Golden Age of Islam

The Spread of Islam - c. 620 to 750
At the time, only Tang China matched Muslim civilization in its degree of sophistication (developed to a highly complex or intricate level).
“Acquire knowledge. It enableth its possessor to distinguish right from wrong; it lighteth the way to Heaven..... it guideth us to happiness; it sustaineth us in misery; it is an ornament amongst friends, an armour against enemies.” (p. 274)
Early Islamic teaching encouraged the pursuit of all knowledge that helped to improve people’s lives.

Arabic became an international language of scholarship.

Muslims translated important works from ancient Greece and Egypt.

Huge libraries were established in big cities like Baghdad, Cairo and Damascus.
“the *ink of scientists* is far more holy than the blood of martyrs”
Golden Age of Islam

Arab culture combined with traditions and knowledge from a variety of lands to create a Muslim civilization that had a cosmopolitan (international) flavor.
Golden Age of Islam: Key Cities

Key **Muslim cities** exhibited this **cosmopolitan** sophistication.

- Baghdad (Iraq)
- Damascus (Syria)
- Cordoba (Spain)
- Cairo (Egypt)
- Jerusalem (Israel)
Even as the Muslim Empire began to divide during the ninth and tenth centuries.....
Golden Age of Islam
Golden Age of Islam

.....scholars, artists and others from all over the Muslim world \textbf{began to extend knowledge} beyond the learning classical (Greek and Roman) texts already written.
established the **House of Wisdom** in Baghdad (p. 276)

library and translation center

translated many Greek works including those by Plato, Aristotle, Galen, and Hippocrates
During the ninth century A.D., Muslim scholars translated and saved

- Ptolemy’s *Almagest*
- Euclid’s *Elements*
- works of Archimedes
Hipparchus (ancient Greek) wrote about trigonometry but because his works have been lost, mathematicians use Ptolemy's *Almagest* as their source for information on Hipparchus' works and ancient Greek trigonometry in general.
also an important source of information on ancient Greek astronomy
Muslims are expected to.....

- **pray five times a day** facing Mecca at the proper times: sunrise, midday, afternoon, sunset and evening

- **build their mosques facing Mecca**
to do this, Muslims needed to determine the direction of Mecca from anywhere determine the phases of the moon
Astronomy was important to Muslims for **practical reasons**
Astronomy contributed to **navigation**
Observations of the sun and moon were used to determine prayer times and an accurate calendar
Large **observatories** were established and **new instruments** such as the **astrolabe** were developed
An illustration from al-Biruni's astronomical works, explains the different phases of the moon.
Golden Age of Islam -- Math

Muslims
Borrowed
the concept
of zero
from India
and developed
Arabic numerals
Ancient Greeks had studied chemistry before the birth of Christ.

Arabs began to study chemistry during the seventh century A.D.

“From the fourth to the twelfth centuries A.D., the original chemical research and writing in Europe was virtually non-existent.”

Introduction to the Arab World - Part II
www.MiddleEastNews.com
Jabir ibn Hayyan

Known to the West as Geber

Born c. 721 C.E.  Died c. 815 C.E.

Born in Persia (Iran)

Sometimes referred to as the

“Father of Arab chemistry”
Golden Age of Islam: Jabir
Jabir - (Geber)

- Recognized the importance of experimentation

- “...perform practical work and conduct experiments...[to] attain...mastery...”
Golden Age of Islam: Chemistry

Jabir

Studied chemical reactions, which have become the foundation of modern chemistry and chemical engineering, such as

- crystallization
- distillation
- calcinations
- solution
- sublimation
- reduction
Jabir

Discovered the following substances and compounds
- red oxide
- nitric acid
- sal ammonic
- nitrate of silver
- ammonium chloride

- bichloride of mercury
- hydrochloric acid
Jabir

Applied his chemical knowledge to the improvement of manufacturing processes such as

- making steel
- preventing rust
- engraving gold
- dyeing and waterproofing cloth
- tanning leather
Golden Age of Islam -- Medicine

Muslim doctors discovered that blood moves to and from the heart.
by 1200, Baghdad had 60 hospitals
Cairo and Damascus and the Spanish cities of Granada, Seville and Cordoba all had hospitals
at this time London was just building its first hospital
Golden Age of Islam -- Medicine

Muslim Hospitals

- medical treatment was usually far superior than in Europe Muslim hospitals
- separate wards for different diseases
- trained nurses and physicians and
- stores of drugs and treatments
- medical knowledge was far more advanced
Muhammad ibn Zakariya al-Razi

Known to the West as Rhazes

Born 865 C.E. Died 925 C.E.

Born in Persia (Iran)
Golden Age of Islam: Rhazes
Rhazes studied several branches of science, philosophy, alchemy, logic, mathematics, ethics, metaphysics and music.

Many of his greatest contributions came in the field of medicine.

He authored over 100 books.
Golden Age of Islam: Medicine

Rhazes

- Diagnosed and treated both measles and smallpox
Rhazes

wrote a medical encyclopedia titled Comprehensive Book which gathered medical knowledge from Greek, Syrian, Arab and Indian sources
Rhazes

hung fresh meat around his city and observed where it spoiled the slowest - built hospital there - patients would recover more quickly breathing clean air
Golden Age of Islam: Abulcasis

Page from a 1531 Latin translation by Peter Argellata of El Zahrawi's treatise on surgical and medical instruments.
Golden Age of Islam: Medicine

Abu al-Qasim Khalaf ibn al-Abbas Al Zahrawi (936–1013), (known in the West as Abulcasis)

- Arab physician considered the greatest medieval surgeon from the Islamic world
- described by some as the father of modern surgery
- greatest contribution to medicine is the *Kitab al-Tasrif*, a thirty-volume encyclopedia of medical practices
Muslims also produced great works of literature.
The most famous were stories of great adventure and fantasy called *The Thousand and One Nights*.
Other famous stories like Sinbad the Sailor, Aladdin, and Ali Baba came out of this period of Muslim history.
Efforts of Scheherezade to keep her husband, King Shahryar from killing her by entertaining him with a tale a night for 1,001 nights.

British translator - Richard Burton
Sinbad the Sailor and Aladdin
Why did the “Golden Age” end?

- **Religious divisions** caused problems by the end of the 11th century.
- Conservative theologians imposed a return to orthodox beliefs and rejected ‘foreign sciences’.
- The European crusades and attacks by the Mongols weakened the empire.
Legacy of Islam’s Golden Age

“...Not only did Muslim Spain gather and preserve the intellectual content of ancient Greek and Roman civilization, it also interpreted and expanded upon that civilization, and made a vital contribution of its own in so many fields of human endeavour - in science, astronomy, mathematics, algebra (itself an Arabic word), law, history, medicine, pharmacology, optics, agriculture, architecture, theology, music. Averroes and Avenzoor, like their counterparts Avicenna and Rhazes in the East, contributed to the study and practice of medicine in ways from which Europe benefited for centuries afterwards.

HRH, The Prince of Wales, Islam And The West
Muslims made advances in other areas as well

- Art & Architecture
- Calligraphy
- Astronomy
- Literature

Read Chapter 10, Section 3, pp. 273-279 and note key advances in these areas