



High School Science Virtual Learning

**College Chemistry**  
**Thermochemistry**

April 14, 2020



High School College Chemistry  
Lesson: April 14, 2020

**Objective/Learning Target:**

Students will be able to explain the basic principles of thermochemistry.



## Let's Get Started:

1. What does the law of conservation of energy state?
2. Identify the two main types of energy.



## Let's Get Started: **Answer Key**

1. What does the law of conservation of energy state?  
**Energy cannot be created or destroyed, but it can be changed into other forms.**
2. Identify the two main types of energy. **Kinetic energy is the energy of motion, and is related to temperature. Potential energy is energy possessed by an object due to its position.**



## Lesson Activity:

### Directions:

1. Watch this [video](#) for an explanation of common terms and concepts, and this [video](#) for some calculation examples.
2. Answer these [questions](#).



Note: Specific heat capacity tells you how much energy is required to heat something up.

Substances that are easy to heat, such as metals, have low specific heat capacities.

Substances that require more energy to heat, such as styrofoam or water, have high specific heat capacities.



# Practice

*Complete the following questions using the information you learned during the lesson activity.*

## Questions:

1. Is burning a log an example of an endothermic or exothermic reaction?
2. Is water boiling an endothermic or exothermic process?
3. If 14.7 grams of water is cooled from  $37.0^{\circ}\text{C}$  to  $13.0^{\circ}\text{C}$ , what is the value and sign of  $q_{\text{system}}$ ?
4. Convert your answer from Joules to calories.





Once you have completed the practice questions check with the **answer** key.

1. Exothermic, the log releases energy, and everything else around it gets warmer, so the surroundings gain energy.
2. Endothermic, the water must constantly absorb energy to boil, and absorbing energy is endothermic.

Once you have completed the practice questions check with the **answer** key.

3.  $q = mc\Delta T$

$$= 14.7 \text{ g} (4.184 \text{ J/g}\cdot^{\circ}\text{C})(-24.0^{\circ}\text{C})$$

$$= -1476 \text{ J} (-1480 \text{ J with sig figs})$$

Negative sign means an exothermic process

4. Convert your answer from Joules to calories.

$$-353 \text{ cal}$$



## More Practice:

Follow the links below to do more practice.

1. [Specific Heat and Endo/Exothermic Practice](#)
2. [Specific Heat Practice](#)



Additional Practice:  
Click on this [link](#) for additional practice.