Museum Profile: Kentucky Science Center

JEFFERSON COUNTY, KENTUCKY

Kentucky Science Center (KSC) is the state science center of Kentucky, located in downtown Louisville. Formerly known as Louisville Science Center, the official name change came in 2012 as the museum expanded its off-site programs to different parts of the Commonwealth. The museum continued to broaden its reach in 2019, with programming offered in all Kentucky counties and a majority of counties in Indiana. In 2019, KSC generated roughly $5 million in revenue, supported nearly 200 staff, hosted more than 324,000 visitors, and maintained roughly 90,000 members.

KSC’s mission is “to encourage people of all ages to ‘Do Science’ in ways that are engaging, educational, and entertaining to inspire a lifetime of learning.” Many of the key initiatives at KSC embody this philosophical shift from learning science to doing science, an attitude that emphasizes inquiry-based exploration. At KSC, children experience science through fun, interactive, and engaging activities that promote a hands-on, informal approach to education.
JEFFERSON COUNTY

Jefferson County is the most populous county in Kentucky, with a population of 759,724. The median household income is about $50,099 a year, and the poverty rate is 11.3 percent, similar to the national poverty rate. In Jefferson County, 69.1 percent of residents are White, 20.7 percent are Black, and 4.8 percent are Hispanic.

<table>
<thead>
<tr>
<th></th>
<th>Population</th>
<th>% Change in Population (2000–2016)</th>
<th>% White</th>
<th>% Black</th>
<th>% Hispanic</th>
<th>% Asian</th>
<th>% Other</th>
<th>Median Household Income</th>
<th>% Families in Poverty</th>
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</thead>
<tbody>
<tr>
<td>United States</td>
<td>318,558,162</td>
<td>13.2</td>
<td>62.0</td>
<td>12.3</td>
<td>17.3</td>
<td>5.2</td>
<td>3.3</td>
<td>$55,322</td>
<td>11.0</td>
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<tr>
<td>Jefferson County</td>
<td>759,724</td>
<td>9.5</td>
<td>69.1</td>
<td>20.7</td>
<td>4.8</td>
<td>2.5</td>
<td>2.8</td>
<td>$50,099</td>
<td>11.3</td>
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</table>

Compared to other urban counties throughout the country, Jefferson County residents suffer from relatively low levels of community health, and the K–12 educational sector experiences extremely high needs, reflected in students’ performance across a range of publicly available measures of success. Jefferson County fell in the bottom quartile on the Community Health and School Effectiveness Indexes.\(^1\) Health Care & Social Assistance, Manufacturing, and Retail Trade are the largest employment sectors in Jefferson County, employing over one-third of working adults.

<table>
<thead>
<tr>
<th></th>
<th>Total Labor Force</th>
<th>% Health Care &amp; Social Assistance</th>
<th>% Manufacturing</th>
<th>% Retail Trade</th>
<th>% Accommodation &amp; Food Service</th>
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</thead>
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<td>United States*</td>
<td>131,362,978</td>
<td>14.5</td>
<td>9.3</td>
<td>10.9</td>
<td>8.9</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>453,483</td>
<td>13.0</td>
<td>12.0</td>
<td>10.0</td>
<td>8.0</td>
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</table>

*Continental figures for total labor force include the 48 lower states and Washington, DC.

\(^1\) Data elements included in the Community Health and School Effectiveness Indexes, along with measures for Jefferson County, can be found at the beginning of Appendix II.

Data Sources: 2012–16 American Community Survey five-year estimates; U.S. Census Longitudinal Employer-Household Dynamics (LEHD), 2017.
SITE VISIT PARTICIPANTS AND DATA COLLECTION

In February 2020, the study team conducted interviews with 12 current staff and representatives from 17 partner organizations. Site visit interviews conducted with KSC staff and partners focused on understanding the KSC programming and partnerships that support formal and informal learning in Jefferson County as well as KSC’s institutional approaches to assessment and sustainability.

In addition, the following data were used to create the network map included in this profile:

- KSC Tax Form 990 for 2017–2018
- KSC Financial Statements for years ended June 30, 2018, and June 30, 2019
- Program evaluations for several KSC programs
- Interview notes and related materials collected by the case study team

This site profile includes the following:

- A summary of select KSC programming and partnerships that support formal and informal education in Jefferson County and the surrounding region
- A descriptive network map that illustrates the scope and variety of connections KSC maintains with local partners throughout the county and beyond

KEY PROGRAMS AND PARTNERSHIPS BRING STEM EDUCATION TO UNDERSERVED STUDENTS AND COMMUNITIES

As the state science center, KSC promotes regional social wellbeing by supporting the development and delivery of quality Science, Technology, Engineering, and Mathematics (STEM) education across the Commonwealth. Health care and advanced manufacturing are two of the biggest employment sectors in the region, and KSC plays an active role in advancing STEM education that aligns with regional workforce development goals. In this environment, KSC provides unique STEM educational experiences that deeply engage participants by building relationships, igniting excitement, and empowering young minds to seek further learning.

The key programs and initiatives at KSC generally represent informal approaches to STEM learning that are designed to meet statewide educational standards, thus serving as a resource to students, parents, caretakers, and teachers in the region. In addition to visitors to its flagship facility in downtown Louisville, KSC reaches regional audiences through several traveling programs such as Science in Play2Go (SiP2Go), Assembly Programs, and Afternoon STEM Clubs.

KSC also makes its facility and its programming accessible and meaningful to staff and volunteers, museum visitors, and program participants through a diverse range of programming and institutional partnerships across the broader community. As the first business certified by Families for Effective Autism Treatment (FEAT) of Louisville as “Autism-Friendly,” KSC also makes concerted efforts to make its installations responsive to the diverse needs and abilities of its patrons and staff. In these ways, KSC makes Doing Science a collaborative activity that reinforces traditional
学术学习，激发新思想的兴趣，并催化合作伙伴关系，增强地区居民的福祉。

KSC 支持地区社会福祉 通过提供合作教育体验

一个最受欢迎的展品是 KSC 的 Science in Play，它是一个早期的教育体验，孩子们从一个区域到另一个区域“调查；评估风险；使用物体作为工具；购买形状、纹理和颜色；探索；构建；爬；预测；并测试。”在 Shapes and Stuff Store，孩子们选择并与其他物体互动，而标志则通过解释每个活动的科学元素来引导父母。这创造了一个开放的环境，激发了好奇心和探索，邀请父母和照顾者分享这一经历。通过使用日常生活中容易找到的材料，如可回收材料，KSC 也展示了学习可以从日常物品中来，使科学更接近普通大众。

提供“不精确”的体验鼓励游客与材料互动并创造出自己的关系。一位工作人员解释说：“我们正试图做的是 [to] 推动对话的界限，人们不仅仅是与缺乏事实的没有事实的实体互动。突然间，人们在分享他们的想法；他们可能不是专家的想法，但它对它们来说感觉更好，因为它是一个共同的想法。它可能不觉得非常深刻或课堂般的，但它是共享的体验。”

强调开放式和合作性不仅影响 KSC 设计的展品和项目，也影响其开发过程。例如，在对 Uniquely Human 的原型展品访问期间，邀请访客探索与身份、无意识偏见、有意识 vs. 无意识思维、感受、情绪和反思性行为相关的主题。KSC 安装了这个原型展品以收集访客反馈的调查、工作人员观察和访谈——这些反馈将指导最终的展览安装。这个过程确保展品是“相关且真实的”对访问 KSC 的人。开放式、迭代性的实践也代表 KSC 进入更广泛的社区对话，关于种族/民族多样性和平等。

The Pulse of Surgery 程序，与路易斯维尔大学的合作，将生命课程的健康生活的重要性带入了鲜明的现实。The program 将实时的心脏手术流媒体，让参与者看到手术室的全貌。医疗专家在手术后回答问题。它给了观众一个反思营养、健康和生活的机会，同时也教会他们不健康的行动可能会产生长期的后果。

这些展品和项目通过 KSC 的主要设施，以许多方式影响个人访客、学校团体和其他访客的体验。KSC 直接与教育者共同设计基于项目的学习体验，将实地考察与学校课程联系起来，并促进学生参与。例如，一个访问班级学习了策展后，设计了一个关于磁性的展览并将其推销给 KSC 工作人员，赋予其课堂化的“现实生活维度。”促进这些类型的对话是教师和学校的理想合作伙伴。

KSC 的主要设施也作为当地高等教育机构的教育基地。通过这种合作，培训中的教师有机会在 KSC 环境中观摩 Next Generation Science Standards (NGSS) 的教育实践。在这些访问前，KSC 工作人员和教育者共同开发任务，以符合课程目标。
KSC Meets Community Needs through Relationship Building and Flexibility

KSC’s focus on relationship building and engagement helps the museum closely understand the needs of the communities it works in and enriches its collaboration with partners. One interviewee commented, “It’s so much easier to push out programs. Once you really establish who are the people and their communities and how we augment that, it becomes a much different type of impact.”

A long-standing collaboration with the Jefferson County Public School District provided KSC the time and space to create learning experiences that enhance the district’s capacity in science education. KSC designed an after-school science enrichment program at the elementary schools with “an inquiry-based framework for instruction and demonstration” to promote and increase scientific proficiency among students. Conceived as a pilot program in 2013, KSC and the district cocreated the program with iterative consultation and feedback across different subject areas. The sessions focus on exploration of hands-on science activities that classroom teachers often do not have time to prepare, like erosion tables or a series of parallel circuits. KSC staff travel to the school to facilitate these programs, providing an added benefit for the school district by eliminating the need for student transportation, concerns around time, and costs.

KSC also works with the district to design pretest and posttest assessments of these enrichment programs, which test the students’ content knowledge. As one public school educator noted:

“They are not shy about evaluations; they work with us on that. KSC’s program measures are robust and strong. When we are funding something, you need the [quantitative] measures. Our board wants to know if it works.”

In this case, KSC adapted its approach to assessment to meet its partners’ needs, which were narrowly focused on students’ performance on key metrics built into the program design.

This type of assessment was a departure from how KSC typically designs its assessment tools, which tend to focus on measuring students’ interest and engagement with its programs and exhibits.

Partnerships with Public Libraries Expand Access to KSC Early Childhood Programming to Communities across the State

In 2018, KSC launched SiP2Go, a three-month residency program for public libraries around the Commonwealth. After the initial support of funders PNC and Genentech, the program has continued with a grant from the Institute of Museum and Library Services (IMLS) via the Kentucky Department for Libraries and Archives.

The partnership with libraries appears mutually beneficial for both institutions. One librarian explained that hosting SiP2Go was a chance for the local community to see that “libraries are not just for books” and that “it was a great community support tool to bring everyone together.” Furthermore, the experience helped the library reimagine its newly constructed branch: KSC added a new creative play area inspired by the themes of SiP2Go. Another interviewee stated that KSC plays a unique role within the Commonwealth “in that they are providing a public service, shifting the conversation about the accessibility of museums and public perception of what libraries are to the community.”

The impact KSC has on communities extends beyond initial engagement with the SiP2Go program. KSC places significant value on relationship building and has continued to strengthen its relationships with statewide libraries by attending industry conferences. For instance, one librarian has kept in touch with a KSC staff member, who has helped them brainstorm STEM programs and STEM resources. They pointed to this type of “consistency and longevity” as qualities that set KSC apart from other organizations that libraries often work with.
KSC STRATEGIC PLANNING AND CONTINUOUS ASSESSMENT TRACK PROGRESS ON ENHANCING WELLBEING ON-SITE AND IN THE COMMUNITY

For every quarterly board meeting, KSC reports Key Performance Indicators (KPI) that summarize its quarterly activities using measures like museum membership, program attendance, community engagement touch points, earned revenue, and program outcomes. Program outcomes align with the four pillars of the strategic plan: 1) Inspire Healthy Lifestyles; 2) Amplify Science, Technology, Engineering, the Arts, and Mathematics (STEAM) Programs and Partnerships; 3) Promote Cultural Excellence through Diversity, Equity, and Inclusion; and 4) Incubate Creative Enterprise Ideas. Within each of these pillars, the KPIs capture multiple metrics that provide a running “scorecard” on KSC’s progress on meeting annual targets as well as a more holistic sense of the degree to which it is advancing its institutional mission.

In addition to regularly tracking key metrics related to institutional goals outlined in its strategic plan, the KSC leadership team provides ongoing support and development for its staff—full-time staff, part-time staff, and the numerous volunteers who keep KSC running. Each staff member, from the leadership team to volunteers, creates a development plan that helps individuals see where their responsibilities fit into the broader organization and how their efforts tie into different elements of KSC’s strategic goals and broader mission. This intentional approach to relationship building and professional development with staff and volunteers is critically important for an institution like KSC that generates most of its revenue as earned income and depends on volunteers for facility operations and key programming activities. In many ways, KSC’s ability to positively contribute to the wellbeing of its visitors, partners, and the broader communities it serves starts with its commitment to support the wellbeing of its staff.

KSC promotes the overall wellbeing of its visitors, partners, and the broader community through the design of the institutions exhibits, the programs it offers on-site, and those it supports with other organizations throughout the region and beyond. KSC is widely recognized by its partners as “having a high ‘say-do’ ratio”—KSC shows up when and where it says it will, and it delivers high-quality experiences with its partners for its patrons and visitors. By creating a diverse range of accessible ways to “Do Science,” KSC enhances the educational experience of school-age children across the state, helps advance STEM literacy throughout the community, and facilitates individual and institutional connections that strengthen broader networks of support for the wellbeing of visitors, residents, businesses, and institutions within Jefferson County and throughout the state.
KENTUCKY SCIENCE CENTER NETWORK MAP

Using data provided by KSC, the study team developed a descriptive network map to highlight the different types of connections KSC maintains with other institutions in the local community. The map illustrates the relationships between KSC and those entities that offer programming at the museum itself and those that support cross-marketing efforts or have reciprocal relationships with the museum, and it includes examples of off-site, KSC-led programming. The map does not provide an exhaustive list of the museum’s programs but attempts to illustrate a subset of the relationships that the museum maintains.

NOTE: The network map is purely descriptive. The connections represented on the map do not necessarily, and are not intended to, provide estimates of the duration, durability, intensity, or broader economic impact of the relationships between KSC and any single entity, or the broader network itself. The goal of the network map is to represent the range and diversity of different types of institutions that connect to the museum in different ways.
The figure above illustrates a sample of the connections of the many programs offered across KSC’s network. Within the orange circle is a small sample of programs conducted on the physical property of the institution—both programs produced by the institution and those produced by others. Within the blue circle is a sample of programs produced by KSC and offered off-site in the community. The gray circle represents a sample of organizations and institutions that have reciprocal relationships with KSC.