

Daily Lesson Plan (DLP)

Topic: Research your growing zone		Day: 2
Grade: 4-5	Lesson Name: Research your growing zone	Time :(60 Mins.)

Topic	How many days is the growing season?		
Weekly key words	Growing season, tropical, annual plants, cultivation, growing season index, etc.		
Seating plan	<input type="checkbox"/> Individual	<input type="checkbox"/> Pairs	Group of 4
Skill development	<input checked="" type="checkbox"/> Reading <input type="checkbox"/> Reflection <input type="checkbox"/> Other (Specify)	<input checked="" type="checkbox"/> Writing <input type="checkbox"/> Illustration	<input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Presentation <input type="checkbox"/> Collaboration <input type="checkbox"/> Observation <input type="checkbox"/> Research

<p>Objectives:</p> <p>➤ The students will be able to:</p>	<p>➤ Learn and know about the growing season.</p> <p>➤ Growing season plants/crops of different regions (tropical, equator)</p> <p>➤ Learn about growing season index</p>
<p>Teaching Resources:</p>	<p>Multimedia/projector, laptop, YouTube, writing board, notebook,</p>
<p>Teaching Learning Strategies</p>	
<p>Introduction: Oral Discussion: Start the lesson by asking the students to differentiate between the first and last frost dates. Listen to their responses and give feedback. 05 mins.</p> <p>Methodology:</p> <p>Discuss that there is the growing season for plants and vegetation all over the year. 10 mins</p> <p>Show the following video to the students using multimedia or a projector.</p> <p>https://youtu.be/n2ulRifkFnQ</p> <p>After watching the video, give them 5 minutes to discuss with their peers and share their understanding of the growing season. Listen to their response and give feedback.</p> <p>The teacher will write down the definition of the growing season on the writing board and will discuss it in detail. 20 min.</p> <p>Definition of Growing Season:</p> <p>The growing season is basically defined as the number of days that last between the last frost date of spring and the first frost date of fall. Frost occurs when the minimum daily temperature falls below 32F.</p> <p>In Massachusetts, the average last frost date in spring has been getting earlier each year while in New England, the frost date in fall has been getting later across New England. The growing season in Massachusetts has been lengthened by 10 days since the 1960s.</p> <p>Future climate projection using a high emission scenario shows that the frost-free growing season across New England is expected to be greater by 2055 while 1-2 months by the end of the century, depending upon the emission scenario.</p> <p>What is Growing Season:</p> <p>Growing season, also called a frost-free season, is that period of the year during which growing conditions for native vegetation and cultivated crops are the most favorable. This growing season becomes shorter as the distance from the equator increases.</p> <p>In tropical and equatorial regions, the growing season normally remains all over the year, while in high altitudes, it lasts for as little as two months or less, e.g: in the tundra.</p> <p>Growing season varies according to the height above sea-level. Higher elevations tend to have shorter growing seasons.</p> <p>Yearly plants complete their life-cycle within a single growing season but biennial plants live for two growing seasons.</p> <p>A plant that lives for more than two growing seasons is called perennial.</p> <p>The growing season for cultivated plants can be increased with the use of greenhouses.</p> <p>Show the following image to the students using multimedia or projector and explain in detail related to the growing season.</p>	



Organic lettuce and peppers growing in a greenhouse. A greenhouse can protect tender or out-of-season plants against excessive cold, thus extending a growing season.

Encourage students to share some more examples of the vegetation of their growing zone.

How to measure growing season:

There are two ways of measuring the length of the growing season.

1. **One** counts the days of the year when the average temperature is above the threshold at which crops and wild plants germinate and continue to grow. This measure varies depending on the species.

For example: wheat and many other plants need an average temperature of at least 5°C (50°F) to germinate. While others, such as corn (maize), have a threshold of germination of 10°C (50°F). Rice has higher threshold of about 20°C (68°F). Generally, in the temperature zones, average temperatures exceed the threshold during most of the growing season---which begins when the threshold reaches spring and ends when the temperature drops below it. Plants need average temperature to exceed the threshold during most of the season in order to mature rapidly. Latitude or elevation keeps average temperatures at or near the threshold all season long, plants ripen slowly and do not develop as fully as they will do in more compatible temperatures.



frost

2. **The other way** of measuring the length of the growing season is stated in terms of frost-free days—the average number of days between the last frost of spring and the first killing frost of fall or winter. Most agriculture requires a frost-free season of at least about 90 days. Some areas of temperature zone countries, such as mountainous areas, have fewer than 90 days in their frost-free seasons, and this is also true of subarctic regions. Such areas are restricted to crops that can germinate and mature within their shorter seasons. However, in these higher latitudes the greatly increased duration of daylight in summer compensates significantly for shorter frost-free seasons. Other areas within temperature zones, where warm oceanic or air currents greatly prolong high average temperatures, may have 240 or more frost-free days every year.

What is Growing Degree Days (GDD) Index?

Growing degree days (GDD) is an index that measures accumulated warmth. GDDs are additive, and so they gather day by day throughout the growing season as Accumulated Growing Degree Days (AGDDs). Once ample GDDs have occurred in sequence and a particular growing degree threshold is surpassed, reoccurring life event cues including transitions (e.g, migration, hibernation), and biological events (e.g, blooming, leaf-out) are triggered.

How are Growing Degree Days calculated?

The growing degree days are calculated for a given day with the average of the daily low and daily high temperatures, minus a base temperature. Base temperature varies by species, although a standard reference temperature (50°F or 65°F) is generally used in weather reports. GDDs begin accumulated, depending on the program and research method, either January 1st or March 1st every year and eventually reach the growing degree threshold. The formula to measure GDDs.

$$\text{GDD} = \left[\frac{(\text{Max Temp} + \text{Min Temp})}{2} \right] - \text{Base Temp}$$

What is pruning?

Pruning, in horticulture, is the removal of parts of a plant, tree, or vine that are no longer productive, are no longer visually pleasing, or are injurious to health or development of the plant.

Pruning is common in orchard and vineyard management for the improvement of flowering and fruiting. In-home gardening (e.g, rose culture), pruning enhances plant shape and flowering potential.

Activity: (20 mins.) (Group Work)

Divide the students into groups of 4-5 students and assign them to note down how to grow onion mentioning site selection, seedling management, transplanting, management, harvesting, and post-harvest handling.

<https://youtu.be/ZYkG2ta3Ctc>

Wrap up (5mins.): Wind up the lesson by asking the students randomly to assess their understanding of the topic.

Individual Work:

Ask each student randomly to share their understanding of the growing degree days index.

Home Assessment:

The students will do the given worksheet as homework.

Worksheet (Day1)

Lesson Evaluation:

- Teacher was able to accomplish all aspects of the lesson well ☐
- Teacher was not able to do warm up activity ☐,
- develop lesson plan well ☐,
- do the learning activity ☐,
- do wrap up ☐,
- accomplish lesson objective ☐,
- manage time well ☐,
- manage class well ☐

Worksheet Day 2

Name: _____

Class: _____

Topic: Growing Degree Days

Subject: Science

Directions: Look at the given table and measure growing degree days (GDDS), using the base temperature 4°C and 10°C using the formula to measure GDD.

Date	Max temp (C)	Min temp (C)	GDD (at the base temp 4°C)	GDD (at the base temp 10°C)
1/07/2014	12.4	8		
2/07/2014	14.6	7.4		
3/07/2014	11.1	1.2		
4/07/2014	11.5	1.4		
5/07/2014	13	2.2		
6/07/2014	14.9	4.5		
7/07/2014	13.2	2.7		