



MATERIAL	(Energy costs in millions of Btu per ton)						Sources of Embedded Energy	
	ENERGY COSTS (new material)	ENERGY COSTS (recycled)	ENERGY SAVED	COSTS (new material)	X 100	= % ENERGY SAVED	NEW MATERIAL	RECYCLED MATERIAL
PAPER					100			
PET PLASTIC					100			
HDPE PLASTIC					100			
GLASS					100			
ALUMINUM					100			
CONCLUSIONS:								
NOTES:								



# Energy in Waste Analysis

ANSWER KEY

MATERIAL	(Energy costs in millions of Btu per ton)						Sources of Embedded Energy	
	ENERGY COSTS (new material)	ENERGY COSTS (recycled)	ENERGY SAVED	COSTS (new material)	X 100	= % ENERGY SAVED	NEW MATERIAL	RECYCLED MATERIAL
PAPER	30	10	20	30	100	67%	Trees	Other Paper
PET PLASTIC	98	12	86	98	100	88%	Petroleum	Plastic Containers
HDPE PLASTIC	98	22	76	98	100	77%	Petroleum	Plastic Containers
GLASS	16	15	1	16	100	6%	Sand	Glass
ALUMINUM	250	12.5	237.5	250	100	95%	Bauxite	Aluminum Cans



## S.C. Science Standards for Grades 6 & 8

### STANDARDS

6.P.3	The student will demonstrate an understanding of the properties of energy, the transfer and conservation of energy and the relationship between energy and forces.
8.E.5	The student will demonstrate an understanding of the processes that alter the structure of Earth and provide resources for life on the planet.

### CONCEPTUAL UNDERSTANDING

6.P.3A.	Energy manifests itself in multiple forms, such as mechanical (kinetic energy and potential energy), electrical, chemical, radiant (solar), and thermal energy. According to the principle of conservation of energy, energy cannot be created nor destroyed, but it can be transferred from one place to another and transformed between systems.
8.E.5C.	Humans depend upon many Earth resources – some renewable over human lifetimes and some nonrenewable or irreplaceable. Resources are distributed unevenly around the planet as a result of past geological processes.

### PERFORMANCE INDICATORS

6.P.3A.1	Analyze and interpret data to describe the properties and compare sources of different forms of energy (including mechanical, electrical, chemical, radiant and thermal).
8.E.5C.1	Obtain and communicate information regarding the physical and chemical properties of minerals, ores and fossil fuels to describe their importance as Earth resources.

### Depth of Knowledge (DOK): 1, 2

#### PRIMARY SCIENCE AND ENGINEERING PRACTICE (SEP)

6.S.1A.4	Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to: 1) reveal patterns and construct meaning; or 2) support hypotheses, explanations, claims or designs.
8.S.1A.8	Obtain and evaluate scientific information to: 1) answer questions; 2) explain or describe phenomena; 3) develop models; 4) evaluate hypotheses, explanations, claims or designs; or 5) identify and/or fill gaps in knowledge. Communicate using the conventions and expectations of scientific writing or oral presentations by: 1) evaluating grade-appropriate primary or secondary scientific literature; or 2) reporting the results of student experimental investigations.

#### CONNECTED SEPS

S.1A.1	Ask Questions
S.1A.2	Develop and Use Models
S.1A.3	Plan and Carry Out Investigations
S.1A.4	Analyze and Interpret Data
S.1A.5	Use Mathematical and Computational Thinking
S.1A.6	Construct Explanations
S.1A.7	Engage in Scientific Argument from Evidence
S.1B.1	Construct Devices or Design Solutions

\*Note Grade-Level Progressions for Science and Engineering Practices