



Welcome to the
2005 Challenge

Ocean Odyssey

Robot Game

Design, build and program a robot to accomplish the Challenge Missions on the Field.

- :: [Read This First](#)
- :: [Field Setup](#)
- :: [Optional Table](#)
- :: [Surface & Borders](#)
- :: [Missions](#)
- :: [Rules](#)
- :: [Q & A](#)

The Project

Our oceans are of vital importance to the health of the Earth, yet only 1% percent of these magnificent bodies of water has been studied.

- :: [The Project](#)
- :: [Resources \(links\)](#)

Poster

Download the comic as a poster for mega print.

- :: [Visit forum for poster download](#)

Forum

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Awards

- :: [Visit awards](#)

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Read This First



After reading and printing the Missions page, every year some teams just jump right into building and programming without giving equal attention to the many important details on the other pages.

These teams experience unneeded confusion and frustration, and are often unpleasantly surprised at tournaments.

To avoid all that and maximize your team's performance, please invest the time needed read ALL of the Challenge pages, and refer back to them often. In particular, The Field Setup, Missions, Rules, and Questions & Answers pages are all critical.

FLL Team Creed

- We are a team.
- We do the work to find the solutions with guidance from our coaches and mentors.
- We honor the spirit of friendly competition.
- What we discover is more important than what we win.
- We share our experiences with others.
- We display gracious professionalism in everything we do.
- We have fun!

Download and Print



[FLL Coach's Honor Code](#)

FLL Coach's Honor Code

As the coach of a *FIRST* LEGO® League (FLL) team, please read the information below for further understanding of FLL core values. As coach, you are responsible for adhering to the following terms and conditions and communicating them to team members, team volunteers, and others affiliated with your team. The signing of the code signifies your intent to uphold and maintain the FLL code.

All teams are expected to abide by FLL rules and guidelines as they exist now and as they may be set forth during the season. Team rules, guidelines, and policies and procedures are detailed in the *FLL Coaches' Handbook*. Any updates, additions, participant consent forms, and volunteer recruitment, screening, and supervision guidelines for the team will be communicated to FLL coaches via email and posted on the *FIRST* LEGO League section of www.usfirst.org.

I UNDERSTAND THE FOLLOWING:

- 1) The kids come first. FLL is about the kids having fun and getting excited about science and technology. Everything my team does starts and ends with that principle.
- 2) The kids do the work. This is their opportunity to learn and grow. The kids on my team do all of the programming, research, problem solving, and building. Adults can help them find the answers, but cannot give them the answers or make the decisions.
- 3) My team is comprised of ten or fewer members, is registered as an official FLL team, and all team members are no older than 14 on January 1st of the Challenge year.
- 4) FLL communicates with my team via my email address, and I am responsible for reading and relaying all aspects of FLL guidelines and rules to my team, other coaches, volunteers, and parents.
- 5) I will encourage my team members, other coaches, volunteers, and team supporters to develop and practice a set of FLL Values that reflects *FIRST's* goal to change culture in a positive way by inspiring others through our team's actions and words.

As the coach of a FIRST LEGO League team, I agree to abide by FLL Values policies, procedures, and standards.

Coach's Signature

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Field Setup Instructions

Overview

The Challenge Field is an obstacle course on a mat. The obstacles are called Mission Models, and the mat is called the Field Mat. Some of the models are secured to the mat using 3M Dual Lock fastening material. The mat must be on a smooth flat surface, and it must be surrounded by border walls to contain all the action.

Requirements

This step first requires that you...

- have read and followed the instructions under "Surface & Borders" so you now have an official framework on which to stage your field.
- have read and followed the instructions on the CD that came with your Field Setup Kit so you now have the LEGO Mission Models.
- have the Field Mat and Dual Lock fastening material that came in your Field Setup Kit.

Field mat placement

Step 1:

Clear any and all debris off the surface you intend to put the mat on. Even the tiniest particle under the mat can give the robot trouble. So vacuum the surface if you can, and run your hand over the surface afterward. Get rid of any protruding imperfections you find.

Step 2:

Unroll the mat and position it so the image is up and the green logo area is at your lower right, at the Southeast corner of your surface. See the sketch labeled Table/Mat Orientation. If the mat won't fit between the border walls, take the time to move the walls as needed. If there's interference in just one or two areas due to imperfection in the border, then it's okay to trim the mat in those areas.

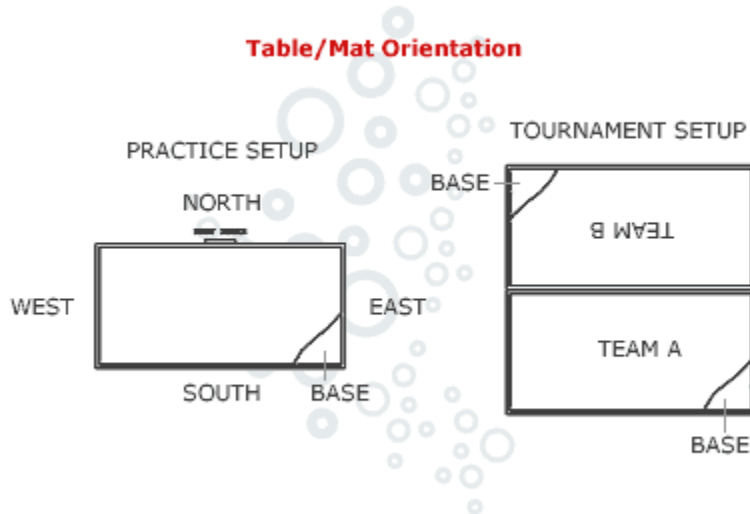
Step 3:

Slide and align the mat so that there is no gap between the "Base" corner's edges of the mat and the corresponding southeast borders. Gaps are acceptable at the north and west edges unless they exceed 1/2 inch (13mm), in which case you should move the borders.

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Step 4:

With help from another person, pull the mat at opposite ends, then massage out any waviness from East to West and re-check the requirements of Step 3. It is expected that some waviness will persist, but that should relax over time.



Using Dual Lock

The Mission Models can be taken off the Field Mat for transport and storage. Some are loose, but others are secured using a re-usable fastening material from 3M called Dual Lock, which comes with the LEGO bricks in your Mission Model Set. Dual Lock is designed to stick or "lock" to itself when two faces of it are pressed together, but you can un-lock it too. Wherever Dual Lock is called for in the instructions that follow, stick one square on the mat, adhesive side down, and then press another square onto the first one, adhesive side up (pulling fingers away will take practice!). These two squares locked face to face are a "pair". Finally, line the model up over its location, lower it, and press it down onto the Dual Lock. Using this technique ensures accurate pattern alignment. This application process for the Dual Lock is only needed once---Later, the models can simply be locked onto the mat or pulled off.

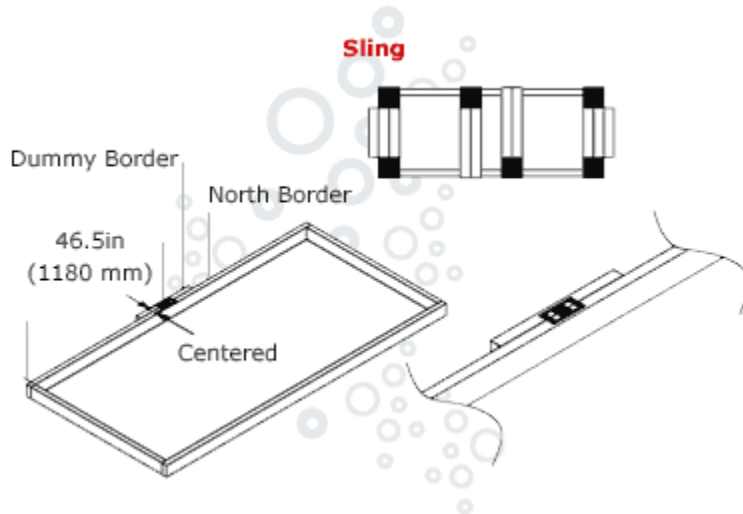
Mission model placement

Sling :

Use 6 Dual Lock pairs to secure this model; half on the Back Border, and half on the Dummy Border. See the sketch labeled Sling, and note that in all sketches, each solid black square represents a Dual Lock pair on the footprint of the model. Measure along the North border wall (don't rely on the mat) to find the midpoint

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between the East and West border walls. This point should be very close to 46.5 inches (1181mm) from the inside of either wall. Center the base of this model here for left/right positioning. For front/back centering, position it equally over the North and Dummy borders.



Pipeline:

READ THESE INSTRUCTIONS FULLY BEFORE STARTING.

This model consists of three subparts---The West, the East, and the Center, and all will be precisely secured to the mat. The West part is the long one with the yellow flags. The Center part is the short one, and the East part is the long one with no flags.

West: Orientation is with the yellow flags on the west end. See the sketch labeled Pipeline, and notice that each base for this side goes to the RIGHT of its location box on the mat. Use 3 Dual Lock pairs on each base, putting 1 pair at each north corner and 1 pair centered on the south side (12 pairs, total).

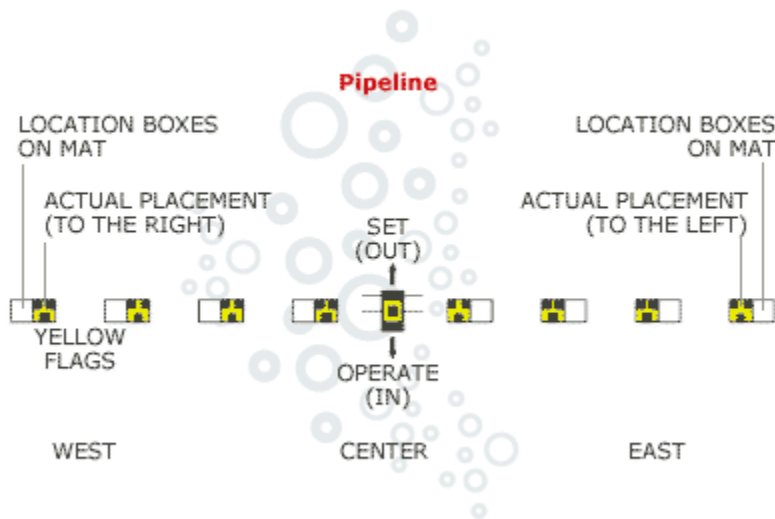
East: Orientation doesn't matter, but notice that each base for this side goes to the LEFT of its location box on the mat. The Dual Lock pattern is the same as for the West part.

Center: Notice that the location box for this model is wider than the model's base--this is for fine-tuning. Make the initial application of Dual Lock to the model's base instead of the mat, and when you press the model onto the mat, center it initially. The Dual Lock pattern is 1 pair at each corner and 1 in the middle. Be sure to orient the model's in/out direction as indicated on the mat.

Final setup for this model is with the Center section's black pipe pushed north (out), and with all three sections of pipe pushed east. To check the function of the Pipeline, make sure the Center part's pipe aligns with the other pipes when pushed south, and after that, a push of the East's pipe toward the west causes all three

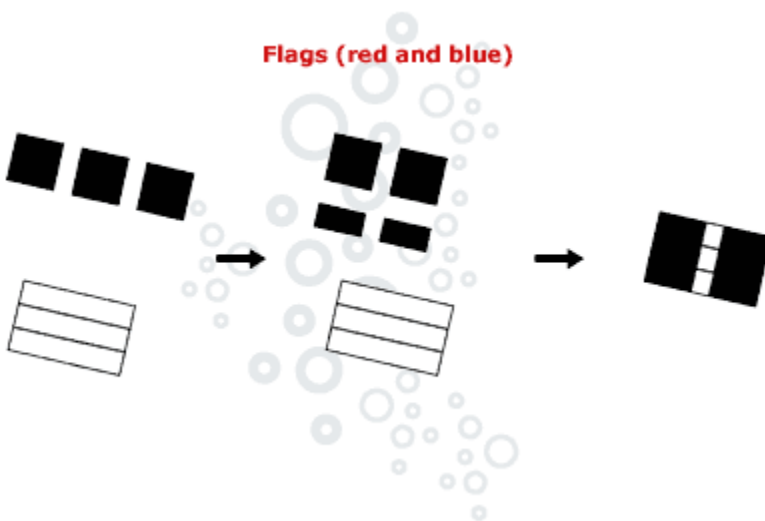
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sections to flip to the west. If the West or East pipes interfere with the Center's pipe when the Center's pipe is pushed south, relocate the Center model as needed.



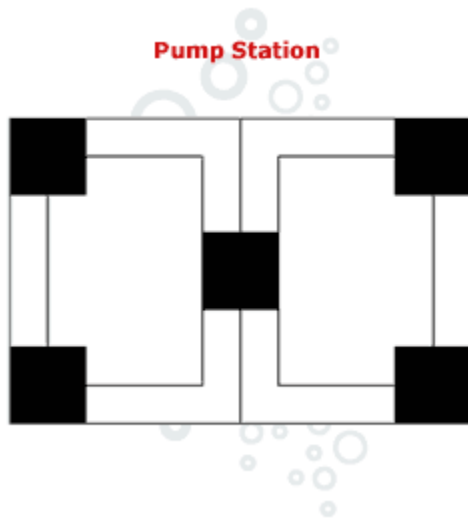
Flags (6 red, 6 blue):

Each grey base will be precisely secured in one of the corresponding rectangles on the mat. Arrange 3 pairs of Dual Lock for each base as shown in the sketch labeled Flags (red and blue). To make this arrangement, one Dual Lock pair for each base needs to be cut in half. Be sure the final orientation has the flag pivot at the south side. Each model is in its setup position when the flag is down toward the east.



Pump station:

This model is secured precisely over its spot on the mat, using 5 pairs of Dual Lock as shown in the sketch labeled Pump Station.



Research vessel:

READ THESE INSTRUCTIONS FULLY BEFORE STARTING.

The swivel base of this model is secured precisely on the mat, using 4 pairs of Dual Lock; one pair at each corner (of the swivel base--not the ship's deck). Make the initial application of Dual Lock to the model's base instead of the mat. While keeping its base off the mat, fit the back of the Research Vessel into its location mark on the mat. When it's perfect, lower the rest of the model down, and press just forward of its center to lock it in place. To gain access to the swivel base, you can temporarily pop off white decking as needed.

Fish (Green and Grey):

There is no Dual Lock on any of the Fish models. Place each Fish precisely over its spot as labeled on the mat, with the grey Fish over the spot labeled "shark" and its TAIL perfectly over its location box.

Submarine:

There is no Dual Lock on the Submarine. Locate this model on the bow of the Research Vessel model, aligning it by nesting its base into the bow's raised black square. Face the Submarine toward the Fish models.

Dolphin:

There is no Dual Lock on this model. Place the Dolphin in the Sling, facing east or west, but with belly down, and make sure the sling is level. Also, since the Dolphin must fall freely from the Sling when the Sling is tipped, be very sure that neither the Dolphin's nose nor tail is tucked under the red side beams of the Sling.

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Artifacts:

There is no Dual Lock on this model. Place it precisely on its spot on the mat.

Artificial reef:

There is no Dual Lock on this model. Place it precisely on its spot pattern on the mat.

Protective structure:

There is no Dual Lock on this model. Place it precisely on its spot pattern on the mat.

Shipping container:

There is no Dual Lock on this model. Place it precisely on its spot on the mat, noting the indicated setup position for the doors.

Crates:

There is no Dual Lock on these models. Place each one precisely on one of the rectangles east of the Shipping Container.

Field maintenance

Keep the models in original condition by straightening and tightening them often. Avoid cleaning the mat with anything that will leave a residue. Any residue, sticky or slippery, will affect the robot's performance compared to a new mat, which should be expected at some tournaments. Use a vacuum and/or a damp cloth for dust and debris (above and below the mat), and try a pencil eraser for tough marks. When moving the mat for transport and storage, be sure not to let the material bend into a sharp kink point. Such kinks are permanent and can affect the robot's movement. Kinks can also cause bubbling.

Optional Table

With safety, weight, height, and cost in mind, a simple design is offered here, but as long as your surface is smooth, and your Border Walls are located properly, how you support the field is up to you.

See your manual for high resolution images

Materials

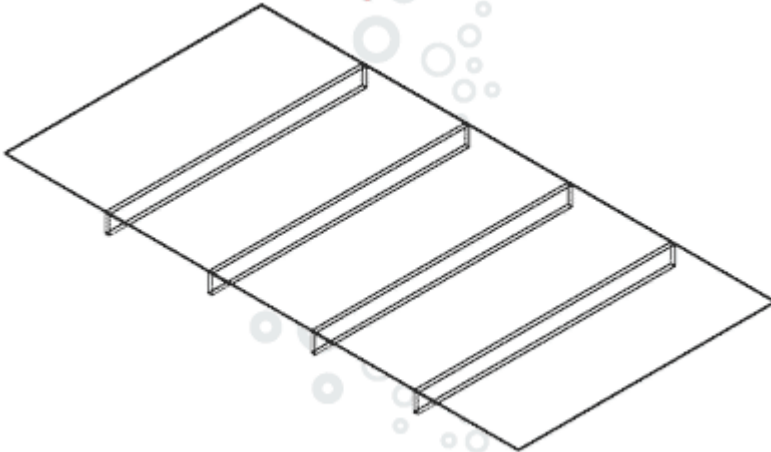
Material	Quantity (with light)	Quantity (no light)
Luan, 96" X 48" X 1/4"	1	1
Two-by-four, 8'	3	3
One-by-three, 8'	2	2
Two-by-three, 8'	1	N/A
Two-by-three, 10'	1	N/A
Black paint	1 pt. or spray can	1 pt. or spray can
Coarse drywall screws, 6 X 2-1/2"	1/2 lb.	1/2 lb.
Saw horse (kit), about 24" high and 36" wide	2	2
48" fluorescent shop light w/(2) 40-watt tubes	1	N/A

Parts

Part	Make From	Dimensions	Paint	Quantity (with light)	Quantity (no light)
Table surface	luan	96" X 48"	no	1	1
Long Field Border	two-by-four	96"	yes	2	2
Short Field Border	two-by-four	45-1/8"	yes	2	2
Stiffener	one-by-three	48"	no	4	4
Upright	two-by-three	48"	yes	2	N/A
Cross beam	two-by-three	99"	yes	1	N/A
Saw horse	kit	H ~ 24" W ~ 36"	no	2	2

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Figure 1



Assembly

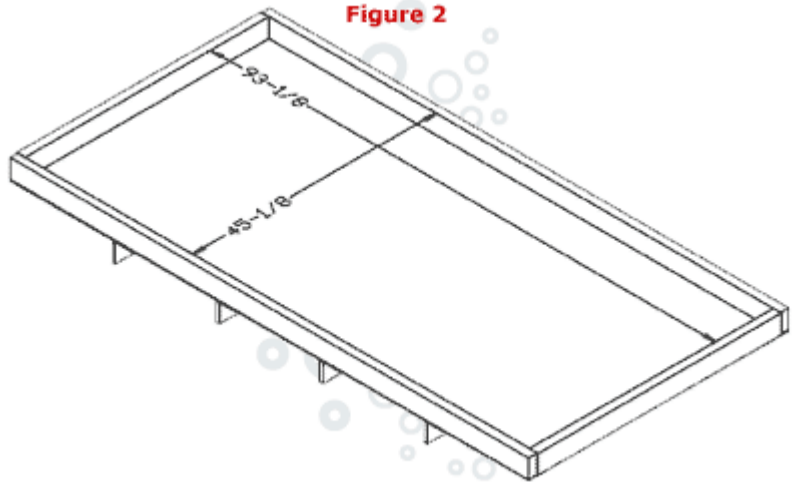
Step 1:

Decide which face of the luan is least smooth, and consider that the bottom face. On the bottom face, locate, clamp, and screw on the Stiffeners as shown in Figure 1 (about every 18 inches).

Step 2:

On the top face of the plywood, locate and clamp the framework of Field Borders around the perimeter as shown in Figure 2.

Figure 2

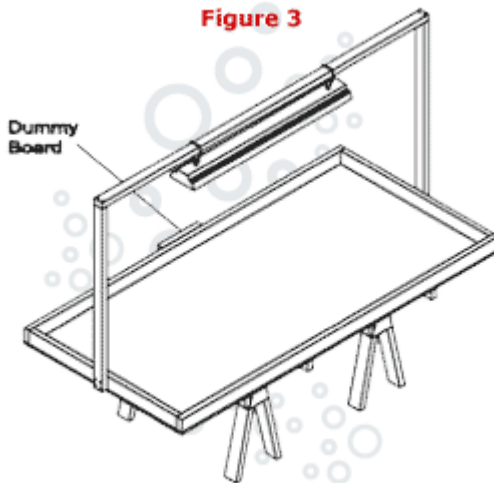


Step 3:

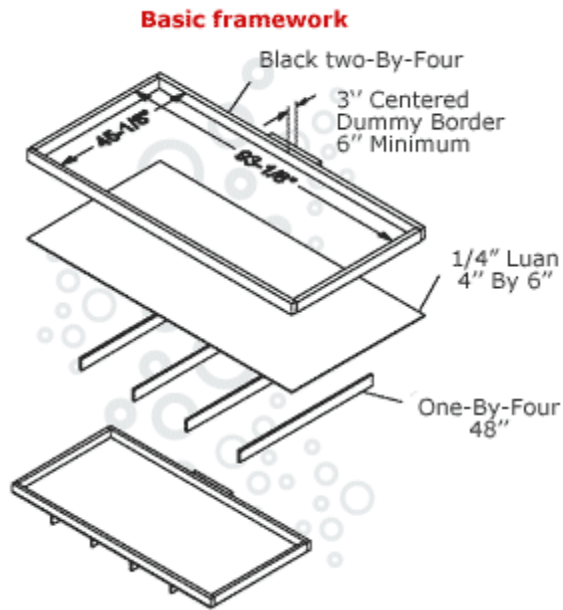
As shown in Figure 3, center, clamp, level, and screw the uprights onto the outside face of the short Field Borders. With the help of another person, situate the Cross Beam on top of the two uprights and screw it down. Hang the shop light by its chains from the center of the Cross Beam. With the help of another person, place the whole assembly on short saw horses.

Hang the shop light by its chains from the center of the Cross Beam. With the help of another person, place the whole assembly on short saw horses. If you do not have two fields to join back to back, center a dummy board made from scrap (at least 6 inches long) along the back Border Wall, since most Challenges include a Mission Model that rests across the three inch thickness of two borders next to each other.

Figure 3



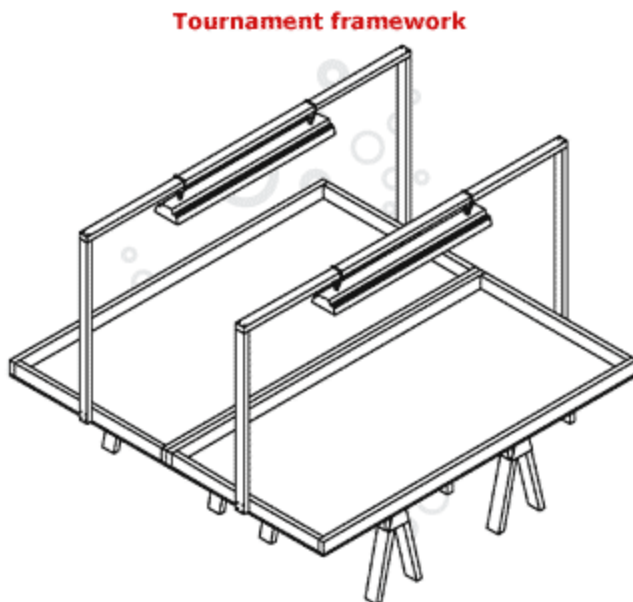
Surface & Borders



- To have the basic framework needed to hold your practice field, place the Field Mat from your Field Setup Kit on a smooth flat surface, and put Border Walls around it as shown in the diagram labeled Basic Framework. Note that the Field Mat and Border Walls could simply be placed on a smooth floor.

To have nearly the same exact setup as at a tournament, elevate the

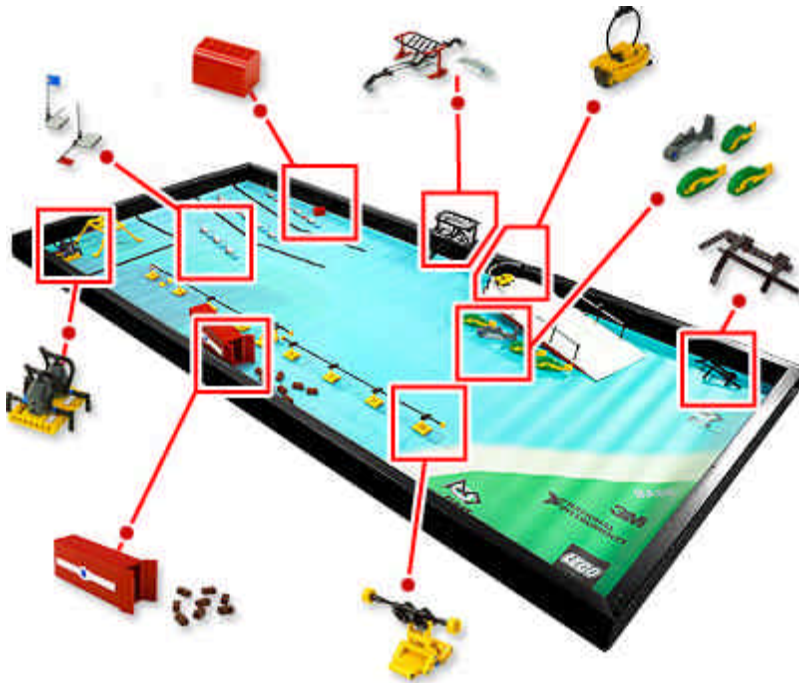
field about 2 feet off the ground and add fluorescent lights as shown in the diagram labeled Tournament Framework (Note: At the tournament, two tables are placed back to back). For ideas on how to proceed in building, go to the Optional Table instructions.



Once you have at least the Basic Framework, you're ready to go to Field Setup.

- :: **Optional Table**
- :: **Field Setup**

MISSIONS



- **Deploy the Submarine**



40 points (If the Sub is upright)

35 points (If not upright)

- The robot must get onto the Research Vessel and put the Submarine overboard from there. The Sub must be touching blue on the mat.

The deployment is worth 40 points if the Sub is upright, and 35 if it is not.

- **Conduct a Transect Mapping**



30 points (Any number of Flags up)

15 points (Each complete east/west row)

To show the location of the ancient shipwreck, the robot must flip transect Flags up.

Any number of Flags up at all (of any color) is worth 30 points, and each complete east/west row is worth an additional 15 points.



- **Protect the Pump Station**

40 Points

The robot must get the Protective Structure to straddle the Pump Station, with at least one of the Protective Structure's foot pads completely past the Pump Station's south wall.

This result is worth 40 points.



- **Service the Pipeline**

40 Points

The robot must install the new segment of pipe so that the team can test the line. When the segment is installed, the team must use hand force at the east end to raise the yellow flags.

The yellow flags raised are worth 40 points.



- **Sample One Species From Among Others**

35 Points

The robot must tag the grey Fish only. The grey Fish must be out of alignment with its location mark in some way and all green Fish must remain aligned with theirs.

This result is worth 35 points.



- **Release the Dolphin**

25 Points

The robot must get the Dolphin back into the ocean.

The Dolphin touching blue on the mat is worth 25 points.



- **Decide About an Artificial Reef**

40 Points

The robot must move the black structural debris either to shallow water, as an Artificial Reef, or to Base, as recyclable material.

The Reef touching shallow water (the lighter blue shade on the mat) or at Base is worth 40 points.



- **Clean Up a Cargo Shipping Accident**

30 Points

Bonus:

5 Points (each Crate at base)

2 Points (each Crate on table)

The robot must get the Shipping Container and its spilled Crates of plastic bags to Base so they don't harm any wildlife.

The Shipping Container at Base is worth 30 points. As Bonus Objects, all Crates are worth points anywhere on the table. Crates at Base are worth 5 points each, and other Crates on the table are worth 2 points each. When removing a Crate, the referee takes the one farthest west at that time.



- **Find and Recover Archaeological Artifacts**

35/25 Points

The robot must get the Artifacts completely off the outline of the ancient shipwreck for 25 points, or back to Base for 35 points.

Rules

1. Read this first: To maximize performance and eliminate surprises, you must take the time to read and understand FOUR documents: The Field Setup Instructions, the Missions, the Rules, and the CURRENT Questions & Answers (Q&A) page on the web.



2. Match: At a tournament, two Challenge fields are joined back to back, and each team is paired opposite another to compete in a match. For 2-1/2 minutes, the robot tries to get the most points it can by completing missions. The timer never pauses during a match. Each match is a fresh chance for the team to get its best score, and no match has anything to do with another.

3. Mission: A mission is a job the robot can complete for points. The robot starts from Base and goes out on one or more trips to try to complete one or more missions per trip. Missions can be tried in any order, alone or in groups, re-tried when possible and allowable, or skipped. Points are given if the required results are still visible on the field at the end of the match.

4. Round: The process of cycling all teams through one match each is called a round. Most tournaments run at least 3 rounds, and teams have time between their matches to go to the pit area and work on the robot and its programs as needed.



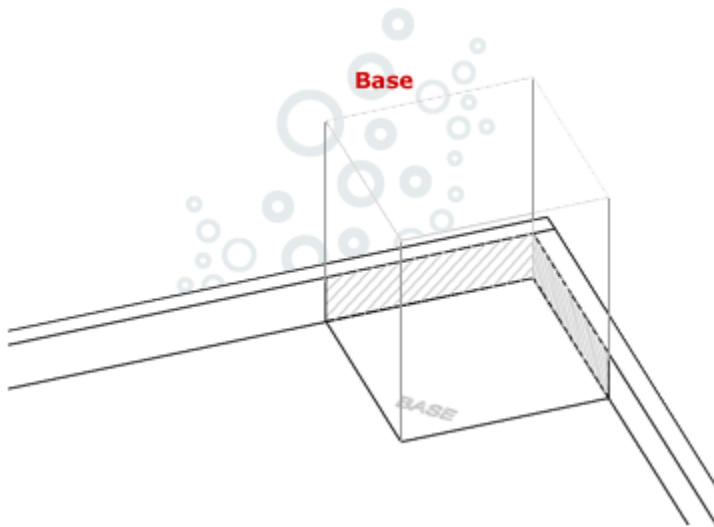
5. Robot: The robot is defined as the RCX and anything currently connected or attached to it. Mission models and strategic objects are not part of the robot.

6. Materials: EVERYTHING the team brings with it to the COMPETITION AREA of a tournament must be made entirely of LEGO elements in original factory condition. Electrical parts are limited in type and quantity to 1 RCX, 1 rotation sensor, 2 touch

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sensors, 2 light sensors, 3 motors, 1 lamp, 6 AA batteries. Wires are not limited. Stickers, paint, tape, glue, oil, etc. are not allowed, except marker can be used for owner identification in hidden areas only. This rule applies only to the competition area (except remote controls are not allowed anywhere).

7. Base: Base is an imaginary hollow shape formed by vertical walls that rise from the perimeter of the Base's footprint (including the inside surfaces of the border walls), and by an invisible ceiling 16in (40cm) high. NOTE: Base is a VOLUME--- not an area.



8. Autonomy: Robot performance must be autonomous (hands off). Ideally, this means that after preparation by the team, the robot is supposed to leave Base and accomplish missions BY ITSELF, and return to Base BY ITSELF if needed. Most robots require multiple trips, with some rescue and/or preparation between trips. If the team must rescue (touch/handle) the robot, depending on where the robot is and what it's doing, there can be negative consequences as described under one or more of the rules RESTARTS, BONUS LOSS, RETRIEVABLES/ROBOT TOUCHED, and LOSS OF CONTACT.

9. Participation: See the Coaches' Handbook for specifics about team size and allowable ages. At the tournament, only two team members at a time are allowed right up at the competition table except during repair emergencies. The rest of the team can stay nearby, but away from the table. To share in participation, members can rotate in/out at any time.

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10. Operational definitions: Though the Challenge is fun, it is robotics after all, and like all technical work it depends on specifics and exact descriptions of physical conditions. So to limit language-induced confusion, the following operational definitions are provided for the location of objects (or the robot) with respect to the missions and rules:



To/At/Reach: When an object must get TO, be AT, or REACH a target, it is sufficient for any portion of the object to barely cross over the outer edge of the destination.

On/Onto: When an object must be ON or get ONTO a target, the target should be able to support all the weight of the object when any/all other supports are removed.

In/Into: When an object must be IN or get INTO a (container-type) target, the object must be trapped from falling out or rolling away in at least 5 directions.

Touching: When and only when an object must be TOUCHING a target, the object itself must be making direct contact with the target.

Completely: When an object must meet a condition COMPLETELY, every bit of the object must meet the condition.

11. Strategic objects: Strategic objects are allowed and defined as any team-designed objects other than the robot and its attachments, used by the team or the robot, for use in or out of Base. Strategic objects with wind-up or pull-back “motors” are allowed, with these restrictions: They must be released by the robot, they must be completely out of Base when released, and the robot must be completely out of Base when it releases them.

12. Stray objects: Any object caused by a robot to be in the way of either team’s robot performance can be moved by the referee (ref) upon team request unless doing so would have a direct effect on scoring, or unless the object is part of a larger mission model.



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13. Preparation: Before the match and between trips into the field, the robot may be repaired, reconfigured with attachments, loaded/unloaded, and aimed. Its mechanisms may be set/reset, its buttons may be pressed, and its sensors may be signaled. This handling of the robot must take place at Base. Objects apart from the robot can be handled at Base or off the table at any time.

14. Starting position: For all starts, all portions of the robot (not just where it contacts the mat) and its currently used attachments, strategic objects, and deliverables must start from completely in Base, with leniency for slight overextensions.

15. Starting technique: To be allowed to start, the robot must be motionless and the team can not be touching it. The team is then allowed to use one of three ways to get the robot in motion: 1) Touch a button, 2) Signal a sensor, 3) Wait for a running/paused program to resume. The team must not handle the robot in any other way throughout the start. Successfully started, the robot is now performing autonomously.



16. Robot must leave base: Directly after every start, the robot must leave Base completely before it can cause any changes in the field. The robot is not allowed to cause any changes in the field while still partially in Base through extension or tethering. Also, the robot is not allowed to cause objects to leave Base unless they are being taken along in contact with it through pushing, carrying, or pulling.

17. Restarts: Any time a performing robot is touched, no matter where the robot is, it is considered STOPPED and must immediately be returned to Base if it's not already there. The team may then make preparations, and follow the starting technique again when ready. NOTE: The robot does not have to return to Base unless the team touches it, or unless a mission specifically requires it.

18. Bonus objects/loss: Bonus objects are described in the missions as already being in scoring position as part of field setup. Each time the robot is touched while completely out of Base, the ref removes one bonus object from the table if there

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are any available at that time. If the robot is touched while in Base, or crossing into or out of Base, there is no bonus loss.

19. Housekeeping: Any objects at Base which could get in the way of the robot's preparation or motion may be kept "near" Base as long as they do not cause any changes in the field.



20. Muscle action: The team is not allowed to cause anything but the robot to leave or extend out of Base, directly or indirectly, except as described in the rules STARTING TECHNIQUE and ROBOT MUST LEAVE BASE.

21. Interference: Your team's robot is not allowed to have any effect on the other team's robot, field, or strategy except by directly meeting the scoring requirements of missions in areas that are shared between the two sides by design of the Challenge.

22. Deliverables/retrievables: Deliverables are objects which are worth points outside of Base. Retrievals are objects which are worth points at Base.

23. Deliverables/points: Points for a deliverable (unless otherwise required in a mission) are given as long as some portion of the deliverable itself is at its target, whether or not it is packaged, or joined with others.

24. Deliverables/robot touched : If the robot is touched while in contact with a deliverable, the team is given that object in Base, no matter where it came from.

25. Retrievals/points: Points for a retrievable are given as soon as the retrievable itself reaches Base, no matter where the robot is, with leniency in close situations.

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26. Retrieval/robot touched: If the robot is touched while in contact with a retrievable which has not reached Base, the ref keeps that object off the field and it is not worth points, with leniency in close situations.

27. Loss of contact: When the robot is completely out of Base and loses contact with a deliverable, retrievable, or strategic object, the team can not get that object back by hand.

28. Robot damage: At any time during the match, the team can recover robot parts that come off as result of obviously unintentional damage. The team can do this by hand or request help from the ref.

29. Field damage: Except as allowed in the rules STRAY OBJECTS, HOUSEKEEPING, and DELIVERABLES/ROBOT TOUCHED, the team is not allowed to handle mission models outside of Base. The team must use the mission models supplied by the tournament and can not bring duplicates to the competition area. Changes in the field are never restored by hand for the sake of giving the team "more tries". However, if a mission model accidentally breaks, malfunctions, moves, or is activated by anything other than allowable robot action, the ref reverses the change as soon as possible, and gives the benefit of the doubt if points are in question. Intentional field damage is also reversed, but draws a warning, and may result in denial of points.



30. Score determination: To minimize controversy about what happened during a Match, THE SCORE IS DETERMINED AT THE END OF THE MATCH, BY THE CONDITION OF THE FIELD AT THAT TIME ONLY. This means that points are not given for accomplishments that the robot accidentally trashes before the match ends.

31. Benefit of the doubt: In situations that are too close to call, like when a split-second or the thickness of a line is a factor, the team gets the benefit of the doubt. In general where the team disagrees with the ref and the team can respectfully raise sufficient doubt in the ref's mind, the ref meets with the head ref,

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and the resultant decision is final. Here, the team should NOT necessarily expect the benefit of the doubt.

32. After the match: At the end of each match, the ref and the team look at the field together and come to agreement about what points were given or missed and why, and to be sure that the team is not walking away with any mission models.



33. Precedence: When there is conflict between a mission and a rule, the mission takes precedence, but the current Q&A page on the web takes overall precedence.

34. Software: The robot must be programmed using LEGO MindStorms Robotics Invention System or RoboLab software (any version).

35. Downloading: One team's download can erase another team's programs and ruin their performance. Therefore, downloading is only allowed in the pit area, download settings must be kept on short range, the process must be shielded from surrounding teams, and the RCX should be kept OFF when not in use.

36. Challenge questions/support: For official answers to questions about the Robot Game part of the Challenge, including rulings on special strategies or situations, e-mail filltech@usfirst.org (most efficient) or call 1-800-871-8326, x118 (less efficient). For best results, be sure you've read the four documents listed above, under the rule READ THIS FIRST. When e-mailing, be sure to put "Challenge" in the subject line, and please state your role on the team (member, coach, parent, mentor). When calling, please leave your contact information slowly, your role on the team, and YOUR QUESTION on voicemail. NOTE: filltech does not answer questions about building or programming the robot. NOTE: The FLL International Forum is great for sharing ideas, but it is NOT A RELIABLE SOURCE OF ANSWERS about the Challenge.



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37. Full disclosure/transparency: Since individual victory need not come at the expense of collective excellence, all official answers given to teams through Challenge support are subject to public posting in the Q&A, including answers about ALLOWABLE strategies. Also, the only documents given to the refs for reference to conduct matches and make calls are the same 4 documents you and every other team have access to all season. So if a strategy is questionable for you, chances are it will be questionable for the ref too, and guarding it until the tournament is risky.

38. Coaches' meeting: If a question does come up right before the tournament, your last chance to ask it is at the "Coaches' Meeting" the morning of the tournament. There, the head ref and the coaches meet to identify and settle any differences BEFORE the matches start. For the rest of the day, the ref's calls are final when the team leaves the table.

Q & A

It is very important for your team to keep checking back to this page often, since it will be updated as needed. The answers, clarifications, updates, and rulings found here are official, and will be applied at tournaments.



<http://www.firstlegoleague.org/default.aspx?pid=15920>

! ALERT ! *New “FULL DISCLOSURE” system being adopted this year: All official answers given to teams through Challenge Support are/will be subject to public posting here in the Q&A, including answers about ALLOWABLE strategies. There are two reasons for this change:*

- 1) Past rulings on protected strategies asked for in confidence were too often seen as mean spirited secrets or mysterious rule changes when they were finally brought to light.*
- 2) We wish to reaffirm that victory over a challenge is more meaningful than victory over another team, and that winning need not come at the expense of collective excellence.*



Definition line for base

9-12-05

Q: Is the “base line” between the trees and the sand, or between the sand and the water?

A: Base extends to and includes the transition between the sand and water. Since the line is fuzzy this year, referees will extend the benefit of the doubt to robots coming and going in this regard.



Red vs. blue flags

9-12-05

Q: What’s the difference between the red flags and the blue flags in terms of scoring?

A: There is no difference. Remember, there are no scoring details other than the ones mentioned in the Missions and Rules. If something is not specified or restricted, then it doesn’t matter.

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The Project



Our oceans are of vital importance to the health of the Earth, yet only 1% percent of these magnificent bodies of water has been studied. We have explored space more than our oceans.

Oceans provide us with many resources and activities from the fish we eat, oil drilled from the ocean floor, to extracts from seaweed used to make ice cream.

The oceans provide a wide, navigable highway for the shipping industry, and an underwater playground for activities like scuba diving.

Oceans fuel this planet's most vital ecological processes, like the water cycle, and the carbon-dioxide cycle. Living oceans absorb carbon dioxide and pump oxygen into our atmosphere, thereby sustaining the

planet's diverse flora and fauna– yet we know very little about how we are impacting this important resource.

Project Overview

Choose an ocean activity you do or resource you use and trace its impact on our oceans' health, biodiversity, and productivity. Learn what the experts and other groups are doing in this area, and identify a challenge they are facing.

Create an innovative solution to help them improve the use of this resource or activity, while minimizing the negative impact on our oceans for present and future generations.

Finally, share what you have learned with others.

All three parts of your Project will be evaluated during the judging session at an Official FLL Tournament. Refer to your *FLL Coaches' Handbook* and Project Rubric for details.

Project Guidelines

1: Choose an ocean activity you do or resource you use and trace its impact in terms of the oceans' health, biodiversity, and productivity.

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- Identify challenges, opportunities, and/or new ideas for this ocean activity or resource.
- Identify experts working in this field. Contact them or read about their work to learn:
 - What fields of science are related to the topic you have chosen?
 - What challenges, opportunities, or new ideas are they exploring and why?
 - How is their work helping the oceans for present and future generations?

2: Create an innovative solution.

- Think of a creative way to help improve the use of this resource or activity while minimizing our negative impact on the ocean.
- Explain how this solution will help, why it is important and what might happen if this solution is not used.

3: Present your solution and research findings.

- Create a presentation that's fun and informative.
- Share your solution with others in your school and/or community.

Getting Started!

Here are some ideas to help you get your Project started:

- Compile a list of questions to ask the experts and others who study the oceans.
- Read about or host a meeting with experts in oceanic studies and learn what they are working on and why.
- After brainstorming, select one idea to focus on.
- Write to your local/state/national government about your project and learn what they are doing to protect the oceans' resources.
- Learn more by contacting universities, museums, businesses, industries, groups and organizations that focus on the oceans.
- Use the Project Resources on this site to gather information.
- Create a flyer, website, brochure, skit, or short play about your Project for your school or community.



Invite other FLL Teams and the public to view your Project presentation.



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Project Resources

Biology & Impact

Reef ball

:: <http://www.reefball.org>

Shifting baselines public service announcement

:: <http://shiftingbaselines.org/index.php>

Monterey Bay Aquarium

:: <http://www.mbayaq.org/>

New jellyfish

:: http://news.nationalgeographic.com/news/2003/05/0505_030505_tvnewjellyfish.html

How sonar works and how animals use it

:: <http://www.exploratorium.edu/theworld/sonar/>

Letter to nature about pelagic fish decline

:: <http://www.seismo.berkeley.edu/~manga/eps3/myersandworm2003.pdf>

:: <http://www.mindfully.org/Water/2003/Predatory-Fish-Depletion15may03.htm>

:: <http://www.seaweb.org/whatis/5.15.03.release.html>

Decline of fish stocks in northeast coastal areas

:: http://pubs.nrc-cnrc.gc.ca/cgi-bin/rp/rp2_abst_e?cjfas_f04-079_61_ns_nf_cjfas4-04

Long line fishing boats and albatrosses

:: <http://www.birdsaustralia.com.au/albatross/longline.html>

:: <http://www.environmentalaction.net/antarctica/albatross/index.html>

Pollution

:: <http://www.wired.com/news/technology/0,1282,63699,00...>

Coral reef ecosystem report

:: http://ccma.nos.noaa.gov/featurearchive/ccma_stateofcoral.html

Carrageenan

:: <http://home.howstuffworks.com/question315.htm>

Seaweb

:: <http://www.seaweb.org/>



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Really deep creatures

:: http://news.nationalgeographic.com/news/2005/02/0203_050203_deepest.html

Engineering & Research



Underwater habitat for humans

:: <http://www.uncw.edu/aquarius/>

Deep sea robot

:: http://news.nationalgeographic.com/news/2003/07/0716_030716_ballard.html

Woods Hole Oceanographic Institution

:: <http://www.whoi.edu/>

National Oceanic & Atmospheric Administration

:: <http://www.noaa.gov/>

Alvin

:: <http://www.ocean.udel.edu/extreme2001/mission/alvin/>

:: http://news.nationalgeographic.com/news/2002/07/0708_020708_TVseamount.html

Dive & Discover expedition logs - info about what happens on a research vessel (including Alvin)

:: <http://www.divediscover.whoi.edu/>

Take a virtual dive for a behind-the-scenes look at the technology involved in exploring the Titanic

:: <http://dsc.discovery.com/convergence/titanic/technology/technology.html>

Ben Franklin Sub

:: http://www.vancouvermaritimemuseum.com/exhibits_ben.htm

Tour a seafloor observatory at an active underwater volcano

:: <http://www.pmel.noaa.gov/vents/nemo/index.html>

Underwater robots you can build

:: <http://www.westcoastwords.com>

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Archeology

Shipwreck

:: http://news.nationalgeographic.com/news/2003/08/0821_030821_republic.html

SS Republic (gold coins)

:: http://news.nationalgeographic.com/news/2003/12/1201_031201_republic.html#main

Careers

Women Oceanographers

:: <http://www.womenoceanographers.org/>

Ocean Careers

:: <http://oceancareers.com>

Career site created by kids for kids

:: <http://www.thefunworks.org/>



Ocean Odyssey Design Team Experts



George Matsumoto

(http://www.firstlegoleague.org/sitemod/upload/Root/America/G.Matsumoto_bio.pdf), Education and Research Specialist, Monterey Bay Aquarium Research Institute



Dave Gallo

(http://www.firstlegoleague.org/sitemod/upload/Root/America/D.Gallo_bio.pdf), Assistant Director of the Center for Marine Exploration, Woods Hole Oceanographic Institution



Other Media



Three Examples of Universal Design Applied to Oceanography (see also "Universal Design Award")

:: <http://www.westcoastwords.com>

:: <http://www.bbc.co.uk/nature/blueplanet/>

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