Worksheet	12.2		
Organic	reaction	pathways	

NAME: CLASS:

INTRODUCTION

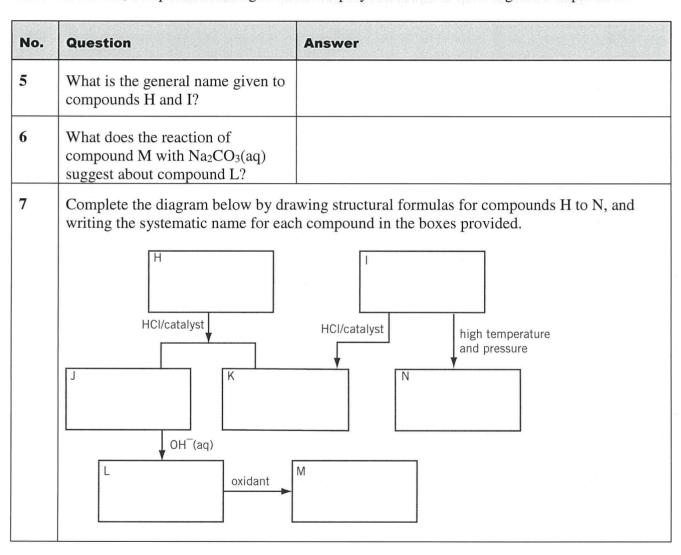
This worksheet looks at two organic reaction pathways, and allows you to apply your knowledge of organic reactions to solve for 'unknown' compounds in these pathways.

No.	Question	Answer
1		eads to the production of organic compound G, propyl drawing structural formulas for compounds A to G, and compound in the boxes provided. H ⁺ (aq) G propyl ethanoate
2	Describe a chemical test that could be used to distinguish between compounds A and D.	
3	Describe a chemical test that could be used to distinguish between compounds C and G.	

Worksheet 12.2 Organic reaction pathways

No.	Question	Answer
4	Which compound, B or F, would be expected to have the higher boiling	
	point? Explain your choice.	

Organic compounds H and I have the same molecular formula, C_4H_8 . Compound H is reacted with HCl(g) and a suitable catalyst. Two organic products, compounds J and K, are isolated. Compound J undergoes reaction with $OH^-(aq)$ to produce compound L. Compound L is oxidised to produce compound M. Compound M undergoes reaction with $Na_2CO_3(aq)$ to produce $CO_2(g)$. Compound I also reacts with HCl(g) and a suitable catalyst to produce a single organic product, compound K. In another reaction, compound I undergoes addition polymerisation to form organic compound N.



Worksheet 12.2: Solutions

Organic reaction pathways

No.	Answer			
1	Compound A: ethene, CH ₂ CH ₂ Compound B: ethanol, CH ₃ CH ₂ OH Compound C: ethanoic acid, CH ₃ COOH Compound D: propane, CH ₃ CH ₂ CH ₃ Compound E: 1-chloropropane, CH ₃ CH ₂ CH ₂ Cl Compound F: propan-1-ol, CH ₃ CH ₂ CH ₂ OH Compound G: propyl ethanoate, CH ₃ COOCH ₂ CH ₂ CH ₃			
2	Test with bromine solution. Compound A (unsaturated) will decolourise bromine, while D (saturated) will not.			
3	C is acidic and will produce a solution with pH less than 7. G is neither acidic nor basic; its solution will be neutral.			
4	B and F belong to the primary alkanol homologous series. F is larger than B and so will have larger dispersion forces between molecules, leading to a higher boiling point.			
5	Isomers			
6	Compound L is an acid (i.e. contains an acidic functional group).			
7	Compound H: but-1-ene, CH ₂ CHCH ₂ CH ₃ Compound I: but-2-ene, CH ₃ CHCHCH ₃ Compound J: 1-chlorobutane, CH ₃ CH ₂ CH ₂ CH ₂ Cl Compound K: 2-chlorobutane, CH ₃ CH(Cl)CH ₂ CH ₃ Compound L: butan-1-ol, CH ₃ CH ₂ CH ₂ CH ₂ OH Compound M: butanoic acid, CH ₃ CH ₂ CH ₂ COOH Compound N: polybut-2-ene,CHCH ₃ CHCH ₃ CHCH ₃			