**Tips for controls:**

* You can put the blocks in the water. If an object floats, you can hold it under water to measure its volume.
* Use the scale and the volume of water displaced to calculate the density of the mystery objects.
* Use the table to determine the identity of the mystery objects.
* 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:**

* For named objects in the drop-down menu, mass changes volume to keep density constant; for "My Block", mass changes density.
* The color of an object in one mode does not imply the same density in other modes; we did this to challenge students to use other characteristics to understand density.
* In the "Same Mass" mode, the density of the blue block is the same as that of water.
* We purposely left out the density of water on the slider, since we saw that it caused students to engage more with the sim.

**Insights into student use / thinking:**

* Students do not need to be told to put the block in the water; it is often their first move.
* Students who do not already know the density of water are able to figure it out by playing with the sim.
* Some students notice that when objects float, they displace their mass, but when objects sink, they displace their volume.
* Students learn that density is what determines whether an object sinks or floats.
* Students are confused by the behavior of the blue block in the “Same Mass” mode; later they discover the block has the density of water.
* Most students do not notice the table in the “Mystery” mode.

**Suggestions for sim use:**

* For tips on using PhET sims with your students, see: [**Guidelines for Inquiry Contributions**](http://phet.colorado.edu/teacher_ideas/contribution-guidelines.php)and [**Using PhET Sims**](http://phet.colorado.edu/teacher_ideas/classroom-use.php).
* 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**](http://phet.colorado.edu/phet-dist/publications/Teaching_physics_using_PhET_TPT.pdf).
* For activities and lesson plans written by the PhET team and other teachers, see: [**Teacher Ideas & Activities**](http://phet.colorado.edu/teacher_ideas/index.php).