

The “Develop” Activity Types

The production of computational artifacts challenges students to express themselves or to solve problems, using and refining their programming skills. Planning, developing, and refining are processes which are used both in the real-world and classroom to create efficient and quality computational artifacts. These artifacts can be original student creations or a modification/combination of existing ones. Computer programs, robotic systems, mobile and web applications, simulations, animations, and games are all examples of computational artifacts.

Table 5: “Develop” Activity Types

Activity Type	Brief Description	Possible Technologies
Plan/Design Artifacts	Students plan and design computational artifacts.	Mindmapping/brainstorming tools (e.g. Popplet , Coggle , MindMup), Online diagram tools (e.g. draw.io , Google Drawings)
Reflect/Modify Development	Students reflect and modify development to reach end goals.	Screen sharing (e.g. ScreenHero), Google Docs , online feedback (e.g. Peergrade)
Create Artifacts	Students create computational artifacts to solve problems, express themselves, or complete tasks.	Coding learning environments (e.g. CodeStudio , Codecademy , CodeBender , BlueJ), Google Docs
Modify Existing Artifacts	Modify, improve, and customize existing artifacts.	Online coding challenges (e.g. CodeEval), development platforms/communities (e.g. GitHub , StackOverflow)