



iNVENTION
C°NVENTION
INDEPENDENT INVENTOR

FOR STUDENTS AND EDUCATORS

2022-2023
Project
Toolkit

Timeline

- January 2023**
Communicate your participation numbers to the Independent Inventor Program
- February 2023**
Invitations to the Independent Inventor Program Competition will be sent
- March 1-22, 2023**
Independent Inventor Program Competition registration
- March 29-April 7, 2023**
Independent Inventor Program Competition with online judging via zFairs
- Week of April 11, 2023**
Winners will be notified via email and announced via a blog post on the Invention Convention webpage
- June 7-9, 2023**
Raytheon Technologies Invention Convention U.S. Nationals at The Henry Ford

Checklist

Use this checklist to help you prepare for the Independent Inventor Program.

Logbook

NOTES: _____

Display Board

NOTES: _____

Video Presentation

NOTES: _____

Prototype

NOTES: _____

FOR QUALIFYING YOUNG INVENTORS:

- Register for the Independent Inventor Program Competition March 1-22, 2023.

Category	Dimension	Description	Points
Invention Process (40)	Identifying & Understanding	<p>The Identifying stage occurs when inventors seek problems they want to solve. This stage involves how inventors uncover problems and discover who else might experience the same problem.</p> <p>Understanding a problem requires research to identify existing solutions that solve the identified problem and the shortcomings of those solutions. Understanding also includes researching the impact the problem may have on others.</p>	10
	Ideating	<p>Ideating refers to the brainstorming or imagination stage inventors go through to generate a variety of original ideas. Ideation includes developing specific criteria for a successful solution.</p> <p><i>Note: An inventor's idea/s may be updated at any time throughout the invention process.</i></p>	10
	Designing & Building	<p>Designing an invention or a prototype requires critical-thinking skills; inventors are expected to articulate how they intend the invention to work and why they chose the materials they did for executing their invention.</p>	10
	Testing & Refining	<p>The keys to this step are iterations, improvements and perseverance. The best inventors know the first build is often not the best and seek feedback through Testing and Refining their design accordingly.</p>	10
Invention Impact (25)	Market Research	<p>Market Research assesses the likelihood of an invention gaining users.</p> <ol style="list-style-type: none"> 1. How would you characterize the potential market? Who are the potential users? 2. How likely is the identified market to adopt the solution? 3. To what extent was the market appropriately researched? Inventors are encouraged to use both quantitative research (e.g., statistics) and qualitative research (e.g., interviewing experts or potential users). 	5
	Environmental & Societal Impact	<p>Inventors are asked to consider and communicate the potential Environmental and/or Societal impacts of their invention, both positive and negative (pros and cons). To what extent does the invention improve Environmental/Societal conditions or have a minimal adverse impact?</p>	5

Category	Dimension	Description	Points
Invention Impact (Continued)	Originality	Does the inventor demonstrate that their invention is better or different from existing solutions? Do they show how it is distinguishable from prior inventions? It is important to conduct and communicate research from a variety of sources to establish and verify Originality.	15
Inventor Communication (35)	Logbook	1. Does the Logbook document a journey, not just a report done after the fact? 2. Does the Logbook thoroughly document/explain all aspects of the Invention Process (Problem Identification, Understanding, Ideating, Designing, Building, Testing and Communicating) in a detailed manner?	10
	Display Board	1. Does the Display Board support the inventor's presentation by communicating significant aspects of the Invention Process? 2. Does the display have strong visual appeal, such as eye-catching colors, pictures, graphs and variety? 3. Are grammar, spelling and punctuation correct and, if hand-printed, neatly done?	5
	Prototype or Model	Does the Prototype support the inventor's presentation and clearly communicate the key characteristics that address the identified problem? <i>Note: Outside assistance and collaboration are acceptable as long as the student is driving the process and documents outside help. Inventors should only do what they can do safely. Credit should be given where assistance was received.</i>	5
	Video Presentation	The Video Presentation should be informative, energetic and speak to the originality of the invention. Inventors should include information on the first two categories of the rubric (Invention Process and Invention Impact). Inventors should prioritize communicating the Invention Process and challenges encountered while completing that process and explain completed research relating to the originality of the invention. Maximum limit of six minutes; minimum limit varies by grade.	15
TOTAL			100

Video Presentation Guidelines

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Rules

- **Grades K-2:** 2- to 6-minute video with permitted use of notecards and/or simple parent prompting (not interview style).
- **Grades 3-4:** 4- to 6-minute video with permitted use of notecards but no parent/adult prompting of any kind.
- **Grades 5-12:** 4- to 6-minute video with no notecards or adult prompting.
- Your video should focus on the problem you are solving, demonstrate how your invention works, explain your invention's originality, and fully address the Invention Process and Invention Impact sections of the rubric.
- The video must run continuously, with no editing or production interruptions.
- While filming on a smartphone, hold the phone horizontally/landscape.

What is the purpose of your video presentation?

- Your video will be judged using the Invention Convention Worldwide rubric. Please see the rubric and the video outline for help with planning your presentation.
- Sponsors may view videos in determining their award winners.

What are the judges looking for?

- Please read the rubric carefully. The judges will score your video presentation based on the rubric and your ability to communicate the key components of your invention. Use the rubric to plan the content of your video.

What if I worked as a team?

- If social distancing does not apply to you, then please include all teammates in the video. Please also include the display board and prototype in the video.
- If you are in a situation where you must respect social distancing, you may choose one inventor to present your team's video. That inventor will be responsible for filming the video, uploading it to zFairs and sharing the link with all of the teammates so that each one may use the same link within our registration system. The inventor who does the video presentation should have the display board and prototype to use in the video, if possible, and should mention each team member's name at the start of the video. If your team has already shot your video as a team or finds a way to shoot as a team using an online social platform, that would be ideal.

Tips to consider

- Begin with introductions; say your name, grade, school and the name of your invention.
- Your video **MUST** address the originality of your invention; include an explanation of research completed to establish originality.
- Consider incorporating all steps of the invention process, including steps you made to create your invention. What challenges did you encounter? What changes did you make and why? Read the rubric carefully to make sure you address all criteria.

Helpful hints for filming

- Film with a smartphone or video camera. Remember to hold the phone horizontally.
- Plan what you are going to say.
- Use your prototype and display board in the video.
- Find a quiet, well-lit spot where you can set up your display board and invention and you have room to present. Natural light from windows works well. Do not stand in front of the window, as you will appear as a shadow. The light should be coming toward you, the invention and your display board.
- Use a loud, clear voice. You may want to practice this a few times with the camera.
- Before recording, take a deep breath and relax. Remember, you are the expert on your invention.

Uploading your video to zFairs

- After you've completed recording your video, you will upload it to zFairs on the Entry screen during your registration.

Receiving and using feedback

- Receiving feedback and making changes based on that feedback are an important part of improving your invention. If you have received judge feedback from regional and state fairs, record that feedback and note any changes that you make to your invention. Remember that feedback is not criticism but a part of the invention process — your judges are experts in their fields and want to help you improve your invention.

Continued on next page

Topics for your video and suggested times

When preparing for your presentation, use this outline and questions as a guideline. These topics are what judges will be scoring you on, so you will want to make sure you address these in your presentation. Overall, the judges want to hear about your invention process, so spend time explaining how you arrived at your end result. The times suggested for each topic are just that, suggestions. Do not feel that you have to speak for that long. Be concise with what you have to say, and do not worry if your video does not reach the maximum time.

Invention Process

Problem and Solution Identification — Identifying, Understanding, Ideating (2 minutes)

Arrival at the problem:

- How did you uncover the problem?
- How did you become passionate about this problem?
 - Answer could be a personal story with a connection to the problem or a written process of identifying and researching a problem and its impact.

Research on who is affected by this problem:

- What sources did you use to better understand the situation and context of the problem your invention solves? What sources did you use to help you create your invention?
 - Answer could be a personal story of how you were inspired or a bibliography of sources. If you spoke to an expert, tell us what you learned.

Arrival at the solution:

- How did you arrive at your solution?
- How does your solution solve the problem you identified in your research?
- What sources did you use to uncover your solution and to better understand your ideas?

Originality research:

- What research did you do to see if something like your invention already exists?
- How did you modify your ideas to be unique?

Problem and Solution Identification — Designing, Building, Testing (2 minutes)

Present your prototype:

- How does your prototype work? Show the judges in your video. If you have a nonworking model, explain how your prototype would work.
- How did you choose the materials used to build the invention?

Testing and iteration:

- How did you test your invention to see if it would work?
- What changes or refinements did you make to your invention during the design process?
- What challenges did you face and how did you overcome them?

What did you learn as a result of inventing?

Invention Impact

Entrepreneurship — Marketing, Environmental/Societal Impact (1 minute)

Environmental/societal impact of the invention:

- How does the invention improve environmental or societal conditions or have a minimal adverse impact?

Your market or audience:

- Who might use your invention?
- How much might it cost if you were to sell it?

Display Board Criteria

Judging is based on the thoroughness and creativity of the display board. Judges should evaluate each board using the topics on this rubric and the depth of explanation provided by the inventor.

Criteria	Description	Points Possible
Content	<p>Minimal to Average: Includes name of invention, inventor’s name and grade, plus patent status and school/state.</p> <p>Essential design process content (in paragraphs or bullet points): problem statement, brainstorming ideas, test and revise/various iterations and improvements.</p> <p>Above Average to Excellent: Quality of required essential criteria (explained in rubric) is a deciding factor. Contains all essential content but also includes in-depth, thorough descriptions and details (age appropriate).</p> <p>Options for going above and beyond include but are not limited to: pictures, statistics, market potential, depth of the problem, age-appropriate research citations (beyond Google), interviews, analysis.</p>	0-3
Visual Appeal	<p>Minimal to Average: Instantly grabs viewer’s attention. All items are spelled correctly, mounted and cut neatly (age appropriate). Uses color scheme. Adds visual appeal. Clean, neat, colorful, eye-catching display.</p> <p>Above Average to Excellent: Unique aspects, original factors making display pop, full of essential content but well-organized and not crowded.</p>	0-2

Process

- Judges will score boards using the criteria above on a 5-point scale.

Invention Logbook Criteria

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Judging is based on the thoroughness of the logbook. Judges should evaluate each logbook using the topics on this rubric and the depth of explanation provided by the inventor. Descriptions in bold are the most important topics in that criterion.

Criteria	Description	Points Possible
Inventing Process	<p>Logbook must document student initiative and the inventing process. Information should begin with brainstorming and continue through to completion of the invention (include modifications/improvements/all changes from beginning to end).</p> <p>Logbook documents how idea originated; evidence of student being the main contributor to the project (students should do all work appropriate for their grade level; adult help is encouraged regarding any safety issues, such as using power tools).</p>	0-4
Research & Documentation	<p>Document research related to the general topic as well as the existence of similar inventions (supports originality).</p> <p>Lists all items used, including borrowed and repurposed. Documents expenses under \$50 for purchased materials. Documents help from adults.</p>	0-4
Analysis	<p>Provides analysis of the invention benefits/consequences: environmental, societal, market potential.</p> <p>Gives pros/cons of design process.</p>	0-2

Process

- Judges will score logbooks using the criteria above on a 10-point scale.