

Science and Astrology

9/16/2009

Opening Discussion

- <http://www.youtube.com/watch?v=uhSYbRiYwTY>
- Do you have any questions about the quiz?
- Have you see anything interesting in the news?
What did we talk about last class?

Minute Essays

- An insane number of questions/comments.
 - Quizzes and Tests
 - What names/facts do you need to know?
 - What about formulas and measures?
 - Pre-Galileo
 - What astronomy happened in the dark ages?
 - Everything done with naked eye observing using structures and math. Naked eye observatories.
 - Why didn't people discover things before Kepler and Galileo?
 - Measuring distances.
 - Some claim Kepler stole data. Conflicting accounts.

More

- Kepler's Laws
 - Work very well. Superseded by Newton's laws.
 - Objects move faster at periapse and slower at apopase. Not in conflict with expanding Universe. Different scales.
 - Planets don't change size as they orbit. They will look different sizes from Earth though.

More

- Galileo
 - Galileo was primarily an experimentalist. It is very hard to argue with experiment.
 - Solar observations.
 - Motion experiments. Newton's Laws.
 - How did Galileo know the Milky Way was made of stars?
 - Can we see everything Galileo did with binoculars? Modern tech allows us to see dimmer, more distant objects (far outside our galaxy).
 - How was he treated/viewed? Public response.
 - Only four moons of Jupiter?
 - Telescopes invented by craftsmen. History not recorded.

Last One

- Other
 - Accelerating rockets through space: requires fuel and fighting gravity.
 - Time travel/wormholes.
 - Determining ages of black holes.
 - Preserving computers and data is hard, ask Hollywood.
 - Telescopes required for measuring parallax.
 - Are there things we don't know about in our Universe?
Uncertainties for me.
 - Planetary names through history.
 - Religion on astronomy.

Science

- Science can be discovery driven or hypothesis driven.
- To be science we need three things:
 - Seek explanations for observations that rely on natural causes.
 - Progress through the creation and testing of models that explain things as simply as possible.
 - A scientific model must make testable predictions and when observations don't match, models are modified or discarded.
- A model that has stood up to repeated testing is elevated to the status of a theory.
- Many models accurate only in certain situations.

Pseudoscience

- Claims that make statements about the observable world, but ignore evidence are called pseudoscience.
- In pseudoscience, people either make claims that are testable and ignore the evidence, or they make claims that are sufficiently vague as to be impossible to test.
- Unfortunately, pseudoscience looks like real science to most people. The best way to not be taken in is to have a better understanding of what we know from science. Science can have bias too, but with experimentation over time, the better model wins.

Astrology

- Historically astronomy and astrology was closely tied with the same people doing both. In many ways, astrology paid for early astronomy.
- The idea of astrology is that the positions of the Sun, Moon, and planets among the stars impacts our lives. In many ways it is true for the Sun and Moon in that they control seasons and tides. However, with what you now know about the stars and the planets you can fairly easily see that the claim that the location of the planets against the stars as seen from Earth quite literally has no impact upon you at all.

Minute Essay

- What is something that you think qualifies as pseudoscience? Why do you feel it qualifies as that?