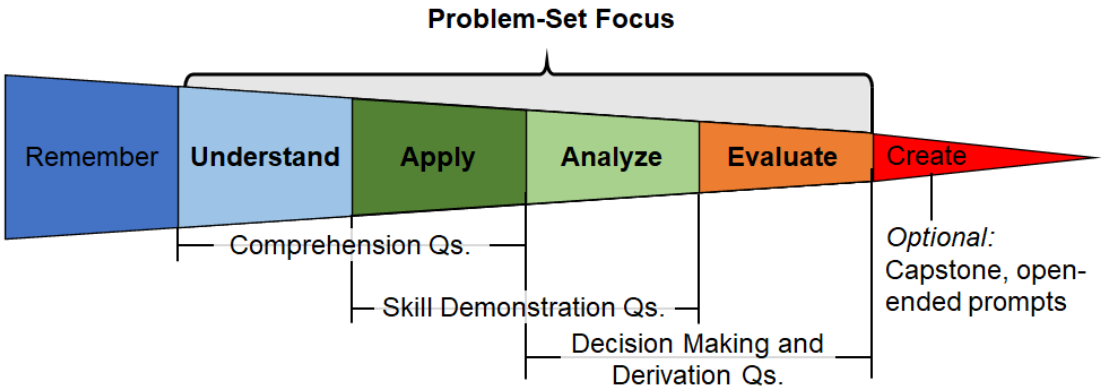
# The Art of Molecular Programming Problem-Set Writing Guidelines

Using the list of Key Concepts and Key Skills from your outline, generate 4 to 11 problems (per section). Comprehension questions will be used both in-text or at the end of the section. Please emphasize the middle of Bloom's Taxonomy, indicated below.

Bloom's Taxonomy of Learning Objectives




- **Comprehension Questions:** *~ 1-4 / section*
  - Apply ~1-2 Key Concepts or Key Skills in a *similar* context to the main text
    - Some of these will be placed in-text as "check your understanding" boxes
- **Skill Demonstration Questions:** *~1-4 / section*
  - Apply 1-2 Key Skills (or equations) in a *distinct* context to the main text
  - *Imply or explicitly indicate which skills should be used*
    - IF possible: include quantitative questions with research application
    - IF possible, use error propagation from *measure->model,* or *model->prediction*
- **Decision Making & Derivation Questions:** *~1-2 / section*
  - Apply 1-3 Key Skills in a context *completely distinct* from the main text
  - *Allow the reader to determine which skills to apply*
    - Derive a NEW relationship analogous to one derived in the text
    - Apply multiple Key Skills to analyze and evaluate two options
- **Capstone Open-Ended Questions:** *~Optional,1 / section*
  - *A real-world experimental or theoretical question*
  - *Depends on multiple judgement/evaluations; there should be no single correct answer.*

**Topic Specific Examples: Structures**

- **Comprehension:** Is the honeycomb or square lattice more compact?
- **Skill Demonstration:** Calculate the $T_m$ for the sequence ATGCATGC
- **Decision Making & Derivation:** Derive the equation for $T_m$ of hairpin as a function of loop size (# of Xs) for the sequence ATGCATGC-XXX-GCATGCAT
- **Capstone:** For a sticky end design that must bind a particle above X C and release above Y C, using either a 4 base or 8 base sequence, would there be a difference in localization precision? Why?