



Science festivals: Very short science education engagements

Science festivals and expos offer very short engagements 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—to engage the public in science activities and provide a venue for scientists and science educators to interact with the public.

Nurturing wonder and curiosity

Science expos offer a unique environment for nurturing wonder and curiosity through surprise and novelty. Developing positive attitudes and interest for science is a component in strengthening scientific literacy.

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 attendees laughing, asking questions, and continuing to engage with the activity.

Given the 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.

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.

Core educational elements

Have an interactive and hands-on exhibit

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

Attendees prefer hands-on experiences where they can manipulate real-world objects. 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 straightforward answer, connected to real science, feasible to explore within the timeframe (less than 10 minutes), and relevant and meaningful to youth.

Avoid dense scientific information

Dense scientific information may limit people’s ability or willingness to interact with your activity.

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.

View example questions, sep.ucsf.edu/wp-content/uploads/2024/03/Questions-are-the-Answer.pdf



Provide prepared prompts to parents

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

Conversations with parents and caregivers play an important role in their children's learning. Parents and caregivers need to encourage youth to ask questions and construct their own explanations rather than telling them the answers. This is very difficult for most adults. Provide parents and caregivers a poster or handout with information or prompts to guide their conversations with their children.

Promote interactions with a professional scientist or engineer

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

Science festival attendees were more satisfied, had more fun, and reported better learning when they interacted with a professional scientist or engineer.

Stay positive and have high energy!

Smiling exhibitors with high energy and enthusiasm will improve interactions and attendees' experiences.

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