Select an alkyl halide and a nucleophile that will give each of the following products:

* 1. CH3C≡CCH2CH3
	2. CH3CH2OCH2CH3
	3. CH3CH2SCH3
	4. (CH3)2CHCH2OH

Draw out each of the following equations in a way that shows clearly the stereochemistry of the reactants and products.

* 1. (R)-3-chlorohexane + sodium methoxide (in methanol) 3-methoxyhexane
	2. (S)-2-chlorobutane + methanol 2-methoxybutane

Determine the order of reactivity for (CH3)2CHCH2Br, (CH3)3CBr, and CH3CHBrCH2CH3 reacting with

* 1. CH3OH (methanol)
	2. NaSH (sodium hydrosulfide)

Tell what products you expect and by what mechanism they are formed for each of the following reactions:

* 1. 2-chlorohexane + ethanol 
	2. 2-chlorohexane + sodium ethoxide (in ethanol) 
	3. 2-chlorohexane + sodium hydrosulfide 

Give the structures of all possible products when 2-chlorobutane reacts by the E-2 mechanism.