

Movement, Sensitivity and Growth in Plants.

PASTURE MANAGEMENT IS MORE THAN JUST WATCHING THE GRASS GROW.

ESSENTIAL QUESTION

Could we convert the 1st XV field to a working dairy farm?

WHAT ARE WE LEARNING?

- Explain how living things are suited to their particular habitat.
- Ask questions and find evidence to support a theory.
- Understand the variables farmers must manage to create good pasture for their animals.

TRY THIS WITH

- Year 9-10
- Students who have an interest in farming.
- Students who enjoy the practical application of abstract concepts.

FIND

- Infer
- Rephrase
- Compare
- Explain
- Observe
- Review

Challenge students to pin as many photos of as many plants as they can in 10 minutes.

Award extra points for a plant living underwater, largest and smallest, strangest location; the furthest away from the class' current location; diversity, etc.

Reinforce the fact that every plant has common elements despite their diversity.

Use Time Lapse videos to step through the stages of plant growth - focus on mitosis.

Create an Explain Everything to show different stages

Create a Pinterest Board of magnified plant cell images.

Revisit the core elements of photosynthesis by brushing up on your French.

"Translate" each stage of the process by inferring from the visuals what is being demonstrated.

Use TedEd to flip 'Crash Course: Photosynthesis' and 'Vascular Plants' and swap flips between groups.

Identify core elements of a plant cell across the samples the students have found.

Introduce the concept of tropisms and environmental factors.



APPLY

- Classify
- Identify
- Examine
- Highlight
- Reason
- Summarise

Review Rye Grass as a plant and introduce the three leaf stages.

Explain that the class will be making a recommendation to the principal regarding the suitability of the school rugby fields for conversion to a dairy farm.

Review key requirements for pasture production - temp, soil type, condition, etc.

Inspect and photograph individual Rye Grass plants and assess which stage of growth they are at.

Identify current pasture growth and evidence of pugging.

Test your playing fields at the correct depth for temperature.

Take a sample of soil from your school playing fields .

Investigate the soil type using Soil Texture by Feel.

Classify it using the Soil Texture Triangle.

Consider sending the soil to be profiled (for a small fee) by Hill Laboratories (pH, etc).

Use the Pasture Growth Forecaster to determine pasture growth trends for your region.



PRODUCE

- Hypothesise
- Discuss
- Conclude
- Evaluate
- Recommend
- Justify

Explain that the main goal of a dairy farmer is to produce the most milk possible and that farmers carefully consider the conditions before they plant new pastures.

Use the soil from your playing fields as the core invariable variable (you cannot change the essence of the soil on which you farm).

Develop an investigation to test the effects of one environmental condition on the growth of Rye Grass.

Support students to predict a range of environmental conditions they think may affect growth including tropisms.

Agree set criteria by which to measure the relative success of their investigation.

Create a time lapse movie using glimpse lite of your grass growing.

Harvest each of the plants in their entirety as they reach the 2½ - 3 leaf stage.

Wash all soil from the plants and dry the plants in an oven at 27°C to create "dry matter".

Evaluate your individual dry matter and consider the criteria established at the beginning of your investigation.

Present your recommendations to your principal.



SUCCESS CRITERIA

Students can check they have successfully completed the task by:

- Translating Photosynthesis by correctly identifying the parts of the process of photosynthesis.
- Identifying and recording a series of environmental conditions for your study site.
- Conducting an investigation that evaluates the effect of one environmental condition on pasture growth.

PRINCIPLES	VALUES	KEY COMPETENCIES	LEARNING AREAS	WORD BANK	KEY CONCEPTS
Learning to learn Future focus	Diversity Ecological Sustainability Excellence	Science Mathematics and Statistics	Science Mathematics and Statistics	1. Dry Matter 2. Loam 3. Photosynthesis 4. Tropism	1. Plant Growth 2. Plant Cells 3. Environmental Conditions 4. Fair Testing