Appendix B: Innovation Process Overview

The Global STEM Alliance (GSA) Innovation Process is intended to guide teams or individuals to apply principles of scientific research and design thinking to solve real-world problems. Here is an overview of the 10-step process.

1. Research: Define the problem you want to solve, and learn as much as you can about factors that contribute to it. This may include reading relevant articles or research papers, reviewing current attempts to address the issue, talking with experts, and/or conducting interviews with people affected by the problem to better understand their needs.

2. Brainstorm: Generate as many possible solutions as you can. Avoid judging ideas as you brainstorm, no matter how crazy they may seem. Sometimes they're the ones that produce the most innovative thinking! The goal is to generate lots and lots of ideas. You'll evaluate them in the next step.

3. Design: Choose a single design or concept to test. This may be a combination of ideas you brainstormed.

4. Plan: Determine how you will develop and test your solution. Will you create mock-ups or sketches to illustrate your ideas, or make a real working prototype? Will you conduct scientific experiments, or gather feedback through user testing? Be sure to state your hypothesis, and outline the methods you will use to evaluate it.

5. Build: Create a prototype or model of your solution. This may be a sketch, diagram, flow chart, mock-up, or functioning prototype—anything that communicates or shows your ideas.

6. Test: Examine the viability of your solution. Identify what you want to test, and be sure your methods will produce reliable results. If you're conducting scientific experiments, carefully think through the experimental design. If you're doing user testing, consider who you will include. Regardless of your approach, seek feedback from as many people as you can—experts, mentors, peers, and anyone else who might help.

7. Analyze: Review the data you obtained from experiments and/or feedback you gathered from others. What does it tell you? Look for trends or themes, and summarize what you learned.

8. Iterate: Modify your design or concept based on the results of your testing. Then test your new solution. Modify your design or concept based on the results of your testing. Then test your new solution. Repeat this process, if time permits, to make your solution as strong as possible.

9. Refine: Make any last revisions to your solution based on what you learned.

10. Present: Create a final presentation to share your solution.