Rocky Mountain BEST
2015 Kickoff
September 12, 2015
South High School, Denver, CO
# Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td>Opening Remarks</td>
</tr>
<tr>
<td>1:20</td>
<td>Awards &amp; Judging Overview</td>
</tr>
<tr>
<td>1:25</td>
<td>Reveal the 2015 Game &amp; Protobot Demo</td>
</tr>
<tr>
<td>1:45</td>
<td>Rest of Today’s Schedule</td>
</tr>
<tr>
<td>1:50</td>
<td>Photos / Videos of Game Floor</td>
</tr>
<tr>
<td>2:00</td>
<td>Breakout training sessions – follow the signs</td>
</tr>
<tr>
<td>3:15</td>
<td>Q&amp;A – return to gym</td>
</tr>
<tr>
<td>3:30</td>
<td>Closing with Kit Pickup: follow the signs, east parking lot</td>
</tr>
</tbody>
</table>
Opening Remarks

Jose Lopez, MC

- Announcements
- Recognize RM BEST Major Sponsors
- Thanks to RM BEST Board, Steering Team & Volunteers

And many generous individual Contributors
<table>
<thead>
<tr>
<th>School</th>
<th>Location</th>
<th>School</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academy for Advanced and Creative Learning</td>
<td>Colorado Springs</td>
<td>Manning MS</td>
<td>Golden</td>
</tr>
<tr>
<td>Broomfield HS</td>
<td>Broomfield</td>
<td>Manual HS</td>
<td>Denver *</td>
</tr>
<tr>
<td>*Cripple Creek - Victor HS</td>
<td>Cripple Creek *</td>
<td>Mrachek MS</td>
<td>Aurora *</td>
</tr>
<tr>
<td>D'Evelyn Jr/Sr HS</td>
<td>Denver</td>
<td>North MS</td>
<td>Aurora</td>
</tr>
<tr>
<td>DSST Byers MS</td>
<td>Denver *</td>
<td>Ralston Valley HS</td>
<td>Arvada *</td>
</tr>
<tr>
<td>DSST Cole HS</td>
<td>Denver *</td>
<td>Skinner MS</td>
<td>Denver *</td>
</tr>
<tr>
<td>DSST Green Valley Ranch HS</td>
<td>Denver *</td>
<td>Skyline HS</td>
<td>Longmont</td>
</tr>
<tr>
<td>DSST Stapleton HS</td>
<td>Denver</td>
<td>Skyview MS</td>
<td>Colorado Springs</td>
</tr>
<tr>
<td>Fountain Valley HS</td>
<td>Colorado Springs</td>
<td>St. Mary's Academy</td>
<td>Englewood</td>
</tr>
<tr>
<td>Fountain Valley HS</td>
<td>Colorado Springs</td>
<td>Standley Lake HS</td>
<td>Westminster</td>
</tr>
<tr>
<td>Golden HS</td>
<td>Golden</td>
<td>Thomas Jefferson HS</td>
<td>Denver</td>
</tr>
<tr>
<td>High Tech Early College</td>
<td>Denver *</td>
<td>Wheat Ridge HS</td>
<td>Wheat Ridge</td>
</tr>
<tr>
<td>Innovation Center of the St. Vrain Valley</td>
<td>Longmont *</td>
<td>Woodland Park HS</td>
<td>Woodland Park *</td>
</tr>
<tr>
<td>Lake County HS</td>
<td>Leadville *</td>
<td>Woodland Park MS</td>
<td>Woodland Park</td>
</tr>
<tr>
<td><strong>Alternate:</strong></td>
<td></td>
<td><strong>Walt Clark MS</strong></td>
<td><strong>Loveland</strong></td>
</tr>
</tbody>
</table>

**14 Rookie Schools** *
What is BEST?

- Student Teams have six weeks to develop a strategy & design, develop, and test a robot
- Each team receives identical parts kit, but the resulting robots are each ingeniously unique
- Student teams are guided by professional mentor and school coaches
- Winning teams from each Hub compete at a Regional competition
BEST Growth

1993:
- Created by two Texas Instrument engineers
- 221 students from 14 schools competed in 1 hub competition in Texas

2014:
- More than 15,000 students from 852 schools competed in 46 hubs in 19 states
BEST Core Values

Students are the sole participants and primary decision-makers, designers, and builders

- Coaches guide the teams through the Engineering Design Process

Any student may participate

- BEST is an equal opportunity program

School participation is cost-effective

- No registration fee & robot building kit and materials are provided at no cost
- Schools only fund their T-shirts and travel

The BEST process makes learning FUN!
<table>
<thead>
<tr>
<th>Event</th>
<th>Date, Time, Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rocky Mountain BEST Kickoff</strong></td>
<td>Saturday September, 12 noon-3pm Denver South High School</td>
</tr>
<tr>
<td>BEST Award and Marketing Presentation Time Slot Sign-up</td>
<td>Friday September 25 via email to <a href="mailto:lscott@rmbest.org">lscott@rmbest.org</a> or 720-250-6896</td>
</tr>
<tr>
<td><strong>Rocky Mountain BEST Practice Day</strong></td>
<td><strong>Saturday October 17, 9am-3pm</strong> Thomas Jefferson High School</td>
</tr>
<tr>
<td>Project Engineering Notebook Submittal Team Demographics Form Submittal</td>
<td>Saturday October 17, by 2pm Thomas Jefferson High School</td>
</tr>
<tr>
<td>(2015 Awards &amp; Judging RM BEST Logistics has Electronic File &amp; Paper Submittal Instructions)</td>
<td></td>
</tr>
<tr>
<td>BEST Award Marketing Presentations</td>
<td>Friday October 23, 8am-5pm MSU Denver</td>
</tr>
<tr>
<td><strong>Rocky Mountain BEST Game Day</strong></td>
<td><strong>Saturday October 24, 7:30am-5pm</strong> Auraria Event Center (aka Gym)</td>
</tr>
</tbody>
</table>
Rocky Mountain BEST Kickoff

Awards & Judging

Linda Scott
Awards Overview

**Game & BEST Awards**
- First, Second & Third Place Trophies – for both awards
- Fourth Place Game Award – BEST Robotics **Game** Finalist
- Individual medallions to team members – for both awards

We qualify multiple teams to advance to Regionals

1. **BEST** Award winner, 1st place
2. **Game** winner, 1st place
3. **BEST** Award winner, 2nd place
4. **Game** winner, 2nd place
5. **BEST** Award winner, 3rd place
6. **Game** winner, 3rd place
7. **BEST** Award 4th Place
8. **BEST** Award 5th Place
9. **BEST** Award 6th Place
10. Etc.

Competing in “BEST Award” increases your chance to advance!
Special Awards

- Founder’s Award for Creative Design
- Most Robust Machine Award
- Software Design and Simulation Award
- Craftsmanship Award
- Best Rookie Team
- Project Engineering Notebook Award
- Sportsmanship Award (Selected by Students)
- BEST “Simulink” Design (Awarded at Regional Championships)
New Software Design & Simulation Award

- Awarded to team able to describe software design process, techniques and experiences in their Project Engineering Notebook – separate score
- Recognizes teams who understand that “programming” is an essential part of their overall robot design.
- Winning team entered into nationwide drawing for one of (3) three $1000 cash awards, announced at conclusion of all local hub competitions.

- MathWorks – National Corporate Sponsor video – [Link](#)
The **BEST** Award

- **Our Most Prestigious Award**
- Presented to the team that best embodies the concept of **Boosting Engineering, Science and Technology**

<table>
<thead>
<tr>
<th>Category</th>
<th>Weight</th>
<th>Category</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Engineering Notebook</td>
<td>30%</td>
<td>Spirit &amp; Sportsmanship</td>
<td>10%</td>
</tr>
<tr>
<td>Marketing Presentation</td>
<td>25%</td>
<td>Robot Game Day Performance</td>
<td>15%</td>
</tr>
<tr>
<td>Exhibits &amp; Interviews</td>
<td>20%</td>
<td><strong>SCORING TOTAL</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

- Your team’s participation in the BEST Award Competition is **optional**
<table>
<thead>
<tr>
<th>Activity</th>
<th>Where / How</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deadline to Sign up for BEST Award &amp; Schedule</td>
<td>Email Linda Scott at <a href="mailto:lscott@rmbest.org">lscott@rmbest.org</a> or call 720-250-6896</td>
<td>NLT Friday 25 September</td>
</tr>
<tr>
<td>Marketing Presentation</td>
<td>Metropolitan State University of Denver</td>
<td>Friday 23 October</td>
</tr>
<tr>
<td>Team Exhibit &amp; Interviews</td>
<td>Auraria Event Center (aka the Gym)</td>
<td>Saturday 24 October</td>
</tr>
<tr>
<td>Spirit &amp; Sportsmanship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robot Performance</td>
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</tbody>
</table>
Project Engineering Notebook

Required by all teams – NO EXCEPTIONS

Physical Hardcopy or pdf file on USB memory stick due on Practice Day 17 October by 2:00 pm

Notebook score use:

- BEST Award
- Best Rookie Team Award
- Founders Award
- Software Design and Simulation Award
- Project Engineering Notebook Award
- On Game Day, determines Wildcard Match competitors
The Big Reveal

Steve Bickel

Game Animation (7 minutes) – link is here
Use password D1g4it
Goal: Your robot, with the help of your driver & spotter, is mining various ores and repairing the mine.

- Reveal the Game Field
- Summarize Game and demonstrate
- Protobot on Game Field
  - Michelle Plarina, Driver & Que Roberts, Spotter
  - Carolyn Hickey & John Pituch – Referees

**HINT:** Values of items might change!
Pay Dirt Game Floor
Game Demo & Introduction

Task Set 1 – Repair the Mine to make it safer.

- Fix the air filtration system – move the Replacement Air Filter from the Spare Parts Rack on Ground level and place it in the Air Filtration System in Sublevel 1

- Fix the broken pipes in Sublevel 2 – move the Replacement Pipe from the Spare Parts Rack on Ground level and place it over the Broken Pipes in Sublevel 2
Game Demo & Introduction

Task Set 2 – Extract Materials from the Mine

- **Limestone Aggregate** is moved from Tunnel 1 to Robot Starting Box

- **Coal** is moved from the Coal Chute Tray in Sublevel 1 to Coal Bin on Ground level. (Rotating the support beam for the Coal Chute Tray is the tiebreaker)
Task Set 2 – Extract Materials (Cont.)

- Magnetite (Iron Ore) from Iron Deposit in Sublevel 1 to Iron Bin on Ground level
- Bauxite (Aluminum Ore) from the Aluminum Vein in Sublevel 2 to Aluminum Bin on Ground level
- Chalcopyrite (Copper Ore) from the Copper Cart in Sublevel 2 to Copper Bin on Ground level
Task Set 2 – Extract Materials (Cont.)

- Spodumene (Lithium) from Lithium Tower in Sublevel 3 to Lithium Bin on Ground level
- Core Samples from Core Sampler in Sublevel 3 to the Spare Parts Rack on Ground level
Game Demo & Introduction

New twist...

- **Commodities** (Coal, Magnetite, Bauxite, Chalcopryrite and Spodumene) **may have their values changed** between Seeding, Semi-final and Final phases due to Market Shift.

- **If all the teams are gathering mostly the same ore in a given phase**, the value of that ore will drop in the subsequent phase.

- **Team Strategies should take this into account!**
Game Field & Pieces

- Sublevels 1-3 are UNDERGROUND and only the tunnel doorways are “open”.
- Obviously you can’t move game field pieces or robots through the walls.
Game Field & Pieces

Ground Level

Robot Starting Box

Coal Bin
Magnetite Bin
Chalcopryrite Bin
Bauxite Bin
Spodumene Bin
Aggregate
Tunnel 1

Replacement Air Filter
Replacement Pipe
Game Field & Pieces

Tunnel 1

Coal Chute

Sublevel 1

Air Filtration System

Iron Deposit

Tunnel 2
Game Field & Pieces

- Copper Cart
- Tunnel 2
- Sublevel 2
- Broken Pipe Platform/Aluminum Vein
- Tunnel 3
Game Field & Pieces

- Core Sampler
- Tunnel 3
- Lithium Tower
- Return Box
<table>
<thead>
<tr>
<th>Task</th>
<th>Points each</th>
<th>Task</th>
<th>Points each</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Repairing Air Filtration System:</strong> Transport filter from Spare Parts Rack on Ground level to Sublevel 1 &amp; insert filter</td>
<td>ALL Rounds: 100</td>
<td><strong>Repairing Broken Pipes:</strong> Transport pipe from Spare Parts Rack on Ground level to Sublevel 2 &amp; attach the pipe</td>
<td>ALL Rounds: 100</td>
</tr>
<tr>
<td><strong>Limestone Aggregate:</strong> Transport ore from Tunnel 1 to Robot Starting Box</td>
<td>ALL Rounds: 2</td>
<td><strong>Core Samples:</strong> Get core sample from rack in Sublevel 3 and transport to Spare Parts Rack on Ground level</td>
<td>ALL Rounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Small: 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Medium: 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Large: 150</td>
</tr>
<tr>
<td>Task</td>
<td>Points each</td>
<td>Task</td>
<td>Points each</td>
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<td>-----------------</td>
</tr>
<tr>
<td>Coal</td>
<td></td>
<td>Magnetite</td>
<td></td>
</tr>
</tbody>
</table>
| Get from coal tray in Sublevel 1 and transport to Ground level Coal bin | • Seeding: 5  
• Semi Finals: ?  
• Finals: ? | Get from iron deposit in Sublevel 1 and transport to Ground Level Iron bin | • Seeding 7  
• Semi Finals: ?  
• Finals: ? |
| Chalcopyrite: |                 | Bauxite:                       |                 |
| Get from copper cart in Sublevel 2 and transport to Ground level Copper bin | • Seeding: 15  
• Semi Finals: ?  
• Finals: ? | Get from aluminum vein in Sublevel 2 and transport to Ground level Aluminum bin | • Seeding: 10  
• Semi-Finals: ?  
• Finals: ? |
| Spodumene:  |                 |                                |                 |
| Get from lithium tower in Sublevel 3 and transport to Ground level Lithium bin | • Seeding: 25  
• Semi Finals: ?  
• Finals: ? |                                |                 |
The Rest of Today’s Schedule

Jose Lopez

- Game Field Photo / Video Opportunity
- 7 Breakout Training Sessions
- Question & Answer Session
- Kit Pickup and Return
Please **do not** enter the game field

- Field components are fragile and can be easily damaged

**Please Be CAREFUL!**

- Game field pieces are easily damaged or disorganized
- Ask a Referee or Volunteer to demo items
## Breakout Training Sessions

<table>
<thead>
<tr>
<th>Room</th>
<th>Presentation</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>118</td>
<td>Kits and Rules</td>
<td>JoAnne Fry</td>
</tr>
<tr>
<td>119</td>
<td>Project Engineering Notebooks</td>
<td>Linda King</td>
</tr>
<tr>
<td>120</td>
<td>The BEST Award</td>
<td>Linda Scott, Connie Vandenburg &amp; Mike Caston</td>
</tr>
<tr>
<td>122</td>
<td>Teacher &amp; Mentor Tips</td>
<td>Lois Walton</td>
</tr>
<tr>
<td>123</td>
<td>Programming easyC</td>
<td>Kevin Barrett</td>
</tr>
<tr>
<td>124</td>
<td>Control Systems</td>
<td>Dave Wilkerson</td>
</tr>
<tr>
<td>Gym</td>
<td>Robot Design &amp; Construction Tips</td>
<td>Scott McEwen</td>
</tr>
</tbody>
</table>

Limit of 2 from each team in the non-Gym Training Sessions
Q&A in Gym

Return to the Gym at 3:15 PM for Q&A after your Breakout Sessions!
Rocky Mountain BEST Kickoff

Robot Design & Construction Tips

Scott McEwen
Q&A In Gym

Steve Bickel Moderator, with Jose Lopez, JoAnne Fry, Michelle Plarina, Dave Porter, Que Roberts, and Linda Scott

Questions about: Game? Kits? Events? Awards: Game, Special or BEST Award?
It’s All About the Rules

Read all the Rules

1. Game Specific Rules
   (may supersede Generic Game Rules)
2. Generic Game Rules
3. Returnable & Consumable Kit Lists
4. Generic Kit Usage Guide
5. Awards & Judging Policies & RM BEST Awards Logistics
6. On-line Question and Answer (Q&A) system

Assign someone to check [Online Q&A] frequently at [http://best.eng.auburn.edu/cgi-bin/bestqna.pl]

- Answers can change your interpretation of the field, rules, etc. Answers may supersede the rules.
Files Online & Thumb Drives

- **BEST files at:** [www.bestinc.org / Participant / File Manager/ 2015 Game Files](http://www.bestinc.org)
- **Password:** D1g4it

<table>
<thead>
<tr>
<th>Game Animation &amp; Overview</th>
<th>Kits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awards &amp; Judging</td>
<td>Rules</td>
</tr>
<tr>
<td>Field</td>
<td>Software</td>
</tr>
<tr>
<td>Game Scoring Software</td>
<td>Kickoff Materials</td>
</tr>
</tbody>
</table>

- **RM BEST files at:** [www.rockymountainbest.org / Our Competitions / 2015 Competition](http://www.rockymountainbest.org) after 19 Sept 2015
  - RM BEST Kickoff Presentations
  - 2015 RM BEST Awards and Judging Logistics
Practice Day

Thomas Jefferson High School Gym
Saturday, October 17, 9:00 AM check-in

- Turn in your Project Engineering Notebook
- Turn in your Driver List
- Complete Robot Compliance check
- Submit your Team Demographics
- Open practice during compliance checks
- Dry run your robots in multiple 3-5 minute matches
Auraria Events Center (aka the gym), Metropolitan State University of Denver
Saturday, October 24, 7:30 AM check-in

- Project Engineering Notebook will be returned
- Turn in your Driver List
- Complete Robot Compliance check
- Compete in 3-minute matches in seeding phase, wildcard phase, semi-final phase, final phase
Kit Pickup and Return

TODAY - Send ONLY 2 people & a vehicle

- Drive into Teacher’s Parking Lot – east side
- Submit yellow kit pickup card & signed RMBEST 2015 Returnable Kit Agreement
- Receive 1 Red Tote & 1 Blue Tote, Plywood, PVC

Looking ahead to Game Day

- Return Red Tote with returnable items or submit RM BEST 2015 Request for Loan of Returnable Kit form
- Return Blue Tote and any consumable items you don’t want or need
Kit Pickup

Rocky Mtn BEST Kick Off
Sept 12, 2015
Denver South
High School
1700 E Louisiana Ave
Closing

Have Fun
Good Luck
Use Your Resources
See You on Practice Day