Project Outline

Use the following outline with the Teacher Logbook, PowerPoint lessons, and teaching notes (*available on our website in the Teaching Guides section of the Teacher Resources*) to guide your students through the invention project. This outline will help you create a schedule while giving you the flexibility to adapt the project for your class. The outline and Teacher Logbook include links to many of the handouts you will need. If you view the outline or the Teacher Logbook on a computer, you can click the links to quickly access these resources. We have also provided Assessment Rubrics to help you evaluate your students' performance. You can find these and more (worksheets, activities, examples, etc.) on our website in the Teacher Resources.

We recommend working on the project at least once a week, but you will likely need additional time when the students are designing, building, testing, and improving their prototype. In total, the project will take at least 12 days of in-class time. If some topics take less time than expected, feel free to go faster or combine days to leave extra time for project revision.

At the end of the project, organize a school invention fair with judges to evaluate each project. The winning team(s) from this event will be eligible to enter Mission: Invent, an NAD-wide invention fair. Here they will present their inventions and engage with students from across North America. For more details about organizing a local invention fair, refer to the Invention Fair Guidelines and Judging Rubric (*available in the Invention Fair section of the Teacher Resources*).

In addition to the STEM topics, we have included a Biblical Connection with this project. Each team will select a Bible story, character, or lesson that relates to their invention. Encourage your students to start thinking about this early and give frequent examples, such as short devotional thoughts at the beginning of each class (*devotional and character examples available in the Biblical Connection section of the Teacher Resources*).

Teacher resources and videos available on our website:
www.andrews.edu/go/invent

Contact us at stemconnect@andrews.edu
with any questions, comments, or suggestions.

	Topics	Activities, Assignments, & Goals
Lesson 1: Who Are Inventors? (PowerPoint Lesson *available in Teaching Guides section*)	• Who are inventors? • Give examples of young inventors • Introduce the project and Student Logbook (*available in Project Resources section*) • Announce school invention fair and Mission: Invent • Form project teams (3-4 students each)	**Class Activity:** • Young Inventors Activity (*available in Activities section*) or create your own activity **Assignment: (Logbook pg. 6)** • Find problems to share with the class next time (worksheets for Kindergarten & Grades 1-2 *available in Project Resources section*)
Lesson 2: Real-World Problems (PowerPoint Lesson *available in Teaching Guides section*)	• How do I find a problem? (use problem worksheets from previous assignment) • Show Invention Fair Example (*available in Examples section*)	**Class Activity: (Logbook pg. 6)** • Share problems you found • Brainstorm new problems • Narrow the list • Choose a problem and describe it in the Logbook
Lesson 3: What Is Engineering? (PowerPoint Lesson *available in Teaching Guides section*)	• What do engineers do? • How do engineers solve problems? • Engineering Design Process (*refer to PowerPoint lesson or Logbook diagram*) • Engineering Videos (*available in Teaching Guides section*)	**Class Activity:** • Option 1 – Use the engineering design process to solve a practice problem (Example Problems *available in Activities section*) • Option 2 – Organize a hands-on engineering activity (Dump Truck Example *linked in Activities section*)
Project: Research the Problem (PowerPoint Slides *available in Teaching Guides section*)	• Work on team projects	**Goals: (Logbook pg. 7)** • Research the problem (*If the research will include interviews, you could send that home after Lesson 3.*)

Project: Requirements (PowerPoint Slides *available in Teaching Guides section*)	• What are requirements? (*Logbook pg. 8*) • Work on team projects	**Goals: (Logbook pg. 8)** • List solution requirements
Project: Find & Choose a Solution (PowerPoint Slides *available in Teaching Guides section*)	• Work on team projects (may require extra time)	**Goals: (Logbook pg. 9)** • Draw solution ideas • Share and compare ideas • Choose the best solution
Project: Design & Build the Prototype (PowerPoint Slides *available in Teaching Guides section*)	• Work on team projects (several days)	**Goals: (Logbook pg. 10-11)** • Draw and describe invention design • Build the prototype
Project: Test the Prototype (PowerPoint Slides *available in Teaching Guides section*)	• Work on team projects (several days)	**Goals: (Logbook pg. 12)** • Continue/finish building the prototype • Test the prototype
Project: Improvement (PowerPoint Slides *available in Teaching Guides section*)	• Work on team projects (several days)	**Goals: (Logbook pg. 10-12)** • Improve the prototype • Run new tests • Finish the prototype
Project: Wrap-Up (PowerPoint Slides *available in Teaching Guides section*)	• Prepare for presentations	**Assignment: (Logbook pg. 13)** • Presentation prep (Presentation Guidelines *available in Presentation Resources section*)
Presentations	• Present inventions at school invention fair • Judges will score the projects (Judging Rubric) • Enter the winning teams in Mission: Invent	