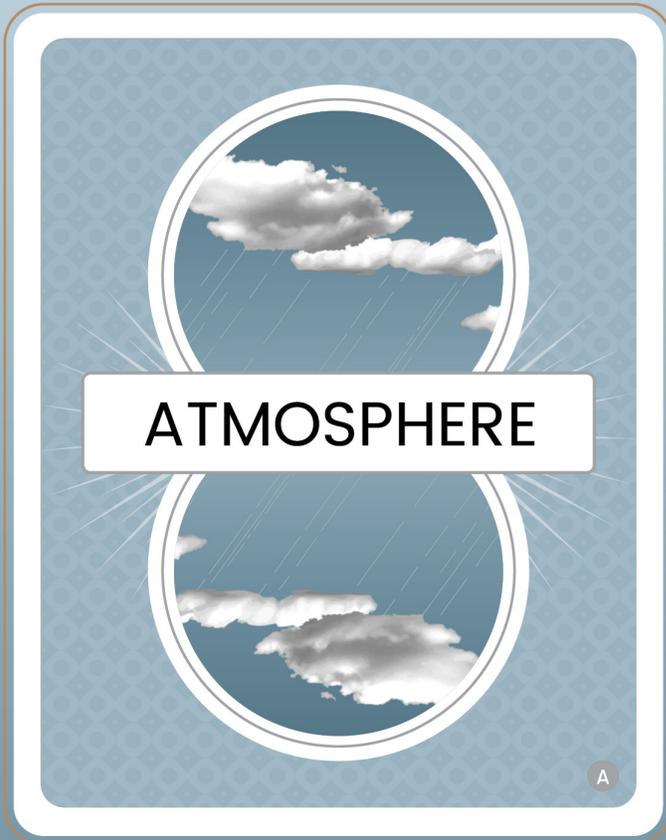
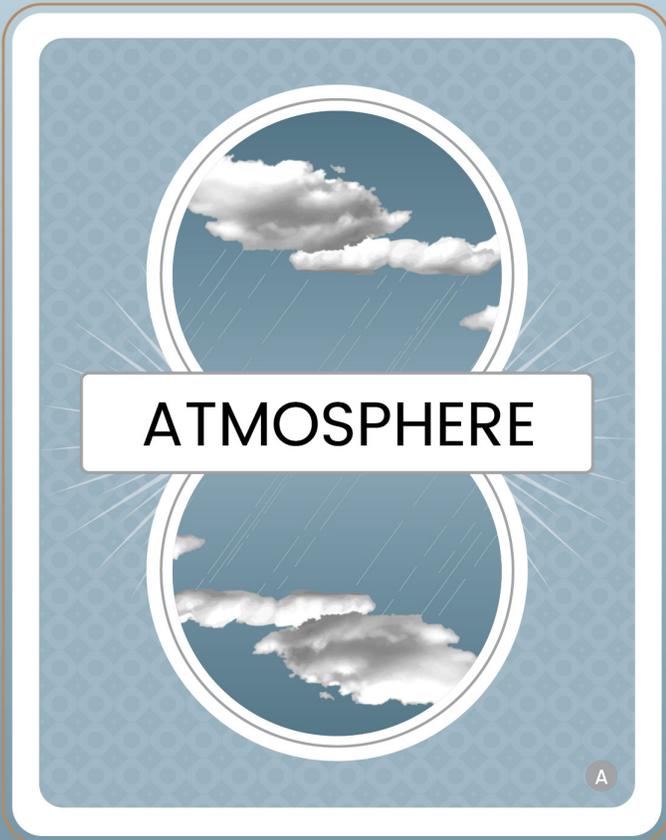
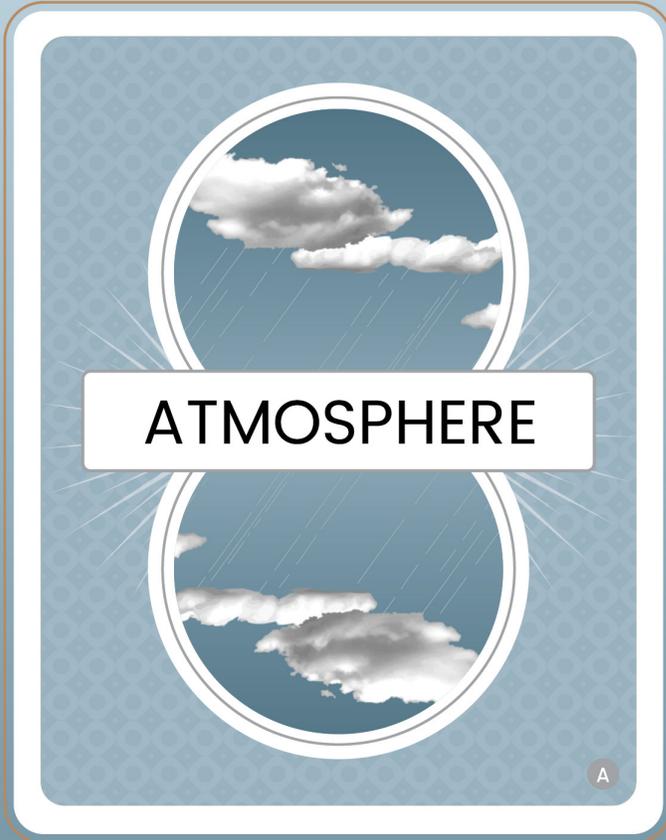
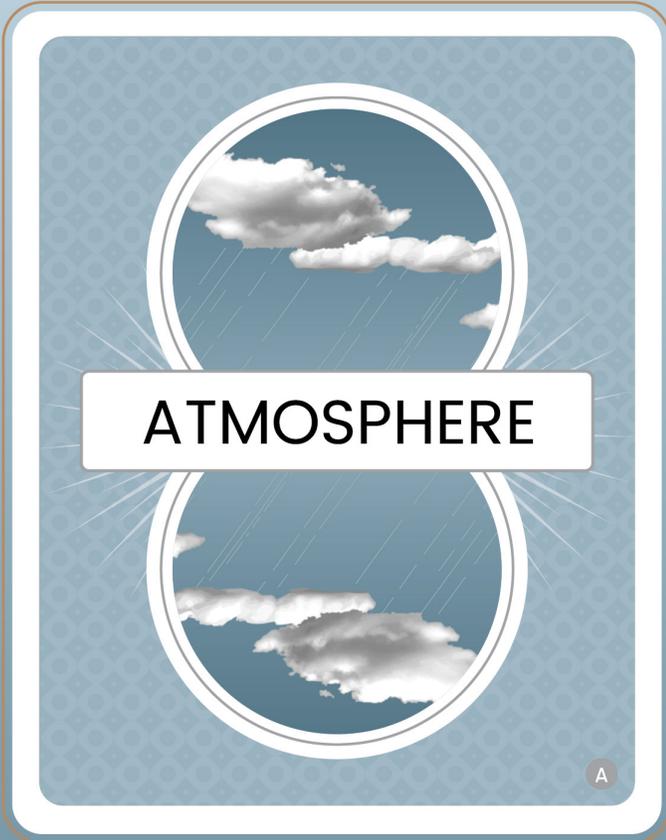
MOVE TO  
the Upper Ocean Layer



You see dust in raindrops falling into the ocean.

MOVE TO  
the Upper Ocean Layer







You see dust carried by strong winds settle back onto the mountains.

GO BACK TO  
the Mountains



You see dust carried by strong winds settle back onto the mountains.

GO BACK TO  
the Mountains



78% of the atmosphere is nitrogen. Special bacteria that live in the soil and water use nitrogen from the air to grow.

**N**

MARK ONE NITROGEN SQUARE  
ON YOUR TRACKING SHEET

DRAW AGAIN

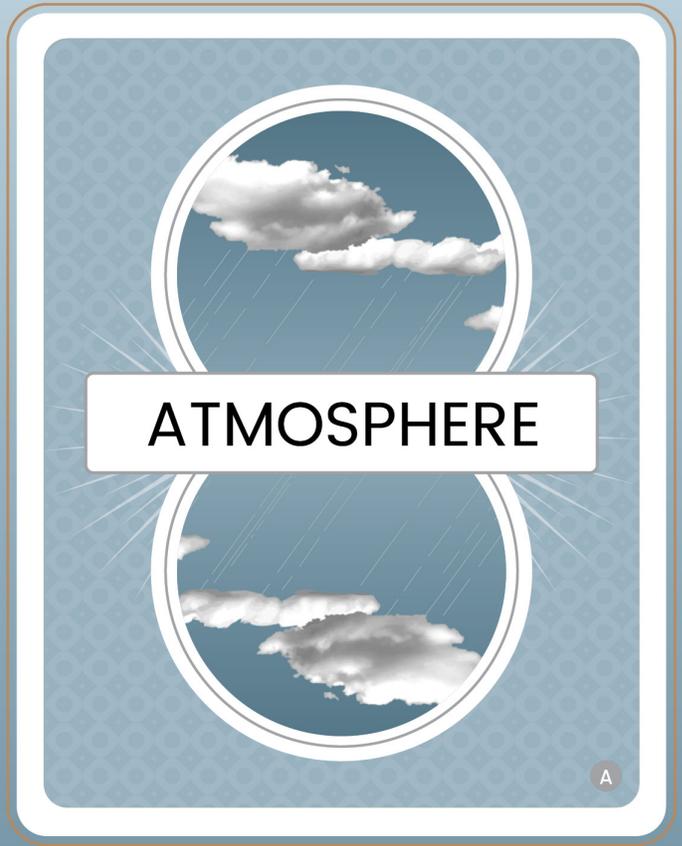


78% of the atmosphere is nitrogen. Special bacteria that live in the soil and water use nitrogen from the air to grow.

**N**

MARK ONE NITROGEN SQUARE  
ON YOUR TRACKING SHEET

DRAW AGAIN





78% of the atmosphere is nitrogen. Special bacteria that live in the soil and water use nitrogen from the air to grow.

**N**

MARK ONE NITROGEN SQUARE  
ON YOUR TRACKING SHEET

**DRAW AGAIN**