ANIMAL ALLIES℠

The 2016/2017 *FIRST*® LEGO® League Challenge

In the past, people often thought about how animals could help us. Today, it's time to think about how we can help each other. What might become possible when we work together with our ANIMAL ALLIES℠?

FIRST LEGO LEAGUE

LEGO education

Solve problems in:
The Project

- *Identify* a problem when people and animals interact
- *Design* a solution that makes the interaction better for animals, people, or both
- *Share* your problem and solution with others

For ANIMAL ALLIES℠, think of people and animals as allies in the quest to make life better for everyone. Sometimes people help animals and sometimes animals help people. Your Project mission this season is to make our interactions with animals better – hopefully better for all of us.

Identify Think about all the different ways that people interact with animals. Sometimes it happens on purpose and sometimes it happens by accident. Pick a situation when people and animals interact, then identify a specific problem you want to solve.

After you select a problem, find out about the current solutions. Why does this problem still exist? Why aren't the current solutions good enough? What could be improved?

In the ANIMAL ALLIES℠ Challenge, an animal is any member of the scientific animal kingdom (besides humans) that is currently alive today.

Design Next, design a solution to your problem. Any solution is a good start. Your ultimate goal is to design an innovative solution that adds value to society by improving something that already exists, using something that exists in a new way, or inventing something totally new.

Share Think about who your solution might help, share your idea with at least one person. Present your solution to people who own, sell, or care for animals. Maybe share with a professional or someone who helped you learn about your problem. Can you think of any other groups of people who might be interested in your idea?

Finally, prepare a presentation to share your work with the judges at a tournament. Your presentation must be live and may include posters, slideshows, models, multimedia clips, props, costumes, and more. Be creative, but make sure you introduce your problem, solution, and how you shared your idea.
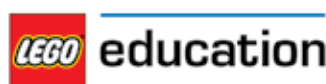
- **Read** the Robot Game Rules in the Challenge Guide:
  http://firstlegoleague.org/challenge#animal-allies
- **Identify** one or more missions to solve
- **Design** a robot using LEGO® MINDSTORMS®
  that can solve the mission(s)

– Mission results must be visible exactly as described
at the end of the match (unless otherwise specified).

Do we need animals, or do they need us? Answer: YES! This
Robot Game showcases just a fraction of our wonderful story
with animals. As you work on the Missions, pay attention to
the many ways innovation and technology have enabled
humans and animals to exchange learning, friendship, help,
daily needs, protection, amusement, and love… As you'll
see, there are many fun problems left to solve!

M01 - SHARK SHIPMENT
- **Visible at the end of the match:**
  – Tank and Shark are completely in
    Target 1: 7 Points, OR Target 2: 10 Points
- **Bonus** (Added only if a Target score is earned):
  Shark is touching only the tank floor and no
  wall: 20 Points
- **More:** After Launch for this Mission, nothing is
  ever allowed to touch the Shark except the Tank.

M02 – SERVICE DOG ACTION
- **Visible at the end of the match:**
  – The Warning Fence is down: 15 Points
- **More:** The Fence must be down because the
  Robot completely crossed it from the west,
  after traveling between the Barriers: Y/N

M03 – ANIMAL CONSERVATION
- **Before the match starts:** Hand-place your choice
  of one animal in your tray of the Animal Conservation
  Mission Model. The placement must match one of
  these options*:
  – Reindeer facing west
  – Gorilla facing south
  – Bat facing south
  – Flamingo facing east
  – Frogs facing south & west
  – If placing another animal other than Reindeer, put
  Reindeer on that animal's mark facing west
- **During the Match:** Participating Robots make the
  trays switch places. A switch is officially successful
  when the red axle causes the system to stop. Robots
  then have the option of removing the received animal
  and replacing it with a different animal for switching.
  The Referee resets the red axle.
- **Visible at the end of the match:**
  – Two identical animals are completely on the same
  **Side: 20 Points per pair
  – Both teams get points for all pairs
- **More:** Each pair must be created through rotation of
  the Animal Conservation Mission Model: Y/N

* The five optional animals listed in this mission are the only ones
allowed for exchange.
** For M03, a "Side" is anywhere completely south of the symmetric line
between Fields, including that Field's Storage areas.

M04 – FEEDING
- **Visible at the end of the match:**
  – A piece of Food is completely in a Target
    Area: 10 Points (Each Piece)
- **More:** If multiple pieces of Food are in one area,
  all must match each other: Y/N

M05 - BIOMIMICRY
- **Visible at the end of the match:**
  The Biomimicry Wall completely supports:
  – All the weight of the White Gecko:
    15 Points
  – All the weight of the Robot: 32 Points
- **More:** For an object to score, no part of it may be
  in contact with anything but the Biomimicry Wall
  and/or Green Gecko, except two scoring objects
  may be in contact with each other: Y/N

M06 – MILKING AUTOMATION
- **Visible at the end of the match:**
  – Milk and Manure have all rolled out: 15 Points
  OR
  – Milk has all rolled out but not Manure:
    20 Points
- **More:** The Robot's only movement of the
  Milk and/or Manure came by moving the
  red lever: Y/N

M07 – PANDA RELEASE
- **Visible at the end of the match:**
  – The slider looks fully open clockwise:
    10 Points

M08 – CAMERA RECOVERY
- **Visible at the end of the match:**
  – The Camera is completely in Base: 15 Points

M09 – TRAINING AND RESEARCH
- **Visible at the end of the match:**
  – The Dog & Trainer are completely in the
    Training & Research Area: 12 Points
  – The Zoologist is completely in the Training
    & Research Area: 15 Points
  – Manure *Samples are completely in the
    Training & Research Area: 5 Points Each
- **More:** Only one Manure Sample may be
  Transported at a time: Y/N

* Only disc-shaped Manure counts as Samples.

M10 – BEEKEEPING
- **Visible at the end of the match:**
  – The Bee is on the Beehive and there is no Honey in the Beehive: 12 Points
  OR
  – The Bee is on the Beehive and the Honey is completely in Base: 15 Points

M11 – PROSTHESIS
- **Visible at the end of the match:**
  - The Prosthesis is fitted to the Pet AND not held by the Referee: 9 Points
  OR
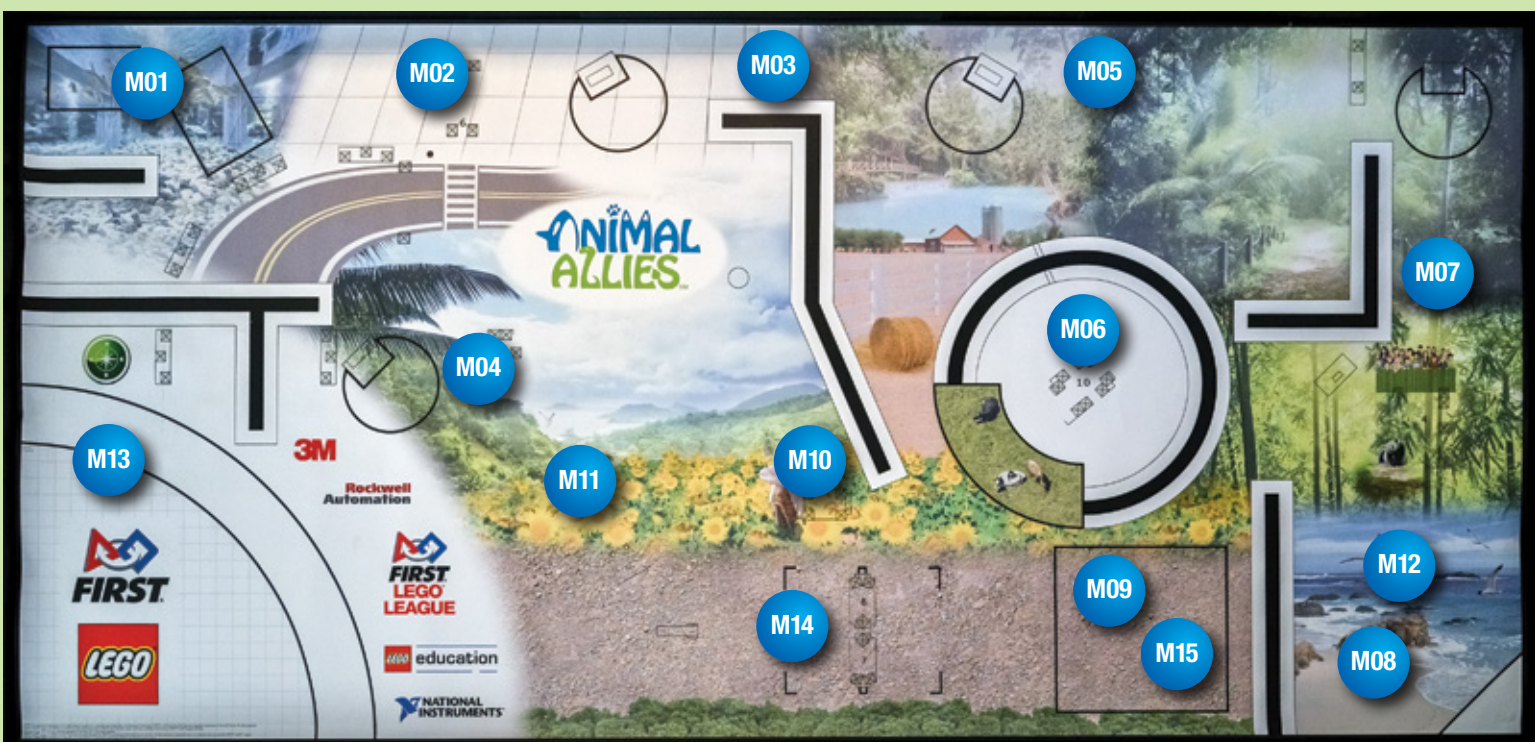 - The Prosthesis is fitted to the Pet AND the Pet is completely in its Farm Target: 15 Points

M12 – SEAL IN BASE
- **Visible at the end of the match:**
  - The Seal is completely in Base and not broken: 1 Point

M13 – MILK IN BASE
- **Visible at the end of the match:**
  - All three Milk are completely in Base: 1 Point

M01 M02 M03 M05

M04

M13 M11 M10 M06 M07

M14 M09 M15 M12 M08

M14 – MILK ON RAMP
- **Visible at the end of the match:**
- **Option 1:** 2 Points
  – All three Milk are completely supported by the Ramp
- **Option 2:** 3 Points
  – All of Option 1 (above),
  – AND they're the only things supported by the Ramp,
  – AND they're the only things touching the Ramp
- **Option 3:** 4 Points
  – All of Options 1 & 2 (above),
  – AND they're all standing

M15 — ALL SAMPLES
- Visible at the end of the match:
– All twelve Manure Samples are completely in the Training And Research Area: 5 Points Added to M09 penalties, worth Minus 6 Points Each.

PENALTIES: Before the match starts, the Referee removes five Manure Samples from Base, and holds onto them, leaving five still there. If you Interrupt the Robot, the Referee places one of the removed Samples in the white triangle, in the southeast, as a permanent/ untouchable Interruption Penalty. You can get up to five such penalties, worth Minus 6 Points Each.

The Robot Game Missions can provide real-world examples for your Project research. Learn about the stories behind the Missions in the Challenge Guide: http://firstlegoleague.org/challenge#animal-allies

The Season's Key Moments

If you need help, look at the sample schedule in the Coaches' Handbook or log into *FIRST*® Steps for a step-by-step guide to your season: http://www.firstlegoleague.org/first-steps

Read the Challenge. → **Register** for an event. → **Identify** Problem and Mission strategies. → **Design** your robot and your Project solutions. → **Practice** your presentations and robot runs. Refine as needed. → **Attend** an event and celebrate!

Download the rubrics to help prepare for your event: http://firstlegoleague.org/challenge#animal-allies

http://www.firstlegoleague.org
http://www.firstinspires.org

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