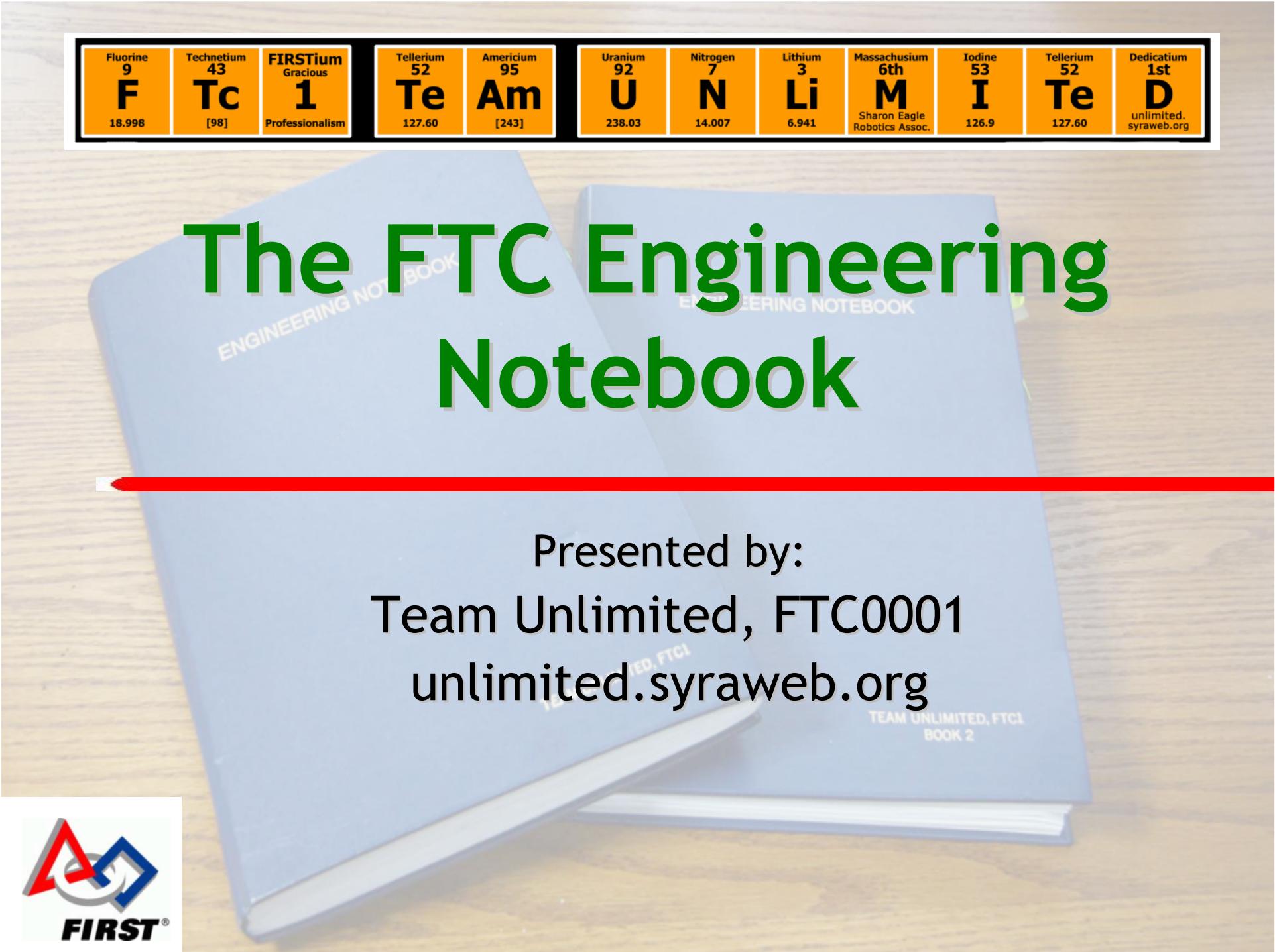


Fluorine 9 F 18.998	Technetium 43 Tc [98]	FIRSTium Gracious 1 Professionalism	Tellurium 52 Te 127.60	Americium 95 Am [243]	Uranium 92 U 238.03	Nitrogen 7 N 14.007	Lithium 3 Li 6.941	Massachusium 6th M Sharon Eagle Robotics Assoc.	Iodine 53 I 126.9	Tellurium 52 Te 127.60	Dedication 1st D unlimited. syraweb.org
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The FTC Engineering Notebook

Presented by:
 Team Unlimited, FTC0001
unlimited.syraweb.org



Dedication	1st	D
Tellurium	52	Te
Iodine	53	I
Massachusetts	6th	M
Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	Gracious
Technetium	43	Tc
Fluorine	9	F

Outline

- What is the FTC Engineering Notebook?
- Why is the Engineering Notebook Important?
- Rules for the Engineering Notebook
- Suggestions for Your Engineering Notebook
- Examples from the Team Unlimited Notebooks
- Awards and the Engineering Notebook
- Our favorite Engineering Notebook supplies
- Question?



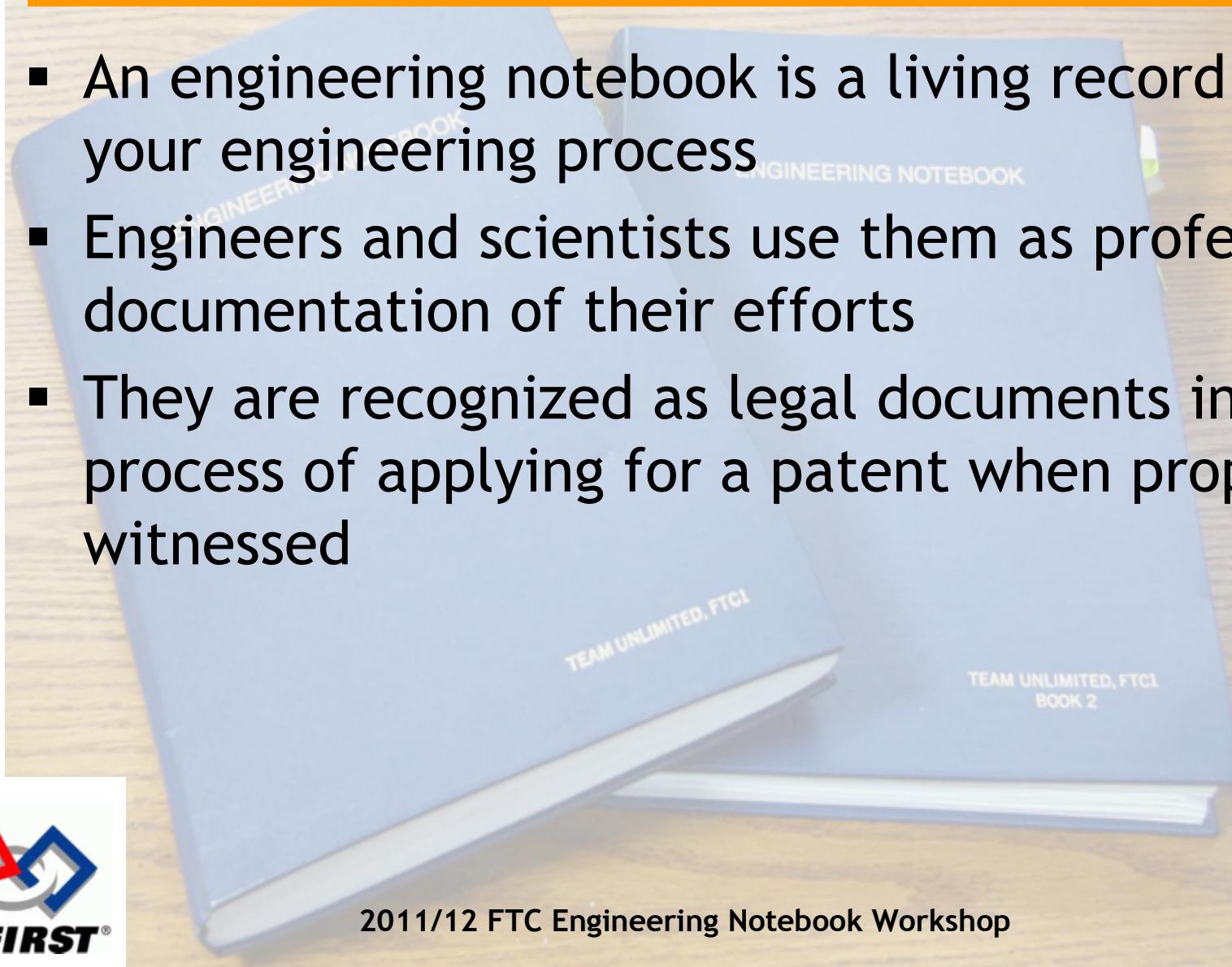
2011/12 FTC Engineering Notebook Workshop

Dedication	1st	D
Tellurium	52	Te
Iodine	53	I
Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	
Fluorine	9	F
Technetium	43	Tc

What is the FTC Engineering Notebook?

- An engineering notebook is a living record of your engineering process
- Engineers and scientists use them as professional documentation of their efforts
- They are recognized as legal documents in the process of applying for a patent when properly witnessed

2011/12 FTC Engineering Notebook Workshop



Dedication	1st	D
Tellurium	52	Te
Iodine	53	I
Lithium	6	M
Nitrogen	7	Li
Uranium	92	N
Americium	95	U
Tellurium	52	Am
FIRSTium	1	Te
Technetium	43	Am
Fluorine	9	Tc

unlimited
syrauweb.org

Sharon Eagle
Robotics Assoc.

6.941
14.007
238.03
[243]
127.60
[98]

Why is the Engineering Notebook so important?

- Education in proper record keeping
 - This is how engineers and scientists document their efforts, both in training and employment
- Eligibility for Awards
 - Many of the judged awards require the engineering notebook
- Competitiveness
 - Your engineering notebook represents you to the judging panels when you are not present (including the judges that did not interview you personally)



Dedication	1 st	D
Tellurium	52	Te
Iodine	53	I
Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	
Technetium	43	Tc
Fluorine	9	F

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Sharon Eagle Robotics Assoc.
Massachusetts 6th Grade
Iodine 126.9
Tellurium 127.60
Lithium 6.941
Nitrogen 14.007
Uranium 238.03
Americium 243
Tellurium 127.60
FIRSTium 1 Professionalism
Technetium 98
Fluorine 18.998

FTC format for the Engineering Notebook

- Format of electronic/online notebook
 - Teams may choose to use electronic or online programs to create their Engineering Notebook.
 - For the purposes of judging, teams must print out their Engineering Notebooks and place them in a binder, no larger than 1.5”.
 - All pages must be numbered and in order.
 - Only one copy is required per team.
 - Online videos or demonstrations cannot be reviewed by judges.



Dedication	1st	D
Tellurium	52	Te
Iodine	53	I
Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	1
Technetium	43	Tc
Fluorine	9	F

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Sharon Eagle Robotics Assoc.
Massachusetts 6th M
Iodine 53 I 126.9
Tellurium 52 Te 127.60
Lithium 3 Li 6.941
Nitrogen 7 N 14.007
Uranium 92 U 238.03
Americium 95 Am [243]
Tellurium 52 Te 127.60
FIRSTium 1 1 Professionalism
Technetium 43 Tc [98]
Fluorine 9 F 18.998

FTC format for the Engineering Notebook

- Format of written notebook

- Spiral--bound, Laboratory, or documentation notebooks are available through your school or local stationary supply store or you may use the notebook supplied by Rockwell Collins delivered to you in your Kit of Parts.
- There are many different types to choose from, using the following criteria:
 - Do not use a loose–leaf notebook.
 - Numbered pages are recommended (but not necessary) so that pages cannot be substituted or deleted.
 - Only one Engineering Notebook is required per team.

Dedication	1st	D
Tellurium	52	Te
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Iodine	53	I
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Massachusetts	6th	M
		Sharon Eagle Robotics Assoc.
Lithium	3	Li
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Nitrogen	7	N
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Uranium	92	U
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Americium	95	Am
	[243]	
Tellurium	52	Te
	127.60	
FIRSTium	1	
Gracious		
Professionalism		
Technetium	43	Tc
	[98]	
Fluorine	9	F
	18.998	

FTC rules for the Engineering Notebook

1. Document **EVERYTHING!!**
2. Engineering Notebooks should be well **organized**
If the judges can't follow your progress, they can't credit it
3. Entries should be in **Permanent Ink** - Not Pencil.
4. Start your notebook by **introducing each team member and mentor** with a brief bio.
 - Name, age (or school year), interests, why they got involved with FIRST . . .
 - Tip: Pictures serve as a great visual for the judges to get to know each member of your team.



Dedication	1st	D
Tellurium	52	Te
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Americium	95	Am
Tellurium	52	Te
FIRSTium	1	1
Technetium	43	Tc
Fluorine	9	F

FTC rules for the Engineering Notebook

5. Start a **fresh page at every meeting**. Your team number, date, and start/stop times should be recorded when starting a new page. Each day should start with two columns:
 - a. **Task Column** - What your team is doing and discovering?
 - b. **Reflections Column** - Where your team records thoughts on what is happening and any questions that need to be answered.
6. Entries should be made by **every team member**, initialed, and dated.



Dedication	1st	D
Tellurium	52	Te
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Massachusetts	6th	M
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Uranium	92	U
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Americium	95	Am
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Tellurium	52	Te
	127.60	
FIRSTium	1	Gracious
		Professionalism
Technetium	43	Tc
	[98]	
Fluorine	9	F
	18.998	

FTC rules for the Engineering Notebook

- 7. All designs and changes to your robot should be recorded directly into your notebook.** The inclusion of all elaborate details and sketches are preferable. Notes and calculations should be done in your notebook, NOT on loose paper.
- Tip: A judging panel is always interested to see a unique design or playing strategy. On the other hand, a design without the substance to support its reasoning will not be viewed as highly.
- 8. In the case of an error, draw a single line through the incorrect data. Do NOT erase or use correction fluid.** All corrections should be initialed and dated.



Dedication	1 st	D
Tellurium	52	Te
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Iodine	53	I
	126.9	
Massachusetts	6 th	M
		Sharon Eagle Robotics Assoc.
Lithium	3	Li
	6.941	
Nitrogen	7	N
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Uranium	92	U
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Americium	95	Am
	[243]	
Tellurium	52	Te
	127.60	
FIRST [®]	Gracious	1
	Professionalism	
Fluorine	9	F
	18.998	

FTC rules for the Engineering Notebook

9. Use both sides of a page. **Minimize any white space.**
10. To insert pictures or outside information into your notebook, **tape or glue the picture into your notebook** and outline with permanent ink, to note that it was there in case it falls out.
 - Tip: Pictures or sketches of your robot designs are recommended as part of a thorough documentation.
11. Insert a **copy of your Robot's Bill of Materials (BOM)** as part of your Engineering Notebook as required by rules elsewhere in this manual. Keep a second copy for the Hardware Inspectors!



Dedication	1st	D
Tellurium	52	Te
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Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	
Fluorine	9	F

FTC rules for the Engineering Notebook

12. The Engineering Notebook is also a good place to **discuss and show team activities** that are done throughout the team's season. These activities can be placed in a separate section of the Engineering Notebook or chronologically within the design pages.
13. Don't forget to **put your team number in your Engineering Notebook** and on your cover, so it can be returned after the judges have seen it!



Dedication	1st	D
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Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	1
Fluorine	9	F

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Sharon Eagle Robotics Assoc.

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FTC

Judge's Tips for the Engineering Notebook

1. Every notebook is a work in progress, forever changing and developing. Judges do not want to see a “final” copy notebook; **they want the real thing** complete with misspellings, stains, worn edges and wrinkled pages. Just remember to keep it real!
2. When turning notebooks into the judges at your event, place **sticky tabs at the top of the page on your top 6-12 best moments as a team**. Judges will use these pages as their preliminary review of your notebook.
3. Don’t be afraid to **customize your Engineering Notebook** to reflect your team’s personality! At the end of the season, this notebook will be a great piece of memorabilia for your team.



Dedication	1 st	D
Tellurium	52	Te
	127.60	unlimited. syraweb.org
Iodine	53	I
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Massachusetts	6th	M
		Sharon Eagle Robotics Assoc.
Lithium	3	Li
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Nitrogen	7	N
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Uranium	92	U
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Americium	95	Am
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Tellurium	52	Te
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FIRSTium	1	
Gracious		
Professionalism		
Fluorine	9	F
	18.998	
Technetium	43	Tc
	[98]	

So what goes in the Engineering Notebook?

- Descriptions of Meetings and Events
- Profiles of Team Members
- Plans and Tasks
- Notes and Observations
- Photos and Diagrams
- CAD renderings
- Bill of Materials (BOM)
- Printouts of RobotC or LabVIEW Code



2011/12 FTC Engineering Notebook Workshop

Dedication	1 st	D
Tellurium	52	Te
Iodine	53	I
Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	Gracious
Fluorine	9	F
Technetium	43	Tc

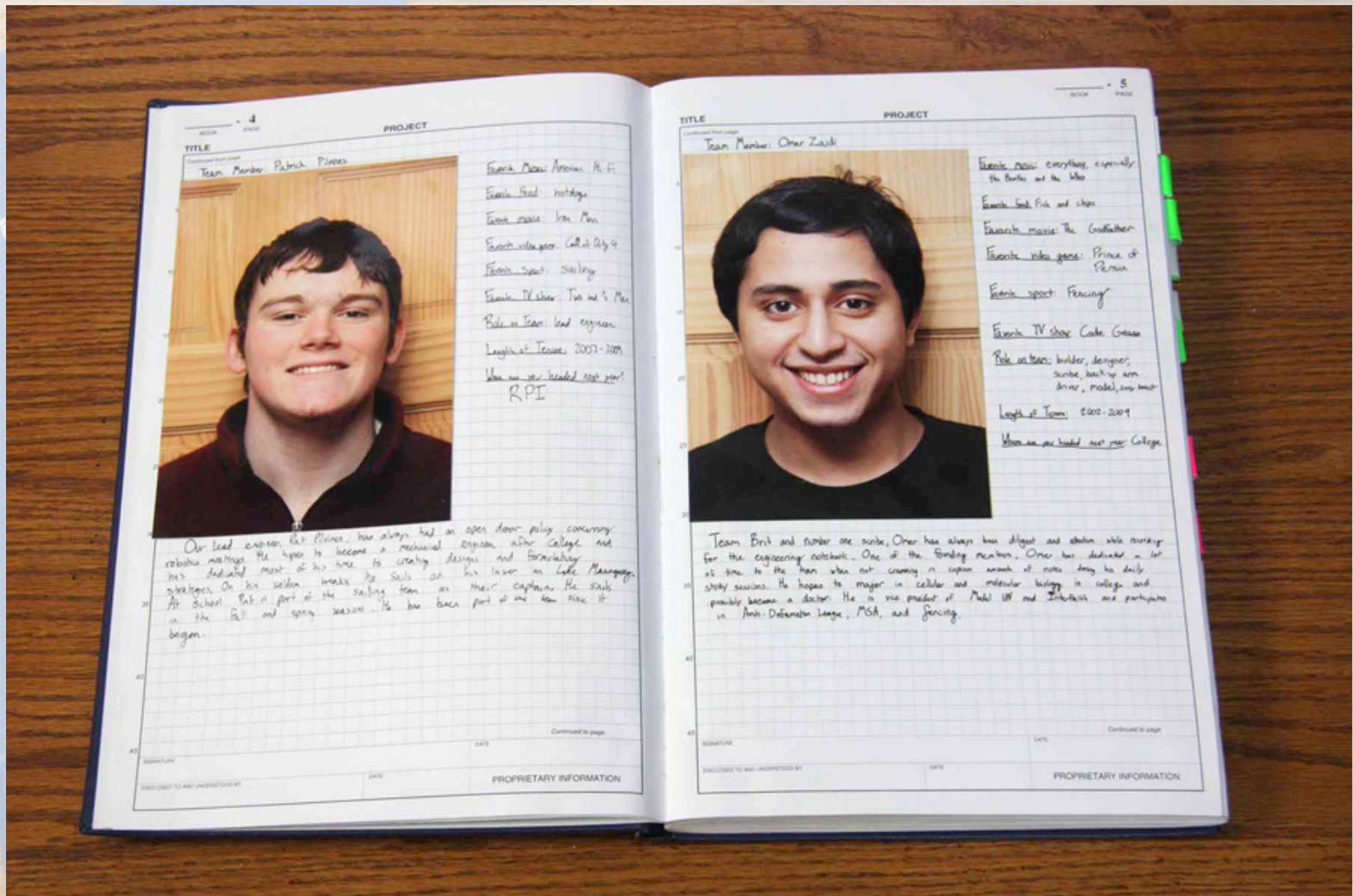
Suggestions for creating your Notebook

- Use white board and flipcharts
- Insert lots of photos and diagrams
- Document team activities separately from meetings and building sessions
 - Meetings are interactive with coaches
 - Building sessions are where the real work gets done
 - Activities are events, volunteer work, fund raising, promotion, et al
 - Outside of the behind-the-scenes team environment





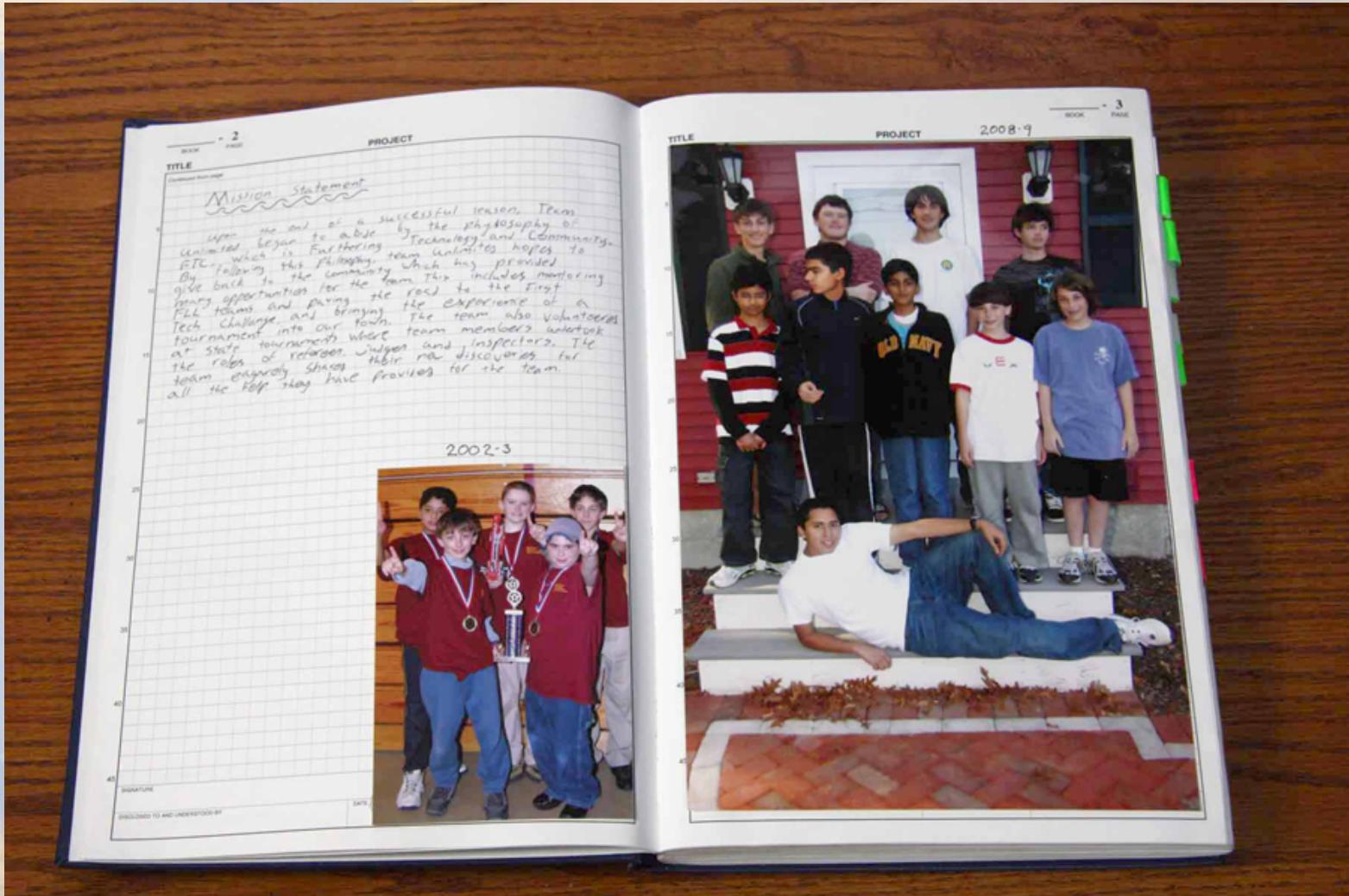
Examples from Team Unlimited Notebooks: Team Profiles



2011/12 FTC Engineering Notebook Workshop

Dedication	1st	D
Tellurium	52	Te
Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	Gracious
Fluorine	9	F
Technetium	43	Tc

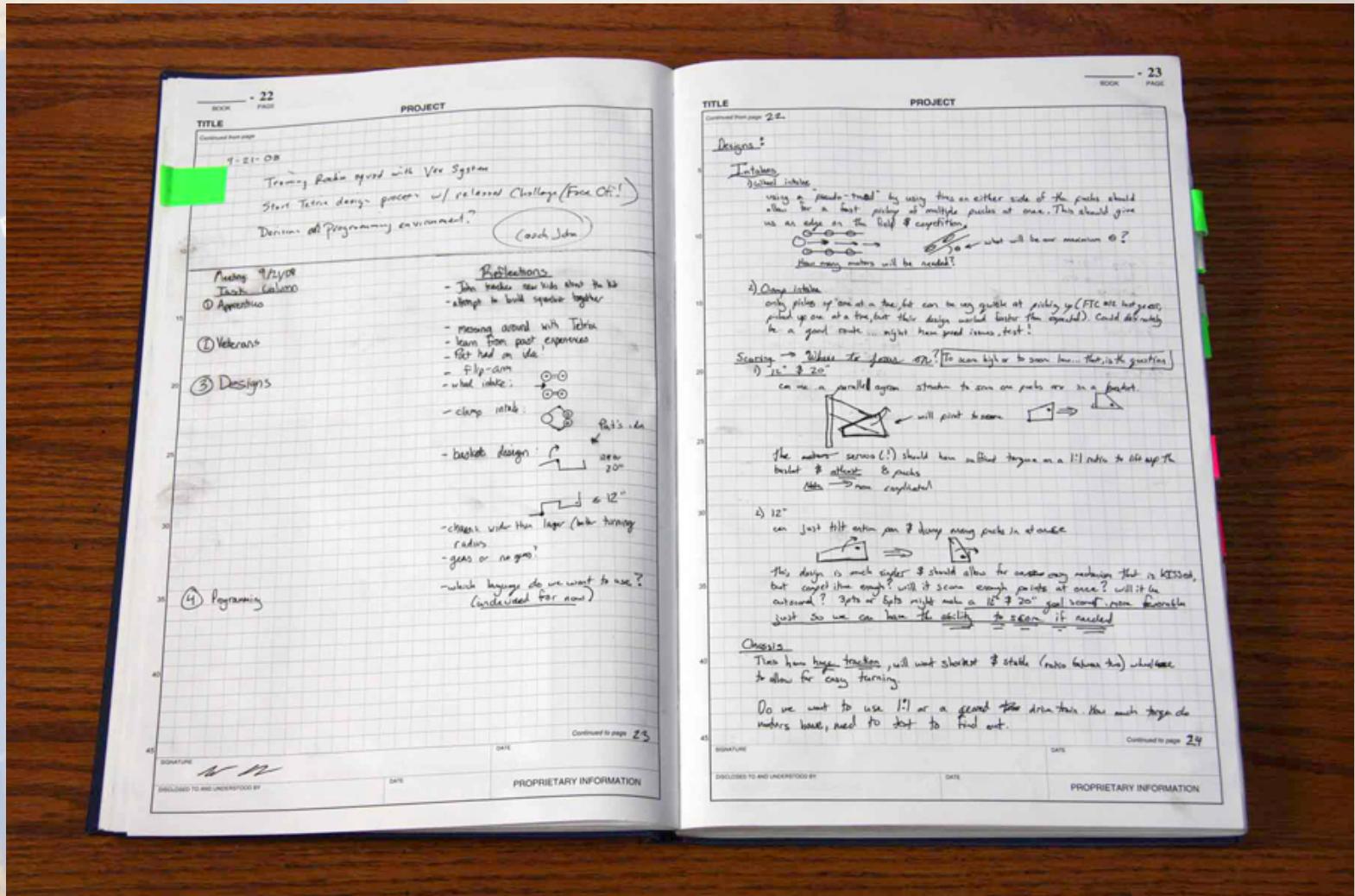
Examples from Team Unlimited Notebooks: Mission Statement and Team Photo



2011/12 FTC Engineering Notebook Workshop

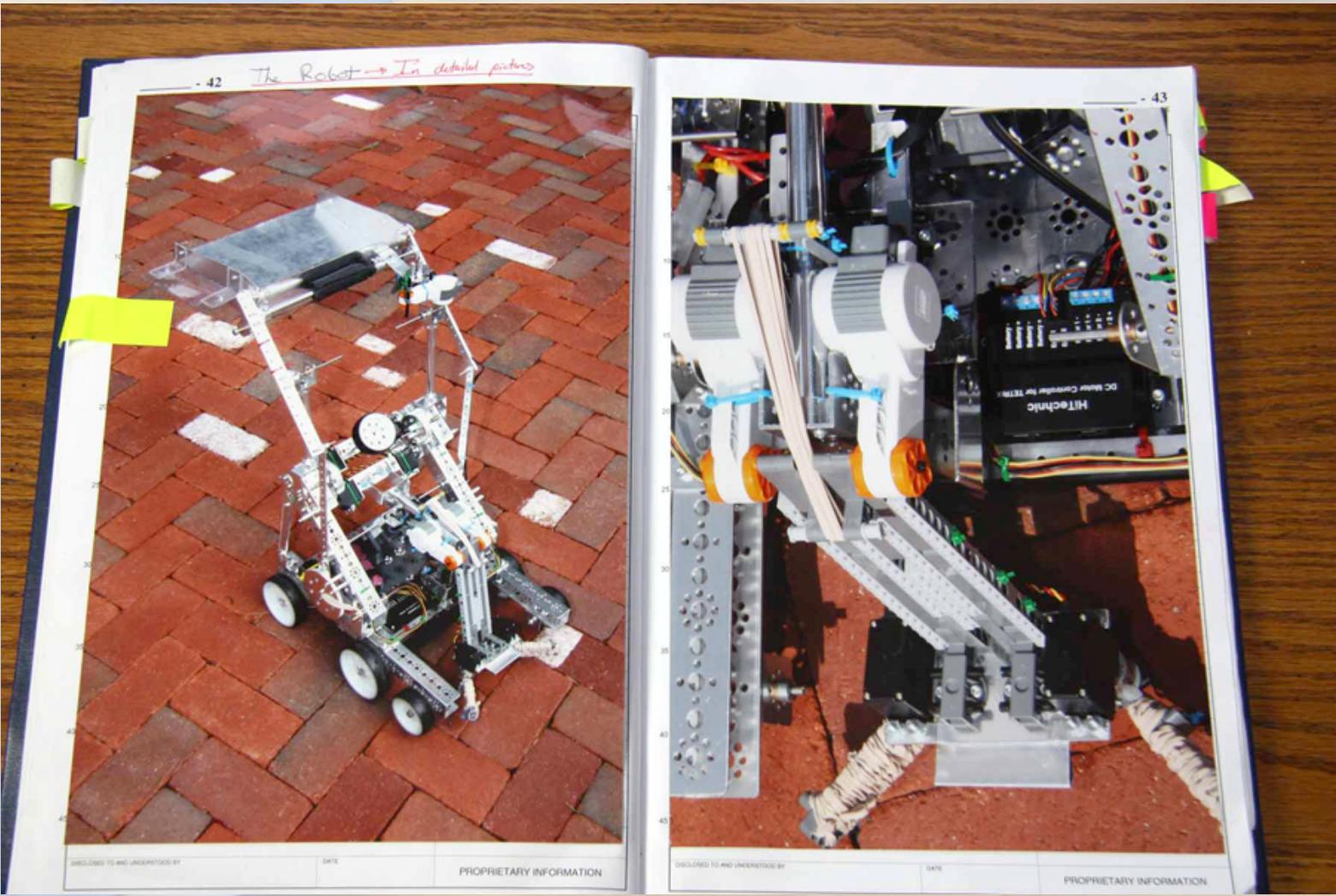
Dedication	1st	D
Tellurium	52	Te
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Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
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Technetium	43	Tc
Fluorine	9	F

Examples from Team Unlimited Notebooks: Meeting & Working Session



Dedication	1st	D
Tellurium	52	Te
Iodine	53	I
Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	Gracious
Technetium	43	Tc
Fluorine	9	F

Examples from Team Unlimited Notebooks: Document Final Robot Design



2011/12 FTC Engineering Notebook Workshop

Dedication	1st	D
Tellurium	52	Te
Iodine	53	I
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Tellurium	52	Te
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Technetium	43	Tc

Examples from Team Unlimited Notebooks: CAD renderings



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Fluorine	9	F	18.998
Technetium	43	Tc	[98]
FIRST ium Gracious	1		Professionalism
Tellurium	52	Te	Am [243]
Uranium	92	U	238.03
Nitrogen	7	N	14.007
Lithium	3	Li	6.941
Massachusetts	6th	M	Sharon Eagle Robotics Assoc.
Iodine	53	I	126.9
Tellurium	52	Te	127.60
Dedication	1st	D	unlimited
			syrnaweb.org



Examples from Team Unlimited Notebooks: Team Activity - FIRST HQ Visit



Dedication	1 st	D
Tellurium	52	Te
Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	Gracious
Fluorine	9	F
Technetium	43	Tc

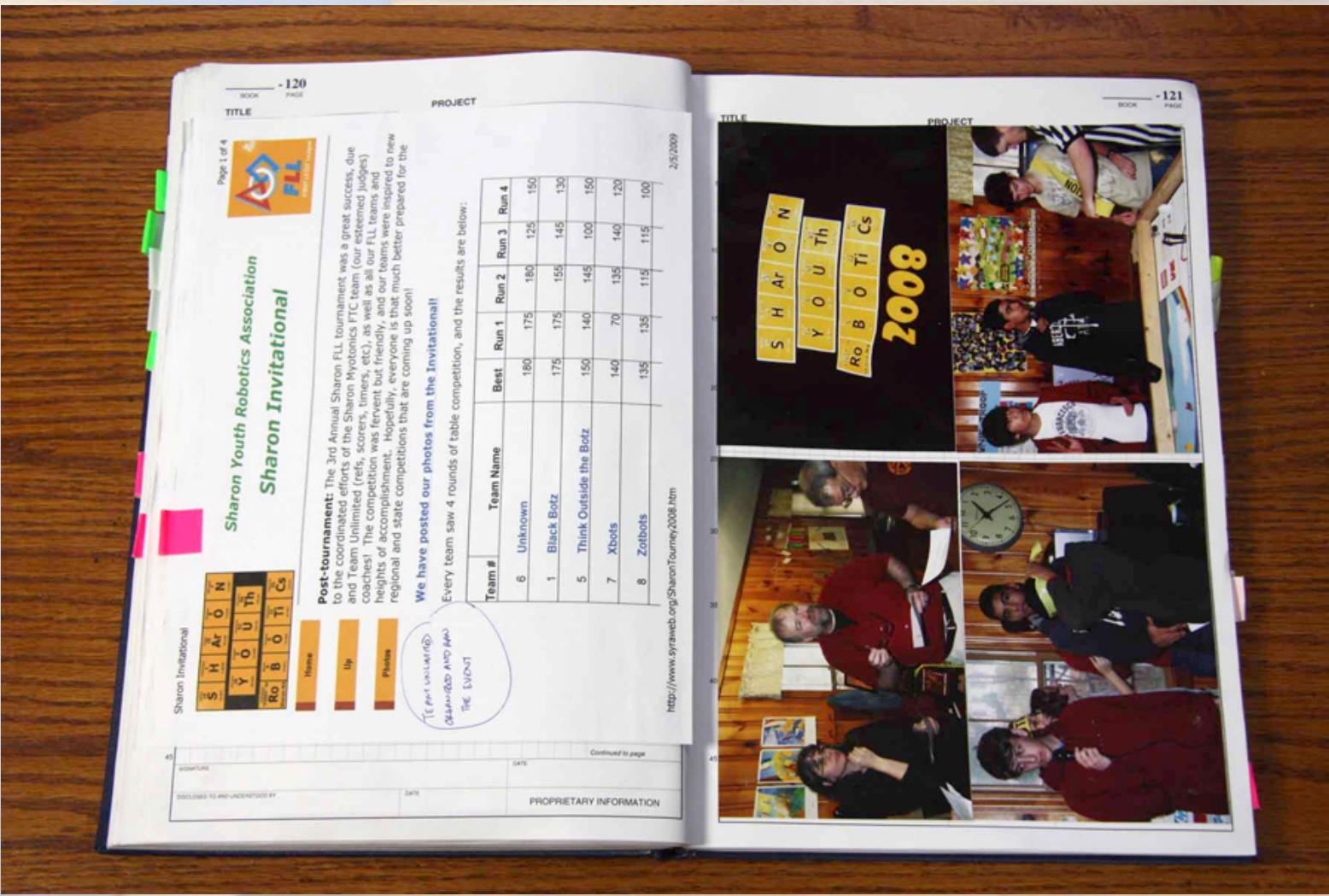
Examples from Team Unlimited Notebooks: CT Robot Rally 2008



2011/12 FTC Engineering Notebook Workshop

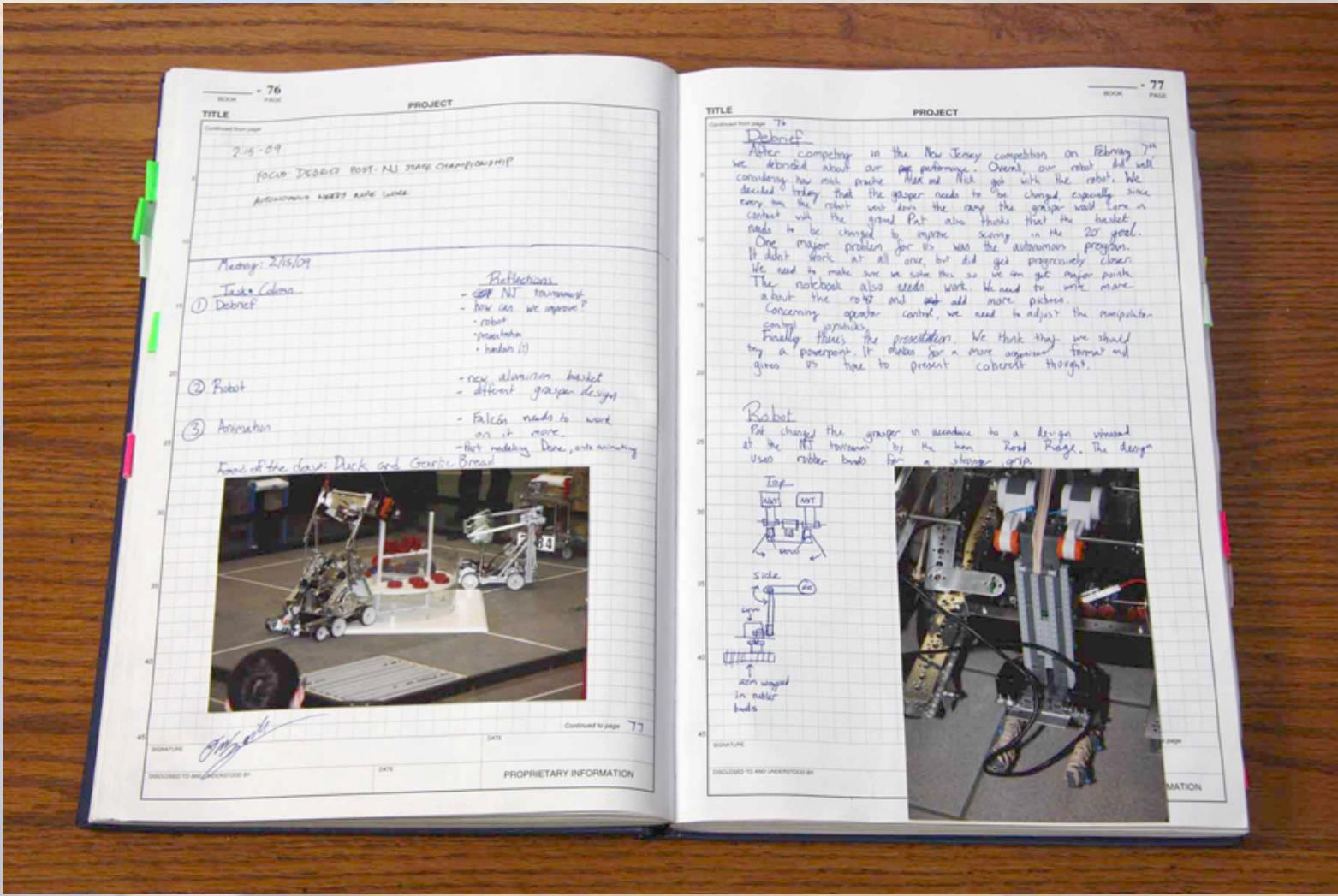
Fluorine	9	F	Technetium	43	Tc	FIRSTium Gracious Professionalism	1
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Tellurium	52	Te	Am	95	M	Iodine	53
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						Robotics Assoc.	Te
						126.9	D
						unlimited	
						syraweb.org	
						Dedication	1st

Examples from Team Unlimited Notebooks: 2008 Sharon FLL Invitational



Fluorine	9	F	Technetium	43	Tc	FIRSTium Gracious	1	Professionalism
	18.998			[98]				
Tellurium	52	Te	Americium	95	Am	[243]		
	127.60							
Lithium	3	Li	Nitrogen	7	N	Uranium	92	U
	6.941			14.007			238.03	
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Massachusetts	6th		Antennae	Antennae		Sharon Eagle		
Iodine	53	I	Antennae	Antennae		Robotics Assoc.		
	126.9							
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Examples from Team Unlimited Notebooks: Lessons learned from NJ FTC competition



Fluorine	9	F	Technetium	43	Tc	<small>[98]</small>	18.998
FIRSTium	1		Gracious				
Tellurium	52	Te	Americium	95	Am	<small>[243]</small>	
Uranium	92	U	Nitrogen	7	N	14.007	
Lithium	3	Li					
Iodine	53	I	Massachusetts	6th	M	Sharon Eagle	Robotics Assoc.
Tellurium	52	Te					
Dedication	1st	D	unlimited				
			syraweb.org				

Examples from Team Unlimited Notebooks: MA FTC Championship 2008-09

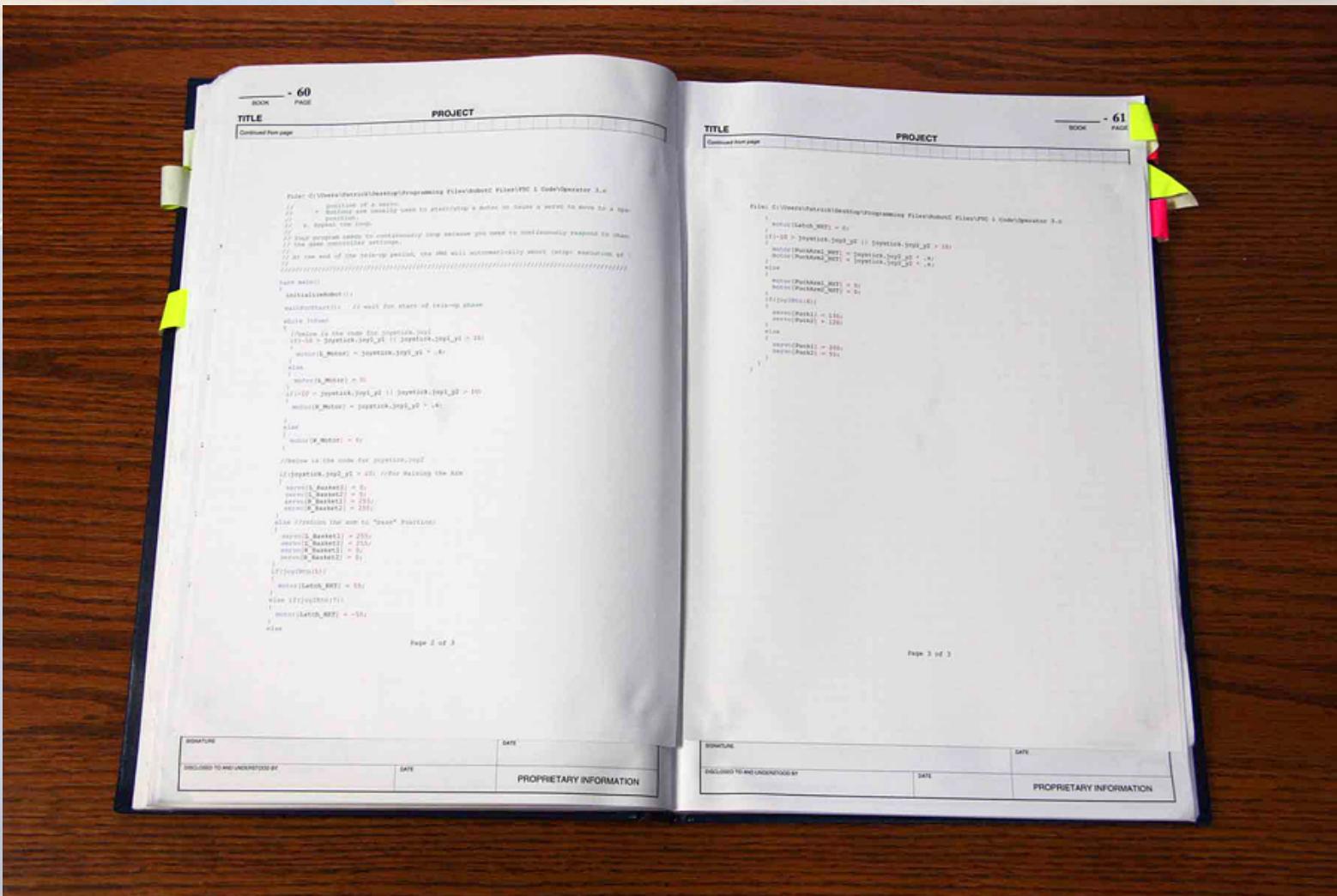


2011/12 FTC Engineering Notebook Workshop

Dedication	1st	D
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Tellurium	52	Te
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Iodine	53	I
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Lithium	3	Li
	6.941	6.941
Nitrogen	7	N
	14.007	14.007
Uranium	92	U
	238.03	238.03
Americium	95	Am
	[243]	[243]
Tellurium	52	Te
	127.60	127.60
FIRSTium	1	Gracious
	Professionalism	
Fluorine	9	F
	18.998	18.998



Examples from Team Unlimited Notebooks: RobotC Code Listings



Fluorine	9	F	Technetium	43	Tc	FIRSTium Gracious	1	Te	Americium	95	Am	[243]
Tellurium	52	Te	Lithium	3	Li	Nitrogen	7	N	Uranium	92	U	238.03
Iodine	53	I	M	6th	M	Lithium	6	Li	Sharon Eagle	6.941		Robotics Assoc.
Dedication	1st	D	Te	52	Te	Massachusetts	127.50		Sharon Eagle	126.9		Robotics Assoc.
syraweb.org												



Examples from Team Unlimited Notebooks: Team Unlimited presentations and website

The image shows an open notebook with two presentation slides and a screenshot of a website.

Left Page (Slide 1):

Title: Coding for the FIRST Tech Challenge NXT/G, LabVIEW & RobotC competition and a Crash Course in Nologic

Presented by: Presented by Team Unlimited, FTC #1: <http://unlimited.syracuse.org/>

Diagram: A diagram of a FIRST Tech Challenge field with a robot in the center, labeled "FACE OFF! FIRST CHALLENGE FIELD".

Left Page (Slide 2):

Title: Designing for FTC with the Tetrix System

Presented by: John Pilivines, coach/mentor of Team Unlimited

Text: We acknowledge the efforts and copyrights of FIRST®. The contents of this workshop - without regard to the FIRST Tech Challenge would not exist.

Right Page (Slide 3):

Title: The FTC Tournament Experience

Presented by: John Pilivines, coach/mentor of Team Unlimited and members of Team Unlimited

Diagram: A diagram of a FIRST Tech Challenge field with a robot in the center, labeled "TETRIX".

Website Screenshot:

Title: Home - Team Unlimited - FTC 1 - Microsoft Internet Explorer

Header: Sharon Youth Robotics Association - New Home of Team Unlimited - FTC 1

Links: Unlimited FTC - Unlimited Archive - SYRA FLL - Other Links Communicate with Team Unlimited via email

Content: A list of news items and photos related to Team Unlimited's activities, including:

- FACE OFF! FTC Challenge
- FTC CAD and Collaboration announced
- NEXTC Workshops at MIT
- MA FTC Workshop at Boston University
- Presentations & Field Worksheets
- FTC Software Resources
- FLL FLL activities for Team Unlimited
- FTC Robot Rally at Kingswood-Oxford
- Netherlands FTC committee staff
- Saxony Rover at WEF
- WWEFTC can buy... the coolest techinc library ever!
- Beach head remote instruments
- Sharon Energy Week Fair
- Sharon Harvest Festival
- Rhode Island FTC Kickoff at NEET
- Our Tetrix kit has arrived!
- Foundations - [source: Sharon.pptx](#)
- Caroline Hynes presents FTC/Tetrix resources (work in progress)
- Tetrix parts now on line at Pitco
- Van 'Iteration' Challenges released
- Flea at MIT and MIT Museum
- LEGO NXT Summer Camp @ House Hill Wildlife Sanctuary (MassAudubon)
- WPI Frontiers robotics competition
- FTC 2008-9 Bill of Materials (WIP)
- Tetrix Promotional video from Pitco
- FTC Coding Seminar at NUU
- FTC-Tetrix™ design, system photos from Regional Director Steve Cramer
- Teams Unlimited visits FIRST HQ in Manchester, NH
- Teams Unlimited Blog
- Registration for the all new FIRST Tech Challenge is now open!
- The new FTC design system - "Tetrix" - unveiled in Atlanta
- 2008 FTC World Championships in Atlanta

Footer: PROPRIETARY INFORMATION

Dedication	1st	D
Tellurium	52	Te
Fluorine	9	F
Technetium	43	Tc
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Amberous	95	Am
Uranium	92	U
Nitrogen	7	N
Lithium	3	Li
Iodine	53	I
Massachusetts	6th	M
Sharon Eagle		
Robotics Assoc.	127.60	



Examples from Team Unlimited Notebooks: Logistics - an army marches on its stomach



Dedication	1st	D
Tellurium	52	Te
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Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	
Fluorine	9	F
Technetium	43	Tc

Awards and the Engineering Notebook

Aside from bringing your team into focus for the judges in all categories, three awards feature the notebook explicitly

- Inspire Award
- Rockwell Collins Innovate Award
- Think Award (all about the notebook)



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Americium	95	Am
Tellurium	52	Te
FIRSTium	1	
Technetium	43	Tc
Fluorine	9	F

Inspire Award

Guidelines

- Team must demonstrate respect and Gracious Professionalism both for team members and fellow teams
- Engineering Notebook must be submitted, and must impress the judges
- Team must work beyond their robot to help spread awareness of the team within the community
- Team displays good communication and teamwork skills within the team as well as with their alliances
- Team communicates clearly about their robot design to the judges
- Team presents themselves well in the judges interview
- Robot effectively competes in the game challenge and impresses the judges
- Team and Robot consistently performs well during matches
- Team is a strong contender for all other judged awards



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Americium	95	Am
Tellurium	52	Te
FIRSTium	1	
Technetium	43	Tc
Fluorine	9	F

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unlimited, FTC1

Rockwell Collins Innovate Award

Guidelines

- Robot or robot sub-assembly must be elegant and unique in its design
- Creative component must work reliably
- Team must submit an Engineering Notebook
- Robot is stable, robust and controllable
- Robot design is efficient and consistent with team plan and strategy

The team's Engineering Notebook should be marked with journal entries to show the design of the component(s) and the team's robot in order to be eligible for this award, and entries should describe succinctly how the team arrived at that solution.



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Lithium	3	Li
Nitrogen	7	N
Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	
Fluorine	9	F

unlimited, syraweb.org

Massachusetts 6th Sharon Eagle Robotics Assoc.

127.50 126.9 6.941 14.007 238.03 [243]

Think Award

Guidelines

- Team must submit an Engineering Notebook
- Engineering Notebook must demonstrate that the team has a clear understanding of the engineering design process, with pictures or drawings and details documenting all stages of robot design
- Engineering Notebook must be organized and follow the formatting guidelines provided by *FIRST*
- Collaboration and co-ownership are dominant themes in the Engineering Notebook or in the judges interview



2011/12 FTC Engineering Notebook Workshop

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Uranium	92	U
Americium	95	Am
Tellurium	52	Te
FIRSTium	1	
Technetium	43	Tc
Fluorine	9	F

Tools for to help produce your notebook

- Notebook itself
- White board and/or flipcharts
 - For whole team to visualize
 - Dry-erase flipcharts are great when you don't have a white board, paper filpcharts are more permanent
 - We use both
- Voice recorder
 - Good to refer to for missed moments
- Camera
 - Images of robot, team, meetings and building sessions, events and activities
- CAD for design and/or documentation
 - pre- or post-build



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FIRSTium	1	1
Technetium	43	Tc
Fluorine	9	F

Sources for Engineering Notebook

- Rockwell Collins spiral bound is supplied
- Bound notebooks from local office supply stores
- On-line specialty suppliers
- Team Unlimited uses oversized notebooks from the BookFactory
 - Expandable binding makes for easier photo and diagram insertion (we insert many, with thin double-sided adhesive photo mounts)
 - Tall and wide format ($8\frac{7}{8} \times 13\frac{1}{2}$) allows for full pages to insert without trimming
 - Custom print on covers



Fluorine 9 F 18.998	Technetium 43 Tc [98]	FIRSTium Gracious 1 Professionalism	Tellurium 52 Te 127.60	Americium 95 Am [243]	Uranium 92 U 238.03	Nitrogen 7 N 14.007	Lithium 3 Li 6.941	Massachusium 6th M Sharon Eagle Robotics Assoc.	Iodine 53 I 126.9	Tellurium 52 Te 127.60	Dedication 1st D unlimited. syraweb.org
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Questions?

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