Empathy and Environmental Design

The Tech Interactive

San Jose, CA

The Bowers Institute

Agenda

1. Go virtual birdwatching
2. Reflect on your observation data
3. Build for a bird
4. Use data to help other animals

Welcome

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Session Goals

- Practice collecting data
- Learn strategies for using data and empathy to drive design
- Reflect on how to apply these strategies to other challenges

Solve for Earth

Real-world Problems

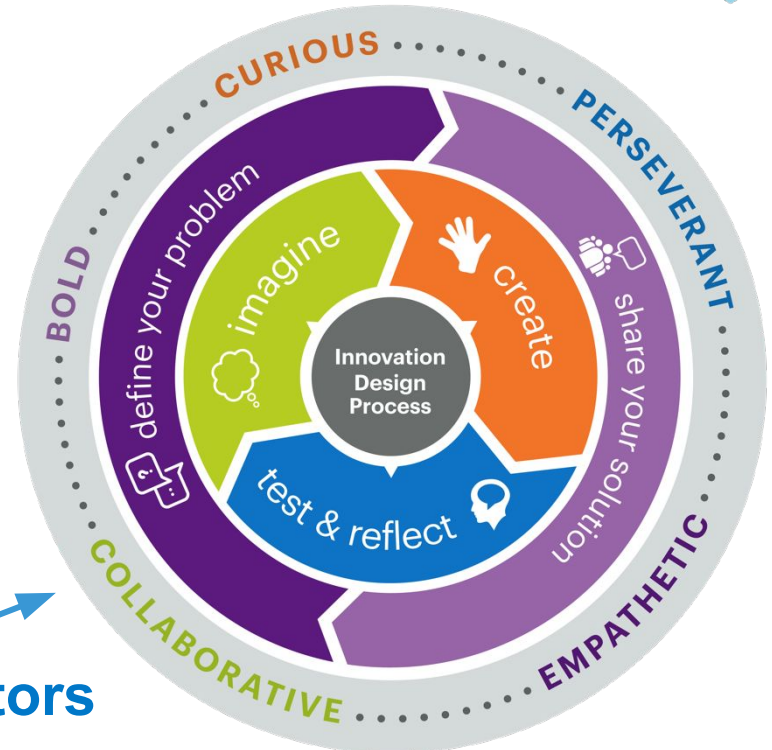Sustainable Solutions

Career Connections

www.solveforearth.com

A Design Challenge is...

Design challenges use real-world problems to engage learners in an iterative design process.

Mindsets of Successful Innovators
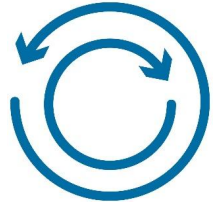
Key Features of Design Challenges

Solvable by **multiple solutions**.

Provide opportunities for **iteration**.
Students can test and improve designs.

Connect with **participant interests**.

Make explicit connections to **real world problems** and **careers**.

Frame the challenge

Gila Woodpecker Nest

Cliff Swallow Home

Bald Eagle Home

Gather Data

- Have your observation paper/document ready

- Watch bird cam together

- Record all of the bird behaviors you observe

  - You can add observations to the chat too
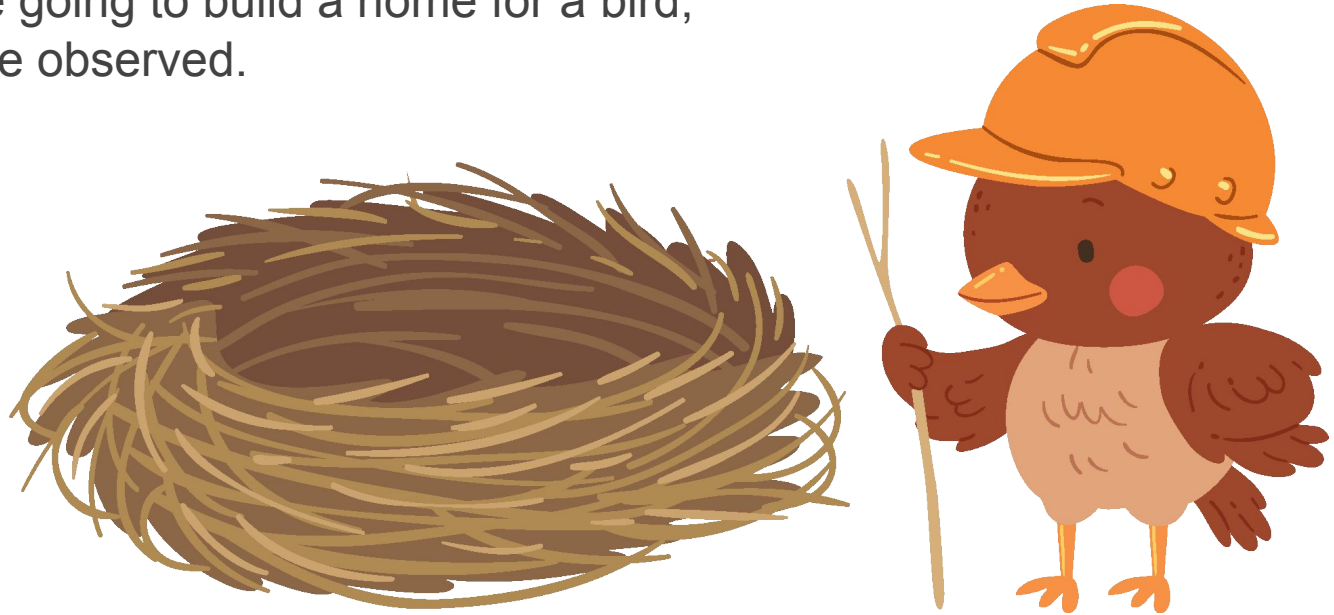
Share Data

- What type of bird did you observe?

- What behavior did you observe?

- Did you observe anything else?

- What might that tell us about what birds need?

Building for Birdie

Today you are going to build a home for a bird, like the one we observed.

Design Problem

Today we will be acting as **Wildlife Veterinarians**.

Wildlife centers take care of animals until they are ready to be released back to the wild. We will practice engineering by designing a temporary home for a recently displaced bird.

Wait! 🙋🏽‍♀️ What's a Wildlife Veterinarian?

A person who takes care of wild animals when they are sick or are displaced from their home

Design Challenge

Problem: Design and build a bird home to meet a bird's needs.

Desired features (criteria):
- Your nest must be able to hold your "bird" and not fall apart
- You must explain how your home meets the needs of your bird.
  - Safety
  - Comfort
  - Other?

Design limitations (constraints):
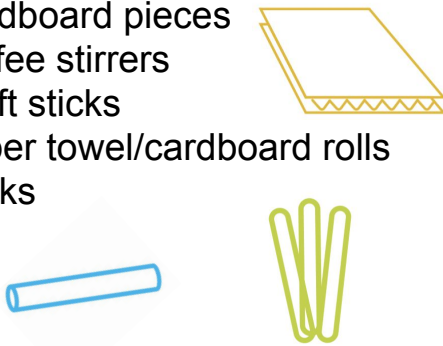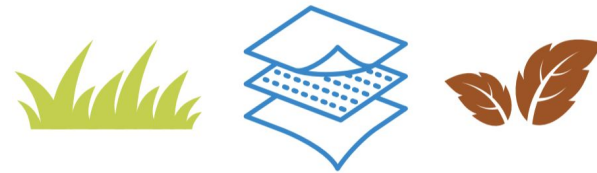- Budget: use only the supplies you have nearby
- Schedule: you have 7 minutes to build

Testing: Any time during your build, put your "bird" inside the home.

Materials Suggestions

Try to find one or two things from each category below (no need for everything on the list!)

Structural supplies	Cushion/Filler items	Connectors
• Cardboard pieces • Coffee stirrers • Craft sticks • Paper towel/cardboard rolls • Sticks	• Cotton balls • Fabric (small scraps, socks, etc.) • Foam pieces • Grass, straw, leaves, etc.	• Rubber bands • Pipe cleaners • Twist ties • Paper fasteners • String • Hair ties or accessories

Test Area Supplies	Tools (optional)
• Item to represent a bird. A few ideas: ○ Golf ball, tennis ball, small toy/figurine, spice container, eraser	• Scissors • Hole puncher • Tape

Design Challenge

Problem: Design and build a bird home to meet a bird's needs.

- How does your design solve the problem?

- What parts of your design help the home to be strong and stable?

- What have you discovered as you're building?

- What do you think will happen when you test?

Desired features (criteria):
- Your nest must be able to hold your "bird" and not fall apart
- You must explain how your home meets the needs of your bird.
  - Safety
  - Comfort
  - Other?

Design limitations (constraints):
- Budget: use only the supplies you have nearby
- Schedule: you have 7 minutes to build

Stop and Share Out

- Choose gallery view on Zoom.

- Turn on your camera and make sure your device is visible.

Questions:

How did you meet your bird's needs?

What would you do if you had more time?

Everyone else: Add helpful feedback or ideas you might have about the design to the chat.

Strategies for Building Empathy

Today we used:

❏ Focusing on the needs of the user

❏ Appreciating the efforts of others

Key Strategies

❏ Addressing real world problems

❏ Connecting with participant interests

❏ Seeking out feedback from the community

❏ Identifying skills that support active listening

What did you notice?

AS PARTICIPANT

- Which parts of the process helped you feel connected to the other participants?
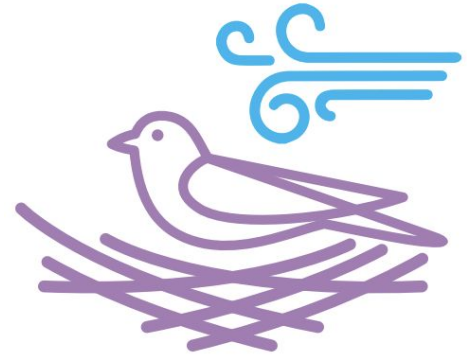
AS FACILITATOR

- What would you add in order to layer in more opportunities for building empathy?

Explore More

Hardcore Habitats: To help restore their dwindling population, the bird species *rhinoceros auklet* on Año Nuevo island need biodegradable homes that can withstand harsh weather and roaming elephant seals that crush their eggs and burrows. ([Source](#))

Wildlife Crossing: Expand your species scope to investigate how humans are impacting animals when they're on the move.
Build a structure (bridge, tunnel, etc.) to get an animal safely across a road.

Bridge   Tunnel   Undercrossing

NGSS Connections

K-2 ETS1-2 Engineering Design: Develop a simple sketch drawing, or physical design to illustrate how the shape of an object helps it function as needed to solve a given problem.

- Developing possible solutions
- Developing and using models
- Structure and function

EPCs: Principle 2 - People Influence Natural Systems

Concept A. Direct and indirect changes to natural systems due to the growth of human populations and their consumption rates influence the geographic extent, composition, biological diversity, and viability of natural systems.

Today's Resources

- **Building for Birdie**

  (**Lesson Plan** and **Unit Plan**)

- **Caution! Wildlife Crossing**

  (**Activity Guide** and **Video**)

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Additional Resources

- **Educator Resources**:
  thetech.org/resources

  Browse our library of Virtual
  Professional Development

- **Parent Guides and Videos:**
  thetech.org/athome
  thetech.org/encasa

Data Resources and Citizen Science

Watch birds!

Record data!

Help scientists!

Find data sets for science!

https://www.birds.cornell.edu/citizenscience

- NestWatch
- Great Backyard Bird Count

https://explore.org/livecams/birds

Remind Yourself:

You are learning and iterating too!

- Be flexible.

- Test and reflect.

- Share your creations!

What will you try next?

Thank you!

We'd love your feedback!

Exit Survey

Stay in touch!

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The Bowers Institute