Amping up Authenticity
with Career-Connected, Community-Centered PBL
Who’s in the room?

Introduce yourself to your table group:
Name, role, where are you from, and 1 goal for your learning today.
Goals

• Explore the power of connecting PBL to community partners in order to create opportunities for strong, embedded career-connected learning.

• Apply key elements of engaging PBL to a community/career connected unit.
Today’s Agenda

1 11:00 – 11:45  Learn while doing: Experience Bird Strike!
2 11:45 – 12:15  Focus on the Process
3 12:15 – 12:30  Debrief & Next Steps
Purpose of the PBL Experience

Experience key features of PBL:

• Engagement first!
• Authentic…
  o Problems
  o Resources & data
  o Career connections

Context:

• Secondary life science class
• Near Sea-Tac Airport*
Extra! Extra! Read All About It!

FLIGHT 1549: A ROUTINE TAKEOFF TURNS UGLY

Captain Sullenberger Recalls The Bird Strike And The Tense And Crucial Minutes That Followed
What turned this flight into a disaster?

Video Link: https://www.youtube.com/watch?v=dy7bSpePOMc
Engine Strikes: FAA Required Testing

To fly in the United States, engines must be tested to make sure they can withstand a bird strike.

Video Link: https://youtu.be/TKFFxwebUI?t=1m47s

So what happened to Flight 1549? Why did its engine fail?
Engine Strike

But sometimes this happens...

Video link: https://www.youtube.com/watch?v=lgspLiTFWlk
Nose Strike

Video link: https://www.youtube.com/watch?v=3tpKs2C3ydc
The entire aircraft is vulnerable
What happens at an airport after a bird strike?

**Flight makes emergency landing after bird strike during takeoff**

*By Fox News*

*April 1, 2018 | 5:20pm*

**AIRCRAFT**

Southwest flight forced to land after bird strike

*Published 0:56 AM ET Wed, 18 April 2018 | Updated 11:18 PM ET Wed, 18 April 2018*

*REUTERS*

A Southwest Airlines airplane flying to Phoenix was forced to land at Nashville airport shortly after takeoff because of a bird strike, a Southwest spokesperson said on Wednesday.
What happens at an airport after a bird strike?
What happens at an airport after a bird strike?

Airports are very complex systems designed to move a lot of people and cargo.

In your opinion, what are the most serious impacts of a bird strike on the airport system?

Consider what happens to:

- airport logistics (air-traffic control, gates, luggage, cargo, runways, etc.)
- economic costs (damaged airplanes, airport delays, additional fuel use, etc.)
- community costs (delayed flights, confidence in aviation safety, etc.)
- others?
Bird Strikes = Big Problems

Is it possible to prevent bird strikes?

In pairs, generate a list of your initial ideas about...

- What do we know about the problem of bird strikes?
- What do we need to know in order to help an airport avoid bird strikes?

Be ready to share!
Meet Mikki Viehoever

Hello! My name is Mikki Viehoever and I’m a wildlife biologist at Sea-Tac Airport.

Did you know Sea-Tac was the first airport in the world to start a wildlife management program to prevent bird strikes? Since the 1970s we’ve been figuring out how to keep airplanes and passengers safe while also protecting the wildlife that can cause catastrophic crashes.

Because we’re leaders in aviation wildlife management, other airports often ask us for advice and guidance. But we’re so busy here at Sea-Tac that we usually can’t respond to many requests. When I heard your class will be learning about bird strikes, I had an idea…
Bird Strikes: Case Study Challenge

Could you help us by reviewing a few airport case studies and creating a preliminary strike avoidance plan for each airport?

We’ve put together some information about Sea-Tac for you to learn our approach to strike avoidance. In order to help us, you’ll need to learn how to...

- analyze bird strike data for trends
- understand habitats and how to assess risk factors
- plan for ongoing management (over time)
- plan for immediate solutions (strike emergencies)

The Challenge: When you’re ready, we’ll share the case studies with you. You’ll need to present your conclusions and proposed wildlife hazard management plan either in a class presentation or report format.

Are you up to this challenge? My team and I hope so!
How big of a problem are bird strikes?

Wildlife Strike Database Reporting Form

How could bird strike data be used by airport wildlife management teams?

What questions would you like to ask/answer by analyzing this data?
What the FAA knows about Bird Strikes

Answers to some of the Frequently Asked Questions:

- Do most bird strikes occur while in flight, at take off, or landing?
  
  - 3%: in flight
  - 37%: takeoff
  - 60%: landing

- At what altitude do most bird strikes occur?
  
  - 92% occur at or below 3,500 ft

- How many deaths have been attributed to wildlife strikes?
  
  - Between 1990-2016: 262 human fatalities

- How many aircrafts have been destroyed due to wildlife strikes?
  
  - Between 1990-2016: 247 civil aircrafts destroyed or damaged beyond repair

- What part of the plane is most frequently damaged?
  
  - Engines, which accounted for 32% of all damaged aircraft between 1990-2012

- What is the economic loss from wildlife strikes?
  
  - An estimated $957 million per year

So... how big of a problem are bird strikes?
Pause to reflect on the launch

• How engaged were you?
• What made it engaging? If you weren’t engaged, what would have made it more engaging?
• How engaged would your students be? Why or why not?

Did you see…
• An authentic problem?
• Authentic resources & data?
• Authentic career connections?
Unit At-A-Glance

Driving Question:
How can we keep the skies safe for passengers, planes, and birds?

Module 1: Bird Strikes: How big is a problem are they?
Lesson 1.1: Unit Launch
(70 min)
Lesson 1.2: National Wildlife Strike Database: U.S. Analysis
(55 min)
Lesson 1.3: Strike Database: Sea-Tac Airport Analysis
(50 min)

Module 2: Why are the birds here? How do we make them go away?
Lesson 2.1: Modeling Habitats at Sea-Tac Airport
(60 min)
Lesson 2.2: What’s for Dinner? Food Chain Exploration
(60 min)
Lesson 2.3: Cycling of Energy and Matter in the Sea-Tac Habitat
(65 min)
Lesson 2.4: Habitat Modification: Putting it all together
(45 min)

Module 3: How can we prevent strikes & preserve a healthy ecosystem?
Lesson 3.1: Wildlife Hazard Management Plan: Part 1
(60 min)
Lesson 3.2: Wildlife Hazard Management Plan: Part 2
(95 min)
Lesson 3.3: Emergency Drill!
(55 min)

Module 4: What’s the best way to prevent bird strikes at our airport?
Lesson 4.1: Tackle an Airport Case Study
(120 min)
Lesson 4.2: Finalize Wildlife Hazard Management Plan Presentations
(120 min)
Lesson 4.3: Presentations & Reflections
(90 min)

[Early product – a complex performance task that demonstrates students’ ability to apply skills, concepts and knowledge learned in the unit.]
Student teams create a Wildlife Hazard Management Plan for their case study airport; they present and defend their plan during an exhibition to the community.
Log on!

https://padlet.com/EducuriousPadlet/DL2019
Wildlife Management: Career connections

To monitor and protect this 5 mile radius requires a team!
Students get to know the Wildlife Management Team
Real-world resources:
The final product: Case Study and checklist

CASE STUDY

Wildlife Hazard Management Plan

Task Checklist

Name: __________________________

Date: ________________ Period: __________

Your wildlife management team has been asked to provide a wildlife hazard management plan to help address some specific bird strike problems they are experiencing at the airport in your case study. Your report and presentation to the airport must include the four components listed below. A checklist of what is required for you to include in each component is also provided.

1. Analysis of the bird strike data
   - Provide an overall summary of your analysis of the data. Include averages and percentages to provide support for your claims in your summary when needed.
   - Timing of strike (time of day, season of year)
   - Types of species
   - Damage reported
   - Phase of flight

   - Identify the two types of birds involved in the most strikes. Then report on the following for each bird:
     - Percentage of bird strikes each type of bird is responsible for
     - Average size of these birds
     - Damage of the bird strike
     - Frequency of bird strikes (month, day, and flight phase)

2. Food web for the airport’s habitat where the problem birds are found
   - Include a brief description of what you expect to find in the habitat.
   - Provide the following information in your food web (think about how to best present the food web so it is easy for others to understand)
     - Organisms present in your habitat
     - Trophic levels
     - Cycling of energy and matter
     - Explain how the food web helps others understand the bird strike problem

3. Identify attractants in the habitat and make a plan for habitat modification and a plan for active intervention
   - Identify what is causing the problem birds to be attracted to the habitat.
   - Propose 2–3 possible habitat management (long-term) plans that will deter birds over time.
   - Propose 2–3 intervention (emergency) plans to immediately harass or displace problem birds away from the airport and area if needed.

educurious
learning that connects
Project development process

I remember the most about the different stakeholders, and their missions. I remember about Public Good and Trust, and I also remember how I learned to cooperate with different groups with different needs.”
– 7th grade social studies student

“It gives students the opportunity to actually learn about something that’s happening right now. And it gives us a chance to work with each other and talk and collaborate.”
– 9th grade biology student
Context for the Port of Seattle units

Port of Seattle goals:

• Increase student awareness of career pathways in maritime, trade, travel, manufacturing, land use, and logistics

• Provide engaging, career-connected learning opportunities for youth in the Port’s neighboring communities

• Co-develop projects around authentic work-based challenges by bringing Port professionals and teachers together
Design teacher goals

- Unit timing: spring quarter (3-6 weeks)
- Aligned to teachers’ learning goals
- Student engagement
- Real world connections
- Structured group work
- Professional learning about PBL curriculum design
# PBL Design at Educurious

## Project Design

<table>
<thead>
<tr>
<th>Students</th>
<th>Teachers</th>
<th>PBL units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Launch</strong></td>
<td><strong>Project Work</strong></td>
<td><strong>Culminating Products</strong></td>
</tr>
<tr>
<td><strong>Sparks student engagement</strong></td>
<td><strong>Drives core content learning &amp; disciplinary skills</strong></td>
<td><strong>Speak to a local or global audience</strong></td>
</tr>
<tr>
<td>Students begin a PBL unit by: • immediately grappling with a complex, relevant problem. • drawing on what they already know from prior experience.</td>
<td>Students respond to the project challenge by: • engaging with a rich variety of resources that support rigorous content learning. • tracking their progress as they gain knowledge necessary to analyze, apply, and collaborate</td>
<td>Student products showcase: • understanding and application of core content knowledge. • craftsmanship and creativity. • connections to the world beyond the classroom. • strengthened personal and civic responsibility, courage and empathy.</td>
</tr>
<tr>
<td>Teachers begin a PBL unit by: • orienting students to the project. • prioritizing students’ ideas, prior experiences, and problem solving.</td>
<td>Teachers support the project by: • providing purposeful and rigorous content instruction. • facilitating sense-making activities. • preparing students for productive group work. • engaging with students in cycles of feedback and reflection in order to monitor learning and project progress.</td>
<td>Teachers support culminating products by: • creating meaningful opportunities for sharing final products with the larger community. • preparing students to clearly and effectively communicate their work.</td>
</tr>
<tr>
<td>PBL units launch by: • sparking students’ motivation by creating a need to know in response to a compelling driving question. • grounding academic work in real-world contexts that matter to learners.</td>
<td>Project work is designed to: • encourage students to think like subject matter experts in order to solve a contemporary problem. • organize learning into modules that deepen understanding over time and pace students in their project work.</td>
<td>Project products are designed to: • spotlight students’ content learning and skill development. • ensure each product reflects a particular perspective or context. • attend to both individual and group work.</td>
</tr>
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Educurious project-based learning units are aligned to national standards and strategically leverage innovative technologies and engage disciplinary and community experts via the Expert Network to collaborate on student projects, bring relevance to classroom instruction, highlight potential career pathways, and share diverse perspectives.

### How do the Port units reflect PBL design?

### How do they integrate authentic...

- Problems?
- Resources & data?
- Career connections?
Explore a 7th grade Social Studies unit: People’s Park
The PEOPLE'S PARK
How can we design a park that positively impacts the public?

Module 1
Who are the stakeholders in deciding the fate of T-117?

Module 2
How can a redesigned T-117 serve the public good?

Module 3
What's the BEST design proposal for T-117?

Final Product:
Present & defend your team's park design for T-117 during a class Port Commissioner meeting.
Identify PBL design in People’s Park (10 min)

Use the PDF on padlet to explore the unit’s resources:
• Poster
• Unit at a glance
• Standards
• Grouping overview
• Module overviews
• Lessons & resources

In small groups...
• Use the PBL design framework to track components of authenticity you see in People’s Park
  o Problems
  o Resources & data
  o Career connections
• Be ready to share out your findings and questions
What organizations in my community would be a good partner?
What contacts or connections do I have already?
What authentic problems do they engage with?
How could those relate to my content area goals?
Does it make the most sense for me to adopt, adapt, or innovate?

- Adopt = use an existing PBL unit (*consider your authenticity!*)
- Adapt = use a PBL unit structure with different content or resources
- Innovate = using the design framework, create a PBL unit for a site-specific or organization-specific unit
- Not sure?

Share what you’re thinking with your group – and why.
Standing discussion

Rearrange yourself into the following groups:

• Adopt = use an existing PBL unit (*consider your authenticity!*)
• Adapt = use a PBL unit structure with different content or resources
• Innovate = use design framework to create a PBL unit for a site-specific or organization-specific unit
• Not sure?

Discuss and record on your group’s poster:

• To teach the unit you have in mind, what are your next steps?
• What questions do you have?

Be ready to share out!
Before you leave, please take the survey.
(it’s on padlet!)
We love feedback – thank you!
Thank you!

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