BEST Award

DAVID WHITMIRE
ASST. HEAD JUDGE, UIL STATE CHAMPIONSHIP – BEST ROBOTICS DIVISION
BEST Award

► Awarded to the team that best embodies the concept of Boosting Engineering, Science and Technology
► Considered the highest achievement a team may get
► Probably the most important thing that sets BEST Robotics apart from other robotics and engineering programs

► Includes:
  ► Summary Project Engineering Notebook (30 points)
  ► Marketing Presentation (25 points)
  ► Team Exhibit and Interviews (20 points)
  ► Spirit & Sportsmanship (10 points)
  ► Robot Performance (15 points)
Summary Project Engineering Notebook

DOCUMENT THE PROCESS THE TEAM USED TO DESIGN, BUILD, AND TEST THEIR ROBOT

Copyright © 2017 BEST Robotics, Inc. All rights reserved
What Is A Project Engineering Notebook?

- A literary masterpiece?
- A comic book?
- A photo essay?
- A journal of your activities for six weeks?
Project Engineering Notebook

► Purpose of the notebook is to document the process the team uses to design, build, and test their robot

► ALL teams must generate and submit a summary project engineering notebook

► Objectives

► Understand what an engineering notebook is
► Understand the notebook’s requirements
► Understand how to design, lay out, and write a quality notebook
Required Topics

► Implementation of the engineering design process
► Brainstorming approaches
► Design creativity
► Analytical evaluation of design alternatives
► Offensive and defensive strategies
► Software design and simulation
► Safety
► Research paper
► Support documentation (in appendices)
Outline for Your Notebook

► Writing an outline from scratch might take 4 hours or more, but try to get it done in first few days.

► The notebook outline is the basic plan for the 6 week build timeline

► Choose to work on sections that need filling in, not necessarily in sequence
  ► “Looks like first thing is to pick an EDP.”
  ► “OK, now we need to pick a strategy.”
  ► “Then brainstorm how to implement the strategy.”
  ► “Hey, our EDP requires prototyping, build that first.”
  ► “What about test results? I guess we need some tests.”

► The outline should address ALL sections (topics) from the rubric
## Brainstorming Approaches

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-25</td>
<td>Approach is explicitly identified, organization and productivity are obvious, explanation is thorough, discussion of how decisions made.</td>
</tr>
<tr>
<td>16-20</td>
<td>Approach is identified, organization and productivity are discernible, there is some explanation.</td>
</tr>
<tr>
<td>11-15</td>
<td>Approach is not identified, there is some discussion of brainstorming.</td>
</tr>
<tr>
<td>6-10</td>
<td>Discussion of approach is minimal.</td>
</tr>
<tr>
<td>1-5</td>
<td>You can tell there were ideas generated.</td>
</tr>
<tr>
<td>0</td>
<td>No discernible brainstorming.</td>
</tr>
</tbody>
</table>

**Comments:**
- Document: What did you brainstorm?
- How did you brainstorm?
- What were the results?
- List ALTERNATIVE ideas
- How did you decide which idea(s) to use? WHY?

**Content Suggestions**
- Your team's strategy and goals in the game
- Brainstorming results
- The robot requirements needed to meet your strategy and goals
- Alternate ideas
- How you will know when you have met your goals
- Schedule and assignments?
Write to the Rubric (Example)

- Brainstorming Approaches (BA) is max 25 pts out of 300 for notebook
  - How well organized and productive is BA?
  - How well is BA documented?
- Brainstorming Approach is ...
  - explicitly identified and documented
  - organization is obvious
  - productivity is obvious
  - explanation is thorough
  - discussion of how decisions made
- Length of section should be about proportional to 25 points out of total “content” points in the rubric
- Since there are 5 sub-sections, ABCDE, each is worth about 5 points
- Skipping any one of them means losing 5 points
Section Outline (Example)

- Brainstorming (25/300 points)
  - “Brainstorming Approach Description” (5/25 points, be thorough)
  - “Brainstorming Organized” (6/25 points)
  - “Brainstorming Productivity” (5/25 points)
  - “From Brainstorming to Deciding” (9/25 points, decision matrix explained and implemented, most important, more points)
Writing Tips

► Focus on what is important and put that first
► Use lists, tables and figures effectively
► Follow your outline
► Avoid passive voice
  ► “The robot was built by the students.” (passive)
  ► “The students built the robot.” (active)
► Use a stylebook
► Use a personal, conversational tone
  ► Make sure it sounds natural when read aloud
  ► Ask another person to read and provide inputs
Page Layout

► Keep it simple!
► *Don’t use* too many fonts or colors!
  ► Max 4 colors per page (unless in a photo)
  ► Max 3 fonts – use bold and italic sparingly
► Don’t use quotes and underlining
► Use white space, avoid clutter
► Emphasize sparingly
► BE CONSISTENT!
  ► If multiple people are creating different sections, make sure they all come together as one single book
Graphic Tips

► Keep them clean and simple
  ► Don’t use too many colors and heavy lines
  ► Clean up hand drawn figures and hand written notes

► Focus on what is important
  ► Get photos of team members using tools, brainstorming, CADs to support your design

► Label every graphic and reference it somewhere in the text

► Link to information in appendices when it supports your point
Quality

► Overall notebook quality
  ► Some rubrics are format checks vs content
► A good editor saves a lot of embarrassment
► Organization
► Presentation
► Compliance with specifications
► Get outside reviewers – have students who are good at grammar, spelling, and writing to look over your book
► Don't forget to review the graphics
Check Quality Rubric Weekly

► What topics are not yet covered?
► Is section length vs point value working out?
► Does each section have a photo with caption, and a reference to details in the Appendix?
► Hey, what does a “Summary” look like? Better write something and title it “Summary”
► It’s better to have even just ONE sentence for each rubric item, than a full page for just the first three sections.
► Write outline in other color/font; makes it easy to remove at end.
IS / IS NOT List

► A HIGH-SCORING Engineering Notebook for BEST:
  ► is NOT a diary
  ► is NOT a wall of text
  ► is NOT just a picture album
  ► is NOT fluffed out to max length with extra words
  ► DOES use bullet lists
  ► DOES use tables, particularly ‘decision matrix tables’
  ► DOES use pictures, with titles and links to text
  ► DOES use the same order and keywords as Rubric
► Make it easy for each judge to give each & every point!
Backups and Version Control

► Simplest version control:
  ► Yesterday, save as “BEST_Notebook_Aug17” (or something similar)
  ► Today, open “BEST_Notebook_Aug17”, AND save it immediately as
    “BEST_Notebook_Aug18” so that save-early, save-often will have today’s date

► Where will you keep backups of the notebook?
  ► Can (should?) more than one person be able to work on the notebook at the
    same time? How?
  ► Can you get to school-drive from home?
  ► What if you lose the only thumb drive?
  ► Can you get to Google-drive without wifi?
  ► Coordinate revisions—free-for-all makes chaos

► Cortex Code has same issues of backup and version control!
Marketing Presentation

TO PRESENT INFORMATION AND RESPOND TO QUESTIONS CONCERNING THE COMPANY'S EFFECTIVENESS IN CREATING A PRODUCT READY FOR MARKET.
Team should view themselves as employees of a “company” (their team) marketing their “product” (their robot) to potential buyers/investors (judges).

Provide information about company, the engineering team involved in the design and construction of the product, and why product is the best one on the market that can complete the assigned task.
Marketing Presentation – Specifications

► Minimum 4, maximum 8 students participate in presentation
► Student presenters from more than one grade level encouraged
► Presentation format is the prerogative of the team
► 25 minutes time allotted for presentation
  ► 5 minutes: Setup
  ► 12 minutes: Presentation
  ► 5 minutes: Q&A with judges
  ► 3 minutes: breakdown and clear room
Marketing Presentation – Topics

► Company demographics (grades, gender, ethnicity, etc.)
► Budget & operations
► Design & manufacturing process (engineering process)
► Marketing strategies
► Use of available technology
Marketing Presentation – Tips

► Dress in a professional manner
► Practice, practice, practice!!!
  ► Make it sound as if you are talking to them, not reciting a script
  ► Keep working to get the flow and the timing correct
  ► Recruit the speech or drama teachers to coach the team
► Make sure all team members have a speaking part
► Avoid technical difficulties
  ► Bring your own laptop, projector, and power cord to the presentation, just in case
  ► Practice setting this up and taking it down so you are prepared and not ruffled
► The judges will not deduct points from your presentation if there are technical difficulties outside your control
  ► They will judge how you handle yourselves during this situation
Team Exhibit and Interviews

Creatively communicate an understanding of the game theme and demonstrate how the team has promoted community awareness about BEST in the school and their community.
Team Exhibit – Specifications

▶ A maximum 8’ X 8’ X 8’ exhibit space
▶ Skirting for the table not provided
▶ Other exhibit items may be used, but must not exceed the space (and sometimes power requirements) allocated by the hub
▶ Avoid using expensive store-bought display boards and structures and opt for more creative and hand-made exhibit props
▶ Any audio-visual equipment needs and extension cords and/or power strips are be the responsibility of the team
▶ Responsible for security
▶ Candy and other food and drink items are NOT permitted at exhibits as complimentary handouts
Team Exhibit – Interviews

► During the designated interview time, at least one student representative from the team must be present who is able to respond to informal questions asked about the exhibit
  ► Two or more is better

► Student representatives should be aware that judges may ask questions concerning robot design and construction

► Judges will also talk with students in the pits
Team Exhibit – Topics

► Level & quality of info presented on promotion of BEST concept
► Sharing information and/or technology resources and mentoring other schools, including other BEST teams
► Presentations & robot demonstrations to other schools & community groups
► Publicity
► Fundraising & sponsorships
► Creativity in incorporating game theme into design and presentation of this exhibit
Team Exhibits
Spirit and Sportsmanship

TO DISPLAY TEAM SPIRIT & GOOD SPORTSMANSHIP AT THE COMPETITION
Spirit & Sportsmanship – Specifications

► Evaluated on Game Day
  ► Any time you are at the competition venue

► Areas evaluated include
  ► Spirit promoted by the team during competition rounds
  ► Team conduct throughout the day in
    ► Seating area
    ► Team exhibit area
    ► Game floor
    ► Pit area
Spirit & Sportsmanship – Topics

► Spirit includes the vigor and enthusiasm displayed by team representatives

► Use posters, props, t-shirts, cheerleaders, musicians, mascots, costumes, and low frequency noise-makers

► Community involvement: number of team supporters present at competition (other than students)

► Sportsmanship includes outward displays of sportsmanship (e.g., helping other teams in need), grace in winning and losing, and conduct and attitude considered befitting participation in sports

► Overall team sportsmanship is also demonstrated by students (not mentors) making robot adjustments and repairs during the competition
Game Day
Robot Performance
HOW WELL (OR NOT) THE ROBOT PERFORMED FOR THIS GAME COMPETITION
Robot Performance – Specifications

► Based on the total game points earned throughout the seeding phase of the head-to-head competition (prior to the semi-final phase)

► Robot performance determines 15% of BEST Award score
Robot Performance – How It’s Scored

- Based on the total game points earned throughout the seeding phase of the head-to-head competition (prior to the semi-final phase)

- Teams ranked from highest (most points scored) to lowest (least points scored)
  - Team finishes in top 20% ➔ 15 Points
  - Team finishes in top 40% ➔ 12 Points
  - Team finishes in top 60% ➔ 9 Points
  - Team finishes in top 80% ➔ 6 Points
  - Team finishes in top 100% ➔ 3 Points
  - Team scores no points ➔ 0 Points
“Brainstorming Approach Description” (7/25 points, be thorough)

Our Team “Pinky Sparkly Fairy Unicorns” (PSFU) uses two methods for generating ideas; 1) Think-at-Home and then we 2) come-together for Brainstorming.

We use the Think-at-Home method first where each team member makes a list of their own ideas at home. (add more description, talk about subsetting the problems first?)

Then we bring all the ideas to a brainstorming session where they can be sorted for uniqueness and discussed, and put into a decision matrix.

We gather around a flipchart and present our ideas and write them down; (add other stuff about taking turns, pass, add on, etc).
Outline the Content Rubric

► Test your word processor for Table of Contents, references, cites, footnotes

► Start each major content section on a new page, with point count
  ► If a small sub-section does not need a new page, still list the point count
  ► Start a new line for nearly every rubric bullet point, and use the same keywords. Example sub-sub section titles (with notes)
“Brainstorming Organized” – We need the keyword ‘organize’ and subsection division, so maybe write one discussion and then see which sentences go in description, and which go in Organization. (6/25 points)

As a team, we agreed on these Brainstorming categories: strategy, base movement, Arms + Gripper, and ‘other’. (any list of more than 2-3 can use a bullet list)

After doing ‘Think-at-Home’ to come up with our own ideas,… (make reference to Timeline in Appendix! )
“Brainstorming Productivity” (5 /25 points)

Each Brainstorming team member was able to come up with 3-5 ideas for each of our categories using ‘Think-at-Home’, for a total of 38 ideas. When we starting listing them in the Flip Board Brainstorming session, we ended with 20 unique ideas after merging them together. (good place for graphic or actual list of 38 ideas, with strikethrough on the similarities. Or put in appendix and reference from here)

“From Brainstorming to Deciding” (7/25 points, decision matrix explained and implemented)

Team PSFU uses both Qualitative and Quantitative Pugh Matrix methods (also known as ‘Decision Matrix’) to help us decide which of our 20 ideas should go on to Prototyping.
Notebook Specifications

► Maximum 30 *single-sided* typed pages, double spaced

► Many hubs and regionals have moved to electronic notebooks
  ► Same formatting and page count rules apply (imagine printing the online version)

► Cover sheet (binder cover), table of contents, and tab separators are NOT included in the page count
Supplemental Info Specs

► Add supplemental information in appendices
► This material should directly support the process described
► No more than 20 double-sided sheets of information
► Include drawings, photos, organization charts, minutes of team meetings, test results, etc.
► Should NOT reflect activities related to community or promotional efforts, spirit development, or team-building
Set your OWN Goals

► Set your own goals that are under your control
  ► We will win each match.
  ► “We will execute our strategy that gets 28 points per match.”
► Make a list of possible options or occurrences, and have team decide and agree on team response in advance.
  ► Plan: "Do Cooperation in qualifying, but not in finals."
  ► Plan: “Game theme is that cooperation is important, so we always try to cooperate”
  ► Plan: If another team needs timeout before a final round, and needs more time, we will offer our timeout, too.
    ► That looks really good on ‘good sportsmanship’ category for BEST Award.
  ► Plan: “Blocking other teams makes us look bad, so we will not block even if they are better if their robot is performing better.”