STEM

Starting at Square One & Beyond

Building STEM Pathways Starting in Kindergarten

Experience the Thrill Of STEM

Collaborating

Critical Thinking

Problem Solving

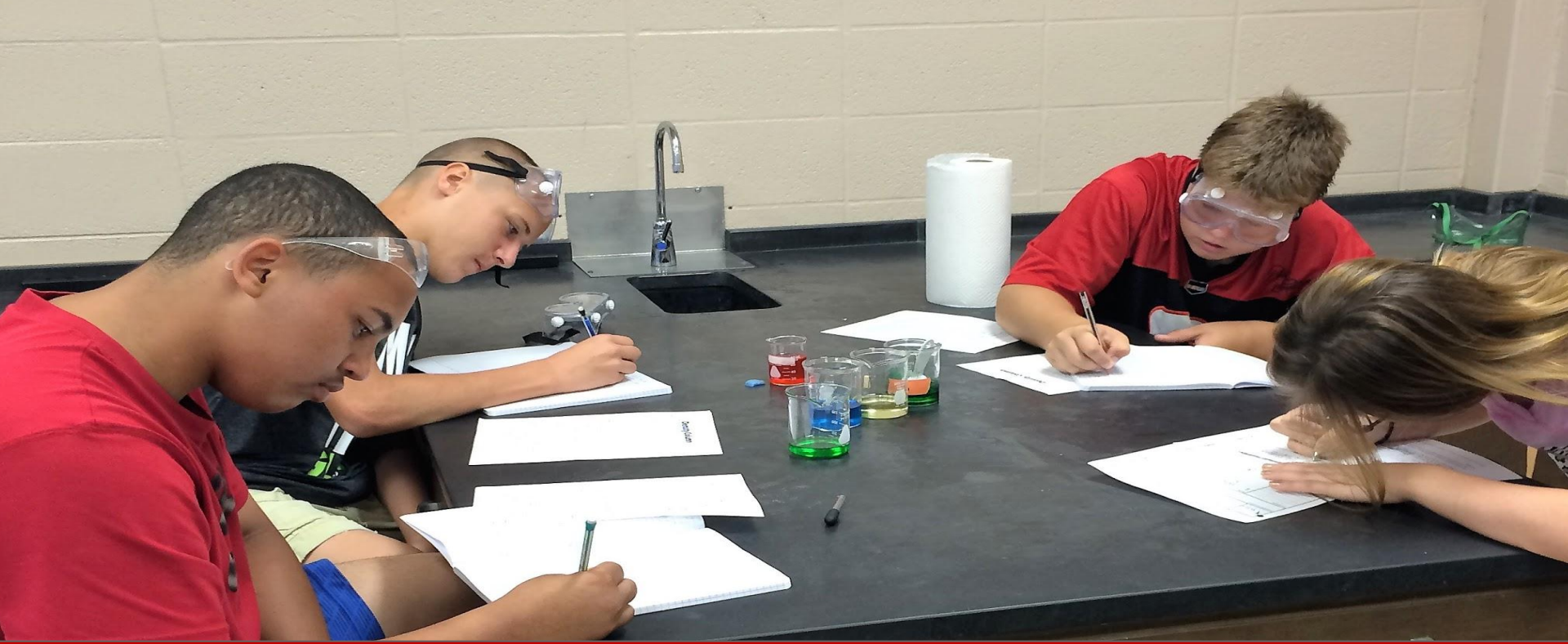
Analyzing

Designing

Innovating

Engaging

Exploring



Evaluating

Engineering

Today's Agenda

- Hands-On Exploration
- STEM K-12 Implementation
- Celebrate Increasing STEM Pathways
- Stakeholder Involvement
- The Future Vision

What's The Big Idea

Knowledge of basic technology and engineering skills and classroom routines will be essential for student success in the Learning Cycles, Preliminary and Primary Challenges of the various units.

Design Challenge

Construct a helicopter to travel from point A to point B under its own power.

Materials Needed:

- 12” of Masking tape
- 2 paper clips (passengers)
- 1 rubber bands
- 2 pieces of paper

Design Challenge

Parameters:

1. You may only use materials provided.
2. It must travel in a vertical path with axis of rotation remaining perpendicular to the floor.
3. It must make at least 4 turns.
4. You may not assist the helicopter with spinning.
5. The passengers must arrive safely without falling off the helicopter.
6. The helicopter must remain in one piece.

Decisions: Data Driven

How? Where? Why?

"The United States will need approximately 1 million more STEM professionals than are projected to graduate over the next decade."

~White House Press Release 2012

Engineering or engineering?

engineering – little "e" – used as a verb

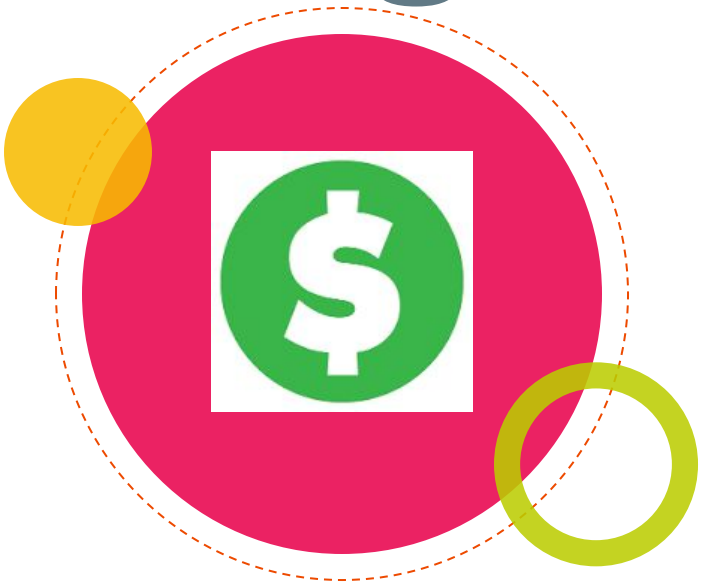
to teach all students to think or learn to engineer or use engineering concepts

Engineering – big "E" – used as a noun

prepare students to be Engineers – career oriented

The ingenuity of children is untapped, unrealized potential that, when properly motivated, will lead to the next generation of innovators, designers, and engineers!

Budget



How to Fund

Budget

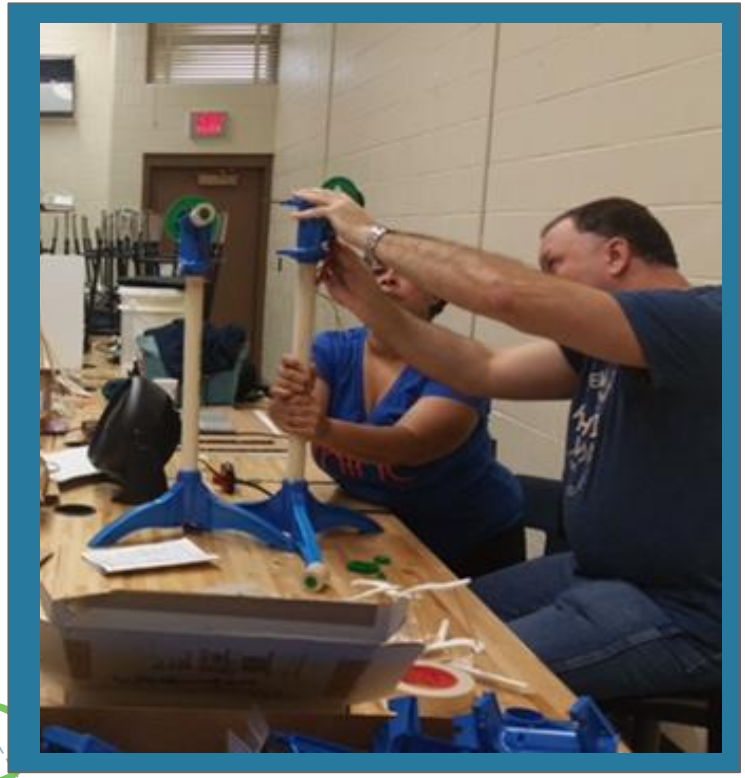
PK-5

- Consumable and Non Consumable
- $3000 from Parent Organization year one
- $750 year two

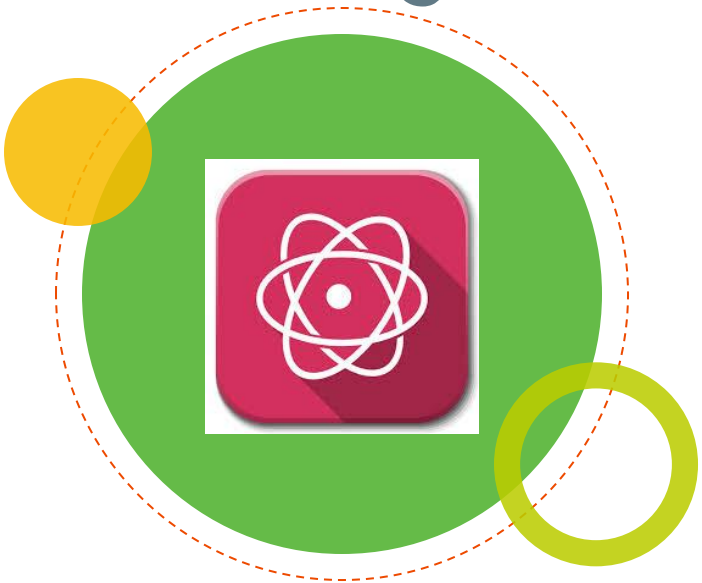
6-12

- Perkins Reserve Grants
- Classroom Budgets
- SB155 Fund Allotment

Look For Savings



Discovery Room



Storage & Furniture


SMART ROBOT
SMART ROBOT


3
4

Schedule

Flexible vs. Fixed

PREK-5 Schedule

Year One

- Fixed Schedule
- EBD Curriculum

Year Two

- Flexible Schedule - Google Calendar
- EBD Curriculum

Schedule

6-12

Year One

- Added 7th grade Inventions & Innovations
- Added 6th grade Tech Enrichment Class

Year Two

- Went to 5 x 5 schedule
- Hired full time Science teacher 7th grade
- Utilized Math/Science teachers for Electives in HS

Technology

What Do You Gotta Have?

Technology

K-5

- K-2 Chromebooks
- 3-5 iPads 1:1
- Smartboard
- Large and Small, removable White Boards

6-12

- 6-8 iPads 1:1
- 9-12 Mac Book Pro 1:1
- CAD-Autodesk
- Word Processing

Curriculum

What Do You Use?

ENGINEE

CORE PROGRAM

K-2		*EbD-TEEMS™ NXTGEN™*	1-6 weeks
3-6		*EbD-TEEMS™ I³* (6th Grade Capstone) NXTGEN™*	1-6 weeks
6		*Exploring Technology*	18 weeks
7		*Invention and Innovation*	18 weeks
8		*Technological Systems*	18 weeks
9		*Foundations of Technology*	18 weeks
10-12	HS	*Technology and Society*	36 weeks
10-12	HS	*Technological Design*	36 weeks
11-12	HS	*Advanced Design Applications **	36 weeks
11-12	HS	*Advanced Technological Applications **	36 weeks
11-12		*Engineering Design (Capstone)*	36 weeks

FAA Flexibility Affordability

Designed to be Affordable!

Designed to be Accountable!

- Formative assessments included in course guides
- Online assessments available for Network schools (summative)
- Data used to improve instruction, content strategies, and student growth (RTT)

Adaptations

What's Appropriate?

Adaptations

- Integration with ELA, Math, Economics and NGSS
- BOOMLET Learning K-5 Science Units
  - ESSDACK-katiep@essdack.org
  - 620-663-9566
- Give permission to add, subtract, change
- Remember your STEM purpose

CTE Alignment

STEM- Added 5 Pathways

- Agriculture Pathway
  - Energy (2017-18 in Ag Pathway)
- Engineering Pathway
  - Cartography/Geospatial/ Spatial Mathematics
  - Engineering & Applied Math
- Health Science Pathway
  - Biochemistry
  - Biomedical

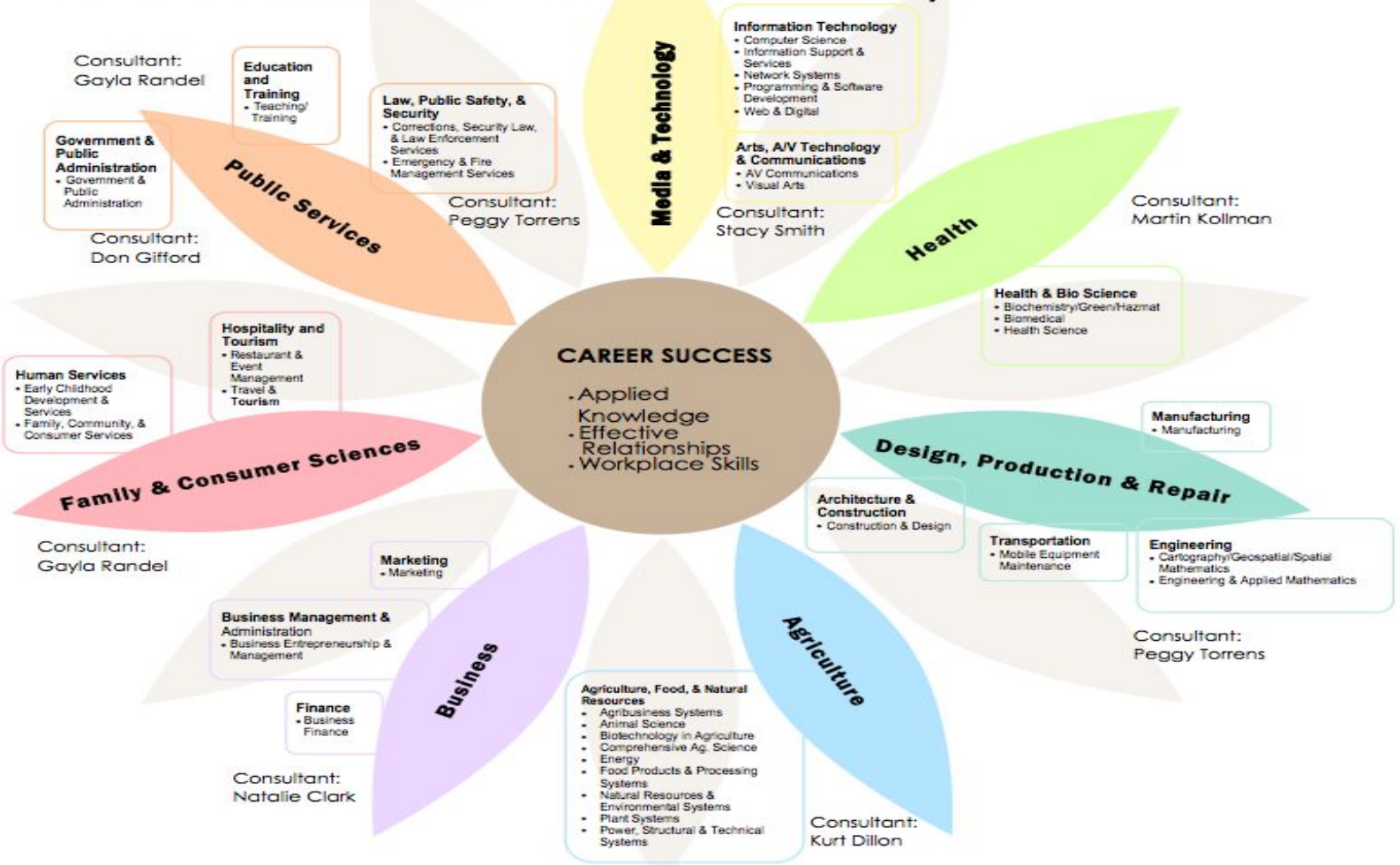
New CTE Courses

- Foundations of Technology (Engineering Technology)
- Engineering Design
- Materials Science & Engineering *(ASM Materials Camp UMKC)*
- Robotics
- Forensic Science
- Care of Athletes
- Sports Medicine I
- Audio/Video Production Fundamentals
- Video Production

Making It Work With All Teachers

* This class is required for pathway ** This class has prerequisites - Suggested for pathway	Introductory Level	Technical Level	Application Level
BioChemistry Pathway	Engineering Technology (1.0) 21103 Chemistry (1.0) 03101	Anatomy & Physiology (1.0) 03053	Project Management & Resource Scheduling (1.0) 21205
Bio Medical Pathway 14.0501	Engineering Technology (1.0) 21103 Biology (1.0) 03051	Anatomy & Physiology (1.0) 03053 Robotics (1.0) 21009	Project Management & Resource Scheduling (1.0) 21205
Cartography/Geospatial/Spatial Mathematics Pathway 15.1102	Engineering Technology (1.0) 21103 Geography (1.0) 03007	Robotics (1.0) 21009	Project Management & Resource Scheduling (1.0) 21205
Energy Pathway 17.2071	Engineering Technology (1.0) 21103	Engineering Design (1.0) 21006 Robotics (1.0) 21009	Materials Science & Engineering (1.0) 21252 Project Management & Resource Scheduling (1.0) 21205
Engineering & Applied Math Pathway 14.010	Engineering Technology (1.0) 21103	Engineering Design (1.0) 21006 Robotics (1.0) 21009	Project Management & Resource Scheduling (1.0) 21205 Materials Science & Engineering (1.0) 21252

Kansas Career Fields, Clusters, and Pathways



State-developed secondary-level pathways lead to:
High-demand and high-wage careers with postsecondary connections and/or industry credentials with labor market value.

2017-18

New Alignments

- Agriculture Pathway
  - Energy (2017-18 in Ag Pathway)
- Engineering Pathway
  - Cartography/Geospatial/ Spatial Mathematics Pathway
  - Engineering & Applied Math
- Health Science Pathway
  - Biochemistry
  - Biomedical

Adding New

- Media & Technology Cluster
  - Computer Science Engineering Pathway
  - Web & Digital Communications Pathway

**Add ADA (Advanced Design Application) EbD course*

Making It Work With All Teachers

Training

What's Available?

Training

ESSDACK

Clelia McCrory
State EbD
Director

1500 E. 11th Avenue, Suite 200
Hutchinson, KS 67501
620-663-9566

CORE PROGRAM

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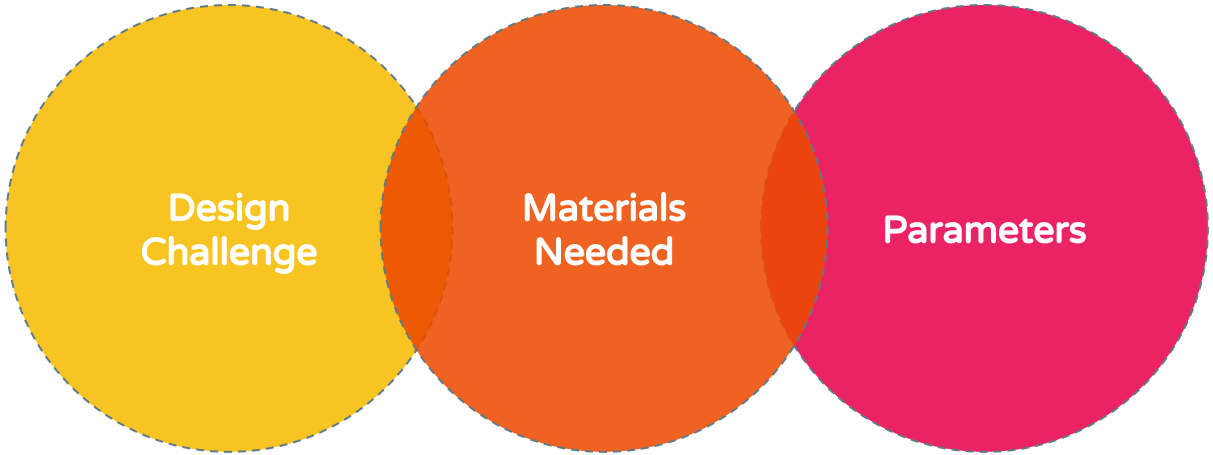
PLD Hands On Training

Organization

Keeping It All Together

STEM Notebook:



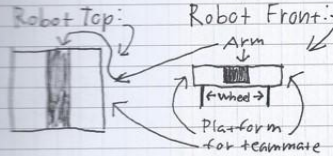
Ideas Diagram

1 BOOK - 57 PAGE

Arm concepts PROJECT

DATE 10.10.2012

1) Arm stowed and folded
(Arm is colored solid black)



2) Arm extended

BO-55-DONUT:
Arm V.1

This is the arm design we'll be sharing with the Lightning Lancers this weekend.

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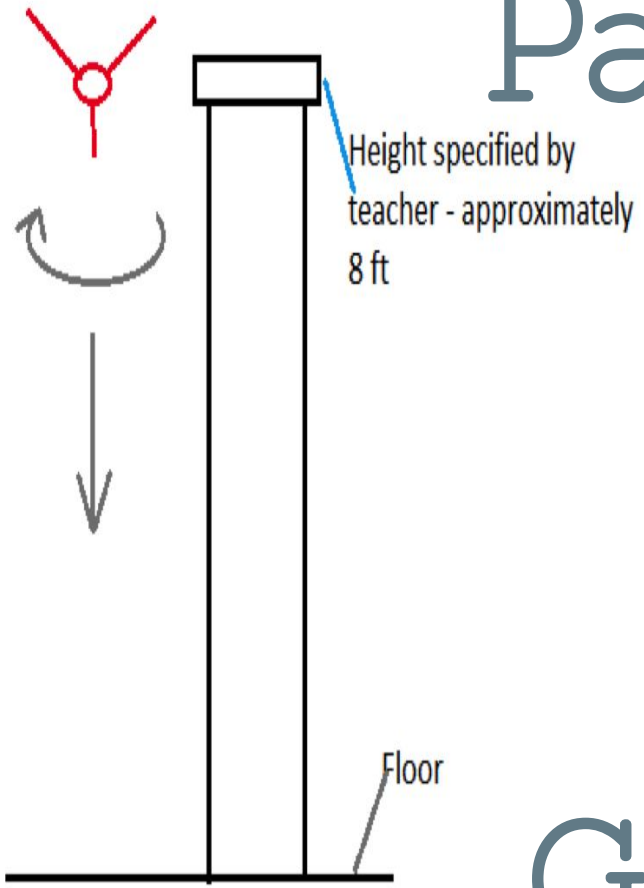
SIGNATURE | DATE 10.10.2012 | WITNESS Tyler Horner | DATE 10/16/2012

Design Challenge Testing Time!

Parameters



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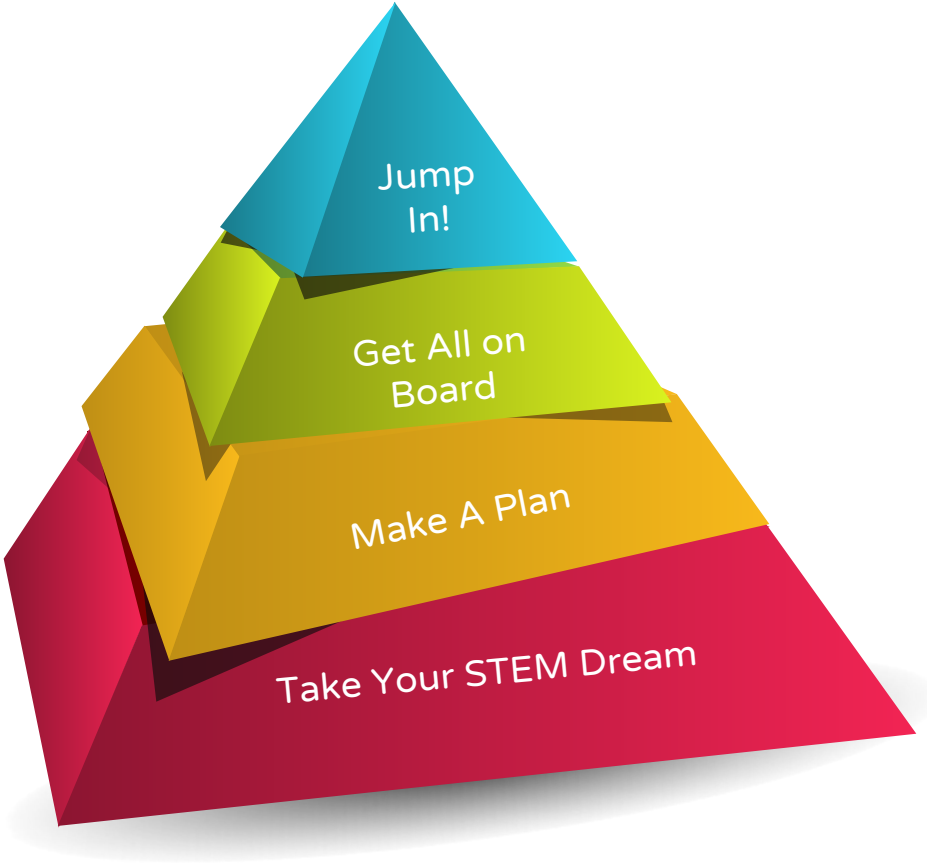
4. You may not assist the helicopter with spinning
5. The passengers must arrive safely without falling off.
6. The helicopter must remain in one piece.
7. Drop from approx. 8 ft.

Good Luck!

Thank You for Attending!



Presented by~

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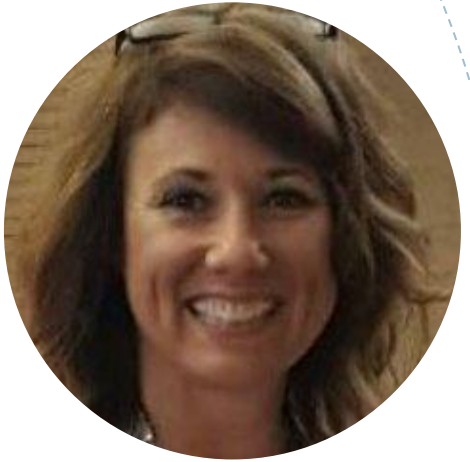

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