Robotics/GPS/GIS Project Helper Guide
Robot Sumo Competition

Robotics/GPS/GIS Skill: Problem Solving.
Life Skill: Performing as Team Member; Solving Problems.
SCANS: Interpersonal: Participates as Member of Team – Technology: Applies technology to task.
ISTE Technology Standard 8: Select and use appropriate tools and technology resources to accomplish a variety of tasks and solves problems.
NSES Science Standard E: Science & Technology: Students should develop abilities of technological design.
NCTC Mathematics Standard 6: Problem Solving: Apply and adapt a variety of appropriate strategies to solve problems.
Success Indicator: Build and program robot to specifications to compete in Robot Sumo Competition.
Participation: Partner
Time Required: 6 to 7 hours
Materials & Supplies: Robot Sumo Competition arena; *Robot Sumo Competition Rules* – one copy for each participant; LEGO MINDSTORMS Education NXT robotics kit for each two-person team; LEGO MINDTORMS NXT Software loaded onto computers

Robot Sumo Competition

It's time to congratulation participants! They've completed 14 robotics activities in *EXPEDITION 4-H*! Now, it's time to apply everything they've learned to compete in a Robot Sumo Competition!

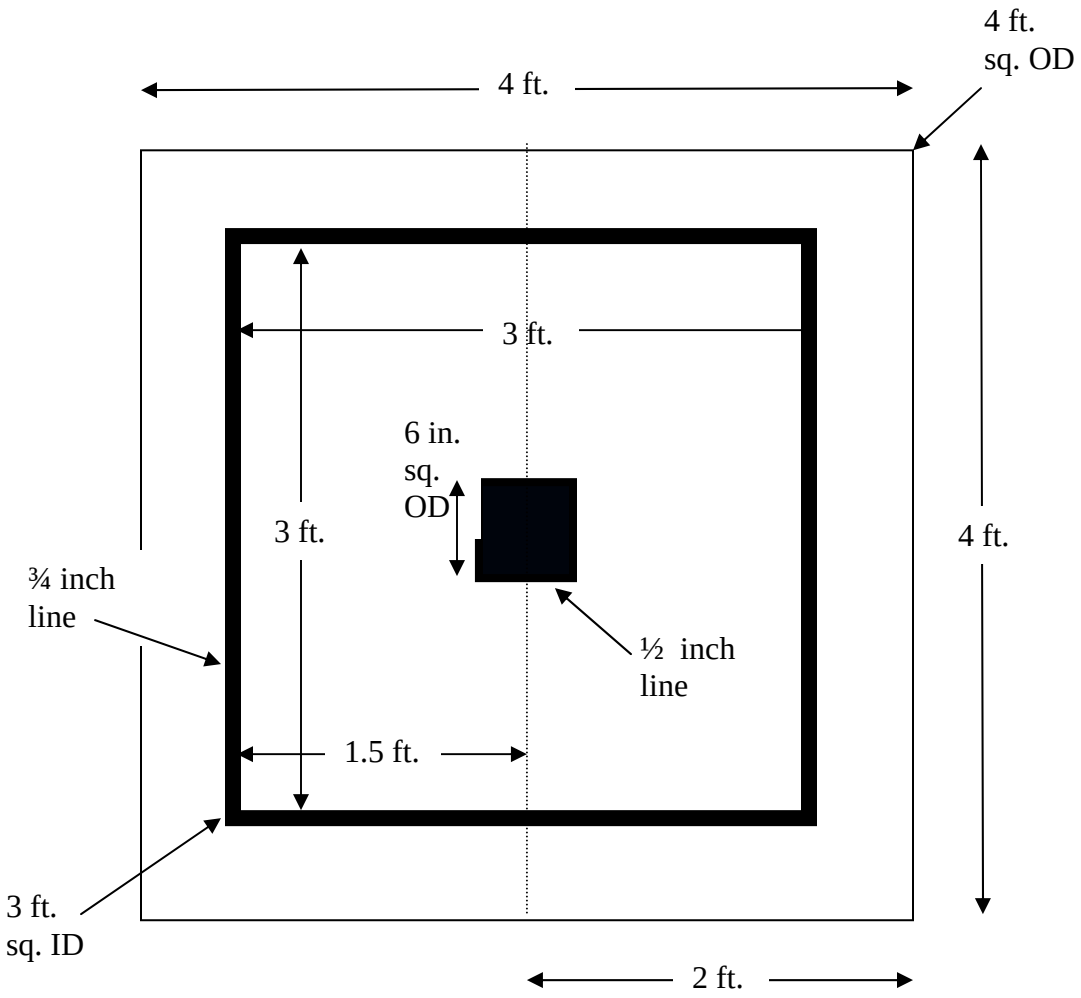
LEGO sponsors a MINDSTORMS NXT Sumo Competition every year. Information on the annual LEGO competition is online at http://mindstorms.lego.com/specialevent. The *Robot Sumo Competition Rules* you use are based on the LEGO competition and the arena is built to LEGO specifications.

The MINDSTORMS NXT Sumo Competition is based on the Japanese sport of Sumo wrestling. Two wrestlers (rikishi) attempt to force one another out of a circular ring (dohyo). Japan is the only country where Sumo is practiced professionally. The Japanese consider Sumo a modern martial art, though it is an ancient form of competition.

Getting Started

Your first task is to create the arena! There are two choices:

1. You can create a **permanent arena** on 4' x 4' smooth plywood painted white. Measure and mark a 3' x 3' square arena with a 3/4-inch wide black border. See diagram below.
2. You can create a **temporary arena** in a 4' x 4' area on a light colored floor. Measure and mark a 3' x 3' square arena with a 3/4-inch wide black border. See diagram below.



Complete preparation by printing the *Robot Sumo Competition Rules* and making one copy for each participant. For each two-person team, you'll provide one computer with the LEGO MINDSTORMS NXT Software and one LEGO MINDSTORMS Education NXT robotics kit.

Do the Activity

This activity requires 6 1/2 hours:

1/2 hour to introduce activity
2 hours to plan and design robot
2 hours to build and program robot
1 hour to facilitate the Robot Sumo Competition
1 hour to complete *EXPEDITION: Discovery* and *EXPEDITION: Q&A Log*

Introduce activity:

1. Youth read *Activity Thirty Four* completely.
2. Pass out and review *Robot Sumo Competition Rules*.

Plan & design robot:

1. Youth should develop a strategy or strategies to win.
2. The plan and design should be based on the strategy or strategies.
3. Encourage youth to write down both the plan and design in detail.

Build & program robot:

1. Open LEGO MINDSTORMS NXT Software.
2. Pass out LEGO MINDSTORMS Education NXT robotics kits.

Robot Sumo Competition:

1. To determine the order of the Robot Sumo Competition, each team draws from a container in which you've placed slips of paper with sequential numbers equal to the number of teams. Team One meets Team Two; Team Three meets Team Four; etc.
2. The winner of the Robot Sumo Competition is the team with the highest point total. Teams can tie for first place OR the match can continue until there is one winner.
3. You may want to create your own judging criteria. For example: In addition to the points teams receive for the Robot Sumo Competition, you can allocate points for how youth answer the questions in the *EXPEDITION: Q&A Log*.
4. You may also want to invite guest judges. All judges should use the official scorecard.

Complete *EXPEDITION: Discovery* and *EXPEDITION: Q&A Log*:

1. Youth have listed six things they want to learn about robotics.
2. Youth evaluate and share their accomplishments.
3. Youth answer questions.
4. Youth share answers.

Additional Information

Youth are probably more familiar with computer gaming than the MINDSTORMS NXT Sumo Competition sponsored annually by LEGO. Have they ever thought of designing games as a career?

Computer game designers are categorized as computer software engineers. It's estimated that computer software engineering will be one of the fastest growing careers over the next decade. Computer software engineers apply the principles of computer science and mathematical analysis to the design, development, testing, and evaluation of software and systems that operate computers.

In addition to computer gaming, computer software engineers design and development a variety of software including word processing and business applications, operating systems and network distribution, and compilers – which convert computer programs into machine language for implementation on computers.

Resources

Google Search:
LEGO Sumo Competition

Student Resources:
LEGO MINDSTORMS NXT
http://mindstorms.lego.com