

There is a lack of research measuring student outcomes from STEAM education – the integration of art into science, technology, engineering, and mathematics ([Aguilera 2021](#); [Perignat 2019](#); [NASEM 2018](#)).

- Arts education alone can improve creativity, innovation, critical thinking, and collaboration, which are skills that benefit science, technology, engineering, and mathematics (STEM) careers ([Burton 2020](#); [Perignat 2019](#)).
- Nobel laureates in science are 2x as likely as other scientists to be photographers or musicians, and 15-20x as likely to participate in crafts such as wood working, creative writing, or performance art ([Root-Bernstein 2015](#)).

Missouri has several professional development (PD) programs to train teachers to integrate art into their lessons (**Table 1**) and educational programs to introduce children to STEAM activities (**Table 2**; [Supplemental Table 1](#)).

- Out-of-school program hosts include universities, science centers, museums, and libraries.
- Some PreK-12 schools emphasize STEAM in their curricula (e.g., [STEAM Academy](#), [Community School](#)).

**Table 1.** Non-exhaustive list of MO PD programs that train educators to integrate art into STEM education.

| Program Host   | Description  | Location    |
|--|--|-------------|
| <a href="#">Missouri Alliance for Arts Education</a>       | STEAM PD for educators in rural schools.   | Rural MO    |
| <a href="#">Center of Creative Arts (COCA)</a>             | Science teachers and administrators partner with artists.  | STL         |
| <a href="#">Springfield Regional Arts Council</a>          | Conference for teachers, principals, & administrators to demonstrate how they can integrate art into teaching. | Springfield |
| <a href="#">KS/MO Kennedy Center Partners in Education</a> | PD for teachers in integrating arts with another subject.  | KC          |

**Table 2.** Non-exhaustive list of MO STEAM programs and summer camps for children.

| Program Examples   | Description  | Type                |
|--|--|---------------------|
| <a href="#">Maryville University Summer Programs</a> (STL); <a href="#">Challenger Learning Center St. Louis</a> (STL) | Combine art with 3D printing, laser cutting, and other techniques to create physical crafts. | Crafts              |
| <a href="#">Art of Science Summer Camp</a> (Rolla); <a href="#">Bartow Summer Camps</a> (KC)                           | Use music to aid in teaching about coding, and show how music can be combined with science.  | Music               |
| <a href="#">College for Kids</a> (Columbia); <a href="#">WashU Lavner Summer Camps</a> (STL)                           | Teach about drawing and animation using the sciences.  | Drawing & Animation |
| <a href="#">GenCyber Camp</a> (KC); <a href="#">Code Ninjas</a> (KC)   | Use games to learn coding; video game development.   | Game Design         |
| <a href="#">Library grants</a> (MO); <a href="#">PreK STEAM events</a> (STL)   | Host public events and check out at-home STEAM kits.   | Other               |