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Tech labs

TECH 3

Types and properties of plastics

PROGRAMS:	ST, EST, AST
LAB TYPE:	Observation
CONCEPT:	Types and properties of plastics (thermoplastics and thermosetting plastics)
STUDENT BOOK:	Chapter 12, page 396
TOOLBOX:	Page 88

GOAL

Classify plastic samples in the appropriate categories.

OBSERVATION CRITERIA

1. What is a plastic?

_____

_____

_____

2. In the table below, write the two main subcategories of plastics and their distinguishing characteristics.

Subcategory	Characteristics
	_____ _____ _____
	_____ _____ _____

3. Which subcategory represents most of the plastics manufactured worldwide? Indicate the proportion of plastics that belong to this subcategory.

_____

_____

_____

MATERIALS

- linear heat table for bending plastic
- sample of each of the following plastics:
  - acrylic
  - polystyrene (PS)
  - polyvinyl chloride (PVC)
  - phenolic C
  - polypropylene (PP)
  - high-density polyethylene (HDPE)
  - phenolic G10
  - polyethylene terephthalate (PETE)

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- yogurt container lid
- CD jewel case
- frozen food container
- melamine plate

PROCEDURE 

1. Turn on the heat table and wait for it to reach its maximum temperature.
2. Place a sample of plastic over the heating element.
3. Observe the effect of heat on the plastic from time to time by trying to bend the sample to form a 90° angle.
4. Record the result (whether the sample bends or not) in the table of results.
5. Repeat steps 2 to 4 with each test sample or object.
6. Turn off the heat table.
7. Clean up and put away the materials.

OBSERVATIONS

Record your observations in the table below. Give your table a title.

Title: _____

Sample	Type of plastic	Effect
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

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REFLECTING ON YOUR OBSERVATIONS

1. Use your observations to classify each test sample or object in the correct subcategory of plastics.

Sample	Type of plastic	Subcategory
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

2. **a)** Which subcategory is the more widely represented in this lab?

_____

b) Is its representation in this lab proportional to its production worldwide?

_____

_____

3. What are the advantages of using thermoplastics?

_____

4. What are the advantages of using thermosetting plastics?

_____

5. Why are thermosetting plastics used less to make everyday objects? Give two reasons.

_____

_____