DESIGNPRINCIPLES RUBRIC 3.0

QUALITY RUBRIC FOR STEM PHILANTHROPY

This rubric aims to help companies gauge the quality of their philanthropic efforts to boost learning in science, technology, engineering and mathematics (STEM). It was created by Change the Equation (CTEq), a national non-profit coalition of nearly 100 corporate CEOs who are committed to improving STEM learning for every child, with a particular focus on under-represented minorities in STEM. The rubric aligns with a set of common *"Design Principles for Effective STEM Philanthropy"* drafted by representatives of CTEq member companies. Together, the Principles and Rubric aim to provide a framework for corporate engagement that measurably improves the STEM performance of our nation's young people.

Use this rubric to guide your judgment. It can help you ask the right questions of partners or grantees and to give structure to your analysis of STEM learning programs. Because STEM learning programs vary greatly in their purpose or focus, many very worthy programs might not measure up on every point in the rubric. Still, it is important to pay careful attention to the whole rubric as you review your entire portfolio of investments in STEM learning. Companies whose efforts routinely fail to meet many of the Design Principles are not likely to contribute to solving one of our nation's most pressing problems: Our young people's lagging performance in STEM.

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NOTE: The rubric has been designed to flow directly from Principles A and B. Programs must be able to clearly identify a need and target audience in Principle A and show evidence of impact in Principle B. Programs should then be able to address each of the remaining principles (C-J) by continually referring back to the need, the target audience, and any evidence of impact. In almost all cases, a program must be able to provide evidence and/or impact in order to be rated as Accomplished for any principle.

A. Need: Does the program address a compelling and well-defined need?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Statement of need is clear, compelling, and supported by recent, valid, and targeted data.	Statement of need is clear and compelling but cites only general data.	Description of need is vague or unconvincing and cites little or no data.
Program makes clear that it adds unique value in addressing the need.	Program identifies other past or present programs that address the same need, but does not fully demonstrate how it adds to those programs.	Program makes no attempt to identify or evaluate other past or present programs that address the same need.
Target audiences are well defined and closely tied to statement of need.	Program defines target audiences but does not clearly tie them to statement of need.	Program does not make clear what audiences it is targeting.
Program can demonstrate that it is reaching the target audience.	Program makes clear efforts to reach target audience but cannot demonstrate what proportion of those audiences it is reaching.	Program makes little effort to reach intended audience.

Sample evidence:

- Program description
- Literature review with cited, research-based data
- Mission/vision or goal statement for program (includes the target population for the program)
- Existing needs assessment data that was used for planning and/or program development
- Logic model
- Evaluation reports that define the need, the target audience, and/or recent data from the research base
- Student/participant demographic data
- Documents that reflect where the program fits into the landscape of existing efforts

Notes:

B. Evaluation: Does the program use rigorous evaluation to continuously measure and inform progress in addressing the compelling need identified in Principle A?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Program goals are well-defined and linked directly to the statement of need and the identified target audience.	Program goals are well-defined and feasible but difficult to measure.	Goals are poorly defined—or too unambitious to be worthwhile.
Current rigorous evaluation data demonstrate that the program is reaching its goals and having an impact with the target audience. If the program was established within the last three years, it is based on high quality research and has a plan for a rigorous evaluation.	Program conducts its own evaluation in lieu of third-party evaluation. Program is based on research that does not directly apply to the program's circumstances.	There is no research cited or plan to evaluate the program's progress to meet goals.
Program regularly uses current data from external or internal evaluations to identify and act on opportunities for improvement. A viable timeline with clear milestones for measuring progress is included.	Program only sporadically uses current evaluation data to identify and act on opportunities for improvement. A scope of work is included, but the timeline is vague or nonexistent.	Program has no plans for using current evaluation data to improve itself. The program lacks clear milestones or timeline.

Sample evidence:

- Documents reflecting scope of work with measurable goals, milestones, timeline
- Evaluation report/s that demonstrate the defined need is being met and/or the target population is being impacted. A rigorous evaluation report:
  - > Is conducted by a third-party evaluator
  - > Outlines clear program goals
  - > Describes the evaluation methodology
  - > Ties program goals to measurable impacts
  - > Includes copies of instruments and measures used
- Third-party evaluation reports of progress or plans to secure third-party evaluation (for newer programs)
- Pre-Post Assessments (i.e. student/participant data) addressing learning outcomes
- Interviews/Focus groups/surveys of participants and staff and/or case studies/cognitive labs of participants
- Internal evaluation reports of progress
- Documents reflecting changes in program based on formative use of evaluation data

Notes:

C. Sustainability: Does the program ensure that the work is sustainable?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Program has identified and made concrete plans to take advantage of opportunities such as matching funds, favorable state or local policies, or existing reform initiatives. Plans are clear for sustaining the program with public funds or ongoing support from other partners if/ when philanthropic support ends.	Program has identified opportunities for securing future internal and external support after philanthropic support ends, but they are more hopeful than viable.	Program has made no efforts to identify funding opportunities that could advance its work. There is no plan or commitment to ensure the program's long-term survival after philanthropic support ends.
Projected benefits to teaching and/or learning justify the cost per participant.	The cost per participant is high but justified, and there is a viable plan to reduce costs.	The program cannot demonstrate a benefit that justifies the cost per participant.
Program has identified potential challenges such as unstable political environments, changes in leadership, and bureaucratic barriers, and it has detailed plans in place to deal with such contingencies.	Program has identified potential challenges, but plans for addressing them are not yet fully developed.	Program makes no effort to address potential barriers to sustainability.
All stakeholder organizations actively support the program and communicate that support to their members or employees.	Some stakeholders are supportive but there is no plan to communicate the importance of the program to others.	Critical stakeholders—such as school district or community leaders--are barely aware that the program exists.

Sample evidence:

- Documents reflecting on-going support from a funding source and/or no ongoing costs or leadership demands that cannot be sustained if funding is withdrawn
- Documents reflecting stakeholder organizations (i.e. school district; community group) actively support program efforts (and communicate that support to their members, employees, and other stakeholders)
- Determination by the program of cost per participant
- Budget report that reflects that benefits justify the cost
- Documents that reflect capacity building within program to ensure sustainability
- Documents reflecting program commits enough time for an effort to have intended sustained and substantial impact

Notes:

D. Replication and Scalability: Does the program demonstrate that it is replicable and scalable?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Program documents how it can be scaled or replicated and offers tools to support such scaling up or replication.	A process for scaling up and replicating the program is offered, but it is not well documented.	There is no effort to show how the program might be scaled up or replicated at other sites.
Program regularly communicates information to new sites to support scaling up or replication.	Program provides information on scaling up and replication, but only on an ad hoc basis.	Program does not plan to promote scaling up or replicating.
Program demonstrates that it is adaptable to appropriate new sites and works with local sites to adapt to local conditions. There is strong fidelity of implementation among sites.	Program is documented so it can be replicated, but it does not account for local conditions that may affect implementation. Fidelity of implementation is weak or unproven.	Program is tied exclusively to a specific site because of its unique resources, personnel, or other requirements.

Sample evidence:

- Documents reflecting how program can be scaled or replicated, possibly including a landscape analysis for new sites
- Documents reflecting how program can/will support scaling or replication
- Budget report that reflects that benefits as a result of scalability/replicability justify the cost
- Documents (i.e. strategic plan) identifying potential opportunities and/or challenges
- Documents reflecting concrete plans to take advantage of opportunities (i.e. matching funds agreements) and/or plans for addressing potential challenges (i.e. contingency plan)

Notes:

E. Partnerships: Does the program create high-impact partnerships where beneficial?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Recognizing that it lacks certain expertise or competencies, the program partners with other competent organizations.	Other organizations or businesses are brought in on an ad-hoc basis to perform discrete tasks, but partners are not included in planning stages, and their relevant competencies aren't fully integrated into the project design.	Though the organization lacks the competencies to reach its goals, it does not partner with organizations that can supply those competencies.
Program identifies and partners with organizations that have already done work that can help it reach its goals or magnify its impact.	Program bases its work on relevant prior work by other local organizations, but it does not explore partnerships with those organizations that could extend its impact.	Program makes no effort to build on the work of others or identify partners that could extend its impact.
Program has documented how staff or volunteers build strong relationships with educators, community members, and program participants they work with.	Program staff or volunteers are learning how to build strong relationships with educators, community members, and program participants.	Program staff or volunteers do not have the skills required to build relationships with key stakeholders.

Sample evidence:

- Documents (i.e. letters of support, work plans with defined roles) that reflect partnerships (either sustained or as needed) that: a) provide needed expertise, competencies, or capacities; or b) experience that will help guide or inform the progress of the program

Notes:

F. Capacity: Does the program have the capacity to meet its goals?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
The program has been active in STEM learning in the past and has a track record of accomplishing STEM education goals with the target audience.	The program has some track record in reaching educational goals but not in STEM, not to the extent proposed, or not with the identified target audience.	Though the program is not new to STEM learning, it cannot demonstrate any track record of accomplishing its goals.
The program clearly articulates how its staff, infrastructure, internal expertise, and other resources support the project.	The program demonstrates that it has enough resources and staff to do the work, but it is not clear that its staff have the time or expertise to do the work.	The program makes no attempt to demonstrate that it has the staff, infrastructure, or expertise to carry out the project.
Staff or volunteers know STEM subject matter and have a command of pedagogy promoting STEM practices.	Staff or volunteers have the STEM subject matter knowledge but may have too little experience with project-based learning or vice versa.	Staff or volunteers lack sufficient depth in STEM subject matter and cannot demonstrate experience with project-based learning.
Where necessary, program provides staff or volunteers with effective professional development on STEM content and practices pedagogy and/or skills in building strong relationships. Alternatively, program provides staff or volunteers with outside resources and training.	Program offers staff or volunteers professional development in some aspects, but neglects it in others. Alternatively, program offers no professional development of its own, but directs staff or volunteers to outside resources and training.	Program offers staff or volunteers no training or direction on STEM content and practices pedagogy and/or skills in building strong relationships.

Sample evidence:

- Organizational chart with roles and responsibilities of program staff
- Education and training (certifications, licenses, etc.) background of all staff (i.e. Bio sketches, CVs, or resumes)
- Evaluation reports of progress (internal and/or external)
- Staff meeting agendas and/or notes
- Program management plan (including regular meeting schedules, decision logs, internal communication plan, etc.)
- Proof of completion of or ongoing involvement in STEM-specific professional development
- Proof of involvement in professional activities (i.e. conferences, meetings, community outreach)

Notes:

G. Challenging and Relevant Content: Is the STEM content challenging and relevant for the target audience?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Program is clearly and explicitly aligned with current and relevant local, state, or national standards. For out-of-school (OST) programs, content is aligned with what students are learning in school or provides enrichment beyond what is offered in school.	Program states that it is aligned with standards and/or school activities but does not clearly demonstrate the strength of that alignment.	Program pays no attention to local, state or national standards or what is currently being taught in school.
Program materials and experiences clearly reflect high expectations for all participants.	Program acknowledges the need for high expectations for participants but does not clearly spell out what those expectations are.	Program emphasizes only lower level skills.
Program provides opportunities for real world applications of STEM where possible.	Program makes an effort to relate STEM learning to real-world applications, but those applications are not always clear, they are forced, or they undermine the rigor of the STEM content.	Program makes no attempt to link content to real world STEM applications.
Program prompts participants to apply or transfer STEM content to new or unexpected situations.	Program offers opportunities to apply or transfer content knowledge, but they are artificial or inconsistent.	Program focuses primarily on recall of knowledge and/or routine skills.

Sample evidence:

- Written curriculum clearly and explicitly aligned to local, state, or national standards
- Program description that clearly addresses high expectations for participants well beyond minimum competency
- Curriculum materials, lesson plans – including student materials (as opposed to solely teacher materials), schedule of program activities, student work, and assessments, specifically including real-world applications and/or prompts for participants to apply their STEM knowledge to novel problems/situations
- Student outcome data
- Internal and/or external evaluation reports

Notes:

H. STEM Practices: Does the program incorporate and encourage STEM practices?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Program creates an environment where staff or volunteers foster students becoming active participants in their learning.	At times, the program allows participants and staff/volunteers to work together as active learners, but, as a rule, the instructor drives the learning.	Staff or volunteers lead instruction with little opportunity for participants to become active learners.
Program promotes STEM practices by encouraging participants to: ask questions and/or define problems; develop and use models; plan and carry out investigations; analyze and interpret data; use mathematics and computational thinking; construct explanations and/or design solutions; engage in argument from evidence; obtain, evaluate, and communicate information; and attend to precision.	Activities are hands-on but do not consistently encourage STEM practices. Some hands-on activities are routine and focus on the 'right answers'.	The program does little or nothing to incorporate or encourage STEM practices.
Program explicitly demonstrates how it builds skills like critical thinking, problem-solving, creativity, collaboration, and teamwork.	Program explicitly aims to promote skills like critical thinking, problem-solving, creativity, collaboration, and teamwork, but it does not clearly specify how.	Program makes no clear attempt to engage participants in skills like critical thinking, problem-solving, creativity, collaboration, and teamwork.
Program prompts participants to be innovative, by having them create new ideas or products in an unscripted fashion.	Innovation is discussed, but not used to create new ideas or products.	Program does not address innovation. Participants are not expected to create new ideas or products in an unscripted fashion.

Sample evidence:

- Curriculum materials, lesson plans, schedule of program activities, deidentified student work, and assessments specifically addressing active and problem-based learning activities (i.e. open-ended research, asking relevant questions, designing problems; carrying out investigations, etc.)
- Student outcome data
- Internal and/or external evaluation reports

Notes:

I. Inspiration: Does the program inspire interest and engagement in STEM?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Program creates excitement by providing positive experiences and dispelling negative misconceptions about STEM.	Program aims to inspire but does little to provide positive experiences and dispel negative misconceptions about STEM.	Program makes little or no attempt provide positive experiences and dispel negative misconceptions about STEM.
Program helps participants connect STEM content to career opportunities that require a strong STEM background.	Program occasionally helps participants connect STEM content to real-world careers, but those connections are not always clear or consistent.	Program makes little or no attempt to help participants connect STEM content and careers that use STEM knowledge.
Program clearly shows how it connects STEM to participants' own interests and experiences.	Program relates STEM to participants' experiences, but only occasionally.	Program does not connect STEM to participants' experiences.

Sample evidence:

- Pre/Post participant surveys
- Transcripts of interviews/focus groups with participants and/or staff
- Time tracking of particular program activities
- Written observations of program at work

Notes:

J. Underrepresented Groups: Does the program identify and address the needs of underrepresented groups?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Program explicitly identifies and addresses needs of groups that are underrepresented in STEM fields.	Program can be used successfully with underrepresented groups, but makes no explicit attempt to address their needs.	Program's structure and content is most likely to appeal to students who are already well represented in the STEM pipeline.
Program accommodates diverse learners' needs through tailored instruction. Where appropriate, technology promotes attention to individual students' needs, diverse interests, and different learning styles.	Instructors check participant progress regularly to address learning gaps. Program may use technology to aid instruction, but the technology does not always adapt to students' individual learning needs.	Instructors do not attempt to diagnose or address individual learners' challenges. Program neglects opportunities to use technology to address diverse learning needs.
Program ensures that individual participants spend the time on task they need to accomplish their learning goals. Learners can learn at their own pace.	Program specifies ample time on task, but it is not clear that participants in greatest need will be able to make the time commitment required to see results. There is only one instructional method and pace,	Program does not consider the time different participants will need to spend on task to make meaningful progress. Most of the STEM instruction is delivered to the whole class, and learners are expected to absorb content delivered at the instructor's pace.
Program demonstrates that it successfully reaches underrepresented groups through targeted recruitment efforts.	Program plans targeted recruitment efforts but lacks mechanisms to document its success.	Program has no recruitment efforts to reach underrepresented groups and no evidence that it is actually reaching those groups.

NOTE: The The term "underrepresented groups" may have different meanings for different programs. For the purposes of the CTEq STEMworks initiative, underrepresented groups refers to any group of underrepresented minorities in STEM education and STEM fields. It is up to each STEM learning program to clearly identify any underrepresented minority groups that it is targeting, how they are underrepresented in STEM, how they address the identified need and target audience (from Principle A), and the specific needs that the program is addressing.

Sample evidence:

- Student/participant demographic data
- Program description
- Mission/vision or goal statement for program
- Existing needs assessment data that was used for planning or ongoing evaluation
- Evaluation report/s that demonstrate that the defined need is being met and/or the needs of underrepresented groups are being addressed
- Documents reflecting recruitment of underrepresented groups
- Documents reflecting accommodations (time, resources, additional support) provided to participants to allow for individual learning goals
- Samples of differentiated instruction (i.e. lesson plans; student work samples; assessments)
- Documents reflecting use of technology to promote individual attention
- Student outcome data

Notes: