



Topic: Insulators

Suggested unit: Electricity

Objective: Students will understand the role of insulators in conducting electricity

Introduction: Show the class a varied group of insulators or show pictures of insulators. Invite discussion about what the objects might be.

Lesson: Teachers will need to adapt the lesson itself to the unit of study as well as to the age group. Additional information can be found from sources on the resource list.

Basic information:

Telegraph/telephone lines were strung along wooden poles and carried relatively low voltages. Since water-soaked wood acts as a conductor, rain-soaked poles would allow the electricity in the wires to travel down through them into the ground. An object made of an insulating material such as porcelain or glass was installed to hold the wire to prevent grounding of the electric signals. Wire grooves around the outside of the insulators were designed to hold the wire in place.

Even with insulators in place, mineral deposits from rain could create a path of conductivity through the pole to the ground resulting in loss of the current/signal. Glass producers experimented with various insulator designs to determine which shape would shed rainwater quickest. Drip points were added on the bottom of the petticoats to quicken the rate at which water dripped from the surface of the glass, hence minimizing the chance of a conductive pathway being developed. Sometimes insulator designs incorporated one or more inner petticoats, resulting in more surface area over which a conductive path would have to develop.

In modern times telecommunication wires have been moved underground. Modern insulators are used mainly for high voltage power transmission lines and are normally made from porcelain or rubber-like materials since the insulating capability of glass is not as great as these other materials.

Wrap up: Encourage students to look for insulators on their way home from school. Tomorrow they can share where they saw them, what colors they were, what shape, etc.

Age-related worksheets can be done at this time.

K-2nd – coloring page of an insulator or of lines along a track.

3rd - 6th – word search of vocabulary terms

7th – 12th crossword puzzle of vocabulary terms