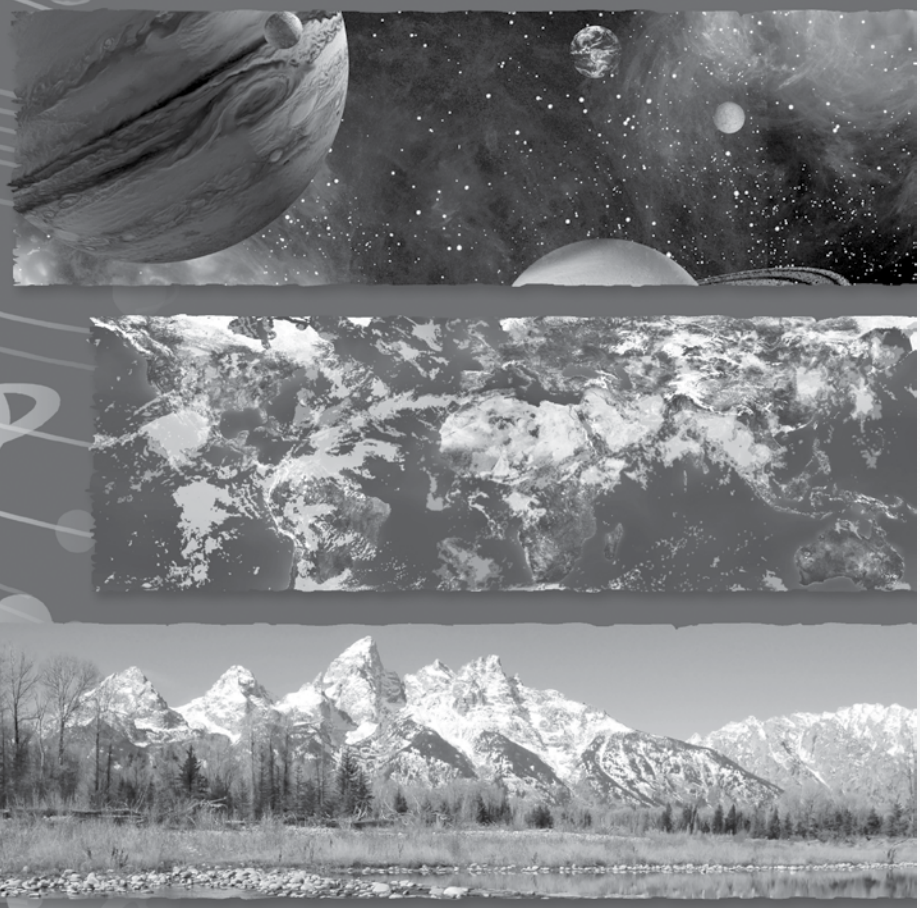
Leveled Texts for Science

Earth and Space Science



SHELL EDUCATION

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How to Differentiate Using This Product

The leveled texts in this series help teachers differentiate science content for their students. Each book has 15 topics, and each topic has a text written at four different reading levels. (See page 17 for more information.) These texts are written at a variety of reading levels, but all the levels remain strong in presenting the science content and vocabulary. Teachers can focus on the same content standard or objective for the whole class, but individual students can access the content at their instructional levels rather than at their frustration levels.

Determining your students' instructional reading levels is the first step in the process. It is important to assess their reading abilities often so they do not get tracked into one level. Below are suggested ways to use this resource, as well as other resources in your building, to determine students' reading levels.

- **Running records:** While your class is doing independent work, pull your below-grade-level students aside, one at a time. Have them read aloud the lowest level of a text (the star level) individually as you record any errors they make on your own copy of the text. If students read accurately and fluently and comprehend the material, move them up to the next level and repeat the process. Following the reading, ask comprehension questions to assess their understanding of the material. Assess their accuracy and fluency, mark the words they say incorrectly, and listen for fluent reading. Use your judgment to determine whether students seem frustrated as they read. As a general guideline, students reading below 90% accuracy are likely to feel frustrated as they read. There are also a variety of published reading assessment tools that can be used to assess students' reading levels with the running record format.
- **Refer to other resources:** Other ways to determine instructional reading levels include checking your students' Individualized Education Plans, asking the school's ELL and special education teachers, or reviewing test scores. All of these resources should be able to give you the further information you need to determine at which reading level to begin your students.

Teachers can also use the texts in this series to scaffold the content for their students. At the beginning of the year, students at the lowest reading levels may need focused teacher guidance. As the year progresses, teachers can begin giving students multiple levels of the same text to allow them to work independently to improve their comprehension. This means each student would have a copy of the text at his or her independent reading level and instructional reading level. As students read the instructional-level texts, they can use the lower texts to better understand the difficult vocabulary. By scaffolding the content in this way, teachers can support students as they move up through the reading levels. This will encourage students to work with texts that are closer to the grade level at which they will be tested.

Strategies for Using the Leveled Texts *(cont.)*

English Language Learners

By Marcela von Vacano

Effective teaching for English language learners (ELLs) requires effective planning. In order to achieve success, teachers need to understand and use a conceptual framework to help them plan lessons and units. There are six major components to any framework. Each is described in more detail below.

1. Select and Define Concepts and Language Objectives—Before having students read one of the texts in this book, the teacher must first choose a science concept and language objective (reading, writing, listening, or speaking) appropriate for the grade level. Then, the next step is to clearly define the concept to be taught. This requires knowledge of the subject matter, alignment with local and state objectives, and careful formulation of a statement that defines the concept. This concept represents the overarching idea. The science concept should be written on a piece of paper and posted in a visible place in the classroom.

By the definition of the concept, post a set of key language objectives. Based on the content and language objectives, select essential vocabulary from the text. The number of new words selected should be based on students' English language levels. Post these words on a word wall that may be arranged alphabetically or by themes.

2. Build Background Knowledge—Some ELLs may have a lot of knowledge in their native language, while others may have little or no knowledge. The teacher will want to build the background knowledge of the students using different strategies such as the following:

> **Visuals**: Use posters, photographs, postcards, newspapers, magazines, drawings, and video clips of the topic you are presenting. The texts in this series include multiple primary sources for your use.
>
> **Realia**: Bring real-life objects to the classroom. If you are teaching about the plant life cycle, bring in items such as soil, seeds, roots, leaves, and flowers.
>
> **Vocabulary and Word Wall**: Introduce key vocabulary in context. Create families of words. Have students draw pictures that illustrate the words and write sentences about the words. Also be sure you have posted the words on a word wall in your classroom.
>
> **Desk Dictionaries**: Have students create their own desk dictionaries using index cards. On one side, they should draw a picture of the word. On the opposite side, they should write the word in their own language and in English.

Strategies for Using the Leveled Texts *(cont.)*

Gifted Education Students

By Wendy Conklin

Open-Ended Questions and Activities

Teachers need to be aware of activities that provide a ceiling that is too low for gifted students. When given activities like this, gifted students become bored. We know these students can do more, but how much more? Offering open-ended questions and activities will give high-ability students the opportunities to perform at or above their ability levels. For example, ask students to evaluate scientific topics described in the texts, such as: "Do you think the United States should be continuing space exploration?" or "What do you think our government should do to deal with global warming?" These questions require students to form opinions, think deeply about the issues, and form pro and con statements in their minds. To questions like these, there really is not one right answer.

The generic, open-ended question stems listed below can be adapted to any topic. There is one leveled comprehension question for each text in this book. These question stems can be used to develop further comprehension questions for the leveled texts.

- In what ways did…
- How might you have done this differently…
- What if…
- What are some possible explanations for…
- How does this affect…
- Explain several reasons why…
- What problems does this create…
- Describe the ways…
- What is the best…
- What is the worst…
- What is the likelihood…
- Predict the outcome…
- Form a hypothesis…
- What are three ways to classify…
- Support your reason…
- Compare this to modern times…
- Make a plan for…
- Propose a solution…
- What is an alternative to…

The Water Cycle

The water cycle is a circle. There is no real start to it. We must pick a place to start. Evaporation is as good a place as any to start.

Evaporation

Evaporation is all around us. You can heat a liquid. Then it will change to a gas. The warmed molecules in the liquid move. They bounce with the heat. They bounce far apart. Then they aren't part of the liquid any more. When water is a gas, it is called water vapor. You can find it in a pot of boiling water on the stove. You can find it when the sun heats water in the oceans.

When the water vapor moves up into the air, it loses its heat. Then it turns back to a liquid. The water clumps up. It forms small drops or ice crystals. They are not big enough to fall back to Earth. When there are enough of them close together, they can form clouds.

The sun heats Earth. It doesn't heat evenly. Some places get hot. Some places don't. The hot air puts pressure on the cold air. The pressure must balance out. Air moves from high-pressure parts to low-pressure parts. This makes wind. Earth's spin twists the air. Currents in the oceans move the air, too. Air moving from side to side is called advection. It is why clouds move.

Precipitation

Water vapor in the sky can form water droplets. It can also form ice crystals. Wind causes the water drops and ice to bump into each other. They form larger clumps. The large clumps make even larger clumps. They fall to the earth. This is called precipitation. We know it as rain, snow, sleet, and hail.

Now the water is on the ground. This is the next phase of the water cycle. What happens depends on where it falls and in what form. The water could be ice as snow, sleet, or hail. It might pile up and stay ice for a while. It may melt and change to liquid water. The water could fall as rain. It can soak into the ground or it can run off and form streams or rivers.

Groundwater

When water soaks into the ground, it flows into tiny spaces. The spaces are in between bits of soil. Deeper down the water can't flow through rock. The rock is impermeable. The water is trapped. It fills up all the spaces in the soil above. That rock is permeable. Then it is called groundwater. The water backs up. It spills out. It starts moving downhill.

Sometimes there is a lot of rain from a storm. The water can't all soak into the ground. The water runs over the ground's surface. It runs into streams. It runs into rivers. The water keeps going and going. Over time, all the water makes its way back to the ocean.

Water flows to the oceans. It has gone all the way around the water cycle. All the water that flows into the ocean once came out of it.

Comprehension Question

Write three things that happen to a drop of water in the water cycle.

The Water Cycle

There is really no start to the water cycle. To talk about it, we must pick a place to start. Evaporation is as good a place as any.

Evaporation

Evaporation happens all over. When a liquid is heated, it changes to a gas. The heated molecules move around very quickly. They move far apart. Then they aren't part of the liquid any more. When water is a gas, it is called water vapor. It is made in a pot of boiling water on the stove. It is made when the sun heats water in the oceans.

The water vapor moves up into the air. It loses the heat it had taken in. Then the vapor turns back into a liquid. The water starts to clump up. It forms small droplets or ice crystals. The droplets or crystals are very tiny. They are not heavy enough to fall back to Earth. When there are enough of them close together, they can form clouds.

When the sun heats Earth, it doesn't heat evenly. Some places get hot. Some places don't. The hot air puts pressure on the cold air. To make the pressure balance, air moves from areas with high pressure to areas with low pressure, creating wind. The spinning of Earth and currents in the oceans can affect movement of the air, too. Air moving from side to side is called advection. It is why clouds move across the planet.

Precipitation

Water vapor in the sky can form water droplets. It can also turn into solid ice crystals. Wind and air movement cause the drops and ice to bump into each other. They form larger clumps. If they get large enough, they fall to the earth. This is called precipitation. Of course, it is better known as rain, snow, sleet, and hail.

Water on the ground is the next phase of the water cycle. What happens depends on where it falls and in what form. The water could be ice as snow, sleet, or hail. It might pile up and stay ice for a while. It may melt and change to liquid water. The water could fall as rain. It can soak into the ground or it can run off and form streams or rivers.

Groundwater

When water soaks into the ground, it flows into tiny spaces. The spaces are in between bits of soil. Even deeper down, the rock is impermeable. That means the water can't flow through it. It is trapped. That water permeates the soil above. That means it fills up all the spaces in the soil. Water that soaks into the ground is called groundwater. The water overflows. It starts moving downhill.

Sometimes there is a lot of water during a rainstorm. The water can't all soak into the ground. Instead, the rainwater runs over the ground's surface. It runs into streams. It runs into rivers. With enough time, all the water makes its way back to the ocean.

Water flows to the oceans. It has gone all the way around the water cycle. All the water that flows into the ocean once came out of the ocean.

Comprehension Question

Describe three things that happen to a drop of water in the water cycle.

The Water Cycle

There's really no start to the water cycle. To talk about it, we must start somewhere. Evaporation is as good a place as any.

Evaporation

Evaporation happens all over. When a liquid is heated enough, it changes to a gas. The heated molecules move around very fast. They move too far apart to be a part of the liquid. When water evaporates, we call it water vapor. It happens on a small scale when a stove heats a pot of water. It happens on a very large scale when the sun heats water in the oceans.

The water vapor moves up through the atmosphere. It loses the heat it had taken in. When it loses enough heat, the vapor turns back into a liquid. The water molecules start sticking together. They form small droplets or ice crystals. The droplets or crystals are very tiny and not heavy enough to fall back to Earth. When there are enough of them close together, they can form clouds.

When the sun heats Earth, it doesn't heat evenly. Some places get hotter than other places do. This causes pressure differences in the air. To make the pressure balance, air moves from areas with high pressure to areas with low pressure, creating wind. The spinning of Earth and currents in the oceans can affect movement of the air, too. This process of air moving from side to side across the earth is called advection. It is why clouds move across the planet.

Precipitation

Water vapor in the sky can form water droplets. It can also turn into solid ice crystals. Wind and air movement cause these particles to bump into each other. They form larger particles. If they get large enough, they fall to the earth as precipitation. Of course, this is better known as rain, snow, sleet, and hail.

Water progresses to the next phase of the water cycle once it hits the ground. What happens depends on where it falls and in what form. If the water is frozen as snow, sleet, or hail, it might pile up and stay frozen for a while. It may melt quickly and change to liquid water. When water falls as rain, it can soak into the ground or it can run off and form streams or rivers.

Groundwater

When water soaks into the ground, it flows into tiny spaces between soil particles. Deeper underground, the rock is impermeable. The water can't flow through it and is trapped. The captured water permeates the soil above. It fills up all the spaces between soil particles. Water that soaks into the ground like this is called groundwater. The water overflows. It starts moving horizontally.

If there is a lot of water during a rainstorm, the water can't all soak into the ground. Instead, the rainwater runs over the ground's surface. It collects into streams and rivers. Eventually, all the water makes its way back to the ocean.

Water flows to the oceans. It has traveled all the way around the water cycle. All the water that flows into the ocean once came out of the ocean.

Comprehension Question

Describe the trip that one drop of water makes as it goes around the water cycle.

The Water Cycle

There's really no start to the water cycle, but to understand it, we must begin somewhere. Evaporation is as good a place as any.

Evaporation

Evaporation happens everywhere. When a liquid is heated enough, it changes to a gas. This happens when the heated molecules move around so fast they are no longer close enough together to be a part of the liquid. When water evaporates, we call it water vapor. It happens on a small scale when a stove heats a pot of water. It happens on a very large scale when the sun heats water in the oceans.

The water vapor moves up through the atmosphere and loses the heat it had taken in. When it loses enough heat, the vapor condenses back into a liquid. The water molecules start sticking together, and they form small droplets or ice crystals. The droplets or crystals are very tiny and not heavy enough to fall back to Earth. When there are enough of them close together, they can form clouds.

When the sun heats Earth, it doesn't heat evenly. Some places get hotter than other places do, and this causes pressure differences in the air. To make up for these differences, air moves from areas with high pressure to areas with low pressure, creating wind. In addition, the spinning of Earth and currents in the oceans can affect movement of the air on Earth as well. This process of air moving from side to side across the earth is called advection, and it is why clouds move across the planet.

Precipitation

Water vapor in the atmosphere can form water droplets or turn into solid ice crystals. Wind and air movement causes these particles to bump into each other, forming larger particles. If they get large enough, they fall to the earth as precipitation. Of course, precipitation is better known as rain, snow, sleet, and hail.

Water progresses to the next phase of the water cycle once it hits the ground. What happens depends on where it falls and in what form. If the water is frozen as snow, sleet, or hail, it might pile up and stay frozen for a while. It may melt quickly and change to liquid water. When water falls as rain, it can soak into the ground or it can run off and form streams or rivers.

Groundwater

When water soaks into the ground, it flows into tiny spaces. The spaces are in between bits of soil. Deeper down the water can't flow through rock. The rock is impermeable. The water is trapped. It fills up all the spaces in the soil above. That rock is permeable. Then it is called groundwater. The water backs up. It spills out. It starts moving downhill.

Sometimes there is a lot of rain from a storm. The water can't all soak into the ground. The water runs over the ground's surface. It runs into streams. It runs into rivers. The water keeps going and going. Over time, all the water makes its way back to the ocean.

Water flows to the oceans. It has gone all the way around the water cycle. All the water that flows into the ocean once came out of it.

Comprehension Question

Describe the water cycle from the point of view of a single drop of water.

How to Use This Product

Readability Chart

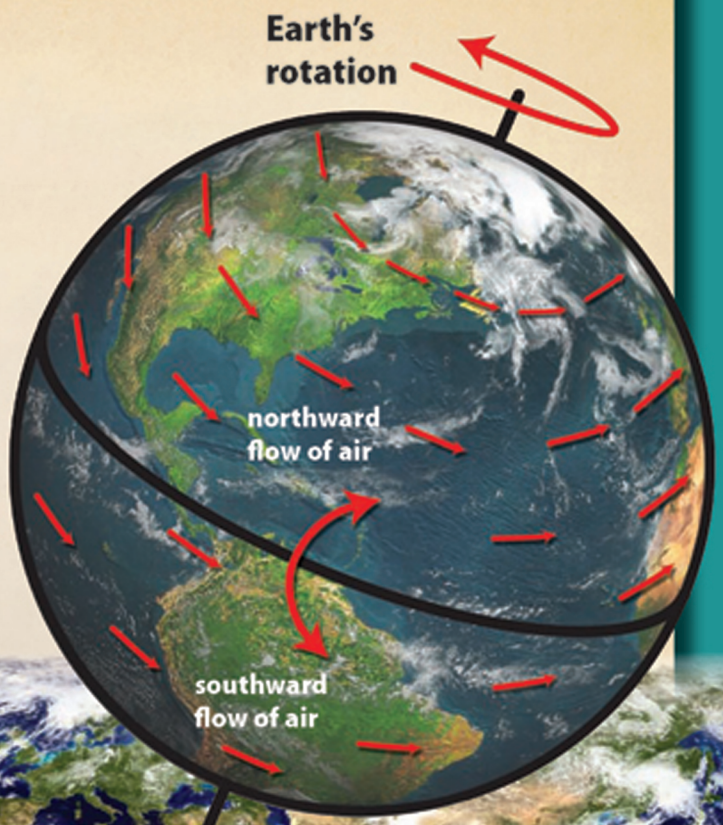
Title of the Text	 Star	 Circle	 Square	 Triangle
Jet Streams and Trade Winds	1.9	3.1	4.7	6.5
The Water Cycle	1.6	3.1	4.7	6.5
Tornadoes and Hurricanes	1.8	3.4	4.6	6.7
Structure of the Earth	2.1	3.5	5.2	6.5
Earthquakes and Volcanoes	2.2	3.0	4.9	6.6
Plate Tectonics	2.2	3.5	5.1	7.0
Wegener Solves a Puzzle	2.0	3.5	5.1	6.6
The Rock Cycle	1.8	3.4	4.5	7.1
Fun with Fossils	2.0	3.2	5.0	6.9
The Inner Planets	2.2	3.1	4.8	6.7
The Outer Planets	2.1	3.4	4.9	6.5
Our Place in Space	2.2	3.4	5.2	6.7
Other Citizens of the Solar System	2.1	3.1	5.0	6.9
The Astronomer's Toolbox	2.2	3.4	4.8	6.8
The Journey to Space	1.7	3.1	4.9	6.7

Components of the Product

Primary Sources

- Each level of text includes multiple primary sources. These documents, photographs, and illustrations add interest to the texts. The scientific images also serve as visual support for second language learners. They make the texts more context rich and bring the texts to life.

Jet Streams and Trade Winds



Some days there are clouds in the sky. Some days there are no clouds. Have you ever wondered why? Where do the clouds come from? Where do they go? You might know the answer. Winds move clouds across the sky. You might not know why it happens. All weather takes place in the layer of air closest to Earth's surface. Lots of things change weather such as heat, water, and wind.

Jet Streams

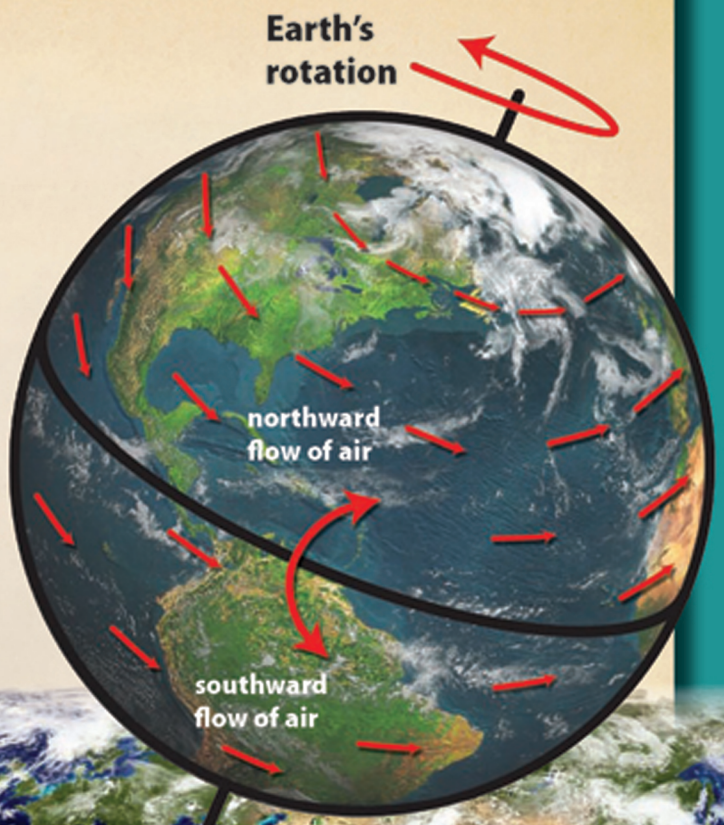
The sun warms Earth's surface. This makes heat and moisture rise into the sky. There are four main jet streams there, high in the sky. Jet streams are rivers of wind. They are thousands of miles long, hundreds of miles wide, and several miles deep.

Jet streams are one of the things that change our weather. They lower the heat. They move the moisture around. They blow about 200 kilometers per hour (125 miles per hour). They bend and move. They don't stay in the same spot. They move toward the equator. Then they move away from it.

Jet streams weren't known about until modern times. When jet planes were invented, they flew high enough to find the jet streams. In fact, that is where they got their names.

Jet Streams and Trade Winds

Some days there are clouds in the sky. Some days there are no clouds. Have you ever wondered why? Where do the clouds come from? Where do they go? You probably know the answer. Winds move clouds across the sky. What you may not know is why it happens. All weather takes place in the layer of the atmosphere closest to Earth's surface. Lots of things change weather. The biggest factors are heat, water, and wind.



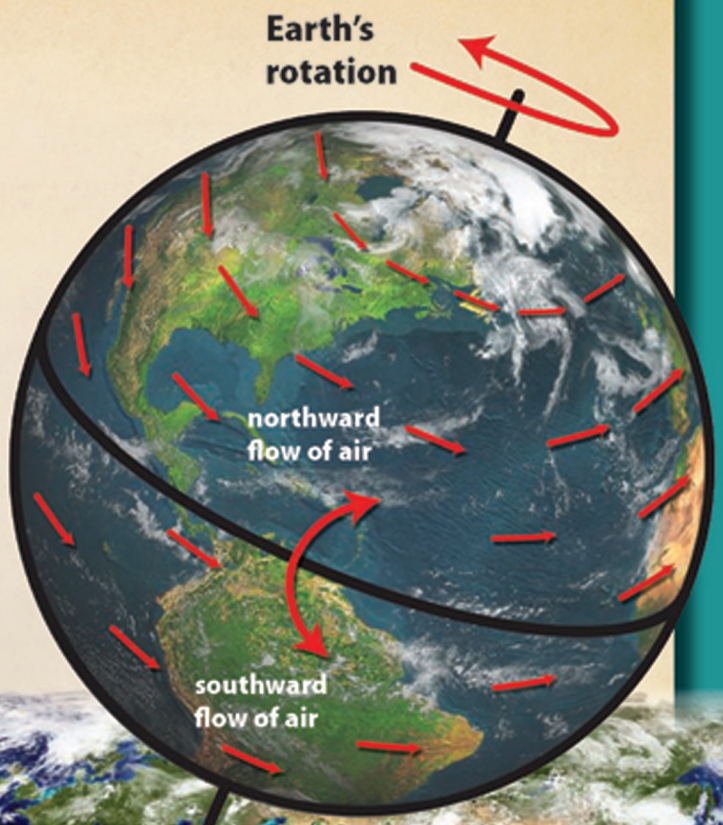
Jet Streams

The sun warms Earth's surface, making heat and moisture rise into the atmosphere. There are four main jet streams there, high in the sky. Jet streams are rivers of wind. They are thousands of miles long, hundreds of miles wide, and several miles deep.

Jet streams are one of the driving forces of weather. The jet streams lower the heat and move the moisture around. They blow about 200 kilometers per hour (125 miles per hour). They bend and move. They don't stay in the same spot. They move toward the equator or away from it.

Jet streams weren't discovered until modern times. Jet planes were invented and flew high enough to find the jet streams. In fact, that is where they got their names.

Jet Streams and Trade Winds



Have you ever wondered why some days there are clouds in the sky and some days there aren't? Where do the clouds come from, and where do they go to? You probably know the answer: winds move clouds across the planet. What you may not know is that all weather happens in the layer of atmosphere closest to Earth's surface. Many things affect weather. The biggest factors are heat, water, and wind.

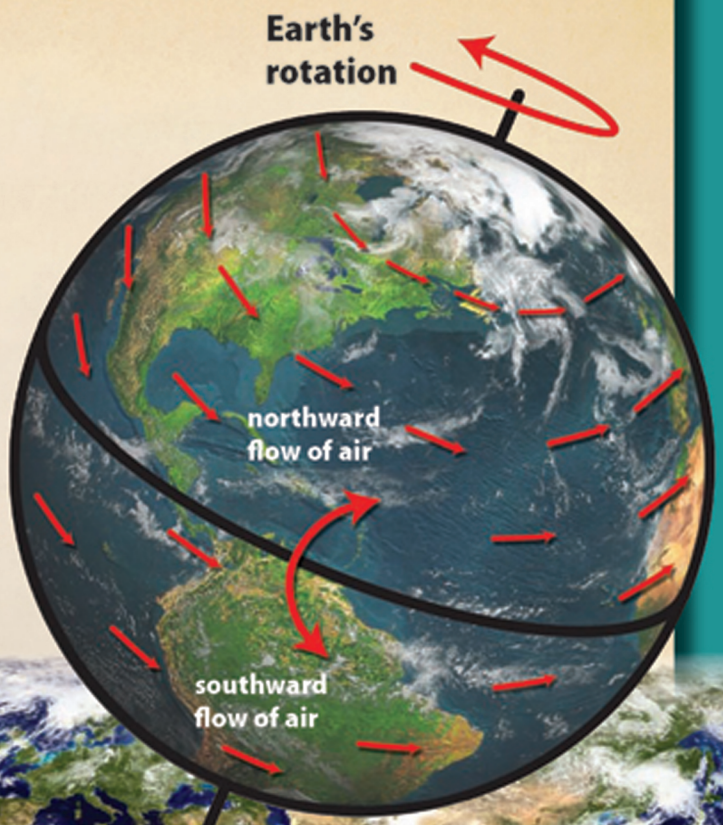
Jet Streams

The sun warms Earth's surface. This makes heat and water rise into the atmosphere. There are four main jet streams there, high in the sky. Jet streams are rivers of wind. They are thousands of miles long, hundreds of miles wide, and several miles deep.

Jet streams are one of the driving forces of weather changes. They lower the heat and move around the moisture. They blow an average of 200 kilometers per hour (125 miles per hour). They bend and move in different ways. They don't always stay in the same spot. They move either toward the equator or away from it.

Jet streams weren't discovered until the modern era, when jet planes were invented and flew high enough to find them. In fact, that is where they got their names.

Jet Streams and Trade Winds



Have you ever wondered why some days there are clouds in the sky and some days there aren't? You probably know why: winds move clouds across the planet. What you may not know is that all weather happens in the layer of atmosphere closest to Earth's surface. Many things affect weather. The biggest factors are heat, water, and wind.

Jet Streams

The sun warms the Earth's surface, which evaporates water into vapor. The vapor rises high into the sky, where four rivers of wind called jet streams flow. Thousands of miles long, hundreds of miles wide, and several miles deep, jet streams are a driving force of weather changes. The jet streams lower the vapor's heat and move it across the planet. Jet streams blow 200 kilometers per hour (125 miles per hour) on average. Jet streams always flow parallel to the equator, but they move north and south over the course of the year.

Jet streams weren't discovered until the modern era, when newly invented jet planes flew high enough to find them. In fact, that is where they got their names.