

Science Festivals: Very Short Science Engagement

Science festivals and expos offer very short engagement with hands-on science activities. Intentional design is needed to leverage these experiences for learning.

Science Expos

Science expos are typically a large-scale, single-day event involving multiple groups providing hands-on science activities varying in disciplinary content.

The attendees, typically youth and parents or caregivers, interact with multiple exhibits, typically spending less than 10 minutes at any one exhibit.

Science expos are one format commonly used as part of a broader ‘science festival’ concept for engaging the public in science activities and providing scientists and science educators a venue for interacting with the publicⁱ.

Nurturing Wonder and Curiosity

Science expos offer a unique environment for nurturing wonder and curiosity in youth through surprise and noveltyⁱⁱ.

Wonder: A feeling of surprise mingled with admiration caused by something unexpected.

Curiosity: Eagerness and a desire to learn more.

Wonder and curiosity are present when you see laughter, attendees asking questions, and continued engagement with the activity.

Increasing Science Awareness: Science expos improve public **awareness** of science in everyday life, nurturing an appreciation for science. Science expos help raise awareness of science careers youth might pursue in the future.

Given the very short length of interaction between attendees and exhibitors, usually less than 10 minutes per exhibit visited, science expos are unlikely to strengthen young people’s scientific knowledge or reasoning abilities.



Core Educational Elements

Have an interactive & hands-on exhibit

Provide a hands-on activity with a noted link to science, technology, engineering, or mathematics.

Attendees prefer hands-on experiences where they can manipulate real-world objectsⁱⁱⁱ. Engage youth in science processes such as observing, asking questions, interpreting data, handling materials, or constructing explanations. Or engage youth in engineering processes including designing, building, and testing.

Passive “information delivery” (including lectures, demonstrations, slide shows, and information-only displays) are typically not as well received. If you are providing a demonstration or passive display, include a related hands-on activity, too.

Pose an inquiry question

Develop and pose an inquiry question to explore.

An inquiry question (also known as a driving question) helps frame your activity in a broad science discipline. Effective inquiry questions are open-ended with no straight-forward answer, connected to real science, feasible to explore within the timeframe (<10 minutes), and relevant and meaningful to youth.

Avoid dense scientific information.



Answer a question with a question

Invite young people to construct their own explanations, rather than giving them the answers.

Pause before giving answers. Encouraging young people to construct their own explanations helps promote deeper learning.

[Click here to view example questions.](#)

Provide prepared prompts to parents

Provide prepared prompts and questions to guide parents and caregivers' conversations with youth.

Parents' and Caregivers' conversations play an important role in their children's learning^{iv}. They need to encourage youth to ask questions and construct their own explanations, rather than telling youth the answer. This is very difficult for most adults! Provide parents and caregivers with information or prompts to guide their conversations with their children on a poster or handout.

Promote interactions with a professional scientist or engineer

Have a clearly identified professional scientist or engineer at your exhibit.

Science festival attendees are more satisfied, had more fun, and report better learning when they interacted with a professional scientist or engineer^v.

Stay positive and have high energy!

Smiling exhibitors with high energy and enthusiasm will improve interactions and attendee experience.



ⁱ Jensen, E., & Buckley, N. (2014). Why people attend science festivals: Interests, motivations and self-reported benefit of public engagement with research. *Public Understanding of Science*, 23(5). <https://doi.org/10.1177/2F0963662512458624>

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ⁱⁱ Davis, S. R. (2019) Science communication as emotion work: Negotiating curiosity and wonder at a science festival. *Science as Culture*, 28(4). <https://doi.org/10.1080/09505431.2019.1597035>

ⁱⁱⁱ Chen, G. (2014). National science festival of Thailand: Historical roots, current activities and future plans of the National Science Fair. *Journal of Science Communication*, 13(04). <https://doi.org/10.22323/2.13040304>.

^{iv} Joy A. et al. (2021). Understanding parents' roles in children's learning and engagement in informal science learning sites. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.635839>

^v Manning, C., Lin, K., & Goodman, I. F. (2013). *The Science Festival Alliance: Creating a Sustainable National Network of Science Festivals - Final Summative Evaluation Report*. Goodman Research Group, Inc.

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