what happens in S_N2, S_N1, E2, and E1 mechanisms

	what happens in the main steps	big obstacle
S_N2	One main step: Nucleophile joins α carbon and leaving group leaves α carbon There may also be an acid/base step.	steric hindrance
S_N1	First main step: Leaving group leaves α carbon Second main step: Nucleophile joins α carbon There may also be an acid/base step, and/or a carbocation rearrangement step.	stabilizing the carbocation intermediate
E2	One step: Base takes β hydrogen, π bond forms between α and β carbons, leaving group leaves α carbon.	none
E1	First main step: Leaving group leaves α carbon Second main step: Base takes β hydrogen, π bond forms between α and β carbons There may also be an acid/base step, and/or a carbocation rearrangement step.	stabilizing the carbocation intermediate

how to determine the mechanism for alkyl halides and alkyl sulfonates

	poor Nu / weak base O with no formal charge (water or alcohol)	**good Nu / weak base** Cl^-, Br^-, I^-, ^-CN, S^-, N_3^- or N, P, or S with no formal charge	**good Nu / strong base** O^-, N^-
methyl α-carbon **1° α-carbon**	no reaction	S_N2	S_N2 Exception: E2 with *t*-butyloxide and 1° α-carbon
2° α-carbon	S_N1 major, E1 minor	S_N2	E2
3° α-carbon	S_N1 major, E1 minor	S_N1 major, E1 minor	E2

In this table, the term "α-carbon" refers to the carbon attached to the leaving group.
The α-carbon in the alkyl halide or alkyl sulfonate must be sp^3, not sp^2 or sp, for S_N2, S_N1, or E1 reactions to occur.

The table shows the major reactions for each situation. There may also be significant minor reactions.

This table will usually give the correct answer for most exam problems for most introductory ochem courses.
But there may be some problems in some courses for which the table gives an incorrect answer.