ModBlocks

Ardavan Amini, Richard Fam, Connie Wang, and Bridget Zeiger

Unmet Need

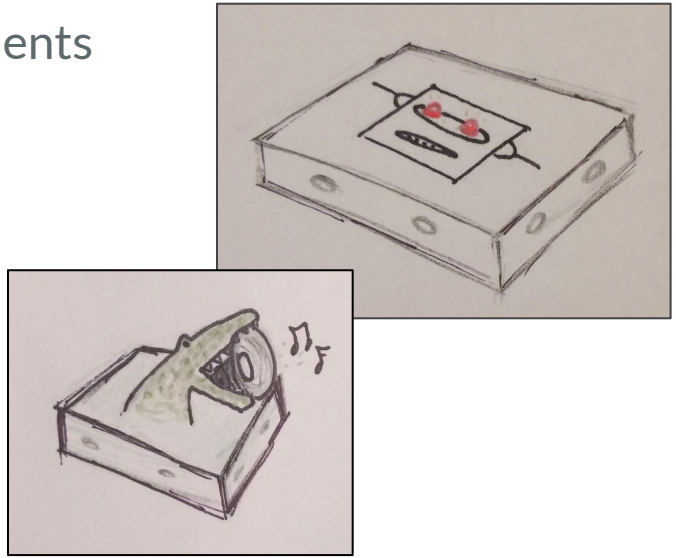
- Limited options for teaching basic circuitry concepts
- Fun way of getting children **ages 4 to 8** interested STEM

Richard

The Solution: ModBlocks

Modular electronic blocks that enable children to build basic circuits!

- **Easy to use:** magnetic, connectable
- **Informative:** clear materials show circuit elements
- **Captivating:** puzzles, themes
- **Intuitive:** understandable faces



Value Proposition:

- Teaching 4-8 year olds about electronics
  - Relate circuits to everyday applications
- Develops problem-solving skills
- Promotes creativity

What comes in the kit?

ModBlocks Starter Kit:

- ➔ **16** Modblocks
- ➔ Puzzle Book + Syllabus
- ➔ Carrying Case

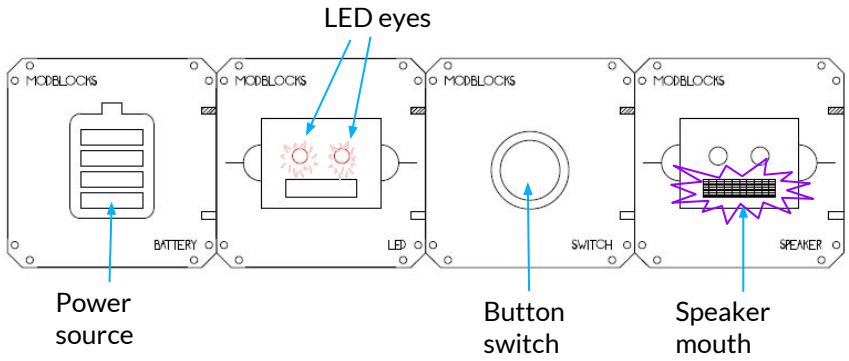
Block List:

- **Power Sources**
  - Battery (9V)
  - Hand Crank
  - Solar Panel
- **Motors**
  - Servo-motor
  - DC Motor
  - Vibration Motor
- **Resistors**
  - Resistor
  - Potentiometer
- **Switches**
  - Momentary Switch (Button)
  - Toggle Switch
  - Motion Sensor
- **Outputs**
  - RGB LED (x3)
  - Fan
  - Speaker

Syllabus

- Input vs. Output Relationships
  - Input: Button, switch, hand crank, motion detector
  - Output: LED, speaker, fan
- Circuits in Series vs. Parallel
  - LED brightness
  - Speaker loudness
  - Fan speed

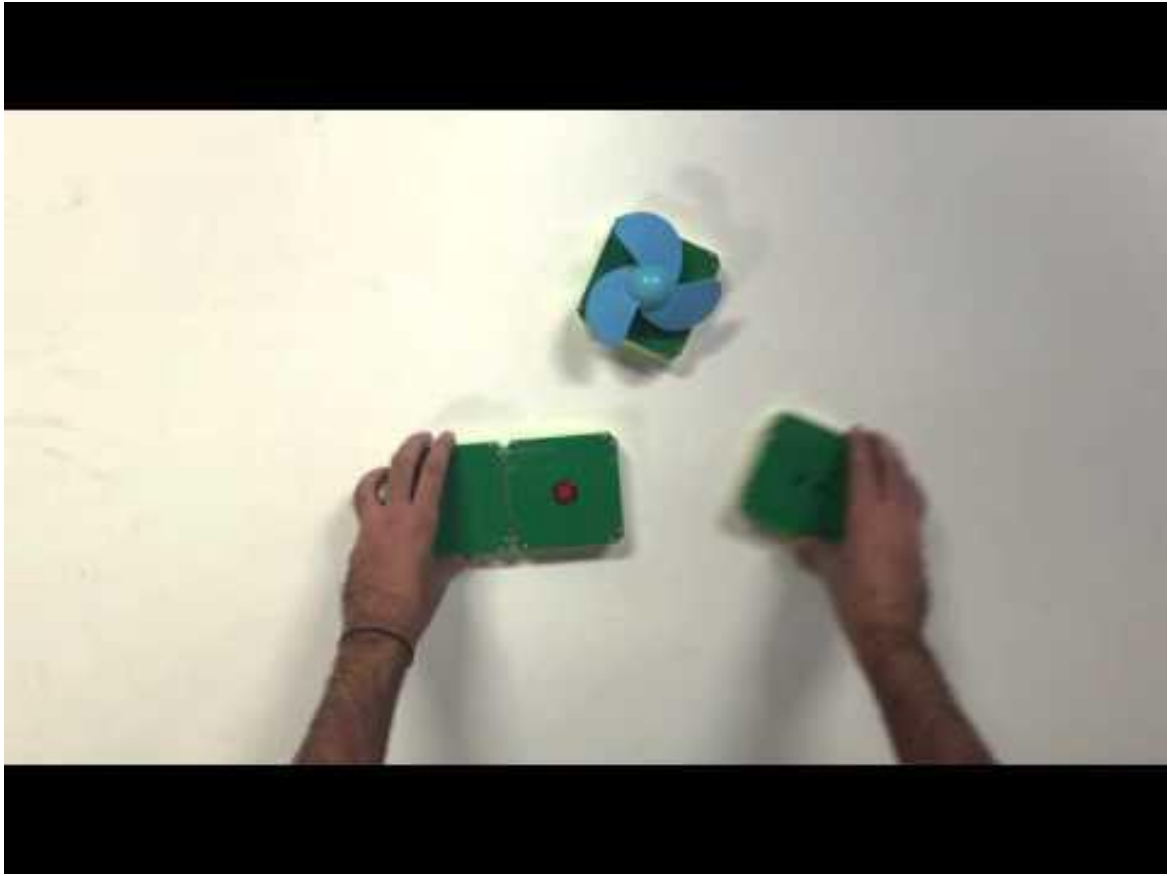
[The Complete Guide to ModBlocks]



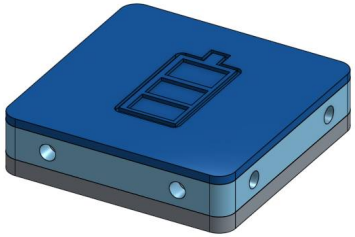
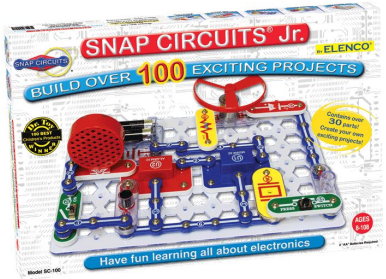
Challenge:

1. Turn on ROBOT (light up *LED* eyes)
2. Have ROBOT talk (power *speaker*)

DEMO

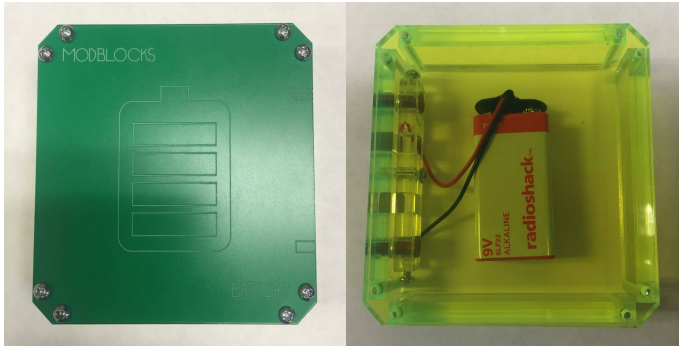


The Competition

			
ModBlocks Base Kit (16 pieces)	LittleBits Base Kit (10 pieces)	Snap Circuits Jr. (30 pieces)	Kid K'Nex (81 pieces)
Circuitry	Circuitry	Circuitry	Mechanical
~$99	$99	$35	$25
Ages 4+	Ages 8+	Ages 8+	Ages 4+

What sets us apart?

ModBlocks (ages 4-8)



(front) (back)

- Basic, understandable faces
- Enclosed circuit components
  - clear encasing shows wiring connections
- Multiple-direction connections

littleBits (ages 8+)

- Pieces require manual connection
- Small, complex parts
  - Small text
  - Tiny switches
- One-way connection

Customer Discovery

Interview Responses:

Parents:

- Shop for toys that enrich children's learning
- "[We] choose products our kids will truly enjoy and and be excited about!"

Teachers:

- "High school students lack a basic understanding of circuits"

Child Development Research: (ages 4-8)

- Asking questions ***What? Why?*** and ***How?***
- Developing fine-motor skills (read, write, and build)

Sources:
Maclyn Eick: High School Engineering Instructor
Alexis Nesper: Middle School CORE Instructor, Parent
http://childdevelopmentinfo.com

Target Market

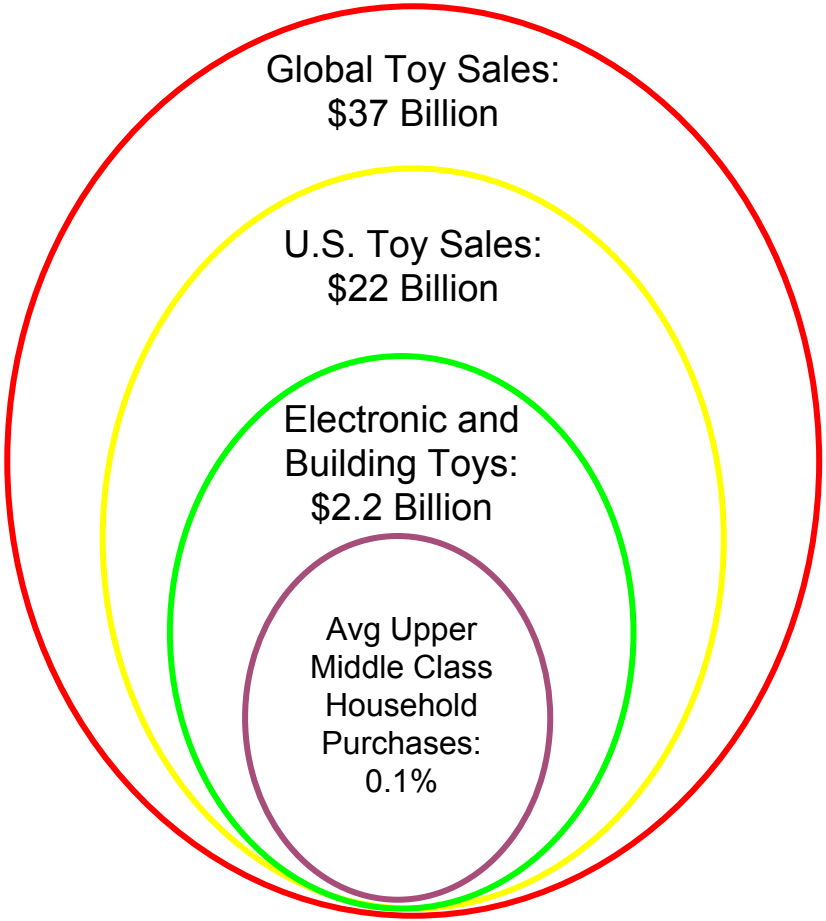
Average household

- 24m children ages 4-8 in the U.S.
  - ~4m family households
- Upper middle class ($80,000+ per year)

After school care, daycares, tutoring centers

- 770,000+ daycare and after school centers
- $3b revenue

Waiting rooms (doctor, dentist offices)



Source: United States Census Bureau, Forbes, NCES, Toy Industry Association
https://www.census.gov/prod/2013pubs/p20-570.pdf

Intellectual Property

Possible Patents:

- Design patent entailing the physical appearance and design of ModBlocks

Competitive Advantage:

- Electronic toy designed for a specific age range (4-8)
  - Larger blocks
  - Safe encasing
- Intuitive design
  - Magnets
  - Understandable faces

Richard

The Business Model Canvas

Designed for: ModBlocks

Designed by:

On: dd/mm/yyyy

Iteration #

Key Partners

Education Industry

Key Activities

Research

Design

Manufacture

Test

Key Resources

Manufacturing Facilities

Suppliers

Lawyers

Programmers

Value Propositions

Exposes young children to basic circuitry

Problem-solving skills development

Promotes creativity

Competitive pricing

Customer Relationships

Hardware distribution

Tablet application distribution

Direct relationship through Social Media

Channels

Amazon

Adafruit

Brick & Mortar

Customer Segments

Average Household

Day care/after school care

Waiting Rooms (doctors offices)

Cost Structure

Bulk material cost estimate: $15

Assembly cost: $16

Estimated MSRP: $99

Revenue Streams

ModBlock Starter Kit

ModBlock Expansion Kits

www.businessmodelgeneration.com

Production Costs

For 1 starter kit consisting of 16 Modblocks

Direct Materials:

Item	1000 Unit Estimate
Rechargable 9V Battery (x2 w/ charger)	$3.00
LEDs (x3)	$0.12
Servo-motor	$2.00
DC motor	$1.00
Potentiometer	$0.11
Piezo Speaker	$0.20
Solar Panel	$0.50
Motion Sensor	$0.20
Hand Crank	$1.00
Momentary (Button) Switch	$0.01
Resistor	$0.01
Fan	$0.20
Vibration Motor	$0.50
Toggle Switch	$0.20
Acrylic Housing	$2.50
Wiring	$0.10
Packaging	$3.00
Total (per unit cost)	$14.65

Direct Labor:

Job	Wage	Hours	Total
Assembly	$8/hr	2 hrs	$16.00

Overhead Costs:

Expense	1000 Unit Estimate
Packaging	$0.15
Shipping (materials)	$1.00
Total (per unit cost)	$1.15

Total costs: $31.80

Estimated MSRP: $99

Source: alibaba.com

High Risk Technical Areas

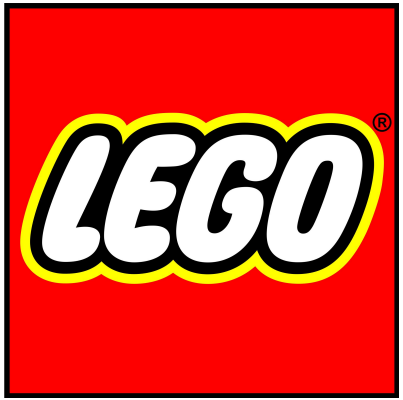
- Cost (materials)
- Safety
  - Secure electrical connection
  - Proper block connections
- Aesthetics
  - Functionality vs. intuition

Risk Reduction Tests

- Prototyping different solutions (materials, designs)
  - Aluminum vs. copper leads
  - Magnet configuration
- Testing children interactions

High Risk Marketing Challenges

- Competing with established toy manufacturers
  - Known for safety, reliability, quality
  - Holding the child's attention
- Hardware vs. Software in "edutainment" industry
  - Tablet application



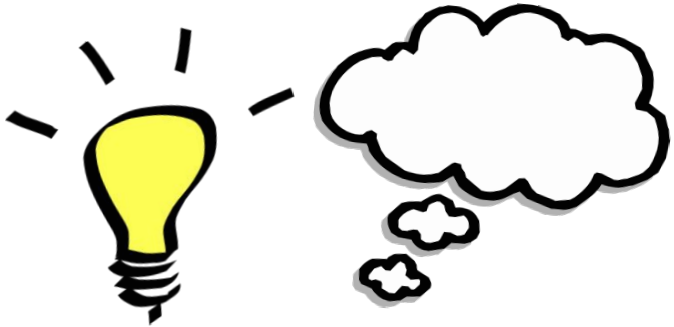
The Future

Timeline:

- **December 1st - January 31st:** Finalize puzzle book design and starter kit theme
- **December 23rd:** Proof of Concept application
- **January 1st - 31st:** Tablet application development
- **February 1st - April 30th:** Researching manufacturing options
- **May 1st - 31st:** Finalize and file design patent

Seeking:

- Potential investors
- Mentor(s)
- Additional teammates



Team Attributes

Continuation Plans:

Interested in continuing the project outside of the classroom

Recruitment Plans:

Open to adding more members to the team

Team Strengths:

- Motivated
- Proactive
- Organized
- Creative
- Technically-minded

Special Thanks to:

Dr. Delson

Sina Kouchaki

Questions?