

## 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; SC.4.1.1; SC.4.3.4; SC.MS.3.8; PE.3.4.6; PE.5.4.6

**Total program time: 50 minutes**