

Charging

Purpose:

To develop a model about how objects become charged and grounded.

Getting Ready:

Navigate to the **Charging** Interactive at The Physics Classroom website:

<https://www.physicsclassroom.com/Physics-Interactives/Static-Electricity/Charging>

Navigational Path:

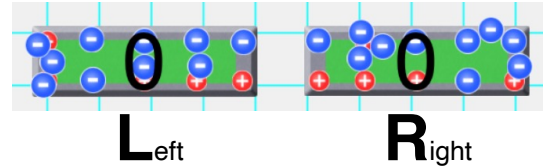
www.physicsclassroom.com ==> Physics Interactives ==> Static Electricity ==> Charging

Getting Acquainted:

Once you've launched the Interactive, experiment with the interface. Observe the two neutral, metal blocks and the charged balloon. Notice that the blocks and balloons can be moved about the screen, brought near to each other, and even touched to each other. There is also a *grounding rod*. The objects can be brought near and touched to the grounding rod.

Exploring the Charging Process

1. Discuss a method for making the **L Block** negatively-charged and the **R Block** positively-charged.



2. In the space at the right, combine your above discussion with a diagram that illustrates your method. Use an arrow to show the direction of electron flow.
3. Describe a method for making the **R Block** negatively-charged and the **L Block** positively-charged.
4. Discuss how the total amount of charge possessed by the **system** of two blocks before the charging process compare to the total charge of the **system** after the charging process. Use some numerical values in your discussion.

5. Complete the table at the right to demonstrate the meaning of the **law of conservation of charge**.

	Charge Before Charging			Charge After Charging		
	L Block	R Block	System	L Block	R Block	System
1	+5 units	-3 units	+ 2 units	+7 units		
2	-8 units			+3 units	+5 units	
3	-12 units	+5 units			-4 units	

6. Can electrons move between the two blocks if they are **not** touching? _____
7. Can electrons move between the balloon and a metal block? _____
8. Describe the role of the balloon in the charging process? What function does it serve?

Exploring the Grounding Process

9. What happens when a metal block with a charge of +6 units is touched to the grounding rod? (Comment on the direction of the electron movement.)
10. What happens when a metal block with a charge of -6 units is touched to the grounding rod? (Comment on the direction of the electron movement.)
11. Is it possible to touch a negatively-charged block to the grounding rod and make the block positively-charged? _____. Explain.
12. What is the role of the grounding rod? What function does it serve?

Play

Your instructor may want you to complete the challenge. If so, then tap on the Play button and get started. If required by your instructor, have him/her check off your completion of the challenge.

Challenge completed?

Partner(s): _____

Initials _____