

Daily Lesson Plan (DLP)

Topic. Plot your Plants.		Day: 2
Grade: 4-5	Lesson Name: What is the evapotranspiration rate for the hottest month in your location?	Time :(60 Mins.)

Topic	What is the evapotranspiration rate for the hottest month in your location?		
Weekly key words	simultaneously, millimeter, factor, weather, parameters, 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

Objectives: ➤ The students will be able to:	➤ Learn about the rate of evapotranspiration for the hottest month
Teaching Resources:	Laptop/multimedia, pictures, writing board, notebook, piece of paper, pen/pencil, plants, worksheet
Teaching Learning Strategies	
Introduction: 5 mins. Start the lesson by asking the students to tell if they know about evaporation and transpiration. Listen to their responses and give feedback. Methodology: (20 mins.) The teacher will <i>vapotranspiration is the process of evaporating water from leaves through plant transpiration during photosynthesis. It varies because of a multitude of factors like wind, temperature, humidity, and water availability.</i> Evapotranspiration is a main component of the water cycle and is important in crop maintenance.	

Evapotranspiration is an important process in the water cycle because it is responsible for 15% of the atmosphere's water vapor. Without that input of water vapor, clouds couldn't form and precipitation would never fall. Evapotranspiration is the combined name for the processes of evaporation and transpiration. When water vapor is released into the atmosphere both processes are involved, so they have been combined into one word to cover all bases.

The evaporation in evapotranspiration refers to water evaporated from over land. This includes evaporation from soil, wetlands, and standing water from places like roofs and puddles. It can also refer to direct evaporation of liquid water from the leaf surface of the plant.

Transpiration happens when plants release water vapor from tiny holes, called stomata, in their leaves. This is caused in part by the chemical and biological changes that occur as the plant undergoes photosynthesis and converts carbon dioxide into oxygen. Transpiration performs the same function as a human sweating because plants do it to cool down their leaves. Figure A shows the stomata on the underside of the leaf releasing water vapor (blue arrow) because of the warmth from the sun.

There are a whole host of factors that affect evapotranspiration:

Temperature – As temperature increases, the rate of evapotranspiration increases. Evaporation increases because there is a higher amount of energy available to convert the liquid water to water vapor. Transpiration increases because at warmer temperatures plants open up their stomata and release more water vapor.

Humidity – If the air around the plant is too humid, the transpiration and evaporation rates drop. It's the same reason sweat does not evaporate from our skin when it's too humid.

Wind speed – If the air is moving, the rate of evaporation will increase. The wind will also clear the air of any humidity produced by the plant's transpiration, so the plant will increase its rate of transpiration.

Water availability – If the soil is dry and there is no standing water, there will be no evaporation. If plants can't get enough water, they will conserve it instead of transpiring by closing their stomata.

Soil type – Soil type determines how much water the soil can hold and how easy it is for the water to be drawn out of it, either by a plant or by evaporation. For areas where the ground is covered by vegetation, the rate of transpiration is considerably higher than the rate of evaporation from the soil.

Plant type – Some plants, like cacti and other succulents, naturally hold onto their water and don't transpire as much. Trees and crops are on the other end of the spectrum and can release copious amounts of water vapor in a day. For example, an acre of corn can release 4,000 gallons of water vapor a day and a single large oak tree can transpire 40,000 gallons of water vapor in a year.

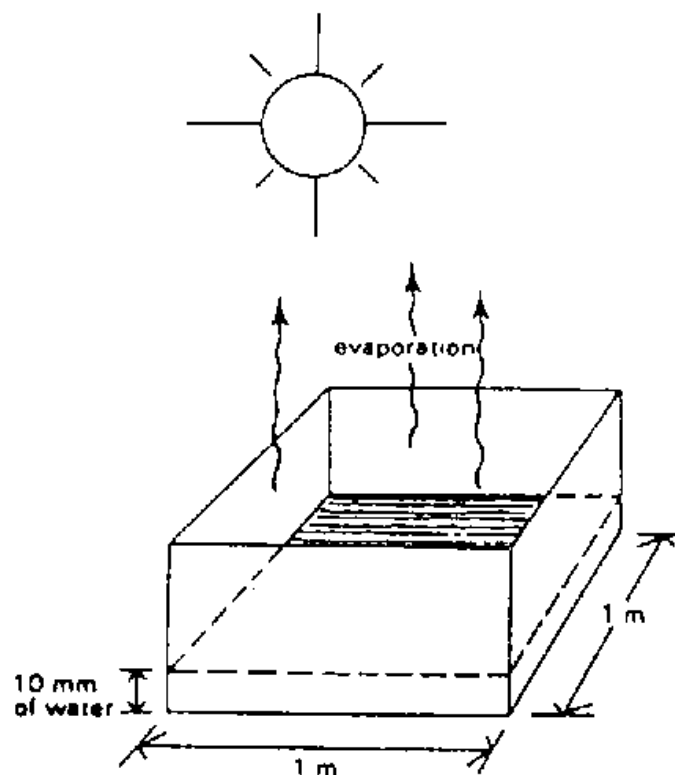
How does this relate to agriculture?

If you can predict evapotranspiration rates, you will be able to estimate the water demands of the crop. This may help you to determine whether or not to irrigate, for example. If crops do not receive enough water, their leaves may curl and their production decline as the plants fight to conserve what water they can. Knowledge of predicted temperature and wind conditions from weather forecasts can give you a clue to how strong the evapotranspiration rates will be.

Evaporation may also directly affect soil moisture conditions. If there is too much moisture in the soil, the farm machinery can get bogged down because it has to work too hard. The weight of the machinery can also compact the wet soil, leading to lack of air for healthy root systems to develop. If the soil is too dry, however, the plants may be easily stressed due to the lack of available water and a crust may sometimes form on top of the soil. This crust may be so impermeable that when it rains on top of the crusty soil, the rain runs right off rather than soaking in.

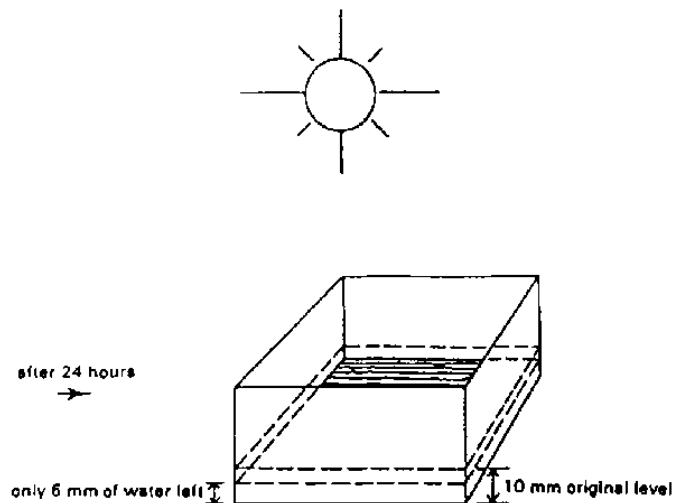
Evaporation:

Imagine the same open container (Section 4.1.1) as used for the collection rainwater, but this time with a depth of 10 mm of water in it; leave the container in the field for 24 hours. Make sure that it does not rain during those 24 hours (Fig. 68a).



At the end of the 24 hours, part of the water originally in the container has evaporated. If only 6 mm of water depth remains in the container, then the evaporation during this day was $10 - 6 = 4$ mm (see Fig. 68b).

Fig. 68b. After 24 hours, 6 mm of water is left in the container



Some water from the soil in the field surrounding the container has also evaporated during the day. But it would be wrong to assume that the evaporation from the container is the same as the evaporation from the soil.

In fact, evaporation from the soil surface is at most equal but usually considerably less than evaporation from an open water surface.

Activity: (30 mins.)

Evapotranspiration

The evapotranspiration of a crop is the total amount of soil water used for transpiration by the plants and evaporation from the surrounding soil surface.

In other words, the crop evapotranspiration represents the amount of water utilized by the crop and its environment.

Evapotranspiration is commonly expressed in millimeters of water used per day (mm/day) or per week (mm/week) or per month (mm/month).

4.2.4 Factors influencing crop evapotranspiration

Many factors influence the evapotranspiration of the crop. The main ones and their effects are shown in the following table.

Factor	Effect on crop evapotranspiration	
	high	low
Climate	hot	cool
	dry	wet
	windy	no wind
	no clouds	cloudy
Crop	mid/late season	initial or ripening
	dense plant	wide plant
	spacing	spacing
Soil moisture	moist	dry

Wrap up (5mins.): Wind up the lesson by asking the students randomly to share their findings.

Home Assessment:

The students will do the worksheet as homework.

Worksheet

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

Name: _____

Class: _____

Topic: Plot the Plants

Subject: Science

➤ **Name and describe any of three of the factors that affect evapotranspiration:**
