

Planning sentences for cognitive work

This resource accompanies the article '**Building blocks**' in *Education in Chemistry* which you can view at: rsc.li/46qmrHf

The table shows some of the jobs we want sentences to do in chemistry. Being aware of the functions of specific sentences helps you plan for students who are likely to find a specific writing (or talking) task difficult.

The function of the sentence	Conjunctions	Simple example	The cognitive work
Stating cause and effect	because, therefore, so, as, since, which results in	The reaction rate increases because the temperature is increased.	Forces the student to link an outcome to a reason, moving beyond simple observation to explanation.
Comparing and contrasting	whereas, however, although, while, in contrast to	Although both are forms of carbon, diamond is hard whereas graphite is soft.	Requires holding two concepts in mind simultaneously and identifying specific points of difference or similarity.
Sequencing a process	first, then, next, after, once, when	When you heat a solid, at first the temperature increases until it reaches the solid's melting point and then it begins to melt.	Builds a mental script for a chemical event, reinforcing the order and logic of a transformation.
Linking structure to property	because of, due to, which means	Diamond is very hard due to its giant covalent lattice structure.	Connects the abstract, invisible structure of a substance to its tangible, observable properties. This is a core chemical concept.
Starting a condition	If ... then ..., unless, provided that	If you add a catalyst, then the reaction will speed up.	Introduces conditional logic. It helps students understand that chemical events are not absolute but depend on specific circumstances.
Defining and elaborating	is a ..., which is ..., meaning that ...	An acid is a proton donor, meaning that it releases H ⁺ ions in solution.	Pushes for a more precise and detailed definition beyond a simple label, connecting a term to its functional meaning.