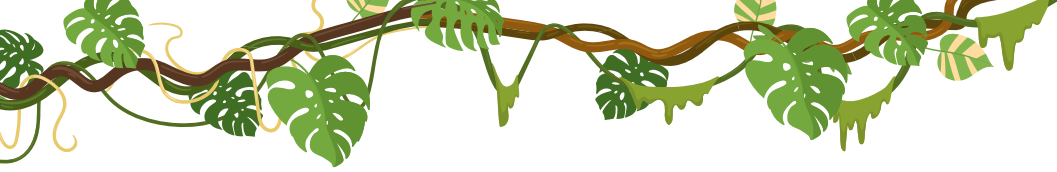


**FIRST
LEGO
LEAGUE**

CHALLENGE

ROBOT GAME RULEBOOK





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Welcome!

Welcome to the *FIRST*® CANOPY™ and your BIOGLOW™ season challenge. Your team will work together as you prepare to compete at an event. This *Robot Game Rulebook* contains the missions, rules, and resources you need to be successful in playing the robot game. In addition to the *Robot Game Rulebook*, visit the **Season Resources page** to find helpful videos, documents, and an *Engineering Notebook* to guide your progress throughout the season.



Season Resources Page

BIOGLOW™

Get ready to explore the living systems that make our planet thrive in the robot game. Your team will journey through a dynamic rainforest and nearby city, discovering how plants, animals, fungi, and people are connected in powerful ways.

As you explore the missions, you'll uncover hidden relationships beneath the forest floor, observe species in their natural habitats, and discover how ecosystems grow, adapt, and recover to meet their

changing needs. Some missions will reward careful navigation, while others will test your engineering design.

Along the way, you'll help restore balance by supporting aging trees, introducing vital species, and designing places where nature and innovation exist together. Every mission reflects real-world strategies scientists use to understand and protect biodiversity.



The Robot Game

The robot game is the culmination of your team's work throughout the season. You will put your engineering design, mission strategy, and teamwork to the test during each 2.5-minute match. Success in the robot game depends on planning, testing, and working together as a team. As you prepare to play the robot game, your team will need to:

- **Plan Your Mission Strategy:** Decide which missions your team will attempt and in what order. Consider the point values, difficulty, time required, and how reliably your robot can complete each mission. Teams may choose to focus on a few missions they can complete consistently or attempt a wider combination to increase their score.
- **Design and Program Your Robot:** Work together to design and build a LEGO® robot and attachments. The robot must operate autonomously after it is launched and follow programming written by your team.
- **Complete Missions:** Your team earns points as your robot completes tasks. Missions are represented by LEGO models called mission models. Missions may require your robot to manipulate objects, activate mechanisms, or move items to designated areas.
- **Understand Scoring:** Mission requirements must be visibly met at the end of the match unless stated otherwise. You will participate in three official matches, and only your team's best score counts toward awards and advancement.
- **Demonstrate Gracious Professionalism®:** The robot game is an opportunity to demonstrate the Core Values your team has developed. Your behavior toward teammates, volunteers, and other teams matters and will be scored by referees at each match.

The above list is meant to help your team understand your goals for competing in the robot game. A glossary and a complete list of rules for the robot game are found on pages 13-18 of this guide.



Inside the Challenge Set

Inside the BIOGLOW™ Challenge Set, you will find a mat, 3M™ Dual Lock™ Recloseable Fasteners, and the LEGO® bricks used to build the mission models. The mission models will come in numbered bags and must be built by your team using the **Mission Model Building Instructions**.



IMPORTANT!

The robot interacts with mission models on the field to score points, so it is important to build the models exactly as shown in the building instructions. Practicing with incorrectly built models can negatively affect your gameplay experience.



**Building Instructions
Season Resource Page**

Mission Number	Mission Name	Bag Number(s)
1	Drone Survey	1, 2
2	Exploding Seeds	3
3	Flip the Rock	4, 5
4	Lucky Leaves	6
5	Reaching Roots	7
6	Leafcutter Frenzy	8, 9, 10
7	Humongous Fungus	10
8	Tangled	11, 12, 13, 14, 15
9	Research Platform	11, 12, 13, 14, 15
10	Fragile Microhabitats	16
11	Window to the Past	17
12	Forest Elder	18
13	Keystone Species	19, 20
14	Seeds of Renewal	21
15	Biocentric Architecture	22, 23, 24

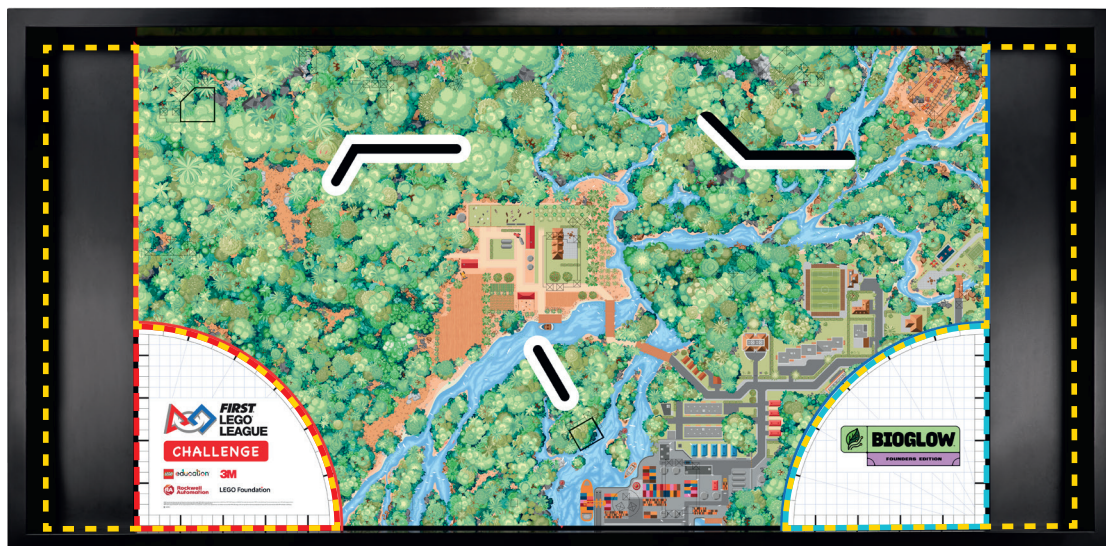
Getting Started | Helpful Resources

- Decide whether to roll out your mat on a table or the floor. Matches will be played on tables at official events. You can use the optional **Table Building Instructions** to build your own table to practice on.
- The table at the bottom of page 5 shows which numbered bags from the Challenge Set correspond with each mission model in the **Mission Model Building Instructions**.
- Set up your field by following the **Field Setup Video**. Additional field setup instructions can be found on page 7 of this guide.
- Watch the **Robot Game Missions Video** and read the complete missions and rules in this guide. The Missions section (pages 8 to 12) describes each mission model and the points that can be scored. The Rules section (pages 13 to 18) describes how to play the game, what equipment is allowed, how a match is run, what a team can and cannot do during a match, and how points are calculated.
- Check the **Challenge Updates** often. This list is updated throughout the season to include official rule updates, clarifications, and amendments. It is especially important to read these leading up to your event.
- Practice calculating your match scores using an **Official Scoring Calculator**. There are online and offline calculator tools available.
- For help with building and coding your robot, check out the **LEGO® Education SPIKE™ App**. The app offers a guided mission for the BIOGLOW™ robot game that your team can use as a starting point.

All bold resources and more are available on the *FIRST®* LEGO® League Challenge **Season Resources page**.



Season Resources Page



Getting Started | Field Setup

Once you have built the mission models, you are ready to set up your field. The following steps are general guidance for setting up your field for the first time.

Step 1: Roll Out the Mat

- ☐ Unroll the mat and lay it flat on the floor or table. If you are using a table, align the mat to the bottom wall and center it between the left and right walls.
- ☐ Optional: Tape down your mat along the left and right edges to secure it in place. Thin matte black gaffer's tape is recommended for easy removal without damage to the mat.



Field Setup Video

Step 2: Place the Dual Lock

- ☐ Locate the spots on the mat where Dual Lock is needed. Carefully stick one piece of Dual Lock on each spot with the sticky side down, aligning it carefully to the wireframe. Then, place another piece of Dual Lock on top of each spot with the sticky side up. These pieces will click together once the models are placed.

Step 3: Place the Mission Models

- ☐ Watch the Field Setup Video to see how to place each mission model onto the mat. Align each model exactly to the mat wireframe.
- ☐ Gently press down on the model until you hear a click to engage the Dual Lock.

Step 4: Set Up for a Match

- ☐ Before any match, double-check that each mission model and any loose pieces are in their correct starting positions and that each of the three new interchangeable models are fully seated and latched.
- ☐ At an event, volunteers do their best to ensure the field is set up correctly before the team arrives. Teams should check the field and let the referee know if any changes need to be made before the match begins.

IMPORTANT!

Tournament setups at events may differ from your practice setup, including variations in table construction, surface smoothness, or shared mission interactions. Be prepared to adapt and approach these scenarios with *Gracious Professionalism*® if they occur.

NEW THIS YEAR

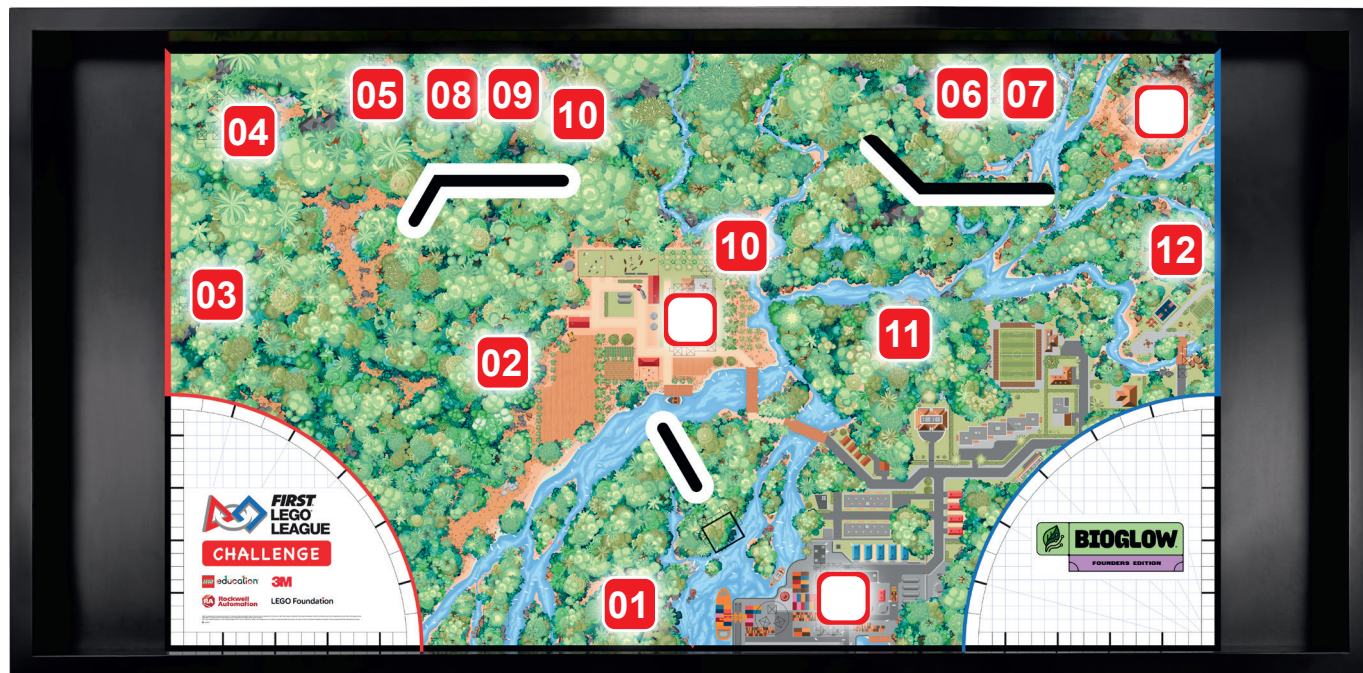
Missions 13-15 use a new interchangeable dock system. The docks are secured with Dual Lock, and teams can choose which mission model to place on each of the three docks (mine, city, farm) before the match begins. Placement of these three models is part of your mission strategy!



Missions



Scan here to watch the
Robot Game Missions Video.



Interchangeable Model Dock (Missions 13-15)

No Equipment Constraint:



When this symbol appears in the top-right corner of a mission, the following rule applies:

"A mission model cannot earn points if it is touching equipment at the end of the match."

This rule applies only to the specific mission in which the constraint appears. If the same mission model is used in another mission where the constraint does not apply, it can earn points as usual. Each mission model is evaluated separately within its respective mission.

Equipment Inspection:

Before the match, there will be an equipment inspection. If your robot and all equipment fit completely in one launch area and under a height limit of 12 in. (305 mm) during this inspection:

20

Precision Tokens

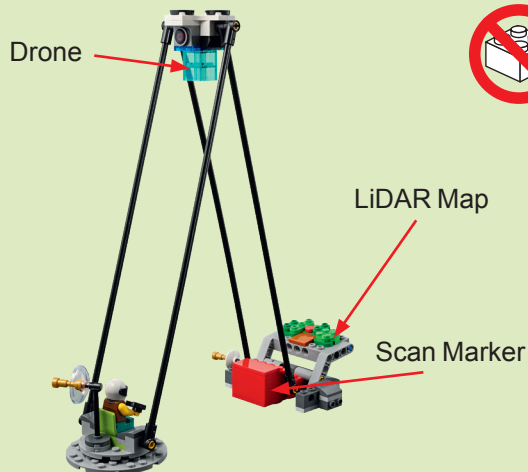
You begin the match with six precision tokens worth 50 total points. If you interrupt the robot outside of home, the referee will remove one token. You earn points for the number of tokens remaining at the end of the match. If the number remaining is:

**1: 10, 2: 15, 3: 25,
4: 35, 5: 50, 6: 50**

(See Rules 15 and 17.)



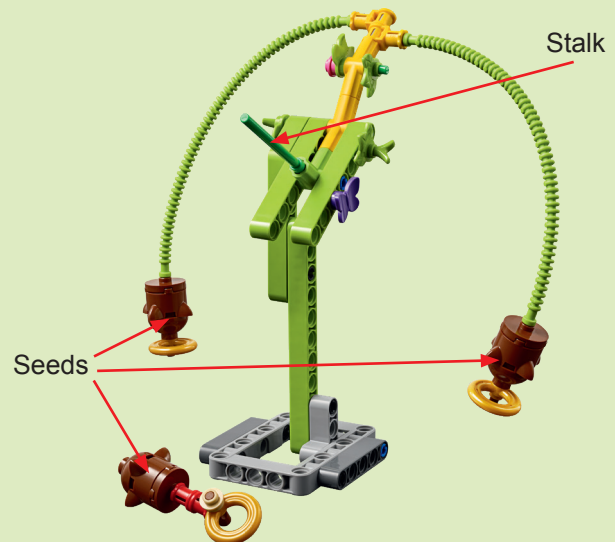
Mission 01: Drone Survey



High above the canopy, drones survey the landscape and transmit data back in real time. Help the pilot launch the drone to create a LiDAR map of this rainforest ecosystem.

Drone is no longer touching the mat: **20**
Bonus: and the LiDAR map is completely flipped over, with the scan marker at least partly in the survey area: **10 added**

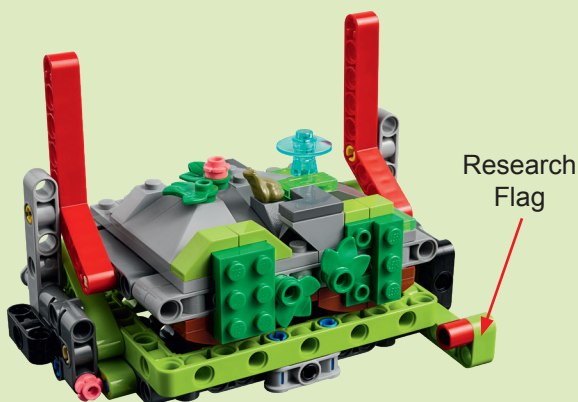
Mission 02: Exploding Seeds



Some trees use a unique strategy to disperse their seeds. Release the seeds from the seed pod, propelling them to new ground.

Seeds no longer touching the stalk: **10 each**

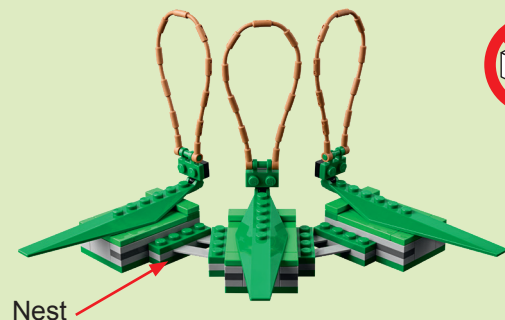
Mission 03: Flip the Rock



Many creatures thrive just below the surface. Flip the rock to discover what's living underneath but leave no trace by placing it back the way you found it.

The research flag is down: **20**
Bonus: and the rock has been returned to its original starting position: **10 added**

Mission 04: Lucky Leaves



Hidden in plain sight, the katydid camouflages with its leafy surroundings. Collect as many leaves as you can without disturbing this master of disguise.

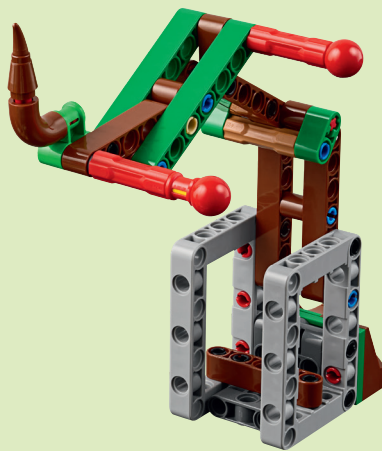
One leaf is completely removed, no longer touching the nest: **10**

Bonus: and the second leaf is completely removed, no longer touching the nest, with the katydid in its original starting position: **20 added**

The nest is the mission model that holds the leaves and the katydid. If the katydid is completely removed from the nest at any time, the bonus is no longer available.

If the katydid is outside the leaf habitat at the end of the match, even partly, the team scores zero points for this mission. The leaf habitat includes the nest and the marked area on the mat surrounding it.

Mission 05: Reaching Roots



Rainforest plants stretch their roots far and wide, reaching resources and forming connections with nearby organisms. Help this plant cross the forest boundary in search of symbiosis.

The plant root is . . .

- a. Partially extended: 10
- OR b. Completely extended: 20

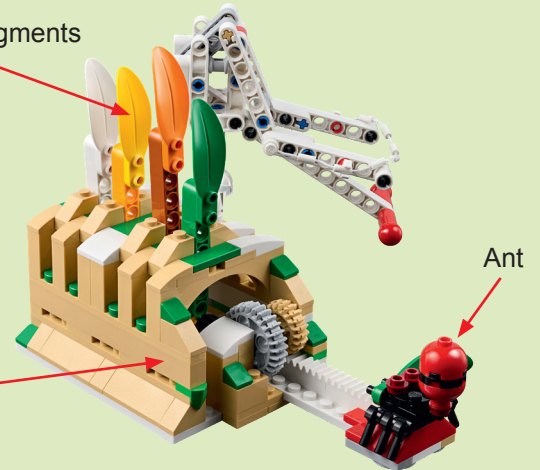
Only one scoring condition is possible for this mission.

Mission 06: Leafcutter Frenzy

Leaf Fragments

Nest

Ant



Leafcutter ants work together to feed an underground fungus garden. Guide the ants back to their nest – but move too quickly, and you may scatter the leaves they collected.

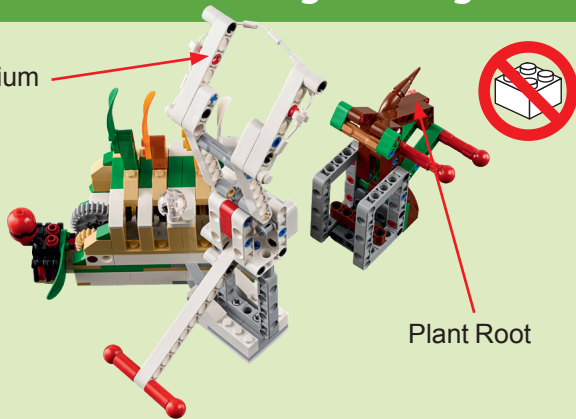
The ant is touching the nest, and the leaf fragments are contained within the nest:

10 each fragment

Mission 07: Humongous Fungus

Mycelium

Plant Root



Mycelium is the vast, underground network of fungus beneath the rainforest floor. Form a new connection between the mycelium and a neighboring tree root.

The mycelium is completely extended: 20

Bonus: and a connection is formed between one team's extended mycelium and the opposing team's fully extended plant root (two bonuses possible): 10 added

The mycelium and plant root do not need to touch to form a connection. If each is fully extended, both teams will earn the bonus. It is not possible to earn the bonus in remote competitions or if there is no opposing team.

Mission 08: Tangled

Vine



Climbing vines have wrapped tightly around this tree. Gently untangle them so the tree has space and sunlight to grow again.

The vine is touching the mat:

30

Mission 09: Research Platform

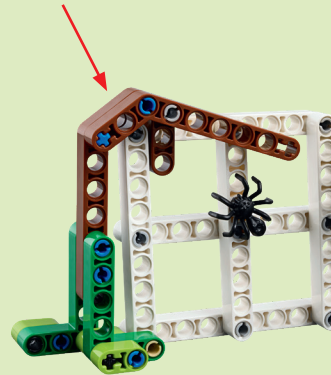


Olivia and Michael are studying species that live the rainforest canopy with the help of their forest guide. Help the team deploy equipment to monitor activity high above the forest floor.

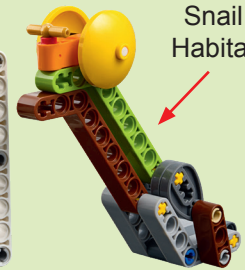
The research platform is raised:	10
The camera trap is deployed:	10
The seed is no longer touching the tree:	10

Mission 10: Fragile Microhabitats

Spider Habitat



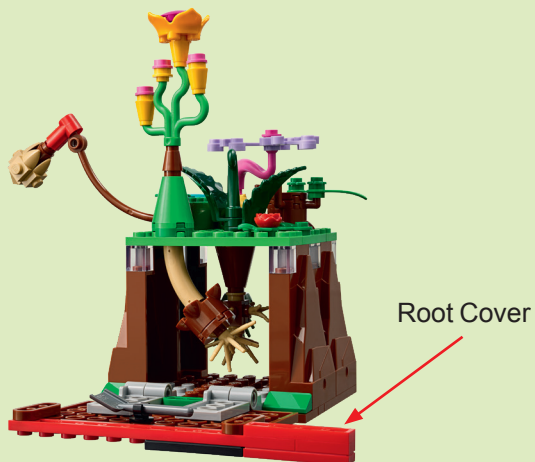
Snail Habitat



Researchers must work carefully when exploring protected ecosystems. Move through the area without damaging these tiny creature's homes.

The spider habitat is in its original starting position:	10
The snail habitat is in its original starting position:	10

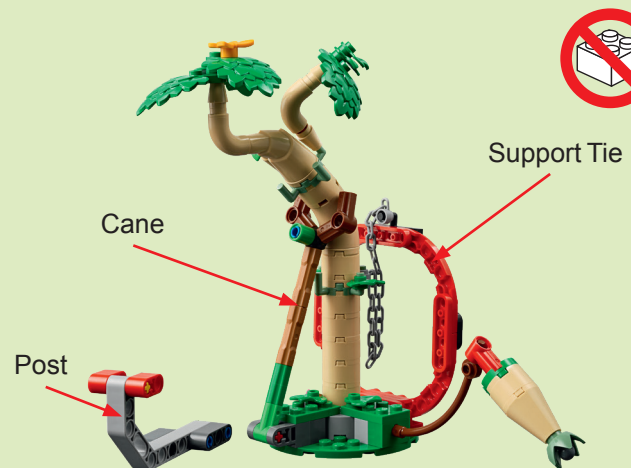
Mission 11: Window to the Past



Roots help to tell the long history of the rainforest. Open the root window and document what you see.

The root cover is down, touching the mat:	20
---	----

Mission 12: Forest Elder



Once a towering giant, this aging tree now bends beneath its own weight. Add a support to stabilize the tree for years to come.

The cane is completely raised, touching the tree:	20
The support tie is around the post:	10

Mission 13: Keystone Species

Young Trees



Restoration Platform

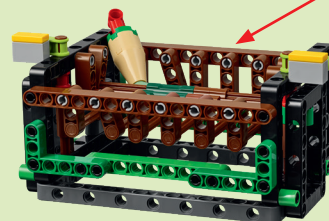
Keystone species bring balance to their ecosystem and shape the forest around them. Your team must build and deliver a keystone species to this newly protected habitat.

Your team's keystone species is on the restoration platform, and the young trees are raised: **30**

You can use the bricks in bag 20 to build your keystone species model. Your keystone species counts as equipment and will be included in the pre-match inspection. Teams will be asked to identify their keystone species at that time.

Mission 14: Seeds of Renewal

Replantation Station



Seeds

A thriving rainforest relies on its plant diversity. Place the seeds your team has collected in the soil and watch as they take root.

Seeds are contained within the replantation station: **5 each**

Bonus: and are touching the mat: **5 added each**

Mission 15: Biocentric Architecture

Garden Skylight



Nesting Canopy

Compost Hatch



Thoughtful design creates harmony between humans and the natural world. Modify the building to create homes for wildlife, restore soil health, and bring natural light to green spaces.

The nesting canopy is raised: **10**

The garden skylight is completely in: **10**

The compost hatch is completely opened, touching the mat: **10**

Environmental Bonus:

If you have completed the greatest ecological need for the dock the model is located:

- a. Mine dock: nesting canopy
- OR b. City dock: garden skylight
- OR c. Farm dock: compost hatch

10 added

Only one bonus is possible for this mission.

Rules



Scan here to watch the
Robot Game Missions Video.

IMPORTANT!

- All robot game wording means precisely and only what it says. If a detail is not mentioned, it does not matter.
- If a situation arises that makes the referee's decision unclear or hard to call, teams get the benefit of the doubt.
- The official *FIRST* Challenge Updates, Field Setup Video, Robot Game Mission Video, and *Robot Game Rulebook* pictures and text will be the only sources of authority. Referees will combine these materials to arrive at the best possible call.
- If rules, missions, or field setup need adjustment or clarification, a challenge update will be issued during the season, superseding previous materials. Updates apply only to events occurring after their release and should not be used to alter the results of past events.
- At an event, your head referee makes the final decision.

Glossary:

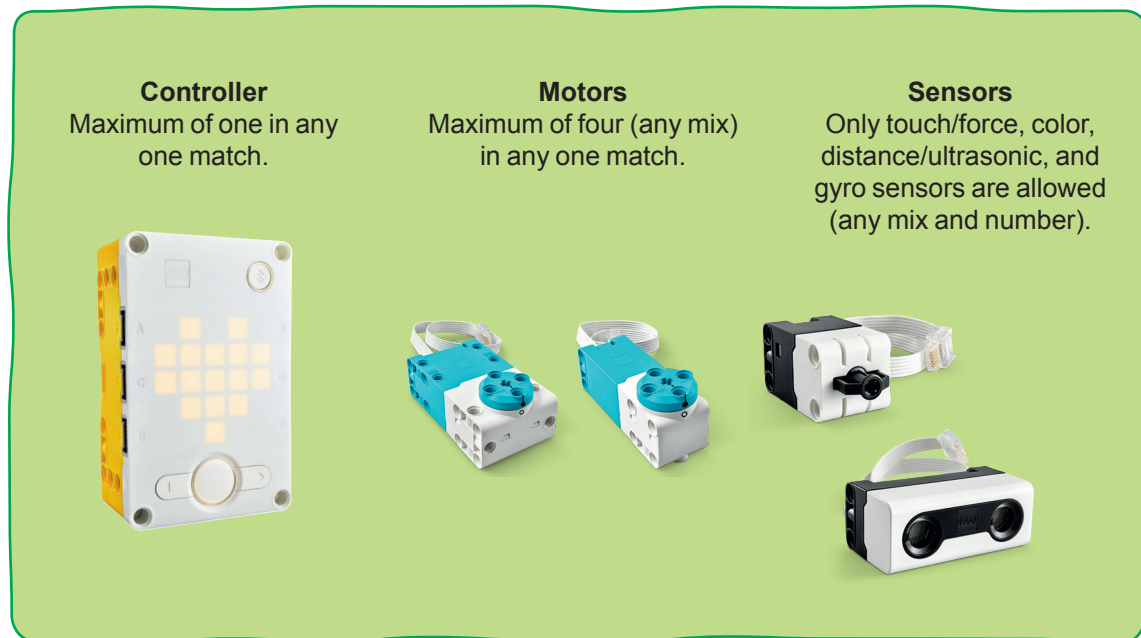
- **Match:** A timed period of 2.5 minutes during which the robot autonomously completes as many missions as possible to earn points.
- **Equipment:** All items that teams bring to the match, including the robot, attachments, and any other materials specified in the rules. (See "Rules: Before the Match" for more details.)
- **Field:** The playing area defined by border walls, including the mat, mission models, and home areas. It serves as the environment where the robot performs missions.
- **Mission:** One or more tasks that can be completed for points. Teams may try missions in any order or combination.
- **Mission Model:** The LEGO® models placed on the field, designed to represent a real-world concept or challenge. The robot interacts with mission models to complete missions and earn points.
- **Robot:** The controller and any attached equipment that is intended to remain connected, unless intentionally separated by hand.
- **Technicians:** The team members standing at the competition table who are responsible for managing and handling the robot during a match.
- **Launch:** The act of activating the robot from rest when completely within its designated launch area to cause it to move autonomously.
- **Interruption:** Any interaction by technicians with the robot or objects in contact with the robot after it has been launched.
- **Autonomous:** The ability to operate independently, without human intervention.

Before the Match | Equipment

The equipment a team brings to the robot game field, such as the robot and its attachments or accessories, must meet the following guidelines:

1. All equipment must be LEGO® building pieces, in original factory condition.
Exception: LEGO string and pneumatic tubes may be cut to length.

2. Teams may use as many non-electric LEGO pieces from any set as they'd like.
3. Electric LEGO equipment is allowed only as described and shown below. (The LEGO® Education SPIKE™ Prime is shown, but LEGO Education SPIKE Essential, MINDSTORMS® EV3, MINDSTORMS Robot Inventor, Powered Up, and equivalent NXT and RCX are also allowed.)



4. Teams can also use LEGO wires, one controller's power pack or six AA batteries, and one microSD card, in any one match.
5. Teams can use any software or programming language. Robots must be autonomous during the match, outside of home. No remote controllers of any type are allowed.
6. Teams may bring one sheet of notebook paper per home area for program notes. This does not count as equipment.
7. Additional or duplicate mission models are not allowed.



Before the Match | Match Setup

At events, matches will be played on official tables. Before the match begins, teams will need to pass the pre-match inspection and set all their equipment in place.

8. During the pre-match inspection, the referee will check that all team equipment fits within the two launch areas and under a height limit of 12 in. (305 mm). If the team can fit all their equipment into just one launch area under the height limit, they will earn 20 points.
9. Teams will not be given additional storage space. Everything must stay on the table or in the hands of the technicians at the table. The areas to the left and right of the mat can be used to store equipment; they each measure approximately 6.75 in. (171 mm) by 45 in. (1,143 mm) (actual measurements may vary slightly). Equipment stored on the table may extend past the left and right walls only, as needed.
10. After the team has passed inspection, they will be given a couple of minutes to set up. They start by distributing any loose mission model(s) provided in home, and their equipment, between the two home areas. Next, they place their robot into the launch area they wish to start from. Any remaining time may be used to adjust the robot and equipment for the first launch, to calibrate sensors using any part of the mat, and to ask the referee to check anything on the field.

11. Team members must then divide into two groups and position one group on each side of the field (left and right). These members cannot switch sides during the match. Teams of:

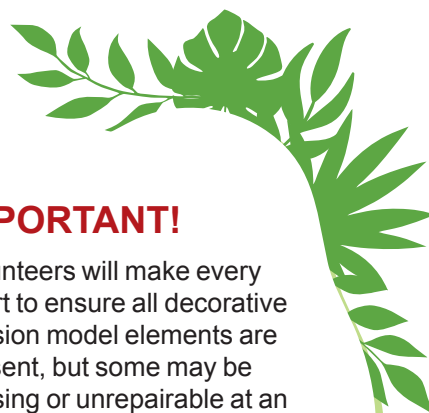
a. Four or more: Position two technicians at each home area. All other team members must stand back. Teams may never have more than two technicians at a single home area, but a team member may swap places with a technician from the same side at any time.

b. Three: Position two technicians on one side and one on the other (team choice).

c. Two: Position one technician on each side.

IMPORTANT!

Volunteers will make every effort to ensure all decorative mission model elements are present, but some may be missing or unrepairable at an event. Teams whose strategy depends on these elements must check their field before the match and alert the referee if something is missing.



During the Match | Inside Home

12. Home is divided into two sections, each with its own launch area. Technicians may use their hands to handle the robot, equipment, and mission models when these items are completely within their respective home area.

13. Technicians may not:

- Hand anything from one home area to the other.
- Touch anything outside of their home area, except for interrupting the robot.
- Cause anything to move or extend outside this area, except for launching the robot.

Points scored in these ways will not count.

Exception: Upon returning home, robots may extend past the walls of home without penalty.

14. When launching:

- Technicians may not keep anything from moving.
- The robot and anything it is about to move must fit completely inside the launch area.





During the Match | Outside Home

After any launch, technicians should allow the robot and anything it is in contact with to return completely into home before interrupting it.

- 15.** If technicians interrupt the robot, it must be relaunched. If the robot or any object it was in contact with during the interruption was outside home (even partly), the team loses one precision token.

a. Partly outside home: If the robot or any object it was in contact with at the time of interruption is partly outside the home area, they must be returned to that same home area.

b. Completely outside home: If the robot and all objects it was in contact with are completely outside of home at the time of interruption, the team may place them in either home area.

The team keeps the robot and any objects it originally launched with. However, any objects obtained outside of home after the robot's last launch must be handed to the referee for the remainder of the match.

Exception: If the team does not intend to launch again, they may stop their robot in place without losing a precision token. The robot and anything it is in contact with should remain in place where it was interrupted.

- 16.** Teams may not interrupt their robot in such a way that they earn points from it. Points scored in these ways will not count.

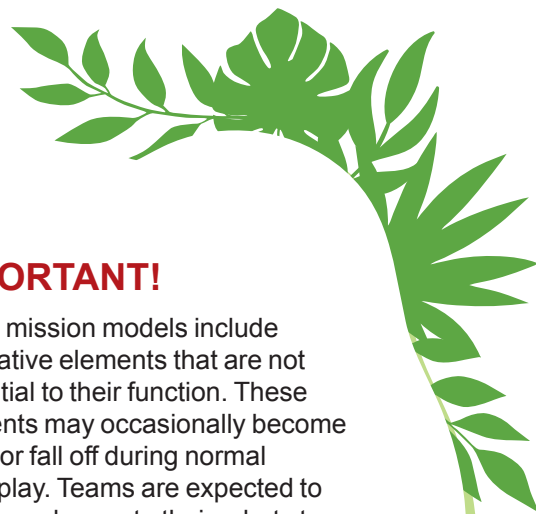
- 17.** If a piece of equipment or a mission model is dropped or left outside of home by the robot, wait for it to come to rest. If it rests:

a. Completely outside home: It stays as is unless the robot moves it.

b. Partly inside home: It stays as is unless the robot moves it. Alternatively, at any time, the technicians may remove it by hand. If the object removed by hand is a mission model, it must be given to the referee for the remainder of the match. If the object is equipment, it must be taken into that home

area, and the team will lose one precision token.

- 18.** Teams may not separate the Dual Lock, take models apart, or break a mission model. Points scored in these ways will not count.
- 19.** If a mission model is combined with anything (including the robot), the combination must be loose or simple enough that a technician can free the mission model in perfect original condition in a single motion, if requested. Points scored using combinations that fail this test will not count.
- 20.** Teams may not interact with the opposing team's field, robot, equipment, or any mission models/interactions that span both fields unless there is a mission exception. Points failed or lost due to interference will score automatically for the other team.



IMPORTANT!

Some mission models include decorative elements that are not essential to their function. These elements may occasionally become loose or fall off during normal gameplay. Teams are expected to design and operate their robots to avoid damaging mission models, but referees will give benefit of the doubt if decorative elements detach as a result of reasonable gameplay (see Rule 18 regarding model damage).

After the Match | Scoring



21. After 2.5 minutes, the match ends. Technicians must stop their robot and touch nothing else. This is when scoring begins.
22. For scoring, all mission requirements must be visibly met at the end of the match unless a method was required in the mission.
23. When something is required to be “in” an area, the lines and airspace above that area count as “in” unless otherwise mentioned.
24. If a team cannot run their robot, they can still gain *Gracious Professionalism*® points by explaining the situation or being present at the match.
25. The referee will document the results of the match with the team. When there is agreement on the results, it becomes official. If no agreement is reached, the head referee makes the final decision. Only the team’s best score of the three official matches counts toward awards and advancement. Ties are broken using second and third best scores. In the case of a tie of all three scores, local tournament officials will decide what to do.



Scan here to watch the
Robot Game Missions Video.

Gracious Professionalism® at the Robot Game

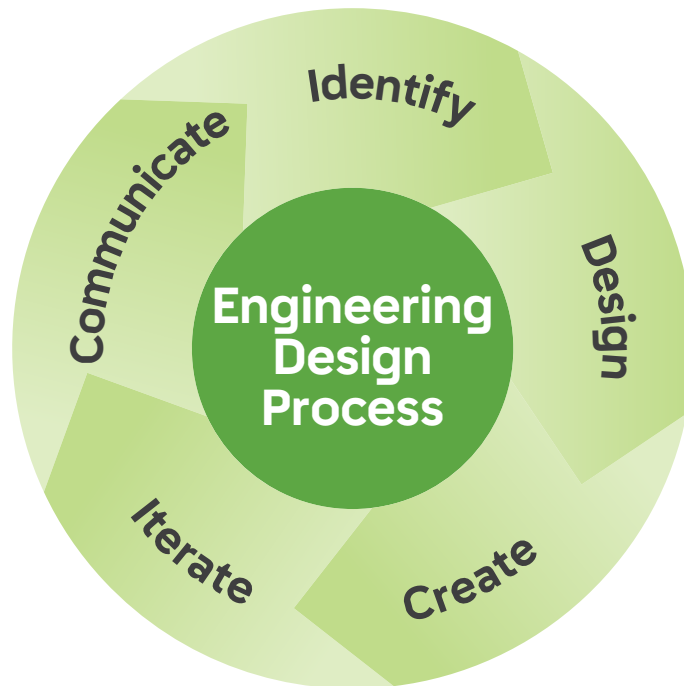
DEVELOPING	ACCOMPLISHED	EXCEEDS
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Gracious Professionalism points will be added to the total Core Values score from judging.

Every team starts each match with an **ACCOMPLISHED** score (3 points), and this is the score most matches will yield. The score changes only if a referee observes above-and-beyond sportsmanship, awarding an **EXCEEDS** score (4 points), or lesser sportsmanship, awarding a **DEVELOPING** score (2 points).

If a team does not show up for their match, they will score no points for *Gracious Professionalism*. However, if a team arrives and does not run the robot but does explain what has happened, they can get a *Gracious Professionalism* score of 2, 3, or 4 points depending on the *Gracious Professionalism* they demonstrate.





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