Notes on Plastics

The best suggestion I have here is to have your students work through the tutorial on the Hands On Plastics web site. http://teachingplastics.org/hands_on_plastics/activities/index.html It will take them through the density tests as well as the burn test results. You can get free recyclable 1-6 plastics from www.handsonplastics.com. But order early because they have lots of requests and run out.

There is also a site with tips for teachers:
http://teachingplastics.org/hands_on_plastics/intro_to_plastics/teachers.html

Besides the site with the interactive tutorial, there are more activities at:
http://teachingplastics.org/hands_on_plastics/intro_to_plastics/students.html

Be careful with the density labs. If plastics have coloring or other fillers in them, then the density part of the lab may not work out. For instance with enough coloring in the plastic, a polystyrene may have a density less than 1 and float in water. However it will still soften in acetone.

Polymer Resources

Web Sites (Revised 4 Jan 2004)

National Information Center for Polymer Education
http://www.psrc.usm.edu/pslc/index.htm
Macrogaleria -- http://www.psrc.usm.edu/macrog/index.htm
The Story of Rubber -- http://www.pslc.ws/macrog/exp/rubber/menu.htm
National Plastics Center and Museum -- http://www.npcm.plastics.com/
Polyed -- http://www.uwsp.edu/chemistry/polyed/ (go to Teaching Resources for lessons)
Brian Niece -- http://www.assumption.edu/users/bniece/Olympiad/Olympiad.html
http://www.chemheritage.org/ This site offers many tools for the researcher, the student and those who want to explore and discover how chemical and molecular science has changed the world we live in.
Hands on Plastics -- This site offers lesson plans and activities on line. They also have a free kit that you can order that has some plastic samples in it. Sometimes the kits are backordered and not readily available. www.handsonplastics.com
www.packagingtoday.com/intronaturalpolymers.htm
www.pembinatrails.ca/vincentmassey/topchem/chemtop.html
www.beyonddiscovery.org/ In the upper left corner is a timeline. Below, check out Chemistry.
www.plastiquarian.com/ind3.htm (this site has a good timeline and info on people)
www.genome.ad.jp/kegg/catalog/compounds.html
www.nationalgeographic.com/resources/ngo/education/plastics/
http://chemistry.about.com/cs/Polymers then click on Chem 381:Polymers and Coating Science
www.tangram.co.uk/ Click on Technical Information. About ¼ of the way down the page you will find a whole section on Plastics. There is an excellent timeline.

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Chesterfield, MI 48047

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http://www.polymers.eezway.com
email: polymers@eezway.com

	Polyethylene Terephthalate (PET)	High Density Polyethylene (HDPE)	Polyvinyl Chloride (PVC)	Low Density Polyethylene (LDPE)	Polypropylene (PP)	Polystyrene (PS)
Plastic ID Code						
Clarity	Clear	Translucent	Clear	Translucent	Translucent	Clear
Moisture Barrier	Fair to Good	Good to Excellent	Fair	Good	Good to Excellent	Poor to Fair
Oxygen Barrier	Good	Poor	Good	Poor	Poor	Fair
Max. Temperature	120F	145F	140F	120F	165F	150F
Rigidity (Stiffness)	Moderate to High	Moderate	Moderate to High	Low	Moderate to High	Moderate to High
Resistance to Impact	Good to Excellent	Good to Excellent	Fair to Good	Excellent	Poor to Good	Poor to Good
Resistance to Heat	Poor to fair	Good	Poor to Fair	Fair	Good	Fair
Resistance to Cold	Good	Excellent	Fair	Excellent	Poor to Fair	Poor
Resistance to Sunlight	Good	Fair	Poor to Good	Fair	Fair	Poor to Fair

Plastic ID Code "7" is for the other plastics except above mentioned 6 groups.

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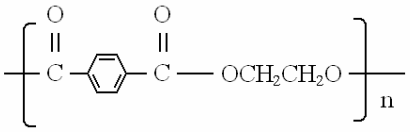
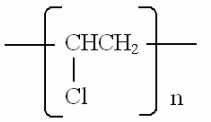
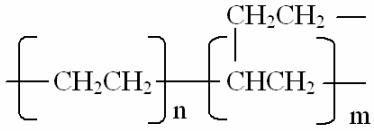
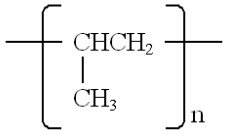
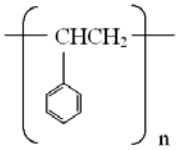
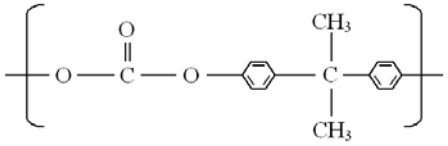
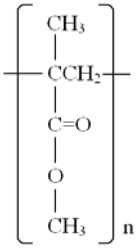
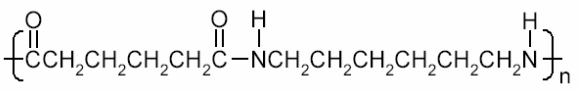
Polymer	Symbol	Recycling Code	Type Polymerization	Monomer	Density
polyethylene terephthalate	PETE	1 PETE	condensation		1.37
high density polyethylene	HDPE	2 HDPE	addition		0.95
polyvinyl chloride (PVC)	V	3 V	addition		1.38
low density polyethylene	LDPE	4 LDPE	addition		0.92
polypropylene	PP	5 PP	addition		0.90
polystyrene	PS	6 PS	addition		1.05
polycarbonate	PC	7 OTHER	condensation		1.20
polymethyl-methacrylate	PMMA	7 OTHER	addition		1.16
nylon-66	N-66	7 OTHER	condensation		1.14

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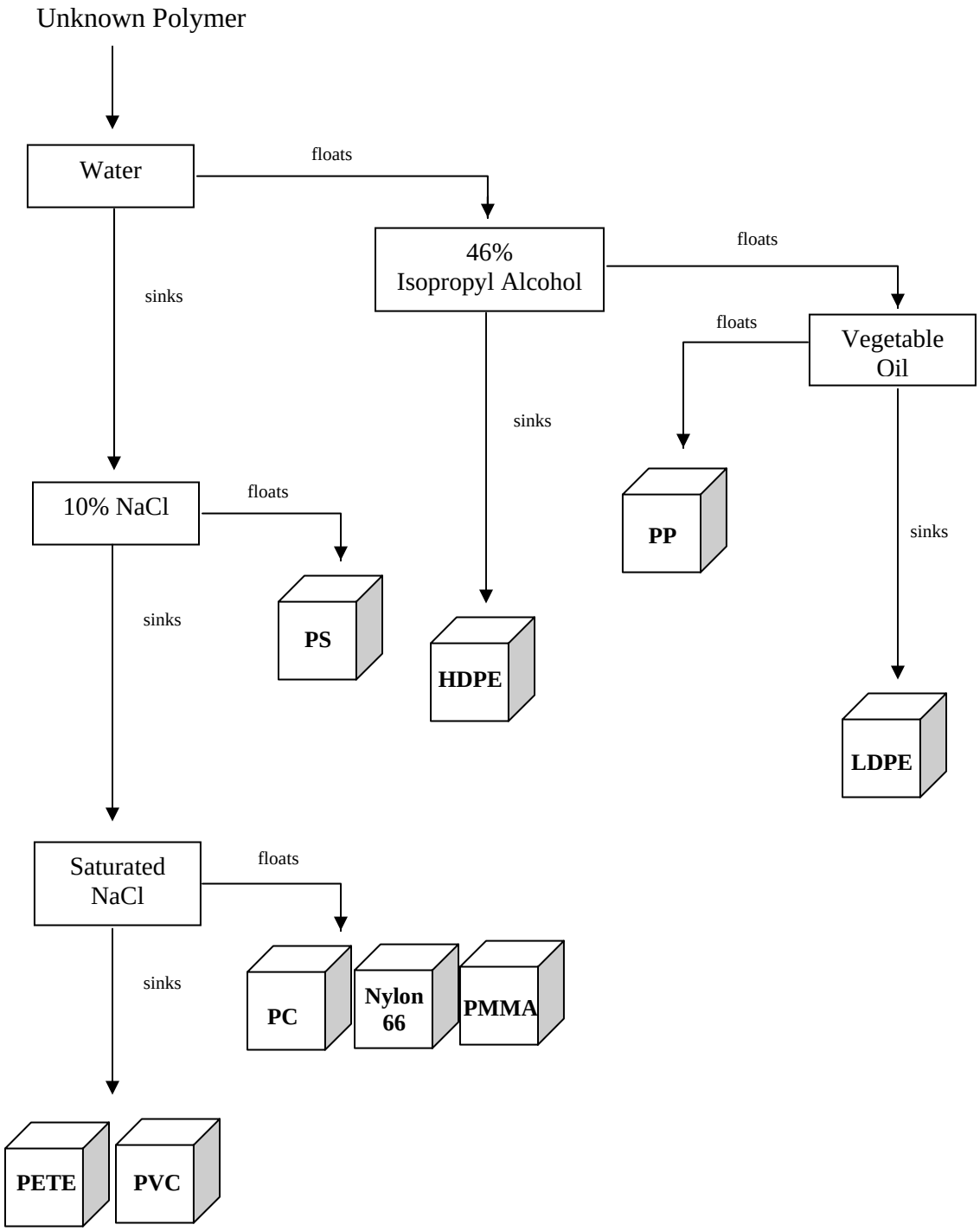

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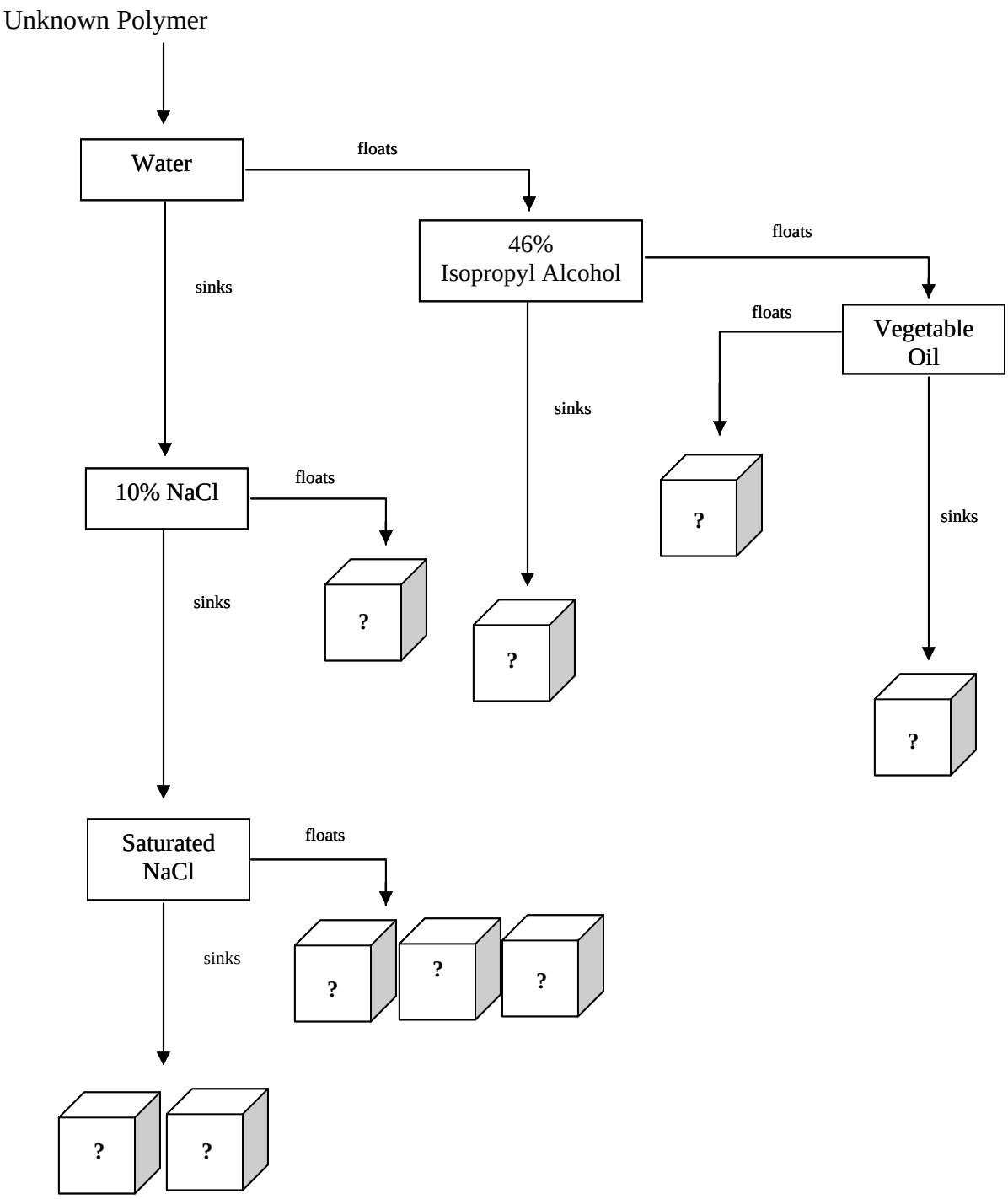

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