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FLL WORLD CLASS Project Updates

7 – ADULT INTERVENTION VS. IMPLEMENTATION

Sometimes teams design a Project solution that you cannot implement alone – it requires special equipment or training that you cannot reasonably get during the FLL season. If the idea, details, and content come 100% from team members, then it is OK to recruit some help to IMPLEMENT the team’s idea. This is not adult intervention because team members are doing all the important work, such as doing the research and making all decisions. Be prepared to tell the judges how your team developed the idea and why you could not implement it alone. For example, if your team’s solution requires complex computer programming (beyond what you need for the Robot Game), you probably do not have time to become fully trained in this special skill. Like an adult inventor, you may work with a mentor or company to produce the item you designed. This is an opportunity to learn more about the careers and skills involved with implementing real-world solutions.

6 – IMPROVE LEARNING WITH YOUR SOLUTION

Remember that your team’s solution should improve the learning experience for the topic you choose. (That’s why your FLL WORLD CLASS Question uses the format “How could we improve the way that someone learns [your team’s topic]?) The judges at your tournament will expect your team to show or explain how your solution makes the learning experience better in some way. An innovative solution will improve something that already exists, use something that exists in a new way, or invent something totally new.

5 – QUESTION VS. PROBLEM ON THE RUBRIC

Most years we ask teams to identify a problem, so the Project rubric asks for a “Clear definition of the problem being studied” in the Problem Identification category. This year we have asked teams to identify an FLL WORLD CLASS Question instead. You can simply substitute the word “Question” for “problem” on the Rubric. For example: “Clear definition of the Question being studied.” You can make your team’s Question more detailed by adding information about your topic, the learners you are trying to target, or other relevant details.

4 – LEARNING AT ANY AGE

People learn at all ages. The learners you are trying to help with your FLL WORLD CLASS Question may be people of any age you choose. If age is important for your topic, you may want to specify this in your FLL WORLD CLASS Question.

3 – SPARE REVERSE ENGINEERING PIECES

If you read the Field Setup for the Robot Game, you will see that you have two sets of Reverse Engineering elements for the Robot Game and “the rest are related to the FLL Project.” These are for the Communicate It! Activity found on the





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Challenge webpage: <http://www.firstlegoleague.org/challenge/2014fllworldclass>. Look under Supplemental Materials for the Project. This activity provides a fun way to think about the concept of learning. You can always use it to build teamwork – or for a fun break.

2 – ANIMALS

To write your FLL WORLD CLASS Question, your team must choose a topic that a PERSON could learn. It is ok if there is an animal involved in a helping role (animals can assist in many learning situations), but the primary focus must be about how a person can learn some new information or skill. If your team is really passionate about involving animals, you could potentially focus on how a person learns ABOUT animals or how a person learns to train them.

1 – FLL WORLD CLASS QUESTION WORDING

You may write your FLL WORLD CLASS Question to target a specific group, if you wish. For example, all of these would be valid questions:

- How could we improve the way that someone on the autism spectrum learns to play soccer?
- How could we improve the way that a hearing-impaired person learns sign language?
- How could we improve the way that someone in 4th grade learns math concepts?

FLL WORLD CLASS Robot Game Updates

Update 38 is NEW.

38 – ENGAGEMENT WHEEL SPINNING TOOL

Rule 39 requires objects the robot is “about to move or use” to be completely in Base during starts/restarts, but how much time needs to elapse between the robot’s activation and its use of something which is NOT in Base? Since this is not at all clear from the Rules, benefit of the doubt is being given. So: If you see a robot leave or even just reach from starting position, activate a strategic object (which is already completely outside Base), and retract, then repeat, turning the pinwheel 90 or 180 degrees each time... This is legal and scoreworthy.

37 – ONE ROBOT, FOUR MOTORS

If you’re wondering if you can use more than one robot in a match, you have apparently missed this Rule 22, in conjunction with Rules 12 & 19...

The one-controller limit is NOT about what you USE in the match... It’s about what the entire team HAS with them. You’re simply not allowed to take more than *one controller to the match at all, period. Imagine the referee inspected your team when you arrived at the match, and looked in your bins, boxes, hands, trays, robot, attachments, pockets, etc... If a second controller is found, even as jewelry





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- it's illegal. (Please use this same reasoning if you're wondering about bringing more than 4 motors to a match.) *You may bring a different controller to a different match, but during any one match, you must commit to one controller, and use that same controller the whole time. (Clarification of existing rules)

36 – ROBOT END-OF-MATCH LOCATION

By Rule 2, since the final location of the robot isn't mentioned in any rule or mission... It doesn't matter.

By Rules 2 and 29, if the robot legally performs an action worth points, or legally produces a condition worth points, nothing anywhere says the robot has to later return to Base for them to count, so it doesn't.

35 - SENSES LOOP SETUP

The Field Setup instructions for the Senses model describes the placement of its loop as "captured in the grabber." There is no mention of its precise position east/west. So by Rule 2, this detail "doesn't matter" when setting up the field. This wiggle room causes the variable behavior you may have experienced on your practice fields over the last two months or so, and since all Senses models are alike, you should expect this same variable behavior at tournaments. By Rule 37, the loop will not be set to your preference, so part of your challenge is to minimize or eliminate the variable behavior through robotic strategy. (Reminders of Rule 2 and 37)

34 - USING EYES SENSORS

Using your "eyes as sensors" is only illegal in the precision-timing context of the rule it appears in - Rule 48. Except for Rule 48 situations (precision robot-grab timing), of course everyone uses eyes as sensors - every time you see the field and prepare your robot accordingly for its next start. People are asking about a particular strategy which I don't want to advertise here, but here's the answer: If you're wondering whether sensor use is a requirement for a particular mission, please re-read Rule 2, and then have a fresh look at the mission's requirements. If you have no idea what this Update means, feel free to ignore it. (Reminder of Rule 2, clarification of Rule 48)

33 – BULB SIDEWAYS

If the bulb slab is on its side, that shall count as up. (Out-Of-Box leniency announcement).

32 – "RELEASE"

For the Sense mission, it's important know the actual definition of "release"... To release something is to allow it to move or be taken. Release does not mean "eject." (Senses mission clarification)

31 – DURING THE SHOT

The process of "sending" the ball is complete as the ball loses contact with whatever moved it. At that loss-of-contact time, the shot lines no longer matter. (Sports mission clarification)





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30 – APPRENTICESHIP PEOPLE, WHITE CIRCLE

Update 25 was meant to remind you about Rule 18, Exception 2. You ARE allowed to arrive with people as part of your model, if they aren't duplicates of this year's mission model people. (Clarification of Update 25)

Of the two interpretations of what could be meant by "white circle," area vs perimeter, the area is what matters. So if your model ends up touching only the interior, and not the edge, that's okay. (Apprenticeship clarification)

29 – TAPE MAT AT SOUTHEAST END

Please tape the mat to the table using a thin strip of black tape about 12cm long. Allow tape to cover only the mat's east black border, and don't stick tape to the wall. Reason for the tape: Sometimes when the Community loop is pulled, the entire model and mat come up instead of just the loop, and this is happening inconsistently. (Policy announcement)

28 – REVERSE ENGINEERING DECISIONS/CLARIFICATIONS *Though it's not required, let's all build our models simple and compact, so this mission runs smoothly!

- If the robot gets the basket to Base, but all or some of the model came out along the way, anyone may simply (carefully!) move it to Base by hand (this is an exception to Rule 38).
- You need to replicate the model you get, as-is, even if it's in more than one piece.
- Where the mission requires "the" model to be in Base, take that to mean this: At the end of the match, be sure the original and the replica are easy for the referee to inspect. (Reverse Engineering Rulings and clarifications)

27 – ENGAGEMENT ENGAGEMENT

For rare yellow lever pushes, the engagement model's black "ball" gears don't settle down and mesh. Anyone who sees this should immediately spin the lower gear (direction doesn't matter) a little by hand to settle the components (this is an exception to Rule 38). If any dial progress is lost due to late discovery of this problem, the team will be on their honor to tell the referee where the dial should actually be. (Policy announcement)

26 – COMMUNICATION "PULL"

People are wondering if it's okay for the camera model's slider to be moved sideways or away from the robot. That means referees would wonder about this too, as referees are a lot like people. Since inconsistent rulings at tournaments are unfavorable, this Update is to reinforce that the mission's method constraint does say to "pull" the slider, and "pull" has a clear physical definition. Conclusion: Make sure the action you design is one that a referee will agree causes the slider to move toward the robot. Please don't send me questions and videos asking if your situation will score, as I won't be your referee. Instead, just know that the more compelled you feel to ask "Is this okay?" the more risk you're taking. And for referees, as usual, if you don't feel strong when ruling about a situation compared to the text that governs it: Rule 3.





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25 – APPRENTICESHIP PARTS

The parts used to make your Apprenticeship model come from your own LEGO supply. If you want to do this mission, you build the model (your own design) before the tournament, and bring it to the competition table with NO people on it. If you'll be attaching people, you'll use the ones supplied by the tournament. (Mission text clarification and reminder)

24 – REVERSE ENGINEERING, REVISITED

The parts used for the Reverse Engineering model/practice come in your Field Setup kit. This explains the similarity between your left-over Field Setup kit parts and the parts shown and described in the middle of Page 10, under "Reverse Engineering." Unlike the Apprenticeship model parts, the parts for the Reverse Engineering model are sitting in Base when you walk up to the table. During setup before your match, that's when you *use one full set of 6 of those parts to build a quick little model and put it in the other team's basket, as described on Page 10. *This is a mandatory part of regulation field setup - you must do this, even if you don't plan on doing the Reverse Engineering mission during the match. If you'd like to save time doing this, plan on making a simple model, and practice it before the tournament. (Mission text clarification and reminder)

23 – SEARCH ENGINE COLORS FOR 60

- If one color is ENTIRELY in the frame, take the matching loop.
- If one color is ENTIRELY above the frame, take the matching loop.
- If one color is ENTIRELY above the frame AND another color is ENTIRELY in the frame, take EITHER matching loop, but not both. (Mission correction/leniency announced)

22 – SEARCH ENGINE SLIDER

- After being used to spin the wheel 1+ times, the final location of the slider doesn't matter.
- When earning only 15 points for the Search Engine mission, you will still get those points no matter what happens to any loops. (Mission text reminder and correction)

21 – KEY INFORMATION

- The LEGO elements for the key you design/"SUPPLY" are not part of the field setup kit. Instead, you use parts from your own supply.
- A key does not need to be in the cloud at the end of the match. (Mission text clarification and reminder).

20 – PEOPLE ATTACHMENT

When earning only 20 points for the Apprenticeship mission, you will still get those points if you forget to attach the people your





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model. (Leniency announced)

19 – ENGAGEMENT 20

The 20 points for pushing the yellow section south are earned even if the pinwheel is never spun. Also: If the pinwheel is spun, these 20 points are not affected by the multiplier. Also: Any penalties are affected by the multiplier. (Mission text correction and reminders).

18 – CHANGING CONDITIONS 90 DEGREES-ISH

- Because this model is proving to be more fragile than it should be, Rule 30 will still apply, but calls will “lean” toward benefit of the doubt.
- Because this model isn’t always dropping into its 90 degree position, you will get benefit of the doubt when the rotation is “close” to complete, by referee judgment.
- Please do not email asking what “lean” and “close” mean. Please expect referees to disagree with you. Please remember that before this leniency Update, you had to be a lot more gentle and precise than you do now. Please remember you still have engineering control: Teams who get closest to perfect will score most reliably. (Mission and Rule 30 leniency announcement)

17 – LOOP DECISION

In order to have more than six loops to put on the Project-Based Learning scale, yes, you have to sacrifice at least 45 Search Engine points. This is a simple consequence of Rule 51, 3rd bullet down, and redundantly of the “end of the match” phrase at the top of the Search Engine mission itself. It is not a penalty, or a loss – it’s your strategic choice. (Rule 51 and Mission text reminder and insight)

16 – “SPIN” AMOUNT

Where the Search Engine mission requires the wheel to have been spun “at least once,” that does not mean spun “some amount.” It means spun “at least one full revolution.” My bad. (Mission clarification)

15 – PENALTY STORAGE

TEAMS: Rule 35 allows you put the penalty markers somewhere out of your way, where they don’t affect anything... For this game, that will be “in control of the referee.”

REFEREES: As a referee staff together at your event, please pick your favorite TWO locations where penalty objects don’t affect anything - on the mat, a border wall, or your person - with at least one of these places being in plain sight for everyone. As penalties are earned, move the objects them from one location to the other. Thanks. (Reminder of Rule 35 and a policy announcement)

14 – REVERSE ENGINEERING WORKSPACE AND TIME

The Rules allow only two team members at the table at a time, and they also require scoring objects to be in view of the referee during the whole match. So the replication work must be performed at the table by one of the two current drivers. Also: Yes, this mission





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takes time during setup, and during the match. Before the match: Do not expect tournaments to help teams with this mission by extending setup time. This is YOUR challenge. With practice, your construction can take just a few seconds. You can make a simple shape, helping yourself as well as the other team, or you can enjoy challenging them and yourselves by making a complicated design. During the match, you don't have to do this mission. (Reminder of Rules 34, 35, plus a rant)

13 – STORED OBJECTS CAN NEVER CAUSE PENALTIES

It doesn't matter where they are, or how big they are. (Clarification/Reminder of Rules 32, 33, 35, 45)

12 – IDEA IN BASE

Since it's not clear if the light bulb slab is part of the "box" mission model, you may bring this part to Base. (Rule 2 related mission ruling)

11 – WHAT'S A "SHOT?"

When a word isn't given an FLL definition, please use the common understanding of the word. Only because it has been frequently requested... Our meaning of "take a shot" is to release or propel the ball in a way the referee thinks was designed to cause the ball to come to rest in scoring position. If you're not sure the action you're designing will look like a shot to any referee, design a different action. (Policy announcement, mission clarification, and strategy advice)

10 – EAST/NORTH OF SHOT LINE

If the robot is taking a shot at the goal, the entire robot needs to be east/north of the shot lines. (Reminder of Rules 2, 12)

9 – GET BALL OUT OF WAY

If the robot leaves the ball outside Base in an undesirable place, you or the referee may move it away at any time, but it may no longer be used for anything. (New exception to Rule 38)

8 – CLOUD KEYS WILL NOT BE JUNK

Leaving a cloud key outside Base will not cause a Junk penalty. (New exception to Rule 32)

7 – APPRENTICESHIP

You arrive at the table with your Apprenticeship model already built. You may add the people to it by hand, any time, including pre-match setup. Just by having the model in view of the referee (in Base or any other Rule 35 storage area) you get 20 points. To get 35 points instead, bind the people to it, and have the robot place it such that it's touching the northwest circle and not touching Base. This will not cause a Junk Penalty. (Mission clarification)

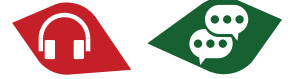
6 - SHARED MISSION

The screen and camera system works very well when set up perfectly. But an always-perfect setup is unrealistic to expect during tournaments. So this year's shared center model will represent sharing, simply because of what it is, and physically it won't work unless both teams activate it, but the POINTS you earn will not be dependent on the other team. (Reminder of Rule 2.)





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5 – FIELD SETUP FACTS

- The picture at the bottom right of Page 11 should be labeled “EAST CENTER GUIDE.” (Page 11 correction)
- The lone loop in the south center of the field is to be placed as shown at the top right of Page 10. (Page 13 picture correction).
- The correct color order for the search engine’s slots: yellow, blue, red, running west to east. (Page 13 picture correction)
- The setup position of the search engine’s wheel is random. (Mission clarification)
- The engagement pinwheel only has two arms (Page 29 picture correction)
- The engagement pinwheel setup is with its red arm up. That means pointing at the ceiling – not to the left, not to the right. Even though the arm does have a bend, look at the whole arm in general, and pretend it’s the arm of a clock... It needs to point at the 12 – not to the 9, not to the 3. (clarification, hopefully)
- Except for the search engine’s loops, other loop color placements don’t matter. (Reminder of Field Setup Pages 9,10)
- The mat has no blue lines. Production mats have green. (Page 10, 11, 13, 26, 27, 28 picture corrections)

4 - MAT SIZE/FIT

This year’s mats are running ever-so-slightly wide (north/south). If this is causing your mat not to lay flat between your table walls, the official solution is to trim the black border off your mat’s north edge, since that border serves no function and this change will not be noticed by a robot. Try to do a good job, but your care is more important for safety than for accuracy. Thanks for your understanding as we adapt to our new mat material. (Mat correction and policy announcement.)

3 - ENGAGEMENT DIAL MATH

There is no error in the Engagement mission scoring examples when you realize this: When the dial is set all the way counterclockwise like it’s supposed to be, it’s one tic BELOW the first red position. (Reminder of model operation.)

2 – DOOR SWING

The door’s tendency to stay still, open, closed, is random, based on tiny variations in how the volunteers attach it to the west wall. Their job is to make it like the picture – which “looks” level. When the robot pushes the handle down, the door is designed to be swingable, and yes, it’s sensitive. Instead of hoping for a door that swings open, or expecting the volunteers to attach it the way you want it, the engineering solution to this mission is to figure out a way to ensure that any door will be open at the end of the match, no matter how it might like to swing. (Insight and strategy advice)





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1 - REVERSE ENGINEERING

This relates to the setup of the “Reverse Engineering” models, described on Page 10 of the Challenge Document. During setup at a tournament, you build your FIRST 6-piece model and hand-place it in a basket on its mark on the opposing team’s field (and their FIRST model will placed on your field). Once the match starts, your robot goes and gets the basket on YOUR field, and brings it to YOUR Base, so you can build your SECOND 6-piece model – a replica of the other team’s FIRST model. Of course in practice, you can only pretend a trade has occurred. (Mission clarification)

