The Pyramids of Giza: A Marvel of Human Achievement

Although there are nearly one hundred pyramids in the country of Egypt, the three pyramids that occupy the Giza Plateau (a flat, raised part of the desert) are arguably Africa's greatest architectural achievement. Many textbooks and films depict the ancient Egyptian builders of the pyramids as being Indo-European, but Herodotus, who visited Egypt in 440 BCE, records that the Egyptians are “black-skinned” with “wooly hair.” Moreover, the esteemed historian and scientist Dr. Cheikh Anta Diop points out that the ancient Egyptians did not call their homeland Egypt. They called their country “Kmt/Kemet,” a word that means “black community/town.” In their ancient language, it is written ☑️ ☒️ (kemet = black community/town). Hence, we can conclude that the pyramids of Giza are an achievement belonging specifically to African people.

By conservative estimates, the pyramids of Giza were built about 4,500 years ago, but it is important to note that this estimate is still being refined. The Giza pyramids may be much older. The largest of the three pyramids, the Great Pyramid, was built in honor of the King Khufu, the second-largest for his son Khafre, and the smallest of the three for his grandson Menkaure.

The base of the Great Pyramid occupies 13 acres—that is about seven city blocks! The Great Pyramid was constructed by using over 2 million stone blocks. The average stone block weighs 5,000 pounds (2.5 tons). Amazingly, some of the stones weigh as much as 12,000 pounds. Modern scientists are still not certain how the ancient Egyptians pulled off such a large engineering feat in ancient times. Even with current technology, the scientific and mathematical precision of the pyramids have not been
duplicated. This is especially true of the Great Pyramid (the largest of the three). Let us look at the amazing facts about the pyramids.

The Great Pyramid of Giza is one of the Seven Wonders of the Ancient World. It is the only ancient wonder still in existence today.

- The foundation of the Great Pyramid has a ball-and-socket, cornerstone construction that enables it to withstand heat expansion and earthquakes.

- The three pyramids of Giza are precisely aligned with the three stars in Orion’s Belt. Orion’s Belt is a pattern of stars that can be seen in the Earth’s night sky. (See figure A)

![Figure A](image)

- Before the pyramids of Giza were built, several others were successfully constructed, of which one of the most notable is the Step Pyramid of Saqqara, built by the multitalented genius Imhotep.

- For the first 3,000 years of the pyramids of Giza’s history, they were covered in a brilliantly polished, white limestone casing. The pyramids also had a pyramid-shaped capstone placed at the very top. This made the pyramids a fabulously
gleaming sight when struck by sunlight. The slabs of limestone, which were about 2.5 meters thick, were fitted together so carefully that Herodotus reports that the joints could barely be detected. The slabs, some of which were shaken loose by an earthquake in the fourth century, were removed and used to build palaces and mosques in Cairo.

- The Great Pyramid, with its limestone casing, was equivalent in height to a modern forty-story building. For more than 3,000 years, it was the tallest building in the world. The Eiffel Tower, erected in 1889, was the first building to be taller than the Great Pyramid.

- Although it was originally thought that the Giza pyramids were built by slaves, archaeologists have found the towns in which these workers lived, and they have confirmed that the workers were not slaves at all: they were professional artists, stoneworkers, and masons.

- Napoleon’s team of surveyors first realized that the Great Pyramid was not randomly placed when they discovered that a meridian line projected through the highest point of the pyramid would bisect the Nile Delta into two measurably equal triangular sections.

- Inside the Great Pyramid is a king’s chamber, a queen’s chamber, a grand gallery, an ascending passage, and a descending passage. The angle of the descending passage in the pyramid is precisely aligned to the star Alpha Draconis as it was situated in the heavens in the year 3340 BCE. The Great Pyramid captures and freezes this date in time. (See figure B.)
The sides of the Great Pyramid are oriented with amazing accuracy to the four cardinal points of the earth (north, south, east, and west).

The longitudinal lines on which the Great Pyramid sits pass through more north–south land mass than any other global longitude; the latitudinal line of the Great Pyramid passes through more east–west land surface than any other. Thus, the Great Pyramid is situated at the exact center of the Earth’s land masses. This placement is too precise to be accounted for by coincidence. The builders of the Great Pyramid had mathematical knowledge of the entire earth!

Activity One

Geography — On a blank map of Egypt (see appendix A), students should mark the location of the following significant places in Egypt: the Nile River, the Nile Delta, Giza, Saqqara.

Activity Two

Astronomy — Africans of the ancient world were diligent sky-watchers. Students should obtain a current map of the night sky from http://www.astronomynow.com/sky_chart.shtml. Based on a current sky map, students should determine whether Orion’s Belt can be seen in the night sky. Students should take the map home and use it to search the night sky for various constellations.

Activity Three

Field Trip — If it is practical, plan a trip to the Adler Planetarium.

Activity Four

Film — Visit the online exhibit African Cosmos by the National Museum of African Art at http://africa.si.edu/exhibits/cosmos/intro.html. Once at the site, students should examine links entitled Ancient Sky-Watchers and Celestial Deities in the Time of the Pharaohs. Students should also watch the short film entitled Fulani Skies at the link http://africa.si.edu/exhibits/cosmos/video1.html

Students should now have a good feel for the extensive use of astronomy in ancient and modern Africa. Using as examples the ancient use of Orion’s Belt and the Fulanis’ use of Orion’s Belt, students should be encouraged to look at that star pattern and create a story relevant to their particular context.
Activity Five

Portfolio Entry — Based on all the facts offered on the pyramids of Giza, students should plan a visit to the pyramids. In their portfolio, they should create an entry for their visit. It should include who they would like to invite along and what they would teach about the pyramids if they were the tour guide for the trip. The entry can include pictures and travel brochures.

Activity Six

Language — Students should complete the worksheet on Egyptian hieroglyphs (see appendix B).

Activity Seven

Students should complete an essay offering three reasons that engineers and architects still marvel at the pyramids of Giza.
Resources

For Teachers


African Cultural Astronomy: Current Archeoastronomy and Ethnoastronomy Research in Africa by Jarita Holbrook, R. Thebe Medupe, and Johnson O. Urama

Imhotep the African: Architect of the Cosmos by Robert Bauval and Thomas Brophy

Breaking the Mirror of the Heavens: The Conspiracy to Suppress the Voice of Ancient Egypt by Robert Bauval and Ahmed Osman

For Students

Cosmic Africa (documentary; read a review at http://movies.nytimes.com/movie/294225/Cosmic-Africa/overview)

The Great Pyramid at Giza: Tomb of Wonders by Sarah Pitt Kaplan

The Pyramids: Make Your Own by Joanne Mattern

Pyramids of Giza (Structural Wonder) by Sheelagh Matthews

Benjamin Banaker: Astronomer and Mathematician by Laura Bakskes Litwin

Black Stars in Orbit: Nasa’s African American Astronauts by Khephra Bu
Appendix A

Blank Map of Egypt
Appendix B

Hieroglyphs Worksheet

Using a separate sheet of paper, write the word “kemet” as it appears in the list below.
In addition, see how many other words you can copy or create.

$sba$ — star, one who gives light, illumination

$sbeet$ — instruction, wise teaching, deep thought, philosophy

$sba$ — star, light, enlightenment

$sba$ — teacher

$seba$ — school, room of instruction

$saret$ — wisdom, understanding

$sai$ — wise one

$sems$ — elder

$shedi$ — to educate, with the determinative of a woman’s breast indicating that children started school relatively young

$permedjat$ — house of books, library

$perankh$ — house of life

$maat$ — truth, justice, harmony, balance

$sba$ — door to heaven, star gate

$rekh$ — to know, episteme, aware of, to learn, to enquire
rehk djet — to know oneself

rehk — wise man, one who knows

rehket — knowledge, science

ptah hotep — the peaceful creative spirit

1. Starting with a knot of beautiful speech (words)
2. The beginning of splendid discourse (meaning)

m sba khem n r rekh

to instruct those who do not know (ignorant) in knowledge

medew — speech

medew netcher — divine speech

ta seti — Land of the Bow (Nubia)

Nebew — Nubia

kush

km — black

km — charcoal, burnt wood

m — owl as phonetic complement

kemet — black community or town

black people
# Lesson Plan

## The Pyramids of Giza: “Marvel of Human Achievement”

<table>
<thead>
<tr>
<th>Grade Level(s)</th>
<th>Grade 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit and Time Frame</strong></td>
<td>Two 50-minute periods</td>
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<thead>
<tr>
<th><strong>Common Core State Standards</strong></th>
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<tbody>
<tr>
<td>- CCSS. ELA-Literacy. RI.6.4: Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.</td>
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<tr>
<td>- CCSS. ELA-Literacy. RI.6.7: Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.</td>
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<tr>
<td>- CCSS. ELA-Literacy. W.6.2: Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</td>
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<tr>
<td>- CCSS. ELA-Literacy. W.6.3: Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</td>
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<tr>
<td>- CCSS. ELA-Literacy. SL.6.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others’ ideas and expressing their own clearly.</td>
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<tr>
<th><strong>Lesson Goals</strong></th>
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<tr>
<td>- Increase students’ understanding that African people have made great contributions in engineering, architecture and other fields by doing the following:</td>
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<tr>
<td>1. Provide an explanation of how the ancient Egyptians built the pyramids of Giza (which are still considered engineering and architectural marvels).</td>
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<tr>
<td>2. Make the connection between the Giza pyramids and astronomy.</td>
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<tr>
<td>3. Explain how the ancient Egyptians developed a writing system based on hieroglyphics.</td>
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<tr>
<th><strong>Materials/Resources</strong></th>
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</table>
### Key Terms and Concepts

- **astronomy**: the study of objects and matter outside the earth’s atmosphere and of their physical and chemical properties.
- **architecture**: the art or science of building; specifically: the art or practice of designing and building structures, especially habitable ones.
- **archaeology**: the scientific study of material remains (such as fossil relics, artifacts, and monuments) of past human life and activities.
- **pyramid**: an ancient massive structure found especially in Egypt having typically a square ground plan, outside walls in the form of four triangles that meet in a point at the top, and inner sepulchral chambers.
- **hieroglyphics**: written in, constituting, or belonging to a system of writing mainly in pictorial characters.
- **Imhotep**: Egyptian man considered to be the first architect, engineer, and physician in early history.

### Interdisciplinary Connections

**Geography** – Teacher will discuss reading with students. Teacher will have students fill in the attached map with the following locations in Egypt: the Nile River, the Nile Delta, Giza, and Saqqara.

**Astronomy** – Africans of the ancient world were diligent sky-watchers. Students should obtain a current map of the night sky from [http://www.astronomynow.com/sky_chart.shtml](http://www.astronomynow.com/sky_chart.shtml). Based on a current sky map, students should determine whether Orion’s Belt can be seen in the night sky. Students should take the map home and use it to search the night sky for various constellations.

Visit the online exhibit *African Cosmos* by the National Museum of African Art at [http://africa.si.edu/exhibits/cosmos/intro.html](http://africa.si.edu/exhibits/cosmos/intro.html). Once at the site,
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Students should now have a good feel for the extensive use of astronomy in ancient and modern Africa. Based on the ancient use of the Orion’s Belt and the Fulanis’ use of the Orion’s Belt stars, students should be encouraged to look at that star pattern and create a story relevant to their particular context.

**Portfolio Entry**
Based on all the facts offered on the pyramids of Giza, students should plan visit to the pyramids. In their portfolio, they should create an entry for their visit. It should include who they would like to invite along and what they would teach about the pyramids if they were the tour guide for the trip. The entry can include pictures and travel brochures.

**Comprehension**
Language – Students should complete the worksheet on Egyptian hieroglyphs (see appendix B).

**Writing**
Students should complete an essay offering three reasons that engineers and architects still marvel at the pyramids of Giza.

**Anticipatory Set (Opening)**

1. **Opening**: Imagine fans cheering as two teams battle to win the game. Fans and players are shouting and screaming. Sounds like a modern championship game, right? It is actually an early form of the game of hockey played by the ancient Egyptians. Teacher will explain that the ancient Egyptians had many organized sports that included wrestling, boxing, and fencing with sticks. Teacher will tell students that the ancient Egyptians also had their own form of the Olympic Games, with competitions in hockey, handball, gymnastics, spear throwing, weightlifting, various equestrian sports, high jump, swimming, boating, archery, long-distance running, and tug-of-war.

2. **Introduction to New Material:**
   - Main Idea: The mastery of architecture achieved by the peoples of the Nile Valley traveled around the world with them. African people have made great contributions to the fields of engineering and architecture.
   - Activate Prior Knowledge: Teacher will ask students to think about the different new buildings that have been constructed in their neighborhoods in recent years. Why were these buildings
constructed and what was their purpose? Teacher will lead a discussion of how the purpose of a building may influence the design of the building.

Teacher will begin lesson by assisting students in locating Egypt on a map. After Egypt has been identified, teacher will assist students in identifying Giza. Teacher will introduce vocabulary words and discuss them with students. Teacher will explain that although there are nearly one hundred pyramids in Egypt, the three pyramids that occupy the Giza Plateau (a flat, raised part of the desert) are arguably Africa’s greatest architectural achievement. Many textbooks and films depict the ancient Egyptian builders of the pyramids as being Indo-European, but Herodotus, who visited Egypt in 440 BCE, records that the Egyptians are “black-skinned” with “wooly hair.” Moreover, the esteemed historian and scientist Dr. Cheikh Anta Diop points out that the ancient Egyptians did not call their homeland Egypt. They called their country Kmt/Kemet, a word that means “black community/town. It is written 🕉️ Egypt. Hence, we can conclude that the pyramids of Giza are an achievement belonging specifically to African people.

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more east–west land surface than any other. Thus, the Great Pyramid is situated at the exact center of the Earth’s land masses. This placement is too precise to be accounted for by coincidence. The builders of the Great Pyramid had mathematical knowledge of the entire earth!

3. Discussion: Students will respond to the following questions:
   - What are some of the reasons that modern engineers and architects marvel at the pyramids of Giza?
   - Identify some places that archaeology has revealed that African people have been to and left an impact on the architecture.

4. Critical Reflection: Students will complete the following:
   - Define pyramid, architecture, and astronomy.
   - Describe the Ishango bone and explain its significance.
   - What is hieroglyphics?
   - Who was Imhotep?
   - Identify five new things you have learned about the Giza pyramids.

5. Closing: Teacher will reiterate the highlights of the lesson.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Observation, critical reflection activity, participation in class discussion, writing, geography, and science activities</th>
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| Extensions (Homework, Projects) | • Observation, critical reflection activity, participation in class discussion, writing, geography, and science activities  
• Teacher will ask students log on to the [PBS Great Pyramid site](https://www.pbs.org/greatpyramid) to take a look at the blueprints and the interior of the Great Pyramid. |