**TEKS 1.8 Earth and space. The student knows that the natural world includes the air around us and objects in the sky. The student is expected to:**
(B) observe and record changes in the appearance of objects in the sky such as clouds, the Moon, and stars, including the Sun;
(C) identify characteristics of the seasons of the year, and day and night.

## Background Knowledge

Students will be observing objects in the sky, but first teach them not to look directly at the Sun for their own protection. Objects in the sky have patterns of movement. The Moon reflects the Sun's light, and has a cycle that can be observed. We see the area of the Moon that has the Sun's light shining on it. The Sun is our closest star. As it appears to move across the sky during the day, shadows form and change shape. However, the Sun doesn't move. It is the rotation of the Earth that makes the Sun appear to move across the sky.

Clouds are formed when droplets of water condense in the air. When the water droplets grow too large and are too heavy, they drop to Earth in the form of rain. Temperature changes can cause snow and sleet. A rainbow is the result of sunshine and raindrops crossing paths. The rotation of the Earth causes day and night. Because the Earth spins on its axis or rotates, the stars appear to move across the sky at night.

Changes in seasons follow a pattern and repeat in a cycle of winter, spring, summer, and fall (autumn). In some climates, there are less major changes, so the students need to be taught about customary seasonal changes. (We are discussing the Northern Hemisphere cycle.) The winter can be snowy with animals hibernating and plants going dormant. In spring, the weather begins to warm up, animals awaken, and plants bud and grow. Summer is hot and dry, and animals look for shade, while trees are green and growing fruit. During fall, animals migrate and prepare for the winter. Leaves may change colors and drop in preparation for cooler weather. Crops are harvested.

**Essential Questions**

What natural nonliving objects do you see in the sky?
(Sun, stars, clouds, rainbows, Moon, rain, storms, snow, etc.)

Where is air?
(All around us.)

How do the objects in the sky seem to change?
(Moon appears to change size; clouds blow away or grow dark; the Sun shines "less" at different times of the day and seasons of the year; we see stars shining brightly at night; rarely do we see a rainbow, etc.)

How do we know the difference between night and day?
(Dark/light; cooler/hotter; many animals sleep during night, etc.)

How do we describe the different seasons?

- Winter is colder and darker, days are short, and it sometimes snows.
- Spring begins to warm, it rains, and the plants bud and flower.
- Summer is hot, dry; and the days are longer.
- In fall, the days grow shorter and cooler; and the plants' leaves change color and fall to the ground.

**Sky Talk!**

**Objective:**

To discuss the appearance of objects in the sky such as clouds, the Moon, and stars, including the Sun.

**Materials:**

- Pictures or objects representing clouds, the Moon, stars, the Sun, a rainbow, various precipitation
- Stuffed buddy or object to pass to the person talking
- Science journals
- Pencils

**How to Conduct:**

A. Form a community circle with the pictures/objects in the center.
   Ask:
   - What do all of these pictures and objects have in common?
     (They are objects in the sky.)
   - Which objects do we usually see during the day?
     (Sun, clouds, precipitation, rainbow, sometimes the Moon)
   - Which objects do we usually see at night?
     (Moon, stars, perhaps snow)

   Now, instruct students that they will each have a turn talking about a memory or thought about one of the objects. Explain that only the person holding the stuffed buddy will do the talking, and the rest will just be listening. Each person may choose from the pictures/objects in the middle to talk about when it is his or her turn. While the student is talking, he or she may hold the picture, and then return it to the middle. More than one person may choose the same topic—that is fine.

B. Students may write in science journals about our community circle discussion and what pictures there were to talk about.

**Sky Watchers**

**Objective:**

To observe and record changes in the appearance of objects in the sky.

**Materials:**

Science journals or chart paper, depending on what the class decides.
Pencils

**How to Conduct:**

A. Invite the students to all record changes in what they see in the sky.
   Ask:
   - Where could we all best see the sky at school?
     (Perhaps, from a big window, or outside on the field or playground.)
   - On what should we record our observations?
     (Science journals or large chart paper.)
   - What can we predict will change in what we see at different times?
     (Record the predictions on large chart paper.)
   - How can we observe changes so we can record them?
     (Watch at different times of the day or week; watch during stormy weather, etc.)

B. Take an observation walk at the different times and places decided on for your class and campus. Children should record and write about the changes seen. (Remind students not to touch, taste, or smell anything outside without permission and to stay with you at all times.)

C. Students may record what is seen in the sky during the evening for homework.

**A Year In The Life Of A Lemon Tree**

**Objective:**

To identify the characteristics of the seasons.

**Materials:**

Paper leaves, green on one side and fall colors on the other side.
Bare tree sketched with marker on white board or chart paper.
Yellow paper lemons
Smaller green paper (unripe) lemons
Paper snowflakes
Tacky clay or tape or magnets to attach leaves and flowers to the chart or board.

**How to Conduct:**

Invite the children to be part of a story: A Year in the Life of a Lemon Tree.
Pass out leaves, lemons, and snowflakes.

Ask:

What do you see on the board?
(A bare tree)
What season do you think it must be? Why do you think that?
(winter; bare tree)

Right, this story begins in the winter.

Read:

Once upon a time, there was a lemon tree right by the school. Walking onto campus, one student notes, "That tree has no leaves. I bet it is dead."
"No! I'm not dead, I'm resting!" thought the silent tree. "Oh, I'm getting tired of this cold winter." (Students place snowflakes on board around the tree.)

Three months went by, and sure enough, the tree began to grow new green leaves. (Students place the green leaves on the tree and take off the snowflake.)
"Look!" noticed the student. "It isn't dead at all! Look at all the buds and little green leaves."
The tree was thrilled to show off its new leaves and little white flowers.

After another three months, the weather was very hot and dry. (Students place unripe green lemons on the tree.)
"Man, it's hot out here," commented a student. "That tree looks thirsty and droopy. Maybe I will give it some water. I see little green fruit on it."
"Oh, thank you, thank you!" thought the silent tree, ever so grateful.
"I will one day have fruit ripe enough to eat."

Three more months went by. The weather grew cooler. It was fall.
(Students place yellow lemons on the tree and take off the green ones.)
"Look at those lemons!" said a student. "What a great job, tree! And the leaves have changed colors, just like we change our clothes in the cooler weather."
(Students turn the leaves over on the tree to be fall colors.)
(Students pick all the lemons off)

"Oh, it's been a wonderful year," thought the lemon tree. "I think I'm ready for a rest. Brrr, this weather is cold."
(Snowflakes are added back on.)
And with that, the tree dropped all the leaves.
(Leaves are moved.)

That is a year in the life of a lemon tree.