Maker Challenge Template

Note: Maker challenges are teacher-prompted, open-ended project ideas and problems for students to solve in a self-directed, thinking-with-their-hands way, guided by the design cycle step—with the intent to cultivate everyday thinking routines and engineering habits of mind. Required items.

Maker Challenge Title [Provide a short descriptive, distinctive and/or catchy title.]

Grade level Target grade = ___ and *scalable* down to grade ___ and up to grade __

Subject area(s) [Choose all that apply since users can browse by subject area.]: algebra, biology, chemistry, computer science, data analysis & probability, earth & space, geometry, life science, measurement, number & operations, physical science, physics, problem solving, reasoning & proof, science & technology

Engineering Category = engineering design process [default for ALL maker challenges]

Estimated Time Required Provide a general time estimate in minutes; example: 600 minutes

Header

[Provide a photo to appear at the top of the document (hint: showing students making their creations are always great!) For this photo (and all images), provide information about it in a box like this.]

Image 1

Image file: makerch1_image1.jpg

ADA Description: A photo shows an illuminated mini LED flashlight on a key chain. *(Write as if describing the image to a blind person; do not repeat caption content.)*

Source/Rights: 2011 Wtshymanski, Wikimedia Commons https://commons.wikimedia.org/wiki/File:Keychain_LED_flashlight.jpg

(optional) Caption: Students invent solutions for how to find often-misplaced items.

For more info, see **Requirements & Tips for Using Images** on the Submit Curriculum **page.**

Maker Challenge Recap

[Provide a few sentences that describe the student challenge, overarching goal and/or problem to solve. Maximum one paragraph of plain text (no images or formatting). Write in present tense, not future.]

Maker Materials & Supplies

[Suggest the materials, tools, equipment and space to make available for students. Describe any teacher preparation related to the supplies and space. For unusual items, suggest source info/URL, part numbers and estimated pricing.]

Kickoff

[Provide teacher prompts, perhaps to orient learners to the space and activity at hand, give intros and demos, lead a community building exercise, clarify constraints and cautions, emphasize habits of mind to focus on such as taking risks and being creative, discussion topics (questions, storyline, ideas, plans, real-world connections), etc. As makes sense, write this section (or portions of it) as if talking to students.]

Resources

[(optional) To help students as they embark on the challenge, list suggested websites, videos, images, outside experts, example designs and attachments such as design journal handouts, circuit diagrams, PowerPoint files, etc. Refer to the *Introductory Notes about the Templates* on the Submit Curriculum page. Provide attachments in original digital file formats such as Word or Excel; TE will make PDFs.]

Maker Time

[Suggest teacher guidance/prompts for this stage. Perhaps forming teams, brainstorming, researching and overseeing students as they make, tinker, collaborate, test, analyze and iterate. Assume students are acting as engineers and following the five-step design cycle (ideate, create, test, iterate, share). Suggest suitable teacher actions such as offering new tools, thought process clarification, just-in-time concepts, new vocabulary words, failure analysis, learning from other teams, teaching other teams, observing engagement, etc. Provide any key background concepts. Include helpful images, photos and diagrams.]

Wrap Up

[Provide teacher prompts to facilitate a concluding time to compare, share and/or reflect, such as through a competition, expo, peer critique exchange, revisiting the challenge goal, students giving marketing presentations as if they are selling what they made, comparing projects across all groups, asking probing questions, leading a class discussion, suggesting extensions and ideas for increasing complexity, etc.]

Attachments

[(optional)]

Tips

[(optional) As necessary, provide tips such as about scaling, incorporating math, safety issues, troubleshooting, pre-requisite knowledge or skills, and overall approach and philosophy.]

Other

[(optional) For anything that does not fit into the provided categories.]

Contributors

[Who is the author(s)? List the name(s) of who contributed to developing, testing and refining the maker challenge. List the primary creator first. *Example*: Jay Shah, Malinda Zarske]

Supporting Program

[Briefly provide the name and organization of the source of this curricular content. This will appear at the top and bottom of the document. *Example*: STEM Program, College of Engineering, University of Idaho.]

Acknowledgements

[(optional) Provide brief text to acknowledge significant funding or other support.]

Example: This curriculum was developed under National Science Foundation GK-12 grant no. DGE 0338326. However, these contents do not necessarily represent the policies of the NSF, and you should not assume endorsement by the federal government.

Example: This maker challenge was inspired by the Flying T-Shirt activity that was created by the Integrated Teaching and Learning Laboratory in the College of Engineering and Applied Science at the University of Colorado Boulder.

Copyright

Maker Challenge Testing Info

[Briefly describe your experience(s) using this maker challenge in a classroom or informal learning setting(s); include month, year, school location, grade and number of students; not to be published.]