Muslim Achievement

Science and Technology

Name: _____

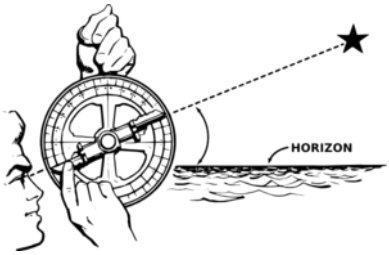
Date: _____ Block: _____

In Baghad, Cordoba, and throughout the Islamic Empire, scientific and mathematical advances were made by groups of scholars who developed new ideas and incorporated ideas from other cultures. Their development of scientific process was based on observation and experimentation.

ASTRONOMY: Muslim interest in astronomy developed from the need to fulfill three of the ***Five Pillars*** - fasting during Ramadan, performing the Hajj, and praying toward Mecca
-a correct ***calendar*** was needed to mark religious periods such as the month of Ramadan and the month of the Hajj
-studying the skies helped fix the locations of cities so that ***worshippers*** could face toward Mecca as they prayed
-to correctly ***calculate*** the locations, Muslim mathematicians developed trigonometry
-cartographers (***mapmakers***) illustrated the information

MAMUN'S OBSERVATORY: In Baghdad, where ***astronomers*** checked the findings of the ancient Greeks
-made ***maps*** of the skies
-produced physical and mathematical ***models*** of the universe
-accurately described ***eclipses*** and proved that the moon affects the ***tides***

ASTROLABE: - an early scientific instrument invented by the Greeks, improved on, and used by Muslims to measure the angles of the sun and stars above the horizon
-it was like a very simple ***computer***
-the device was a brass disk engraved with a star map and having a moveable bar used for sighting the ***angle*** of sun or stars – to find the location north or south of the ***equator (latitude)*** the user rotated the rings to the positions of the stars on any given night
-using the astrolabe, Muslim geographers measured the size and circumference of the ***earth*** with accuracy that was unmatched until the ***1900s***



MEDICINE AND CHEMISTRY

MEDICAL ADVANCES: -Muslims were credited with medical advances including:
-discovering that blood circulates to and from the ***heart***
-founding the science of optics (the study of ***light*** and its effect on sight)

-performed many ***surgeries*** including cataract removal
-opened the first school of pharmacy and the world's first " ***drugstore"***
-wrote texts about how disease was ***transmitted***
-using inhalation and oral ***anesthesia*** before surgery
-believed patients would get better more quickly if they ***breathed*** clean air
-introducing the concept of ***quarantine***
-using purified alcohol as an antiseptic for wounds/surgery
-introducing ***hygiene*** protocols prior to, during and after surgery
-suturing with catgut (made from animal intestines) rather than pouring ***boiling oil*** on open wounds
-treated the ***mentally ill*** in hospitals

CHEMISTRY: -Muslims developed alchemy (the branch of chemistry that attempted to change lead into ***gold)*** – although they never succeeded, they did develop the equipment and methods that are still used in modern chemistry
-classified chemical substances as animal, ***mineral,*** or vegetable

<u>OTHER ADVANCES</u>

MATHEMATICS: -founded al-jabr (***algebra***), "the art of bringing together unknowns to match to a known quantity"
-adapted the decimal system and the use of ***zero*** from India

TRADE: -between 750-1350, merchants built a vast trading network across the Muslim world and beyond
-formed ***banks*** to change currency
-Muslims invented the ancestors of today's bank ***check*** (sakk)

PAPER: -paper factories were built in Baghdad (replacing ***papyrus*** and ***parchment)*** which led to the opening of bookstores and libraries

AGRICULTURAL ADVANCES: -Abbassids organized massive irrigation projects and drained swamplands between the Tigris and Euphrates
-created ***underground*** canals called qanats
-introduced new breeds of ***livestock***
-analyzed ***soil quality***