

## An Ob-Scertainer Lab for large Astronomy 101 classes By John Feldmeier ([jjfeldmeier@ysu.edu](mailto:jjfeldmeier@ysu.edu); Youngstown State University) and Amanda Lewis (Kent State University)

In order to teach the scientific method in our large ASTRO 101 classes, we have borrowed a tool from other sciences – the Ob-Scertainers (which can be found online at: <https://lab-aids.com/kits-and-modules/details/ob-scertainer-a-better-black-box> ) Often, this tool is used in lab classes of different ages, but we have adapted the Ob-Scertainer to be used in a large class setting. **We thank Dr. David Wittman (UC Davis) for making us aware of the Ob-Scertainer.**

An electronic copy of this document can be found at:  
<http://class.ysu.edu/~jjfeldme/publications.html#astroed>

Some notes about using the Ob-Scertainers:

1. It's best to stage the disks underneath the class chairs if possible, usually before class. You want one Ob-Scertainer for every 3 students.
2. Once the Ob-Scertainers come out, it will first get extremely noisy in the class, as students tend to shake them like maracas at first. It will quiet down however, as the students realize that is not a successful strategy to figuring out the shapes.
3. You will need to display the potential shapes as a PowerPoint slide while the exercise is going on. The PowerPoint slides we use are available on the web page.
4. We suggest both color-coding each Ob-Scertainer type and giving a number to each type, to avoid problems with visually impaired students.
5. You should glue the Ob-Scertainers shut!
6. You should decide well ahead of time whether you will give the answers at the end or not. Generally, since this is an early activity in our class, we do give the answers to avoid massive student frustration, but this is up to you.

Names: \_\_\_\_\_ Student IDs: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## Scientific Method Lab

**Instructions:** You will be working in groups of 3-4 on this lab, which will count for attendance for today's class. Each group should have one black disc. Each of these disks has a steel ball bearing inside as well as a certain wall pattern. As a group, you should try to figure out what this pattern is by "feeling" the motions of the ball bearing. An image of all the discs' possible patterns is projected overhead on the screen.

Write down the roman numeral of your disc in the first and the color of the dot on the disc next to that. On the line provided, write down the letters of which patterns you believe yours **could not** be. Finally, draw what you believe your pattern, the predicted shape, is in the blank circle. When you are done, exchange discs with another finished group and repeat this process. There are questions for you to answer on the back of this sheet

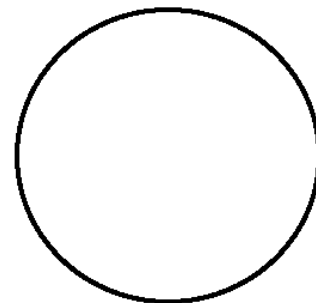
Roman Numeral

\_\_\_\_\_

Color

\_\_\_\_\_

Which ones it cannot be (letters)



Predicted Shape

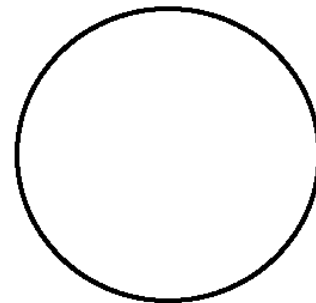
Roman Numeral

\_\_\_\_\_

Color

\_\_\_\_\_

Which ones it cannot be (letters)



Predicted Shape

Of the two discs you had, which one did you think was the easiest?

Of the two discs you had, which one did you think was the hardest? Why?

Was there any debate or disagreement between the group about what the actual pattern was?

Imagine you could take the discs out of the classroom. Come up with as many ways possible you could figure out the pattern *without breaking or damaging the disc*.