Spec ref: 4.6.5.3

KEY FACTS

★ 1. Identify desired gene (e.g. human insulin gene)
★ 2. Cut out gene using RESTRICTION ENZYMES (leave sticky ends)
★ 3. Cut plasmid with same restriction enzyme → complementary sticky ends
★ 4. Insert gene into plasmid; DNA LIGASE seals joins → recombinant DNA
★ 5. Introduce plasmid into host cell; host expresses gene → produces protein
★ Examples: insulin-producing bacteria, herbicide-resistant crops, golden rice

KEY TERMS

Restriction enzyme	Cuts DNA at specific sequences — used to remove genes
Ligase	Joins DNA strands — seals gene into plasmid
Recombinant DNA	DNA containing genes from two different organisms
Plasmid	Small circular DNA in bacteria — used as vector to carry foreign genes

■ EXAM TIP: Restriction enzyme = CUT. Ligase = JOIN. Both names and functions in genetic engineering answers. Sticky ends are complementary — that's how the gene fits into the plasmid.