

**Symmetry in Nature**  
**Applications of Symmetry**

**Homework Assignment Week 5**

1. Look at your workshop material from Tuesday. Complete the work and correct any mistakes you made. Submit this work with the following.
  
2. Determine the geometry of the following molecules using the VSEPR model.
  - $\text{PCl}_3$
  - $\text{H}_2\text{S}$
  - $\text{AlCl}_3$
  - $\text{SF}_4$
  - $\text{ClF}_5$
  - $\text{N}_3^-$  ion
  - $\text{NO}_2^-$  ion (N is the central atom)
  - $\text{SeO}_3$
  - $\text{TeF}_4$
  - $\text{ICl}_5$
  - $\text{SeCl}_6$
  - $\text{PH}_3$
  - $\text{HCN}$
  - $\text{GeH}_4$
  - $\text{ClF}_3$
  - $\text{XeF}_2$
  - $\text{XeOF}_4$
  - $\text{XeF}_4$
  - $\text{NH}_4^+$  ion
  
3. Write down the complete set of symmetry operations for the following molecules.
  - $\text{H}_2\text{O}$
  - $\text{BH}_3$
  - $\text{HCl}$
  - $\text{N}_2$
  - $\text{CH}_4$