

## Objectives

- Describe the fundamental rule at the base of all electrical phenomena. (32.1)
- Explain how an object becomes electrically charged. (32.2)
- Describe Coulomb's law. (32.3)
- Distinguish between a good conductor and a good insulator. (32.4)
- Describe two ways electric charges can be transferred. (32.5)
- Describe what happens when a charged object is placed near a conducting surface. (32.6)
- Describe what happens when an insulator is in the presence of a charged object. (32.7)

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**MATERIALS** electrophorus, piece of wool, fur, or cloth, electroscope, faucet, paper

**EXPECTED OUTCOME** Students will charge the metal pie pan of an electrophorus by induction.

## ANALYZE AND CONCLUDE

1. There is an electrical interaction between the pan and the electroscope, water, or paper.
2. In theory, the charging of the pie pan could be repeated indefinitely. However, the insulating plate slowly discharges to the surroundings and needs to be charged by contact periodically.
3. Electric charge is the source of the electrical force that causes objects to attract or repel each other.



## THE BIG IDEA

Electrostatics involves electric charges, the forces between them, and their behavior in materials.

**E**lectricity in one form or another underlies just about everything around you. It's in the lightning from the sky; it's in the spark beneath your feet when you scuff across a rug; and it's what holds atoms together to form molecules. This chapter is about **electrostatics**, or electricity at rest. Electrostatics involves electric charges, the forces between them, and their behavior in materials.

An understanding of electricity requires a step-by-step approach, for one concept is the building block for the next. So please study this material with extra care. It is a good idea at this time to learn more heavily on the laboratory part of your course, for doing physics is better than only studying physics.



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## How Can an Object Become Electrically Charged?

1. Obtain an electrophorus and rub the insulating plate with a piece of wool, fur, or cloth.
2. Lower the pie pan onto the plate.
3. Touch the pie pan with your finger. The pan should now be charged.
4. Bring the pan in contact with an electroscope or hold it near a thin stream of water or small pieces of paper.

## Analyze and Conclude

1. **Observing** What evidence do you have that the pie pan was actually charged?
2. **Predicting** How many times do you think you can charge the pie pan without having to once again rub the insulating plate?
3. **Making Generalizations** Based on your experimentation with the electrophorus, how would you define electric charge?

# Lectricity Study Guide 20 Answers

**Ray Holder**



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