

PBL UNIT PLANNING FORM



Project Title

PBL Unit Name | Subject | Grade

Empowered by the Numbers: Using Math to Drive Community Change | High School Math (Algebra I/II, Data Science, Quantitative Reasoning) | High School (Grades 9–12)

PBL Unit Designers

Magnify Learning

Duration of PBL Unit | Timeline for Implementation

4–5 Weeks

Plan with the End in Mind

Statement of Real World Problem

What authentic, real-world problem(school, local, or global) will the students' work attend to?

Despite living in one community, many people face inequitable access to resources—whether it's food, internet, public transportation, or safe housing. Students will investigate a **genuine, local issue** using **math as a tool of visibility and justice**. How can we, as community data strategists, use mathematics to uncover inequities in our city—and empower decision-makers to create a more just and equitable community?

Project Overview

Describe the project your students will embark upon.

In this unit, students take on the role of community data strategists to explore how mathematics can reveal and address inequities in their local context. Through sustained inquiry, they will investigate a real-world issue—such as access to transportation, affordable housing, food security, or digital connectivity—by gathering and analyzing authentic data. Using tools like scatter plots, linear regression, and mathematical modeling, students will uncover patterns and develop data-driven solutions. Their final products, including visual reports and public presentations, will be shared with stakeholders in their school or community. By connecting mathematical skills with civic engagement, this project empowers students to use numbers as a tool for justice, visibility, and change.

Community Partners

What partnerships does the project offer, suggest, necessitate? When in the project do they best serve students. *Consider the launch, as a part of Scaffolding, at a Benchmark, as well as during Project Culmination.*

Local nonprofits (e.g., food banks, housing orgs, digital equity groups)
City council or mayor's office
Local planning commissions or school district research office
Journalists or data visualization experts

PBL UNIT PLANNING FORM



Standards

Copy and paste the standards below.

Indiana Academic Standards Alignment

Algebra / Data & Functions

- **HSS.ID.B.6:** Scatter plots and correlation
- **HSS.ID.C.7:** Interpret slope/intercepts in context
- **HSF.LE.A.1:** Construct linear/exponential functions to model real-world scenarios
- **HSF.IF.C.7:** Graph and analyze key features of functions
- **HSN.Q.A.1:** Use units to understand multi-step problems

Driving Question

What real-world **role and performance** does the problem enable?

ROLE (what role will your student assume, e.g., who does this work professionally)

How can we, as community data strategists, use mathematics to uncover inequities in our city—and empower decision-makers to create a more just and equitable community?

TASK (what will your students create/do/make?)

PURPOSE (why do experts do the work?)

PBL UNIT PLANNING FORM



Create the Bookends: Launch and Assessment

Entry Event

A document, video clip, guest speaker, or other experience that sets the stage for the student task and outlines the product or problem for students. It engages students, compels them to complete the project, and generates Knows/Need to Knows.

Launch Experience:

- Watch a short documentary or news clip (e.g., on broadband deserts, food deserts, or walkability)
- Host a guest speaker (local planner, nonprofit leader, or youth advocate) who shares how data is needed to make a difference

"Our community has challenges that aren't visible to everyone. Can you help us **tell the story through numbers**—so we can push for change?"

End Products (Authentic Task that addresses the Driving Question)

Each project ends in the creation of a student-centered product that requires demonstration of mastery of the content and skills in an authentic way.

Community Equity Brief (with graphs, explanations, and solution modeling)

Visual (Infographic, Slide Deck, or Video Summary)

Public Presentation or Symposium (live or recorded)

Optional: Submit to city council or school board

Rubrics and Assessment

A tool used to measure an end product/task against a set of defined standards. Rubrics are used to communicate a teacher's expectations for a given assignment.

Mathematical Modeling – accuracy, clarity, correct use of functions

Interpretation – analysis of slope, y-intercept, predictions

Communication – clarity of presentation, visuals, and audience-appropriate writing

Collaboration – documented roles, peer evaluation, team dynamics

Reflection – individual written response: *How does math empower change?*

Employability Skills

What skills will the students need to succeed in all phases of the project, including those which make them employable(i.e. collaboration, critical thinking, agency, etc.).

Critical Thinking & Problem Solving
Communication (Written, Visual, and Oral)
Data Literacy & Quantitative Reasoning

PBL UNIT PLANNING FORM



Anticipate Knows/Needs to Know

As you create the student-facing work, make sure you are anticipating what your students Know and what they will Need to Know. You will build on their assets and design learning opportunities to address their needs.

Knows:

- Basics of graphing and interpreting data
- Slope and linear functions
- Real-world problem examples

Needs to Know:

- How to interpret and model real data
- How to analyze inequity using math
- How to write for a public audience
- How to use visuals (infographics, charts) effectively
- How to communicate math-based recommendations persuasively

PBL UNIT PLANNING FORM



Create the Learning Plan

Project Launch	Scaffolding	Benchmark #1	Scaffolding	Benchmark #2
Entry Event Entry event: video + guest speaker on local equity issue K/NTK Process	Introduction to community data sources (e.g., Census, open data portals)	Initial research plan created Equity topic selected Sub-driving question drafted Deliverable ☐ Individual ☒ Team	Lessons on scatter plots, correlation, and lines of best fit	Inquiry & Math Foundations - Early scatter plot or regression model built - Data source documented - Mathematical question drafted Deliverable Interview notes Feedback Plan - Peer review of graphs - Teacher conferencing/check-in Reflection Reflective journal prompt: "What story do the numbers tell so far?"
	Explore examples of math-based advocacy (infographics, equity reports)	Feedback Plan Group brainstorm + affinity mapping Reflection Daily journal entries on topic interest	Mini-lessons on units, slope, intercepts, and modeling real-world relationships	
	Team formation + equity issue brainstorming		Investigate and clean datasets	
			Explore mapping tools or Google Forms for community survey design	
Scaffolding	Benchmark #3	Scaffolding	Benchmark#4	
Use models to analyze equity gaps	Storyboard or rough visuals - Drafted math model with interpretation - Solution plan connected to data	Finalize math model and visuals	Complete draft of presentation or product Feedback Plan Peer-reviewed and teacher-approved final model	

PBL UNIT PLANNING FORM



Deep dive into slope, rate of change, and function interpretation	Deliverable ☐ Team Feedback Plan - Gallery walk of early visuals - Peer feedback protocol (e.g., "I like, I wonder, I suggest") Reflection Exit ticket: "What's our math telling us about the problem?"	Revise based on feedback		
Brainstorm possible solutions supported by math		Practice explaining model to non-experts		
Design visual representation of findings (e.g., infographic, dashboard, slides)		Write community brief or speaker notes		
Scaffolding	Project Culmination			
Host "Math for Change" community showcase or class symposium	End Product <i>What will students be creating? Is your end product going to be completed individually or by groups? How will you assess your end product?</i> Public presentation Project Reflection & Debrief Visual report or proposal - Individual reflection piece Audience feedback forms - Partner and self-assessment - Group retrospective: "What would we do differently next time?"			
Present findings to audience (live or recorded)				
Reflect on personal growth, team process, and real-world application of math				

PBL UNIT
PLANNING
FORM



	Celebration of Learning Invite families and the community to a special event where students present their work	
--	--	--

PBL Toolbox
Learning Strategies

Workshop Template	
Learner Centered Experiences w Content	
Learner with Peers	
Community Building Tools	
Feedback, Reflection, Assessment, and Revision Tools How will you establish a reflective culture early in the project? How will you embed reflection throughout the project? How will you use reflection at the end of the project?	

Group Contracts & Grouping

What group contract will you use? Why will your students work in groups? What is the purpose of the group? How long will the group work together? How will you group students? How will you grow their collaboration skills?

Protocols and Learning Structures

Protocols are a tool for bringing organization and direction to conversations so that all voices have an opportunity to be heard.
What protocols will you use to bring structure to your class conversations and activities?

PBL UNIT PLANNING FORM

