7.2 Energy in Chemical Reactions

Content Area: **Science**
Course(s): **Science 7**
Time Period: **Marking Period 1**
Length: **10 days**
Status: **Published**

Established Goals/Standards

Please choose the appropriate Goals/Standards from the Standards tab above.

SCI.MS-PS1-6	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.
SCI.MS-PS3-3	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
SCI.MS.PS3.A	Definitions of Energy
SCI.MS.ETS1.B	Developing Possible Solutions
SCI.MS-PS3-4	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed worlds.

Technology Standards

TECH.8.2.8.A	The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.
TECH.8.2.8.A.1	Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e., telephone for communication - smart phone for mobility needs).
TECH.8.2.8.A.2	Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.
TECH.8.2.8.A.3	Investigate a malfunction in any part of a system and identify its impacts.

NJ 21st Century Life and Careers/NJ Career Ready Practices

CAEP.9.2.8.B.1	Research careers within the 16 Career Clusters ® and determine attributes of career success.

Interdisciplinary Connections

ELA/Literacy -

RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (MS-PS1-6)
WHST.6-	Conduct short research projects to answer a question (including a self-generated question),

8.7 drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-PS1-6)

Essential Questions

- How can we help people make a flameless heater?
- How do the properties of materials determine their use?
- What are the states of matter and what role does thermal energy have in an object's state of matter?

Enduring Understanding

- Chemical reactions can be endothermic or exothermic.
- The structures of materials determine their properties.
- When materials interact within a closed system, the total mass of the system remains the same.

Content

- All matter is made up of atoms.
- Heat is transferred from warmer objects to cooler objects.
- Many substances can be changed from on state to another by heating or cooling.
- Pure substances have characteristic intrinsic properties.
- Solids may be formed from molecules, or they may be extended structures with repeating subunits.
- The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule.
- When a new substance is made by combining 2 or more substances, it has properties that are different from the original substances.

Assessment

Summative assessment:

Students develop a design to create a flameless heater and explain their design process.

Formative Assessments

- Participation/Observations
- Questioning
- Discussion Circles
- Science Notebook
- Exit Slips

- Peer/Self Assessment
- Rubrics
- Teacher-created project-based assessment
- Turn & Talk

Alternate Assessments

- Teacher-created project-based assessment
- Alternate running records
- Discussion Circles
- Turn and Talks

Benchmark Assessments

- Teacher-created assessment

Accommodations and Modifications

Accommodations and Modifications according to student IEP, 504, I&RS goals, and/or gifted status.

Resources

- Amplify
- Discovery Education
- Middle School Chemistry NJ online curriculum
- OpenSciEd