

Assessing Student Knowledge

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There are three broad categories of questions used to assess student knowledge.

- Recall
- Algorithmic
- Conceptual (a.k.a. higher-order)

Recall questions ask you to recall facts, equations, or explanations.

Examples include

- What is the symbol for sodium?
- Write the equation used to determine standard state enthalpy changes from standard enthalpies of formation.
- Which of the following compounds is insoluble: KCl, KNO₃, AgCl, AgNO₃?

Algorithmic questions ask you to use information or processes in a familiar way. (A computer could be programmed to answer many of these types of questions.)

Examples include

- Write the electron configuration of a cobalt atom and identify the number of unpaired electrons.
- Determine the mass of CuO necessary to prepare 25.0 grams of Cu(NO₃)₂. (Although you may find stoichiometry problems challenging, practice turns them into routine algorithmic exercises.)
$$\text{CuO(s)} + 2\text{HNO}_3\text{(aq)} \longrightarrow \text{Cu(NO}_3)_2\text{(aq)} + \text{H}_2\text{O(l)}$$
- Use the VSEPR model to determine the molecular structure of NH₃.
- Determine the chloride ion concentration in a saturated solution of AgCl ($K_{\text{sp}} = 1.8 \cdot 10^{-10}$).

Conceptual questions ask you to evaluate a problem and determine a method of solution. This may include some combination of the following:

- Translate information between words, symbols, and figures.
- Analyze information for underlying principles and relationships.
- Analyze information to select data relevant to the problem.
- Apply concepts and methods to unfamiliar systems.
- Evaluate information, experimental results, or models for validity and limitations.
- Rationalize why a process occurred and/or propose what would occur.
- Explain why a particular method of solution was chosen.

Your preparatory (high-school) courses most likely focused on recall and algorithmic questions. At the post-secondary level, you are expected to answer questions from all categories so that your understanding of the course material can be accurately assessed.