

# Keeping the User in Mind: Solving Problems in PLTW Launch

# Overview

- Welcome
- What Is User-Centered Design?
- How Can You Integrate User-Centered Design?
- Why Do This With Students?
- Q & A



# PLTW Launch Instructional Development Team



**Ginger Teague**  
Senior Director of  
Instruction



**Jenni Kruse**  
Senior Instructional  
Developer



**Kristen Champion-  
Terrell**  
Instructional Developer

# Learning Objectives

- Explore strategies that empower students to consider the user experience.
- Investigate how students can consider user experience throughout the design process.
- Discuss user-centered design implementation ideas for PLTW Launch.

# What Is User-Centered Design?



# User-Centered Design

User-centered design is an iterative design process in which designers focus on the users and their needs in each phase of the design process.

Interaction Design Foundation





**Jane Iglesia**  
UX DESIGNER

# Connecting to the Real World

# Empathy and Design Thinking

In general, empathy is the ability to see the world through other people's eyes. When designing tools or products for users, it is very important for the designer to understand their user so that the design solutions actually work for those users. Empathy helps design thinkers to set aside his or her own assumptions about the world to gain insight into their users and their needs.

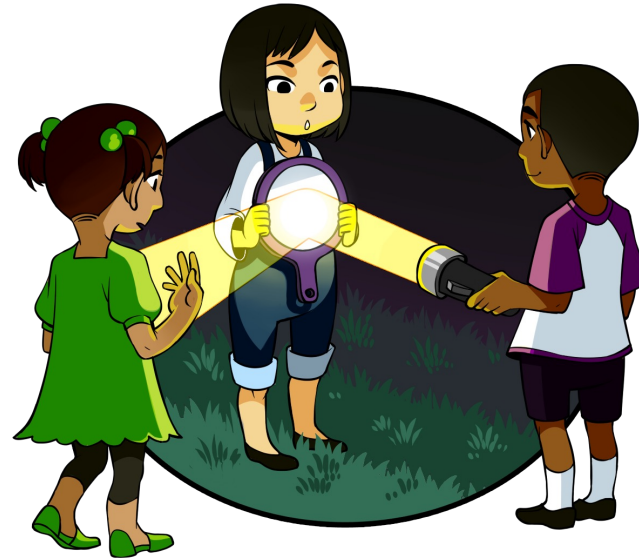






# Developing Transportable Skills

# Keeping the User in Mind in PLTW Launch



# How Can You Connect Students to the User?

- Analyze the project(s) or problem and identify opportunities to connect students to the user(s) they are designing for.
- Who is the user?
  - What is their story?
  - Why do they need the solution?
  - How will they use the solution?
  - Would the same solution work for all users? How might circumstances and needs vary?

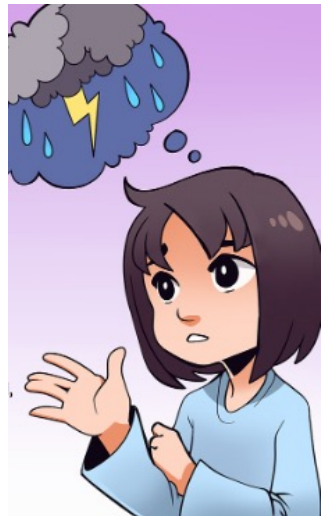
# How Can You Integrate User-Centered Design?



# Weather: Factors and Hazards

## Problem

You have learned about the three weather factors: precipitation, temperature, and wind. You also investigated climate zones and weather-related hazards. Now, you will use what you have learned to sketch, build, test, and reflect on a solution that reduces the impact of a flood.





# Keeping the User in Mind

## Teacher 1

Follows the suggestion included in the Teacher Guide for the module problem and guides students to research a local flood to learn about the needs of community members as they prepare to solve the problem.

## Teacher 2

Invites a local meteorologist to visit the classroom. Students engage the meteorologist in a conversation about the impact of flooding in their local community.

## Teacher 3

Connects students with a member of the local government that leads the development of the county floodplain program in their area.

## Teacher 4

Shares a podcast that provides the perspective of someone who has experienced flooding.



# Building Your Capacity to Integrate User-Centered Design

- Explore problem examples from PLTW Launch.
- Brainstorm ideas for how to bring in a user-centered design focus for students.



Why Do This With Students?



# How Can You Connect Students to the User?

- Analyze the project(s) or problem and identify opportunities to connect students to the user(s) they are designing for.
- Who is the user?
  - What is their story?
  - Why do they need the solution?
  - How will they use the solution?
  - Would the same solution work for all users?
  - How might circumstances and needs vary?



# Questions & Answers



# Resources

Bell, S. J. (2008). Design Thinking. *American Libraries*, 39(1/2), 44–49.

Brown, T. (2008, June). Design Thinking. *Harvard Business Review*, 86(6), (84–92).

Caroll, M. P. (2014). Shoot for the moon! The mentors and the middle schoolers explore the intersection of design thinking and STEM. *Journal of Pre-College Engineering Education Research*, 4(1), 14–30.

Common Sense Education. (2016, July 25). 8 steps to implementing design thinking in your classroom. *Common Sense Educator*.  
<https://www.commonsense.org/education/articles/8-steps-to-implementing-design-thinking-in-your-classroom>

Gray, C. M. (2018, May). Revealing students' ethical awareness during problem framing. *International Journal of Art & Design Education*, 38(2), 299–313. DOI: 10.1111/jade.12190

Interaction Design Foundation. (n.d.). User-centered design. *Interaction Design Foundation*. Retrieved on September 13, 2022 from  
<https://www.interaction-design.org/literature/topics/ux-design>

Kemnitzer, R. B. (2005). “Are you talking to me?” – Teaching user-centered design. *Technology Teacher*, 64(5), 14–16.

Kross, S., & Guo, P. J. (2022). Five pedagogical principles of a user-centered design course that prepares computing undergraduates for industry jobs. *SIGCSE 2022: Proceedings of the 53rd ACM Technical Symposium on Computer Science Education V. 1*, 168–174. Association for Computing Machinery, 168–174. <https://doi.org/10.1145/3478431.3499341>

Schmidt, A. (2010, January). The user experience. *Library Journal*, 135(10), 28–29.

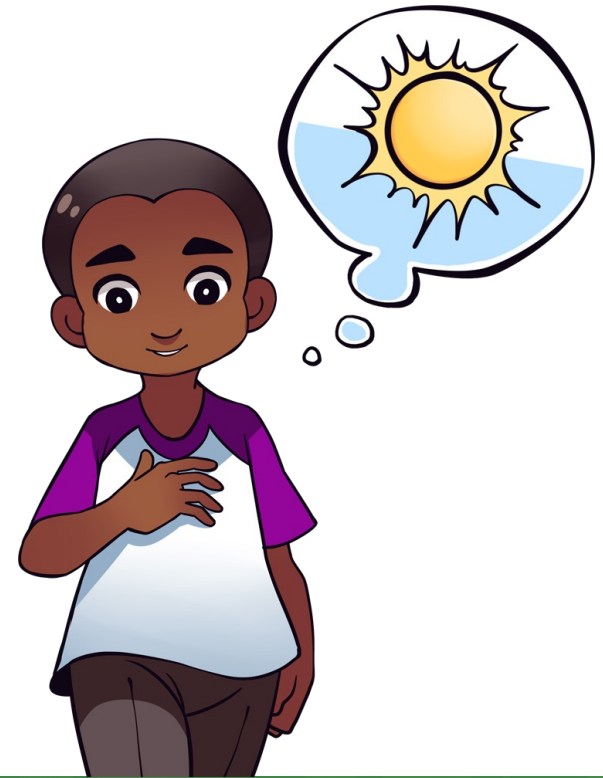
# Sunlight and Weather

## Problem: The Cool Down

In this problem, students consider the question, “How can we build a model to reduce the Sun’s warming effect on Earth?”

Students work collaboratively to design and build a model that reduces the Sun’s warming effect in one of these situations:

- Hosting a lemonade stand
- Watching an outdoor sports event
- Reading a book outside
- Visiting the beach





# Living Things: Diversity of Life

## Problem: Design a Garden

In this problem, students follow the design process as they design a planter garden. Students consider the question, “How can we design a planter garden that will survive...

- indoors”
- outdoors in the sun?”
- outdoors in the shade?”



Students work collaboratively to design, plant, and care for their garden.

# Input/Output: Computer Systems

Problem: Game Time!

In this problem, students consider the question, “How can we design a digital game that keeps children busy while they are waiting?” Students work collaboratively to design and program a digital game. Then they write instructions, so others know how to play it.



# Earth's Water and Interconnected Systems

Problem: Clean Enough to Drink

In this problem, students apply their knowledge of the interactions between Earth's systems, the Sun, gravity, and the water cycle to create a method for generating clean drinking water. Students use the design process to sketch, build, test, and reflect, on a device that produces clean water.

