



## Arab American National Museum

### Arab American Contributions-Grades 4-8

#### Description:

- This lesson highlights the ways Arabs have historically contributed to the global community and the ways Arab Americans currently contribute to the US and world through science, art, and many other venues. Part one is a slideshow about major advancements and contributions of Arabs to civilizations, part two is a visit to the Arab American National Museum with special attention to the “Making an Impact Gallery” and part three is a brief follow up exercise that asks students to think about what kind of mark they would want to leave on the world.

#### Part One

#### Materials:

- Arab Contributions Slideshow. Included as PDF here.
- Arab Contributions Quiz and Key, enough copies of quiz for each student. Included as PDF.

#### Procedures:

- Distribute Contributions Quiz to students. Have students complete it. Should take approximately 10 minutes.
- Use slideshow to correct quiz as group, and as a way to introduce lesson around Arab American contributions.
- Lecture via slideshow, allow time for questions.
- Conclude lecture with contemporary status of Arab world and introduce Arab American National Museum and visit thereto.

#### Part Two

Location: AANM, Second Floor, Making an Impact Gallery

#### Procedures:

- Allow students to peruse the contributions gallery.
- Ask students to respond, formally or informally, to the following questions:
  - What ways have Arab Americans contributed to US culture?
  - Who/what is particularly notable/exciting/unexpected? Why?

#### Part Three

#### Materials:

- Drawing Paper

- Drawing Materials

Procedures:

- Ask students to consider what kind of mark they would like to make on the world. Where and to what things would they most like to contribute?
- Ask students to consider a problem in the world or something about life right now that they would like to see changed or improved. Have them draw that problem or a representation thereof on one half of the drawing paper. On the other half, draw how they envision the solution or the contribution they would make to improve the problem.
- Have students present their drawings and discuss some of their visions for making a contribution.



## Arab American National Museum

### Arab American Contributions-Grades 9-12

#### Description:

- This lesson highlights the ways Arabs have historically contributed to the global community and the ways Arab Americans currently contribute to the US and world through science, art, and many other venues. Part one is a slideshow about major advancements and contributions of Arabs to civilizations, part two is a visit to the Arab American National Museum with special attention to the “Making an Impact Gallery” with follows up questions that ask students to think about why it would be important to consider Arab American contributions to the US.

#### Part One

#### Materials:

- Arab Contributions Slideshow. Included as PDF here.
- Arab Contributions Quiz and Key, enough copies of quiz for each student. Included as PDF.

#### Procedures:

- Distribute Contributions Quiz to students. Have students complete it. Should take approximately 10 minutes. (The quiz could also function as a scavenger activity at the AANM).
- Use slideshow to correct quiz as group, and as a way to introduce lesson around Arab American contributions.
- Lecture via slideshow, allow time for questions.
- Conclude lecture with contemporary status of Arab world and introduce Arab American National Museum and visit thereto.

#### Part Two

Location: AANM, Second Floor, Making an Impact Gallery

#### Procedures:

- Allow students to peruse the contributions gallery.
- Ask students to respond, formally or informally, to the following questions:
  - What ways have Arab Americans contributed to US culture?
  - Who/what is particularly notable/exciting/unexpected? Why?
  - Ask students to consider why it would be important to have a “Making an Impact” gallery for Arab Americans.
  - Do other ethnic groups highlight their contributions in similar ways? What ways? To what end?

- Does having a “contributions” gallery make the group seem more like insiders or outsiders? Why insiders? Why outsiders?



## Arab American National Museum

### Arab World Contributions Quiz

1. Where was the world's first public library?
2. Which of the following English words are from Arabic?
  - a. Alcohol
  - b. Cotton
  - c. Macabre
  - d. Tambourine
  - e. A and B
  - f. All of the Above
3. True or False: Hieroglyphics originated in Egypt, but the written word as we know was a Greek creation.
4. How many of the Seven Wonders of the Ancient world were/are in the Arab World?
  - a. All seven
  - b. None
  - c. Two
  - d. Three
5. True or False: Our current numerical system (1, 2, 3, 4, 5, ...) was created by an Arab mathematician.
6. What century were astronomers able to demonstrate the annual existence of eclipses and even predict lunar eclipses?
7. This author and explorer produced "The Book of Roger" and created a large map of the earth that was exceptional and groundbreaking for its time, the 12<sup>th</sup> century.
  - a. King Roger of Sicily
  - b. Muhammed Al-Idrisi
  - c. Antonio Lafreri
  - d. None of the above
8. This Arab-invented objet allows its user to measure the altitude of the sun and the stars.
  - a. I-pad
  - b. Compass
  - c. Quadrant
  - d. Astrolabe
9. True or False: The field of optometry is a relatively recent scientific advancement.
10. True or False: The Arab music tradition is rich and rather sophisticated, blending unique Arab instruments and beats with Western ones and producing a complex and rhythmic ambiance.

**Arab World Contributions Quiz Key**

1. Where was the world's first public library?

The first public library in the world was founded in Alexandria around 295 BCE by the king of Egypt, Ptolemy I.

2. F. All of the Above!

3. True or false: Hieroglyphics originated in Egypt, but the written word as we know was a Greek creation.

False. Evidence of written systems of communication existed well before the massive intellectual production of the Greeks. From excavations of ancient Uruk, (modern day Warka) in southern Iraq have come some of the earliest clay tablets dated to around 3200-3100 B.C.E.

4. How many of the Seven Wonders of the Ancient World were/are in the Arab World?
  - a. All seven
  - b. None
  - c. Two
  - d. Three

C. Three—The Great Pyramid of Giza is in Egypt. The Hanging Gardens of Babylon would have been in Iraq. The Lighthouse of Alexandria was located in Alexandria Egypt. Many consider Petra, which is in Jordan, the unofficial eighth wonder of the world.

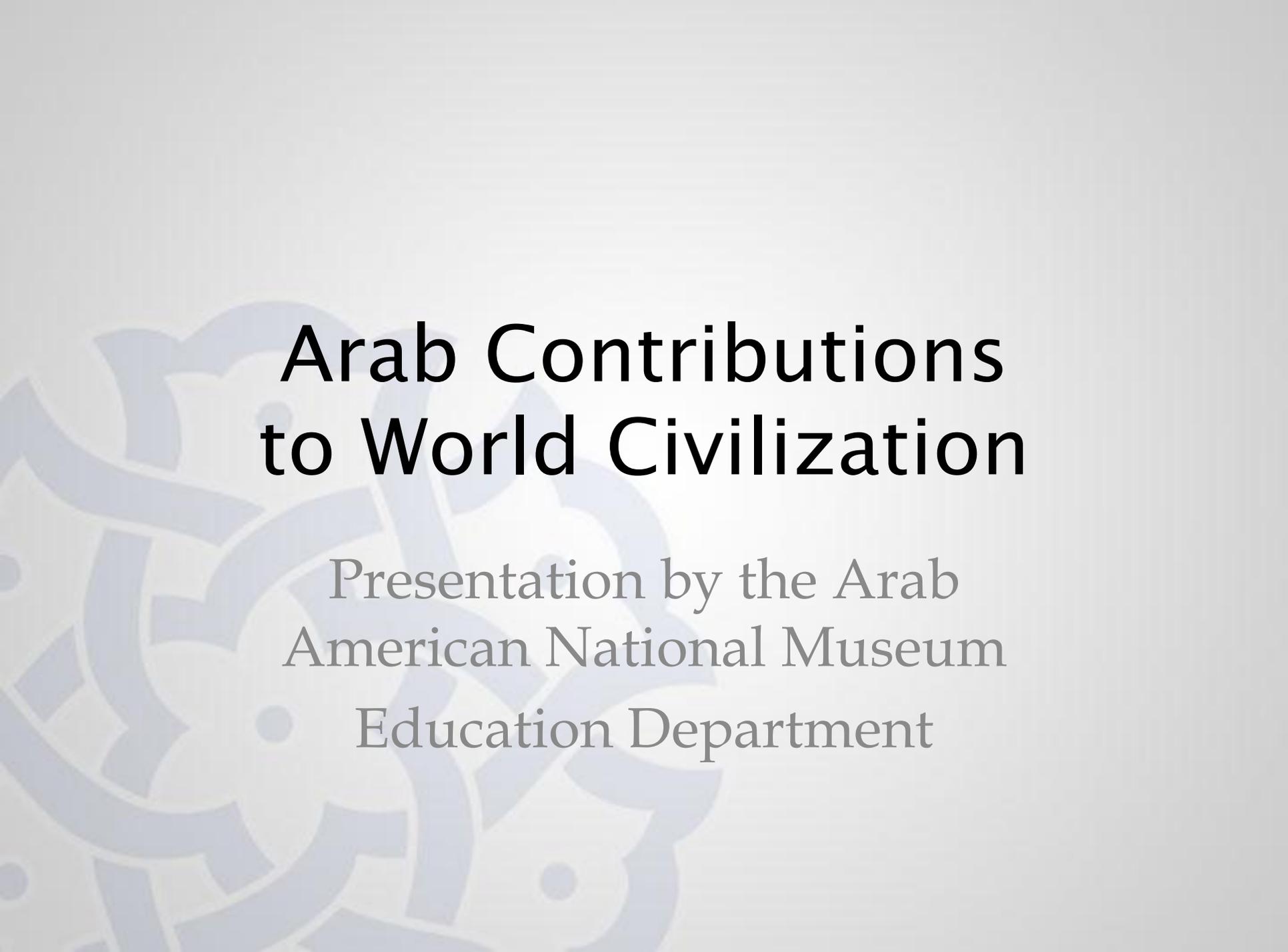
5. True or False: Our current numerical system (1, 2, 3, 4, 5,...) was created by an Arab mathematician.

True! Muhammad Al-Khwarizmi (780- 846) adapted Indian numerals into the now familiar Arabic ones. He was also expanded the use and study of the cipher (zero). Incidentally, the word algebra derives from the Arabic "Al Jabr."

6. The tenth century. Astronomy was much pursued by Islamic scholars in the Abbasid Caliph. Al-Battani demonstrated the existence of annual lunar and solar eclipses while Al Biruni predicted the lunar ones.

7. B. Muhammed al-Idrisi. Al-Idrisi (1100-1166) was a famous Moroccan mapmaker in the twelfth century. He was a scholar in the court of Roger II, the ruler of Sicily, during which time he was commissioned to produce the geographical encyclopedia, "The Book of Roger." In one of his maps, Al-Idrisi included all of Europe, Asia and Africa north of the equator in remarkable detail. He also produced a large silver map of the earth. It was one of the earliest and most important works of its kind. Since "South" is at the top of the silver map it must be turned upside down in order to see the lands of the Mediterranean, Red Sea and Indian Ocean.

8. D. Astrolabe: The Astrolabe, an invention of Arab and Muslim astronomers, was the basic instrument for measuring the altitude of the sun and the stars. It was a tool that told the time of sunrise and sunset for any day of the year. It could also locate the position of the planets and the stars. The earliest known astrolabe is dated to 984 CE. The instrument reached Europe by the thirteenth century and continued to be used there for four hundred years. The Astrolabe, generally small in form, was made of metal and could be an object of great beauty with graceful designs. The Arab astronomer Al Biruni (970-050 CE) used a “mechanical” Astrolabe, which could be geared to move around to find the position of the planets and the stars. (The Quadrant, an important instrument used in navigation as well as astronomy for measuring altitudes. It was usually made of wood or metal and shaped in a half circle. Its original purpose was to measure the altitude of the sun to determine the times of prayer for Muslim worshippers. )
9. False! As early as the 9<sup>th</sup> century, Arab scientists were making significant progress in researching and understanding the physiology of the eye. Hunayn Ibn Ishaq (808-873) wrote the work, “Ten Treatises on the Eye”, an anatomically accurate work that remained standard for four hundred years.
10. True! Arabic music is well known for its beauty and originality. Some typical Arabic instruments are:
  - a. The **Ud**: one of the most popular urban instruments of the Arab world, the *Ud* is a fretless short-necked lute from which the European lute was historically derived. In the medieval Islamic era, it was played by accomplished court musicians and was utilized as a theoretical device for representing various systems of tuning. Today, it is used by theorists, professional artists, and amateur musicians and may be performed either solo or with other traditional instruments.
  - b. The **Nây**: is a traditional end-blown reed-flute widely used in urban Arab music. Associated with certain Sufi groups, the instrument has distinct mystical connotations. Today, it is played in various secular and sacred contexts alone or with other instruments. Typically, the performer uses a set of about half a dozen *nây*-s of different sizes to facilitate playing at different pitch levels. Having six front holes and one thumbhole, the *nây* is known for its haunting, breathy sound.
  - c. The **Ṭablāh** (also called *darbukkāh*): is a goblet-shaped hand-drum with a single skinhead. It is used predominantly in modern Arab ensembles. Originally a folk instrument played in various festivities especially for dance accompaniment, it has retained a certain association with popular entertainment. Today, the instrument has a metal body covered with a plastic head, instead of the natural clay and fish skin, as was the case until recent decades.



# Arab Contributions to World Civilization

Presentation by the Arab  
American National Museum  
Education Department

# Arab Contributions to World Civilization

- Contrary to common stereotypes about the “Arab World” that render it unchanging and uncivilized, Arabs have contributed in important and long-reaching ways to human achievement and world progress.
- Arabs have made contributions to numerous fields, including: Language, Literature, Religion, Architecture, Geography, Mathematics, Astronomy, and Music.

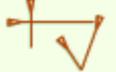
# Language

- Ancient Arab civilizations were on the “cutting edge” of modernity in regards to language development.
- Excavations of ancient Uruk, modern day Warka in southern Iraq, found some of the earliest known clay tablets dated to around 3200-3100 B.C.E.
- At first, only pictures were used to stand in for the word, which they represented. Each sign was impressed on wet clay by a sharp instrument.

# Language

- By 2300 B.C.E. writing had become an abstract wedge-shaped cuneiform script.

- Writing began in Egypt around 3100 B.C.E. It was hieroglyphic (which includes pictographs, ideograms, and phonograms).

original pictograph	pictograph position in later cuneiform	early Babylonian	Assyrian	original or derived meaning
				bird
				fish
				sun, day
				to plow, to till

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- Hieroglyphics were used as late as 400 C.E.

# Language

- The Arabic language is written from right to left. There are 28 letters in the Arabic alphabet and each letter has a different form, depending on its location in a word.
- Arabic is the 6th most common first language in the world and the official language of 21 of the 22 countries which make up the Arab world. (Somalia's official language is Somali.)
- Classical Arabic is the language of the Qur'an and is used today for religious recitations and for formal settings. Spoken Arabic, however refers to the different dialects used throughout the Arab world.
- Arabic has borrowed from other languages such as Turkish, Berber, French, and Spanish. Other languages such as Spanish, English, and Swahili have also borrowed words from Arabic. For example, in the 7th century, European languages borrowed many mathematical and scientific terms from Arabic.



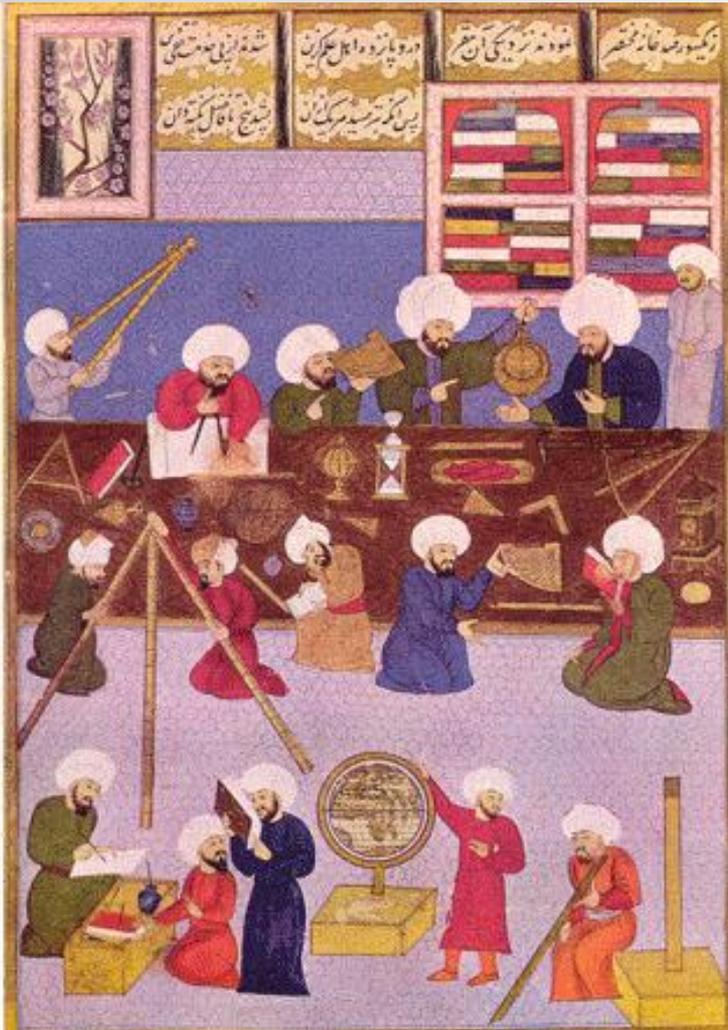
# Literature

- The first public library in the world was founded in Alexandria around 295 BCE by the king of Egypt, Ptolemy I.
- The library was greatly expanded by Ptolemy II (308-246 BCE).
- Various ancient accounts placed its holdings between 100,000 to 700,000 documents.
- Many important thinkers and scientists worked for the library
  - Euclid
  - Archimedes
  - Aristophanes



Visualization of Ancient  
Library of Alexandria.

# Literature



- Beit al-Hikmah (the House of Wisdom) was the second most significant intellectual haven and archive since the Library at Alexandria. It was built in AD 830 and functioned as an academy, museum, library, observatory, and translation center.
- Arab scholars produced prolific translations, which allowed the cross-pollination of ideas across cultures and civilizations, translating in both directions, everything from Latin and Arabic to Spanish and Greek.

# Literature

- A tradition of poetry existed among Arabs long before Islam. At first, poetry was an oral tradition, performed in public either by the poet or a *rawi* (meaning reciter). Poetry during this early period was called *diwan*, meaning the register of what Arabs had done. Poetry thus served as a form of collective memory, although the *rawi* maintained a degree of liberty in improvisation.
- By the 8th century, the highest literary form was thought to be “Desert Poetry” composed by nomadic people of the desert. Poetry also developed in the cities of Baghdad and the Holy Cities of Mecca and Medina. Poems were composed in honor of powerful patrons and to celebrate love. Eventually poetry began to be written and its circulation was aided by the introduction of paper in the 9<sup>th</sup> century.

# Religions

Judaism, Christianity and Islam, the three major monotheistic religions, all originated in what is known today as the Arab World.

The old city of Jerusalem alone contains a significant holy site for each religion:

- The Western Wall (Judaism)
- The Dome of the Rock (Islam)
- The Church of the Holy Sepulcher (Christianity).



View of Western Wall and Dome of the Rock in Jerusalem

# Architecture

- Architecture in the Arab world demonstrates a vibrant and diverse history. Christian churches, Islamic mosques, and other religious and cultural monuments enrich the landscape. In fact, three of the Seven Wonders of the Ancient World are located here: the Great Pyramid of Giza, the Lighthouse of Alexandria in Egypt, and the Hanging Gardens of Babylon in Iraq.
- As the Arab-Islamic Empire expanded, architectural elements were borrowed from a variety of traditions. Mosques and palaces, urban centers and military fortifications met the needs of the new faith in innovative and impressive forms. At the same time, as Christianity continued to flourish alongside Islam, other communities contributed to the diversity of architecture in the region.

# Architecture: Some “Wonderful” Examples

## The Great Pyramid of Giza



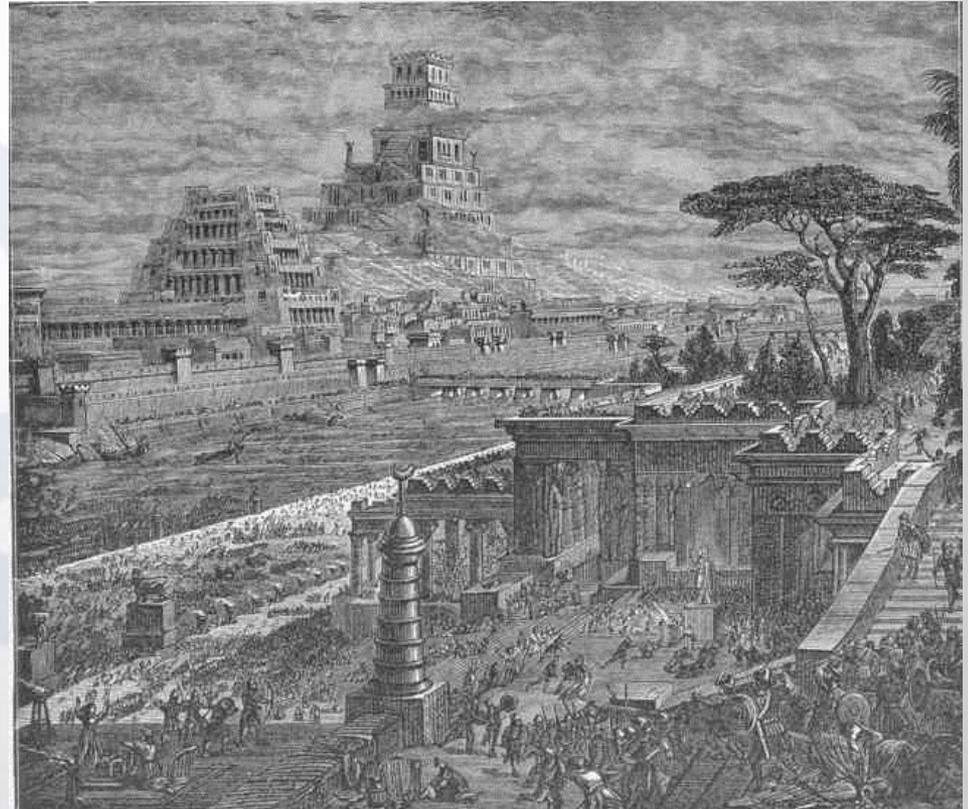
The Great Pyramid of Giza is the oldest and only surviving of the Seven Wonders of the Ancient World.

- Built around 2560 BCE.
- Originally stood at almost 500 feet.
- Took over 20 years to complete ; composed of approximately 2 million blocks of stone, each weighing more than 2 tons.
- Although we still do not understand how the Pyramid was constructed, we know that the Egyptian Pharaoh Khufu built it to serve as his tomb.

# Architecture: Some “Wonderful” Examples

- The Hanging Gardens of Babylon were thought to have been built by the Babylonian king Nebuchadnezzar II (604-562 BCE) for his Median queen Amytis, homesick for the lush gardens of her northern homeland.
- Some scholars believe that the vaults excavated at the king’s palace in Babylon were the foundations for the gardens.

The Hanging Gardens at Babylon



# Architecture: Some “Wonderful” Examples

- The Lighthouse of Alexandria was built in 290 BCE on the island of Pharos by Ptolemy Soter, who was the ruler of Egypt after Alexander the Great.
- In the early 14<sup>th</sup> century, two earthquakes damaged the structure. In 1480 C.E., the Egyptian ruler used the fallen stone and marble to build a medieval fortress where the lighthouse once stood.

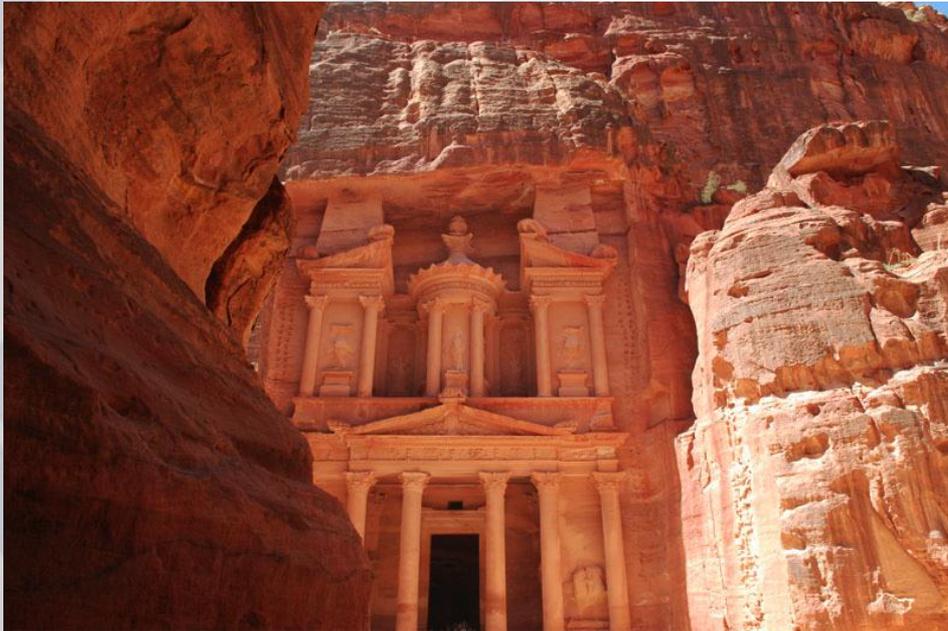
The Lighthouse of Alexandria



Painting by Ferdinand Knab, 1886

# Architecture: Some “Wonderful” Examples

Petra was the capital of the Nabataeans, an ancient Arab tribal people, located in present day Jordan. Petra is famous for its water channels and massive architecture which is carved out of the pink sandstone cliffs.



The Treasury in the city of Petra

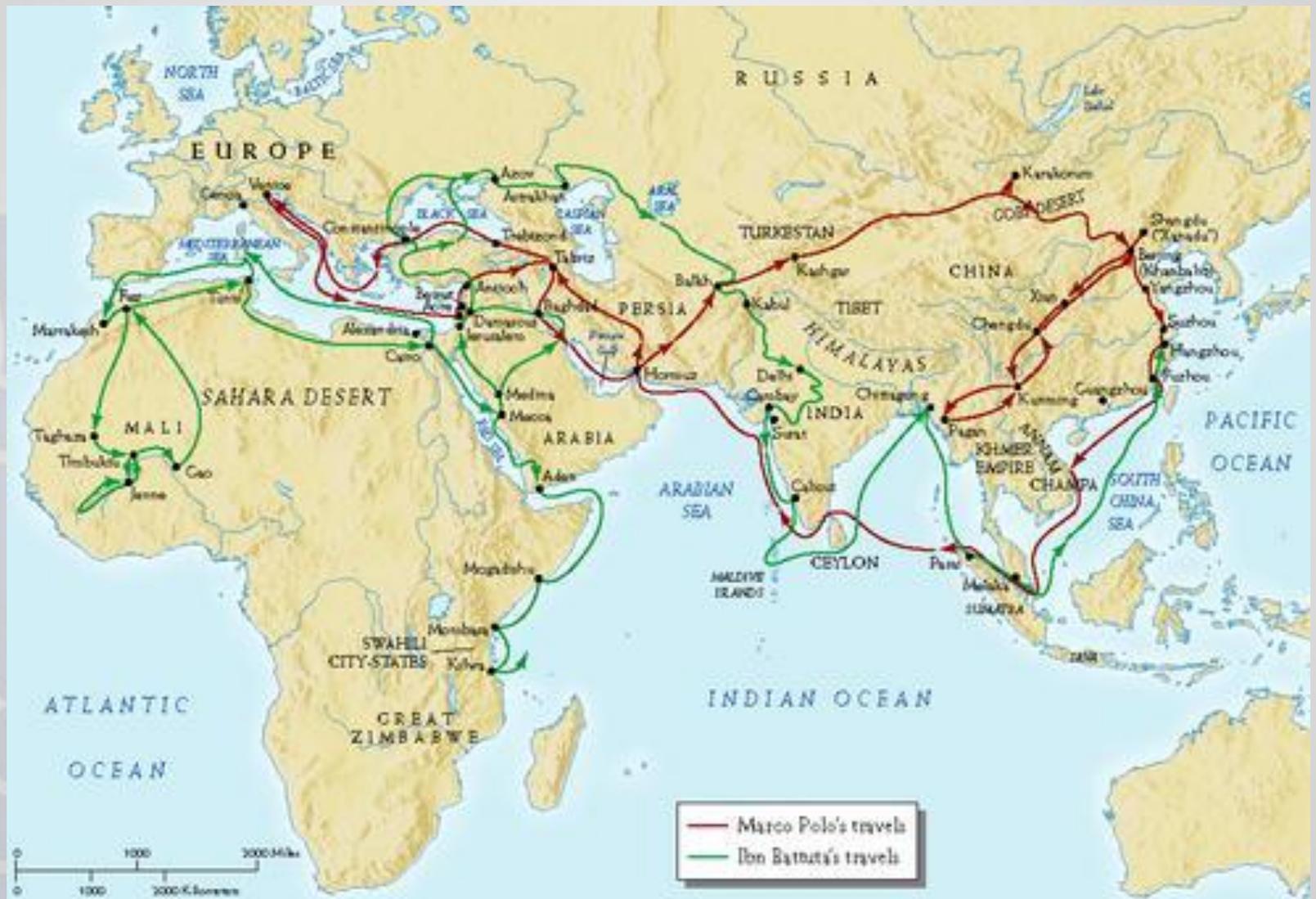
- *Al-Siq*, or the alley, is a winding hidden trail at the bottom of the canyon leading to the ancient city.
- The most famous building is *el Khazneh* or the Treasury. A Temple-Tomb carved of solid rock, the building stands 140 feet high and 90 feet wide. Its façade exhibits influences from Roman, Greek and Egyptian architecture forming a unique architectural style
- Petra is sometimes considered the eighth wonder of the world.

# Geography

- Throughout their travels, Arab voyagers, pilgrims, merchants and scholars helped to develop the field of geography.
- The famous Moroccan explorer Ibn Battuta (1304-1377) traveled seventy-five thousand miles in thirty years. Leaving from his native city of Tangier, Ibn Battuta journeyed throughout Central Asia, Turkey, China, Spain and West Africa. His observations on the geography, politics, economy, and culture of the places he visited were documented and published.



# Ibn Battuta's Travels



# Geography

- Al-Idrisi (1100-1166) was a famous Moroccan mapmaker in the twelfth century.
- He was a scholar in the court of Roger II, the ruler of Sicily, during which time he was commissioned to produce the geographical encyclopedia, “The Book of Roger.”
- In one of his maps, Al-Idrisi included all of Europe, Asia and Africa north of the equator in remarkable detail.
- He also produced a large silver map of the earth. It was one of the earliest and most important works of its kind. Since “South” is at the top of the silver map it must be turned upside down in order to see the lands of the Mediterranean, Red Sea and Indian Ocean.



# Al Idrisi's Map



# Mathematics



- Arabs contributed significantly to the field of mathematics.
- Muhammad Al-Khwarizmi (780- 846) was perhaps the greatest mathematician of his time. He systematized all scientific knowledge known to him, including geography, mathematics, and astronomy, into Arabic.
- He also adapted Indian numbers, now called “Arabic” numbers.
- The mathematical terms **algebra** and **algorithm** are of Arab origins.

• ٩ ٨ ٧ ٦ ٥ ٤ ٣ ٢ ١  
0 9 8 7 6 5 4 3 2 1

**Numerals used by Arabs in the Middle East (top)  
and Arabic numerals used in the West (bottom).**

# Mathematics

- In 1206, the engineer Ibn Ar-Razzaz Al-Jazari published his book, “The Knowledge of Ingenious Mechanical Devices”.
- This book contained engineering treatises on the construction of fifty mechanical devices, with instructions on how to build them.
- There were 173 original illustrations and diagrams on how to build clocks, drinking vessels, basins for bloodletting or hand washing, constructions of fountains and other hydraulic systems, and automated palace gates, alarm clocks, locks, and bolts.
- An elephant clock, a device for measuring time in the shape of an elephant, told time on the half-hour by a complex movement of parts.

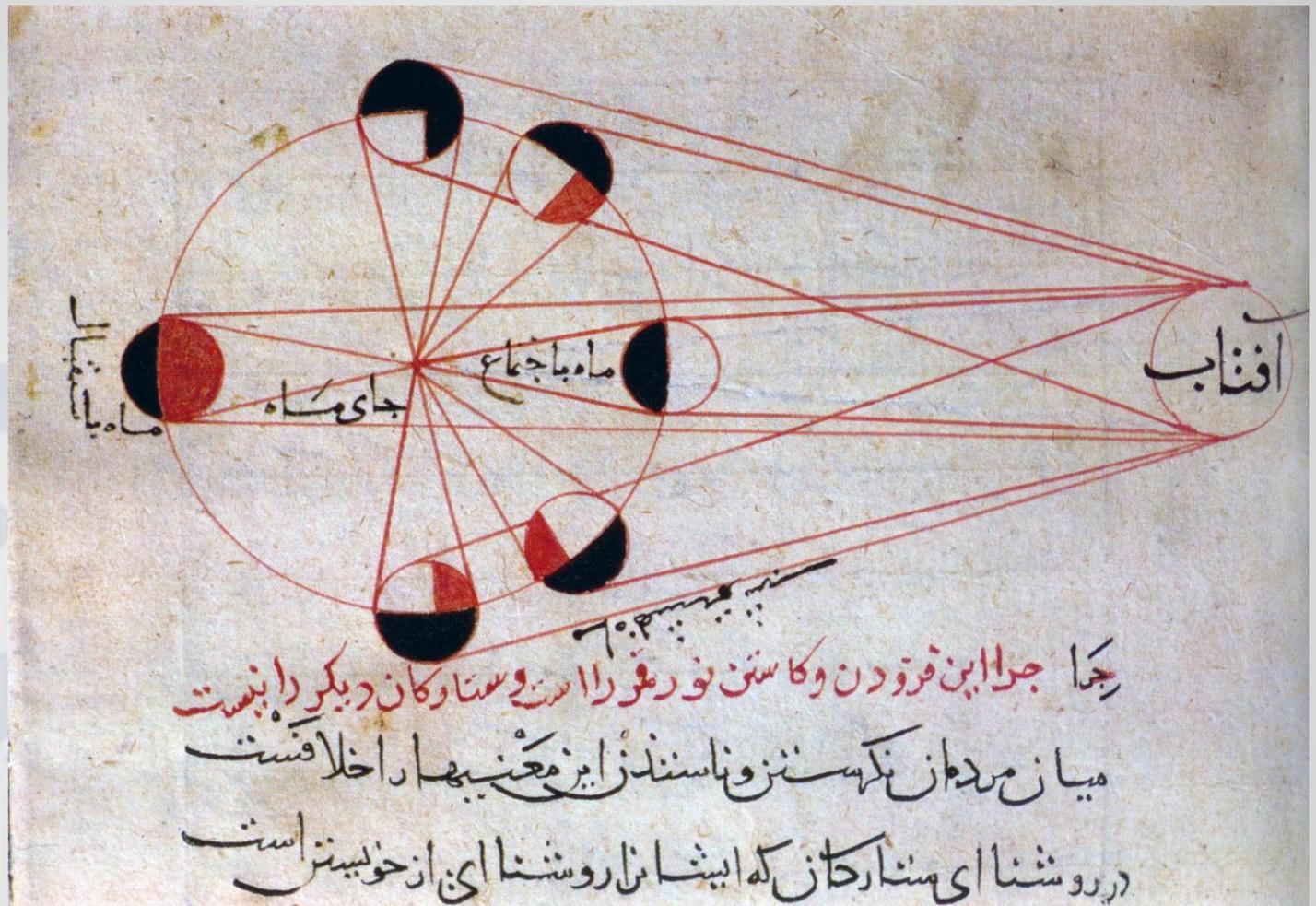


Elephant clock  
illustration from  
Al-Jazari's book.

# Astronomy

- As early as the ninth century, during the time of the Abbasid Caliph (ruler) Al-Ma'mun, observatories were built near Baghdad and Damascus.
- Al-Battani, the greatest Arab astronomer of the tenth century, demonstrated the existence of the annular eclipses of the sun and moon.
- By the end of the tenth century, Al-Biruni was able to precisely predict lunar eclipses.





One of Al Biruni's sketches of the moon cycles. Translation of text:  
 "Why – why the increase and decrease of the light of the moon is settled while  
 other stars don't behave so, observing these and not understanding the spirit of  
 these is a misdeed, that the light of the stars is of their own."

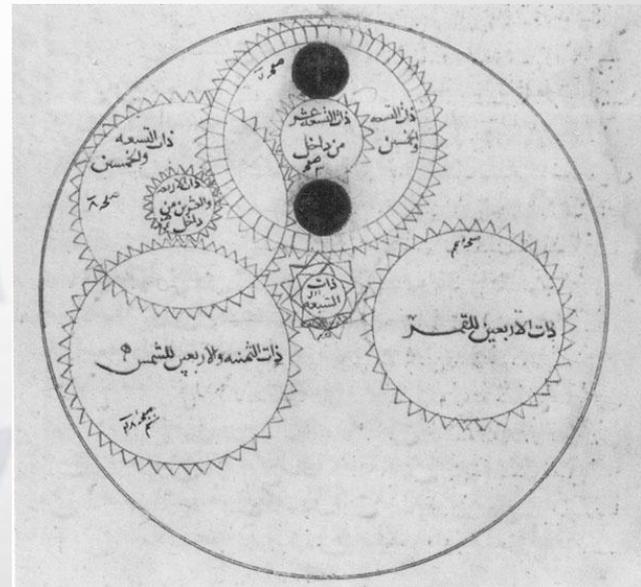
- The Astrolabe, an invention of Arab and Muslim astronomers, was the basic instrument for measuring the altitude of the sun and the stars.
- It was a tool that told the time of sunrise and sunset for any day of the year. It could also locate the position of the planets and the stars.
- The earliest known astrolabe is dated to 984 CE. The instrument reached Europe by the thirteenth century and continued to be used there for four hundred years.

# Astronomy



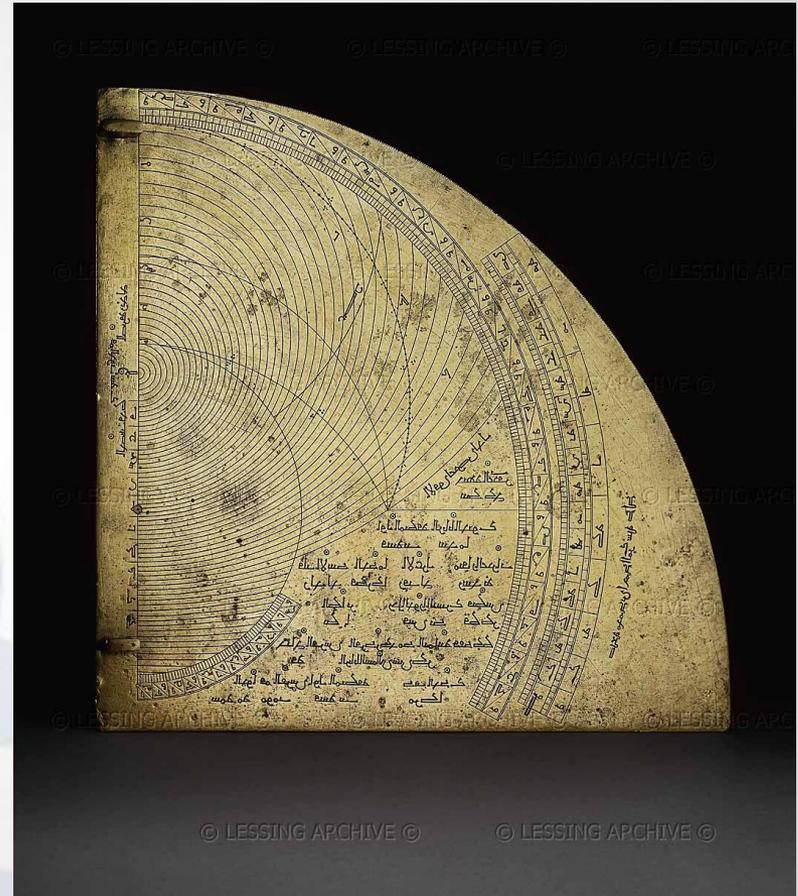
Left: Persian Astrolabe, circa 1991.

Right: Al Biruni's sketch of the first mechanical Astrolabe.



# Astronomy

- The Quadrant is an important instrument used in navigation as well as astronomy for measuring altitudes.
- It was usually made of wood or metal and shaped in a half circle.
- Its original purpose was to measure the altitude of the sun to determine the times of prayer for Muslim worshippers.



Muhammad ibn Ahmad al-Mizzi.  
Astrolabic quadrant, Syrian, around  
1333-1334.

# Arab Contributions to World Civilization

- These are just some examples of Arab contributions to the world. Arabs and the Arab world continue to advance the fields of art, science, literature, agriculture, engineering, and so on endlessly.
- Part of celebrating Arab American culture is recognizing the rich cultural legacy of our ancestors and homelands.
- At the Arab American National Museum, we can see the continuation of the legacy of global and local citizenship in the work of Arab Americans.