NSTA Online Short Course: Energy

Dates: Tuesdays, September 30, October 7, October 14, October 21, October 28
Time: 8:00 p.m. to 9:30 p.m. Eastern time

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Welcome to the NSTA Online Short Course: Energy. This short course will explore energy, forms of energy, potential, kinetic, energy transformations, temperature, thermal energy, heat, simple machines, and other concepts. The online short course will be delivered to science teachers of students in grades 3-9, using interactions with a course instructor and moderator via five live web sessions, an asynchronous discussion listserv, and a number of self-paced electronic materials related to the topic of Energy, such as: NSTA SciPack, NSTA SciGuide, two Journal articles, and the NSTA Press publication Stop Faking It!: Energy written by Dr. William C. Robertson.

Course Materials:

- NSTA SciPack: Energy
- NSTA SciGuide: Energy
- Book: Stop Faking It: Energy, by Dr. William C. Robertson
- Journal Articles about Energy
- Live Web Sessions' presentation slides

Course work:

- At least one entry in the ENERGY discussion listserv per week.
- Attendance to all five live web sessions (or, attendance to four web sessions, with additional participation in the listserv after viewing the web session archive).
- Completion of the Energy SciPack and its final assessment.
- Pilot with students of an Energy SciGuide lesson plan. (If taking the course for credits – a one-page reflection paper is required after completing this assignment. Guiding questions to include in the reflection will be provided to those participants taking the course for credits.)
- Completion of suggested readings from the Energy book and related journal articles.

Short course participants spend, on average, thirty hours (30) completing the course requirements: Discussion listserv (5 hrs.), five web sessions (7.5 hrs.), SciPack (8 hrs.), SciGuide (3.5 hrs.). In addition, the average participant spends six (6) hours reading the Energy book and related journal articles.

After successful (70% or higher) completion of the SciPack final assessment, all course participants receive a certificate from NSTA demonstrating understanding of the topic. Below is a description of the content covered in each of the live web sessions. On the right, note the reading assignments and the SciPacks' Science Objects that are recommended for each week. All assignments should be completed BEFORE the live web session takes place.

WEB SESSION DATE	TOPICS	ASSIGNMENTS to be completed before class session
September 30	What is Energy? • Brief history • Forms of Energy • What is Energy?	Science Object *Energy: Different Kinds of Energy* Read Stop Faking It: Energy, Chapter 1 Participate in ENERGY listserv
October 7	Energy Transformations • Potential energy and energy of motion • Calculating energy and units of energy • General transformations • Specific transformations: PE to KE and back • Keeping track • Work?	Science Object *Energy Transformations* Read Chapter 2 Participate in ENERGY listserv Read Journal Article *Egg Bungee Jump*
October 14	Temperature, Thermal Energy, and Heat • Temperature • Thermal Energy • Kinetic Molecular Theory • Heat and Stuff • Radiation, Conduction and Convection	Science Object *Thermal Energy, Heat and Temperature* Read Chapters 4 and 5 Participate in ENERGY listserv Model of Air Assignment Read Journal Article *Evaporating Is Cool*

October 21	Useful Energy and Simple Machines • How do we know it is useful? • Simple Machines and efficiency • Other machines • Entropy	Science Object *Useful and Not So Useful Energy* Read Chapters 3 and 6 Participate in ENERGY listserv Pilot lesson plan with students from Energy SciGuide
October 28	Power, Solar Energy, Alternate Energy	Complete Final Assessment on Energy SciPack Participate in ENERGY listserv Pilot lesson plan with students from Energy SciGuide