Types of Soil

TEKS: 1.10B; 4.11A

Content Objective: The students will determine the capacity for different types of soil to retain water.

Language Objective: The students will record their observations in their science notebooks and will discuss them aloud with their peers.

Five E Connection: Exploration

Materials: (for each group)

soil	sand	clay
measuring cup	water	3 plastic cups
Scientific Journal	magnifying glass	

Vocabulary:

natural resource	sand	retain
clay	top soil	

Procedure:

- Explain to students that in this activity they will be able to observe and describe the differences that exist in different samples of rocks and soil.
- Explain to students that without soil we could not survive. Plants get all their nutrients (their food) from the soil. Soil also maintains the roots of the plants.
- Place the students in groups of 3 or 4.
- Ask students to examine the different types of soil.
- Ask students to fill 3 cups, ½ full, with sand, clay, and soil. Make sure that each cup has equal amounts.
- Explain to students that they will be working with three different types of soil to see which one best retains water.
- Ask:
    - Why is it important to know what type of soil best retains water?
- Provide students with enough time to answer the question.
- Ask students to observe what happens in each of the cups as the same amount of water is added to them.
- Add a cup of water to each of the cups and wait until the soil absorbs the water.
- Ask:
    - What did you observe?
- Ask students to describe what they observed in their journal.
- Explain to students that each type of soil retains different amounts of water.
- Ask:
    - What type of soil do you think will retain the most water?
    - What type of soil will retain the least amount of water?
- Provide students with enough time to answer the questions.

- Explain to students that the soil that retains the most water is the one that is used to plant certain types of plants. Plants that do not require very much water can be planted in clay or sand.
- Ask students to describe the differences that exist in the three different types of soil in their journal.

The Moonlight

TEKS: 5.12C

Content Objective: The students will compare the physical characteristics of the sun with those of the moons.

Language Objective: The students will discuss the differences in small groups before sharing in a whole group.

Five E Connection: Explanation

Materials: (for the class)

styrofoam ball	a pencil	a flashlight
aluminum foil	scientific journal	

Vocabulary:

moon	darkness	compare
shine	moonlight	miles
distance		

Procedure:

- Review with students what they know about the moon.
- Cover the styrofoam ball with aluminum foil.
- Stick the pencil in the styrofoam ball to form a handle.
- Hold the ball by the "handle."
- Turn off the light.
- Ask:
    - What does the ball look like in the dark?
- Provide students with enough time to answer the question.
- Ask a student to shine the flashlight on the ball.
- Ask:
    - What makes the moon appear to be shining?
- Provide students with enough time to answer the question.
- Explain to students that the moon looks like it is shining, but in reality the moon does not give off light. Explain that the moon gets it light from the sun. This is one way it is different from the sun.
- Ask
    - In what other ways is the moon different from the sun? Allow the students to share their ideas with one another before sharing whole group.

It Looks Like a Volcano

TEKS: 5.3C; 3.6B

Content Objective: The students will compare and contrast the oozing of toothpaste coming out of a tube with the flow of lava coming out of a volcano.

Language Objective: The students will engage in converstion regarding the similarities and differences observed.

Five E Connection: Engagement

Materials: (for the class)

a pencil	toothpaste	scientific journal

Vocabulary:

volcano	magma	lava
eruption	volcanic layer	

Procedure:

- Ask students to observe while you squeeze a tightly closed tube of toothpaste.
- Ask:
  - Why does the toothpaste not come out?
- Provide students with enough time to answer the question.
- Explain to students that the toothpaste does not come out because the pressure that you are exerting is not enough to cause the toothpaste to come out.
- Ask:
  - What would happen if I made a hole in the tube of toothpaste?
- Provide students with enough time to answer the question.
- Ask the students to describe what would happen if we made a hole in the tube of tooth paste. Accept all responses and suggest that we test.
- Ask students to observe while you make a hole close to the lid of the tube of toothpaste with a pencil.
- Ask:
  - What happened? Why?
- Provide students with enough time to answer the question.
- Explain to students that the toothpaste came out of the tube because of the pressure that was exerted.
- Ask:
  - How can we compare this to a volcano?
- Listen while students discuss their observations and compare them to an actual volcano. How is this example like a volcano and how is it not?

Wearing Out and Disappearing

TEKS: 2.7 A; 5.12A; 5.11A

Content Objective: The students will explore how rocks erode over time and leave residue.

Language Objective: The students will discuss what happens to the limestone in the experiment in an oral discussion among peers.

Five E Connection: Exploration, Explanation

Material: (for each group)

paper	a pencil with an eraser	scientific journal
a small piece limestone	a piece of corrugated card board	plastic bag
a piece of glass	rain water in a jar	vinegar
a magnifying glass		

Vocabulary:

particles	graphite	rocks
mineral	to rub/rubbing	

Process:

- Before class begins, cover the card board with the plastic bag, and fold it in the shape of a "U." Keep the card board at a 45º angle.
- Divide students in groups of 3-4.
- Ask students to write their names on piece of paper with a pencil.
- Ask students to observe what happens when they erase their name with the eraser from the pencil.
- Show the students the pencil's eraser.
- Ask:
    - What happened?
- Provide students with enough time to answer the question.
- Explain to students that their name that was written on the paper was erased and it disappeared.
- Explain to students that if they examine their paper they will see small particles of residue. Also explain that the eraser changed the form of what was written on the paper.
- Explain that the eraser also changed shape.
- Ask:
    - Can water change the shape of rocks?
    - How is it possible for water to have such force?
- Explain to students that they will begin an investigation that will show how water has the capacity to make rocks disappear.
- Ask students to predict what will happen to the water and the limestone.

- Ask students to take descriptive notes regarding the investigation.
- Ask students in each group to wash the rocks with the rain water and to measure the rocks. Then ask them to place the rocks on the cardboard.
- Ask students to place the glass at the bottom of the cardboard and to place the cardboard on their desk.
- Ask students to slowly pour drops of rainwater from the top of the cardboard. The glass will hold the water that has gone through the rock.
- Ask students to, very carefully, expose the glass to the sun and wait until the water evaporates.
- Ask students to examine the glass using the magnifying glass.
- Ask:
    - What do you see?
    - Is the glass completely clean?
    - What is on the glass?
- Provide students with enough time to think about their answers, and ask them to write their answer in their scientific journal.
- Ask:
    - What would happen in mountains that had limestones?
    - What happens to the mountains that get ten million gallons of rainwater?
- Provide students with enough time to answer the question.

Making Craters

TEKS: 3.3C; 5.12C

Content Objective: The students will create a representation of the surface of the moon.

Language Objective: The students will use the words crater, comet, and asteroid in conversation.

Five E Connection: Engagement

Materials: (for the class)

a newspaper	rocks of different sizes	plaster of paris
safety googles	starch	water
a small childrens pool	coffee grains	gravel
sand	pencils	scientific journal

Vocabulary:

crater	comet	asteroid

Procedimiento:

- Remind students that the moon has craters that were formed by the impact of comets and asteroids that landed on the surface of the moon.
- Place the plaster of paris (already mixed) in the pool and allow it to dry for 10 minutes before beginning the activity.
- Take students outside into the playground area.
- Ask the students to spread out the newspaper in order to place the pool on top.
- Ask students to form a large circle around the pool.
- Ask students to put on their safety goggles and to fill the pool with a layer of coffee grains, starch, sand, gravel, dirt, rocks, water, and plaster of paris.
- Ask students to stand at different altitudes and carefully drop 3 rocks into the pool.
- Ask:
    - What happened?
- Provide students with enough time to answer the question.
- Explain to students that what thae have just done is similar to what happened to the surface of the moon when the asteroids and the comets landed on it. These impacts created the different size craters on the moon.
- Explain to the students that they will observe the model that they made for a week.
- Ask students to make drawings and keep notes in their scientific journals describing the daily changes they observe.

Voyage to the Center of the Earth

TEKS: 3.11A

Content Objective: The students will explore what the inside of the Earth must look and be like.

Language Objective: The students will use the words crust, mantle, and layer in writing in their science notebooks.

Five E Connection: Engagement

Materials: (for the class)

a plastic knife	an apple	a hard boiled egg
an avocado	a globe	

Vocabulary:

crust	mantle	outer layer
inner layer	layer	

Process:

- Explain to students that with this activity they will be able to identify and describe the importance of our natural resources including rocks, dirt, water, gases in the atmosphere. They will also learn to classify resources that are renuable, non-renuable and inexhaustible.
- Show the students the egg, the avocado, and the globe.
- Ask:
  - What do these objects have in common?
- Provide students with enough time to answer the question.
- Explain to students that all objects have layers, just like the planet earth.
- Ask:
  - What do you think is inside the earth?
- Explain to students that the earth has various layers: the crust, the mantle, and the nucleus.
- Show the students the egg. Remove the shell and show the eggs layers.
- Peel the avocado and show the students its layers.
- Show the students the apple.
- Ask:
  - What does the apple have on the outside?
  - What do you think is inside the apple?
  - Are there any other layers?
- Ask students to describe what they think is inside the apple in their scientific journal.
- Divide students in 4 groups, and give each group an apple.
- Ask students to cut the apple in half.
- Ask students to examine the apple and compare it to the earth.

- Explain to students that the earth's layer is like the apple's skin. The apple's pulp is lke the eath's mantle and the apple core is like the earth's nucleus.

Solar System BINGO

TEKS: 3.11 C

Content Objective: The students will play a game to become familiar with terminology related to the study of the planets.

Language Objective: The students will match terms with their definitions through listening and responding to the spoken definitions.

Five E Connection: Engagement

Materials: (for each student)

BINGO cards	information cards	beans for counters

Vocabulary:

solar system	axis	orbit
asteroid	star	meteor
galaxy	comet	rotation
movement	gravity	astronomer
astronaut	satellite	

Process:

- Explain to students that in this activity they will be able to identify the planets in our solar system and their position in relation to the sun.
- Ask students to pick a partner to play BINGO with.
- Give each pair of students a BINGO board and some beans.
- Explain that one student Hill read the information cards while the other student places a bean on the correct answer on the BINGO card.

Venus

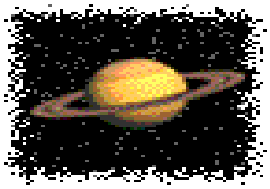
Sun	Movement	Axis	Satellite	Venus
Movement	Neptune	Uranus	Gravity	Earth
Moon	Galaxy	BINGO	Star	Meteor
Comet	Saturn	Asteroid	Mercury	Astronomer
Astronaut	Uranus	Jupiter	Rotation	Mars

Uranus

Sun	Astronaut	Rotation	Star	Comet
Movement	Mars	Axis	Gravity	Moon
Saturn	Gravity	BINGO	Satellite	Meteor
Venus	Astronomer	Earth	Mercury	Asteroid
Movement	Uranus	Jupiter	Rotation	Neptune

Earth

Earth	Mars	Jupiter	Saturn	Mercury
Venus	Neptune	Uranus	Pluto	Sun
Moon	Movement	BINGO	Comet	Meteor
Asteroid	Satellite	Star	Galaxy	Astronomer
Astronaut	Gravity	Orbit	Rotation	Axis

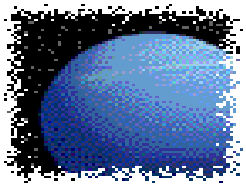


Saturn

Asteroid	Astronaut	Rotation	Star	Comet
Movement	Mars	Venus	Gravity	Moon
Saturn	Galaxy	BINGO	Sun	Meteor
Satellite	Astronomer	Earth	Mercury	Axis
Orbit	Uranus	Jupiter	Rotation	Neptune

Pluto

Saturn	Astronaut	Satellite	Star	Mars
Movement	Neptune	Axis	Gravity	Sun
Comet	Moon	BINGO	Uranus	Meteor
Gravity	Astronomer	Earth	Mercury	Asteroid
Orbit	Venus	Jupiter	Rotation	Neptune



Neptune

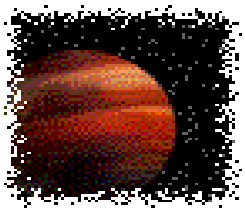
Sun	Astronaut	Saturn	Star	Mars
Movement	Neptune	Axis	Gravity	Moon
Comet	Gravity	BINGO	Satellite	Meteor
Venus	Astronomer	Earth	Mercury	Asteroid
Orbit	Uranus	Jupiter	Rotation	Neptune

Mercury

Sun	Orbit	Astronaut	Satellite	Venus
Movement	Neptune	Astronomer	Gravity	Moon
Earth	Galaxy	BINGO	Star	Meteor
Comet	Saturn	Asteroid	Mercury	Axis
Astronaut	Uranus	Jupiter	Rotation	Mars

Mars

Earth	Orbit	Axis	Satellite	Venus
Movement	Neptune	Uranus	Pluto	Sun
Moon	Mercury	BINGO	Star	Meteor
Comet	Saturn	Asteroid	Galaxy	Astronomer
Astronaut	Gravity	Jupiter	Rotation	Mars



Jupiter

Asteroid	Astronaut	Astronomer	Star	Comet
Movement	Neptune	Venus	Gravity	Moon
Earth	Galaxy	BINGO	Sun	Meteor
Satellite	Saturn	Orbit	Mercury	Axis
Orbit	Uranus	Jupiter	Rotation	Mars

Sun

Saturn	Meteor	Satellite	Star	Mars
Rotation	Neptune	Axis	Gravity	Sun
Comet	Moon	BINGO	Uranus	Orbit
Gravity	Astronomer	Movement	Mercury	Asteroid
Earth	Venus	Jupiter	Astronaut	Neptune

Comet

I am a piece of dark dirty ice, mixed with dust and sand.

Satellite

I am any object in space that orbits another object.

Asteroid

I am a very small object, I can be found in every part of the solar system.

Star

I am a ball of gas in constant explosion. I give off light and heat.

Moon

I am a rock that rotates in orbit around the Earth.

Mars

I am the fourth planet in our solar system. My neighbors are the Earth and Jupiter. I am known as the red planet.

Saturn

I am the sixth planet in our solar system. I am surrounded be rings that are formed from gases and rocks.

Orbit

I am the path that a planet or another thing makes when it goes around another planet, a star, or a moon.

Meteor

A streak of light in the sky at night that results when a meteoroid hits the earth's atmosphere and air friction causes the meteoroid to melt or vaporize or explode.

Sun

I am a mediam size star, and the center of our solar system.

Gravity

I am a force of attraction.

Earth

I am the third planet in our solar system, and I am full of life.

Astronomer

I am the person who studies our solar system.

Jupiter

I am the largest planet in our solar system, and I am the Earth's neighbor.

Astronaut

I am the person that travels through space in a spaceship. I use a special suit to walk on the moon.

Uranus

I am a strange planet because I rotate on my side, and I have 4 moons.

Mercury

I am the planet closes to the sun, therefore I am warm.

Neptune

I am the eighth planet in our solar system. I am blue due to the presence of methane gas in my atmosphere.

Venus

I am the planet in between Mercury and Herat. I am known as the morning star because I shine just like a star.

Pluto

I am the coldest planet in our solar system.

Rotation

I am the movement of an object as it turns on its axis.

Axis

I am an imaginary line that crosses the North Pole and the South Pole.

Movement

I am the practice of changing locations over time.

The Sun and Its Spots

TEKS: 3.11D; 5.3C

Content Objective: The students will describe the characteristics of the sun.

Language Objective: The students will record the characteristics in their science notebooks.

Five E Connection: Engagement

Materials: (for each group)

plastic bowls	whole milk	liquid dish soap, not “Dawn”
toothpicks	dropers	paper towells
red and yellow food coloring	pepper	soda lids

Vocabulary:

Sun spots		

Process:

- Explain to students that in this activity they will be able to describe the characteristics of the sun.
- Explain to students that they will be making a model f the sun.
- Divide the students in groups of 3-4.
- Give each group of students a plastic bowl.
- Ask students to pour ½ a cup of milk in the plastic bowl.
- Ask students to pretend that the bowl is the FACE of a clock.
- Ask students to add a drop of yellow food coloring where 12:00 o’clock would be and another yellow drop where 6:00 o’clock would be.
- Ask students to add a drop of red food coloring where 3:00 o’clock would be and another red drop where 9:00 o’clock would be.
- Ask students to carefully add a little bit of pepper in the middle of the plate without touching the food coloring.
- Ask students to carefully place the end of a toothpick in the liquid soap and place that end of the toothpick in the middle of the milk.
- Ask students to observe what happens for 10 seconds.
- Ask:
    - What happened when the liquid soap was added to the milk?
    - What happened to the drops of food coloring?
    - What happened to the pepper?
    - How does this model compare to the surface of the sun?
- Provide students with enough time to answer the question.
- Explain to the syudents that the sun is composed of gases that are constantly turning and it has black spots called “solar spots” which are in constant motion.
- Ask students to draw a model of the sun with its spots in their scientific journal.

Filtration Across Different Earth Matter

TEKS: 4.11A; 5.11 A

Content Objective: The students will experiment to find out which materials will filter the water most quickly and most slowly.

Language Objective: The students will write about their observations in their science notebooks.

Five E Connection: Exploration

Materials: (for each group)

a 36 inch ruler	4 graduated cylinders	4 two litter bottles cut in half
a chronometer	a 250 ml measuring cup	digging tools
scientific journal	a pencil	4 beach pales
sand	dirt	clay
gravel		

Vocabulary:

filtration	Earth matter	test

Process:

- Divide the students in groups of 3-4.
- Explain to students that each person in the group will be responsable for measuring the time it takes the water to filter through the different matter.
- Ask students to repeat the investigation 2 times (2 tests). Each test will have two different times: Test # 1, test # 2.
- Ask students to use the worksheet to take notes.
- Explain to students that it is important that they follow the instructions carefully in order to acquire scientific results.
- Ask students to use their journals to write down details of the investigation.
- Ask:
    - What do you think will happen?
    - What type of dirt does water filter through more easily? Why?
- Provide students with enough time to form a hypothesis.
- Ask students to share their hypothesis with their classmates.
- Ask 2 students from each group to pick up the materials necessary for the investigation.
- Ask students to fill ½ way each of the 4 bottles with earth matter (sand, dirt, gravel, clay). Make sure to compact the matter into the bottle.
- Explain to students that they need to place the bottles against the graduated cylinders.
- Ask students to place 4 cups of water in each of the beach pales. Ask students to place the water in the bottles at the same time.

- Ask students to time how long it takes for the water to filter through the graduated cylinder.
- Ask students to repeat the same process a second time.
- Explain to students that they need to analyze the results of the investigations.
- Ask:
    - What matter filtered the water faster? Why?
    - What matter filtered the water slowly? Why?
    - Why is it important to know this?
- Provide students with enough time to answer the questions.
- Explain to students the importance of knowing the capacity of filtration of the different earth matters in their daily lifes.
- Ask:
    - Why do we see different vegetations in different areas of the country?
    - How does the filtration of water affects this?
- Ask students to think about other situations in which this information would have impact (cattle industry, house construction, roads, and communities).

Filtration Across Different Earth Matter

TEST	SAND	SOIL FROM GARDEN	GRAVEL	CLAY
# 1				
Beginning Time				
Ending Time				
Total Time of Filtration				
# 2				
Beginning Time				
Ending Time				
Total Time of Filtration				

Effects of Erosion

TEKS: 5.12 A

Content Objective: The students will analyze the positive and negative effects of erosion.

Language Objective: The students will write about how water, ice, wind and gravity affect the surface of the Earth using the vocabulary listed below.

Five E Connection: Exploration

Materials: (for each group)

a 9 x 12 x 2 pan	a poster board	safety goggles
2 cups of sand	2 cups of gravel	a brick
a measuring cup	a fan	a gallon of water
scientific journal	a pencil	

Vocabulary:

erosion	environmental degradation	desintegration
geographic accidents	deposition	sediment
distructive forces	constructive forces	natural forces
agents	gravity	degradation

Process:

- Ask:
  - What causes erosion?
- Provide students with enough time to answer the question.
- Explain to students that the four causes of erosion (movement of sediments) are water, air, ice, and gravity.
- Ask:
  - What examples can you find in the environment regarding these causes?
- Provide students with enough time to answer the questions.
- Show the students pictures of geographical accidents that have occurred due to erosion.
- Divide students in groups of 3-4.
- Ask students to place 2 cups of sand on the right side of the pan in the shape of a mountain.
- Ask students to place 2 cups of gravel on the left side of the pan.
- Ask studnets to place the brick (gravity) under the right side of the pan to elevate the pan.
- Ask students to place the fan (wind) on the table directly behind the pan and to turn it on.
- Ask students to measure 4 cups of water (rain) and to slowly pour it over the mountain of sand and the gravel.
- Ask students to wait 10 minutes and repeat the process with another 4 cups of water until there is no more water.

- Ask:
    - What do you think will happen?
- Ask students to write what they observed in their scientific journal including the answers to the following questions:
    - How does water affect the sand?
    - How does wind affect the sand?
    - How does gravity affect the sand?
    - What are the positive and/or negative affects of these causes of erosion?
- Ask students to share what they wrote in their journals.

Refreshing Water!

TEKS: 1.10 A; 3.11A; 4.11C;

Content Objective: The students will learn about bodies of water such as lakes, creeks, and oceans.

Language: The students will record their research findings in their window books.

Five E Connection: Exploration, Explanation

Materials: (for each student)

construction paper	pencils	markers
crayons	computer	encyclopedias

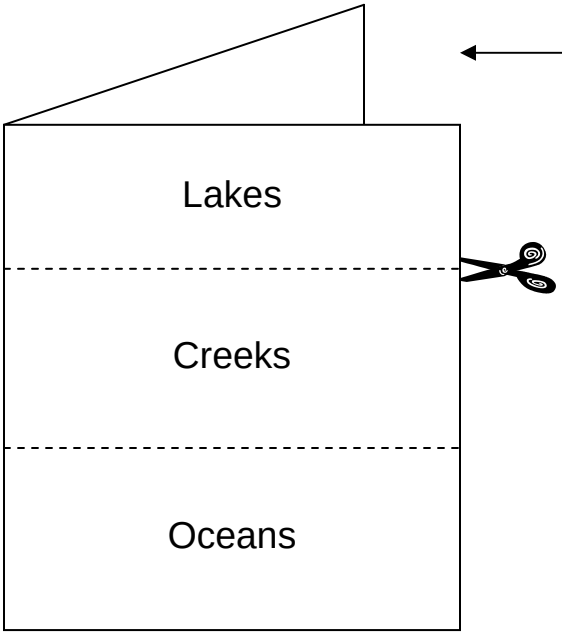
Vocabulary:

bodies	water	creek
lake	ocean	

Process:

- Ask:
  - Where does water come from?
  - Where can we find water?
- Explain to students that they will make a window book to study the natural bodies of water.
- Show students how to make a window book (fold a piece of construction paper in half vertically and then fold it again in three parts, and cut the three windows).
- Ask students to make and decorate their own window book.
- Fill out the information on the first window together.
- Ask students to look up information about the other two bodies of water on the Internet, encyclopedia, or books to write in their window book.
- Review the different bodies of water that they are studying (lakes, creeks, and oceans).
- Explain to students that when they have finished their books they will share their information with the rest of the class.

Window Book


Write the information behind the appropriate window.
Lakes
Creeks
Oceans

The Water Cycle

TEKS: 2.10 A; 5.3C; 5.5A

Content Objective: The students will identify the four stages of the water cycle.

Language Objective: The students will use the vocabulary terms precipitation, evaportation, condensation, and accumulation in their notes in their science notebooks

Five E Connection: Engagement, Exploration, Explanation

Materials: (for the class)

a clear plastic container	a paper cup	food coloring
a lamp	a zip-loc plastic bag	scientific journal
manila paper	a globe	ice

Vocabulary:

water cycle	evaporation	condensation
precipitation		

Process:

- Explain to students that in this activity they will have the opportunity to describe and illustrate the water cycle.
- Prepare this activity an hour before class starts.
- To accelerate the evaporation process boil water on a small hot plate.
- Explain this process to students using examples that we see in our everyday life. (for example what they do to get ready to go school).
- Provide students with enough time to think of cycles that exist in their daily lives.
- Explain to students that there are many cycles in nature, and that the water cycle is very important to our planet.
- Ask:
    - What can we find more of on the surface of our planet, water or dirt?
- Show students a globe, and explain that ¾ of the earth is covered in water.
- Cut the top part of the paper cup so that once it is placed inside the plastic container, it is small enough for the lid to fit.
  Fill the cup with water, place it in the container, and cover it with the lid.
- Place a light directly over the water to represent the thermal energy from the sun.
- Wait 2 hours and ask:
    - What changes can you observe?
- Ask students to write their observations in their journal.
- Place ice in the plastic bag, and place the bag on top of the container that holds the paper cup.
  Once the evaporation, condensation, and precipitation cycle has begun add food coloring to the water in the container. After 10 minutes, the condensed water will have the same color.
- Ask:

    - What happened?
    - Why did the water change color?
- Provide students with enough time to discuss their responses.
  Explain to students that water drops from the bag of ice when the water evaporates, and when the water condenses, the water returns to the container.
- Ask:
    - Can you identify an example of evaporation that you have seen around your home?
- Provide students with enough time to discuss their responses.
- Inform students that when their mom makes a stew, after a few minutes she adds more water to the stew. When she lifts the lid, it has small drops of water, this is called condensation.
- Ask:
    - What process happens when ice is placed on the condensation found on the containers' lid?

  Ask students to draw the water cycle in their journals and label each phase.
- Provide students with enough time to discuss what they learned about the water cycle.

Forming Clouds

TEKS: 3.5 B; 4.6A; 5.5A

Content Objective: The students will learn how clouds form and will identify the different types of clouds.

Langauge Objective: The students will read about clouds and will document their findings in their science notebooks.

Five E Connection: Exploration, Explanation, Elaboration

Materials: (for the class)

a glass container	black construction paper 12x12	a thermos with hot water
manila paper	bag of ice	scientific journal
pencils	a plexiglass	markers

Vocabulario:

clouds	air	surface
prediction		

Process:

- Provide students with the opportunity to learn about the different phases of clouds using library books, the Internet, and teacher led discussions.
- Ask:
  - Who can tell me the four types of clouds?
  - What are clouds?
  - What do clouds have inside?
- Review with students the names of the four types of clouds (cumulus, cirrus, stratus, and cumulus-nimbus).
- Explain to students that they will begin a demonstration to learn more about how clouds are formed and the process of the water cycle.
- Ask:
  - How do you think clouds are formed?
  - What do you think will happen when the hot water is mixed with the cold air in the bag with ice?
- Ask students to write their predictions in their journals.
- Explain to students that you are going to fill the jar with hot water, ½ way full, and place the bag with ice over the opening of the jar (place the bag with ice on top of the jar).
- Make sure to place the jar behind the Plexiglas to protect the students and so that the students can clearly see how clouds are formed.
- Ask students to observe what happens.
- Show students the drops of water that begin to form a cloud.
- Ask:

    - What is happening with the water and the ice?
- Provide students with enough time to discuss their responses.
  Explain to students that the humidity of the hot water (evaporation) rises to mix with the cold surface (the bag with ice). When the humidity cools, drops of water form (condensation). Many drops of water form clouds. When clouds are full of the many drops of water and they begin to cool off, rain drops form (precipitation). The drops of water return to the jar.
- Review with students that this process also occurs in nature with the humidity in the sea.
- Ask:
  Who has seen it rain?
    - How can you explain rain?
- Provide students with enough time to discuss their responses.
- This process of evaporation, condensation, and precipitation, is the water cycle.
- Ask students to use library books, the internet, and look for more information about the water cycle and clouds.
- Ask students to make a flyer explaining how clouds form. They are to include the name of the clouds, a description of the type of cloud, and the climate where the clouds can be found.

Making Clouds

Drawing of Type of Cloud	***Description***	***Type of Climate***
Cumulus	• Large, white • Low clouds	• Warm climate
Cirrus	• Look like feathers • Skinny and white • Made of ice • High clouds	• A sign that the climate will change • Usually bring rain or snow
Stratus	• Large, thick and gray • Low clouds	• When it is cold, it can snow a little • When it is hot, a light rain can fall
Cumulus-nimbus	• Dark and large • Low clouds	• Bring hail storms and tornados

The Climate

TEKS: 5.6A; 5.11A; 5.12A

Content Objective: The students will learn about tools used to predict and/or measure the effects of weathering in the environment.

Language Objective: The students write about and conduct oral reports on weather tools such as the barometer, anemometer, pluviometer, weather vane, and thermometer.

Five E Connection: Engagement, Exploration, Explanation

Materiales: (for the class)

barometer	pluviometer	thermometer
anemometer	weather vane	manila paper
markers		

Vocabulary:

measure	air pressure	wind velocity
wind direction		

Process:

- Explain to students that they are going to make a book about meteorology instruments.
- Give each student a sheet of manilla paper and ask them to fold it in three vertically.
- Provide students with an opportunity to research information about the instruments used by meteorologist (the library, internet, interviews with meteorologist).
  Explain to students how to use the following instruments; the thermometer, barometer, pluviometer, anemometer, and the weather vane.
- Review the following information with the students:
  - Barometer: measures the atmospheric pressure.
  - Thermometer: measures the temperature.
  - Pluviometer: measures the amount of rain that falls in a day.
  - Anemometer: measures the velocity of the wind.
  - Weather vane: indicates the direction of the wind
- Place students in groups of 3 or 4.
  Explain to each group that they will choose one instrument to research. They will write a report they will include all the information that they gathered including a drawing. They will become the experts in the usefulness of the instrument that they selected.
- Help students identify the types of severe weather that exist, and ask that they include how their instrument is usefull in those types of severe weather.

Electrical Storms
Hurracanes
Sudden Floods
Tornados

Earthquakes
Tsunamis

- Provide students with an opprtunity to present their reports with the class.

Light in Winter

TEKS: 4.11C

Content Objective: The students will observe how the angle in which light hits the Earth impacts weather.

Language Objective: The students will record their observations in their science notebooks.

Five E Connection: Engagement

Materials: (for the class)

a flashlight	a black sheet of paper	a table
scientific journal		

Vocabulary:

solar rays		

Process:

- Ask students to gather around the table.
- Turn off the light and make sure you are in the dark.
- Place the black sheet of paper on the table.
- Turn on the flashlight and focus the light on the paper at a distance of approximately 6 inches.
- Ask students to observe the shape and size of the light on the paper.
- Ask:
    - What did you observe?
    - How does the light look?
    - How does the size and shape of the light look?
    - What do you think will happen to the size and shape of the light if we place the light at an angle?
- Provide students with enough time to respond and write their prediction in their journal.
- Place the flashlight at an angle and observe the size and shape of the light once again.
- Ask:
    - What happened?
    - What changed?
- Provide students with enough time to respond.
- Explain to students that when the flashlight is shining directly above the paper, a small and bright circle is produced, however, when the light is placed at an angle, a longer oval shape that is not as bright is produced.
- Ask:
    - How does this relate to the light in winter?
- Explain to students that during winter the sun's light reaches the Earth at an angle, just like the light from the flashlight that was placed at an angle. The sun's rays spread out in longer areas and do not provide as much heat as when they reach Earth

in a straight and direct way.

- Ask:
  - What conclusion can you make from this investigation?
  - What affects the light that reaches Earth during winter?
- Ask students to write in their journal, in their own words, what they have learned during this investigation.

Why is Sea Water Salty?

TEKS: 2.7; 5.5B

Content Objective: The students will analyze the processes involved in making the ocean salty.

Language Objective: The students will discuss the processes orally in small groups.

Five E Connection: Exploration, Explanation

Materials: (for each group)

rock salt	water	a 250 ml graduated cylinder
2 recipientes de plástico	a colander	a probe (100 ml)
materials found in the ocean (optional)	scientific journal	

Vocabulary:

salty	ocean	dissolve
evaporate	mixture	solution

Process:

- Ask:
  - Have you ever tasted sea water?
  - What does it taste like?
- Provide students with enough time to talk about their experiences.
- Ask:
  - Why is sea water salty?
  - Where does sea salt come from?
- Explain to students that they will conduct an investigation to show where salt water comes from and why it is salty.
- Place students in groups of 3 or 4.
- Place a container underneath each colander.
- Put 100 ml of salt in each colander.
- Add 200 ml of water to the container with salt.
- Ask students to write a prediction and document their observations in their journals.
- Ask:
  - What happened to the salt? (it dissolved in the water)
  - What do you think will happen if you leave the container exposed to the sun? (the water will evaporate)
  - Ask students to place their containers in the sun until the water evaporates.
- Ask:
  - How does this investigation relate to what happens in the ocean? (the salt was taken by the water or dissolved in the water and deposited in the ocean)
  - Then why is sea water salty?
  - Where does the salt come from?

- Ask students to write their findings in their journals.

Tremors

TEKS: 3.6 B

Content Objective: The students will simulate an earthquake.

Language Objective: The students will write about earthquakes in their science notebooks.

Five E Connection: Exploration

Materials: (for each group)

9x13" mold	computer	informational books
a pencil	bonbons	toothpicks
soil	scientific journal	rocks

Vocabulary:

earthquake	movement	change
natural forces	consequences	tremors

Process:

- Show the students pictures of the devastation left after an earthquake.
- Ask:
  - What is an earthquake?
  - Why is an earthquake dangerous?
- Provide students with enough time to respond.
- Explain to students that they will make a simulation of an earthquake.
- Place students in groups of 3 or 4.
- Ask students to place a light layer of soil on the bottom of the mold, place rocks on top of the soil, and add more soil to cover the rocks.
- Ask students to design their own city. They can use toothpicks and bonbons to represent buildings. Each group will build at least 6 buildings of different sizes and place them on the surface of the soil.
- Ask:
  - What happens in the Earth during an earthquake?
  - What do you think will happen to the buildings if we move the soil? Why?
- Provide students with enough time to respond.
- Ask students to move the mold from side to side, slowly at first then faster.
- Ask students to write their observations in their journal.
- Ask:
  - What happened?
- Provide students with enough time to respond.
- Explain to students that an earthquake is a movement of the terrestrial surface. The surface of the Earth contains large rocks that simulate a puzzle. They are all glued together. These rocks are called tectonic plates. When they move, the plates cause the Earth to move, and that is when we feel tremors or an earthquake.

Powerful Storms

TEKS: 4.3 C; 4.6A; 5.5AB

Content Objective: The students will create a model of a tornado/cyclone and describe how these systems are formed.

Language Objective: The students will write about tornadoes and create leaflets to share their warnings and suggestions with others.

Five E Connection: Engagment, Exploration, Explanation, Elaboration

Materials: (for each student)

a plastic 20 oz bottle with a lid	a few drops of dishwashing liquid	2-3 small rocks or a penny
water	droppers	scientific journal

Vocabulary:

tornado	vertice	cold air
hot air	cyclone	

Process:

- Ask:
  - What does a windy day look like?
    Have you seen how the trees bend or how cars move when it is very windy?
- Explain to students that strong winds cause a lot of damage to our environment and our natural resources. They also affect our lives. That is why it is very imprtant that we study cyclones and tornados.
- Explain to students that they are going to create their own cyclone.
- Ask students to:
  - fill ¾ of the plastic bottle with water.
  - add 2 or 3 drops of dishwashing liquid in the bottle.
  - drop the rocks or the penny in the bottle.
  - place the lid on the bottle.
  - hold the bottle with both hands parallel to the floor.
  - quickly make circles in the air with the bottles.
  - observe their bottles so that they can see the formation of a tornado.
- Ask:
  - What do you see happening inside the bottle?
  - What does the inside of the bottle look like?
  - Where are the rocks or the penny?
- Provide students with enough time to discuss their responses.
- Explain to students that the center of the tornado raised the rocks or penny. A tornado is a cloud that turns very fast and takes on the shape of a funnel. It keeps getting bigger and it lowers itself from a cloud until it touches the surface of the earth. Tornados are one of the most powerful and destructive storms. The center of the

storm is the vertice. The vertice has an inmense energy and great power. Its' strong winds can lift houses, cars, and animals leaving them in other places. Tornados can even lift trees out by their roots. Tornados generally occur in places where the terrain is flat. Cold air pushes the hot air up. The air that is light rises and quickly turns.

- Find "Tornado Alley" on a map and ask:
  - Why do you think that this map has an area labeled "Tornado Alley"?
  - What do you think occurs there?
  - Why do so many tornados form in that area?
- Ask students to write their thoughts in their journals.
  Provide students with an opportunity to visit the library and search the internet to find information about tornados.
- Ask students to make three leaflets about 3 interesting facts about tornados (for example, safety in case of a tornado).
- Provide students with an opportunity to present their flyers to the class.