

ENSP 2324 Scioli
Science, matter, energy, and systems

Readings : Chapter 02 in textbook

Use these objectives in addition to the Review Questions on page 52-53 of your textbook.

01 Be able to describe how science works. Be prepared to distinguish between **frontier science** and **consensus science**. Be ready to summarize the limits of environmental science.

02 Be able to define **matter**. Be prepared to distinguish between **forms of matter** and **quality of matter**.

03 Be able to define **energy**. Be prepared to distinguish between **forms of energy** and **quality of energy**.

04 Be prepared to explain why **mathematical models** are useful in predicting the behavior of a complex system.

05 Be able to describe the effects of positive and negative **feedback** on the behavior of complex systems. Prepared to explain and to provide examples of the effects on the system of receiving **delayed feedback**. Be prepared to explain what is meant by a **synergistic interaction**.

06 Be able to describe how the **Law of Conservation of Matter** and the **Law of Conservation of Energy** (aka the **First Law of Thermodynamics**) govern **physical changes** and **chemical changes**. Be prepared to describe (briefly) the restrictions we encounter due to the **Second Law of Thermodynamics**. Be able to define **efficiency** and to provide examples of **energy-use efficiency** that we should be pursuing.

07 Be able to define **radioactivity**. Be prepared to distinguish among **natural radioactivity**, **nuclear fission** and **nuclear fusion**.

08 Be able to define **high-throughput economy**. Be ready to explain where you would expect to see this type of economy (and to justify your answer).

09 Be able to define **low-throughput economy**. Be ready to explain where you would expect to see this type of economy (and to justify your answer).

10 Be prepared to compare the sustainability of these two different types of economies for future generations of humans.