Botball 2010
Teachers' Workshop
Game Review

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Regional Workshop & Tournament Hosts

Grandville Academic Team Boosters

Botball 2010 Tournament

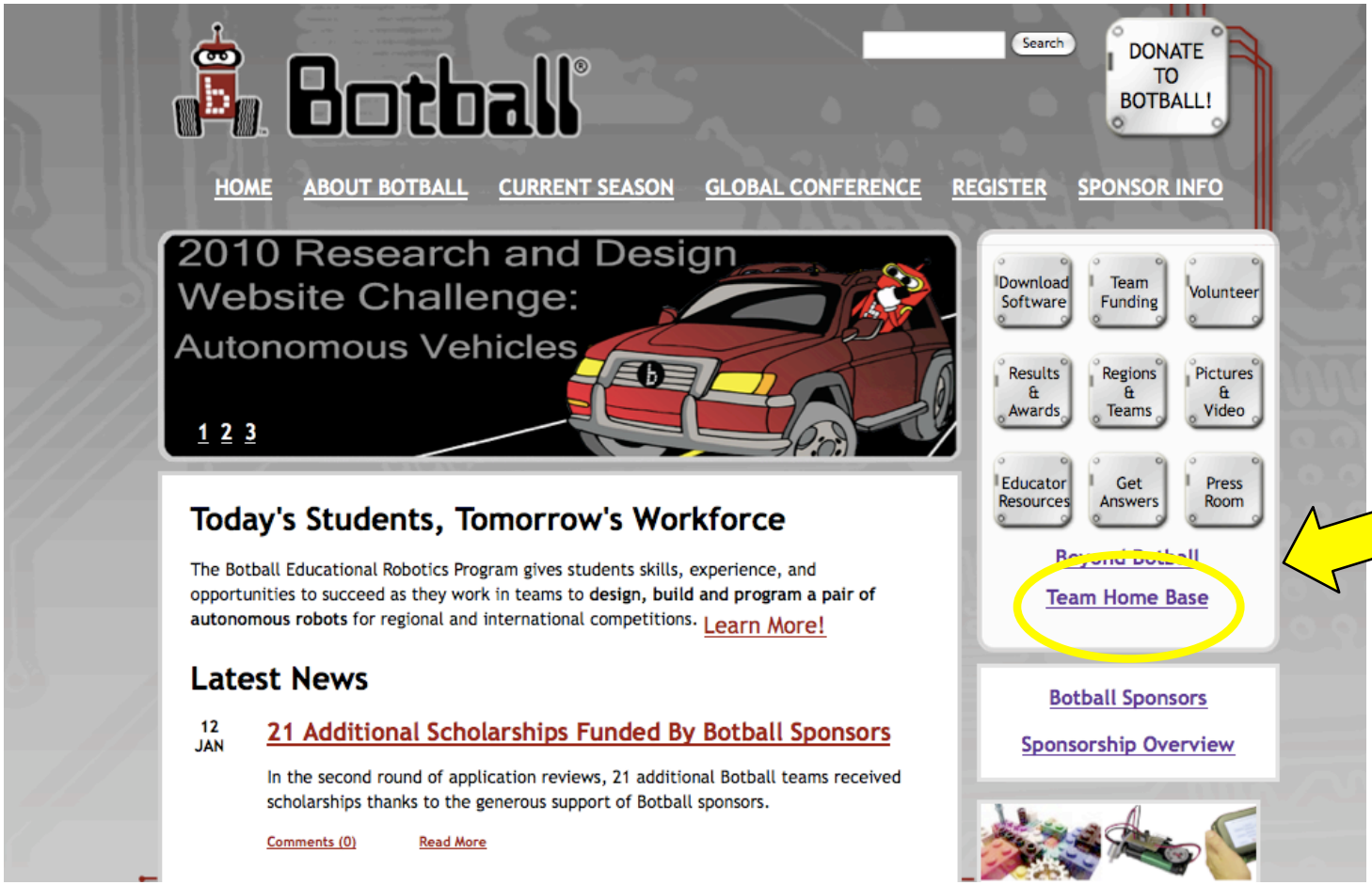
- Project Documentation
  - Overview, website and scoring information
- Robot Tournament
  - Robot Construction Rules
  - This Year's Game
    - Game Board
    - Scoring Rules
    - Game Play
  - Tournament Logistics
    - Practice Boards
    - Lighting
  - Game Rules FAQ
  - Things to do to get started
  - Tournament Day

Botball Online Project Documentation (BOPD)

- BOPD teaches the value of documentation in engineering.
- BOPD & Onsite Documentation are 1/3 of the overall tournament score.
- There are **3 Documentation Periods** representing different stages of the engineering process. **See the Team Home Base for deadlines.**
- Required documentation covers project planning; mechanical design; simulation, prototyping and testing; and software development.
- **All BOPD documentation should be submitted through the BOPD area of the Team Home Base.**

See the **BOPD area of the Team Home Base** and **the BOPD Handbook** on your workshop flash drive for details.

Finding the Team Home Base



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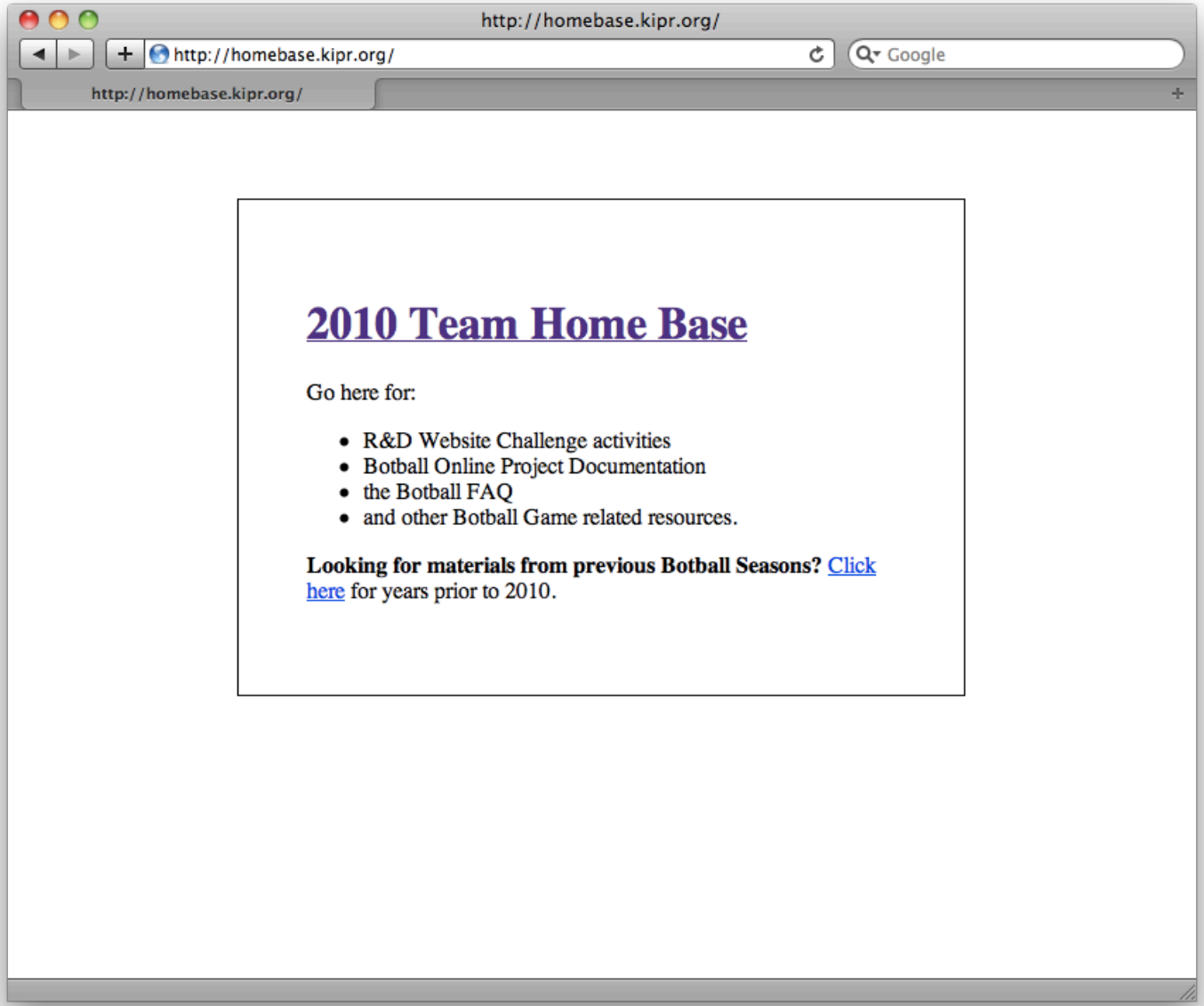
http://homebase.kipr.org/



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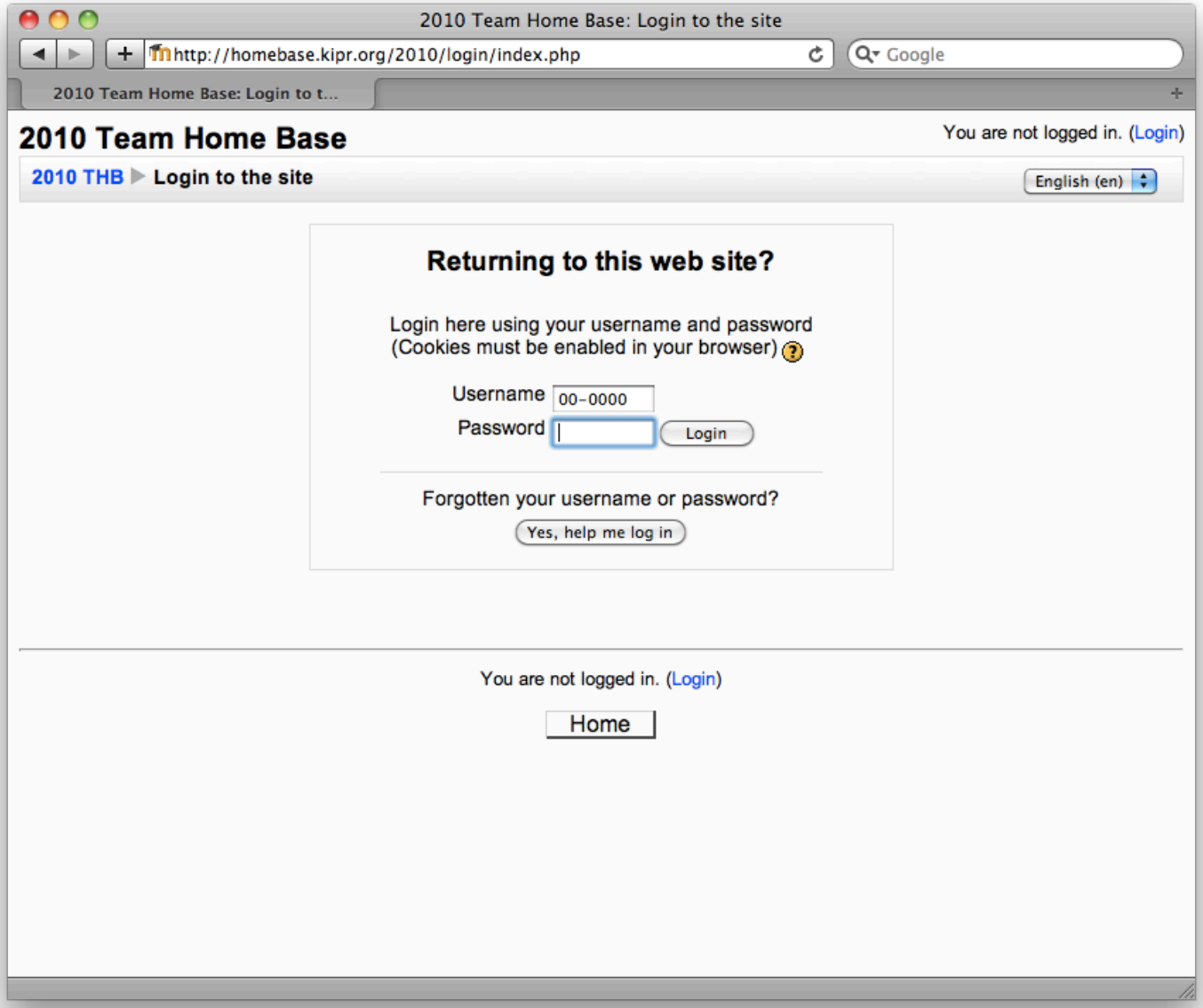
Log In



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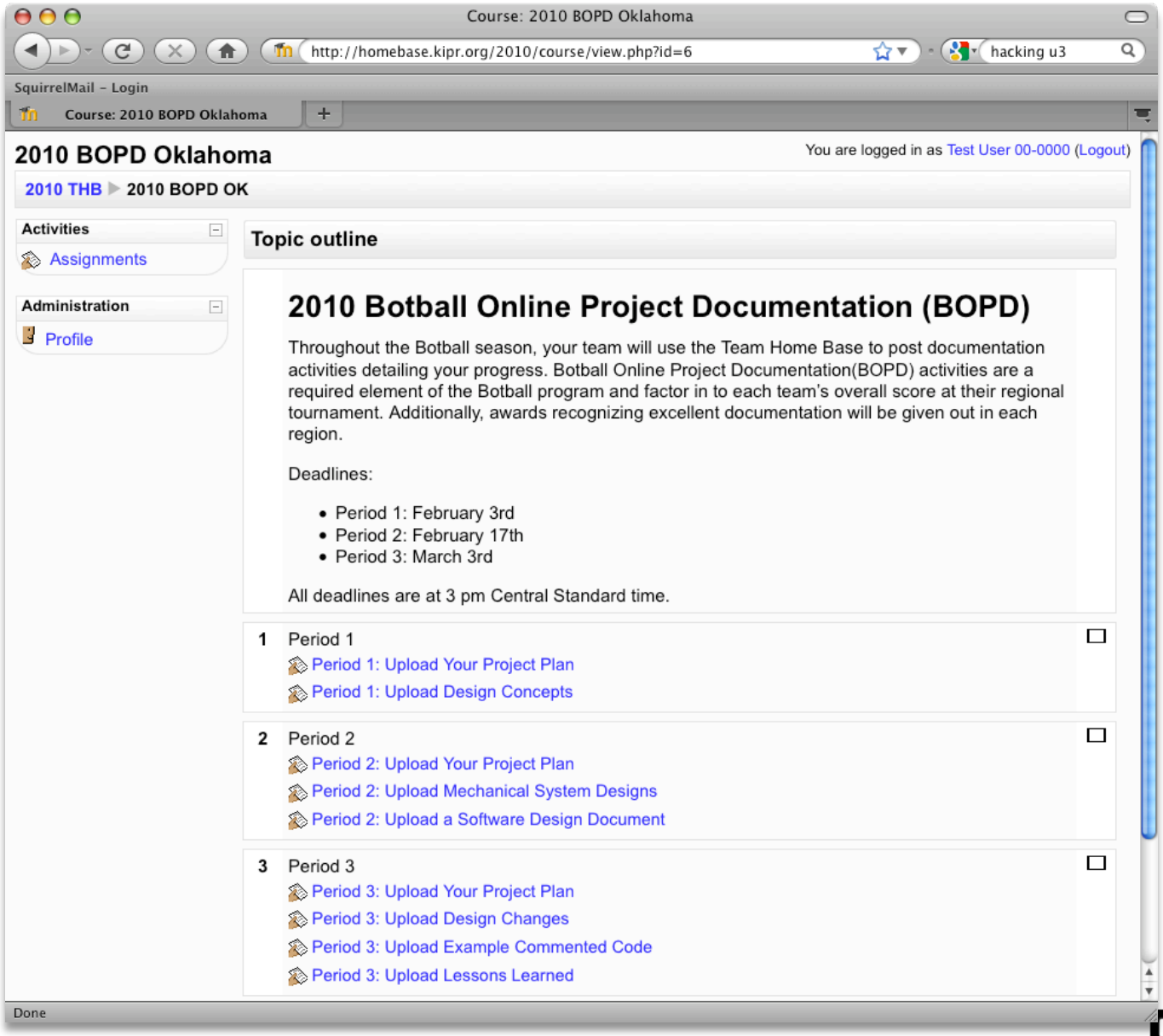
2010 BOPD Area



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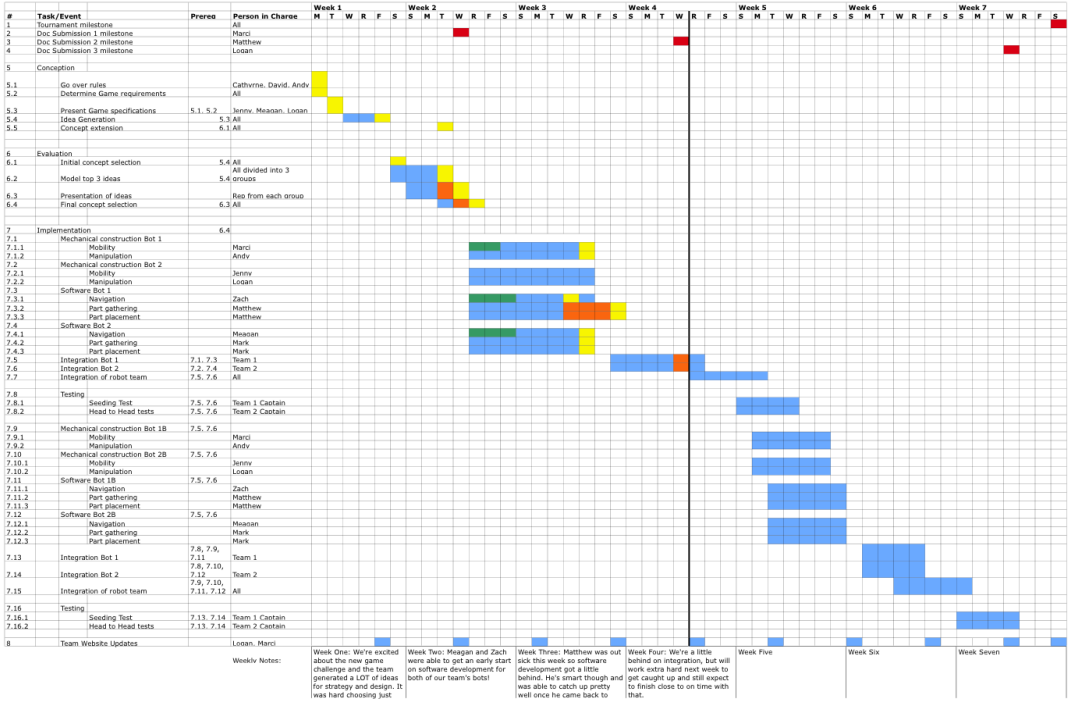
BOPD Notes

- Teams are rewarded for insightful, concise descriptions of their work. The quality of each response is considered rather than the length.
- Judging will be based on the scoring rubric for each activity.
- Make sure you follow the **file format and naming rules**. Most documents should be submitted as PDFs.
- All work on content and design must be performed exclusively by students.
- The BOPD Handbook (on your flash drive and on the Team Home Base) has detailed information on each assignment and should be passed along to students on Monday.
- If you have any problems creating or submitting your documentation, contact the KIPR office for assistance at (405) 579-4609 or email support@kipr.org.
- KIPR staff is only available between 9am and 5pm US Central Time, so don't wait until the last minute to ask for help.

BOPD Examples

(Available on the Team Home Base)



Your plan should include a section where you can update th
and comments that explain the progress (or lack thereof) th
which your team is particularly proud or roadblocks you hav

Period One Example:

Milestones/Tasks	Assignment	Day	Status
Week 2:			
Concept ideas	All	Mon/Tues	complete
Record rejected ideas	Mimio Electronic Device	Mon	complete
Finish Game Board	Mishal/Noah	Tues	in progress
Recheck all measurements	Mishal	Tues	complete
Build mousetrap disperser	Unkown	Unkown	incomplete
Update project plan	Nadir	Fri	complete
Inventory equipment	All	Wed	complete
purchase baggies and containers	Mr. Benn	M	complete
lable everything	David/Mishal/Jasdeep	W	complete
Begin models	Ashim/Nadir	W/F	complete
Go through SolidWorks tutorial	Justin	W	in progress
Doc. Site update	Nadir	F	complete
Week 3:			
Bot 1 - construction	Ashim/Nadir (All)	Mon	complete
Finalize construction plan	All	Mon	in progress
gather materials	All	Tues	in progress
Bot 2- construction			
Finalize construction plan			
Gather materials			
Software - B			
Review IC			
Software - B			
Review IC			
Update proj			
Doc. Site up			
Week 4:			
Bot 1 - construction			
Mobility			
Bot 2 - construction			
Mobility			
Integration - Bot 1			
Mobility			
Integration with Bot 2			
Integration - Bot 2			
Mobility			

Don't forget to include your teams target completion dates for the entire building period!

** Notice that when period one stops, the team has planned the rest of their tasks but they haven't updated the status or made notes. The judges can easily see the progress between period one and period two.

Mobility	Mishal	Tues	in progress
Programming	Nadir	Thurs	in progress
Integration - House Bot	Ashim		in progress

Due to the fact that the mobility structure for the bot is still incomplete, we have not been able to begin the integration process for the bot.

The Harvest Bot is still not complete, so the only coding achieved this far is still the arbitrary code created for the prototype claws.

Althought the structure for the mobility of the

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BOPD Deadlines and Scoring

- Consult your Team Home Base for documentation Deadlines.
- All documentation deadlines are set for Wednesdays at **3pm US Central Time**.
- Submitting documentation early is the best way to avoid problems that could affect your score.
- The final documentation deadline will be the Wednesday preceding the regional tournament.
- Scores for each regional judging period will be posted on the Friday following each Wednesday deadline.
- The first judging period will account for 20% of the total documentation score.
- The second period will account for 23% of the total doc score.
- The third period will account for 27% of the total doc score.
- The remaining 30% of the documentation score is based on your onsite presentation (coming up in a couple slides).

A Few Words About Documentation

- Documentation is a living thing
- We expect there will be changes in strategy and design over the weeks -- that's ok -- as long as you document the reason for changes
- Scoring is not on the quality of the code or the design, but on the **quality of the documentation** of the code and the design and how well it follows the **rubric.**

Top four reasons for doing your online project documentation:

1. By maintaining your Botball project documentation throughout the process you are providing your team (and future teams) an excellent resource for organizing and improving your project
2. Material gathered and recorded in your online documentation can be used to write and submit a paper for the Global Conference on Educational Robotics
3. The scores you earn during each judging period count towards your overall score during your regional tournament
4. Awards are presented for outstanding documentation during the awards ceremony in each region

Onsite Presentations

- Each team will give a 10-minute onsite presentation about their robot.
- Your onsite presentation score accounts for 30% of your total documentation score.
- Onsite presentation will be judged using the **Onsite Presentation Guidelines** and **Onsite Presentation Rubric** that can be found on the workshop flash drive or the Team Home Base.

TEAMS WHO DO NOT REVIEW THE RUBRIC WILL BE AT A SEVERE DISADVANTAGE DURING THEIR ONSITE PRESENTATION!

2010 Botball Onsite Presentation Rubric

(Prompt-refers to the judges having to prompt the student to provide the answer)	No Prompt	Prompt
Introduction		
Presenters are ready to present at assigned time.	2	1
Presenters introduce themselves to judges.	2	1
Team Knowledge		
Structure and organization		
Description provided detailing team demographics (#, gender, grade level)	2	1
Described process for meeting (in-class, extracurricular, after school, weekends)	2	1
Described how the team was organized (officers, leaders, committees, etc)	2	1
Teamwork		
Description of the decision making process the team used when deciding on strategy and/or robot design.	4	2
At least one example of how the team handled conflict	2	1
A brief discussion of the team's goals/strategies at the beginning of the season and how they did or did not change over the building and programming period.	4	2
Description of how division of labor was accomplished.	2	1
Robot Design		
Description of the overall robot system (students may use robot of choice)		
Provided overview of the robots mechanical systems	4	2
Included explanation of how the mechanical design supports sensors	4	2
Included explanation of how the mechanical design supports actuators	4	2
Provided at least one example of how the robot was tested.	4	2
Provided at least one example of actual robot Code and explained what it does by pointing out what sensors are being used and what motors are being driven.	8	4
Detailed analysis of sub-unit (Drive train, grabber, arm, etc)		
Provided detailed description of the unit	4	2
Provided explanation of how the code was tested.	4	2
Supporting Documentation (no electronic presentations allowed)		
Includes at least one: Photograph or CAD or Drawing or Physical Model	2	
Item was used to effectively support idea/concept	2	
Includes a Flow Chart	2	
Item was used to effectively support idea/concept	2	
Includes a Graph	4	
Item was used to effectively support idea/concept	4	
Communication skills		
Presentation followed a logical progression	6	
Presenters spoke up and used good eye contact	2	1
Overall Quality of Presentation		
Finished in allotted time (10minutes)	4	
Knowledgeable in Q & A responses		
Effectively answered questions about team structure and organization	2	
Effectively answered questions about Mechanical Design	2	
Effectively answered questions about robot code	2	
Thank You (An example of a letter you used to thank your sponsor(s) or teacher, mentor)	2	

Presentation Rubric

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Presentation Materials

- Each team must bring a printed document with them to the onsite judging. We recommend a notebook, poster, folder, or display.
- **Teams must bring a PRINTED documents.**
- **No electronic presentations materials (PowerPoint, etc) are allowed.**
- Presentation materials and how well they are used will be reflected in scoring. See the rubric for details.

Onsite Presentation Procedure

1. During registration at the regional tournaments, all teams will sign up for a time slot for their onsite presentation.
2. At the assigned time, a maximum of 2 students from the team should proceed to the onsite judging area with their presentation materials.
3. Teams are responsible for keeping track of their assigned time.
4. **The presentation may take place during a seeding or double elimination round so you may want to choose presenters who do not need to be at the competition table!**
5. Presentations should not be longer than 10 minutes.

Robot Construction Rules

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Robot Construction Rules (1)

1. Robots may be made out of any or all of this year's kit parts except: the boxes, bags and wrapping or packing material; the chargers; download cables (including the white iRobot Create cable), wrenches, screwdriver and color stickers. Materials supplied at the workshop for creating your game board (e.g., poms, ducks, etc) are not part of the kit and cannot be used on your entry.
2. 12 square inches of UGlu have been supplied in the kit and additional UGlu may be used as desired (at team's expense). It may only be used for construction purposes; it may not be exposed for sticking things otherwise in any manner. *In particular, this means you can **not** use UGlu to contact the game board, game elements, or the other team's entry.* **Note that hot melt glue or any other adhesives are not allowed.**
   - Spare UGlu may be purchased through the Botball Store or the retailers listed at: http://www.ugluit.com/index.php?id=55

Robot Construction Rules (2)

3. Judges may require excessive UGlu to be removed. You should always try to come up with a mechanical means for construction and only resort to UGlu as a last resort!
4. Supplied servo accessories such as grommets, screws, etc may only be used to mount pieces to the servo horn.
5. Servos and motors may be mounted to structural pieces using the supplied machine screws.
6. You may trim the connector potting material as needed to ease insertion or mounting of sensors.
7. Servo horns may be trimmed as desired.

Robot Construction Rules (3)

8. You may add 36 square inches of paper (max 20lb) or foil. The paper/foil may only be held in place through the use of other kit parts (including UGlu). **Paper may only be black or white; only gray scale may be used for printing including official logos for sponsors of your team.**
10. You may add 36 inches of thread or line or cable (max diameter 1mm), for use ONLY as tensile elements in winches and pulleys.
12. Up to 5 standard office rubber bands of maximum size #19 may be used (#19 is 3.5” x 1/16” x 1/32”); rubber bands may not be glued or melted. Rubber bands may be cut, but only a total of five rubber bands or five pieces of rubber band (or any combination therein) may be used on a single entry.

Robot Construction Rules (4)

11. Soda straws, paper, electrical tape and/or foil may be used as light guides for the sensors (light guides may shielded by using tape, but not in a fashion that is for structural purposes or for manipulation). Light guide materials are in addition to the allowable parts.
12. You are limited to five 4” white wire ties (included in the kit), and they may be used for any purpose. You may replace damaged ties with ones of equivalent size and color.
15. Lego parts cannot be physically modified.
16. Metal parts may NOT be cut, or broken to a smaller size. Flat bars and plates may be bent if desired.
    - Warning: KIPR will not provide replacements for metal parts that have been altered or damaged. Replacements may be purchased from the Botball Store.

Robot Construction Rules (5)

15. Optional Create parts are the rear wheel, the drive wheel clips, and the rear cargo bay wall. These parts may be used as desired as kit parts. The rear cargo bay wall may be removed, disassembled and loaded with standard pennies for added weight, in which case it must be re-installed on the Create*. The Create may not be assembled/disassembled otherwise. The optional parts if installed must be fully installed and may not be used otherwise.
16. Teams are limited to the screws supplied in the kit. There are eight #6 silver screws (packed with the Create). There are 50 #8-32 quarter inch, 25 #8-32 half inch, and 20 #8-32 three-quarter inch screws in the kit. All #8-32 screws are black.
    - Only the #6 machine screws should be used in the mounting holes on the Create.
17. Each robot must have a name (G rated) approved by an adult team leader before the tournament.

*green battery box may only be used as a substitute battery

Robot Construction Rules (6)

18. The starting box is 22 x 31.5 inches (56 x 80 cm) with a (virtual) height of 15 inches (38 cm).
    - The starting box boundaries are given by the interior edge of the PVC and tape that delineates it.
19. **All elements (multiple robots and other structures) being used by a team for a round must be within the starting box at game start**
    - While in the starting box prior to game start, the maximum height for a robot is 15 inches (38 cm) from the surface of the game board; after game start, robots are allowed to expand in size
    - Starting light sensors should be shielded as demonstrated in the workshop slides and may not extend outside the starting box
20. Multiple processors (such as two CBCs) may exist on a single robot.

Robot Construction Rules (7)

21. It is not necessary to use all the parts in a kit
22. Robot teams can have a maximum of 4 independent structures on the field at a time
    - All components together must fit in the starting box **without any external restraint** (the starting box floor and border PVC is not an external restraint) at game start.
    - Each structure must be large enough so that it does not, in the judge's opinion, constitute a jamming hazard.
    - Examples of structures include: robots, barricades, detachable baskets, etc.
    - A team's entry can contain as many robots up to the structures limit that can be constructed from the parts in a single kit.
    - Items intentionally ejected from a robot count (judges judge intention); there are special rules regarding projectiles, discussed later.

Robot Construction Rules (8)

23. No electrical modifications may be made to any CBC, the Create, any sensors or any motors, except you may substitute a different battery in the Create (i.e., the green battery pack filled with alkaline batteries – an expensive alternative!)
24. No wire extensions may be used except those provided in the kits (foil may **not** be used as wire!)
25. No external communications (e.g., IR, blue-tooth, wireless, or semaphores) may be used during tournament play:
    - The serial cables & chargers may not be used during tournament play
    - Non-radio communications among the robots forming your team's entry is allowed

Robot Construction Rules (9)

26. Human & Robot Safety:
    - No untethered projectiles, other than **game** pieces, are allowed
    - No tethered projectiles containing metal pieces are allowed
    - No metal pieces are to be used in effectors that move or rotate at high speed
    - No metal protrusions are to be used that are likely to cause electrical short risks for other robots
    - Judges will judge safety. Teams may alert judges to a potential safety hazard, but judges will interpret whether or not a robot is safe, needs to be modified, or is not allowed to run.
27. Electrical tape (either black or white) may be used (or required to be used by judges) to cover metal pieces that are deemed to otherwise be a safety risk to robots or humans. NOTE: tape still may not be used structurally.
28. If a robot is not considered safe, as decided by the Head Judge, then the robot will not be allowed to run until it has been modified.

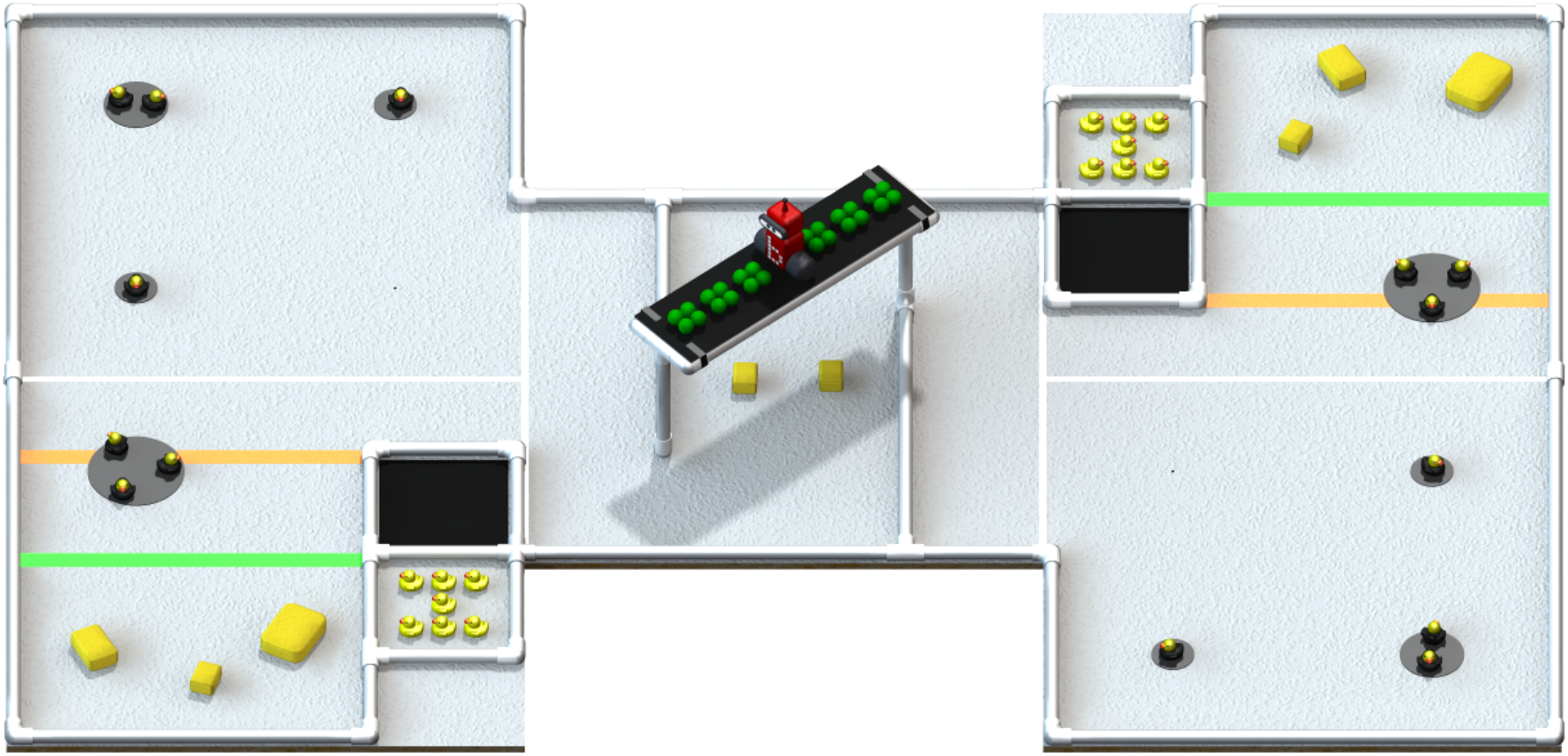
This Year's Game

Disaster at Lake Čapek!

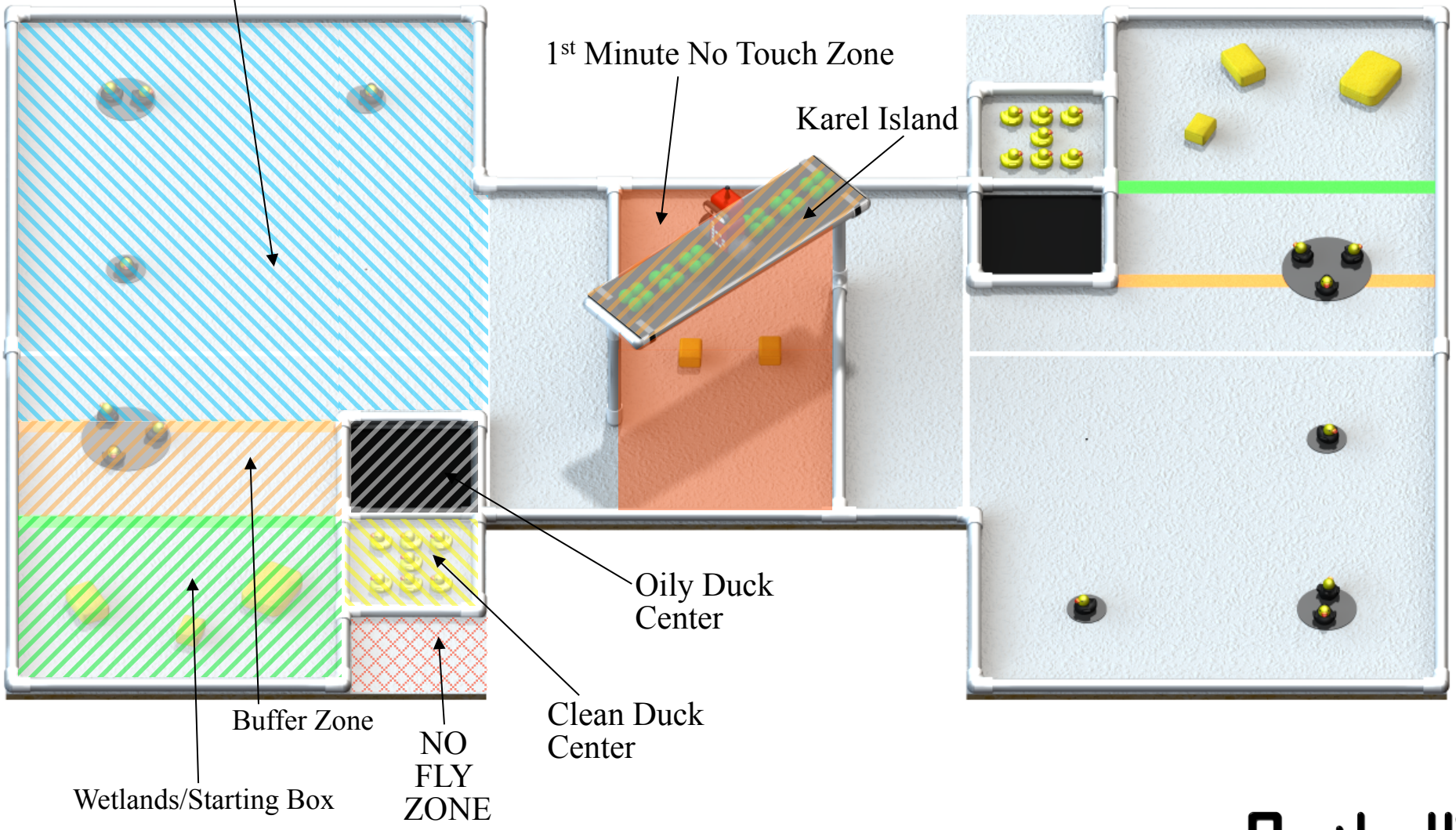
A natural disaster has caused some oil to contaminate Lake Čapek. Botguy has contained the oil with booms, rescued half of the ducks, and in the process of rescuing some frogs became stranded on Karel Island.

Your mission is to rescue the oily ducks and take them to the cleaning center. The oil slicks should also be neutralized with sorbents, but there are only a limited number available and they work best when paired with appropriately sized oil slicks. Botguy and the frogs need to be rescued and delivered with the clean ducks into the freshly cleaned wetlands. The ducks should be corralled into a line on the green strip of grass with Botguy at the front so he can count the ducks before they get released back into the wild.

The Game Board (1)



The Game Board (2)



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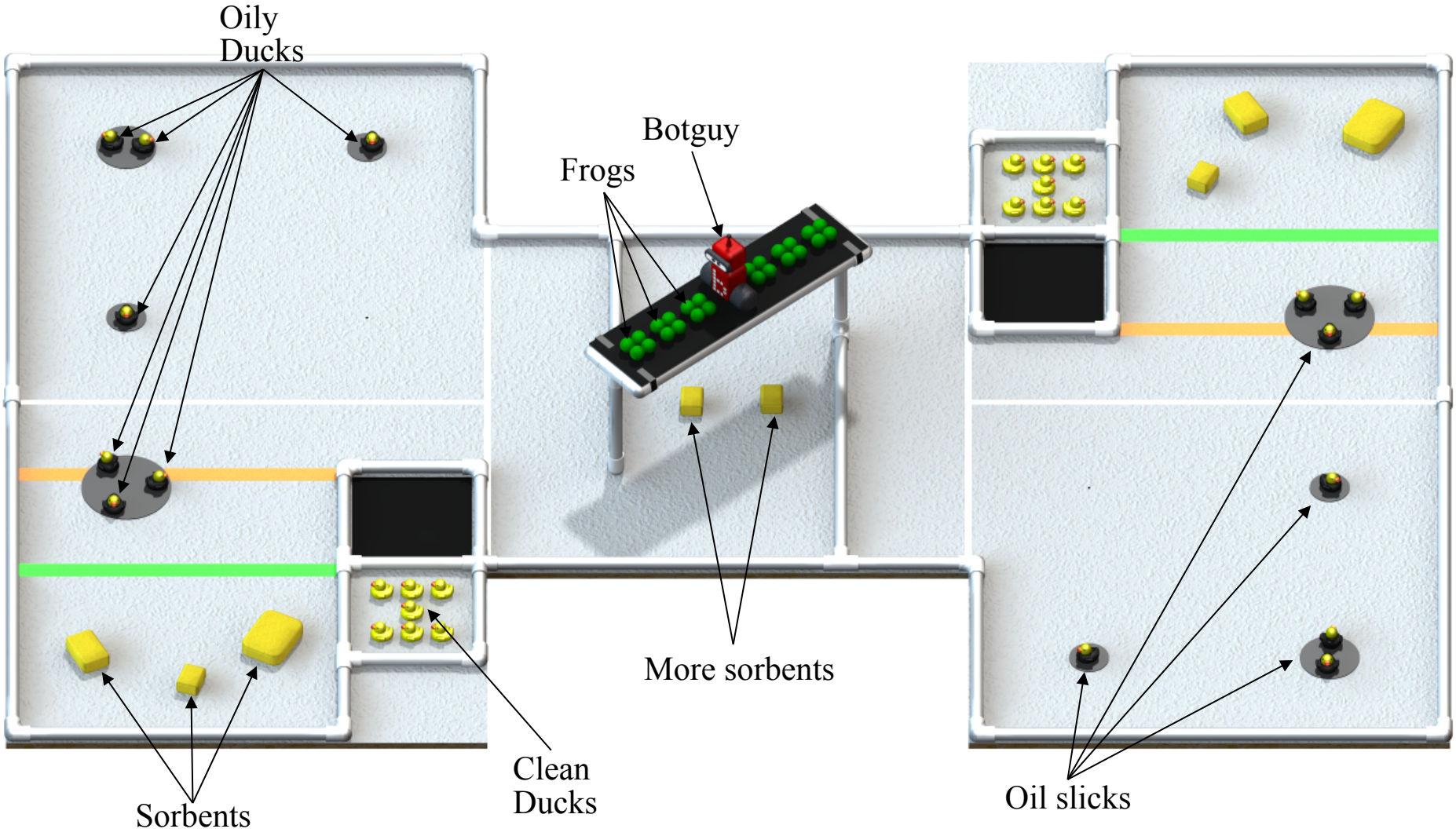
The Game Board (3)



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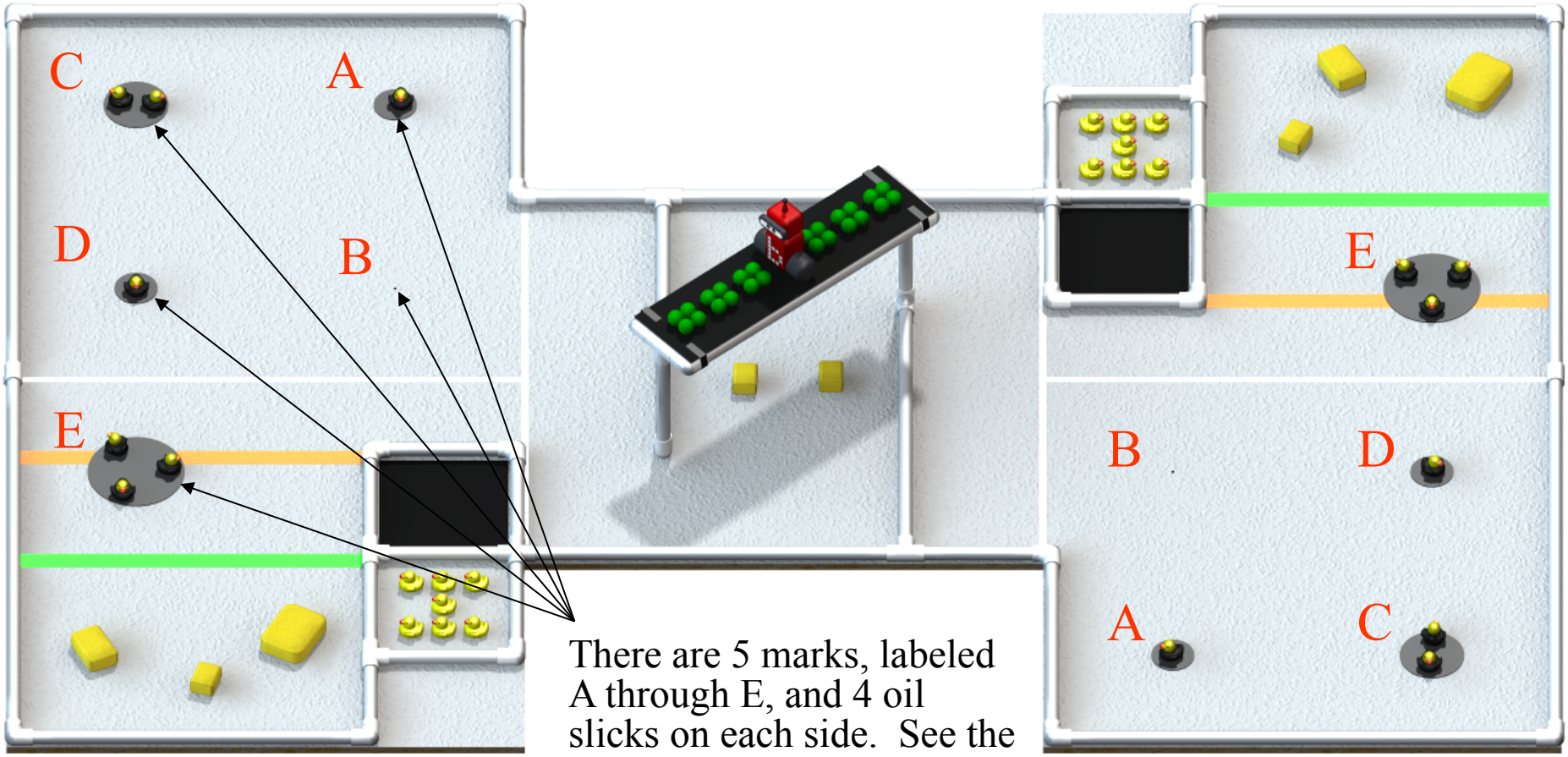
The Game Board (4)



There are 5 marks, labeled A through E, and 4 oil slicks on each side. See the next slide for detailed instructions. Exact location of the marks may be found on the table construction document.

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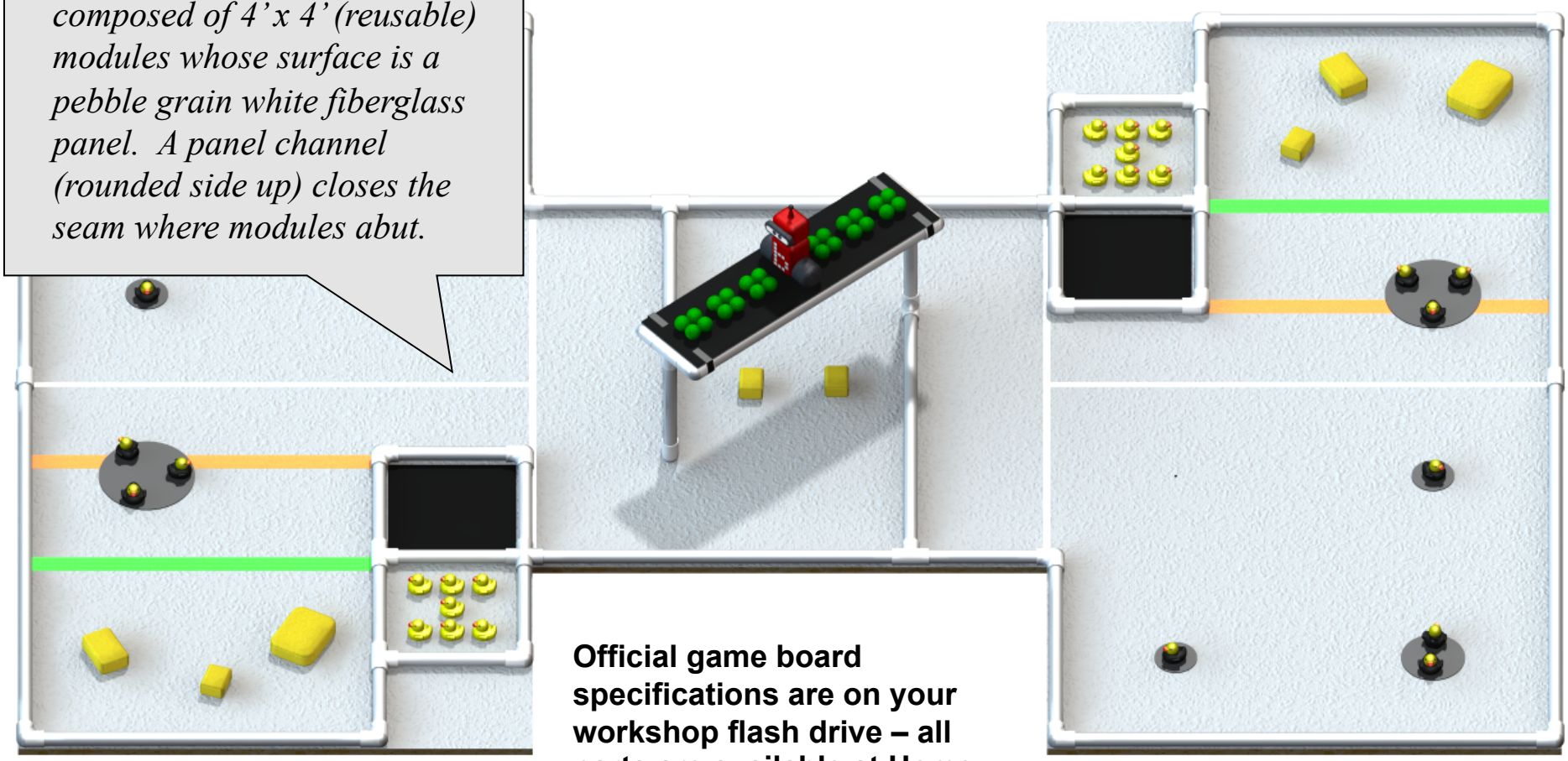
Oil Slick Initial Placement

- Each oil slick potential location is marked on the board.
- The two small, one medium and one large oil slick are randomly assigned to four of the five potential slick locations after the “hands off” (defined later) period.
- Each slick will **cover** the mark for its assigned location, but not necessarily be centered.
- The **assignment** is the same on both sides.
- The exact **placement** of each slick over the mark may not be the same on each side.
- Three oily ducks will always start on a large slick, two on a medium slick and one on a small slick. The oily ducks will be sitting upright, but their heading and placement on the slick is unspecified and non-uniform from slick to slick.

The Game Board (5)

Notes: The game board is composed of 4' x 4' (reusable) modules whose surface is a pebble grain white fiberglass panel. A panel channel (rounded side up) closes the seam where modules abut.

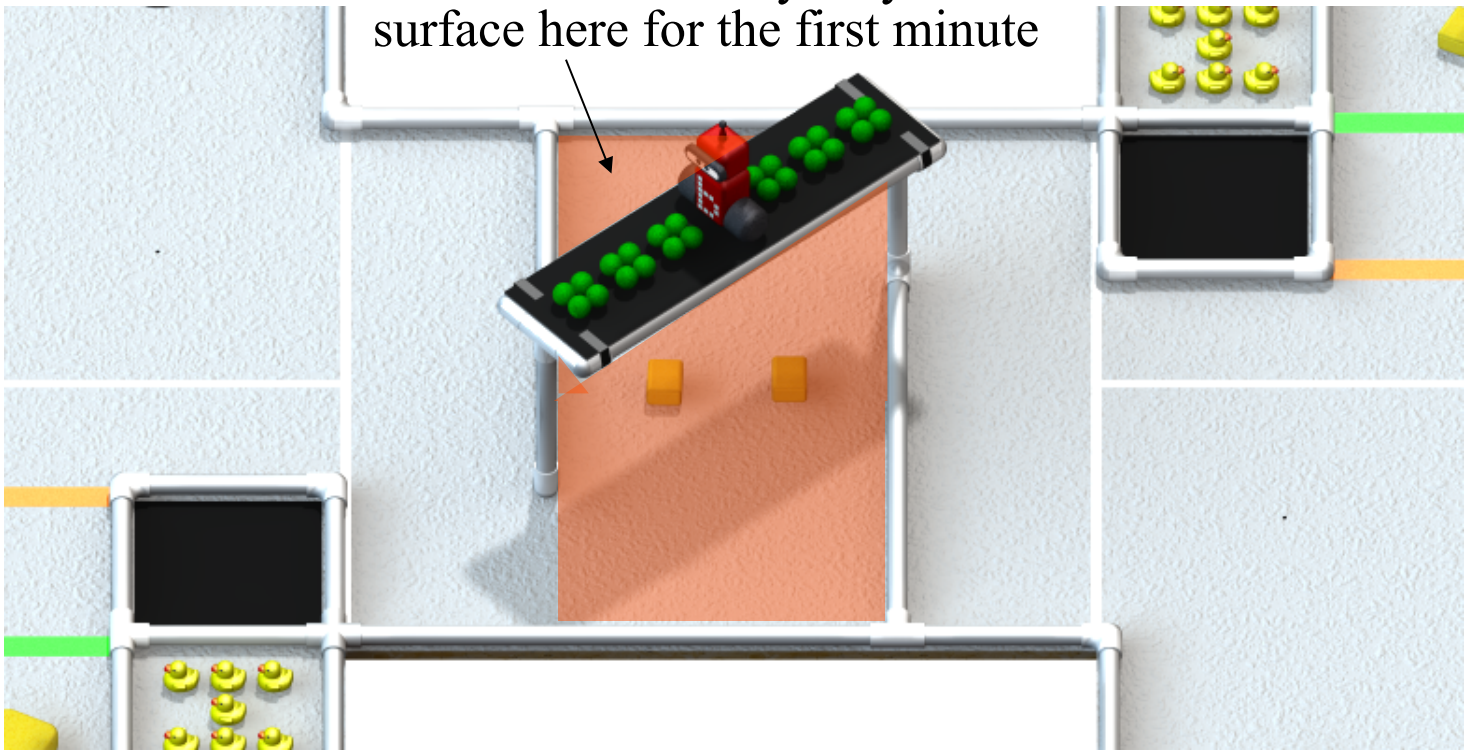


Official game board specifications are on your workshop flash drive – all parts are available at Home Depot (and samples of the surface and colored tape are in your game piece set).

The Game Board (6)

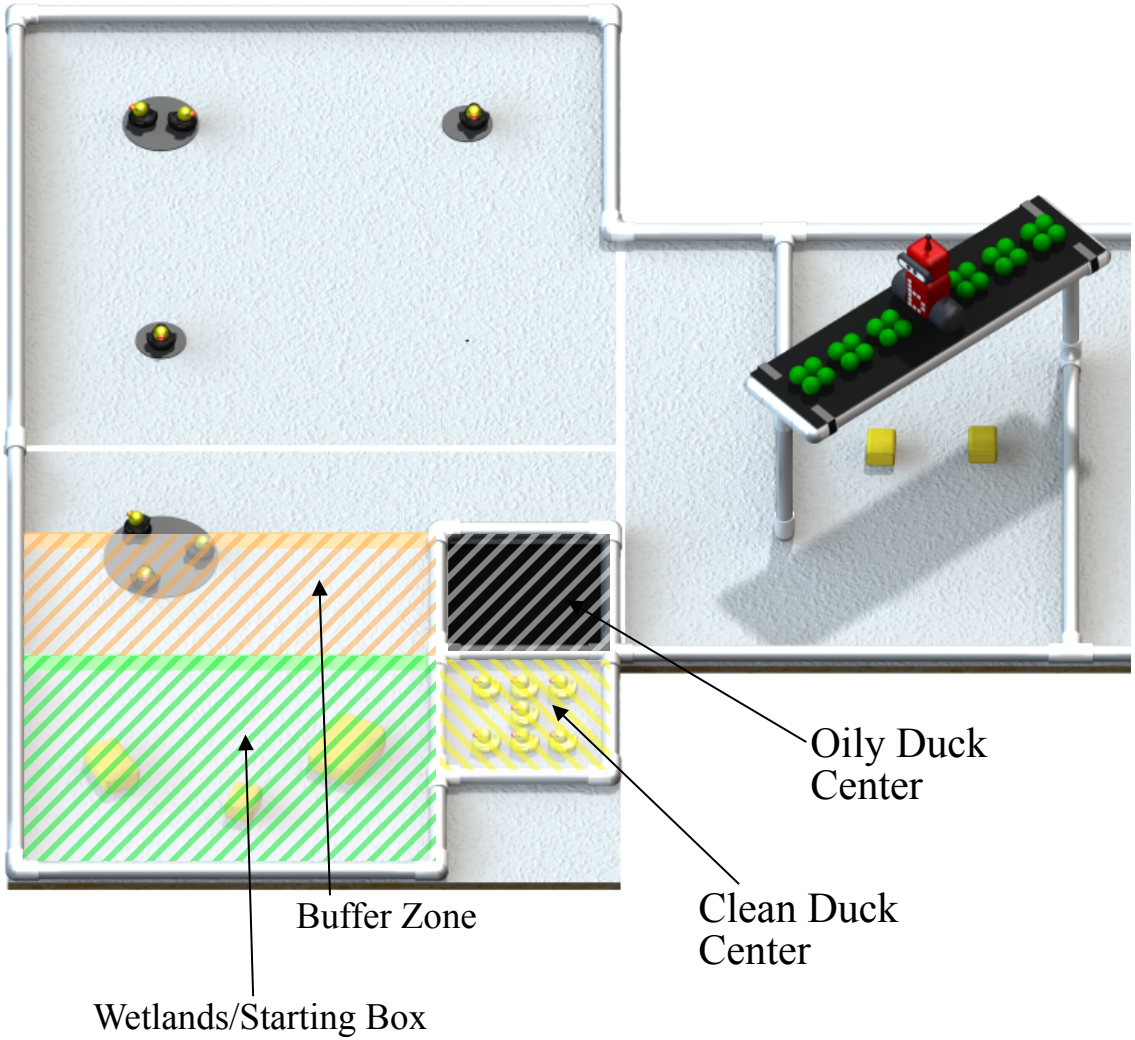
1st Minute No Touch Zone:

Neither team's entry may touch the surface here for the first minute



The 1st Minute No Touch Zone is the table surface highlighted in red here and defined by the inner edges of the PVC pipe that surrounds the rectangle area underneath Karel Island (a little less than 2'x4' in size).

The Game Board (7)



During the entire game no team's entry may enter the vertical projection of their opponents Buffer Zone, Wetlands, Oily Duck Center or Clean Duck Center.

Table Build Instructions

- The table build instructions may be found on the team homebase and the workshop flash drive.
- All measurements on official boards, whose precision is not otherwise specified, will be within +/- 1/2 inch (12mm) or 1%, whichever is greater. Deal with it.

Scoring Items

- 1 Botguy
- 24 Green Frogs (1.5” poms)
- 14 Oily Ducks
- 14 Clean Ducks
- 8 Sorbents (sponges)
  - 2 Large
  - 2 Medium
  - 4 Small
- 8 Foam Oil Slicks (EVA craft foam 2mm thick)
  - 2 Large (9” diameter)
  - 2 Medium (6” diameter)
  - 4 Small (4” diameter)

Scoring Rules

Scoring Objects by Location

	Oily Ducks	Clean Ducks	Frogs	Botguy	Sorbents
Touching oil slick on your side	0	0	0	0	3 or 5*
On your side, not touching a slick	1	1	1	5	0
In your wetlands	0	5	5	10	0
On your green line	0	10 or 15+	5	20+	0
In your oily duck center	5	0	0	0	0
In your clean duck center	0	0	0	0	0

* Incorrectly sized sorbents earn 3 points, correctly sized sorbents earn 5 points.

+ If Botguy is on the green line and all of the clean ducks on the line are to one side of Botguy, then the ducks on the line score 15 points each, otherwise they all score 10 points each.

Initial score is 0

max points = 460

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Scoring Conditions (1)

- The boundary of the *wetlands* is defined by the inside edges of the green tape and PVC that surround the *wetlands*. A scoring object with any part within the vertical projection of the *wetlands* is scored as in the *wetlands* (ducks fly, frogs hop).
- Pieces only score on the *green line* if any part of them is in direct physical contact with the *green line*.
- The boundary of the *oily duck center* is the inside edges of the PVC surrounding it and oily ducks score if any part of them is within the vertical projection of the *oily duck center*.
- The boundary of *your side* is defined by the inside edges of the PVC surrounding *your side* and it also includes the entire *buffer zone* (for scoring items). Items score if any part of them is within the vertical projection of *your side/buffer zone*.

Scoring Conditions (2)

- An object scoring in more than one area only scores in the area yielding the higher score, with the exception of oil slicks. If anything is touching an *oil slick* it counts/scores as being on an *oil slick*.
- Only one sorbent per *oil slick* will score.
  - If one of them is the correct size, that one will score.
- If an *oil slick* with no sorbent is moved so that it touches the *green line* or *wetlands*, it zeroes out the score from that area.
- If Botguy is on the *green line* and **all** of the clean ducks on the *green line* are to **one** side of Botguy, then all the clean ducks on the *green line* score 15 points each.
  - If clean ducks are on both sides of Botguy on the *green line*, then all the clean ducks on the *green line* score 10 points each.

Scoring Calculation

- Your score is determined only where objects finish up, and not how they got there.
  - Judges will wait until any objects still moving have come to rest.
- If your team does not agree with the calculation of a round score they must notify the table judge(s) **before** the team leaves the table and **before** any items have been moved on the table. Teams will be required to initial a score sheet before they leave the table – this signifies that they agree that the scoring was done properly.

Special Conditions and Ties (in order)

- If any part of one team's entry touches the No Touch Zone surface during the first minute, the game ends immediately and it loses the round.
- If any part of one team's entry enters the vertical projection of the other side's buffer zone, wetlands, oily duck center or clean duck center at any time during the game, the game ends immediately and it loses the round.
- If one team never breaks any border of the starting box, it loses the round.
- If one team's robots do not shut down their motors & stop servos at the end, it loses the round.
- In case of a tie score a team wins if none of the above apply AND it is the team with (first condition to apply):
  - Botguy on their line
  - The most clean ducks on their line
  - Botguy in their wetlands
  - The most points from sorbents
  - The most points from oily ducks
  - The most points from clean ducks
  - The most points from frogs
  - Botguy on their side
  - The most frogs on their side
  - The robot with the closest CBC power switch to Botguy

Game Play

Game Play (1)

- Teams will place their robot(s) and the three sorbents within their starting box as desired (**the sorbents may be placed anywhere within the starting box even on/in their robots!**).
- Prior to the start of the game, teams may position either or both of the starting lights on their side as they wish, provided:
  - Starting lights must be attached to the outside edges of the game board around your starting box.
  - Starting lights may not be in physical contact with any part of your entry or game pieces.
  - Starting lights may not be aimed to disrupt an opponent or blind anyone (judge's interpretation).
  - Note that there are two starting lights for each team so each robot can have its own starting light, and both lights will turn on and off at the same time and cannot be controlled individually.
- Prior to the start of the game, teams may position the seven clean ducks within the clean duck center; all seven ducks must be sitting flat on the table surface.

Game Play (2)

- Sorbents are positioned underneath Karel Island covering their marks.
- When both teams are ready or judges decide adequate time has been allowed for calibration, each team positions/ activates its robots and then -- **Hands off!**
  - If the judges feel a team is taking too long to calibrate, they will issue a 30 second warning
  - At the end of the 30 seconds, if either team is not ready for 'hands off', that team will be assigned a fault, and the setup clock will be reset
  - The target setup time (may be extended at judges' discretion) is 90 seconds

Game Play (3)

- After *hands off*,
  - The judges randomly select the position of the oil slicks, oily ducks and direction Botguy faces.
  - The starting lights are initiated by the judge and signal to the robots that the round has begun.
- After *hands off*,
  - No part of a team's robot(s) may leave the starting box until the round has begun (movement is OK so long as the starting box boundary isn't violated).
    - If this happens, the judges will call a fault on the team.
  - Team members may not move the starting lights anytime after hands off, however robots may.
- If a team receives a 2nd fault in a round, they forfeit the round.

Game Play (4)

- Team members may not signal to their robots after "hands off", in any way, to start their robots.
- Once the starting lights have turned on, the round counts unless a judge rules otherwise.
- Each team will be given a single Timeout card labeled with their team number when they register at the tournament site.
  - At any time before 'hands-off' a team may turn in their timeout card and get a 3 minute timeout
  - The team may spend that time in the pit or at the table, but not to practice at the table
- Only a single timeout per team is allowed for the day

Game Play (5)

- Robots must **cut power to their motors (including those on the Create) and stop servo motion** by the end of the round or that team will lose the round in all situations except against a team that does not break the boundary of the starting box (in seeding this condition will give a score of 0).
- Scoring is based on the location of pieces at the end, not how the pieces got there. Scoring takes place when items come to rest. If teams do not agree with a score calculation they must notify the judges immediately.
- Judges may at any time, while a robot is on the table, decide that a robot is in violation of construction rules, or that team members are guilty of interference and then disqualify that robot for that round
  - Judges will not accept challenges to robots from the peanut gallery
  - Challenges must come from the judges and team members at the table
- If all motion has stopped before 120 seconds, the judges may ask teams if robots are done and if they are then the judges may end the round at that time (if both teams agree)

Game Play (6)

- 1st Minute No Touch Zone: During the first minute of play, if a team's robot touches the table surface in the No Touch Zone the team will lose that round.
  - Robots may touch Karel Island or any of the PVC pipe surrounding it. The only prohibition is touching the table surface in the No Touch Zone during the first minute.
  - Teams may move/launch game pieces anywhere on the board

- No Fly Zone: The no fly zone (next to the starting box) will have table lighting equipment and possibly other items in it. Teams may not enter this area otherwise their robot may be removed from the game.

- If any part of one team's entry enters the vertical projection of the other side's buffer zone, wetlands, oily duck center or clean duck center at any time during the game, the game ends immediately and it loses the round.

Game Play (7)

- At the start of the game the starting lights turn on and robots are allowed to leave the starting box as soon as the lights turn on.
- The round lasts two minutes
- Lighting Sequence:
  - 0 seconds: lights turn on; robots can leave start boxes
  - 5 seconds: lights turn off
  - 60 seconds: Lights turn on and stay on; robots can enter the no touch zone
  - 115 seconds: lights blink for five seconds
  - 120 seconds: lights turn off; game over; robots must turn off motors and freeze or power down servos.

Tournament Logistics

Tournament Logistics (1)

1. No part of any adult is allowed over the vertical projection of the outer edge of the pit area (with the exception of tournament staff)
   - Electronic/Voice communications between the pit and teachers/ mentors is strongly discouraged and if abused will result in sanctions for the offenders
2. Once teams register for the tournament, the role of teachers, parents and mentors should be high-level coaching & cheerleading
3. Robots may only leave the pit to go to the game tables for practice or competition
4. Up to 2 students from a team bring the team's robot(s) to the tournament table and perform the set up

Tournament Logistics (2)

5. Teams shake hands and visually inspect each other's robots before calibration
6. If either team wants to challenge the validity of the robots they are facing, they have to bring it to the table judges' attention during the inspection period
7. Teams can bring the list of parts to the table to aid in the inspection
8. Inspection is limited to a max of 1 minute unless a specific challenge is made
9. Teams should wear neutral color shirts/clothes to the table and may be required to wear the official regional t-shirt

Tournament Logistics (3)

10. Challenges have to be of the form:
    - That robot has way too many X, or is using an illegal part, eg.:
      - That robot is using welding instead of UGlu
      - That robot has nail gun duct taped to it
11. Judges are the final arbiter
    - Judges can dismiss what they believe to be spurious or irrelevant challenges
    - Teams determined by the judges to be in safety or performance changing violation will have a minute to remove the offending parts or forfeit that round
    - A robot that is determined before the beginning of a round to be in a safety or performance changing violation of the construction rules will not be allowed to play while in that state
    - A robot ruled not human safe will not be allowed to run until modified

Tournament Logistics (4)

12. We don't care what LEGO, processors etc teams have in the pits; construction rules apply only to what is brought to the Game Table
13. There are no instant replays; we do not want to see videos to question decisions; if a team is unhappy with a judge's decision, they should challenge it then and there; challenges to scoring or robot construction after the teams have left the table will not be considered
14. Teams cannot touch, borrow equipment, modify robots or computers, or beam commands to another team's stuff (including their pit table) without the permission and presence of a member of that team
15. The security of a team's equipment is the responsibility of that team **-- don't leave valuables unattended**

Seeding/Performance Rounds

Seeding/Performance Rounds

- S/P rounds take place before double elimination
- Each team will get three S/P rounds and teams play unopposed during the S/P rounds
- Each round is scored and the S/P round score is:

  (your side score) - (opponent side score*)
- Seed scores of less than 0 will be counted as 0, except for passing on a round gives a score of -1 for that round
- Seed Score = average of best two rounds

* During S/P rounds your opponent's score will always be zero unless your team scores points on your opponent's side.

Double-Elimination Tournament

Double Elimination Tournament

- A team is out of the tournament when it has lost two games
- Initial matches are decided by seeding round
- Matches are arranged using KIPR tournament software
- Judges' decisions are final

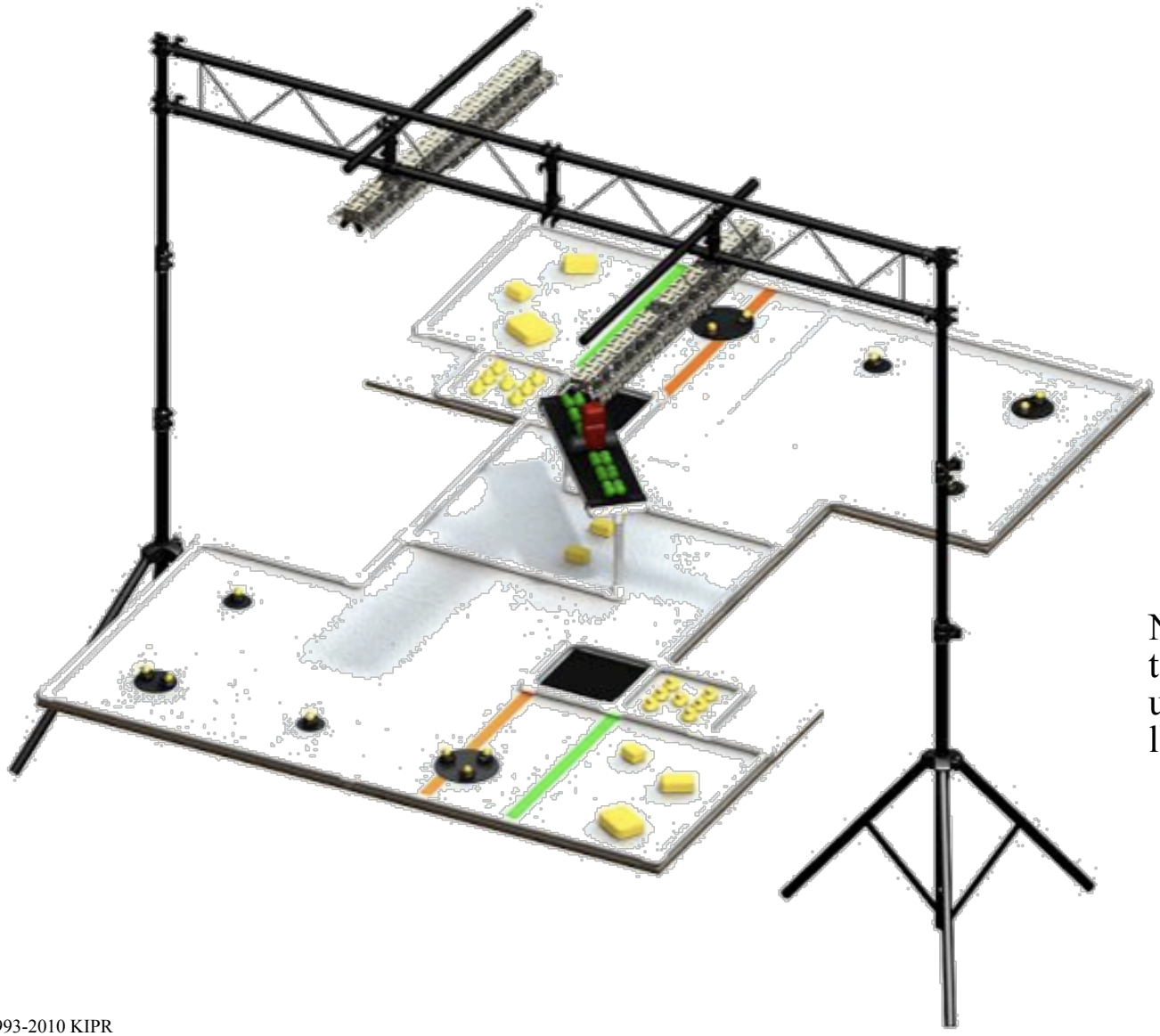
Practice Boards (1)

- Teams benefit from having a representation of the game board to use in developing and testing their robots
  - Game elements that might be difficult to duplicate locally are included in your robot kit
- For many aspects of robot development, it is not necessary to build a complete or even regulation practice board
  - The modular nature of the game board allows set up on folding tables, in whole or in part
  - The fiberglass panels used for module surfaces can be supported by any available means
    - The underlay does not have to be as rugged as it is for a tournament board
  - The fiberglass panels are reusable and easier to store from year to year
  - A substitute surface material is sufficient for many aspects of robot development

Practice Boards (2)

- No practice boards in the pit area without prior arrangement
- Official specifications for the game board are provided on the workshop flash drive (and also on the team home base)
- Providing a practice board is a good parent project
- The new starting lights are Office Depot Part #681-811

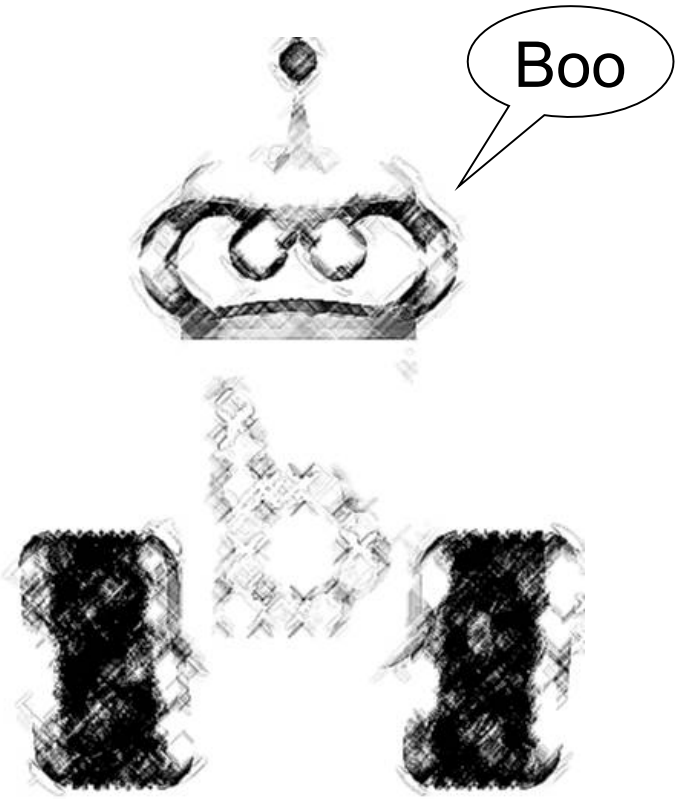
Game Board Lighting Setup



Note: actual tournament tables will be supported underneath, rather than levitating.

The Spirit of Botball

- Botball is an educational experience for students
- Parents, teachers and mentors are there to guide, not to *do*
- Adults who want to *do* should build practice boards and work on an entry for the KIPR Open
- Parents and mentors should set good examples of behavior and sportsmanship -- especially at tournaments



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Regional Awards

- Awards will be given for a variety of robot and team features
- Awards will be given for:
  - Top finishers in tournament
  - Top finishers in seeding rounds
  - Top finishers in Documentation/Presentation
- Trophies will be given for categories such as overall winners

Documentation Score

\+ Seeding Score

\+ Double Elimination Score

= Overall Score

*Overall score will be between 0 and 3

Scoring Details

$$\text{Doc Score} = 0.2\left(\frac{n - \text{P}_1\ \text{Rank} + 1}{n}\right) + 0.23\left(\frac{n - \text{P}_2\ \text{Rank} + 1}{n}\right) + 0.27\left(\frac{n - \text{P}_3\ \text{Rank} + 1}{n}\right) + 0.3\left(\frac{n - \text{Onsite Rank} + 1}{n}\right)$$

$$\text{Seed Score} = \frac{1}{2}\left(\frac{n - \text{Seed Rank} + 1}{n}\right) + \frac{1}{2}\left(\frac{\text{Team Average Seed Score}}{\text{Max Tournament Seed Sco}}\right)$$

$$\text{DE Score} = \left(\frac{n - \text{DE Rank} + 1}{n}\right)$$

n = Number of Teams at Tournament

Regional Scoring Example

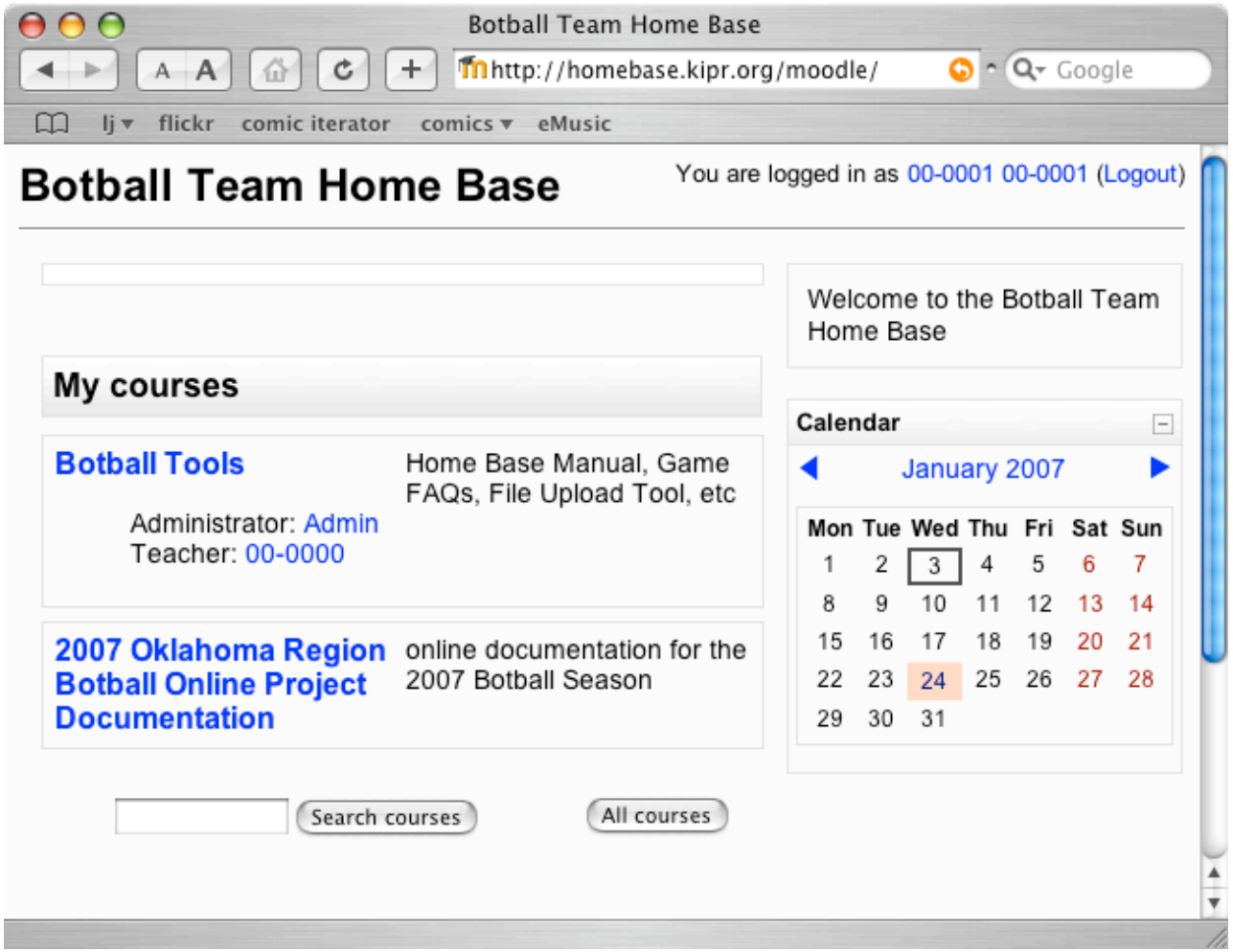
- Winning the double elimination does not guarantee winning the tournament as the following theoretical example for a 16 team regional illustrates:
- One team receives 0.8 pts for their documentation score, wins the seeding round with a 59 average (and the overall seeding high score is 61) and finishes tied for 8th in the double elimination. Their overall score is 2.3461 pts.
  - Doc score of 0.8, seed score of 0.9836 ($\left[\left(\frac{1}{2}\right)\left(\frac{16-1+1}{16}\right)+\left(\frac{1}{2}\right)\left(\frac{59}{61}\right)\right]$) and DE score of 0.5625 ($\left(\frac{16-8+1}{16}\right)$).
- Another team receives 0.25 pts for their documentation, finishes 9th in the seeding with a 15 average and wins the double elimination. Their overall score is 1.6230 pts.
  - Doc score of 0.25, seed score of 0.3729 ($0.5\left(\frac{16-9+1}{16}\right)+0.5\left(\frac{15}{61}\right)$) and DE score of 1.0 ($\left(\frac{16-1+1}{16}\right)$).

Frequently Asked Questions (FAQs) and Homebase

FAQ

- The official rules for the game are defined by this document and the **game rules FAQ**
- All questions about the game rules should be submitted to the **game rules FAQ**
  - Questions not dealing with the game rules should be submitted to one of the other FAQs or to a message board
  - Submissions dealing with the game details sent to other FAQs or message boards will be deleted. Please don't do that.
- Changes or clarifications made in the FAQ supersede this document
- If it is not written here or in the FAQ, then it is not official!!

FAQ 1: Choose Botball Tools from the Home Base



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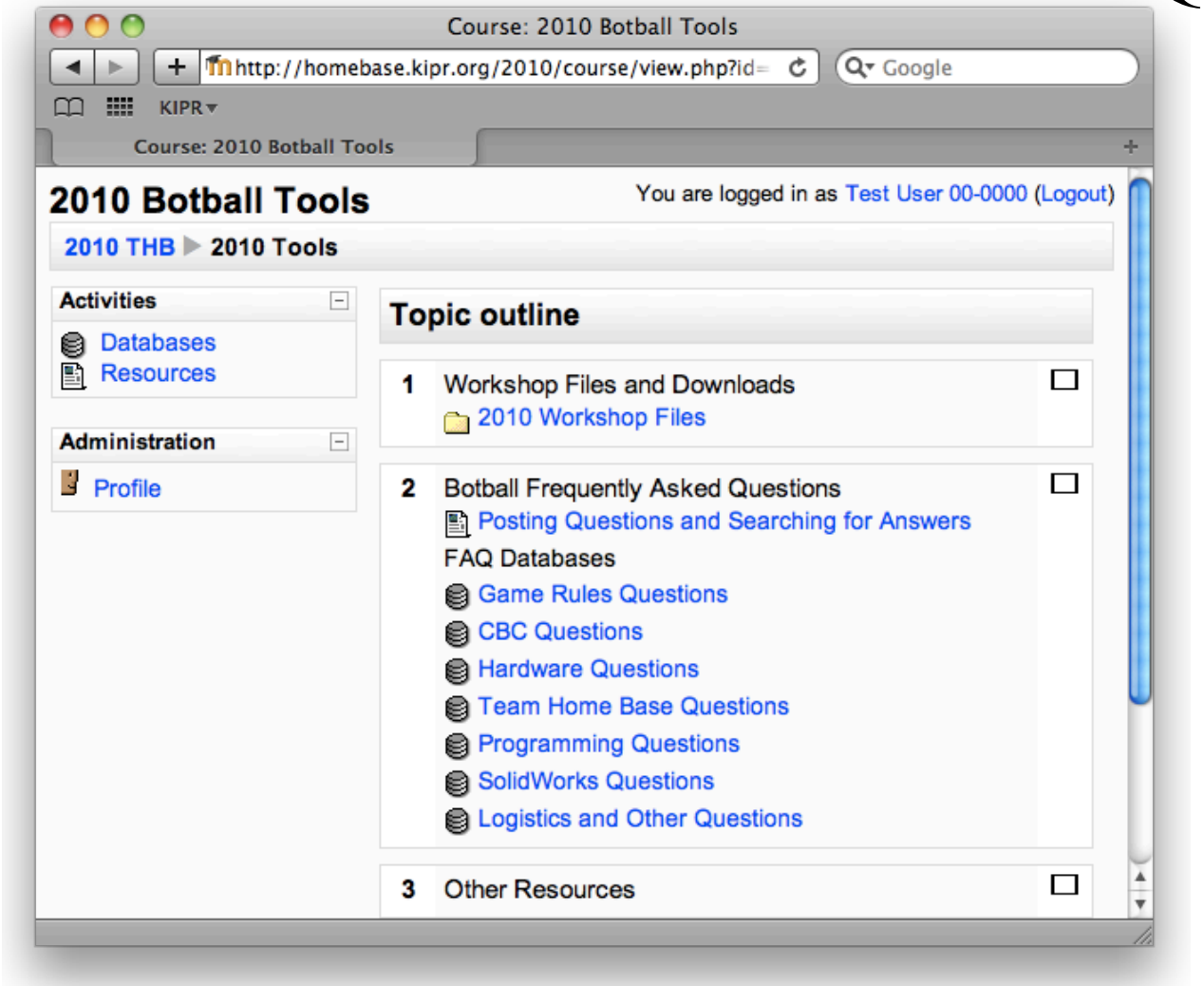
FAQ 2: In Botball Tools, Select the Desired Section of the FAQ



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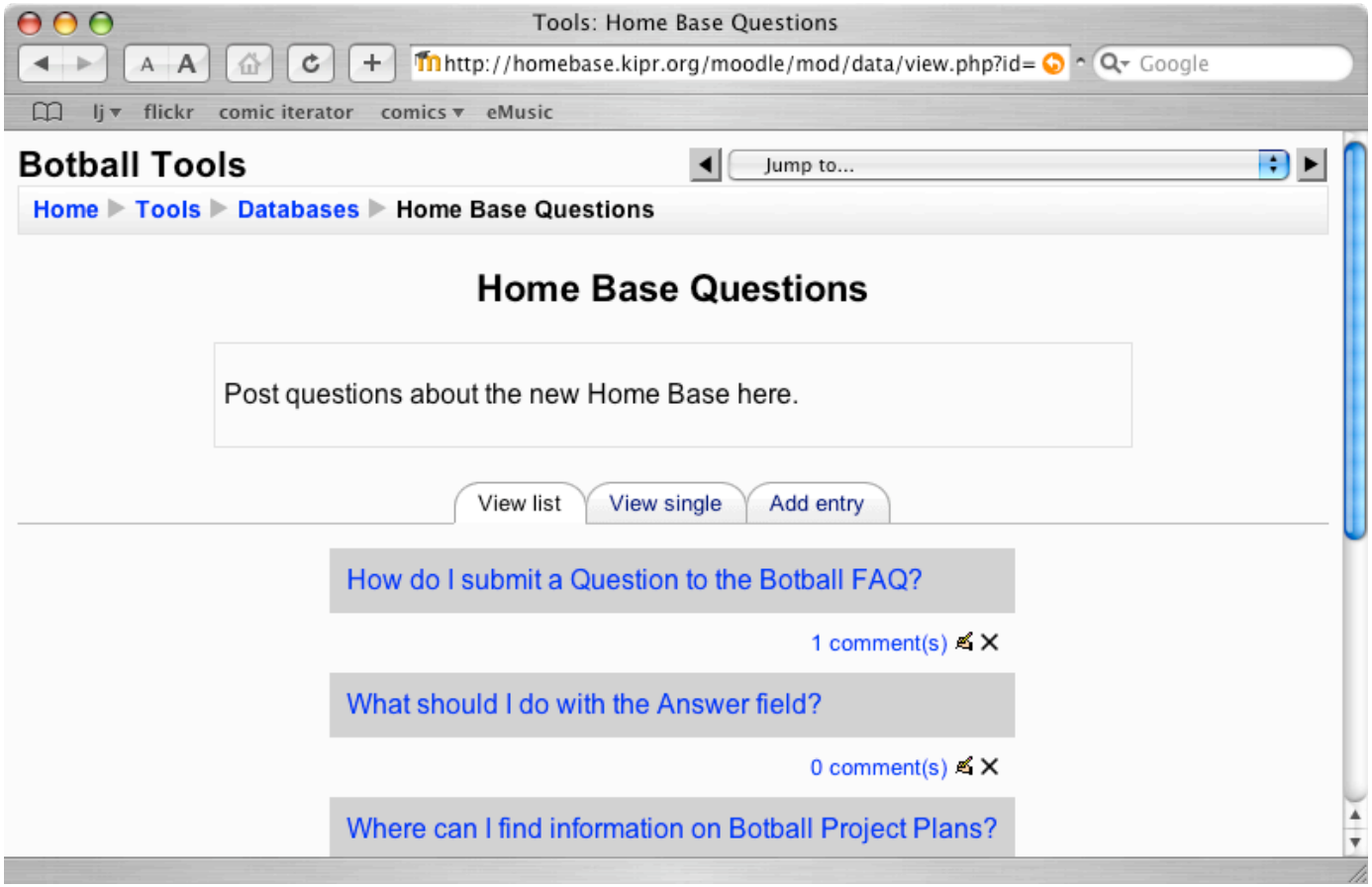
FAQ 3: View the Questions



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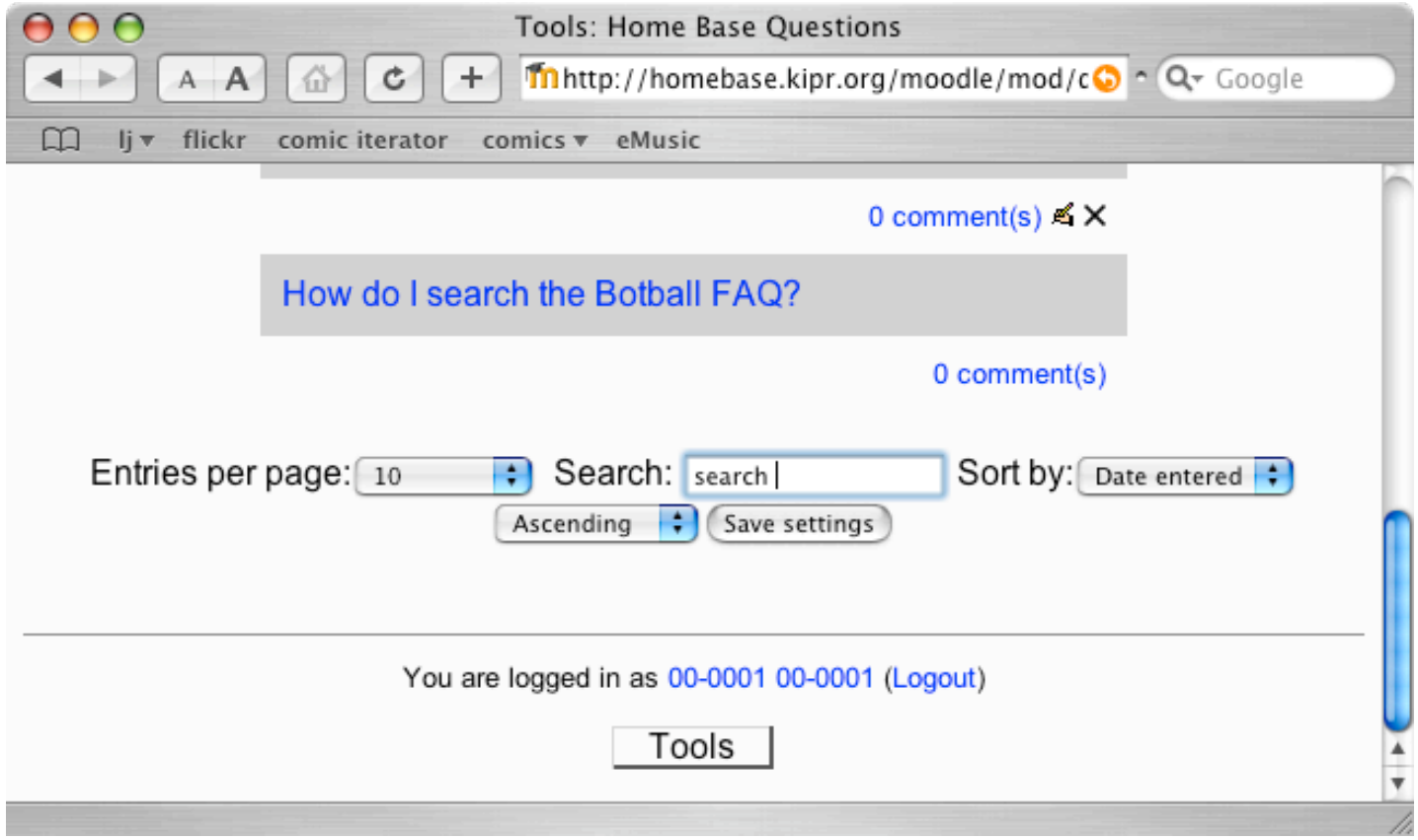
FAQ 4: Search the Questions



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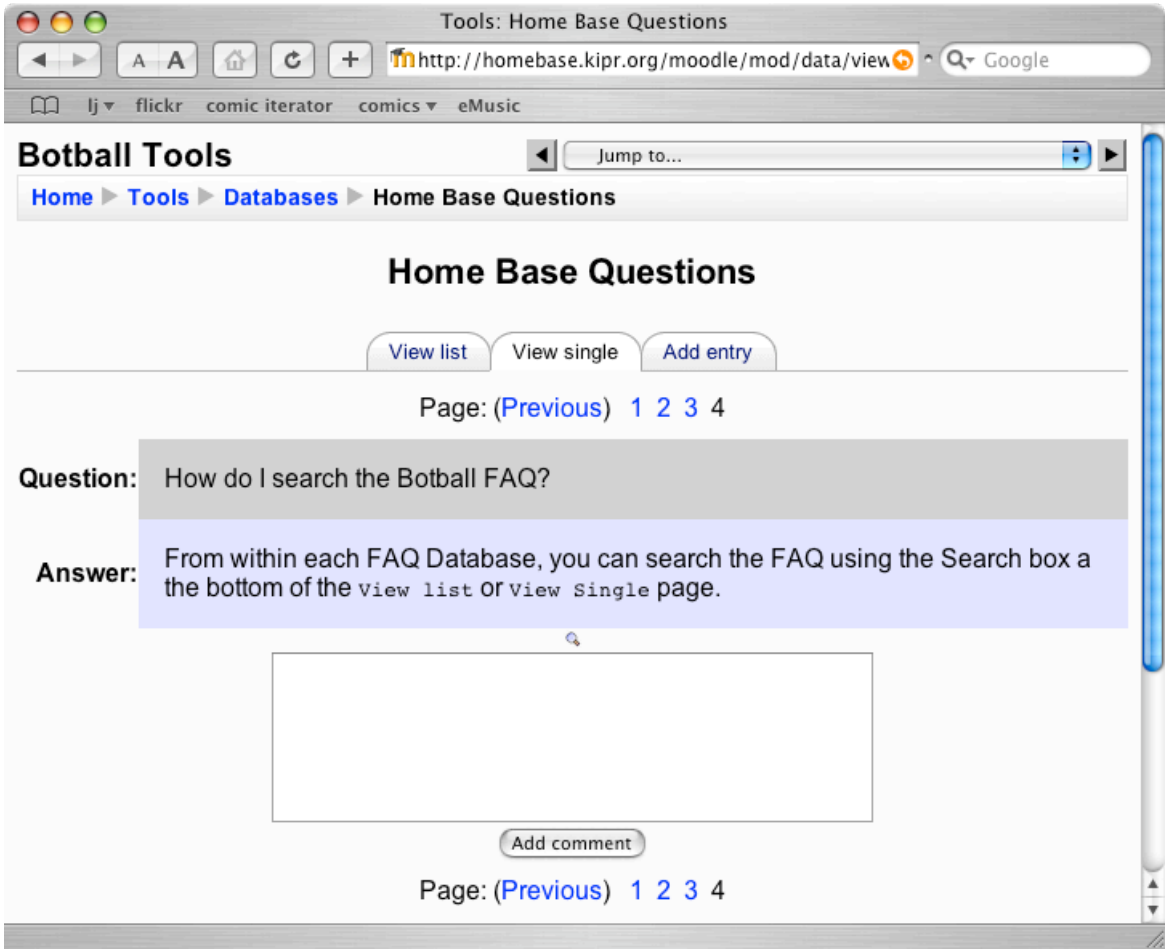
FAQ 5: Select a Question to See the Answer



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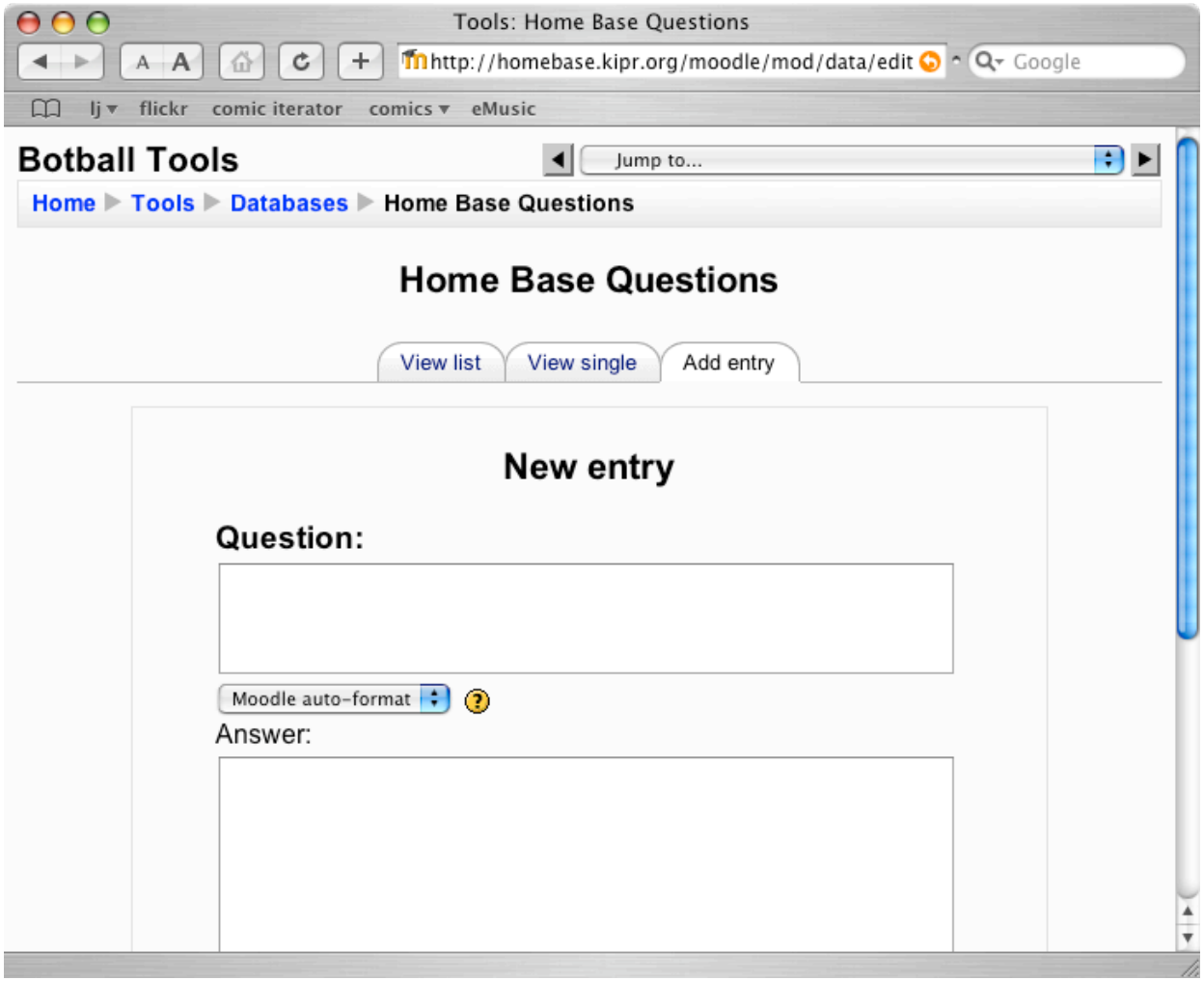
FAQ 6: Submit a New Question



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Mentors

Mentoring

- Students design the robot(s)
- Students build the robot(s)
- Students program the robot(s)
- Mentors provide encouragement
- Mentors answer questions (not too explicit)
- Mentors give examples (not too explicit)
- Mentors give advice (not too explicit)

Things to Do to Get Ready

- On Monday following the workshop
- During the first week
- Before coming to the tournament

Things to do on Monday

- Gather the team and...
  - Review rules changes if a returning team
  - Make copies of rules and slides available to all team members (e.g., place workshop flash drive and its PDFs on shared disk)
  - Give board construction info, etc to interested parents and mentors
  - Read over home base and onsite-presentation manuals and review rubrics
  - Log onto your home base
  - Start brainstorming
  - Start documentation

Things to do first week...

- Decide on team strategy (how team will make decisions and resolve conflicts)
- Create project schedule
- Create project team roles
  - e.g., have a sub-team start working with the vision system
  - Make sure someone is regularly reading FAQs for rule updates
- Start entering documentation
- Have team buy-in on a game strategy
- Perform team programming project (e.g., each person writes a function that moves the robot around on the simulator)

Things to do Before You Come to the Tournament...

- Test your robots **from start to end**:
  - Shield the light sensor you are using for starting
  - Go through the entire starting sequence
  - Make sure you can calibrate your light sensor(s) to the starting light
  - Make sure the robots stop when they are supposed to: verify with a stop watch!
- **Does your starting sequence work with very bright overhead lights?** (tournament tables will have two 48 inch light fixtures, two Sylvania F032/835/XP/EC03 32W 3500K bulbs in each fixture; lights hung about 50 inches (127 cm) above the tables) The starting lights will be 40 watt halogen.

Tournament Day

- Have a check list of what to bring
- Bring on-site documentation materials and know who is going to present them
- Have “understudies” for your team construction and programming “experts” in case one of them is sick or can’t get there
  - Ideally team members back each other up
- Bring backups for software
  - Things get changed on the fly at tournaments and not necessarily for the better
- Be prepared to set up and work in the small “pit” area allocated to each team (usually nothing more than a 6’ table with chairs and power access)
- Don’t forget laptop power supply and power strip
  - Verify it’s working and has the necessary software
- Don’t forget the chargers for your Create and CBCs

Test, Test, Test

- **Test**
  - **The shielding of your light sensor(s)!**
  - **Performance of your robot(s) after repeated test runs**
  - **Under different battery charge conditions**
  - **Under different lighting conditions**
    - **Your classroom lighting may be very different from the tournament lighting**
  - **Against opponents (real or imaginary)**
    - **Have a sub-team that uses a robot puppet and acts out other strategies**

Check
www.botball.org
and your team
online home base
regularly

Good Luck!

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