

INTD262 Midterm

Unit 0°

1. The Spaniards created the virreinatos of Nueva España and Perú in Tenochtitlan and Lima because these cities were already hubs of scientific institutions and knowledge, as well as also sharing a common language with the Spaniards.
2. The growth of modern science preceded capitalism
3. One example of the creating and transmission of scientific results from the periphery to the center of science was the cure for Malaria. Quinine from cinchona bark was known to treat Malaria by some in Latin America, but eventually this knowledge spread worldwide.
4. One example of pseudo scientific beliefs regarding mythical places by colonials is the Spanish belief of "The Fountain of Youth" and how if one bathed in it they would be given health and youth. Another example is the myth of the Seven Cities of Cibola which the Spaniards search for in deserts to the North of New Spain.



Chapter 10: the foundations of codices and writing in the Americas

Review of section 10.1: Mission of the Aztecs

Midterm Continued

5. a) Amoxtl and tlacuiloil
b) A. Ponce de León → D. Belief about certain river
B. Griffins → B. A condor
C. Water turning to stone → C. A mercury mine
D. Fish that become butterflies → A. A flying fish
E. Monstrous animal → E. The Mexican opossum

6. a) This writing tells us that the Nahua understood the physics of sound and how it travels, as well as optics and how animals have different types of vision.
b) Spaniards and Aztecs believed hummingbirds were connected to immortality, because hummingbirds hibernate for six months, and then in spring they resuscitate as if revived.

7. Deductively valid statement: Eve has Strontium-90 in her bones. Therefore, Eve was born between 1945 and 1991.

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8. One argument against Act 590 was that creation science was not based on scientific evidence but on religious beliefs and thus should not be portrayed as being on equal ground with evolution science which is based on actual scientific evidence. Another argument was that creation science cannot be falsified, making it unscientific.

9. A) One example of a scientific revolution is the discovery of general relativity. The anomaly was that there was no scientific explanation of why the energy of physical matter curved metaphysical spacetime.

B) Yes, I do think the colonization of Nueva España triggered a scientific revolution because when the knowledge of the Spaniards combined with indigenous scientific knowledge, many scientific discoveries were made.

Map in Fig. 1	Virreinato	Capital
B	Nueva España	Tenochtitlan
C	Nueva Granada	Santa Fe de Bogotá
D	Río de la Plata	Buenos Aires
A	Perú	Lima

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11. A) The distribution of texts in this library tells us that Latin American Scientists were open to reading a large variety of text subjects in many different languages and from many different origins.
- B) Some items owned by Bartolache include a microscope, hydrometer, magnifying glass, and thermometer. This tells us that the scientific attitude in Latin America at this time focused much on scientists conducting their own experiments.
- C) One comparison is that in the U.S. scientists like Benjamin Franklin were doing scientific research at the same time, but unlike Latin America the U.S. did not start creating scientific institutions until much later.

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Unit 1 :

1. The Law of Gravity was not falsified. The problem was solved when they tried to locate Neptune using Newtonian gravity and then with the use of tools they found Uranus instead.
2. Bode's Law did not become scientific fact as it was considered only a correlation of numbers and was not always accurate, such as the case of Neptune where its location did not fit the predictions made using Bode's Law.
3. Gamboa shared the technique of the patio process with the crown. He suggested creating schools which would teach science to the children of miners.
4. Mexican efforts to preserve El Real Seminario de Minería included support from scientists teaching there and financial support from mine owners. Also graduated students taught for free when there were few professors left. Locals also helped by translating books and preparing texts to be used in class.
5. The two tenets of the scientific attitude are "We care about empirical evidence" and "we are willing to change our theories in light of new evidence".

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6. The scientific method was applied by Semmelweis when he did tests where he changed variables and monitored the results, and when one hypothesis was refuted, he changed his theory basing it off of new information
7. A) The scientific attitude was not applied in the case of cold fusion as the theory was released without being reviewed or more data being collected. This shows that they did not care about empirical evidence. They also tweaked the data they did have to make it look like it proved their theory when it did not. This shows that they were not open to revising their theory when evidence was shown to go against it.
B) One example is the Spaniards deeming Indigenous medicinal practices "unscientific" and ineffective until they tested them and they were shown to be even more effective than some Spanish medicinal practices which caused them to change what they considered scientific.

Midterm Continued

Unit 2:

1. A) Santa Fe de Bogotá was in Nueva Granada.
B) The scientific implication was that science was being held back by religious views that refused to consider a heliocentric solar system.
C) The goal of the Expedición Botánica was to discover how botanical knowledge could further benefit society. Its main achievement was that it spread knowledge past borders.
2. A) Carcas was in Nueva Grenada.
B) The implication for science was that knowledge discovered by the Jesuits were pushed out of education systems.
3. Mutis created Flora de Bogotá o de Nueva Granada.
4. This claim is logically true as anti-vax campaigns do not rely on any actual scientific evidence and are thus not scientific endeavors.
5. One example is herbal cures for sicknesses.

Midterm Continued

6. A) Multiple theories and discoveries from different regions came together.
- B) We can infer that there were more native than foreign professors, but as more foreign professors arrived the amount of native professors decreased.
- C) In the Ptolemaic system the Earth is the center of the universe and everything revolves around it. In the Copernican system everything revolves around the Sun. In the Tychoonic system the Earth is the center of the universe with the Sun orbiting it, and all other planets orbit the Sun.
7. A) The main point was that the Bible was not contradicted by heliocentric views.
- B) It was not considered controversial as all the data proving that planets orbited the Sun was already out there and believed by many scientists, many who were religious themselves.

Midterm Continued

8. A) They took geographical and astronomical measurements.
- B) This improved local knowledge by better helping locals understand the surrounding geography and how to traverse it.
- C) As a result, when there was an epidemic of disease, d'Auteroche died but his data survived and was taken back to Paris.
9. Labrador reopened direct connections between Paraguay and Potosi through the Santa Cruz de la Sierra. He also found an alternative route through the Chaco River. He also broke the isolation of the mission of Chiquitos.



Midterm Content

Mayan and Incan

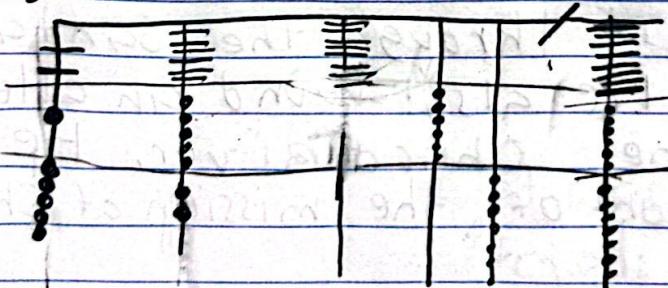
1. A) $365 + 365 = 730$

$$\begin{array}{r} \overset{\bullet}{\text{---}} \\ \overset{\bullet}{\text{---}} + \overset{\bullet}{\text{---}} - \overset{\bullet}{\text{---}} \\ \hline \end{array}$$

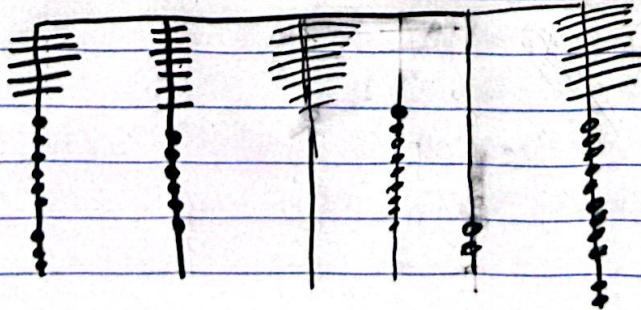
B) $1024 - 512 = 512$

$$\begin{array}{r} \overset{\bullet}{\text{---}} \\ \overset{\bullet}{\text{---}} - \overset{\bullet}{\text{---}} = \overset{\bullet}{\text{---}} \\ \hline \end{array}$$

2. A) $512 + 256 = 768$



B) $365 - 67 = 298$



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3. $16 \times 4 = 64$

$$\begin{array}{r} 16 \\ + 16 \\ + 16 \\ + 16 \\ \hline 64 \end{array}$$

4. $2 \times 150 \text{ m}^2 = 300 \text{ m}^2$ $\frac{300 \text{ m}^2}{0.04 \text{ m}^2} = \frac{300}{0.04}$

$$0.2 \times 0.2 = 0.04 \text{ m}^2$$
$$= 7500 \text{ potatoes}$$
$$4 \times 150 \text{ m}^2 = 600$$
$$0.3 \times 0.3 = 0.09 \text{ m}^2$$
$$\frac{600}{0.09 \text{ m}^2} = \frac{600}{0.09}$$
$$= 6666.7 \text{ quinoas}$$

Gamma Ray

1. A

2. C

3. D

4. Hawk detected highest energy light from Sun. It also created detailed maps of gamma ray diffusion.

Modern Science

1. The purpose was to study cosmic ray air showers caused by high energy particles.

2. D: 10^{18} eV