

Computational Thinking and Associated Science Practices

Jeanette Wing (2014) has defined computational thinking as, “the thought process involved in formulating a problem and expressing its solution(s) in such a way that a computer—human or machine—can effectively carry it out.” While CT practices have previously been thought of as most closely related to actual computing (Papert 1980), today the relevance and use of CT has expanded to many disciplines. CT practices that students engage in during the Baltimore Floods unit include:

- Making a conceptual model of a system
- Using a physical model to explore system components and processes
- Using data from a physical model to quantify system behavior
- Representing a system in discrete time and space to identify relationships and define rules
- Using data from a discrete model to quantify system behavior
- Validating models
- Testing solutions and making predictions

CompHydro Baltimore provides resources and a roadmap of engagement for integrating computational thinking and science practices into the classroom through Baltimore Floods, a place-based water science unit aligned with state and *NGSS* science standards.

CT practices adapted from sources including Covitt et al. 2020, Grover and Pea 2006, Weintrop et al. 2016, Wilensky and Reisman 2006.