The worksheets are available in the tutorials and form an integral part of the learning outcomes and experience for this unit.

**Model 1: Carboxylic Acid Derivatives**

1. See below. The base, B, could be solvent or H$_2$NCH$_3$.

   ![Reaction diagram](image)

2. Addition of an amine:

   ![Reaction diagram](image)

3. An alcohol (with its alkyl group corresponding, as shown above, to the –OR’ group in the ester).

4. Simple H$^+$ transfer reactions occur:

   ![Reaction diagram](image)
5. Step 1: CH$_3$OH is added and H$_2$O is removed. The acid and alcohol combine to make an ester in the condensation reaction.

Step 2: H$_2$O is added and CH$_3$OH is removed in this hydrolysis reaction.

6. See below.

7. An acid chloride is more reactive to nucleophiles like water than an amide.