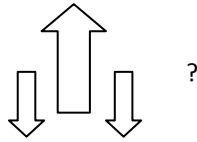


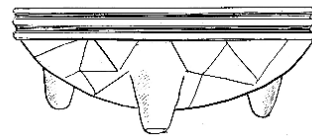
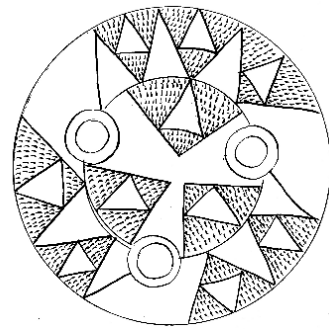
**ST/ (STE) PreTest 3.4 2012**

- Which of the following is **not** a thermoplastic?
  - polyethylene
  - polypropylene
  - polystyrene
  - melamine
- Which twisting constraint is experienced by buildings during earthquakes?
  - Shearing
  - Torsion
  - Tension
  - Compression

- What constraint is symbolized by deflection



- List two elements with an atomic number less than 4 that have poor thermal conductivity.  
He and H
- What third period material has decent electrical conductivity but lousy thermal conductivity?  
Si
- All ceramic materials contain oxides that include  $Al_2O_3$ . What charge does aluminum have? Show why using simple algebra.



- Complete the table revealing the composition and uses of composite materials. *(STE)*

Composite	Matrix material	Reinforcing material	Uses
wood			House construction; furniture; floors
Carbon fiber		Carbon fiber	
Plastic- fiberglass		fiberglass	

- Explain what is meant by a monomer in the context of plastics?
  - In fiberglass the matrix can be either a thermoset or thermoplastic. What's the difference?
  - Which of the above are recyclable?
- Draw a dot structure for 4 different greenhouse gases. *(STE)*

- When ice melts, mass is conserved. Use this fact to derive an expression for the volume of water in terms of density ratios and the volume of ice. Then show that this is the same as the buoyancy formula, which proves that when ice melts the volume of water created is the same as the volume of submerged ice. The density of ice is about 0.912 g/ml. *(STE)*

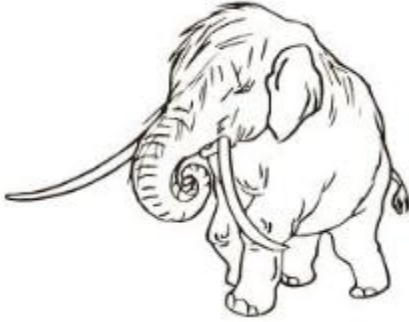


11. List two countries whose northern areas and mountain tops are dominated by permafrost.

12. What biome exists in the active layer of permafrost?

13. What greenhouse gas is released by permafrost during periods warm enough to melt upper layers?

14. How do vegetation and topography impact watersheds?



15. What term is used to describe the quantity of organic matter produced by plants in a given territory?

16. Why aren't energy transfers between trophic levels 100% efficient?

17. To which trophic level does a leaf-eating caterpillar belong?



**FLASHBACKS:** all STE flashback questions will be based on theoretical aspects of whatever was covered by the STE lab exams: stoichiometry, circuits, phosphorus cycle etc.

**ST flashback questions will be on guiding controls and tides only.**