

Subject:	Science
Term/Unit:	1, Unit 2
Grade:	4
Time:	2 hours
Theme:	Living Things, Life Processes and the Environment
Topic:	Applying Information on the Needs Common to Plants to the Design of an Ornamental Garden

Objectives

Students should be able to:

Science

- Apply concepts related to the needs of living things in order to satisfy a need
- Apply the engineering and design process in designing an ornamental garden
- Work collaboratively and cooperatively with peers to create designs and select best solutions

Agriculture:

- Apply concepts related to the needs of plants to develop possible design solutions for an ornamental garden for a selected site or location

Visual Arts

- Observe and identify and discuss the natural and man-made environment
- Interpret designs from the natural and man-made environments

Language Arts

- Engage in Journal writing to reflect on their use of the writing process
- Identify and use sight words appropriate to grade level
- Modify speech and writing with noun substitutes

Spanish - Weather

- Use weather-related vocabulary to compare and contrast the weather conditions in different places as related to different plant environments

Skills: observe, collaborate, communicate, analyse, research, plan and design

Assessment Criteria:

- Concepts related to the needs of plants appropriately connected to aspects of the miniature garden
- Man-made and natural designs relevant to the ornamental garden are interpreted, selected and integrated based on student interests and applied to design process
- Engineering and design process effectively applied to generate ornamental gardening solutions relevant to specified sites
- Sight words (including technical vocabulary) and pronouns appropriately used orally and in writing to complete tasks related to the ornamental garden
- Spanish vocabulary accurately/appropriately used to describe different weather conditions associated with plants in an ornamental garden

Materials: plain paper (size: A4, if possible), pencils, materials to create prototype of garden (students will decide on this based on their designs), paper bag puppets with plant designs, videos (floating gardens, ornamental garden designs).

Engagement:

View and discuss as a whole class, a video on floating gardens to develop awareness of how plants are used to create pleasure/aesthetic appeal. Comment on the use of different designs that include natural and man-made items.

Exploration

In groups, students view a portion of video titled '50+ Best Miniature Garden Design Ideas 2018' https://www.youtube.com/watch?v=4VWiw_eqtcc or other similar videos (Alternatively, view a panorama of miniature garden designs and then plan and design at least two solutions for a miniature ornamental garden. Each group selects the best solution and records reasons for their choice. Students also record the steps they followed in developing the design solutions. Use pronouns and specialist terms (new sight words) appropriately in outlining information.

Guidelines

NB – Science, Agriculture, Visual Arts requirements are captured here)

In planning and designing the garden for a hot and dry backyard the following should be evident:

- ✓ Application of the engineering and design process
- ✓ Evidence of research in development of the two solutions
- ✓ Pros and cons of both solutions
- ✓ Clear reasons for choosing one design over the other
- ✓ Reasons for selection of plants
- ✓ Strategy to maintain garden and keep plants healthy
- ✓ Evidence of the application of knowledge of design elements in natural and man-made environments in the selection of and placement of ornaments for the garden (Visual Arts)
- ✓ Evidence of the application of knowledge of basic elements to be considered when creating a garden (Agriculture)
- ✓ Production of a prototype

Explanation

1. Each group displays, describes and explains (to class) how their prototype represents a miniature garden that will be able to survive successfully under hot, dry conditions. Make a journal entry of their experience in working with their peers to develop the design. Briefly explain the steps and say what big lessons were learnt in terms of new knowledge about agriculture/science and about working with their peers. Use sight words (including specialist terms) and pronouns accurately.

2. Using paper bag puppets associated with different plants in their ornamental gardens, act out brief scenarios in which 'plants' use different weather-related words to 'say how they feel or describe the situations in their gardens'.

E.g.

- Tengo calor (I am hot.)
- Es genial. (It is cool.)
- Hace sol. (It is sunny.)
- Está seco (It is dry.)

Explain how the design of the ornamental garden may address the weather conditions which appear unfavourable and the benefits of the those that appear favourable.

Guiding questions

- How is an ornamental garden similar to a miniature garden such as a greenhouse?
- What will allow this garden to survive under different weather conditions?
- What did you learn about your peers as you worked with them in designing the ornamental garden?

Elaboration

In groups, develop a pamphlet or brochure for peers, outlining brief steps in developing an ornamental garden. List at least three (3) points that should be considered as one does this. Include a picture of an ornamental garden on this pamphlet.

Evaluation

The following tools will be used at relevant portions of the lesson to assign the stated dimensions/elements of the integrated lesson:

- Rubric to assess elements of engineering design process (dimensions of Science, agriculture and Visual Arts concepts and processes)
- Collaboration checklist to be used by teacher to assess the participation of students
- Journal entries to indicate the measure of students' understanding and collaboration with peers – Self and rubric to assess content and use of targeted Language Arts skills.
- Rubric to score class presentations and lab reports