# Exploring Science Tools

## Summary

Students use a balance and make predictions about heavier and lighter objects. Students also use a graduated cylinder and compare how the same volume of water looks to be a different amount when poured into different sized containers. Data recording could be done in a large group setting with an adult facilitator or with helpers at each station.

## Time Frame

1 class periods of 45 minutes each

## Group Size

Small Groups

## Materials

One balance per group of students. 1 g mass cubes from enasco.com TB16755M Set of 500 for $12.50.
Assorted objects to measure mass. About 15 -- 20 objects per group and it is easiest to make them all the same objects for each group.
One 100 ml graduated cylinder per student, if possible. If not, students can share them in groups. These can be purchased in plastic from many different vendors. Carolina.com 721613 $1.90 each.
500 ml Wash bottles, one per student, if possible. If not, students can share them in groups. Carolina.com 716594. $4.45 each. May be cheaper from other vendors.
6-10 different plastic containers per group. Make them different sizes in height and width.
1 bucket per group to put the waste water in.

## Background for Teachers

Students need to become comfortable using science tools. In this lab, a balance, wash bottle (squeezable bottle with a straw) and graduated cylinder will be introduced. Students will make many different predictions during the lab. It is critical that students learn at the earliest age that making predictions is not a right and wrong process and incorrect answers are acceptable. This needs to be reinforced constantly

## Intended Learning Outcomes

Framing questions. Conducting investigations. Collecting data. Drawing conclusions.
Developing social interaction skills with peers. Sharing ideas with peers. Connecting ideas with reasons.
Ideas are supported by reasons. Communication of ideas in science is important for helping to check the reasons for ideas.

## Instructional Procedures

Pre-lab Discussion:
Ask the students if they are scientists. Tell them they are and scientists need to learn how to use science tools. Show them the balance and graduated cylinder and go over the names with them. Talk to students about what a prediction is and that there are no wrong predictions in science.
Instructional Procedures:
Using a balance: This activity is done at each table as a group.

Show the students a balance and have them predict how it works.
Have students take turns picking up two objects and testing them in their hands. They should predict which is heavier and then try it out on the balance. Be sure that students are put at ease when their predictions are incorrect.
After a couple of turns at this, have the students as a group, measure the mass of an object using the balance and gram cubes.

Using a Graduated Cylinder:

Discuss the purpose of measuring liquids in a science lab.
Ask the students to measure different amounts of water in units of 10. Students can use a wash bottle to fill the graduated cylinder to the designated amounts.
After they measure, they can transfer the liquid to different size containers and observe that the same amount of liquid looks different in different shaped containers. Have them predict what will happen as they transfer the liquids from container to container.
Students can empty their container of water into a bucket and then measure a new volume and pour it into a different container.

## Bibliography

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