

This is an older sim that has some features that are not optimized. In particular, there is no way to show the properties of a ball after being added. [Charges and Fields](#) is an updated simulation that has many more features and is maintained.

Tips for controls:

- **Reset All** does not reset the **Properties** window.
- Once you add a ball, the properties of that ball are not variable; you can view the properties if you have not made changes in the **Properties** window.
- If you want to add a ball with different properties- Open **Properties**, make your changes, hit **Done** and then the next added ball will have those properties. The changes will not be implemented until you select **Done**. You could record the charge as you add the balls and keep track by observing the e-field.
- You can **Pause** the sim and then use **Step** to incrementally analyze.
- If you are doing a lecture demonstration, set your screen resolution to 1024x768 so the simulation will fill the screen and be seen easily.

Important modeling notes / simplifications:

- All the balls are blue and have the same size regardless of mass. In most PhET sims, color and size are used to would cue charge and mass (blue is typically for negative charge and mass denoted by size magnitude). Since the balls are all the same color and size, this sim could be used to encourage students to make sense of the field lines without editing images.
- Gravity is off.

Suggestions for sim use:

- [Charges and Fields](#) is an updated similar simulation that has many more features and is maintained.
- For tips on using PhET sims with your students see: [Guidelines for Inquiry Contributions](#) and [Using PhET Sims](#)
- The simulations have been used successfully with homework, lectures, in-class activities, or lab activities. Use them for introduction to concepts, learning new concepts, reinforcement of concepts, as visual aids for interactive demonstrations, or with in-class clicker questions. To read more, see [Teaching Physics using PhET Simulations](#)
- For activities and lesson plans written by the PhET team and other teachers, see: [Teacher Ideas & Activities](#)