

The Science of Safety – Electricity & Natural Gas

1. **Introduction** (2 min)
 - Colorado Springs Utilities provides four services.
2. **Electricity Basics** (5 min)
 - What do you use electricity for?
 - What is electricity? Rubbing hands activity.
 - How does Colorado Springs Utilities make electricity?
3. **Circuits, Conductors and Insulators** (10 min)
 - How do light switches work? Electricity flows in a circuit.
 - Energy Stick demonstration of open and closed circuits.
 - Conductors and insulators - plasma globe demonstration and electrical wires.
4. **Safety around Electricity** (8 min)
 - Electricity always seeks a path to ground.
 - People are conductors – stay out of the circuit.
 - Top Safety Tips -
 - Never touch a powerline
 - Stay off electrical equipment such as transformers.
 - Only undamaged electrical cords below in outlets.
 - Call 811 before digging.
5. **Natural Gas Basics** (5 min)
 - Natural Gas is a fossil fuel mined from ancient organic matter buried deep in the earth.
 - Natural gas characteristics – invisible odorless gas, nontoxic but explosive.
 - What do we use Natural Gas for?
6. **Explosion hazard of Natural Gas** (8 min)
 - Natural Gas is safe unless leaking in a confined space and ignited.
 - Explosion hazard demonstration – whoosh bottle experiment.
 - Mercaptan is added to give a stinky smell.
7. **Safety around Natural Gas** (7 min)
 - The Three Ss of safety – sight, smell, sound
 - Smell gas – exit fast – scratch and sniff cards.
 - Blue flame is good – orange flame indicates incomplete combustion producing carbon monoxide, a deadly gas.
8. **Q&A and Wrap Up** (5 min)
 - Energy activity booklet, safety item, safety action assignment.

Objective: Students learn about energy and how to be safe around electricity and natural gas.

Target grades: 3rd – 6th grade

Time commitment: 50 minute presentation; optional pre/post activities: [Electricity Safety](#) and [Natural Gas](#) activity worksheets.

Standard/GLE Code: SC.3.1.2, CH.3.4.3, SC.4.1.2, SC.4.1.4, SC.4.3.4, CH.5.4.3, SC.MS.3.8

Total program time: 50 minutes