1. Adventures in Climate and Health: Weather Wizards: Unraveling the difference between Weather and Climate

Student Objectives:

- The students will be able to identify the difference between weather and climate.
- The students will be able to accurately categorize visuals as related to climate or weather.
- The students will be able to describe weather conditions associated with each season in New England.
- The students will be able to identify health conditions associated with each season in New England.
- The students will be able to recognize that some weather conditions and associated health conditions that had been associated with one season, may now be associated with multiple seasons because of climate change.

Materials Required:

Cards with visuals related to weather and climate, baskets, descriptions of weather conditions and health issues for each season, and descriptions of weather conditions and health issues that apply to multiple seasons.

Key Vocabulary:

Weather: the state of the air and atmosphere at a certain time and place
Humid continental climate: an area with 4 seasons, hot summers, and cold winters
Air quality: how clean or dirty our air is
Respiratory infections: an infectious disease of the respiratory tract
Hydration: the process of causing something to absorb water
Precipitation: rain, snow, sleet or hail that falls to the ground

Background Information:

Climate and weather are two different aspects of our environment. Weather is what is happening outside right now or over a short period of time, like a day or a week. It includes things like the temperature, whether it's sunny or cloudy, if it's raining or snowing, and if it's windy or calm. Weather can change from day to day and even throughout the day.

Climate is the average weather conditions in a particular place over a long period of time, usually many years. It's like the "normal" weather for a specific location. It includes things like the average temperature, the typical amount of rainfall, and the seasonal patterns (like summer, winter, spring, and autumn. Climate doesn't change as quickly as weather and is more about long-term patterns.

In New England, we live in a humid continental climate with weather that changes based on the season. In summer, June-August, it's generally humid, with occasional rain showers and thunderstorms with temperatures averaging in the 70s-80s. In the fall, (Sept – Nov) the weather is cooler and drier than summer. In winter, it is usually cold and snowy. In the winter, (Dec-Feb) temperatures often drop to below freezing and we experience storms and blizzards with snow and strong wind. In Spring (March – May), the weather starts to warm up and can bring a mix of rain showers and snow, with the days becoming milder and more pleasant as we get closer to summer.

The main types of climates include tropical, arid, Mediterranean, temperate, continental, polar, and highland. There are also subcategories of climate, for example, NH has a humid continental climate with 4 distinct seasons.

Following are key characteristics of each of the main types of climates:

- Tropical climate- found near the equator, typically hot and humid throughout the year.
- Arid climate- deserts, low precipitation, and high temps, often with sandy or rocky landscapes.
- Mediterranean climate- regions bordering the Mediterranean Sea and other areas typically characterized by mild, wet winters and warm to hot dry summers.
- Temperate Climate- moderate temps and well-defined seasons, found in many parts of the word.
- Continental climate- large seasonal temperate variations with hot summers and cold winters with less influence from nearby oceans.
- Polar climate- extremely cold, located near the Earth's poles (Artic and Antarctica), with low temps year-round, with lots of ice and snow.
- Highland climate- high elevation influenced by altitude. As altitude increases, temperatures tend to decrease, there can be a wide range of temperatures and precipitation patters depending on the specific location.

The climate we live in impacts our health. Higher temperatures mean we must make sure we stay hydrated and don't get overheated. With less days of freezing, there are more ticks and mosquitoes, even in the winter, and they carry diseases. Higher temperatures and more days of pollen can worsen air quality and increase challenges with asthma, allergies, and other respiratory infections. The combination of higher temperatures and changes in rainfall also changes what food can be planted in certain areas and food availability.

Procedure:

1. Fill out the K and W on the KWL chart.
2. Talk with the students about weather and climate by asking questions, such as:
    a. “What are your favorite activities to do in the winter, spring, summer, and fall?
    b. “What are some benefits of knowing the weather forecast?”
    c. “If you were going to go on a trip to someplace like Antarctica or Death Valley National Park, why would it be helpful to know the climate?”
    d. “What’s the weather like today?”
    e. “How would you describe the climate for this month?”
3. Read the background information about weather and climate (first two paragraphs) to the students.
4. Introduce the climate and weather scavenger hunt. Tell the students that there are picture cards scattered throughout the area for them to find. There are two baskets, one for climate related pictures and one for weather related pictures. Each time someone finds a card, they should put it in the corresponding basket. Tell the students how many visuals there are in total and once all the pictures have been found, as a group ask them to identify what makes each picture you hold up from the baskets either weather or climate related.
5. Read the background information about the seasons in New England. Ask questions about the seasons.
    a. “What is your favorite season?”
    b. “What do you do during that season that makes it your favorite?”
    c. “How do you typically dress during that season?”
    d. “What is your least favorite season?”
    e. “What is it about that season that makes it your least favorite?”
    f. “How do you typically dress during that season?”

5. Read the background information about the impact of climate on health. Ask questions about health and climate.
    a. “Ticks are active in NH when the temperature is above 40 degrees. When does the temperature usually get above 40 in NH? Does it ever get above 40 during the winter?”
    b. “Who knows someone with allergies and when are they the most challenging?”
    c. “Who knows someone with asthma and when do they have it the most?”
    d. “Who plays sports during the summer and what do you do to stay healthy?”
6. Lead into this next activity by saying something to the effect of, “Just like the weather changes what we do and what we wear, we also want to be aware of how it can affect our health. By knowing how the weather can affect our health, we can try to slow down the climate changes and adapt by preparing when we go outside. Let the students know that this activity will increase their awareness of weather conditions and the impact on our health. Then have the students identify 4 different areas where you are playing this game, each one will represent one of the 4 seasons (winter, spring, summer, fall). Then tell the students that you will be reading a list of weather conditions and health issues associated with the seasons, and they should run to the season they think is being describe. There will be more than one correct answer for some of the lists, so point that out within the context of climate change, for example, tick bites in December.
7. Conclude the lesson by completing the L on the KWL chart.