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. This model collaboratively develops processes that prioritize local expertise, leadership, and perceptions of needs and solutions. In each of four project regions, a council of local residents with specific skill sets 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, understandings, and experiences related to STEM. Thus, an important element of the research is that analysts 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.
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 an 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. Fahn’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 learning STEM classifications with theories of motivation and the language people use to describe these conceptions provides an appropriately systematic way to handle large volumes of qualitative data while maintaining fidelity to respondents’ own framing.

### Rural Activation and Innovation Network Guiding Questions

1. **How can networks foster a STEM-related identity at the personal and community level?**
2. **How do rural communities currently perceive, access, and engage in ISE learning?**
3. **What is the extent to which these communities identify themselves and their communities in relation to STEM?**
4. **What is the extent that relevant, place-based networks can increase public awareness of local STEM assets, resources, and opportunities?**

### 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.

### 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.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Value of STEM</th>
<th>Average Scores on Key Factors for Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEM</td>
<td>4.99</td>
<td>4.63</td>
</tr>
<tr>
<td>Science</td>
<td>4.66</td>
<td>4.63</td>
</tr>
<tr>
<td>Math</td>
<td>4.91</td>
<td>4.66</td>
</tr>
<tr>
<td>Engineering</td>
<td>4.83</td>
<td>4.66</td>
</tr>
<tr>
<td>Technology</td>
<td>4.87</td>
<td>4.66</td>
</tr>
</tbody>
</table>

### Engagement 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?**

**Science:** 42.8%

**Math:** 42.8%

**Engineering:** 16.9%

**Technology:** 15.2%

**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.

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**Thanks to our institutional partners:**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Role</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona State University</td>
<td>Research Center</td>
<td>Lifelong Learning Group</td>
</tr>
<tr>
<td>UTHSC School of Public Health</td>
<td>Research Center</td>
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</tr>
</tbody>
</table>

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**The importance of STEM education and community identity and relevance**

Across the RAIN regions, people felt that STEM is important and valuable for the community particularly for supporting economic growth. On the other hand, they perceived their community as lacking a strong STEM identity — that is, they didn’t feel there were many assets, expertise, and resources related to STEM in their region, or they were unclear whether or not these existed. Non-rural residents were more likely to value STEM for the community, but no group saw their community as having many STEM resources.

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**STEM interest**

Of all the STEM domains, people from all four RAIN regions reported moder-