



*Inspiring the world with MINDSTORMS*

# MARC-ANDRE BAZERGUI

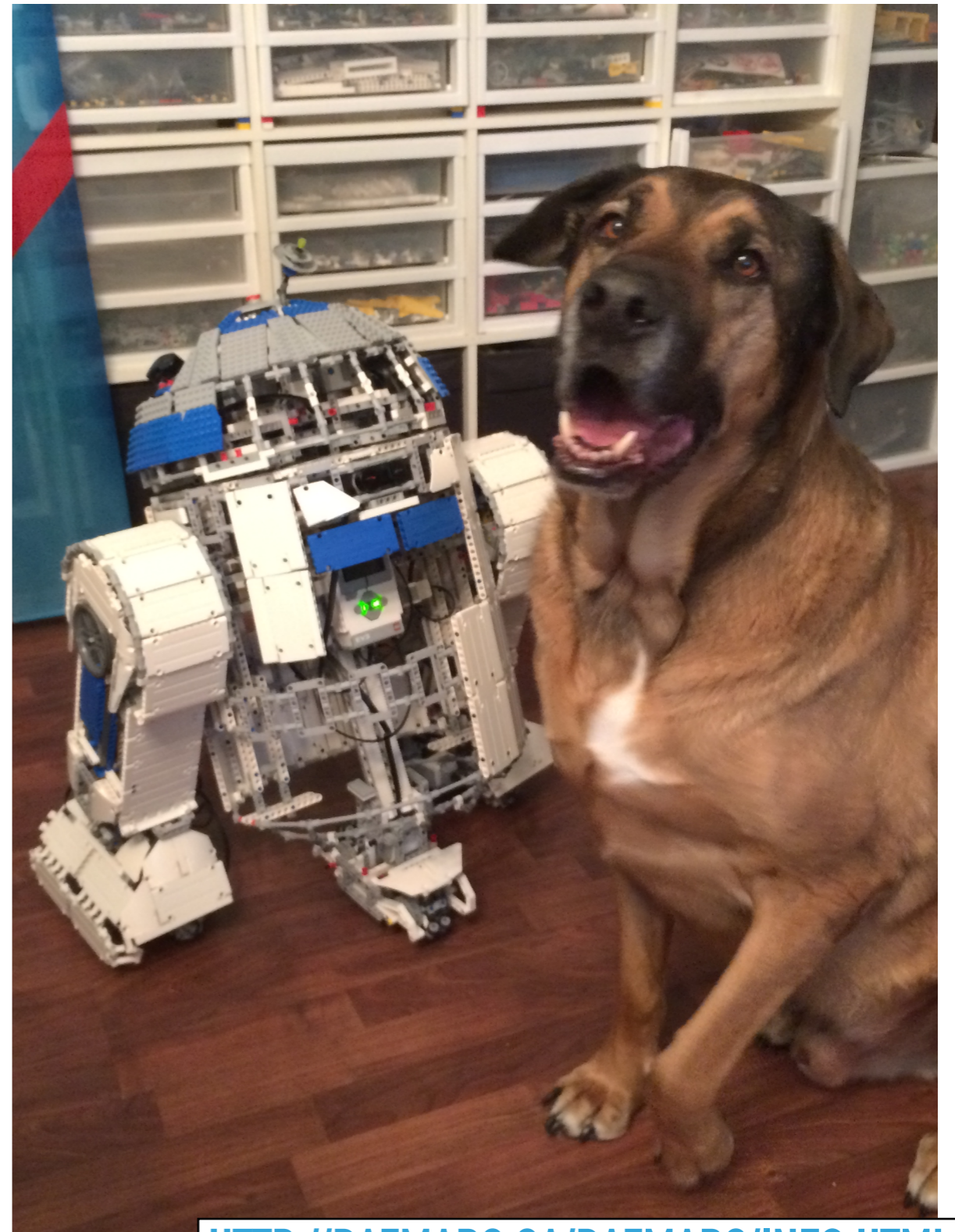
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**LEGO LEARNING SYMPOSIUM  
JUNE 6TH — JUNE 7TH, 2016**

**BAZMARC**

## ABOUT ME

- ▶ I am from Montreal, CANADA
- ▶ I make LEGO robots since 2007
- ▶ I have a big dog named EDWIN
- ▶ Online i'm known as bazmarc
- ▶ I work at IBM Canada  
in Remote Technical Support



# PEOPLE & PLACES OF MINDSTORMS

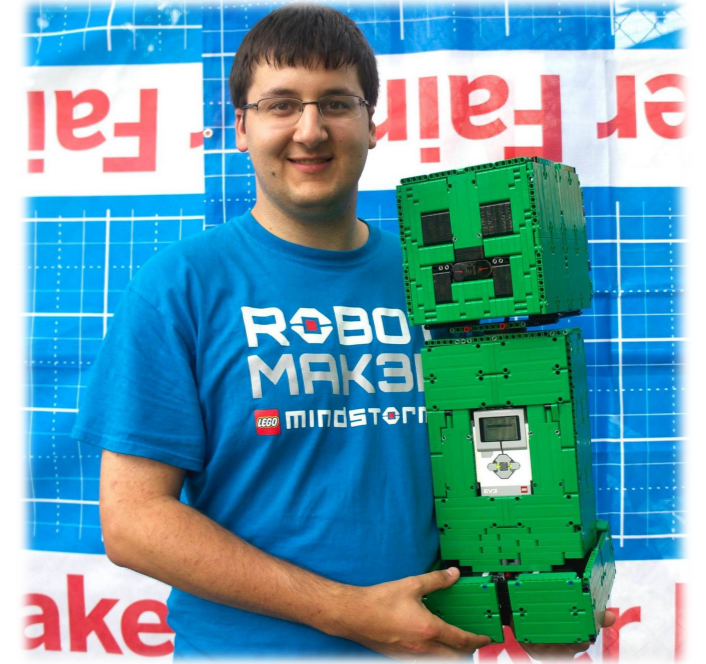
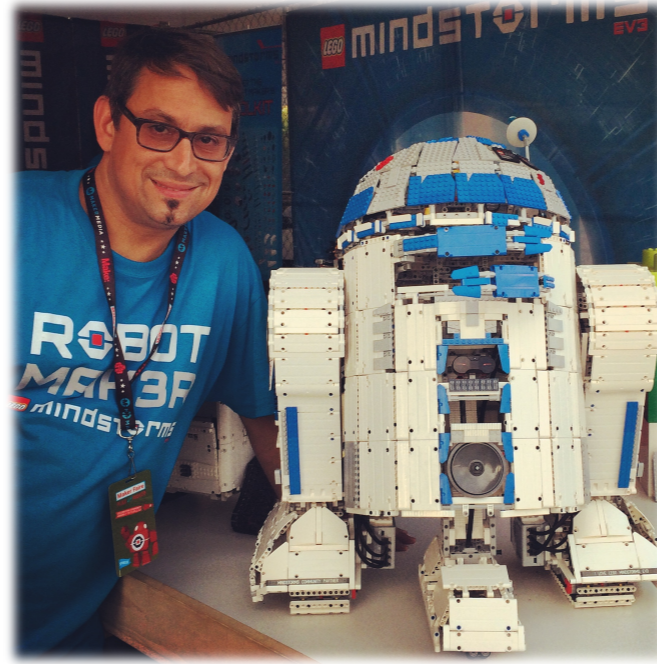


[HTTPS://WWW.FACEBOOK.COM/GROUPS/LEGOMINDSTORMS/](https://www.facebook.com/groups/legomindstorms/)



**A GLOBAL COMMUNITY OF MINDSTORMS USERS  
OF ALL LEVEL WITH A COMMON DESIRE TO  
HELP EACH OTHER OUT!**

[HTTPS://DRIVE.GOOGLE.COM/OPEN?ID=1XH6PMC52SNFA0ZWLRXDQH5D4KU&USP=SHARING](https://drive.google.com/open?id=1XH6PMC52SNFA0ZWLRXDQH5D4KU&usp=sharing)



## POP-CULTURE ROBOTS

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# WALL-E, R2-D2, CREEPER

[HTTPS://WWW.FACEBOOK.COM/LEGOMINDSTORMSWALLE/](https://www.facebook.com/legomindstormswalle/)

[HTTPS://WWW.FACEBOOK.COM/LEGOMINDSTORMSR2D2/](https://www.facebook.com/legomindstormsr2d2/)

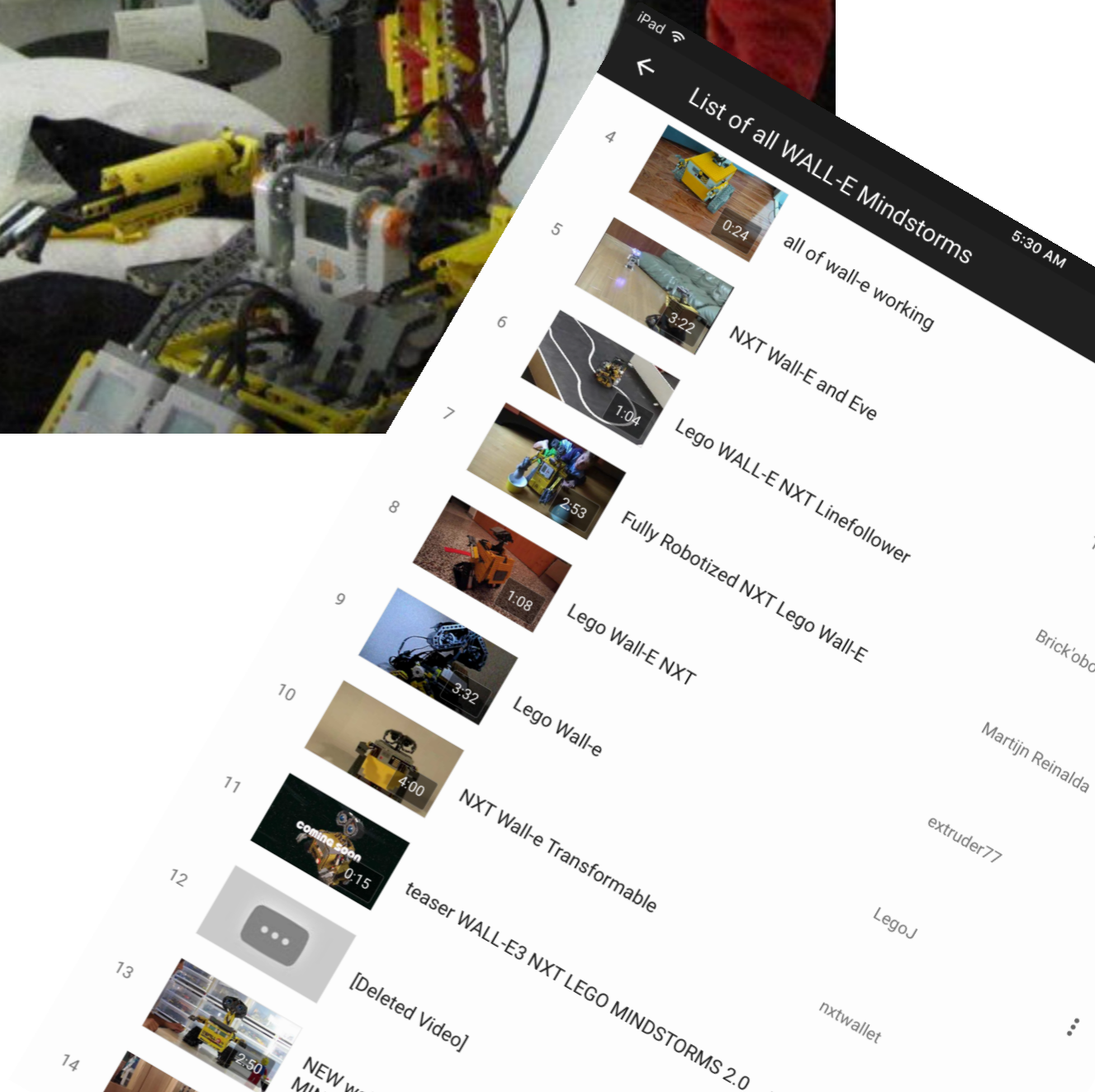
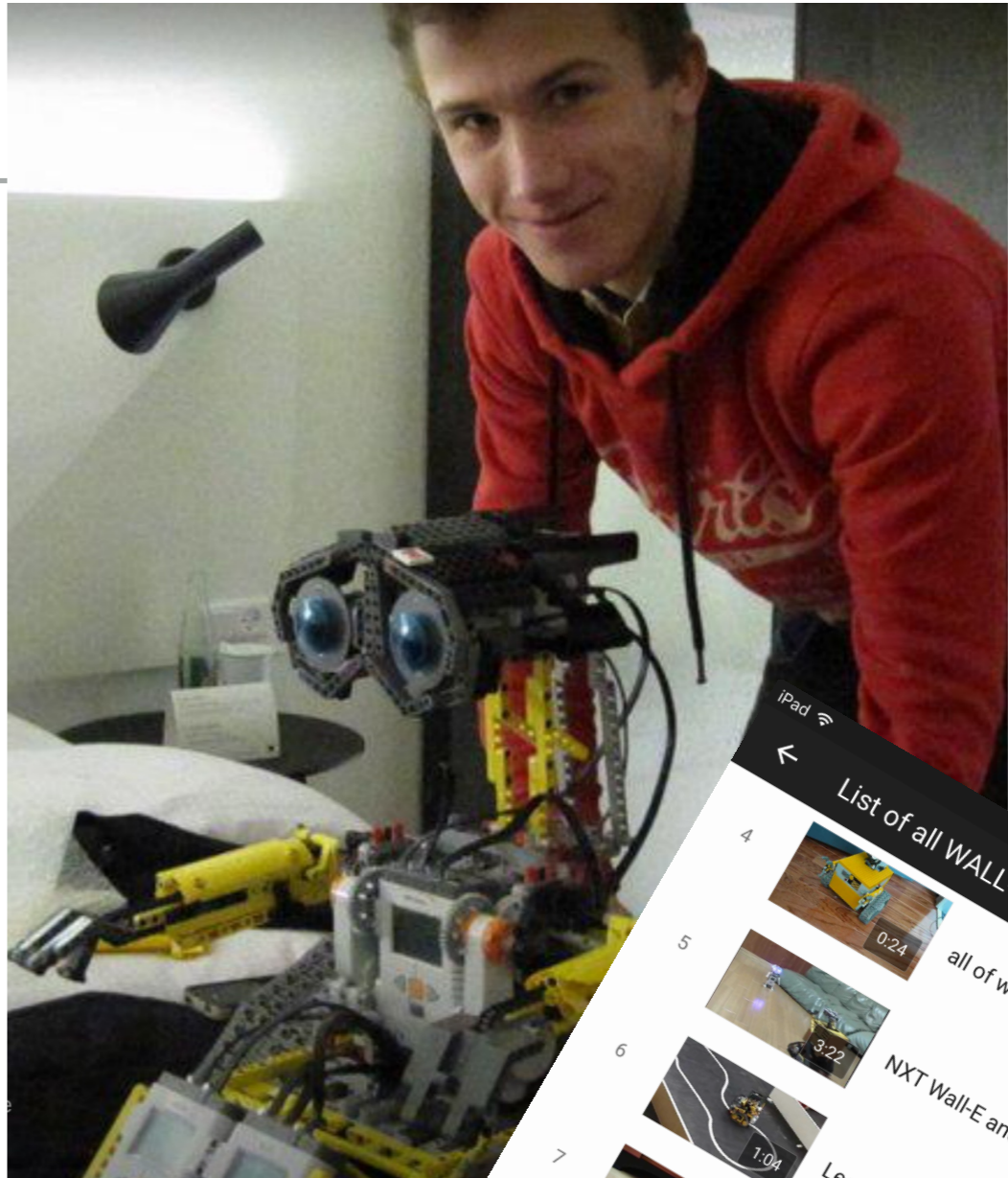
[HTTP://WWW.LEGO.COM/EN-US/MINDSTORMS/VIDEOS/MINECRAFT-CREEP3R-ROBOT-BY-ANDY...](http://www.lego.com/en-us/mindstorms/videos/minecraft-creep3r-robot-by-andy...)



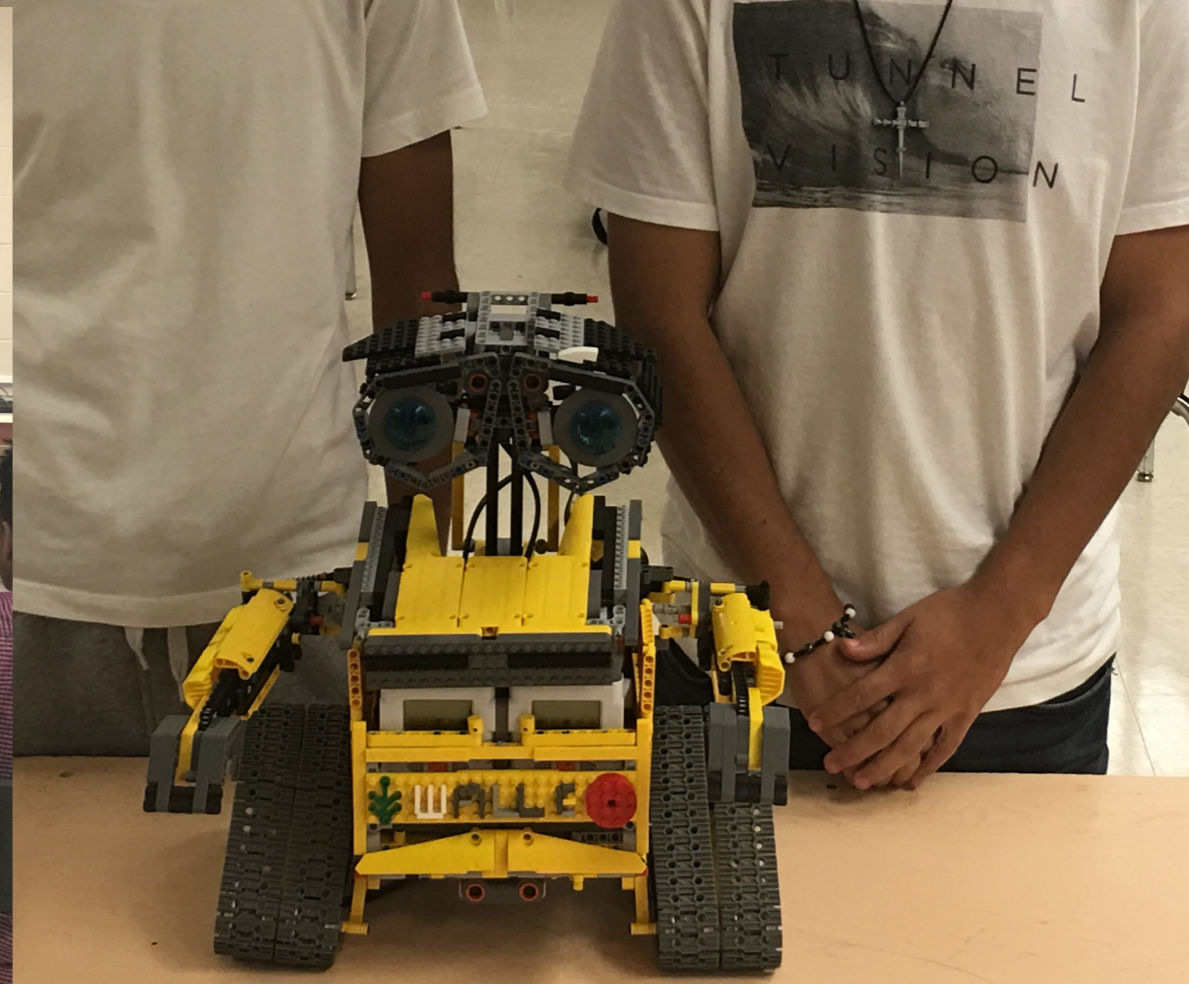
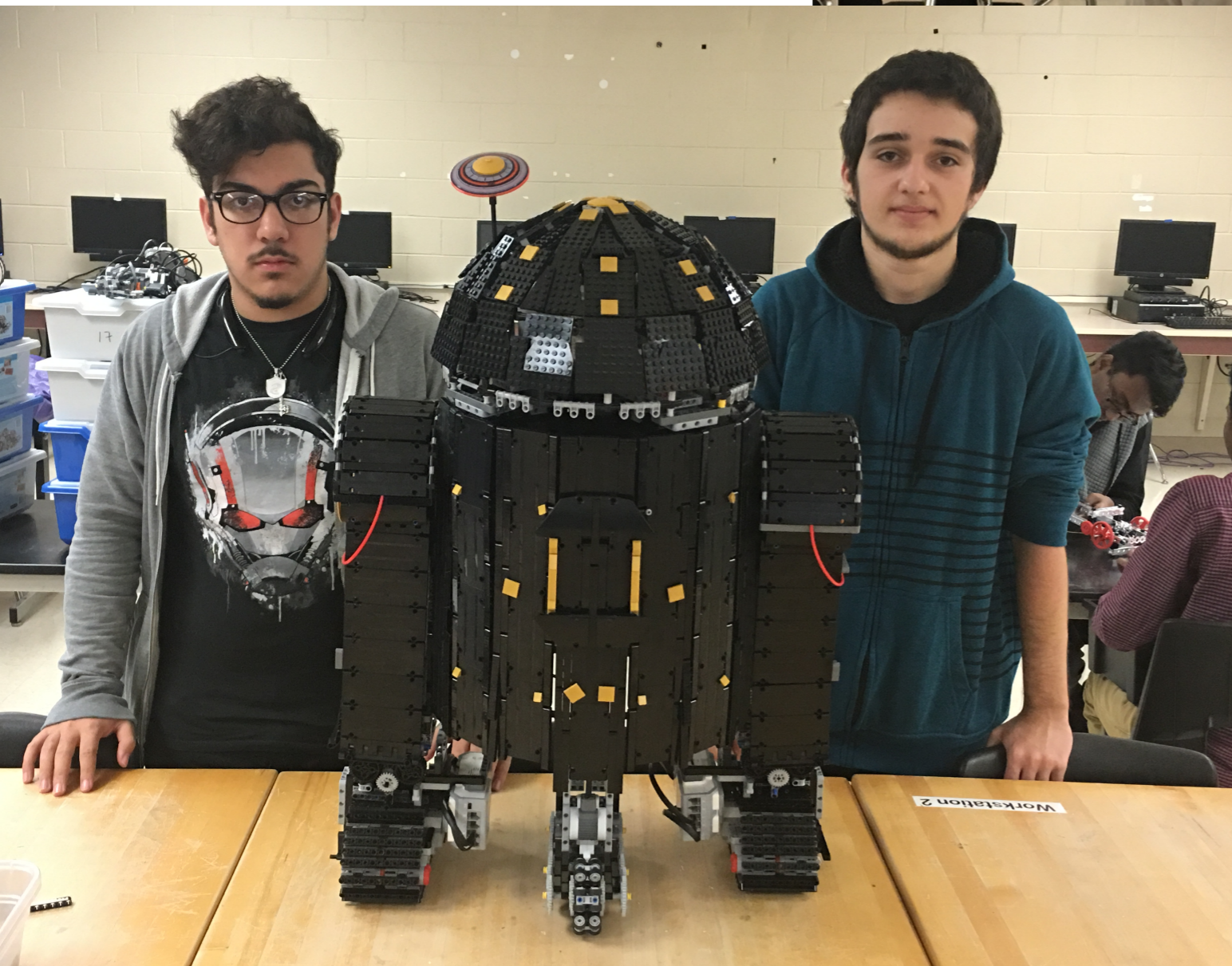
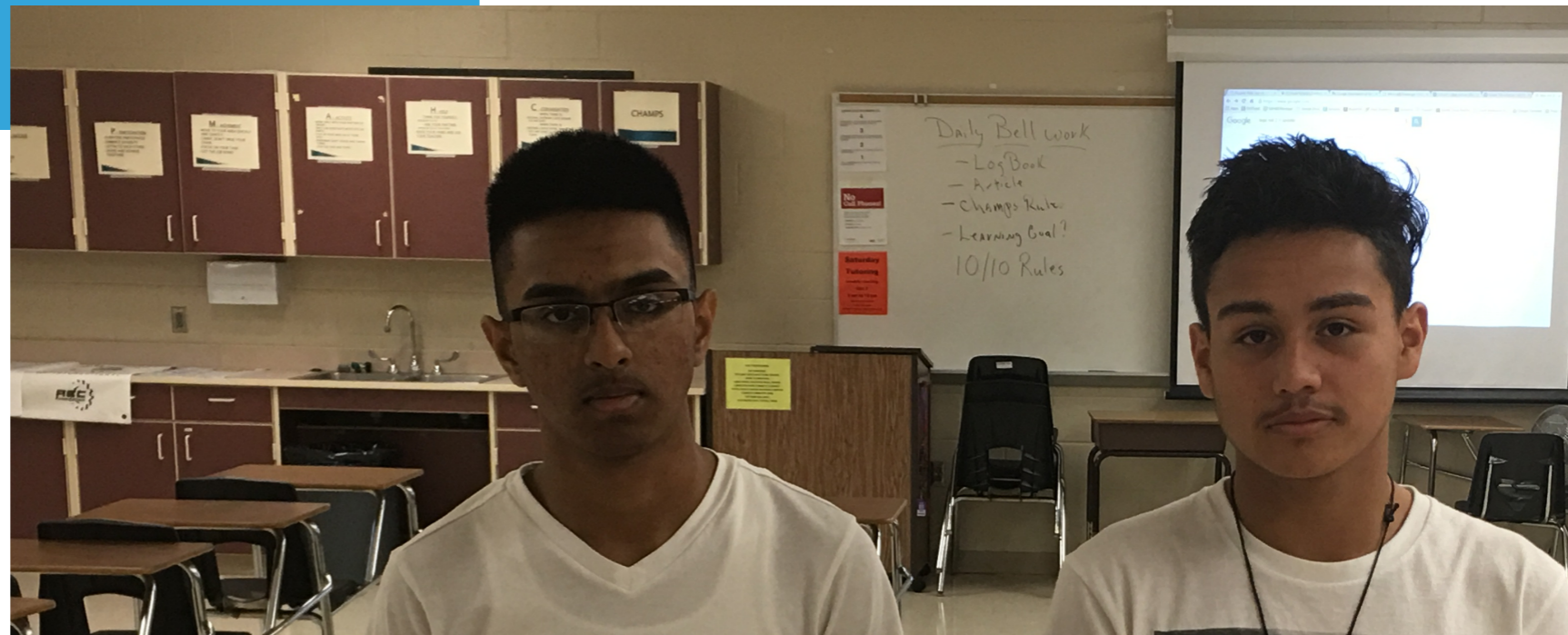
**MINDSTORMS**  
education

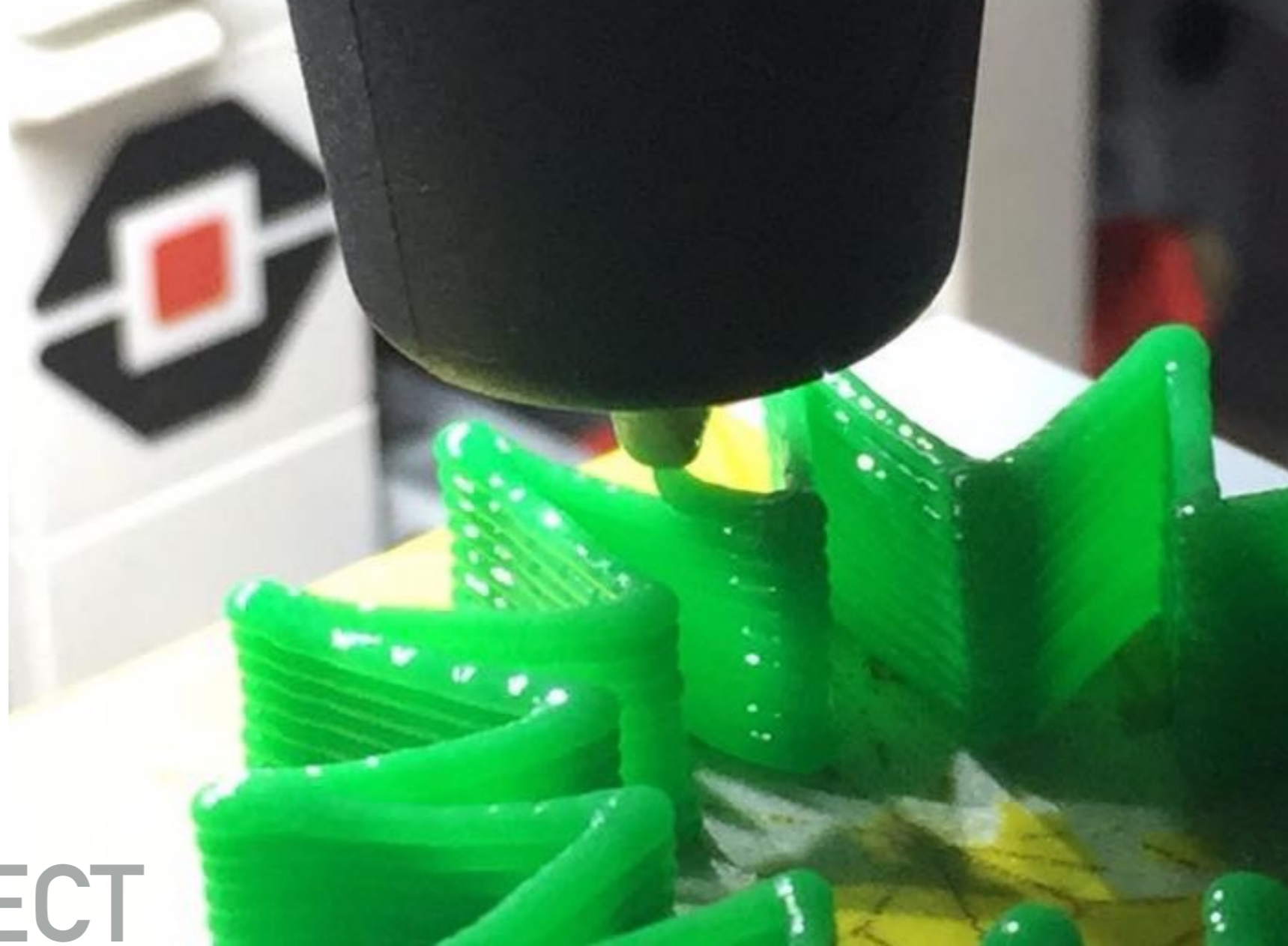
**EV3**





- ▶ Teacher/Coach  
James Jones from OCPS  
had his students replicate  
both R2-D2 and WALL-E





A GREAT  
STE(A)M PROJECT

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# EV3D PRINTER

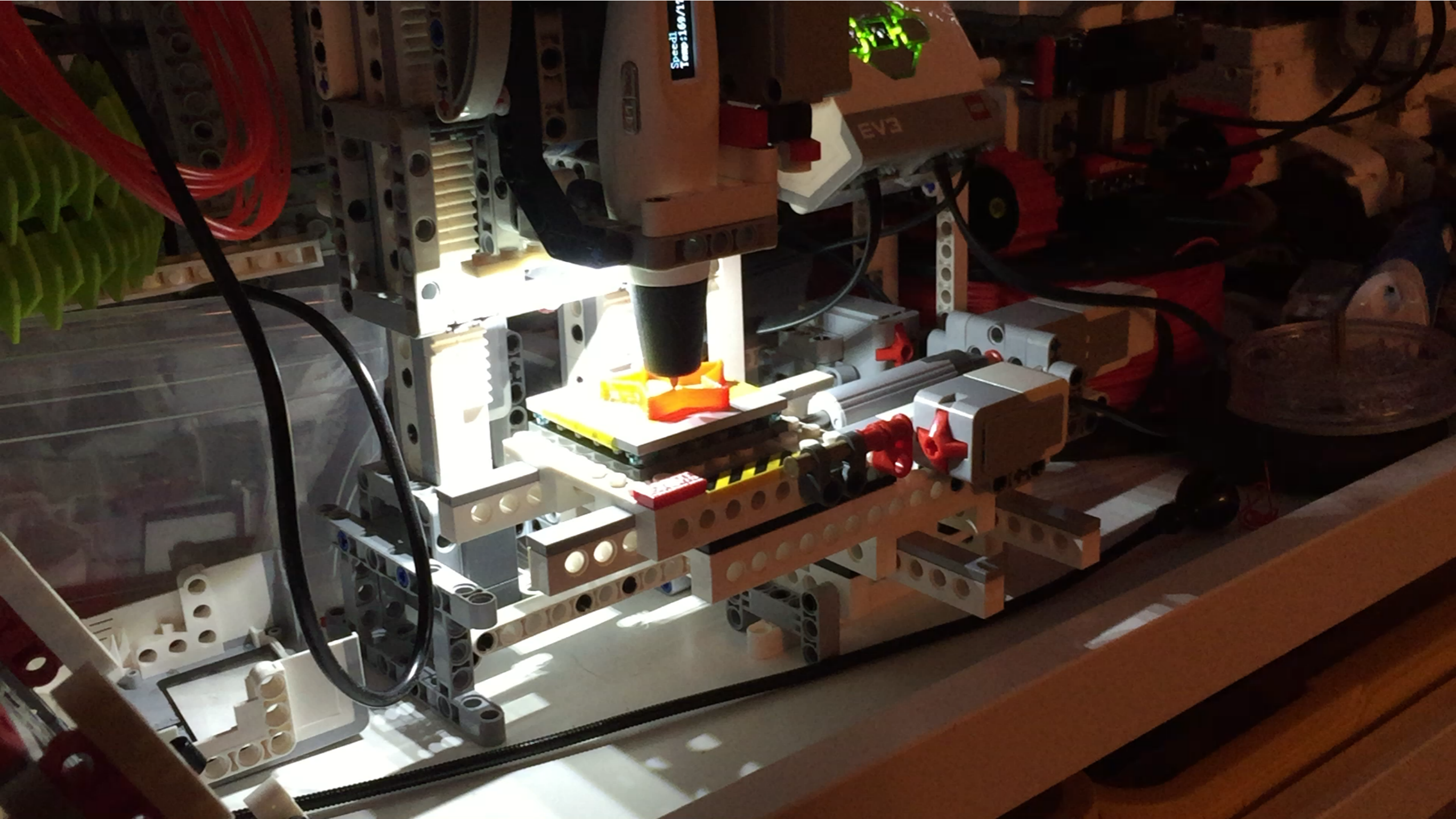
[HTTP://WWW.INSTRUCTABLES.COM/ID/NEW-EV3DPRINTER/](http://www.instructables.com/id/new-ev3dprinter/)

[HTTPS://WWW.FACEBOOK.COM/EV3DPRINTER/](https://www.facebook.com/ev3dprinter/)



TEXT

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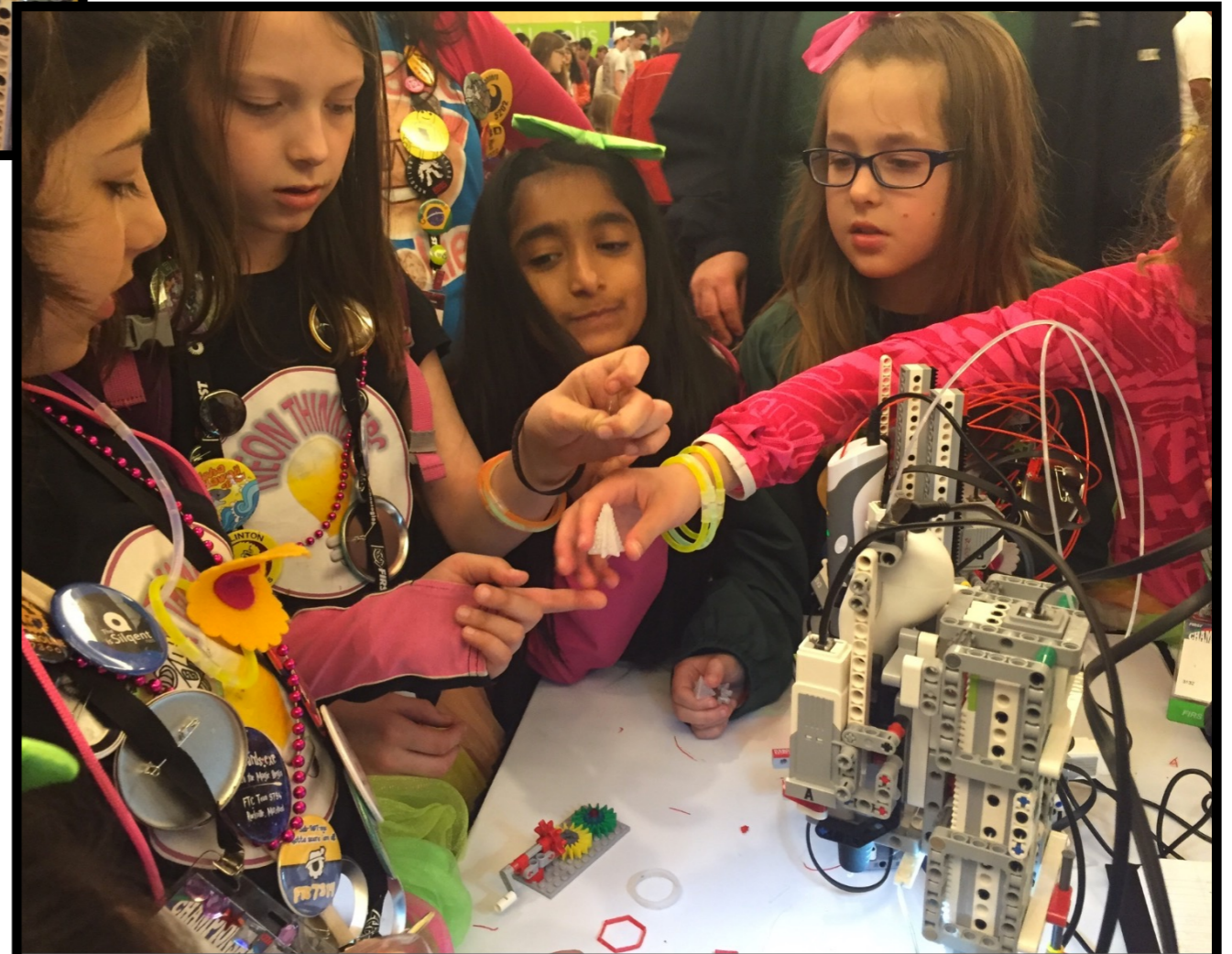
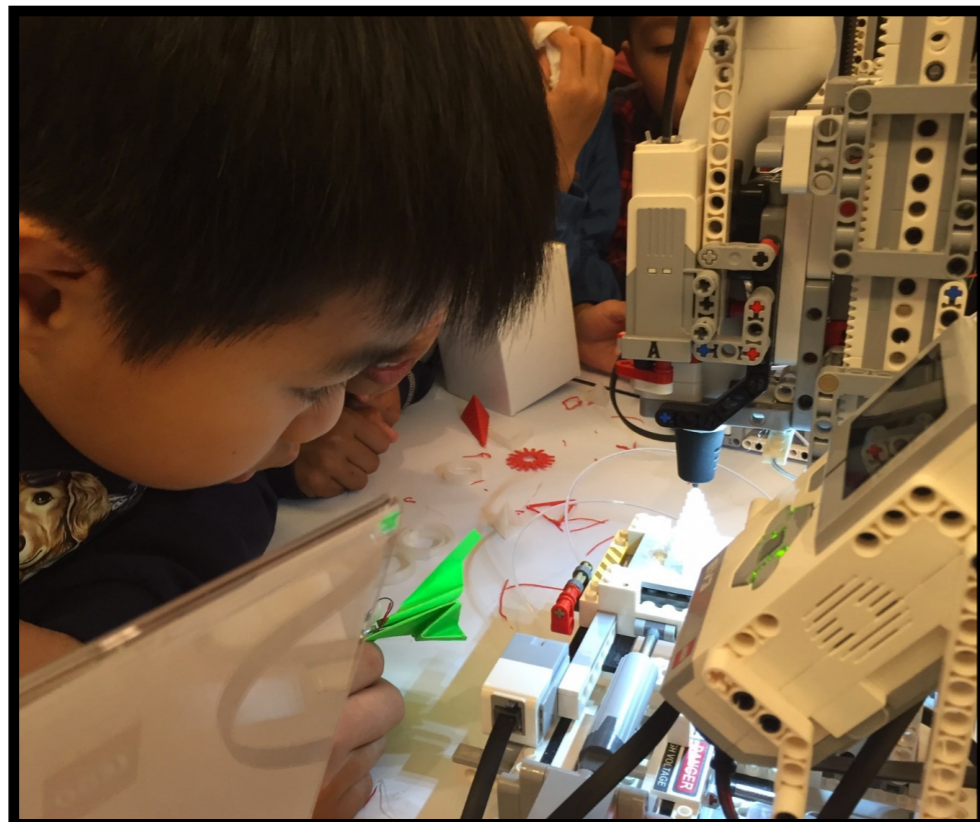
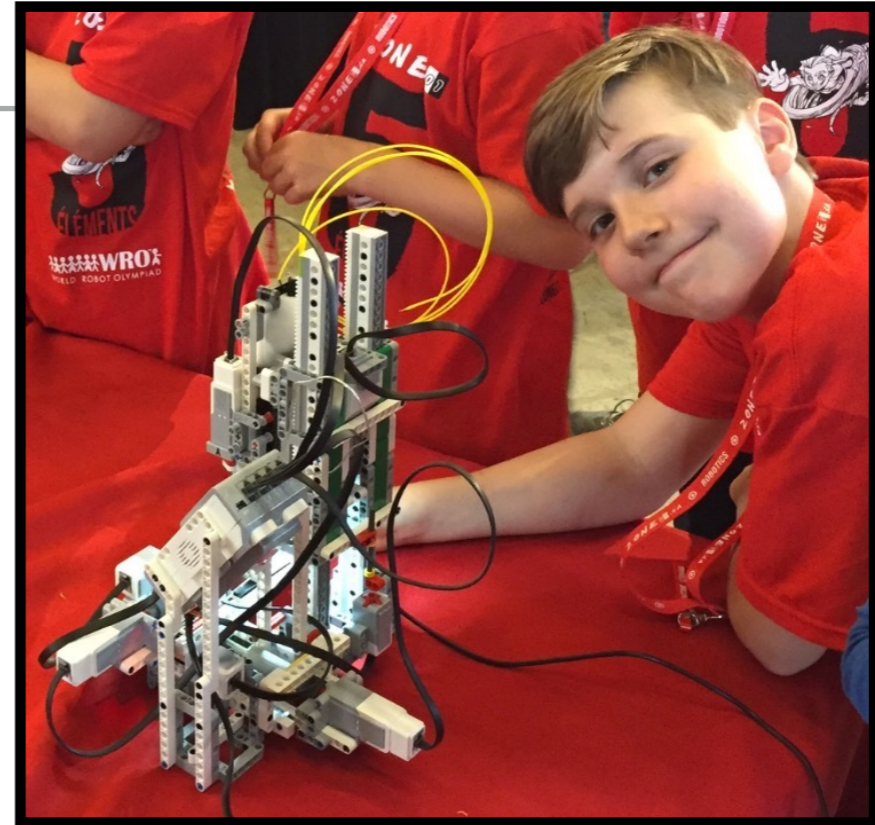
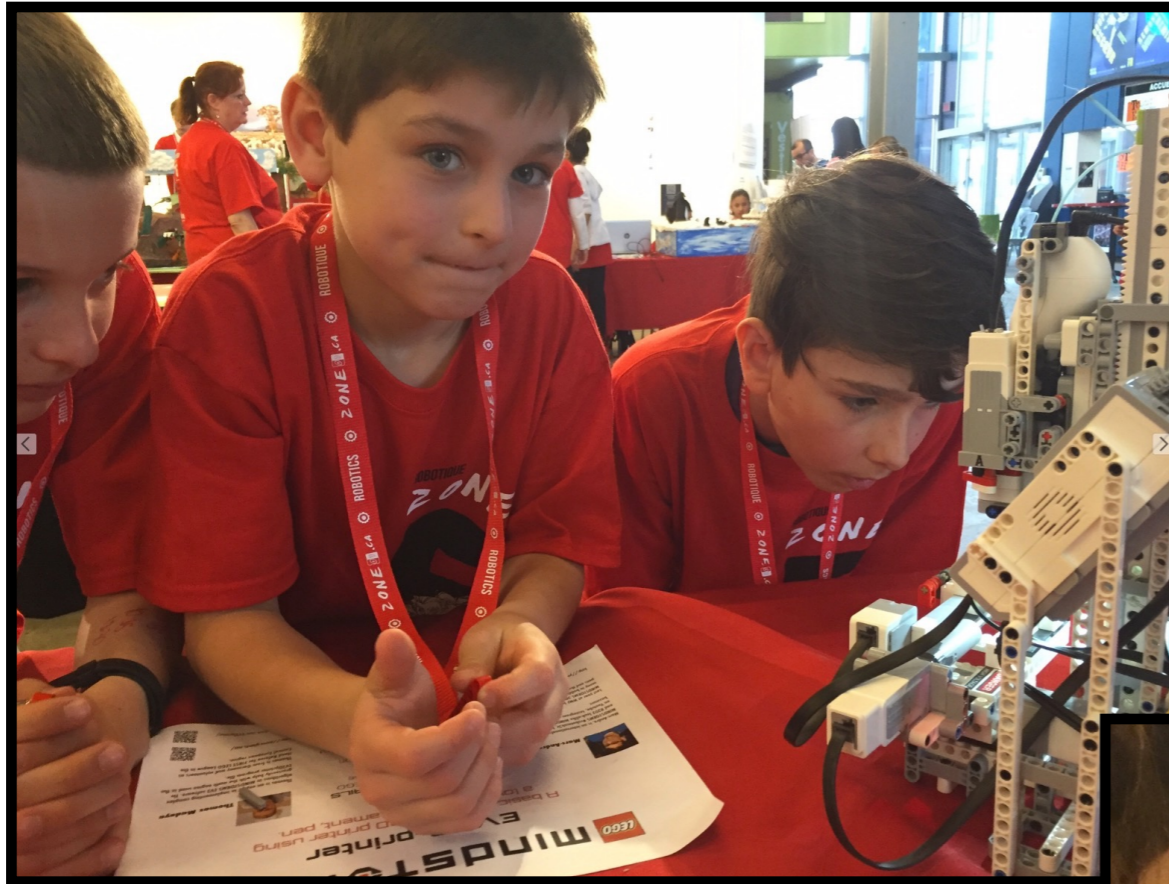


**3rd Generation  
(PLA or ABS)**

**1st Generation  
(ABS only)**

[HTTPS://WWW.FACEBOOK.COM/EV3DPRINTER/](https://www.facebook.com/ev3dprinter/)

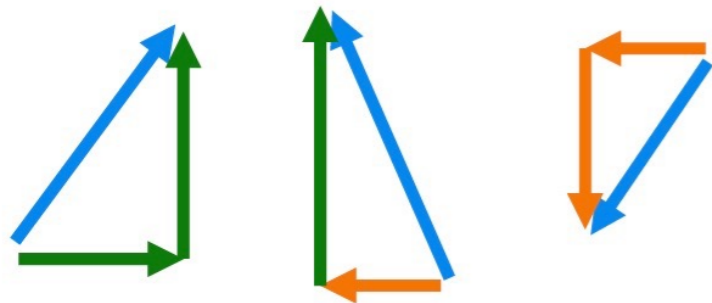
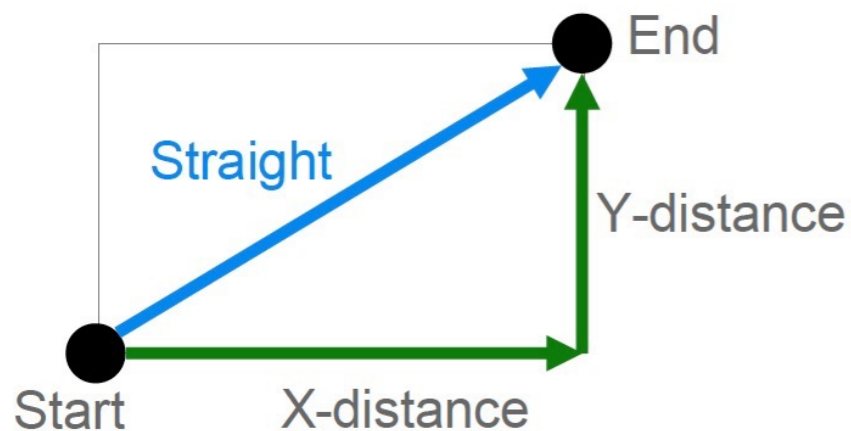
# THE EV3DPRINTER IN ACTION





# Q1 How to Plot a Straight Line?

## Straight lines



**For EV3:**  
distance = motor degrees

## Options to drive the motors

In sequence



X first,  
Y next

Parallel – same power



Y done,  
while X still runs.

Parallel – adjusted power



Less power for Y.  
Same duration.

## Calculating the Power

distance = power \* time

or

time = distance / power

time = x-dist / x-power

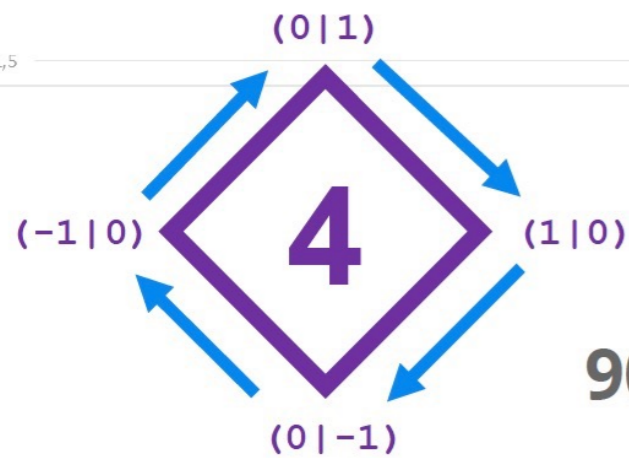
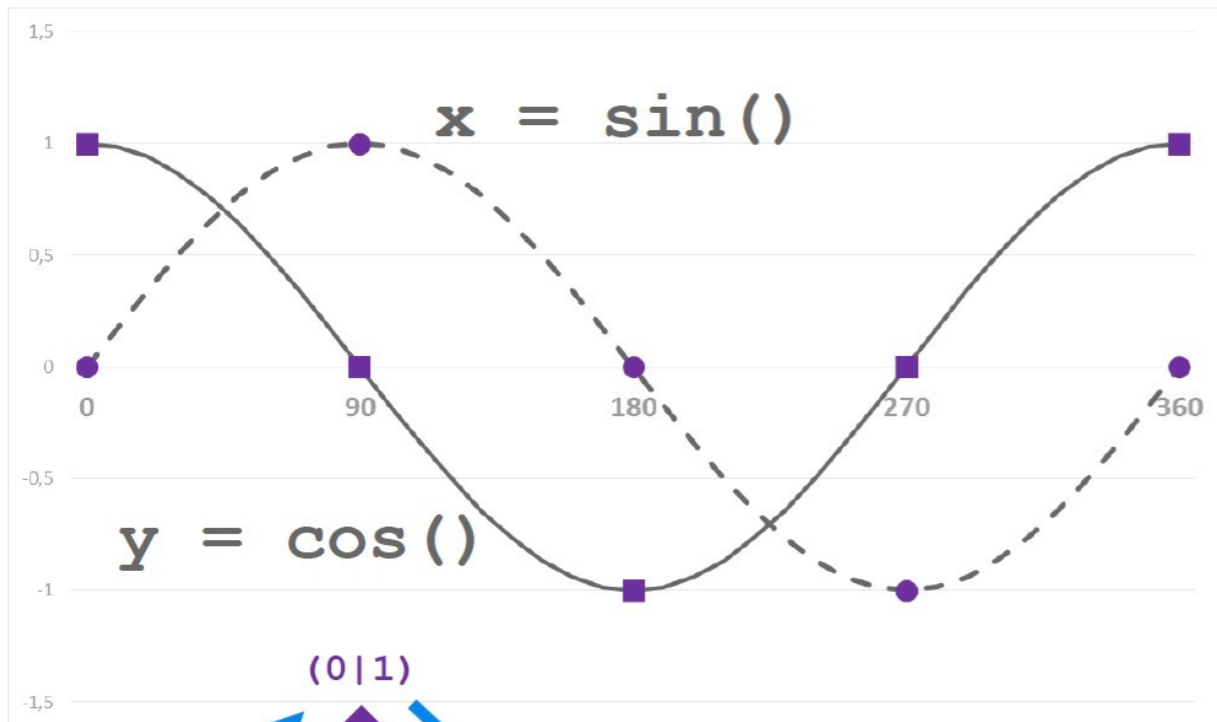
time = y-dist / y-power

x-dist / x-power  
= y-dist / y-power

y-power =  
y-dist / x-dist \* x-power

# Q2: How to Calculate Start/End Points?

## Trigonometry is the key

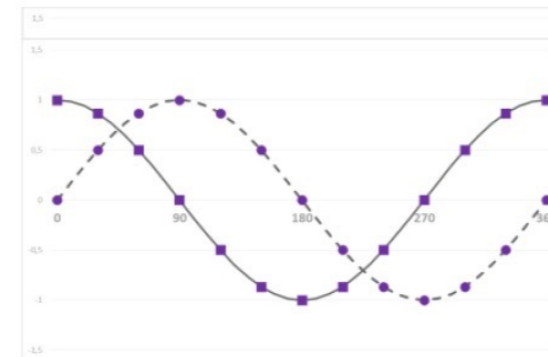


90 degree steps

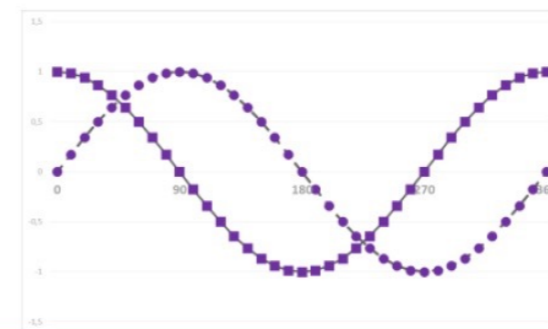
## Low degree = more lines



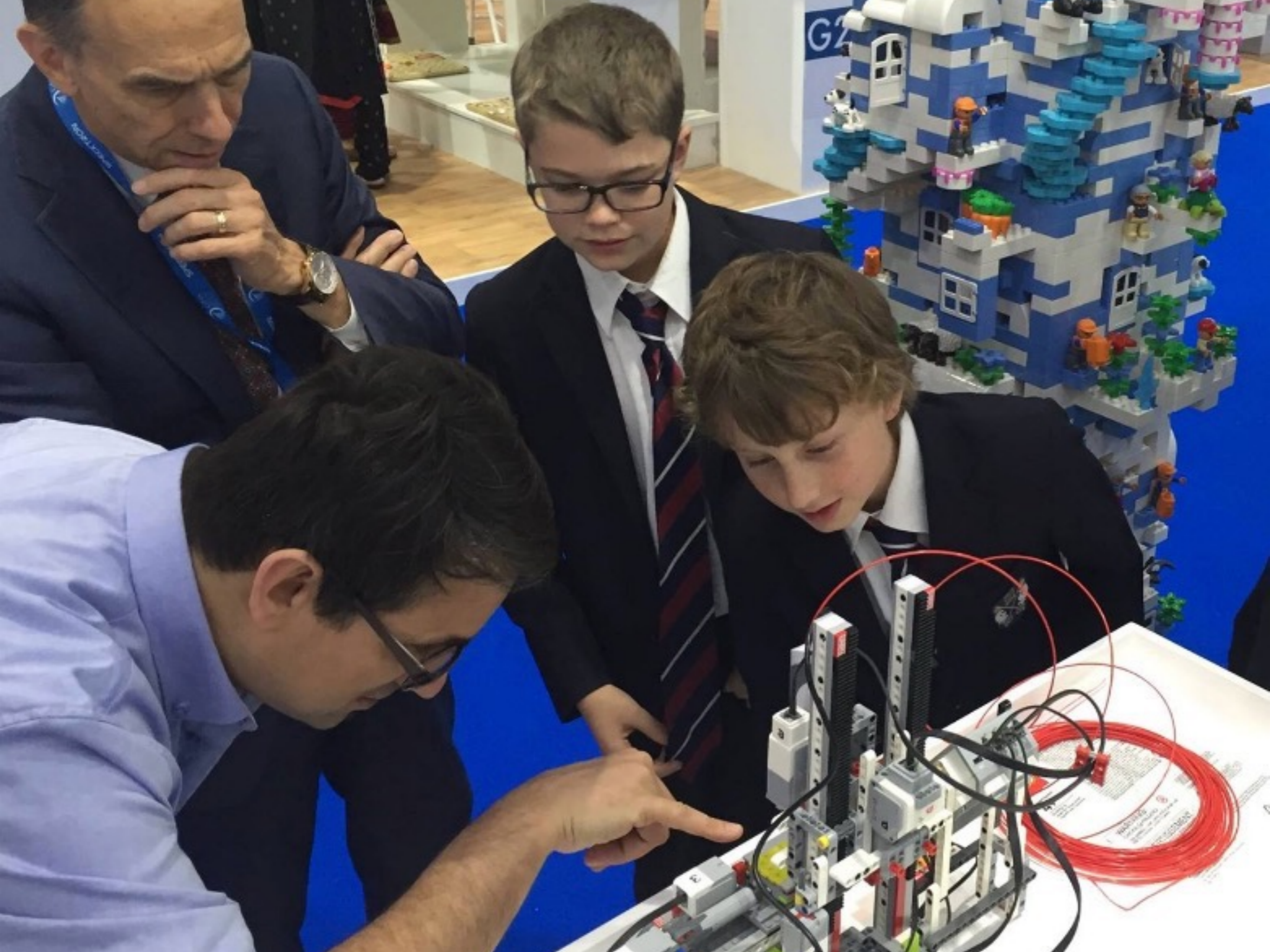
45 degrees



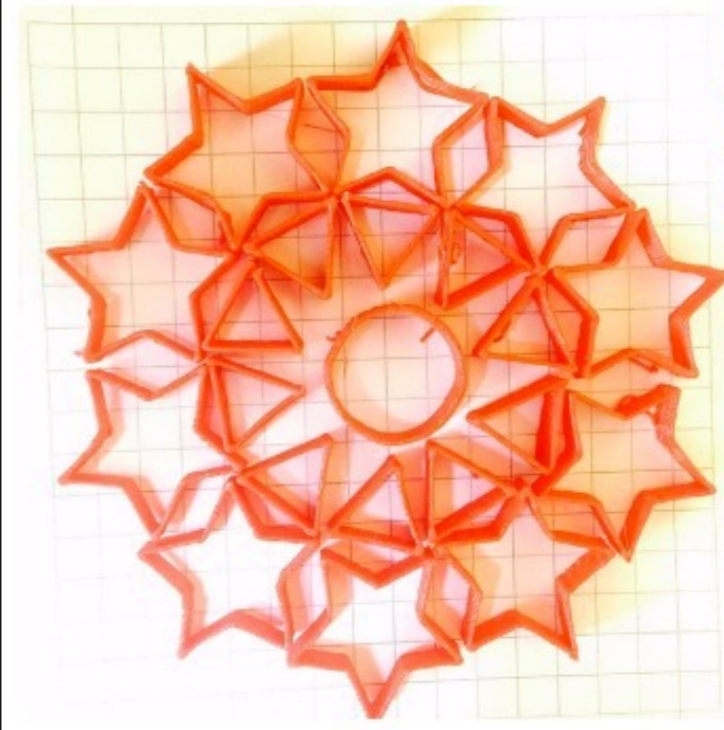
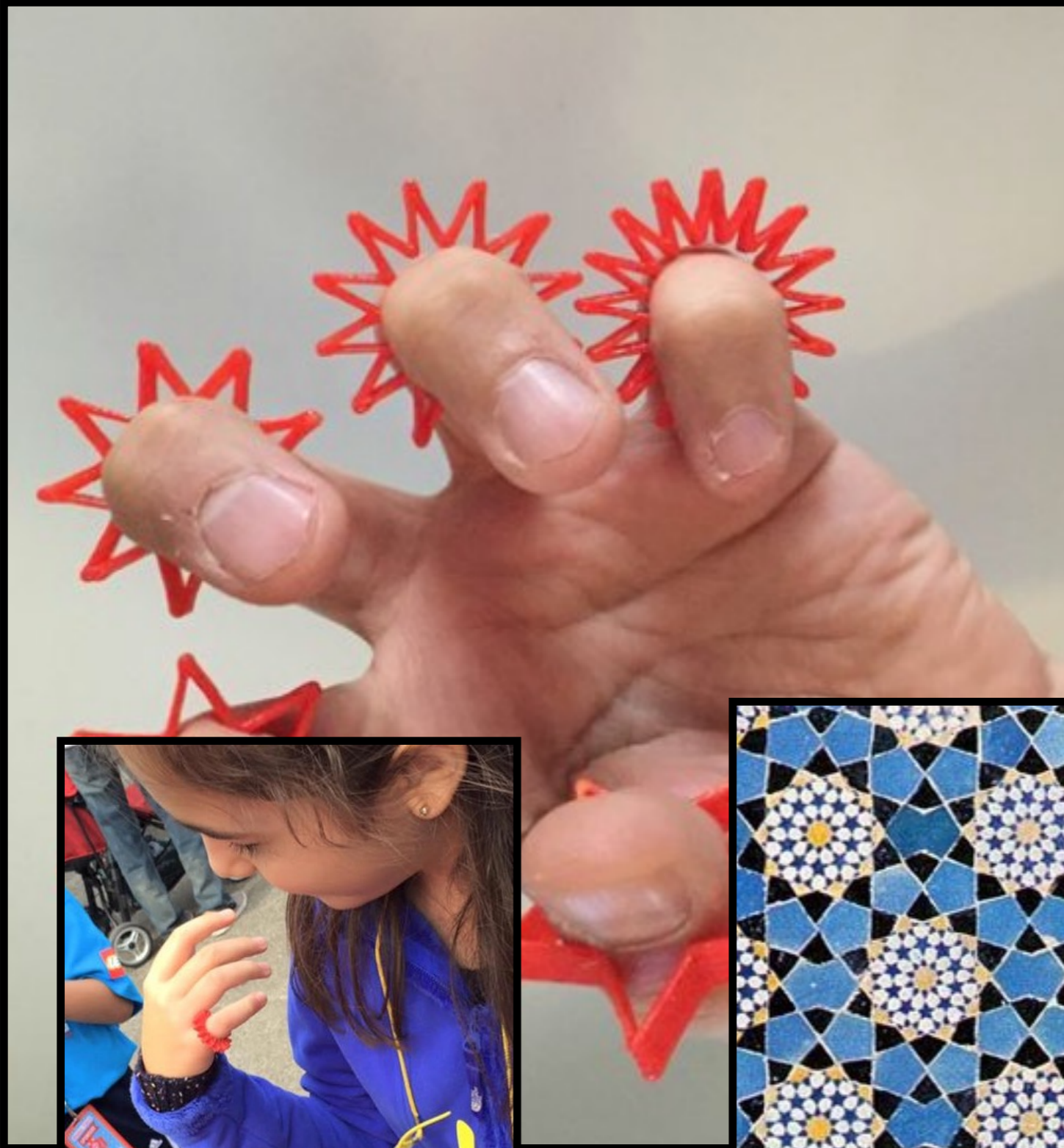
30 degrees

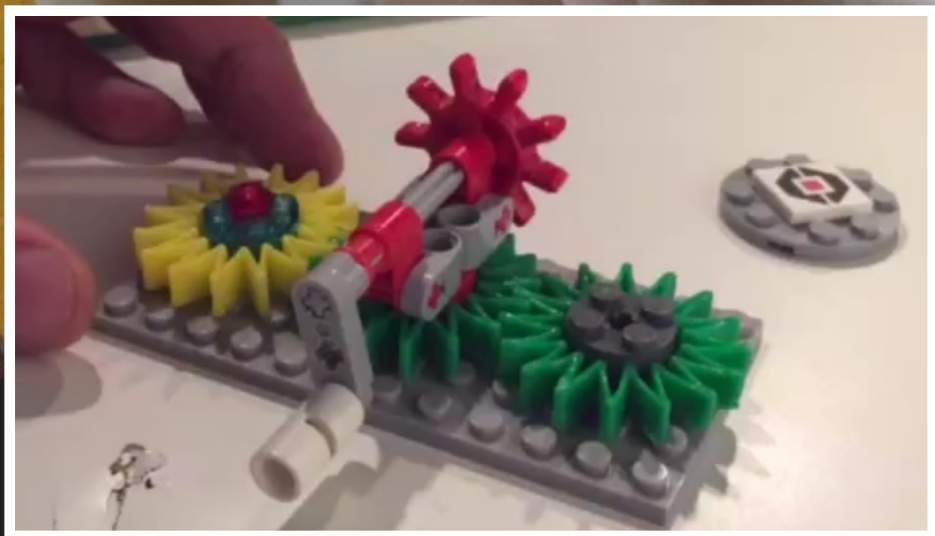


10 degrees



# THE ART IN STEM

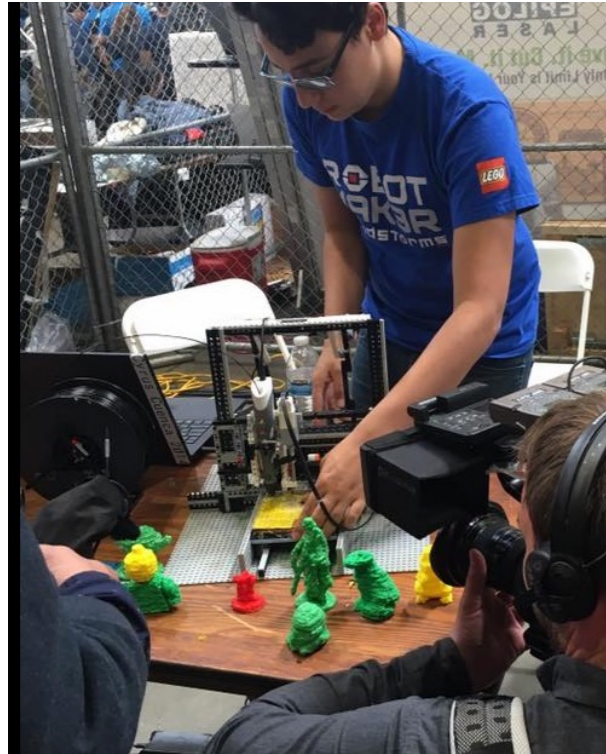






# SPINOFF PROJECT

## G-PARS3



Personal Open source



**Cyrus Cuenca**  
cyruscuenca

I'm a robotics enthusiast from California.

📍 Santa Rosa, California, USA  
🌐 <http://cyruscuenca.blogspot.com>  
📅 Joined on Mar 28, 2016

<https://github.com/cyruscuenca/g-pars3>

### Uploads



**3D Printing: Ultimaker at Maker Faire 2016**  
433 views • 4 hours ago



**Lego Mindstorms 3D Printer**  
1,432 views • 12 hours ago

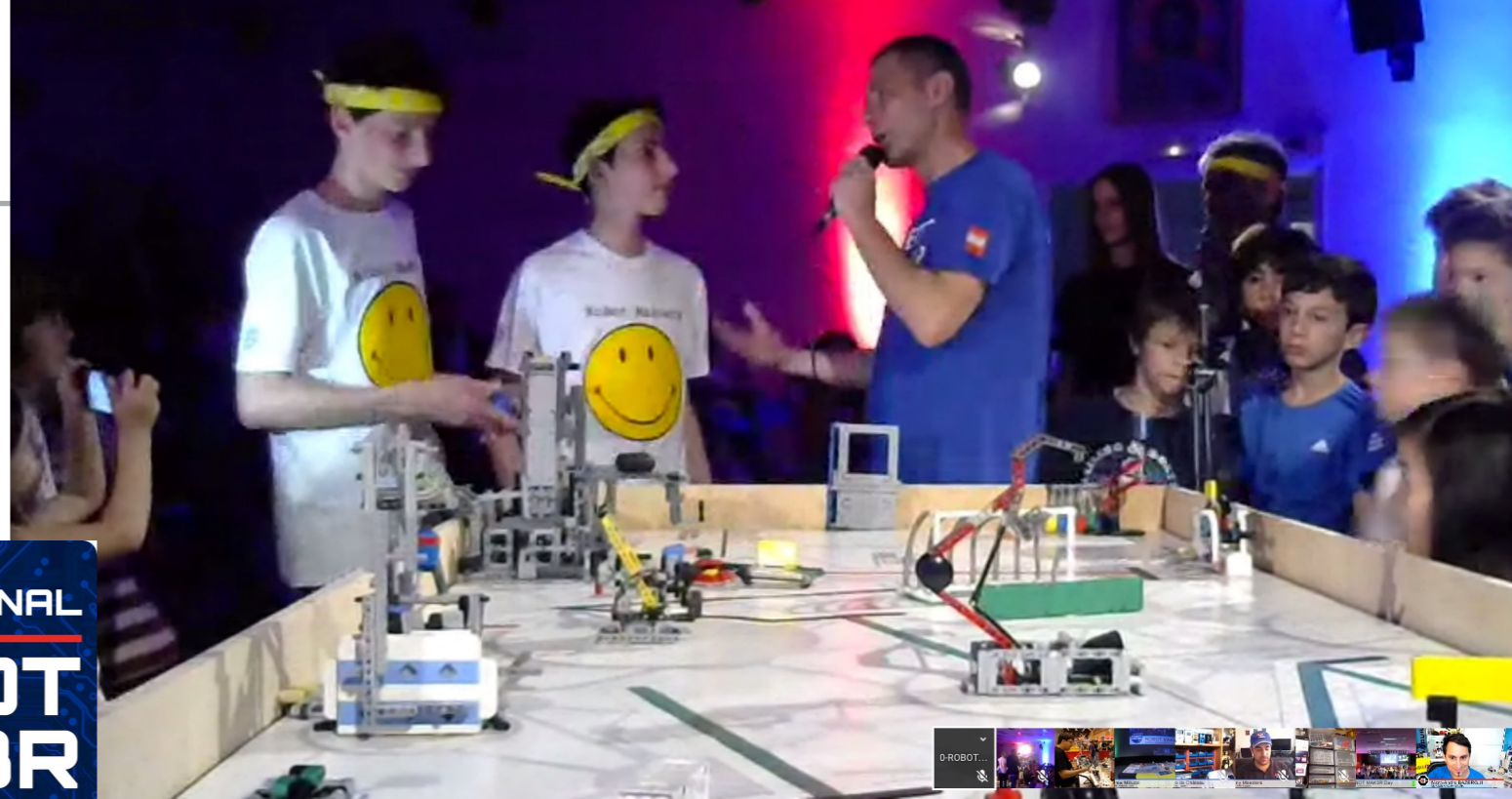


**Painting & Finishing 3D Printed Models: Harry Potter Elder Wand**  
4,975 views • 2 days ago



INTERNATIONAL ROBOTMAK3R DAY

# HANGOUTS



[HTTPS://WWW.YOUTUBE.COM/WATCH?V=X91M1RKVKFS](https://www.youtube.com/watch?v=X91M1RKVKFS)

**Marc-Andre BAZERGUI**  
ROBOT MAK3R Day - 2015



 **bazmarc [session]**

# EV3Dprinter



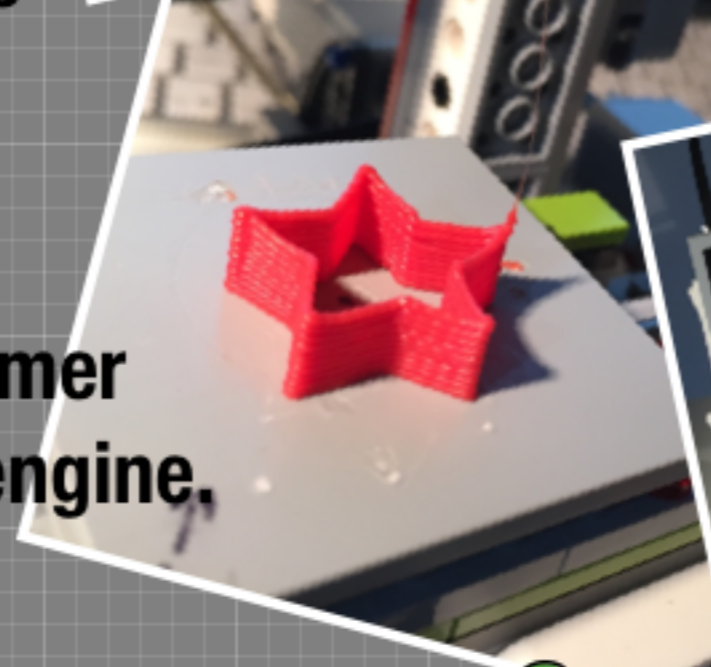
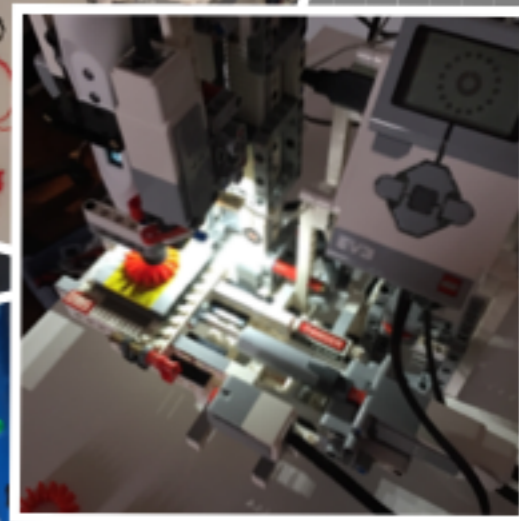
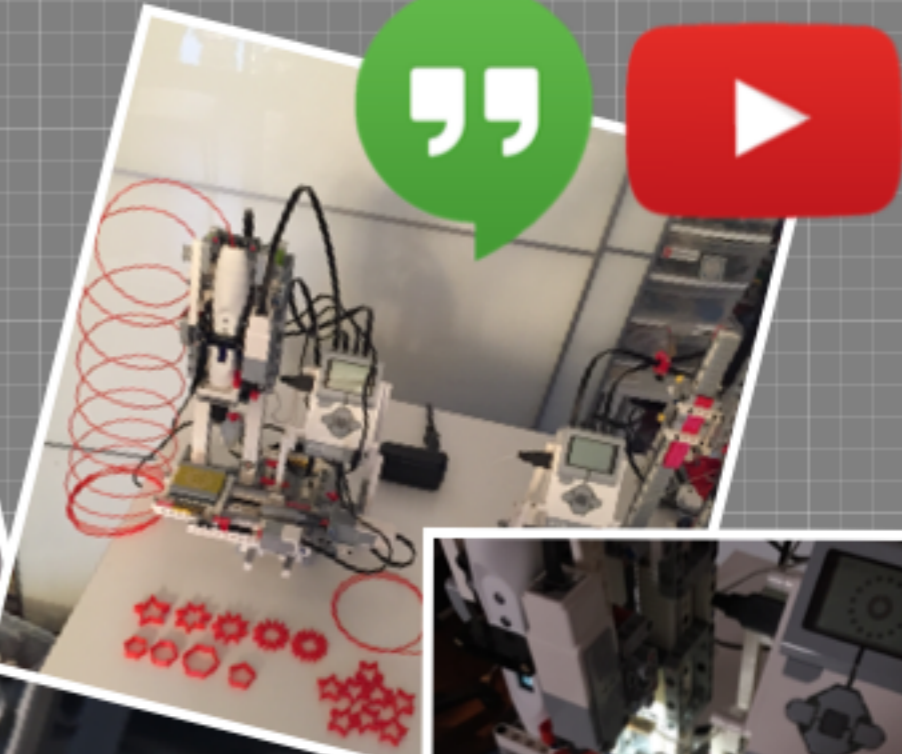
**Marc-Andre;  
Creator of the  
EV3Dprinter.**



**Thomas;  
EV3 programmer  
of the math engine.**



**Maureen;  
Educator  
STEAM integration.**



***Come Hangout  
With Us !!***

**Wed 27th 12pm EST (GMT -5)**

[HTTPS://WWW.YOUTUBE.COM/V](https://www.youtube.com/v)

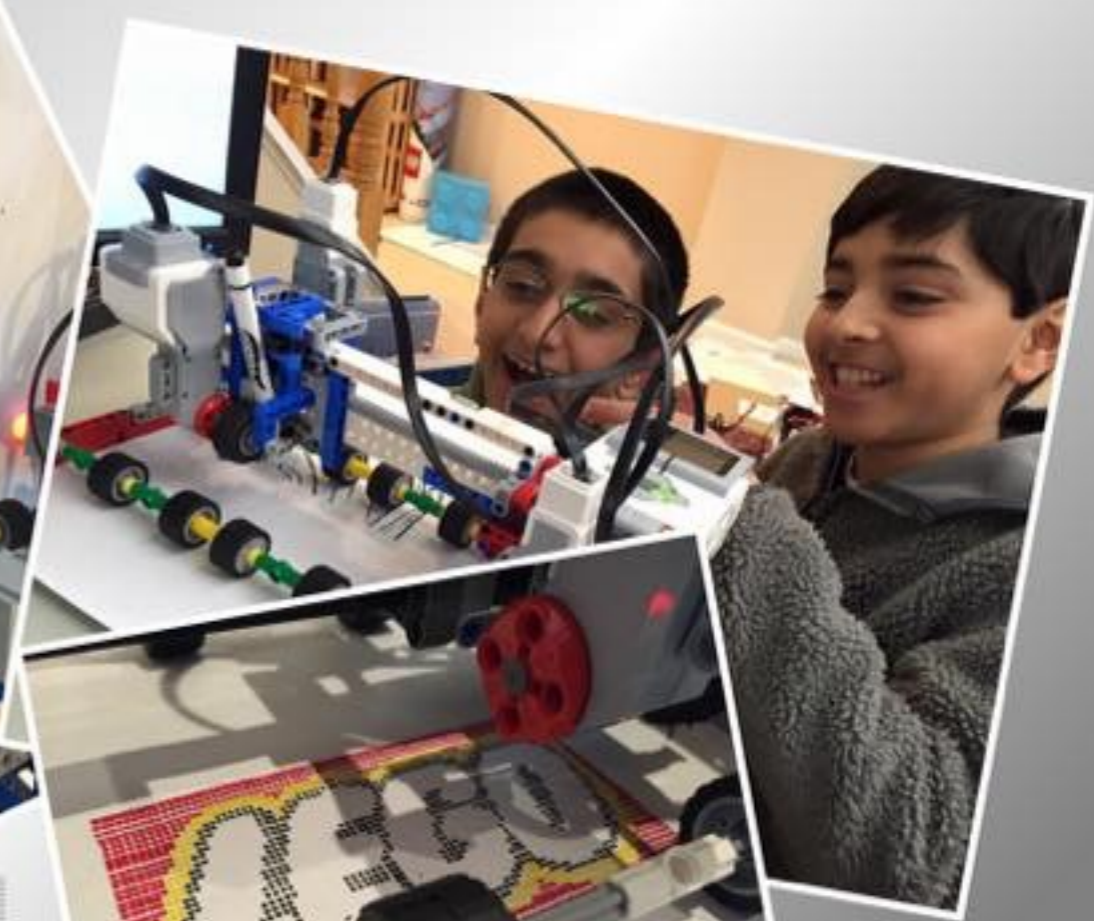


bazmarc[session]

Presents



seshan[session]



Wed  
March  
16th  
3pm  
EST

Come learn all  
about the amazing  
Pix3l Plott3r with  
Sanjay and Arvind

and special guests  
Joe Meno and  
Ralph Hempel

[HTTPS://WWW.YOUTUBE.COM/](https://www.youtube.com/)