

# Engineering And Robotics Learned Young

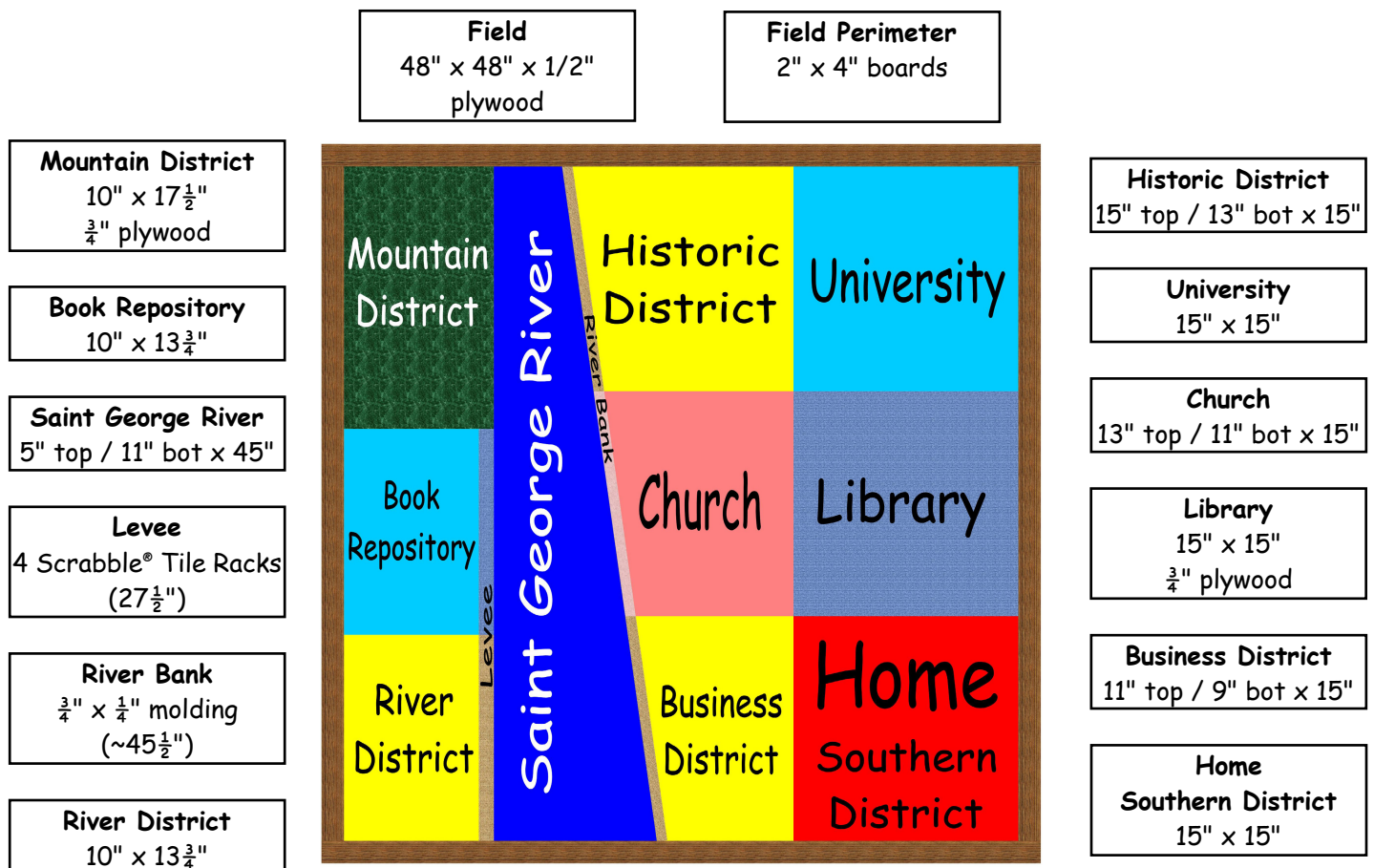
## ◆ EARLY ◆

### Spring 2009 Robotics Competition

Roboticists, the citizens of Saint George Parish thank you for expanding their knowledge by distributing books throughout their parish. Saint George Parish now needs your help collecting the books from the citizens and returning the books to the Church, Library, University, and Book Repository. Please help the Saint George Parish Citizens keep learning!

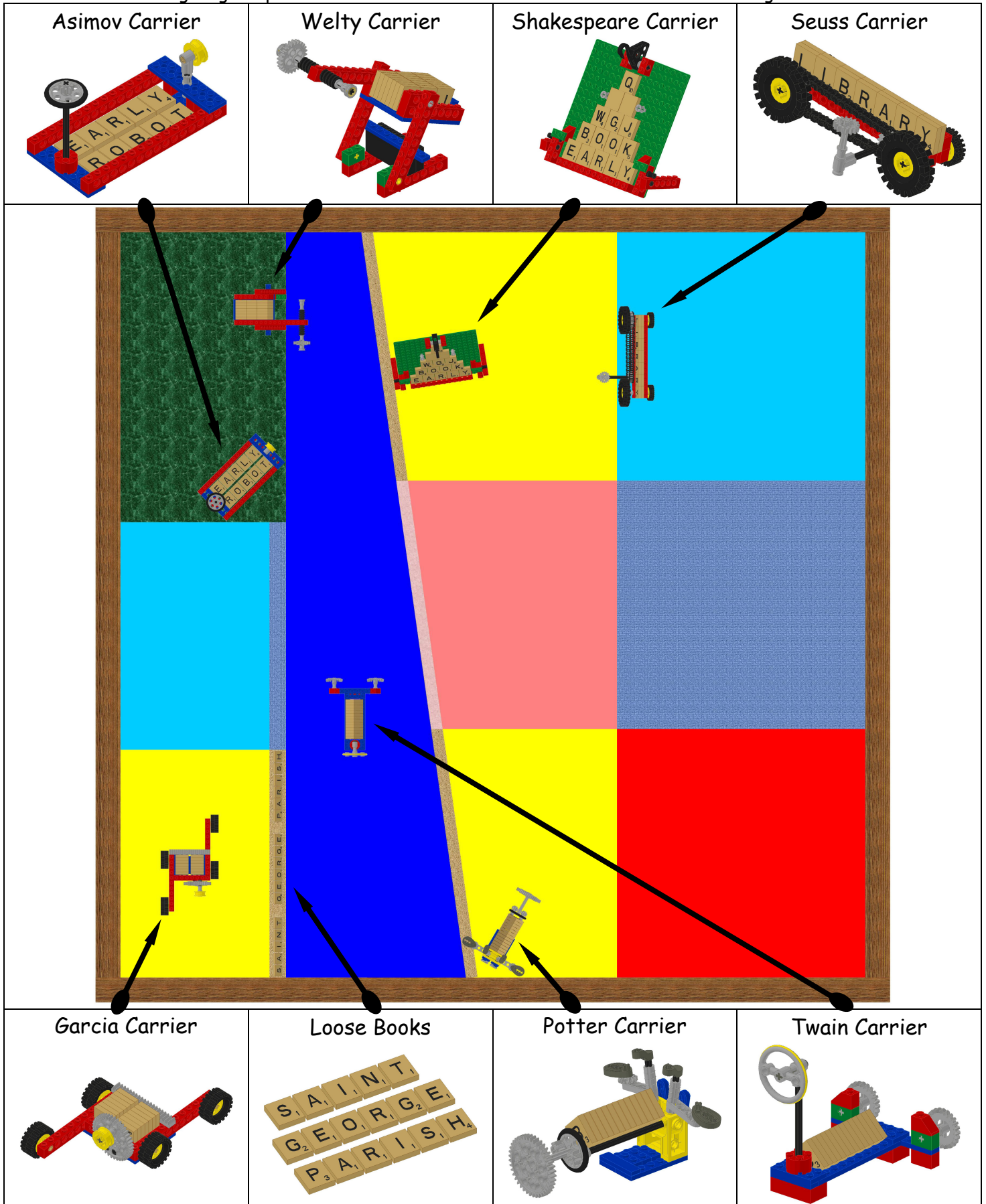
Below is everything that we know about the mission.

- The team must be ready to execute the mission for your EARLY Tournament.
- The equipment available for a team to build a robot or robots is 3 LEGO® Motorized Simple Machines Kits.
- The following diagram presents the environment that will be encountered.



Saint George Parish

- The following diagram presents where the *Books* and *Carriers* will be in Saint George Parish.



# Mission Rules

1. The team has 2 minutes to complete the mission.
2. There will be 118 **Books** on the playing field at the beginning of each mission, represented by *Scrabble*<sup>®</sup> *Letter Tiles*.
3. There will be 7 **Book Carriers** on the playing field at the beginning of each mission constructed from one LEGO<sup>®</sup> Motorized Simple Machines kit.
4. The team's score is determined at the end of the 2-minute mission.
5. If a **Book** is moving when time expires, the referee will wait until the **Book** has stopped moving before determining the **Book's** scoring position.
6. There are four scoring zones: **CHURCH**, **LIBRARY**, **UNIVERSITY**, and **BOOK REPOSITORY**.
7. The team scores 1 point for each **Book** in the **CHURCH**.
8. The team scores 2 points for each **Book** in the **LIBRARY**.
9. The team scores 3 points for each **Book** in the **UNIVERSITY**.
10. The team scores 4 points for each **Book** in the **BOOK REPOSITORY**.
11. There is one penalty zone: **SAINT GEORGE RIVER**. The **RIVER BANK** and **LEVEE** are NOT part of the **RIVER**.
12. The team is penalized 3 points for each **Book** in the **RIVER**.
13. A **Book** breaking the plane of a scoring zone is considered in the scoring zone.
14. A **Book** in multiple zones simultaneously (straddling scoring zones, scoring zone & penalty zone, penalty zone & non-scoring zone, etc.) is considered in the zone that results in the most points.
15. Only the parts that are contained in three LEGO<sup>®</sup> Motorized Simple Machines kits may be used to construct the robot (i.e. no other materials such as glue or tape may be used on the robot). The kit parts may not be altered.
16. The **HOME** is the 15" x 15" boundary extended vertically.
17. The team's robot/robots and all parts must start inside the **HOME** at the beginning of the 2-minute mission. The parts do NOT have to be assembled together and the parts can be removed from and returned to the field during the 2-minute mission. The robot can not extend over the **HOME** boundary at the beginning of the mission.
18. If a robot is touched, the robot must be returned to the **HOME** to continue the mission.
19. The team can retrieve their robot without penalty when the robot is partially inside the **HOME** by lifting the robot vertically. After retrieving, the robot must be completely inside the **HOME** (i.e. the robot can not extend over the **HOME** boundary after being touched by a team member) to continue the mission.

20. Any **Book** or **Carrier** that remains with the robot when the robot is retrieved without penalty remains in play. This rule is intended to eliminate the need for the referee to determine if a **Book** or **Carrier** is completely in the **HOME** when a robot is retrieved after entering the **HOME**. This rule is NOT intended to allow teams to retrieve their robot in such a way as to drag **Books** or **Carriers** into the **HOME**; **Books** or **Carriers** that are dragged into their base will be removed from play by the referee.
21. A penalty of 10 points will be assessed if a team touches their robot, including parts that have become separated from the robot, that is outside of the **HOME**.
22. The controllers and wires are NOT considered part of the robot.
23. The robot shall not have any elastic stored energy (i.e. stretched rubber band) when the mission begins or when the robot is returned to the **HOME**, but elastic stored energy can be generated from activating a motor.
24. The controller and wire can ONLY be used to provide electrical power to robot motors (e.g. it can not be used to drag or corral a robot, **Books**, or **Carriers**). If a controller or wire is used illegally (referee's judgment), the team will be required to immediately place the robot back in the **HOME** to continue the mission.
25. A team may touch any **Book** or **Carrier** COMPLETELY inside the **HOME** without penalty. If a **Carrier** is illegally touched, the **Carrier** along with any contained **Books** will be removed from play for the remainder of the mission.
26. A **Carrier** is NEVER considered part of the robot.
27. Because **Books** are very valuable, a penalty of 10 points will be assessed for each **Book** that is ejected from the playing field. No penalty will be assessed for **Books** that are removed by a team member or referee.
28. A score of zero will be awarded if the resulting score (points minus penalty points) is negative.
29. The following are scoring examples:

# of <b>Books</b> in CHURCH	# of <b>Books</b> in LIBRARY	# of <b>Books</b> in UNIVERSITY	# of <b>Books</b> in BOOK REPOSITORY	# of <b>Books</b> in the RIVER	# of Robot Touching Penalties	# of <b>Book</b> Ejection Penalties	Score
40	8	5	6	0	0	0	95
10	7	14	0	6	2	0	28
11	22	10	10	2	1	0	109
0	0	74	0	0	0	0	222
24	0	15	4	4	0	1	63
2	5	0	60	12	1	1	196
10	4	2	3	8	6	2	0
0	0	14	0	14	0	0	0

30. All referees' rulings are final and may not be appealed.

Please contact [Mission.Control@EARLYrobotics.org](mailto:Mission.Control@EARLYrobotics.org) with any questions or comments.

Thank you for maintaining the spirit of the game!