

The “Maker-Literate” student:

- identifies the need to invent, design, fabricate, build, repurpose or repair some “thing” in order to express an idea or emotion, or to solve a problem
 - recognizes unmet needs that may be filled by making
 - expresses curiosity about how things are made and how they work
 - “hacks” and “tinkers” to learn how things are made and how they work
 - evaluates the costs & benefits of making as an alternative to buying or hiring
- applies design praxis
 - defines the problem
 - analyses the problem and breaks it into component parts
 - acquires reliable and relevant background information
 - identifies stakeholders
 - specifies project requirements
 - identifies and works effectively within project constraints, be they financial, temporal, proximal, or material
 - brainstorms for a variety of solutions & chooses the best one
 - evaluates the costs & benefits of using off-the-shelf parts or kits as opposed to making from scratch
 - creates and tests prototypes
 - revises and modifies prototype design over multiple iterations
 - takes intelligent risks and learns from failures
- demonstrates time management best-practices
 - outlines project milestones and identifies dependencies
 - constructs critical paths
 - builds in extra time to allow for multiple prototype iterations
- assembles effective teams
 - recognizes opportunities to collaborate with others
 - evaluates the costs & benefits of “Doing-it-Together” (DIT) vs. “Doing-it-Yourself” (DIY)
 - seeks team members with skills appropriate for specific project requirements
 - joins a team where his/her skills are sought and valued
 - solicits advice, knowledge and specific skills succinctly from experts
- employs effective knowledge management practices
 - communicates clearly with team members and stakeholders
 - restates technical and “maker” jargon in plain English
 - documents work clearly
 - uses version control to manage project outputs and documentation
 - preserves project outputs and documentation for long-term access
- assesses the availability of tools
 - selects the best tools for the job
 - acquires the necessary tools or revises project to conform to tool availability
 - seeks alternate tools when a required tool is not available

- creates necessary tools that can't be acquired or when an alternate is not an option
- assesses the availability of materials
 - selects the best materials for the job
 - acquires the necessary materials or revises project to conform to materials availability
 - seeks alternate materials when a required material is not available
- demonstrates understanding of digital fabrication process
 - recognizes additive and subtractive fabrication techniques
 - applies 3D modeling principles
 - creates 3D models using appropriate software
- understands many of the ethical, legal and socio-economic issues surrounding making
 - demonstrates an understanding of intellectual property rights and protections
 - identifies project outputs that may be protectable by trade secret, patent, trademark or copyright
 - compares the costs & benefits of seeking intellectual property protections v. making project outputs open and freely available to others
 - evaluates the costs & benefits of open source and proprietary systems
 - recognizes and respects the intellectual property rights of other makers
- employs safety precautions
 - seeks training for dangerous equipment and materials
 - wears personal protective gear when appropriate
 - teaches safety precautions to others
- transfers knowledge gained into workforce, community, and real-world situations
 - teaches what he/she knows to less experienced makers