MOUNTAINS

A

MOUNTAINS

B

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

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
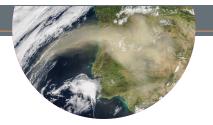to look for more nutrients

OR

MOVE TO
the Atmosphere

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

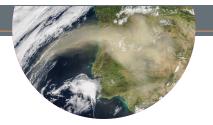You see dust that has piled up over many years, forming a **Loess Plateau**.

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.

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

MOVE TO
the Atmosphere

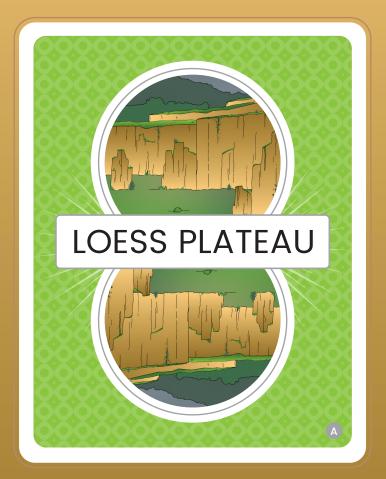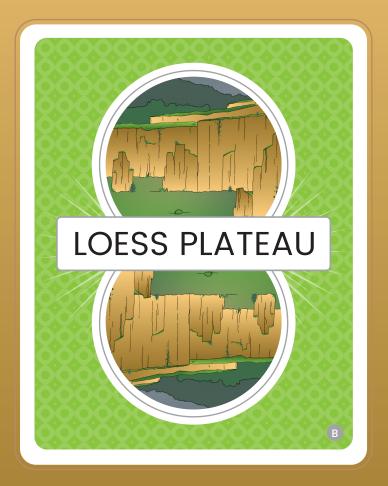You see rain wash dust down from the mountains into **lakes and rivers**.

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

B

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

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

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**.

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

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

GO BACK TO
the Mountains

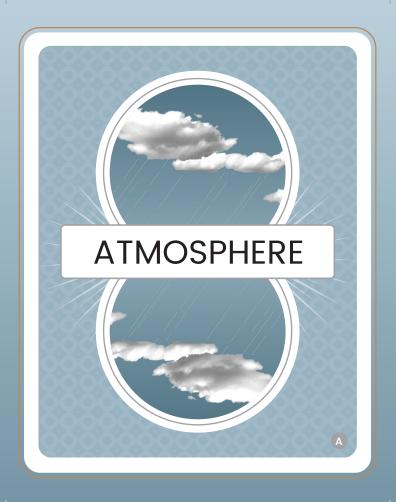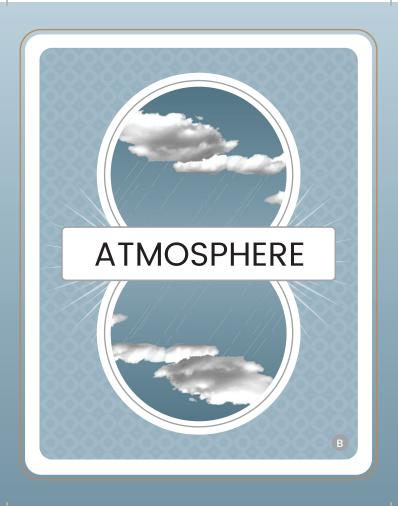You see dust caught up in a strong storm that carries it back to the **mountains**.

GO BACK TO
the Mountains

ATMOSPHERE

A

ATMOSPHERE

B

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.

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**.

You see dust carried by
strong winds settle back onto
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.
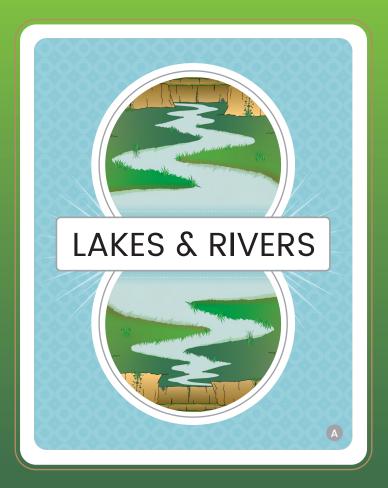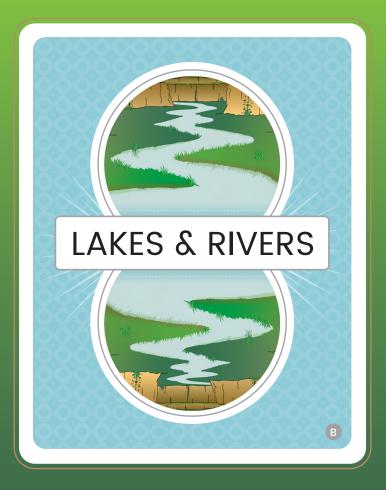
N

MARK ONE NITROGEN SQUARE
ON YOUR TRACKING SHEET

DRAW AGAIN

LAKES & RIVERS

A

LAKES & RIVERS

B

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
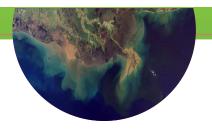the bottom of a lake.

DRAW AGAIN
to look for more nutrients
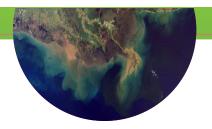
OR

MOVE TO
the Loess Plateau

You see dust carried by a river wash into the **ocean**.
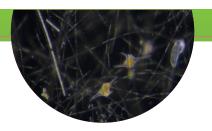
MOVE TO
the Upper Ocean Layer

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

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.
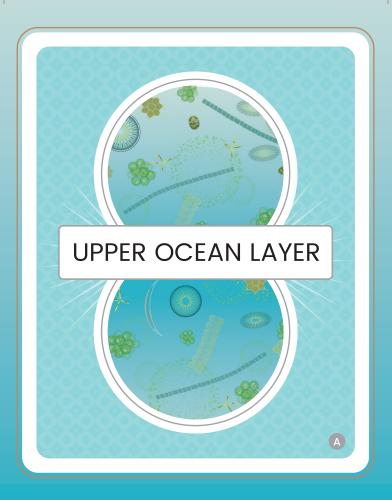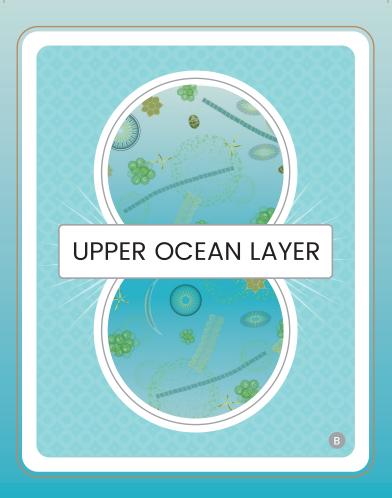
N

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

UPPER OCEAN LAYER

A

UPPER OCEAN LAYER

B

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

You see krill eating phytoplankton. The iron that was in the phytoplankton is now a part of the krill.
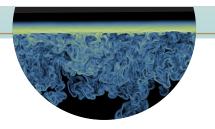
DRAW AGAIN
to look for more nutrients

OR

MOVE TO
the Deep Ocean Layer

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.

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

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

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.
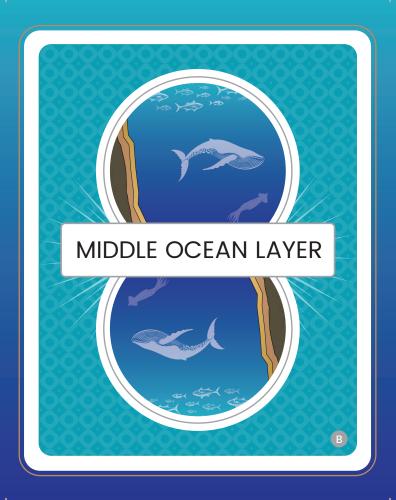
Fe

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

MIDDLE OCEAN LAYER

A

MIDDLE OCEAN LAYER

B

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
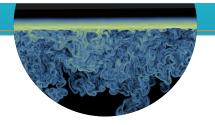
OR

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.

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

DEEP OCEAN LAYER

A

DEEP OCEAN LAYER

B

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

Fe
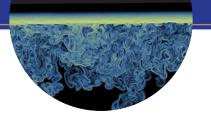
MARK ONE IRON SQUARE ON YOUR TRACKING SHEET

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

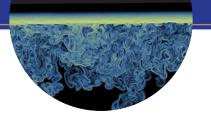Ocean plants and animals release **nitrogen** into the water after they die.

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
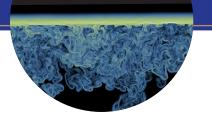the Middle Ocean Layer

You see deep ocean currents carrying nutrients from the ocean floor up to the **middle ocean layer**.
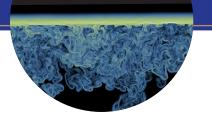
MOVE TO
the Middle Ocean Layer

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