

FUNCTIONAL GROUPS I - WORKSHEET

Name or draw the following compounds:

	Chemical structure	IUPAC Name
1	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{OH} \\ \\ \text{NO}_2 \end{array}$	3-nitro-1-butanol
2	$\begin{array}{c} \text{Cl} \quad \text{Cl} \\ \quad \\ \text{H}_3\text{C}-\text{C}-\text{CH}-\text{CH}-\text{CH}_3 \\ \quad \\ \text{Cl} \quad \text{OH} \end{array}$	3,4,4-trichloro-2-pentanol
3	$\begin{array}{c} \text{Cl} \quad \text{H}_2\text{C}-\text{CH}_2-\text{CH}_2-\text{OH} \\ \quad \\ \text{H}_3\text{C}-\text{CH}-\text{C}-\text{CH}_2-\text{CH}_3 \\ \\ \text{Cl} \end{array}$	4,5-dichloro-4-ethyl-1-hexanol
4	$\begin{array}{c} \text{NO}_2 \\ \\ \text{CH}_3-\text{CH}-\text{CH}-\text{CH}-\text{CH}-\text{CH}_3 \\ \quad \\ \text{OH} \quad \text{NO}_2 \end{array}$	2,5-dinitro-3-hexanol
5	$\begin{array}{c} \text{NH}_2 \\ \\ \text{CH}_3-\text{C}-\text{CH}_2-\text{OH} \\ \\ \text{NH}_2 \end{array}$	2,2-diaminopropanol
6	$\begin{array}{c} \text{H} \\ \\ \text{H}_3\text{C}-\text{CH}-\text{CH}-\text{CH}_2-\text{C}=\text{O} \\ \quad \\ \text{Cl} \quad \text{Cl} \end{array}$	3,4-dichloropentanal
7	$\begin{array}{c} \text{CH}_3 \quad \text{CH}_3 \quad \text{H} \\ \quad \quad \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}-\text{C}=\text{O} \end{array}$	2,4-dimethylpentanal
8	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{C}-\text{CH}_2-\text{CH}_3 \\ \\ \text{O} \end{array}$	3-hexanone
9	$\begin{array}{c} \text{NO}_2 \quad \text{O} \\ \quad \\ \text{H}_3\text{C}-\text{C}-\text{CH}_2-\text{C}-\text{CH}_3 \\ \\ \text{NO}_2 \end{array}$	4,4-dinitro-2-pentanone
10	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{C}-\text{C}=\text{O} \\ \quad \\ \text{Cl} \quad \text{H} \end{array}$	2-chloro-2-methylpropanal
11a	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{COOH}$	butanoic acid

11b	$\text{H}_3\text{C}-\text{COOH}$	ethanoic acid
11c	$\text{H}-\text{COOH}$	methanoic acid
12	$\begin{array}{c} \text{COOH} \\ \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}-\text{CH}_2-\text{CH}_3 \\ \\ \text{CH}_3 \end{array}$	2-ethyl-3-methylpentanoic acid
13	$\text{H}_3\text{C}-\text{CH}=\text{CH}-\overset{\text{NO}_2}{\text{CH}}-\text{CH}_2-\text{COOH}$	3-nitro-4-hexenoic acid or 3-nitrohex-4-enoic acid
14	$\begin{array}{c} \text{Cl} \quad \quad \quad \text{Cl} \\ \diagdown \quad \quad \diagup \\ \text{C}=\text{C} \\ \diagup \quad \quad \diagdown \\ \text{H}_3\text{C}-\text{CH}_2 \quad \quad \quad \text{CH}_2-\text{CH}_2-\text{C}(=\text{O})-\text{OH} \end{array}$	<i>cis</i> -4,5-dichloro-4-heptenoic acid
For each of the following, name the functional group and state the type of organic compound		
15a	$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$	ethanal Functional Group: carbonyl Type: aldehyde
15b	$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$	ethanoic acid Functional Group: carboxyl (carbonyl and hydroxyl) Type: carboxylic acid
15c	$\text{H}_2\text{C}-\text{CH}_2-\text{CH}_3$ OH	1-propanol Functional Group: hydroxyl Type: alcohol
15d	$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\text{CH}_3$	2-butanone Functional Group: carbonyl Type: ketone
15e	$\text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\text{CH}_3$	propanal Functional Group: carbonyl Type: aldehyde
15f	$\text{H}_3\text{C}-\overset{\text{CH}_3}{\parallel}{\text{C}}=\text{O}$	propanone (common name: acetone) Functional Group: carbonyl Type: ketone