

How the Shadoof? Egyptian Technology

Author Nadia Morello
Grade Level 6
Duration 3 class periods

National Standards

GEOGRAPHY

Element 5: Environment and Society

- 14. How human actions modify the physical environment
- 15. How physical systems affect human systems
- 16. The changes that occur in the meaning, use, distribution, and importance of resources

NGSS ENGINEERING

MS-ETS1-1.

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

AZ Standards

ELA

Writing Text Types and Purposes

6.W.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content

SCIENCE

Life Science

6.L2U1.14 Construct a model that shows the cycling of matter and flow of energy in ecosystems.

Arizona Social Science Standards

Geography

Human-environment interactions are essential aspects of human life in all societies.

6.G2.1 Compare diverse ways people or groups of people have impacted, modified, or adapted to the environment of the Eastern Hemisphere.

G3: Examining human population and movement helps individuals understand past, present, and future conditions on Earth's surface

6.G3.2 Analyze the influence of location, use of natural resources, catastrophic environmental events, and technological developments on human settlement and migration.

SIOP Elements

Preparation

Adapting content
Linking to background
Linking to past learning
Strategies used

Scaffolding

Modeling
Guided practice
Independent practice
Comprehensible input

Grouping Option

Whole class
Small groups
Partners
Independent

Integrating Processes

Reading
Writing
Speaking
Listening

Application

Hands on
Meaningful
Linked to objectives
Promotes engagement

Assessment

Individual
Group
Written
Oral

Arizona English Language Proficiency Standards

Grade 6-8

Basic

Speaking and Writing

Standard 3 By the end of each language proficiency level, an English learner can speak and write about grade appropriate complex literary and informational texts and topics.

B-3: compose informational texts that include details to develop a topic while using appropriate conventions.

B-5: use examples of precise language and domain-specific vocabulary within informative texts
Standard 5 By the end of each language proficiency level, an English learner can adapt language choices to purpose, task, and audience when speaking and writing.

B-2: use general academic and content specific words, phrases, and phrases to express ideas.

Listening, Speaking, Reading, and Writing

Standard 7 By the end of each language proficiency level, an English learner can conduct research and evaluate and communicate findings to answer questions or solve problems.

B-1: gather information from multiple provided resources to answer questions.

B-2: paraphrase observations/information notes with labeled illustrations, diagrams, or other graphics, as appropriate.

Overview

Understanding how civilizations live and survive is important. The Nile River played an important role in shaping the lives and society of ancient Egypt. The Nile River Valley provided the ancient Egyptians with food, transportation, building materials, and more.

Purpose

In this lesson, students will learn about the early civilization of Egypt and how the Egyptians adapted to and modified their physical environment. Their adaptations allowed them to prosper and become one of the great river valley civilizations.

Key Vocabulary

fertile- producing or bearing many crops in great quantities

crop- a plant or plant product that is grown by farmers

flax- a plant grown for its fiber and its seed used to make linen cloth for clothing; main type of cloth used by the Egyptians

papyrus- a plant that grew along the shores of the Nile River used to make paper

inundation- to cover something with a flood of water

harvest- the season when crops are gathered from the fields; gathering crops

irrigation- the watering of land by artificial means to foster plant growth

shadoof- a counterbalanced sweep used since ancient times especially in Egypt for raising water as for irrigation

Materials

- Vocabulary Test and Answer Key
- Projection device/computer/internet
- Why Was the Nile Important in Ancient Egypt YouTube video (3.12 min)
<https://www.youtube.com/watch?v=gO8V3XGMkME>
- Notebook paper or journals

- Video Notes for possible answers
- Vocabulary Cards
- Ancient Egyptian Shaduf YouTube video
<https://www.youtube.com/watch?v=qTsHexCuBrQ> (1.30 min)
- Shadoof Project worksheet
- Possible items to build a shadoof: pencils, paperclips, rubber bands, pebbles, wooden rods, string, yarn, binder clips, brads, cotton balls, index cards, construction paper, small cups, sticks, etc.

Objectives

The student will be able to:

1. Determine or clarify the meaning of unknown and multiple-meaning words and phrases.
2. Write informative text.
3. Analyze the influence of the Nile River, use of natural resources, catastrophic environmental events, and technological developments on human settlement and migration.
4. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, relevant scientific principles, and potential impacts on people and the natural environment that may limit possible solutions.
5. Construct a model that shows the flow of energy.

Procedures

Prior to SESSION ONE, give the Vocabulary Test as a pretest.

SESSION ONE

Engage:

1. Introduce the Nile River by displaying Google Earth <https://earth.google.com/web/@0,-1.46,0a,26090570.70463531d,35y,0h,0t,0r>
First ask what continent is being shown. Then zoom in to show the Nile River. (**Preparation: Link to past learning**) Ask the students to think about, "How was the Nile River was helpful to the Egyptians"

2. To record their answers, have the class, decide on the graphic organizer they will create on notebook paper or in their journals to describe the many ways the Egyptians used the Nile River. **(Grouping Option: Whole class; Scaffolding: Comprehensible input; Integrating Processes: Listening, Speaking, Writing)**
3. Model filling in the graphic organizer with one or two examples given by the class. **(Scaffolding: Guided Practice)**

Explore:

4. Explain that to gain more information they will be watching Why was the Nile Important in Ancient Egypt YouTube video (3.12 min) <https://www.youtube.com/watch?v=gO8V3XGMkME> Think about pausing the video at certain points so students share ideas and can write down their answers. **(Integrating Processes: Listening, Writing)**
5. After viewing the video, have students categorize the ways the Nile River was used into three uses: transportation, activities of daily living, and agriculture. Again, have the class decide on the type of graphic organizer or color coding they would like to use. Note: some statements might fit several categories. **(Grouping Option: Whole class; Scaffolding: Comprehensible input; Integrating Processes: Listening, Speaking, Writing)**
6. Project and explain the Vocabulary Cards. In time remaining have students work in small groups to practice the definitions or draw illustrations of their own for the vocabulary to be learned. **(Application: Linked to Objectives; Grouping Option: Small group)**

SESSION TWO and THREE

Explain:

7. Have students review their graphic organizer from SESSION ONE. Have them focus on the uses that were under the category agriculture. Ask which of their answers would be a kind of technology? (irrigation and canals) **(Preparation: Link to past learning)**
8. Explain that to get the water from the river to the fields of crops, the Egyptians used the shadoof. Project the Vocabulary Card showing the definition of the word and an illustration. Instruct students to complete a Quickwrite 1) Describing how they think the shadoof was built. Remind them to include the materials they might have used from their environment. 2) How does the shadoof work? Describe how the flow of energy is transformed. **(Scaffolding: Independent practice; Application: Promotes engagement)**

9. Project Ancient Egyptian Shaduf YouTube video <https://www.youtube.com/watch?v=qTsHexCuBrQ> (1.30 min)
10. Have the students return to their Quickwrite and have them add or correct their first responses. **(Scaffolding: Comprehensible input; Integrating Processes: Listening, Reading, Writing)**

Elaborate:

11. Ask the class how the farmers in ancient Egypt got a shadoof. Discuss what it is to be resourceful. What resources did they have in their environment?
12. Divide the class into groups of four students. Show them the items to which they will have access.
13. Distribute the Shadoof Project worksheet to each group. Instruct students to complete questions 1-4 before getting materials.
14. Allow the students to research ways to build their shadoof. Note: There are many international videos of school children building shadoofs.
15. Once questions 1-4 are completed, allow groups to gather materials from back table. They can use some or all materials, but no copying other groups. **(Grouping Option: Small groups; Application: Promotes engagement, Hands on)**
16. Have groups test their models. Have groups complete question 5 on the Shadoof Project worksheet.

Evaluate:

17. See Assessment.

Assessment

ELA, Science, and Geography

The Quickwrites and graphic organizers can be graded for completeness. Mastery will be considered a score of 90% or higher. . **(Assessment: Written, Individual)**

The Shadoof Project worksheet can be graded by using the points provided. Mastery will be considered a score of 28 points or higher. . **(Assessment: Written, Group)**

The Vocabulary Test can be given to assess vocabulary acquisition. Mastery will be considered a score of 80% or higher. **(Assessment: Written, Individual)**

Extensions

Hold a competition to determine which shadoof is most effective.

Look at irrigation methods around the world. How do we irrigate in Arizona? How do they do it in China or India or even Montana?

Gather data of standard capacity measurements and create a graph or table.

Sources

Google Earth <https://earth.google.com/web/@0,-1.46,0a,26090570.70463531d,35y,0h,0t,0r>

Why was the Nile Important in Ancient Egypt
YouTube video (3.12 min)
<https://www.youtube.com/watch?v=gO8V3XGMkME>

Ancient Egyptian Shaduf YouTube video
<https://www.youtube.com/watch?v=qTsHexCuBrQ>
(1.30 min)