

# Summer Learning With PLTW Launch



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**SPARKING  
CURIOSITY**  
A PLTW Launch Conference

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# Agenda

- Summer Learning Experiences
- Benefits of Problem Based Learning
- PLTW Launch for Summer Learning
  - *Potential implementations of PLTW Launch in the summer learning space*
- Grade Level Recommendations
- Develop a Plan
- Q and A
- Exploration in the Exploratorium



# Summer Learning Experiences

- What are examples of bad summer learning experiences?
- What are examples of great summer learning experiences?



# Benefits of Launch for Summer Learning

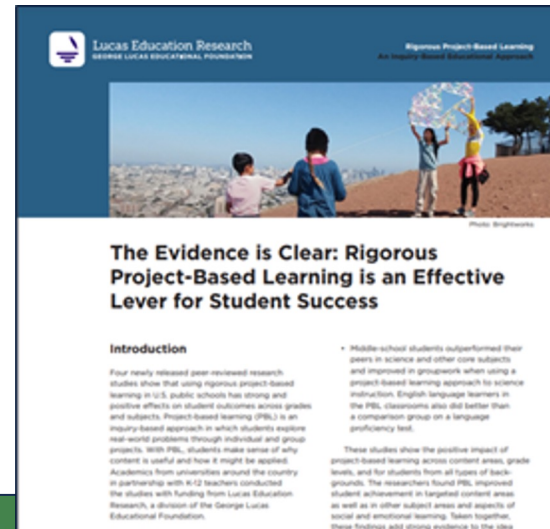
*“Moreover, researchers conducted the studies in diverse districts with large percentages of traditionally underserved students, indicating project-based learning can be a powerful lever for improving equity in U.S. schools.”*

*“There is significant evidence that active, student-centered forms of instruction, such as PBL, are better at producing deeper learning in students.”*



On average, third graders in the ML-PBL classrooms performed 8 percentage points better on science assessment compared with students in the control group classrooms.”

[Read the Case Study▼](#)



Rigorous project-based learning has strong, positive effects in science achievement and aspects of social and emotional development related to science learning among elementary students.”

[Read the Case Study▼](#)



# Why use PLTW Launch during the summer?

**Science Domain Focus** – Turn students’ curiosity into confidence with learning experiences that focus on developing sense making in specific science domains.

**Early Exposure Science Learning** – Spark students’ excitement with early, hands-on exploration of phenomena in science for the upcoming school year.

**Review Science Learning** - Provide students with a hands-on, engaging learning experience to review standards from the past school year.

**Learning Support** – Elevate school year learning by selecting modules that cover your grade level standards and expose your students to additional science content.

**Computer Science Focus** – Shape your students’ computational and algorithmic thinking by selecting computer science modules from PreK-5th grade.








**VEX IQ focus** – Kickstart a robotics club at school, or support an existing one, by selecting modules that utilize VEX IQ kits.



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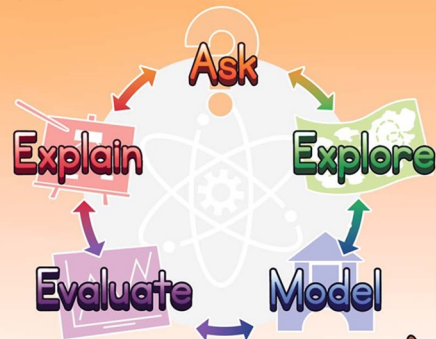
# Kindergarten

## Sunlight and Weather

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
						
Hot	Hot	Hot	Hot	Hot		

"I think it will be hot and sunny," said Mylo.

"Very good!" said Ms. Morales. "You made a prediction about the weather pattern."

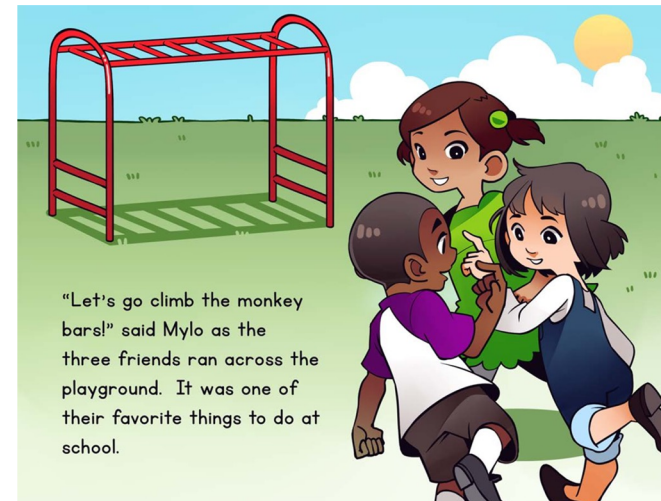


"This sounds like a problem!" said Mylo.

"We can use the design process to design a structure that will block the sunlight so we will not be as hot during our weekend activities."



## Structure and Function: Human Body



"Let's go climb the monkey bars!" said Mylo as the three friends ran across the playground. It was one of their favorite things to do at school.

with Ms. Morales and the school nurse.

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"In the meantime, try not to move your arm."

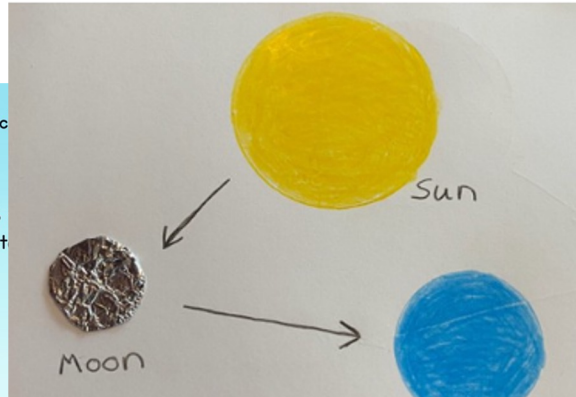


## First

### Light: Observing the Sun, Moon, and Stars

The friends decided to take a break. They sat in a small patch of shade next to the school building.

"I wish we could be protected from the bright sunlight, heat, those UV rays while we play. Our recess is too short to waste time sitting," said Mylo sadly.



**•HIKING LIST•**

- Backpack
- Comfortable Walking Shoes
- Water Bottle
- Bandana
- Rain Jacket
- Snack
- Flashlight

The school's nature club gave everyone a list of supplies.

"We can't go hiking without our supplies," said Mylo.

"I forgot to bring a flashlight," Angelina said. "It gets dark."

"My dad says that you need to be prepared for anything that happens that you don't expect," said Suzi.

Angelina, Mylo, and Suzi had designed a communication device using flashlights and mirrors. They heard a whistle and sounds of people coming near them. They had been found!

An illustration of three children in a dark setting. One child is holding a flashlight that is shining on another child. A third child is also present. The scene is lit by the flashlight beams.

### Designs Inspired by Nature



# Second

## Materials Science: Properties of Matter

"This is what we have been learning about in school," said Angelina. "The ice pops are matter and right now they are a solid. If they melt, they will turn into a liquid."

"This is a problem!" said Mylo. "We need to find a way to keep the ice pops frozen during the soccer game."



Have you ever had to keep something frozen?

What did you use?

What would you design to keep ice pops frozen?

What materials would you use?

## Living Things: Diversity of Life

"Thank you so much, Mr. Patel!" said the three friends.

"Of course!" said Mr. Patel. "Angelina wants to grow plants indoors. What about you, Suzi and Mylo?"



"I think I would like to plant something that would grow in the shade by my playset," said Suzi.

"And I would like a planter garden to grow beside my cactus - in the sun," said Mylo.



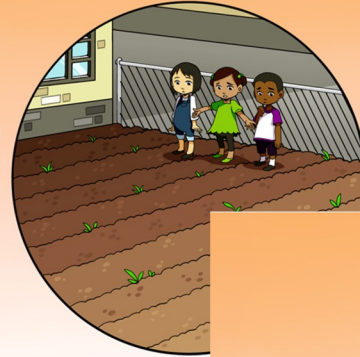
# Second

## Materials Science: Form and Function

### The Changing Earth



"Oh no!" said Angelina as they walked toward the field. "Some plants are already growing in the field where we need to plant the seeds."



"How did they get there?" asked Mylo. "We haven't planted anything yet."

How can you help the three friends solve the problem of spreading seeds over the large area?

What would you design to spread the seeds?

What do you need to learn to get started?



"The problem is that rain is coming!" said Mylo.

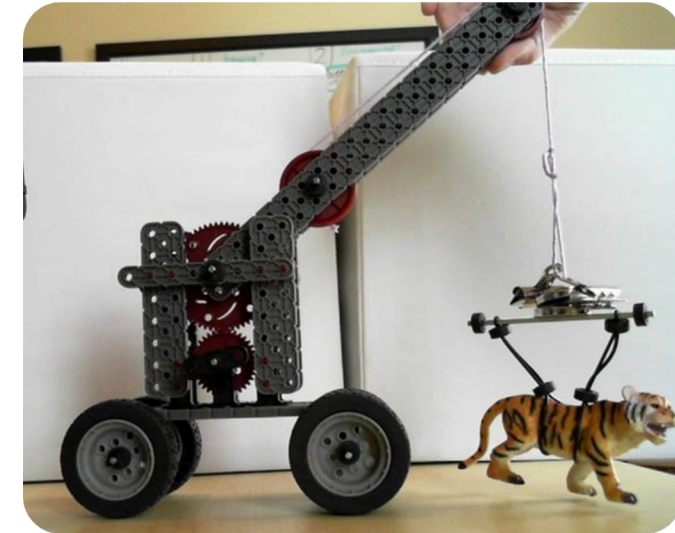
"No, the problem is that the hill is just ashes and burnt tree stumps. The rain may cause a landslide because there are no plants to hold the soil in place," suggested Suzi.

# Third

Stability and Motion: Science of Flight

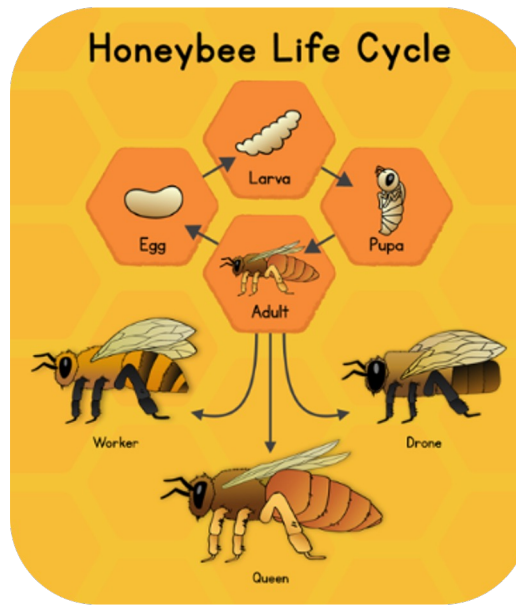


Stability and Motion: Forces and Interactions



# Third

## Life Cycles and Survival



### Mystery Pollen Simulation

#### Introduction

In this simulation, you repeat the simulation from Activity 3, but now there is a new type of pollen for you to collect. Investigate what happens as you collect the mystery pollen!

#### Players for Part 1

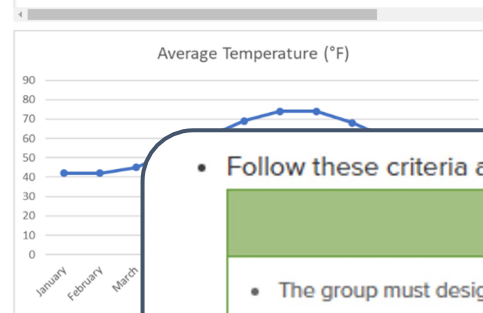
- **One queen bee:** The queen bee stays at the designated hive area. The queen does not search for food nor work in the hive.
- **Two drone bees:** The drone bees entertain the queen. They do not search for food nor work in the hive.
- **Worker bees:**
  - One queen attendant: The student attends to the needs of the queen. The student pretends to feed and groom her.
  - Two pollen packing bees: The students accept the pollen and nectar from the foraging bees.

## Weather: Factors and Hazards

### Part 3. Climate Data

- 14 Listen as your teacher models how to make a claim about climate and support the claim with evidence.  
Istanbul, Turkey

	January	February	March	April	May	June	July	August	September	October
Average temperature (°F)	42	42	45	53	61	69	74	74	68	64
Average precipitation (inches)	4.0	2.8	2.8	2.0	1.3	1.2	0.9	1.3	1.8	2.0



- Follow these criteria and constraints for your design:

Criteria	Constraints
<ul style="list-style-type: none"> <li>• The group must design, build, and test a solution that reduces the impact of a flood.</li> <li>• The solution must sustain exposure to the conditions caused by the flood.</li> <li>• The solution must be testable with the available equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Time</li> <li>• Materials</li> </ul>

# Fourth

## Waves and the Properties of Light



## Energy Exploration

- Follow these criteria and constraints for your design:

Criteria	Constraints
<ul style="list-style-type: none"><li>• The group must design, build, and test a game that incorporates light.</li><li>• The game must be able to be played with two to four people.</li><li>• The game must include:<ul style="list-style-type: none"><li>▪ A rule book</li><li>▪ Lasers (one or two)</li><li>▪ 12x12 plates (one to four)</li><li>▪ Reflection</li><li>▪ Transparent, translucent, and/or opaque materials</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Time</li><li>• Materials:<ul style="list-style-type: none"><li>▪ VEX IQ PLTW Light Game</li><li>▪ Other materials as determined by teacher</li></ul></li></ul>

# Fourth

## Organisms: Structure and Function

## Earth: Human Impact and Natural Disasters

### A New Kind of Leg



Prosthetic Blade

Prosthetic blades allow people who have lost one or both legs to run, jump, and play sports. Van Phillips, an engineer and athlete who lost a leg, created the first prosthetic blade. He wanted to run and jump like he used to. But to do that, he would need to design a new kind of prosthetic leg.

As he worked on his design, Phillips observed animals as they ran. Phillips wanted to understand how an animal's leg structure affected its ability to function. He used what he learned about a cheetah's running stride in his design.

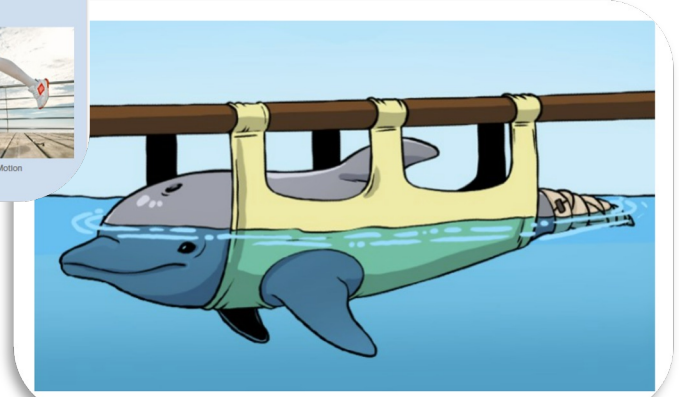
The new prosthesis, called the Flex-Foot®, was shaped to function like a cheetah's hind leg. Today, athletes all over the world use prosthetic blades. [Source](#)



Cheetah in Motion



Person with Prosthetic Blade in Motion

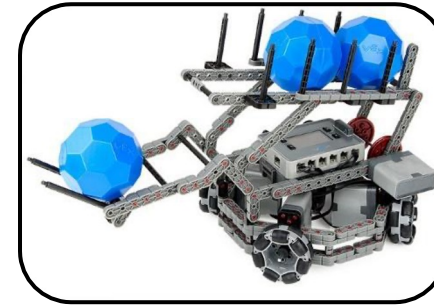


Dolphin (tail)



# Fifth

Robotics and Automation  
Robotics and Automation: Challenge

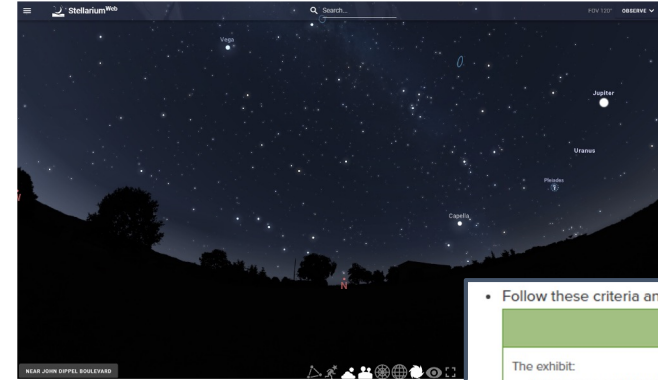


Matter: Properties and Reactions



# Fifth

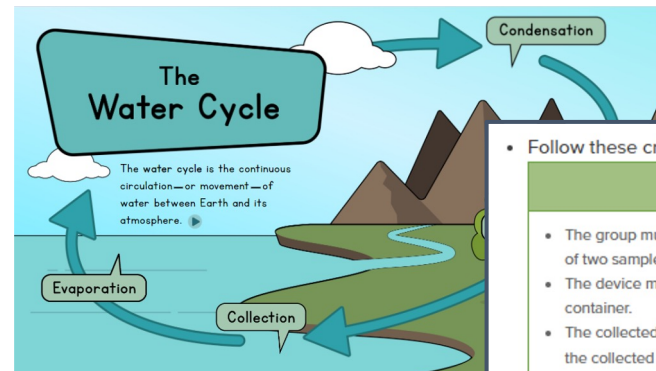
## Patterns in the Universe



• Follow these criteria and constraints for your design:

Criteria	Constraints
<p>The exhibit:</p> <ul style="list-style-type: none"><li>• Includes a goal that states what the audience will learn.</li><li>• Includes at least five facts and three pictures aligned to the exhibit goal.</li><li>• Includes a visual display, such as a tri-fold board, poster board, chart, or model.</li><li>• Includes an interactive, digital component aligned to the exhibit goal.</li><li>• Cites sources used in researching the topic.</li><li>• Is designed for the right audience.</li></ul>	<ul style="list-style-type: none"><li>• Time</li><li>• Space on the visual display to fit information</li><li>• Digital product apps</li><li>• Available research</li></ul>

## Earth's Water and Interconnected Systems



• Follow these criteria and constraints for your design:

Criteria	Constraints
<ul style="list-style-type: none"><li>• The group must design, build, and test a device to produce clean water from one of two samples of contaminated water: dirty water or salt water.</li><li>• The device must collect as much water as possible in the clean collection container.</li><li>• The collected water must be visibly less cloudy than the original dirty water, or the collected water must have less salt than the original water.</li></ul>	<ul style="list-style-type: none"><li>• Time</li><li>• Available materials</li></ul>

# Action item:

1. Develop a plan for summer learning experiences



**Questions?**

**Thoughts?**



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# Visiting the Exploratorium to experience new modules

Choose two modules to experience that would fit well into your potential summer learning experience.