Studying for Exam Two:

Newtonian Science, the Enlightenment, & Evolution (ca. 1660s-1880s)

1. **How to study? 🡪 see the syllabus or talk to me**
2. **What to study? 🡪 see below for textbook readings [remember website readings, study guides, & in-class handouts too]**

Think about the **broad themes** of each chapter & section. How does the material presented **illustrate** these broad themes? **Re-read** the **handouts** and the **introductions** to each chapter assigned. Most importantly, think about how the material fits into a broader story of scientific change from the time of Newton (1642-1727) to the time of Darwin (1809-1882) & the debates over the *Origin of Species* (1859). See how the **specific evidence** fits into the **bigger picture**. Remember that your readings are NOT just facts, they are a selective INTERPRETATION comprising a larger historical argument. This is the model to use for writing good essays.

## Between Newton & Darwin: Enlightenment & Enlightenment Science

* All the readings, video, & handouts about Isaac Newton, Spread of Newtonianism, and Science during the Enlightenment (18th century)

**Evolution: Before Darwin, Darwin, & Darwinism**

* Bursting the Limits of Time [Ch. 1]
* A Growing Sense of Progress [Ch. 2]
* On the Origins of Darwinism [Ch. 3]
* Enthroning Naturalism [Ch. 4]
* Ascent of Evolutionism [Ch. 5]
* Missing Links [Ch. 6, partial]

Here's what you need for the exam: **good** **notes, pen, exam book**. Open notes will only help if you do not spend most of the exam looking at them. You will need to ***manage time wisely*** and have ***well-organized* notes**. Students who rely too heavily on notes will run out of time. Remember: the time-constraint is part of the exercise. Finally, remember that if you need help or have any questions to be sure and ask me. I am more than willing to help any student with study skills or course content, but ultimately students must put in the effort and seek assistance when they need it.

**Exam Format**

**SECTION POINTS TIME (Approx.)**

Essay 70 points (2 BROAD questions, pick **ONE**) 65-70 minutes

Identifications 20 points (10-12 listed, pick **TWO**) 15-20 minutes

Quotations 10 points (4-5 listed, pick **ONE**) 8-10 minutes

100 points

**Think about how you might organize an essay response beginning with one of these quotes below as a starting point. You will see at least one of them again on Exam Two [History of Science].**

1. According to internalists, since correct science reflects nature, it is unaffected by the human traits of ambition, ideology, prejudice, or dishonesty . . . According to externalists, by contrast, the science that people produce, just as everything else they do, reflects their biases and wishes and social environment. . . In reality and quite obviously, internalist and externalist positions are both right and both wrong . . .
2. Facts do not come to us as objective items seen in the same unambiguous way by all reasonable people. Theory, habit, prejudice and culture all influence the facts we choose to observe and the way in which we perceive them . . . Theory informs any good scientific work from the very beginning; for we ask questions in its light, and science is inquiry, not mindless collection. Moreover, the sources of theory are manifold; new ideas arise more often by the creative juxtaposition of concepts from other disciplines. . . than from the gathering of new information within an accepted framework.
3. The history of modern evolutionary science does not begin with Charles Darwin or even with biology. It begins with breakthroughs in late-eighteenth-century geology and paleontology. Indeed, when Darwin converted to an evolutionary view of biologic origins during the 1830s, he viewed himself as much as a geologist as a biologist. . . Darwin’s theory ripped through science and society, leaving little unchanged by its force. For nearly a century, scientists disagreed sharply among themselves over how evolution operates.
4. [The Darwinian theory of evolution has] created a revolution in the thought of our time, the magnitude of which, in many of its far-reaching consequences, we are not yet in a position to appreciate, but the action of which had already wrought a transformation in general philosophy as well as in . . . biology that is without parallel in the history of mankind.
5. “Facts” in science do not speak for themselves but assume their meaning based on theoretical and ideological commitments. The practice and beliefs of scientists are embedded in a greater social context . . . . Individual attitudes toward Darwin’s theories varied enormously. . . . What made Darwin a revolutionary thinker was not facts but rather a certain type of personality—a *revolutionary* personality . . .

**Even if you don’t know exactly what the essay will be, it would be a good idea to practice writing & outlining possible essays based on the quotations above. Also, look at the big picture questions from the study guides [Chs. 1-5] for the *Evolution* book.**