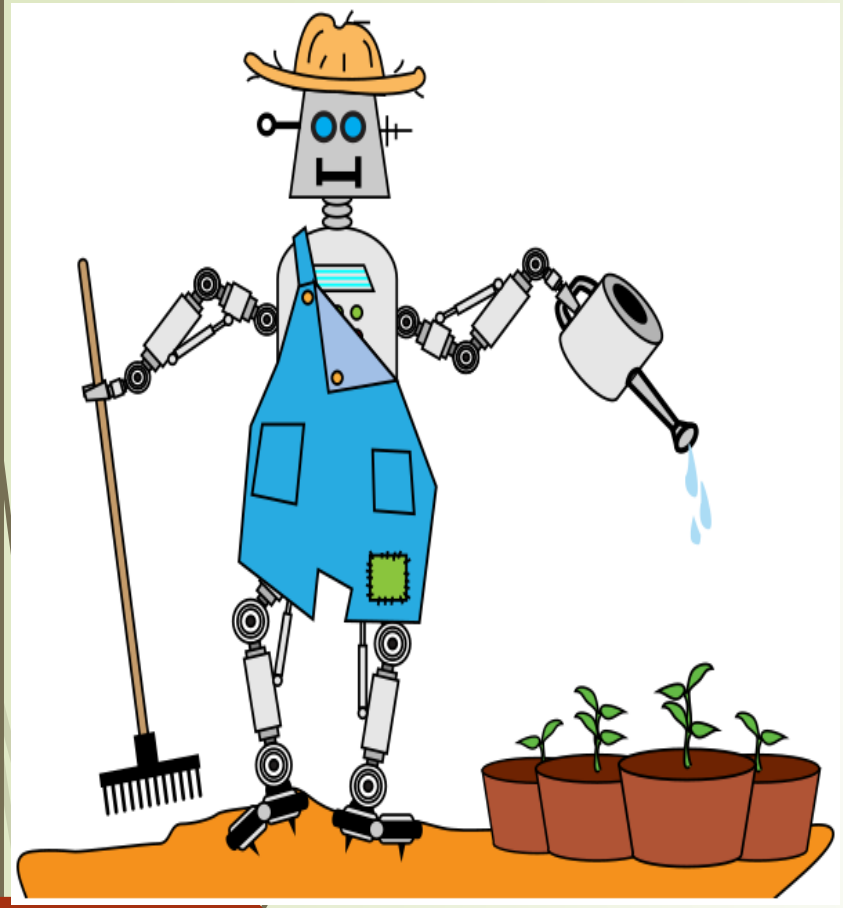
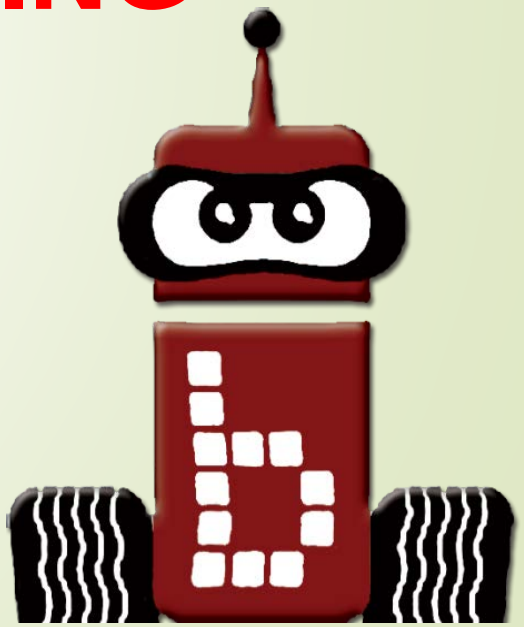


AG BOTS

KIDS PROGRAMMING FOR THE FUTURE

PRESENTED BY:
Johnnie Keel
Truman Elementary, Norman, Oklahoma.
jkeel@norman.k12.ok.us



Botball Video

It All Starts Here

HOW WILL WE FEED A WORLD OF 9 BILLION PEOPLE?

7 BILLION
2015 world population

9 BILLION
2040 world population

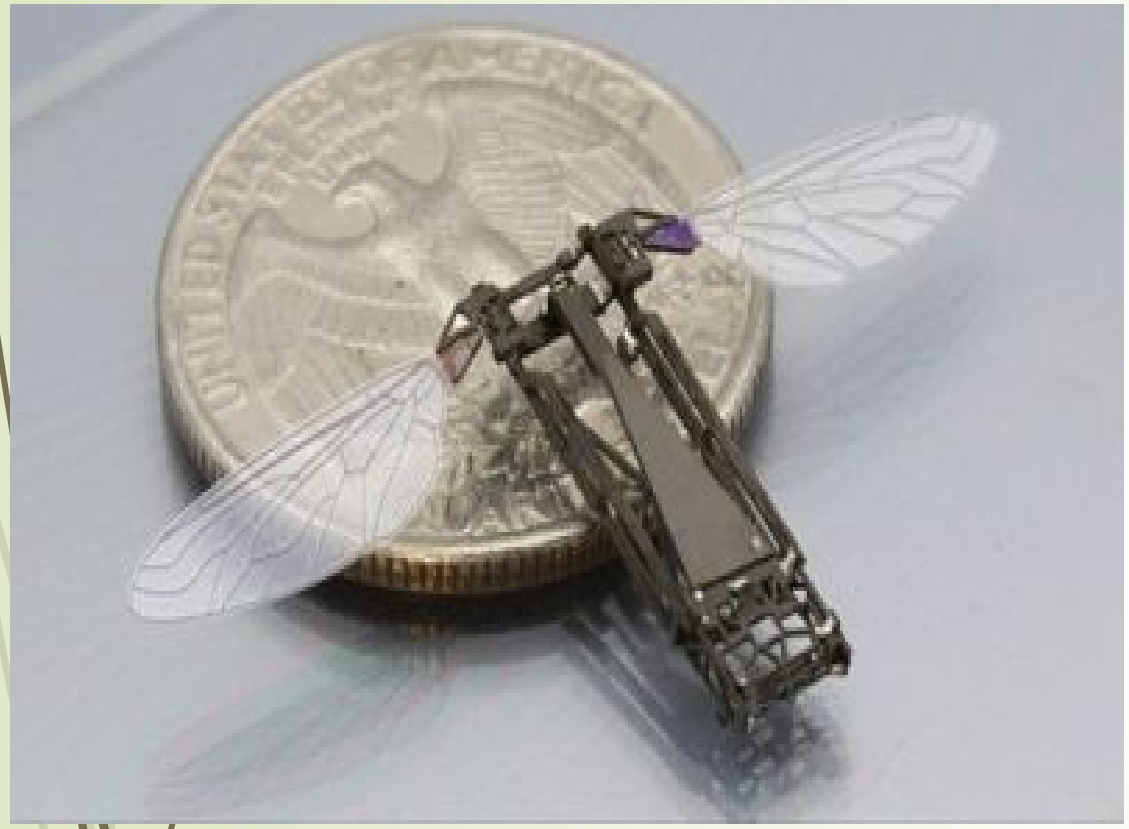
1 billion

CINQUE TERRE, ITALY

INNOVATIVE FARMING

CROPBOX
Cultivating the future of food

AG BOTS OF TODAY



Bee Bot used for Pollunation

Automatic Weed Control

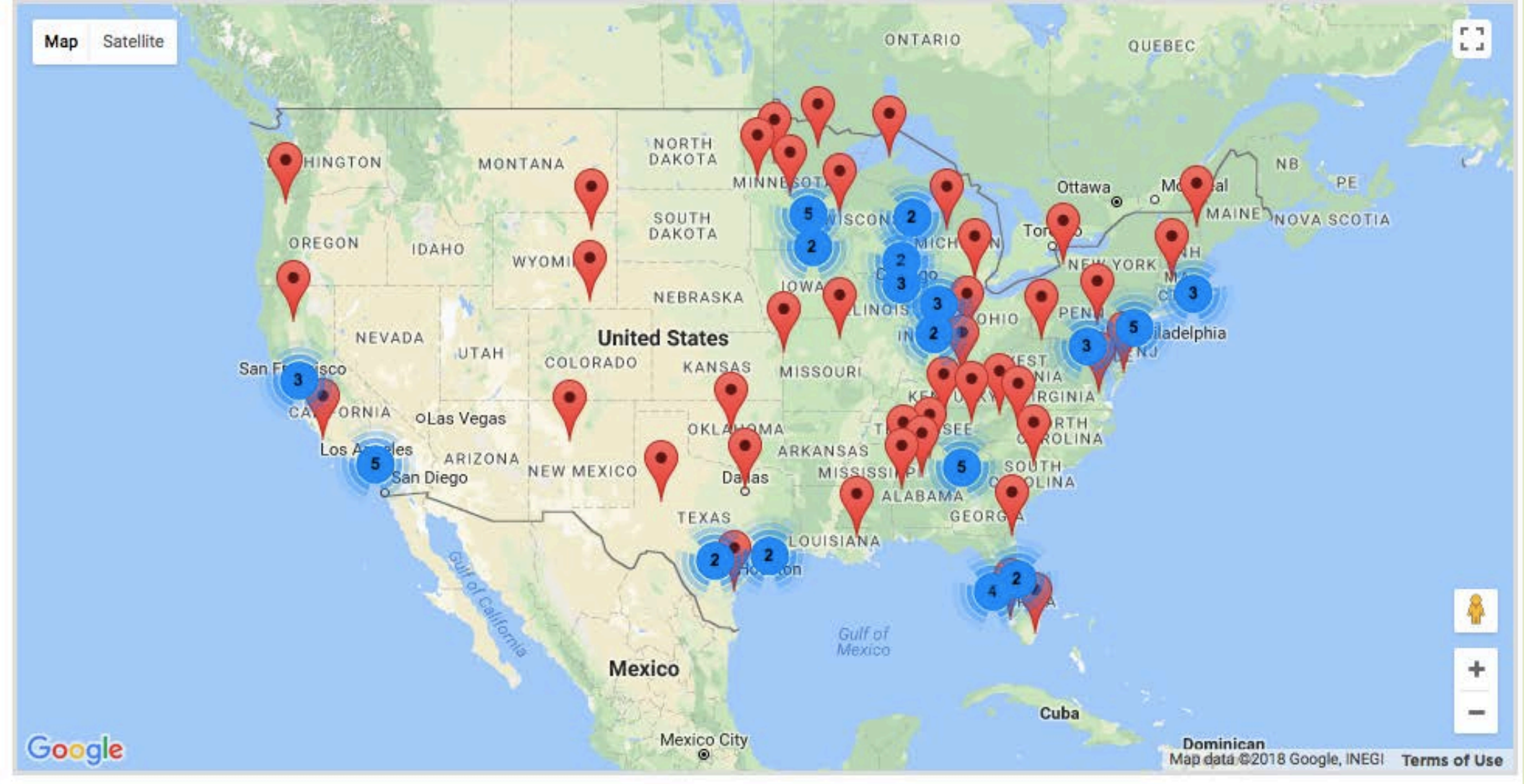
COMMERCIAL WEED CONTROL

Deepfield Robotics
BoniRob
DATA GATHERING

LETTUCE HARVESTER

FARMBOT

CODE.ORG PROFESSIONAL DEVELOPMENT

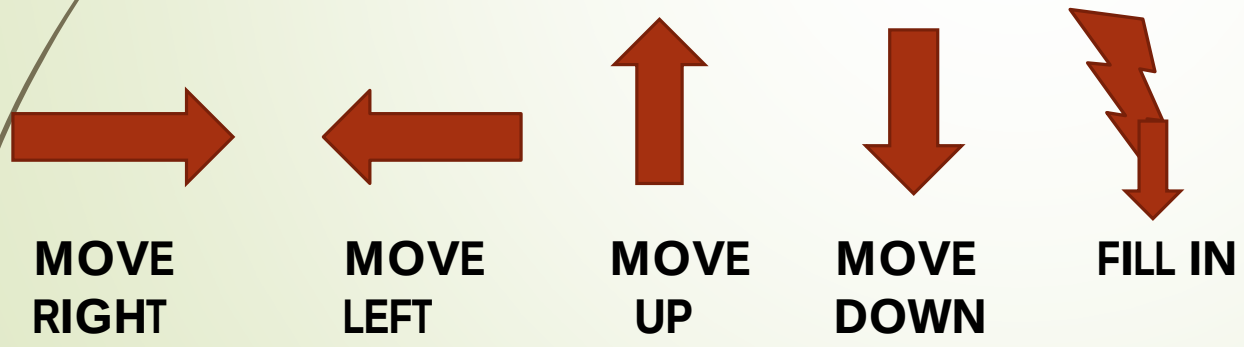


UNPLUGGED ACTIVITY

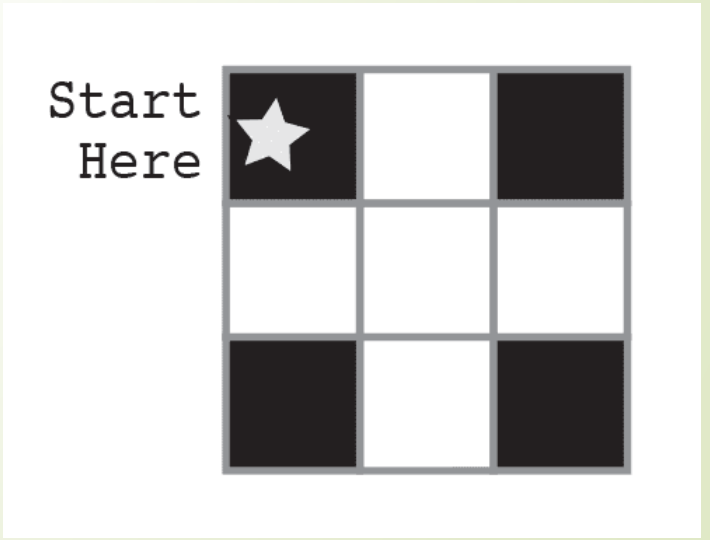
Graph Paper Programming

DISCUSS: Refer to FarmBot Video. Does a robot really "understand" what you say? Is it worried about getting in trouble if it doesn't do what it's told?

EXPRESS: Robots can only do what they've been told to do, but we don't just tell them using words. A robot needs to have a list of steps that it can read. Today, we are going to learn what it takes to make that happen.

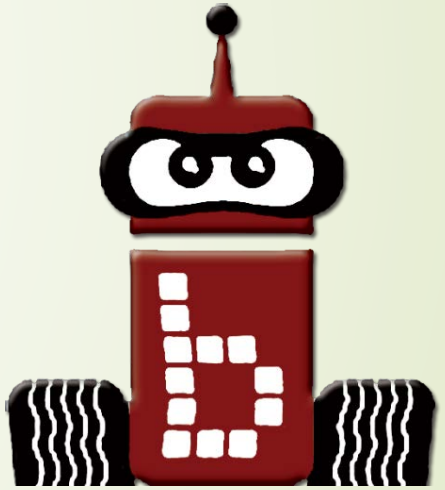


MOVE RIGHT **MOVE LEFT** **MOVE UP** **MOVE DOWN** **FILL IN**



PROGRAMMING WITH KIDS

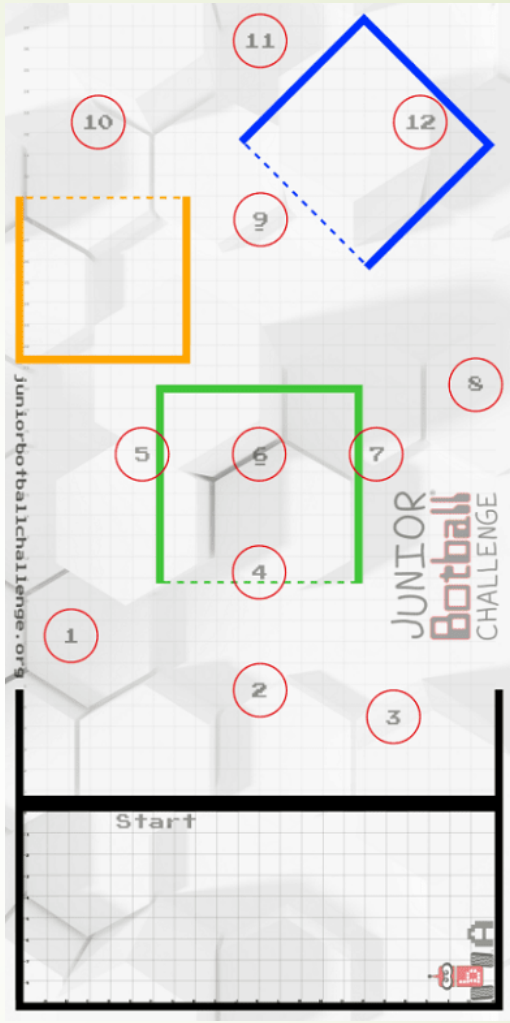
- Computational Skills
- Problem Solving
- Collaboration
- Critical Thinking Skills
- Real-life Application of Engineering Process
- Open Minded, Flexibility
- Creativity/Innovation
- Communication Skills
- Instills Persistence
- Awareness of Careers



Eggo

KISS INSTITUTE FOR PRACTICAL ROBOTICS

1818 West Lindsey Street
Building D, Suite 100
Norman, OK 73069
(405) 579-4609
Steve & Carol Goodgame



$500/kit with 2 mats, resources, training
$75/team for challenge events

C Programming Language

JUNIOR BOTBALL

"Hello, World!"

File: main.c

```
1  #include <kipr/botball.h>
2
3  int main()
4  {
5      printf("Hello World\n");
6      return 0;
7  }
```

Note: We will use this template every time; we will delete lines we don't want, and we will add lines that we do want.

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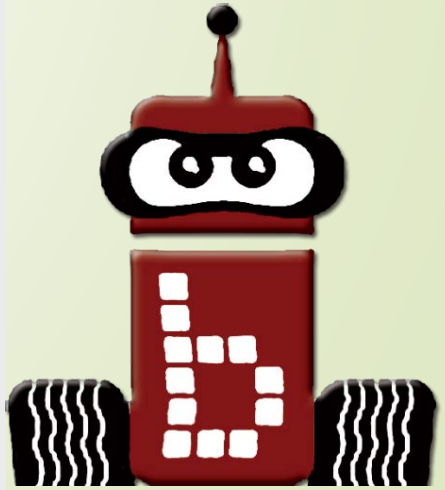

Text color highlighting

The KISS IDE highlights parts of a program to make it easier to read.
(By default, the KISS IDE colors your code and adds line numbers.)

- **Preprocessor commands** in **red**
- **Comments** in **green**
- **Text strings** appear in **blue**
- **Keywords** appear in **purple**

File: main.c

```
1 #include <kipr/botball.h>
2 // Created on Sat January 9, 2016
3
4 int main()
5 {
6     printf("Hello World\n");
7     return 0;
8 }
```


Professional Development Workshop
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Resource

Robot Driving Hints

- **Remember your # line:**
positive numbers (+) go forward and negative numbers (–) go in reverse.

- **Driving straight:** it is surprisingly difficult to drive in a straight line…
  - **Problem:** Motors are not exactly the same.
  - **Problem:** The tires might not be aligned perfectly.
  - **Problem:** One tire has more resistance.
  - **Solution:** You can adjust this by slowing down or speeding up the motors.

And many, many other reasons…

- **Making turns:**
  - **Solution:** Have one wheel go faster or slower than the other.
  - **Solution:** Have one wheel move while the other one is stopped.
  - **Solution:** Have one wheel move forward and the other wheel move in reverse (friction is less of a factor when both wheels are moving).

Debugging Errors

Activity

line # : col # (the error is on or before the line # 8)

```
\KISS\src\workshop\main.c: In function 'main':
\KISS\src\workshop\main.c:8:1: error: expected ';' before '}' token
```

" expected : " (semicolon)

File: main.c

```
1 #include <kipr/botball.h>
2 // Created on Sat January 9, 2016
3
4 int main()
5 {
6     printf("Hello World\n");
7     return 0
8 }
```

When there is an error, you can ignore the first error line ("**In function 'main'**") and read the next to see what the first error is. If you have a lot of errors, start fixing them from the top going down. Fix one or two and recompile.

Compilation Failed ← **Yikes! Our program did not compile!**

```
Compilation Failed

C:\Users\Charles Winton\Documents\KISS\src\workshop\main.c: In function 'main'
C:\Users\Charles Winton\Documents\KISS\src\workshop\main.c:8:1: error: expected ';' before '}' token
```


Click to add text

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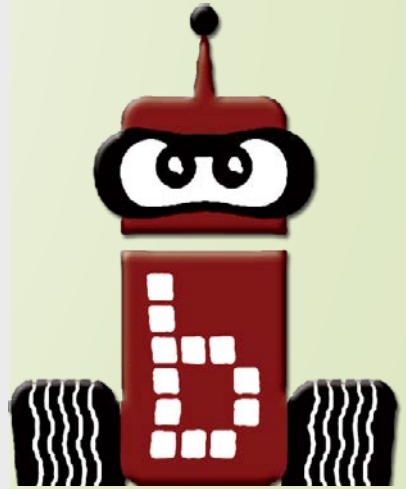
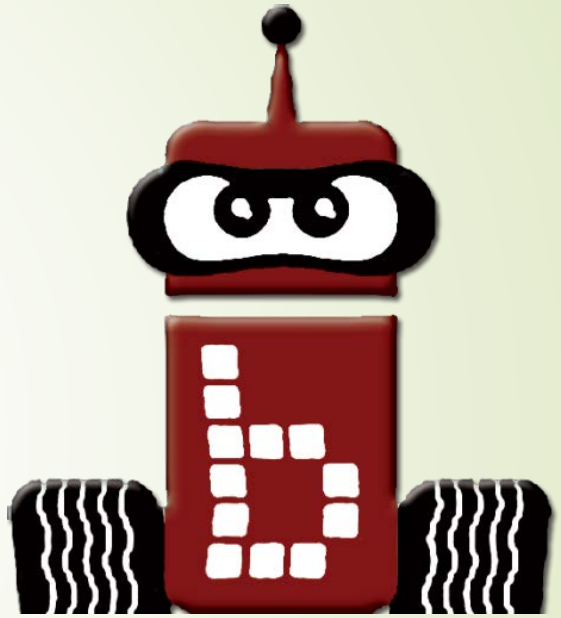
Botball®



Feeding Pigs

FUNDING

- SCHOOL FOUNDATION GRANTS
- PTA FUNDING
- COMPANIES/ORGANIZATIONS
- DONORS CHOSE
- PRIVATE DONORS
- FUND RAISERS
- TEAM REGISTRATION
- WOMEN'S GROUPS

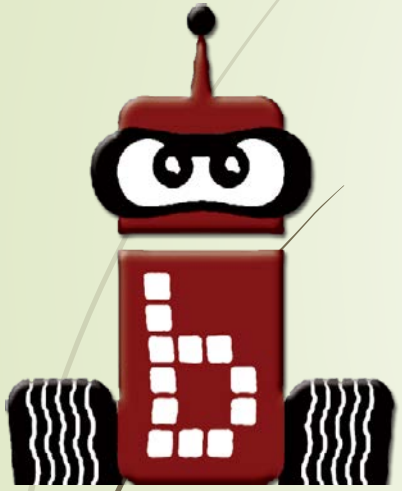


HAY

TRUMAN BOTBALL TEAM

- Application Process
- Students/Parents Sign Expectation Contract
  Pay Team Participation Fee
- Meet Weekly 1-1/2 hours after school
  Some extra practices when near a Challenge Date
- Usually 3 Challenges/Year
  Mandatory Spring Regional Challenge
- Ideally 4 per bot
- Priority given to 5th graders, hard working veteran team members
- Teacher coaches and parent helpers
- Alternative Robotic Opportunities

TRUMAN BOTBALL TEAM



COW TIPPING