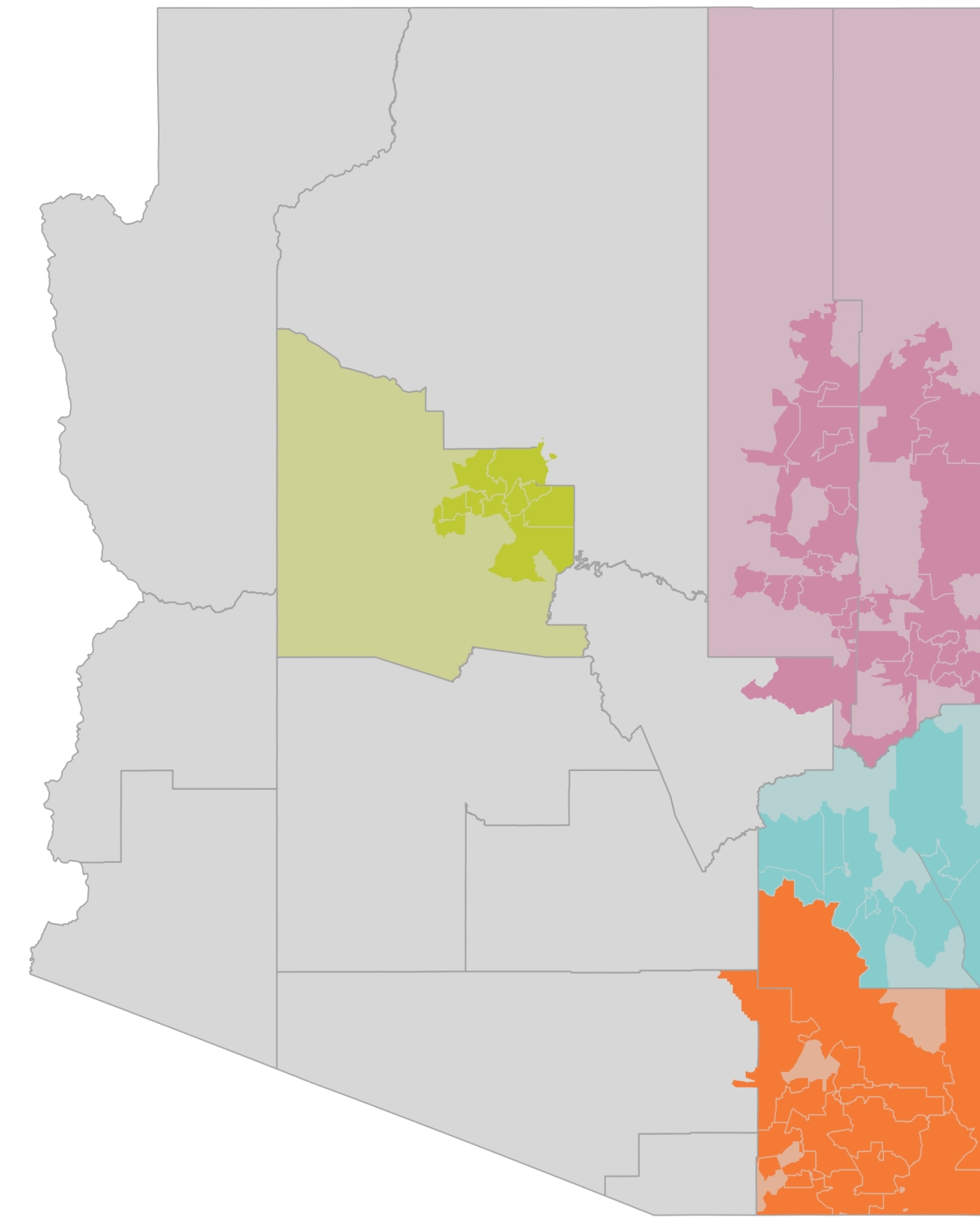


Rural Activation and Innovation Network

Summary of findings: 2017 community survey



The NSF-funded RAIN (Rural Activation and Innovation Network) initiative employs a place-based, asset-based model to support local networks of rural STEM advocates in creating relevant STEM experiences. Central to this undertaking is a collaborative development process that privileges local expertise, leadership, and perceptions of needs and solutions. In each of four project regions, a council of local residents with specific skill in STEM and/or community engagement leads the work of reviewing and awarding mini-grants to fund initiatives that address community interests and needs related to place-

based STEM engagement. While much of the research on these topics has identified rural communities in terms of a "science poor" deficit model, RAIN's asset-based approach identifies opportunities and resources for STEM learning in each study region, drawing upon local values, beliefs, understanding, and experiences related to STEM. Thus, an important element of the research is analysis that can accurately reflect community members' accounts of their practices while remaining manageable at a regional scale.

STEM in daily life

As part of the larger RAIN project, a research team from COSI's Lifelong Learning Group undertook an exploratory, community-based study in order to...

- 1) understand the ways in which rural communities currently perceive, access, and engage in informal STEM learning, and
- 2) explore the extent to which local, place-based STEM programming can increase rural public awareness of local STEM assets, resources, and opportunities and foster a science-related identity at both the community and personal level.

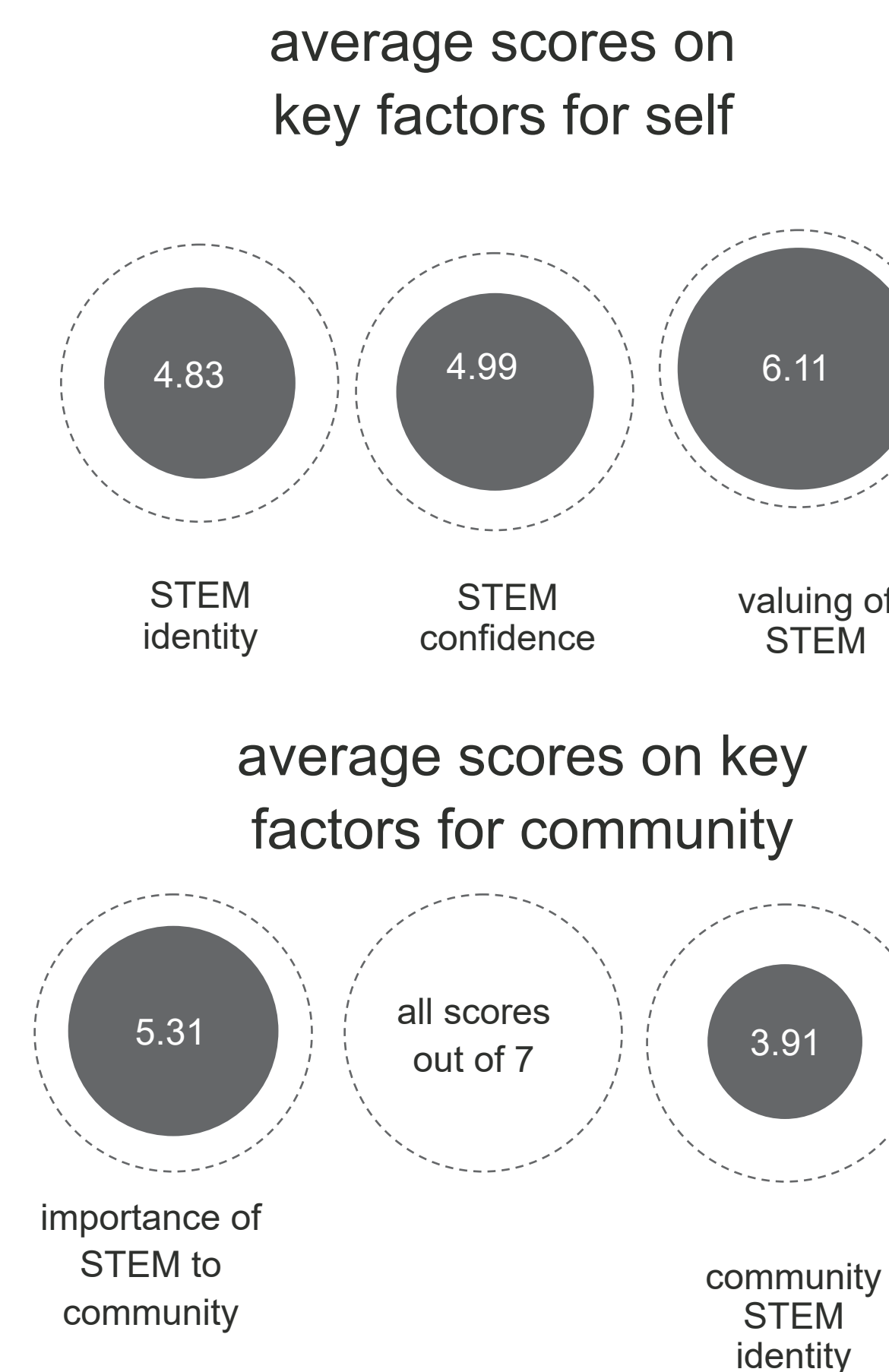
The coding framework introduced here was designed to support analysis of an open-ended prompt:

"Please provide one example of how you do something related to STEM in your life."

The attempt was to capture how respondents (n=729) saw themselves encountering or using STEM in their daily lives. This framework layers contextual identity models for describing the motivations of museum visitors (cf. Falk's *Identity and the Museum Visitor Experience*) with NSF-influenced frameworks for classifying domains of STEM research and practice. By doing this, we propose that layering STEM classifications with theories of motivation and the language people use to describe those convergences provides an appropriately systematic way to handle large volumes of qualitative data while maintaining fidelity to respondents' own framing.

Residents of rural Arizona place high value on STEM for themselves and for their community.

They see themselves as **connected to STEM**, but they see their community as **lacking STEM assets**.

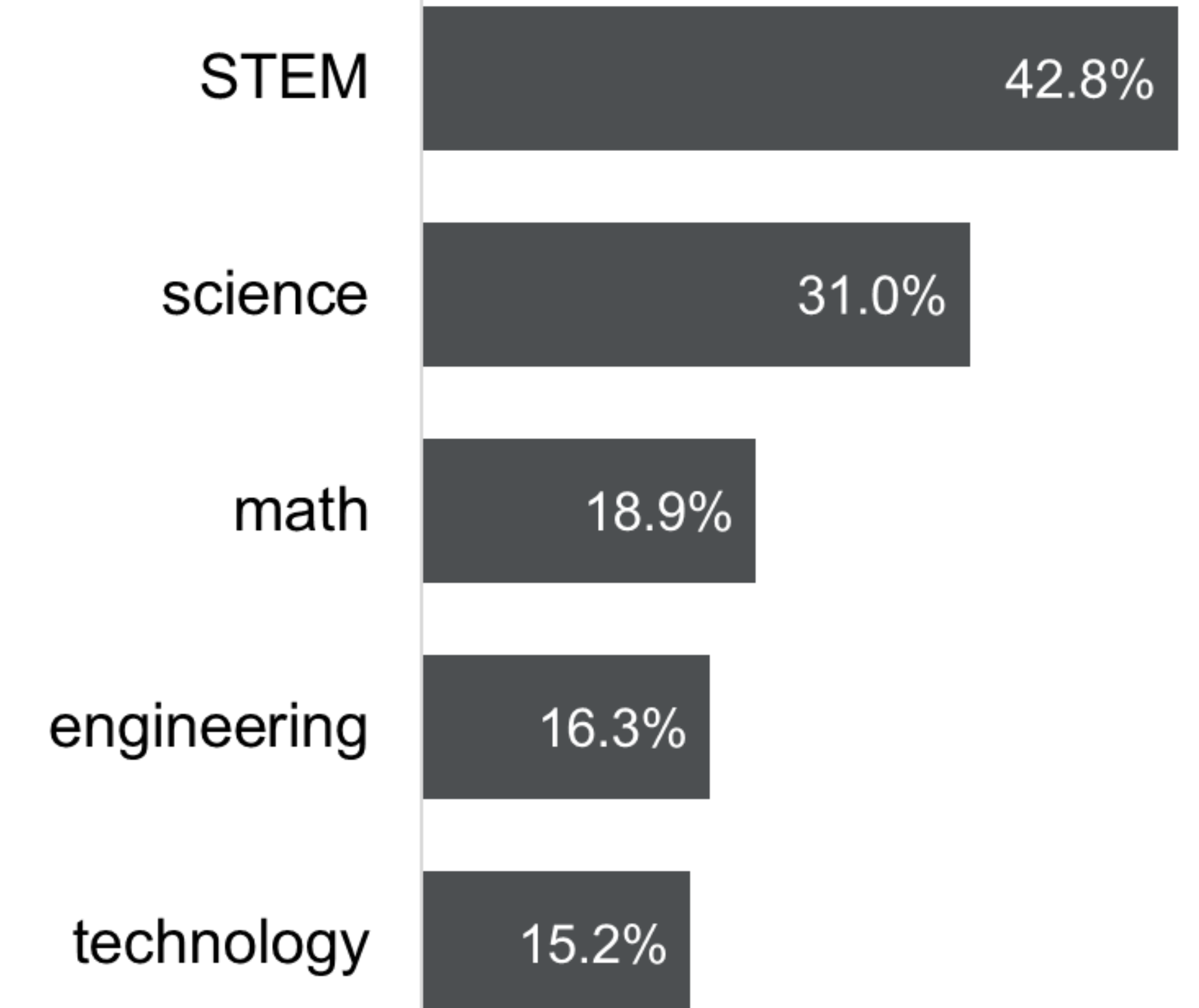


Engaging in STEM in daily life

In order to understand how rural communities in Arizona perceive STEM as part of their everyday life, the community survey included the following open-ended question, "Please provide one example of how you do something related to STEM (Science, Technology, Engineering, and/or Math) in your life?"

Domain:

What was the activity connected to?



Motivation-Role:

Why was the person doing the activity?

Professional - General: 28.8%

The activity was related to the respondent's profession, excluding careers in formal education, informal education, and academic study or apprenticeship (captured separately).

Hobbyist: 27.6%

The activity was a hobby or a necessary household task.

Consumer-User: 16.5%

The activity involved the instrumental use of a consumer product.

Professional - Formal Education: 14.8%

The activity related to the respondent's work in the formal education sector.

Facilitator: 11.5%

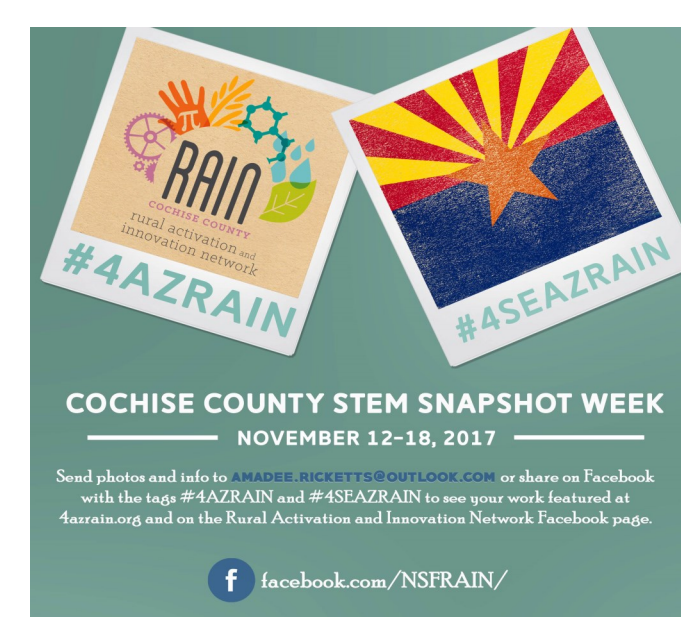
The activity involved facilitating a positive experience for someone else.

who participated

A fairly representative sample was achieved for ethnic background for the regions included in the study; however, the overall sample was **biased toward females and those with high education levels, and respondents were slightly older** on average than the population at large. A surprising finding was that the sample was also **biased toward residents of urban, rather than rural, locations** (as defined by the U.S. Census). In general, we believe this sample represents people who may be **more likely to engage in STEM-based activities**.

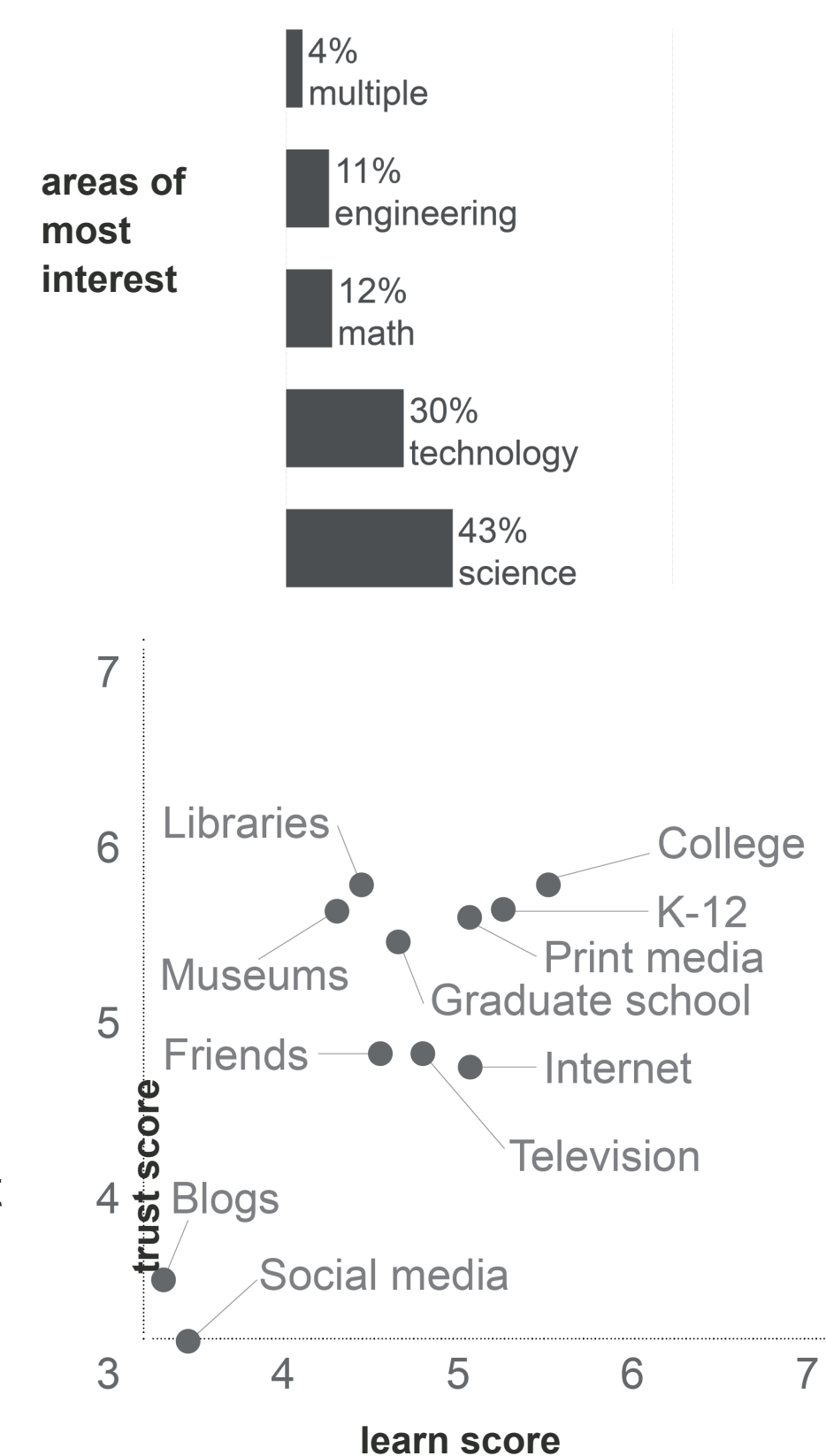
STEM participation

Participation in STEM was based on self-report using ordinal categories (never, occasionally, frequently) around 10 STEM-based activities. People in all four rural regions of Arizona reported **moderate participation in STEM-related activities**, particularly those that were more accessible in rural regions: about 46% of the sample reported engaging in all five "accessible" activities at least occasionally. **Age did not seem to play a role in how much someone participated in STEM**, but people of color and those with high school degrees or lower were more likely to say they never participated in STEM activities.



STEM interest

Of all the STEM domains, people from all four RAIN regions reported that they were **most interested in science**, but reported much more interest in technology, engineering, and math than expected, suggesting that all four domains may provide relevant entry points. People associated learning STEM mostly with formal education settings—suggesting a conventional notion of what it means to "learn" - but reported **high trust in museums and libraries**, as well. This suggests that libraries are well-suited for STEM outreach activities.



self perception

Building of the Test of Science Related Attitudes (TOSRA), Likert-scale items were used to measure STEM identity, confidence, and valuing, as well as STEM-related attributes of curiosity and love of new ideas. Rural residents expressed only **moderate STEM enjoyment and identity**, but conveyed a **high value** around the importance of STEM, as well as holding important STEM-related attributes such as **curiosity and interest in new ideas**. The term "STEM" tended to be a disconnector for people, especially those with lower education levels, while everyone expressed equally high curiosity and interest in how the world works. **Non-rural residents exhibited stronger STEM identity, value, and enjoyment** than did rural residents.

Rural Activation and Innovation Network Guiding Questions

How rural communities currently perceive, access, and engage in ISE learning?

What is the extent to which these communities identify themselves and their communities in relation to STEM?

What is the extent that relevant, place-based networks can increase public awareness of local STEM assets, resources, and opportunities?

How can networks foster a STEM related identity at the personal and community level?

Considerations for Application

1. Are you interested in promoting STEM in rural and low-density areas of your state?
2. Do you have the financial support to reach demographics that have limited economic drivers?
3. Many rural populations have a hunger for STEM programming that will support their children and economic development. How can your organization fit into these needs?

- > Reaching rural communities can be expensive since there are few human capital or financial resources
- > Before moving into a new rural region find a local champion to help. Without this person long term sustainability will be limited.

