

## INSTRUCTIONAL GUIDE

### Contents

Qty.	Element	Color	Holes	Angles & Geometry	Dia. (mm)
6	Carbon (C)	Black	4	109° tetrahedral	23
14	Hydrogen (H)	White	1		17
1	Boron (B)	Beige	3	120° trigonal planar	23
1	Nitrogen (N)	Blue	3	107° pyramidal	23
2	Nitrogen (N)	Blue	4	109° tetrahedral	23
6	Oxygen (O)	Red	2	105° angular	23
1	Oxygen (O)	Red	4	109° tetrahedral	23
1	Sulphur (S)	Yellow	2	105° angular	23
1	Sulphur (S)	Yellow	6	90° octahedral	23
1	Phosphorus (P)	Purple	5	90° 120° trigonal bipyramidal	23
1	Phosphorus (P)	Purple	3	107° pyramidal	23
6	Halogen (Cl, F)	Green	1		17
2	Metal (Na)	Grey	1		20
2	Metal (Ca, Mg)	Grey	2	105° angular	23
1	Metal (Be)	Grey	2	180° linear	23
1	Metal (Al)	Grey	3	120° trigonal planar	23
1	Metal (Si, Cu)	Grey	4	109° tetrahedral	23
1	Metal	Grey	6	90° octahedral	23
1	** sp <sup>3</sup>	Beige	4	109° tetrahedral	23
1	** dsp <sup>3</sup>	Beige	5	90° 120° trigonal bipyramidal	23
1	** d <sup>2</sup> sp <sup>3</sup>	Beige	6	90° octahedral	23
3	Lone pair e <sup>-</sup> cloud			Flat, pear-shaped	

Qty.	Bonds	Color	Length
20	Medium	Grey	31
12	Long flex.	Grey	46
5	Medium	Purple	31
1	Box	Grey	

\*\*These may represent any element with the structures sp<sup>3</sup>, tetrahedral, dsp<sup>3</sup> trigonal bipyramid, d<sup>2</sup>sp<sup>3</sup> octagonal.

- Medium grey links are used for single covalent bonds as in water.
- Long grey links are flexible and are used for double (as in oxygen) or triple bonds
- Purple medium links are used for contrast in the following cases:
  - Co-ordinate/dative covalent bonds, e.g. H<sub>3</sub>N. BF<sub>3</sub>, or metal complex ions.
  - Representation of ionic bonds in the empirical formulae of ionic compounds such as Na<sup>+</sup>...Cl<sup>-</sup>

### Common Organic Structures:

Ethane		Ethene	
Ethyne		Ethanol	
Butanone		Ethanoic acid	
Ethyl ethanoate		Trans 1, 2- dichloroethene	
Dimethyl ether		Lactic acid	
Aminoethane		Cyclohexane	
Butane		Ethylene diamine	
Isobutane		Glycerol	
1-chloropropane		D-Glucose	
2-chloropropane		Alanine	
Cis 1, 2-dichloroethene		Benzene	