

# STEM

Science, Technology, Engineering, Math

## DESIGN CHALLENGE

### DESIGN CHALLENGES



#### Event Planning

Create 3-D invitations, simple recipes, automatons, and stringed instruments for the Design Challenge Showcase!



#### Builder's Showcase

Build better shelter & structures to protect and help people and animals in need.



#### Mission: ... Solar System

Design landing gear, a robotic arm and lunar rovers as you tackle real-world



#### Arcade Challenge

Create working video games, arcades with electrical features to entertain the crowd at the showcase

Science, Technology, Engineering & Math are increasingly digital, networked and rapidly changing. To meet the recommendations of the National Academy of Sciences and the National Governor's Association agenda for STEM, the Lincoln Intermediate Unit STEM Advisory Council is improving the STEM skills to better prepare our local students for 21st century college and career expectations through a design challenge.

## LIU STEM DESIGN CHALLENGE at James Buchanan High School

July 13 - 16, 2015

Ages 9 - 12

9:00 AM - 3:00 PM

### INVENT!

Learn the Design Process

Build—Test—Re-evaluate—Design

Expand Thinking

Become Innovative

Learn from Mistakes

Develop Engineering Skills

Work as a Team

Communicate

### WHY STEM?

**21st Century Skills:** Among the most critical academic disciplines for success in a 21st century work force are those involving Science, Technology, Engineering and Math (STEM).

**College & Career Ready:** It has been reported that more than a million jobs will open up that require specialized technology skills in the next seven years, according to the U. S. Labor Statistics—But there won't be enough qualified college graduates to fill them.

**PA Green Jobs Report:** Pennsylvania is among the states with the highest number of green jobs. Potential jobs will be in energy efficiency, renewable energy, clean transportation, pollution prevention & environmental cleanup. Design is involved in all of these jobs..

All student designs will be showcased on June 28th in the afternoon. Plan to celebrate with your student and see what they have learned!

L I N C O L N I N T E R M E D I A T E U N I T # 1 2

6 5 B I L L E R B E C K S T R E E T

N E W O X F O R D P A 1 7 3 5 0

# Help Shape the Future and Join a Design Team

## Brainstorm, Design, Build, Test and Re-design

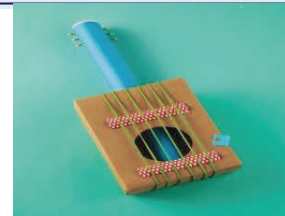
All sessions will be taught by certificated educators.



Paper Engineering

### Event Planning Challenge

A great party or event has food, fashion, entertainment and atmosphere. In this challenge students will plan the Design Challenge Showcase and create all the elements needed to pull off a great event. It will take teamwork to build a band of stringed instruments that are tuned to different pitches and play a simple melody. Paper engineering will be utilized to make invitations and puppets with moving parts. The challenge requires the team to plan a simple menu for the event.



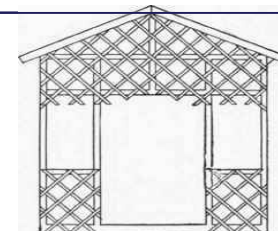
Build-a-Band



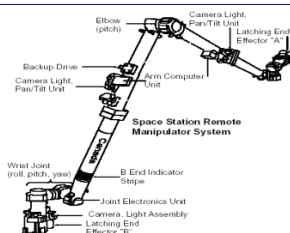
Shelter

### Builder's Showcase Challenge

Build it better! Design a structure to protect people from tornadoes, carriers for wheel chairs or crutches, speedy shelter for emergencies, or a device to deliver a care package safely to disaster areas. Building cranes, towers, bridges and objects to scale are other challenge options in this category. Through trial and re-design your child will be challenged by the laws of physics and gravity as they prepare for a Builder's Showcase.



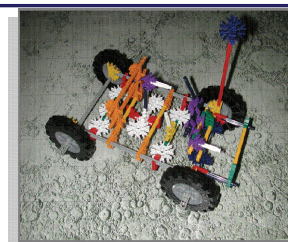
Structures



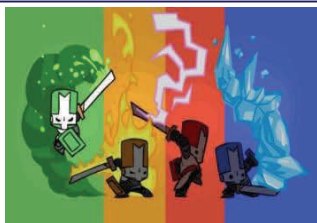
Robotic Arm

### Mission: Solar System Challenge

Launch into space exploration to learn NASA science concepts! Design an airbag landing system, a robotic arm, air-powered rockets and rubber band-powered rovers. Exploring solar heat and magnetic fields are other options in this challenge category that is structured around real-world engineering applications. Through the design process, teamwork, and hands-on problem solving, students will be challenged to be creative problem solvers who design things that matter for the Design Showcase!



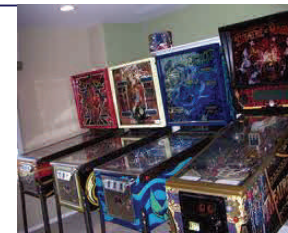
Lunar Rover



Video Games

### Arcade Challenge

What game shall we play? That is up to you! Build buzz boards, zip lines, launchers, and marble runs to create a dance pad, target games, mini roller coaster, or a new carnival game. Through the design process of brainstorm, design, build, test, and re-design create a Carnival to showcase the games created during the week!



Pinball

## REGISTRATION INFORMATION

Child's Name: \_\_\_\_\_ School Entity: \_\_\_\_\_

Address: \_\_\_\_\_  
Street City State Zip

Phone #: \_\_\_\_\_ Email: \_\_\_\_\_ Child's Age \_\_\_\_\_ / \_\_\_\_\_  
Last grade completed

You may mail completed registration form with payment, by check or money order, for \$180.00 per student to:

Lincoln Intermediate Unit 12  
Attn: Bobbye Dillman  
P.O. Box 70  
New Oxford, PA 17350

Questions? Phone (717)624-6401  
Email: [bkdillman@iu12.org](mailto:bkdillman@iu12.org)  
Fax: 717-624-6589

## Registration Form

**Camp Location: July 13-16, 2015 at James Buchanan HS – Tuscarora SD**

**Camp Time: 9 am - 3 pm**

**For Students Ages 9 - 12**

\*Certified teachers with current Pennsylvania clearances lead the camp.\*

**Option 1: Secure online Registration at: <http://goo.gl/8Ehwvh>**

**Make your Payment via PayPal at: <http://goo.gl/g1UGy>**

You will use [designchallenge@iu12.org](mailto:designchallenge@iu12.org) when submitting your payment on Pay Pal.

### Option 2: Paper Registration

**Child's Name: \_\_\_\_\_ Camp Location: James Buchanan HS, Tuscarora SD**

**Address: \_\_\_\_\_**  
Street City State Zip

**Phone #: \_\_\_\_\_ Email: \_\_\_\_\_ Child's Age \_\_\_\_\_ / \_\_\_\_\_**  
Birthdate

**Please indicate which (ONE) Design Challenge your child would like to participate in for the week.**

Event Planning

Builder's Showcase

Mission: Solar System

Arcade

**Return completed registration form with \$180 payment per student to:**

**LIU #12**

**Attn: Bobbye Dillman**

**P.O. Box 70**

**New Oxford, PA 17350**

**Questions? Phone (717)624-6401**

**Email: [bkdillman@iu12.org](mailto:bkdillman@iu12.org)**

**Fax: (717)624-6589**

**Checks payable to LIU #12**

**Registration Guidelines:**

Registrations will be accepted through **July 6th**.

Registrations will be processed in the order they are received.

A registration is complete when the registration form and payment-in-full is received.

**Payment may be made via Pay Pal, check, or money order.**

Registration forms may be returned via on-line form or US mail.

Participation will be confirmed through e-mail or US mail. E-mail, if available, will be the primary method of communication.

**Following confirmation, medical forms must be completed and returned.**

**Refunds will be granted in the following increments:**

Full refund up to June 19th

50% refund up to June 26th

No refund anytime after July 3rd