St. Joseph County, MI 4-H Youth Program

Robotics Guidelines

Log Notebook - Notebook showing the development or progression of knowledge and experienced gained through the course of the project year. Multiple years in a binder must have a divider with a dated tab dividing each year's log from the other years.

Your Log must include the following, in the listed order:

- Title sheet - Include your name, 4-H age and class number entered.
- Table of Contents - List in order what is in your Log Notebook and where the items can be found.
- Summary Page.
- All other information in your Robotics Log arranged chronologically or by category. The notebook may contain photos, notes, diagrams, meeting minutes, research, articles, flat examples of work accomplished, certificates, instructions, etc.

Your Robotics Log Notebook is like a Scientist's or Engineer's **journal** and file cabinet combined. It can be assembled bit by bit through the year by adding to the notebook every time you have a Robotics meeting, read an interesting article, come up with an idea to try someday, discover something robotic in your everyday life, go on a STEM field trip, learn something in school that you can apply to Robotics, etc. Everything and anything Robotics in one place!

Making the Table of Contents is easy, too. The easiest way is to put a piece of notebook paper after the Title sheet and each time you add something to the binder you write down what it is and the date you added it to your binder (for chronological order). Or you can make categories of information and list what those categories are.

The Summary Sheet should be no longer than one page. Use your Summary Page to explain how Robotics interests you.

Robotics Study - Report and poster focusing on one aspect of Robotics studied during the project year. May not be a school project. May be an in-depth report on an application, a technology, a manufacturer, a useful skill, various solutions to a particular engineering problem, etc. Report must be secured in a three-ring binder with a Title Page which should include Name, 4-H age and class number entered.

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Individual Robotics - Notebook about a Robotic project worked on during the year must be included. You may choose to accompany the notebook with either a display Robot or an informative 11" x 14" poster. Project may be one worked on with a team, but notebook report and robot or poster submission should reflect the individual's experience, not the team's. To submit a team display or a robot built by a team, see Team Robotics.

Individual Robotics Project Notebook Report must include after the title page (your name, 4-H age and class number entered) the following information in order. Include the number and topic heading for each section in your report. [You don't have to copy what you see in brackets into your report.] Use photos or drawings or glued-on components for your poster if you're making one. You can also add pictures to your notebook report.

If you are using premade robotic components, you don't have to take components apart to list their inner workings, especially if the manufacturer says not to. You may use a manufacturer's expanded parts diagram to add to your list or only pick out parts like a battery chamber or track wheels or claw arms for the parts list. So long as the member understands that robotics blends varying degrees of electronics, mechanics and programming intentionally and efficiently. **Note:** For 12 - 14 year olds and 15 - 19 year olds you may use a manufacturer's expanded parts diagram to add to your list if one is available or simply list obvious external features. Understand that robotics intentionally and efficiently combines varying types of electronics, mechanics and programming.

9-11 year olds:

Topics:

1. Robotics Goal - [What is the Robot supposed to do?]
2. Mechanical Components - [List all the "working" parts that move or balance or adjust]
3. Electronic Components - [List DC circuitry, batteries, wires, circuit boards and everything that carries electric power.]
4. Framework - [List other materials used to build and hold together the Robot.]
5. Programming - [List computerized equipment used and explain what you did to program the robot
6. Design and Assembly - [Explain how all the parts are designed to interact together – a diagram may be helpful.]
7. Helpers - [Who helped you and what did they do?]
8. Tweaks - [Did anything not turn out right at first? What did you do to make it work?]

12-14 year olds:

Topics:

1. Robotics Goal - [State the specific task or set of tasks the machine is designed to perform.]
2. Design Restrictions or Considerations - [Costs, safety, aesthetics, limited time or materials, etc.]
3. Mechanical Components - [List any and all mechanical components, "working" parts that transfer or transform force and movement. They often move, balance, lessen or adjust a force.]
4. Electronic Components - [List any and all electronic components, including DC circuitry and the electronic or electrical parts they power. Include batteries, wires, circuit boards and all other components that direct or restrict the flow of power to the mechanical parts.]
5. Framework - [List parts that hold together the mechanical and electronic parts in a way that contributes to the overall success of the robot's purpose.]
6. Programming - [List computer hardware and software used and explain what you did to program the robot.]
7. Design and Assembly - [Explain how all the parts are designed to interact together – a diagram may be helpful.]
8. Helpers - [List people who worked with you and what each of them did to contribute to the Robotics Project.]
9. Needed to Learn - [List what you needed to learn this year to do this Robotics Project.]
10. Tweaks - [What problem solving or adjustments did the project need as you built and tested your robot design?]
11. Evaluation - [How successful is your robot at performing its intended task or set of tasks? Is there something you would do differently next time or for version 2.0 of this project?]

15 - 19 year olds:

Topics:

1. Robotics Goal - [State the specific task or set of tasks the machine is designed to perform.]
2. Design Restrictions or Considerations - [Costs, safety, aesthetics, limited time or materials, etc.]
3. Mechanical Components - [List any and all mechanical components.]
4. Electronic Components - [List any and all electronic components.]
5. Framework - [List parts that hold together the mechanical and electronic parts in a way that contributes to the overall success of the robot's purpose.]
6. Programming - [List computer hardware and software used and explain what you did to program the robot.]
7. Design and Assembly - [Explain how all the parts are designed to interact together – a diagram may be helpful.]
8. Resources - [List any instruction manuals, websites or experts consulted.]
9. Helpers - [List people who worked with you and what each of them did to contribute to the Robotics Project.]
10. Needed to Learn - [List the specific skills and knowledge you needed to learn this year to participate in the Robotics Project.]
11. Tweaks - [What problem solving or adjustments did the project entail as you built and tested your robot design?]
12. Evaluation - [How successful is your robot at performing its intended task or set of tasks? Is there something you would do differently next time or for version 2.0 of this project?]
13. Sharing - [How have you share or exhibited this Robotics project, or the skills and knowledge learned, with others?]

Team Robotics - This project focuses on developing teamwork awareness during a Robotics project. Notebook Report and display Robot or display poster should all be completed by team members as part of the overall team project. Team must include at least two (2) St. Joseph County 4-H team members. All St. Joseph County 4-H team members must be present and judged at the same time.

Team Notebook Reports in this section must include the following information in order. Include the number and topic heading for each section in your report. You do not need to copy the words in [brackets] into your report. Use photos or drawings or glued-on components for your poster if you're making one. You can also add pictures to your notebook report.

Title page with class entered and names and 4-H ages of each team member
Summary page – Team Project:

- Describe how the decision to form a team came about and how the team decided upon their Robotics Goal.

Topics:

1. Teamwork Goal - [State the way in which you intended for everyone on the team to contribute to the effort.]
2. Robotics Goal - [State the specific task or set of tasks the machine is designed to perform.]
3. Design Restrictions or Considerations - [Costs, safety, aesthetics, limited time or materials, etc.]
4. Mechanical Components - [List any and all mechanical components.]
5. Electronic Components- [List any and all electronic components.]
6. Framework - [List parts that hold together the mechanical and electronic parts in a way that contributes to the overall success of the robot's purpose.]
7. Programming - [List computer hardware and software used and explain what you did to program the robot.]
8. Design and Assembly - [Explain how all the parts are designed to interact together – a diagram may be helpful.]
9. Resources - [List any instruction manuals, websites or experts consulted.]
10. Team Members - [List team members and what each ended up contributing to the Team effort. Focus on positive qualities that helped meet the Teamwork Goal as well as the Robotics Goal.]
11. Helpers - [List non-team members who worked with you and what each of them did to contribute to the Robotics Project or to the Teamwork effort.]
12. Robotic Tweaks - [What problem solving or adjustments did the project need as you built and tested your robot design?]
13. Teamwork Tweaks - [What adjustments did you need to make in your expectations of each other as team members as the project progressed? Any pleasant surprises?]
14. Project Evaluation - [How successful is your robot at performing its intended task or set of tasks? Is there something you would do differently next time or for version 2.0 of this project?]
15. Team Evaluation - [What have you discovered about working as a part of a team during the course of this project? Did you need to learn how to explain better? Listen better? To share, to wait, to speak up? How does teamwork slow a project down? Speed it up? Anything else?]