

At-Home Activities Framework

A guide for tailoring hands-on activities for at-home learners and caregivers.



The activity has an exceptionally effective and easy-to-use guide

Add a short introductory question and/or description, complete materials list, safety notices, and STEM background information, in plain language.

Label basic activity characteristics such as target age range and time required.

Include specific step-by-step instructions with pictures. Learners and caregivers should not have to read between the lines when using instructions.

Divide into clearly labeled sections so information is easy to find.

Consider adding a video walk-through of activity and photos of all necessary materials.

Consider an ending section for extension activities or suggestions on how to age-up or age-down the activity when appropriate.

Consider adaptations to make the activity guide accessible to as many learners and caregivers as possible (e.g., larger font sizes, high-contrast colors, instructions with minimal wording, multiple languages).



The activity uses common, low-cost household materials

Use common items found around the home or recycled materials.

Do not require expensive materials or those that can't be sourced locally.

Consider including a list of alternative items that can be used if learners do not have access to the listed materials.

Avoid food waste if possible.



The activity encourages caregivers and learners to work together in a meaningful way

Include prompts on how the caregiver can interact with the activity and work together with their learner.

Add simple questions for caregivers to ask learners when appropriate.

Consider relevance and creativity as entry points for caregiver participation.



The activity is related to the everyday lives of learners

Include ties to observable scientific phenomena (e.g., shadows, ripples in water, vibrations, sounds from musical instruments) or daily activities (e.g., playing, riding in a car or bus, eating, learning) that are accessible to the target age range.

Use connections that motivate children (e.g., animals, favorite characters, food, sensory items, games).

Consider using a story or storybook to frame the activity.

Within activity steps and outcomes, create opportunities for learners to practice patience, sharing, working together, and helping others.



The activity engages the learner's senses

Include sensory elements such as vibrant colors, rich sounds, interesting textures, fragrant smells, and tasty treats.

Consider adding information about loud noises, flashing lights, and other potentially extreme stimuli for learners with sensitivities.

Consider adaptations for learners with sensory disabilities.



The activity lets learners practice and express their creativity

Include steps or recommendations for learners to express themselves and add their own ideas.

Include open-ended questions that encourage learners to try multiple solutions.

Consider adding creative pathways for learners and caregivers to repeat or grow the activity.



howtosmile.

Resources That Informed the Framework

Four Principles for Supporting Family Learning During the Global Health Crisis

Informalscience.org

Clear strategies for educators to support at-home family learning, including building on families' interests and values, working with caregivers as partners in education, and celebrating the unique nature of learning outside school when even small moments can be powerful.

What Do Parents Want Now? Children's Virtual Programming During the Pandemic

Rockman et al.

Survey results showing caregivers strongly favored at-home science experiments or building activities as virtual programming during the pandemic. Caregivers also highly valued topics on STEM, arts, and social-emotional skills.

Leap into Science – Core Four Strategies

The Franklin Institute

Evidence-based strategies for facilitating science and literacy workshops for families that could inform caregiver practice at home. Suggestions include asking open-ended questions and connecting activities to children's everyday experiences.

How to Build Creative Confidence in Kids

IDEO | Medium.com

Strategies for nurturing creativity in children at home through play and open-ended learning, such as the importance of creativity, encouraging judgment-free exploration, and not utilizing extrinsic rewards.

Howtosmile Activity Requirements

Howtosmile.org

Accessioning criteria for adding hands-on STEM activities to the digital library served as the basic foundation for the framework.

What Is the Framework?

Science museums, children's museums, natural history museums, and other informal learning institutions inspire a curiosity for learning through authentic and enjoyable experiences. During the COVID-19 pandemic, our community mobilized to support these experiences with learning materials uniquely suited for caregivers and children at home.

Through funding from the Institute of Museum and Library Services, ***Howtosmile.org*** brought together over a dozen museums across the U.S. to document their shared practices with a new **At-Home Activities Framework** focused on learning at home. The framework is a list of recommended activity criteria, including accessible guides,¹ low-cost materials, caregiver support,^{2,3} relevance,^{4,5} and creativity,⁶ informed by exemplars, established design principles, and educational research.

The project team has used the **At-Home Activities Framework** to curate a new collection on ***Howtosmile.org*** that showcases the best hands-on STEAM activities for learners at home. Both the framework and the resulting collection are directed at educators searching for, adapting, or creating at-home activities.

1 Constantopedos, E. (2019). Accessible Interactive Activity Templates: Creating interactive activities in ePubs. UNICEF, Accessible Digital Textbooks for All Initiative. Retrieved from: <https://www.accessibletextbooksforall.org/stories/accessible-interactive-activity-templates>

2 Van Voorhis, F. L., Maier, M. F., Epstein, J. L., & Lloyd, C. M. (2013). The impact of family involvement on the education of children ages 3 to 8: A focus on literacy and math achievement outcomes and social-emotional skills. MDRC.

3 McClure, E. R., Guernsey, L., Clements, D. H., Bales, S. N., Nichols, J., Kendall-Taylor, N., & Levine, M. H. (2017). STEM starts early: Grounding science, technology, engineering, and math education in early childhood. New York: The Joan Ganz Cooney Center at Sesame Workshop.

4 Roberson, R. (2013, September). Helping students find relevance. Sdl.Web.DataModel.KeywordModelData. <http://www.apa.org/ed/precollege/ptn/2013/09/students-relevance>

5 Pattison, S., Svarovsky, G., & Ramos-Montañez, S. (2020). Storybooks and STEM: Using Books as a Tool to Support Early Childhood Family STEM Learning.

6 Conradt, C., & Bogner, F. (2020). STEAM teaching professional development works: effects on students' creativity and motivation. Smart Learning Environments. 7. 10.1186/s40561-020-00132-9.



The At-Home Activities Framework was developed by the Children's Creativity Museum, UC Berkeley's Lawrence Hall of Science in partnership with Boston Children's Museum, Carnegie Science Center, Children's Science Center, Discovery Museum, Explora, Exploration Place, Florida Museum of Natural History, Marbles Kids Museum, Museum of Life and Science, Sciencenter, and project advisors Cassie Byrd and Paulmichael Maxfield.



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