**Background and Problem Statement**

The National Aeronautics and Space Administration (NASA) Science, Technology, Engineering, and Mathematics (STEM) Engagement program strives to increase K-12 involvement in NASA projects, enhance higher education, support underrepresented communities, strengthen online education, and boost NASA's contribution to informal education. The intended outcome is a generation prepared to code, calculate, design, and discover its way to a new era of American innovation.[[1]](#footnote-0)

As part of this program, the NASA Knows! website[[2]](#footnote-1) provides elementary and middle school students with web pages on a variety of STEM topics including NASA History; Earth; the Solar System; Aeronautics; Astronauts, Rockets and Space Vehicles; and Technology. While the website and its supporting web pages contain educational information for students, it lacks the ability for students to demonstrate and measure their understanding of these topics for their teachers and parents. For example, students cannot answer a set of quiz questions based upon their reading of STEM topics to reinforce their learning and understanding of those topics. As a result, teachers and parents do not have a feedback mechanism to help assess the education of their pupils and children, respectively.

**Project Objective and Scope**

To improve and complement the NASA Knows! website, Team 2 plans to build a “Show NASA What You Know!” website for middle school students in grades five through eight. On this website, students will be able to select their grade level, STEM topic, and quiz question difficulty level. Students will be provided some, but not all, educational information from the NASA Knows! webpages to read. Afterwards, students will answer a set of randomized questions (i.e., multiple choice, true/false) to demonstrate and measure their understanding of a STEM topic from the parameters they initially provided.

To achieve project proof of concept, Team 2 will design and build website functionality for one grade level and STEM topic. Additionally, Team 2 will design and build functionality for two quiz question difficulty levels. Lastly, Team 2 will design and build functionality primarily for students. Team 2 may investigate and propose plans for additional functionality for teachers and parents to view quiz results. This additional functionality may be backlogged.

**Project Deliverables and Deadlines**

Team 2 will provide a project presentation, including supporting slides, to discuss project planning, analysis, design, and implementation. Team 2 will provide this documentation between Monday, December 7, 2020 and Sunday, December 13, 2020.

Team 2 will provide documentation from weekly project planning meetings. Team 2 will also provide documentation supporting project analysis and design, including but not limited to an entity-relationship diagram, wireframes, user stories, and additional features backlog. Team 2 will provide this documentation on or before Sunday, December 20, 2020.

Team 2 will provide documentation supporting project implementation including but not limited to HTML, CSS, JavaScript files and code. Team 2 will also provide a copy of its SQL server-side data store and Python scripting language code in the Django web development framework. Team 2 will provide this documentation on or before Sunday, December 20, 2020.

Team 2 will provide a project report that discusses the project phases previously mentioned above as well as any project issues, lessons learned, and opportunities for improvement. Team 2 will provide this documentation on or before Sunday, December 20, 2020.

1. See NASA STEM Engagement website, [https://www.nasa.gov/stem/about.htm](https://www.nasa.gov/stem/about.html), and NASA Strategy for STEM Engagement, <https://www.nasa.gov/sites/default/files/atoms/files/nasa-strategy-for-stem-2020-23-508.pdf> [↑](#footnote-ref-0)
2. See <https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/index.html> and <https://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/index.html> [↑](#footnote-ref-1)