

SEPARATING PLASTICS

Teacher Demonstration

Directions: Follow the steps below to demonstrate how plastics separate.

1. Label beakers A, B, and C.
2. Fill beaker A half full of water (Density = 1.00g/cm^3). Fill beaker B half full of propanol (Density = 0.94 g/cm^3). Fill beaker C half full of corn oil (Density = 0.91 g/cm^3).
3. Cut up plastics that have recycling codes 1-6 into small pieces.
4. Place one piece of each type of plastic into beaker A (water). Stir. Note: Three plastics will float (2, 4, 5) and three will sink (1,3, 6).
5. Skim off the pieces that floated and place them into beaker B. Stir. Note: Two will float (4, 5) and one will sink (2).
6. Recover the two pieces that floated by skimming and place them in beaker C. Note: One will float (5) and one will sink (4).

Tell students that pieces 3, 6, and 1 could also be separated by using other liquids of different densities or by other means such as melting point, flame test, and reaction to acetone.

Note: If you would like more information, you may visit the following sites:

Word Format for Demo – Separation of Plastics by Density:

http://www.teachingplastics.org/hands_on_plastics/activities/plastics_analysis_lab_lesson/plastics_analysis_lab_lesson.html#2

Flowchart for Demo – Separation of Plastics by Density:

http://www.teachingplastics.org/hands_on_plastics/activities/plastics_analysis_lab_lesson/plastics_analysis_lab_ws.html

Computer Visualization of Demo – Separation of Plastics by Density:

http://www.teachingplastics.org/hands_on_plastics/activities/index.html# and click on interactive multimedia walk-through of lab

The above website uses two other tests (heat for melting point and flame for element identification) besides density to separate plastics. Density can be used to easily separate all six recyclable plastics, but by using water, oil, and isopropyl alcohol only plastics with codes 2, 4, 5, and 6 can be completely isolated and tested, although water does separate 1, 3, and 6 from 2, 4, and 5.