

Engineering Notebook

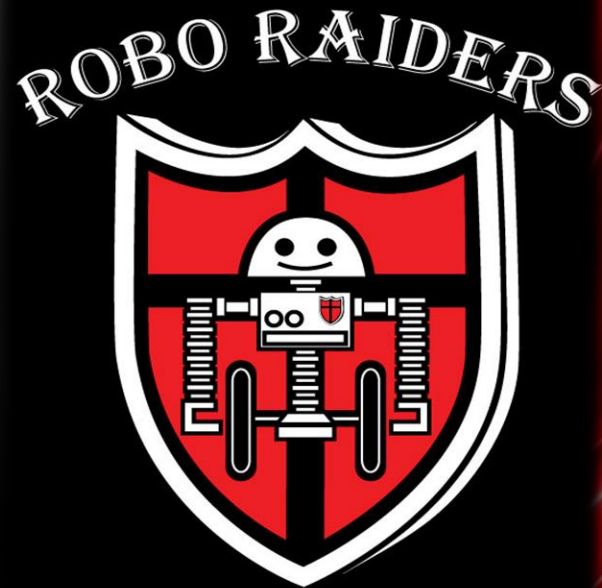
2013-14

- Illinois state & North Super Regional Think Award
- World Championship Think nomination

2014-15

- MO State Think Award
- IL State Inspire Award
- IL State Finalist Alliance
- North Super Regional Think Award
- World Championship Think and Control nomination

Presented by:



FTC #7129

Our Purpose For This Document

This is intended to be resource for FTC teams to use in their evaluation of how to set up their engineering notebook

- Purpose of the EN for FTC
- Specific guide lines for the EN
- Ideas for team consideration



WHAT'S
THE BIG
DEAL?



Why an Engineering Notebook?

An introduction to real world requirements

- Lab notebooks in college
- Engineering notebook in industry
- Proof of concept (patent)

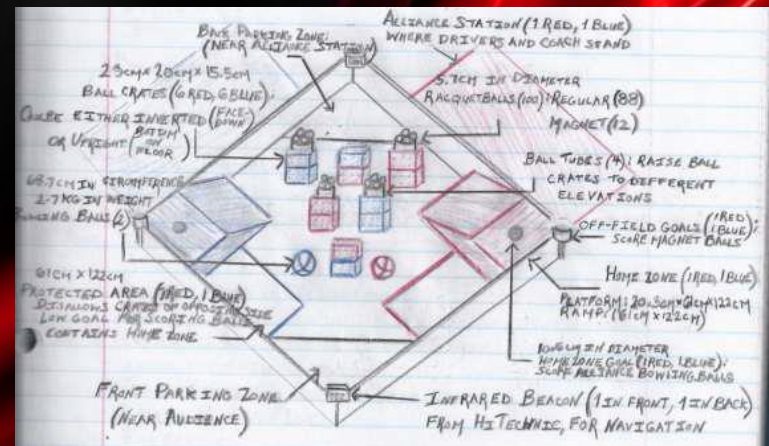


Why an Engineering Notebook?

Record of team journey throughout the season

Shows development of:

- Robot design
- Game strategy
- Team outreach
- Team organization



Why an Engineering Notebook?

To meet FTC requirements:

- Important facet of judging
- Required for 6 of 7 awards
- Represents team to the judges



“ The FTC Engineering Notebook is a complete documentation of your team’s robot design.”

Include:

- Sketches
- Discussions
- Team Meetings
- Design Evolution
- Processes
- Obstacles



The Notebook Guidelines

New this year-Fewer Guidelines

More options for teams

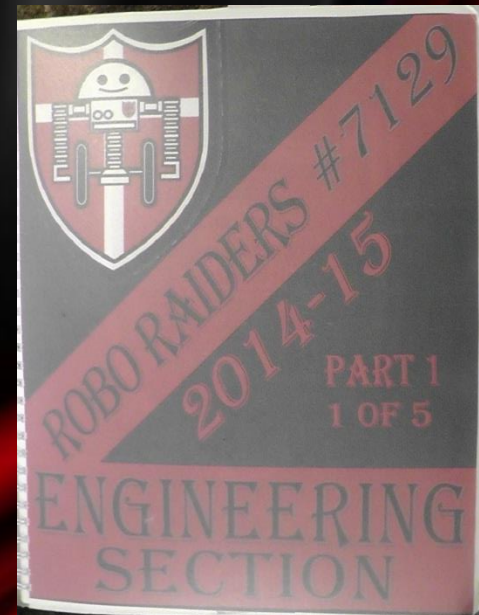


See current year's game manual for exact guidelines



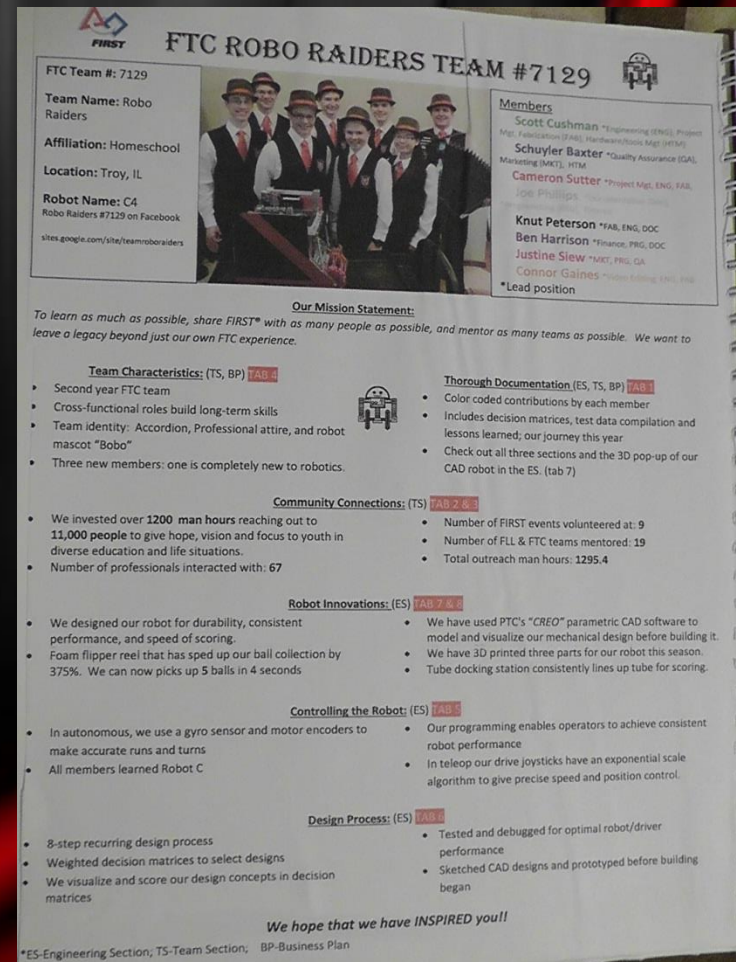
Engineering Notebook Requirements

- Team Number/Name must be on notebook cover
 - Your book will be judged by its cover



Engineering Notebook Requirements

- Attach a summary page to the front cover of the Engineering Notebook.
- Give the judges an overview of season
- Include highlights and pages you want them to consider



FTC Notebook Guidelines

Divide notebook into sections

1. Required - Engineering Section

- 1. -Includes robot design documentation

2. Required - Team Section

- Includes team bios and outreach activities

3. Required (Different from last year)- **Business Plan**

- Could be a Business, Strategic or Sustainability plan



Our Tips

With fewer guidelines,
these tips might help you complete your EN

Engineering Notebooks should
be organized enough that an
outsider (e.g. potential sponsor)
can understand your team and
your journey.



More Tips

Team introduction:

Start the Team Section of your notebook by introducing each team member and mentor with a brief biography of their name, age (or school year), interests, and reasons for joining your FTC team.



More Tips

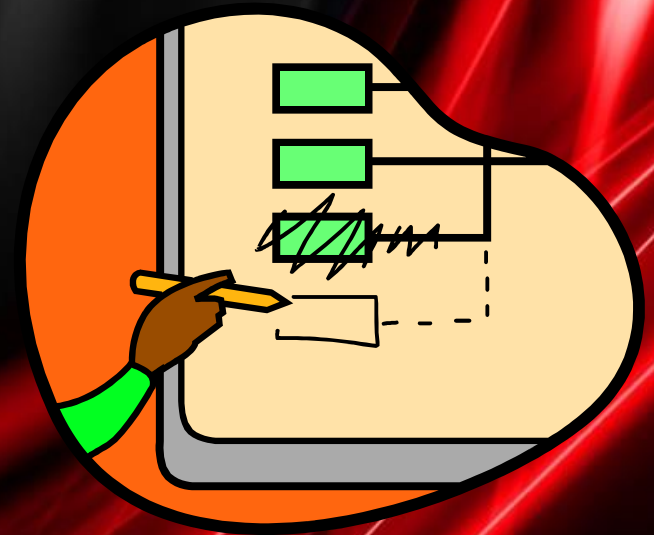


The Team Section of the Engineering Notebook is also a good place to discuss and show team activities that are done throughout the team's season.



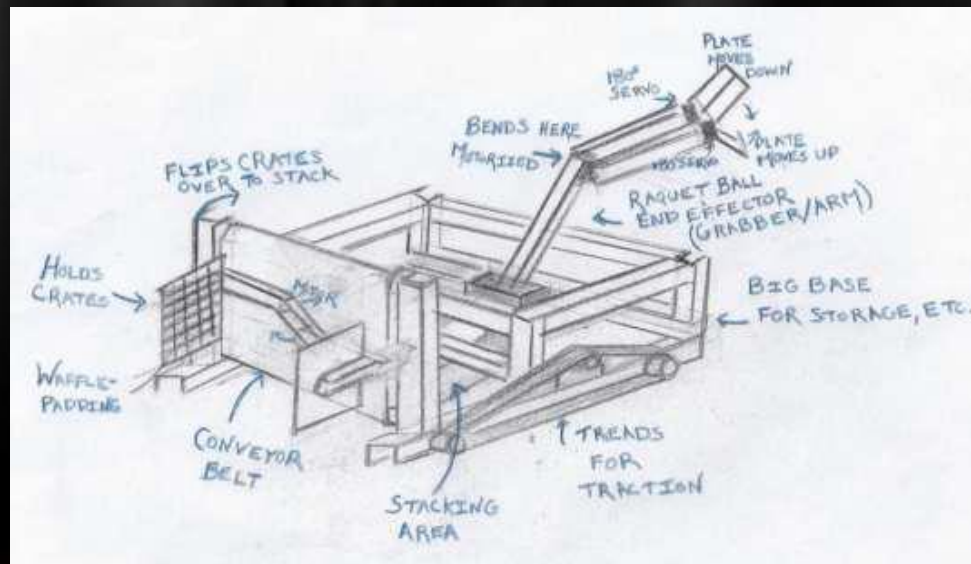
Even More Tips

All designs and changes to your robot should be recorded directly into the Engineering Section of your notebook.



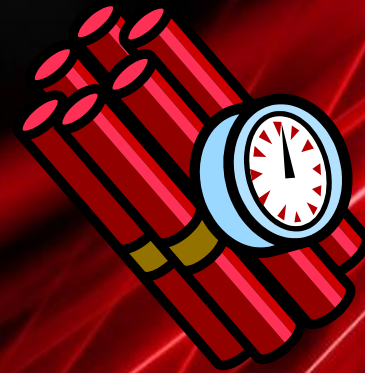
Yes, Even More Tips

The inclusion of all details and sketches are preferable. Notes and calculations should be done in your notebook, NOT on loose paper.



AND More Tips

- Insert a copy of your robot's Bill of Materials (BOM) as part of your Engineering Notebook
- No longer required for EN, but still a good idea



Tips for Handwritten Notebooks

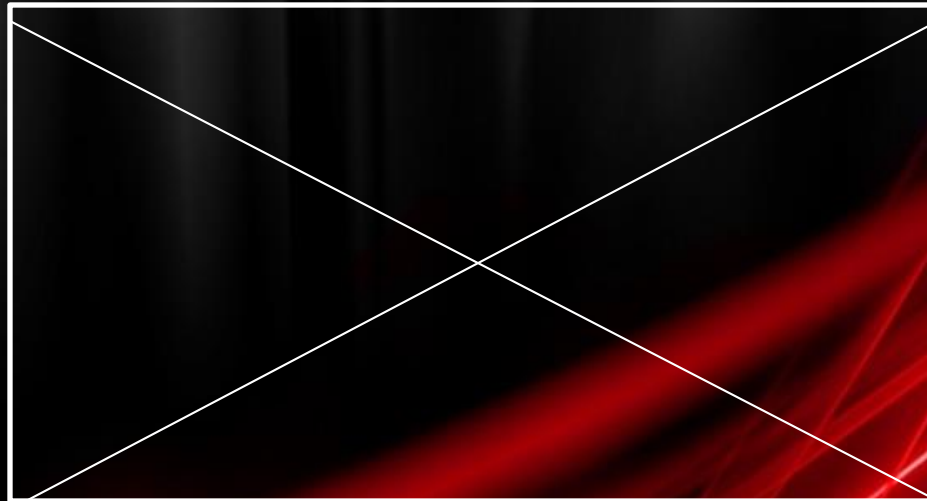
Written entries should be in permanent ink – not pencil.

Entries should be made by every team member



Tips for Handwritten

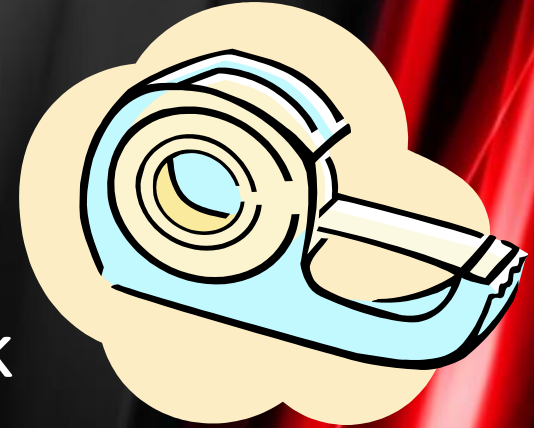
- Use both sides of a page.
- Never leave any white space: “X” out or crosshatch all unused space,
- Sign and date each page.



Tips For Handwritten Notebooks

To insert pictures or outside information into your notebook, tape the picture into your notebook and outline with permanent ink, to note that it was there in case it falls out.

Put the corresponding page number on that inserted information.



Our Tips

In the case of an error, draw a single line through the incorrect data.

~~(Just like this)~~

Do NOT erase or use correction fluid.
All corrections should be initialed
and dated.



IDEAS FOR TEAMS TO CONSIDER



Ideas To Consider

What Notebook style to use?

- Electronic
 - Online
- Handwritten



Ideas To Consider

What format to use?

- Task/Reflections/Observations
- Task/Reflections/To Do
- Task/Reflections/Observations/Lessons Learned
- Task/Work Log/Summary
- Task/Work Log/To Do
- Make your own!



Ideas To Consider

Judges want the real thing.

Keep it real ... worn/wrinkled pages ... etc.
Don't get behind! Document on same day.



Judges literally knew we put
blood, sweat and tears into
our notebook.



Ideas To Consider

What the notebook is not:

- 
- Blog
 - Journal
 - Scrapbook



Sample Pages From Our Notebooks

NAME 1	NAME 2	DATE
		9/30/14
EXPERIMENT/TITLE		COURSE/SECTION
OUTREACH		Team Section

Continued from page 34

May 29, 2014 - Demo / Motorcoring -
24 min hours - John, Spina, Joe, Cameron,
Jon, Karl, Skyley, Scott - 200 ppl

We did a demo at an edmundville school we brought our robot and showed all ~~the~~ the different robots and what they were used for we also let kids drive the robot there was also a FRC team there so we got to talk to them and we even got to drive there robot that was a lot of fun

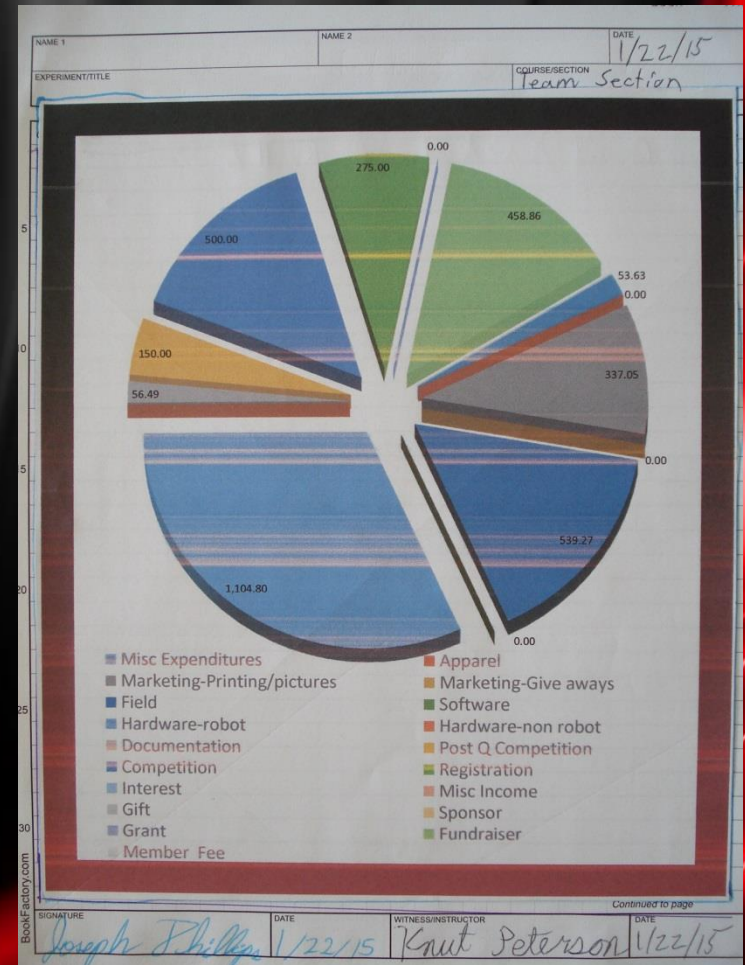
We got to see the design & materials used by the FRC team on their robot, they used 50/20 ports that could be very effective for this years game.

We demoed our robot and showed all the kids how it worked. Then we let them all take turns driving it around. We also drove it around for a while and delivered blocks into baskets. A lot of the parents had questions about FTC and FLL, so we answered them and told them about several resources that they could use.

One of the reasons we did this demo was to help the new FTC team that they were starting. We were able to show the team an FRC robot, as well as answer some of their questions.

Continued to page 36

SIGNATURE	DATE	WITNESS/INSTRUCTOR	DATE
Justin Siew	9/30/14	Cameron Mink	9/30/14



Sample Pages From Our Notebooks

BOOK PAGE 34

NAME 1 NAME 2 DATE 3-31-15

EXPERIMENT TITLE Team Section

Continued from page 53

Abel's log:

Our finances are new stake and we have money and ~~we~~ we found out the fast and willing to pay for our world fairment

Pictures from North Super Regionals

Below: us with Mrs. Log's car mirror this year

Right: picture of us for getting think and for our notebook very exciting

Right: lots of teams came by and talked with us. They all liked our awards and Teams.

Left: Our Scoring for our Partners at Super Regionals.

it was a very hard competitive tournament we learned alot about our look ups & Superst were going to come but

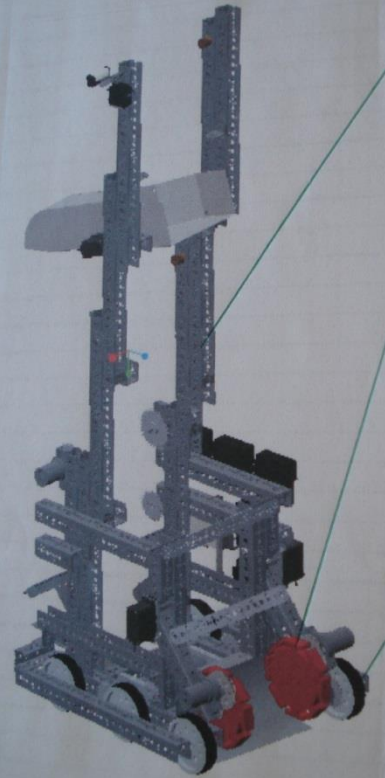
Continued to page

BooFactory.com

SIGNATURE Joseph Phillips DATE 3-31-15 WITNESS/INSTRUCTOR Schuyler Barker DATE 3-31-15

EXPERIMENT TITLE

Continued from page 40



We are going to use a slider configured in a system. This allows the of our hopper to lift 130 cm in .5-1 second counting friction.

Our 3d printed Sweeper rubber bands stretch. Due to the gearing, the about 304 rpm. The mechanism is on an arm which can be raised to control what size are being gathered. position only large be collected, in the all sizes will be collected.

Our skidsteer control drive uses chain drive to optimize our speed. The wheels are placed in balance and also assist the sides are supported on each side our wheels firmly in reducing stress on the

SIGNATURE



Ideas To Consider

Preparing for Competition:

- Tab/flag 6 to 8 pages of the very best documentation.
- We gave a short (30 second) blurb about EN in our presentation to judges
- Insert current BOM and clearly tab
- Update summary sheet as needed
- Update table of contents as needed



Ideas To Consider

How we did our notebook

- Examined and tried to follow the rules very closely
- We included the tools that we used to:
 - record information
 - make decisions
 - model our robot
 - and some other things



Where We Get Our Engineering Notebooks

- <http://www.bookfactory.com/lab-notebooks.html>
- Find a layout that your team likes
 - Graph paper?
 - Lined Paper?
 - Sizes?

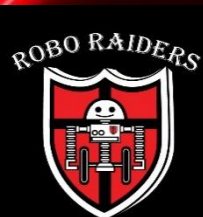
Ideas To Consider

Different teams, different notebooks

No one template fits all

Customize your Notebook to fit your
team personality

What works for your team?



Any questions?
Contact your Documentation team.

The Engineering Notebook including the three sections: Eng, Team, and Business Plan is a **team effort** to share your journey with others. Think about the legacy you are leaving for your future team members.



Notebook Resources:

Our EN will soon be posted on the USFIRST Website.

<http://www.usfirst.org/roboticsprograms/ftc/team-resources>

Other Online Engineering Notebook links:

Techno Warriors Advanced

<http://ftc-team-3486.wikispaces.com/>

Techno Guards

<http://www.technoguards.org/EngineeringView>

Green Army Robotics

<http://greenarmyrobotics.org/notebooks>



Notebook Resources

More Online Notebook Resources:

Psychotic Strawberries

http://www.ortop.org/Documents/FTC_RES_PS_EngNotebook.pdf

Bounty Hunters

http://www.usfirst.org/sites/default/files/uploadedFiles/Robotics_Programs/FTC/FTC_Documents/EngineeringNotebookFTCTeam2864.pdf



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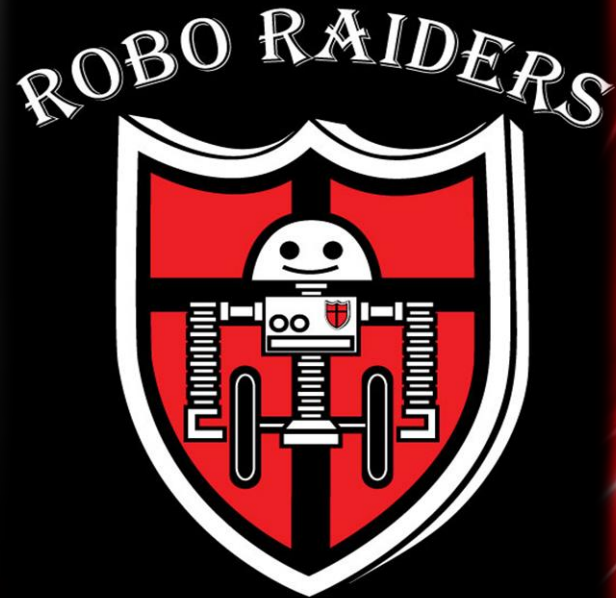
Thank you!

If you have any questions,
please contact us at:

teamroboraiders@gmail.com

These slides will be available
on our website as a resource.

Presented by:



FTC #7129