

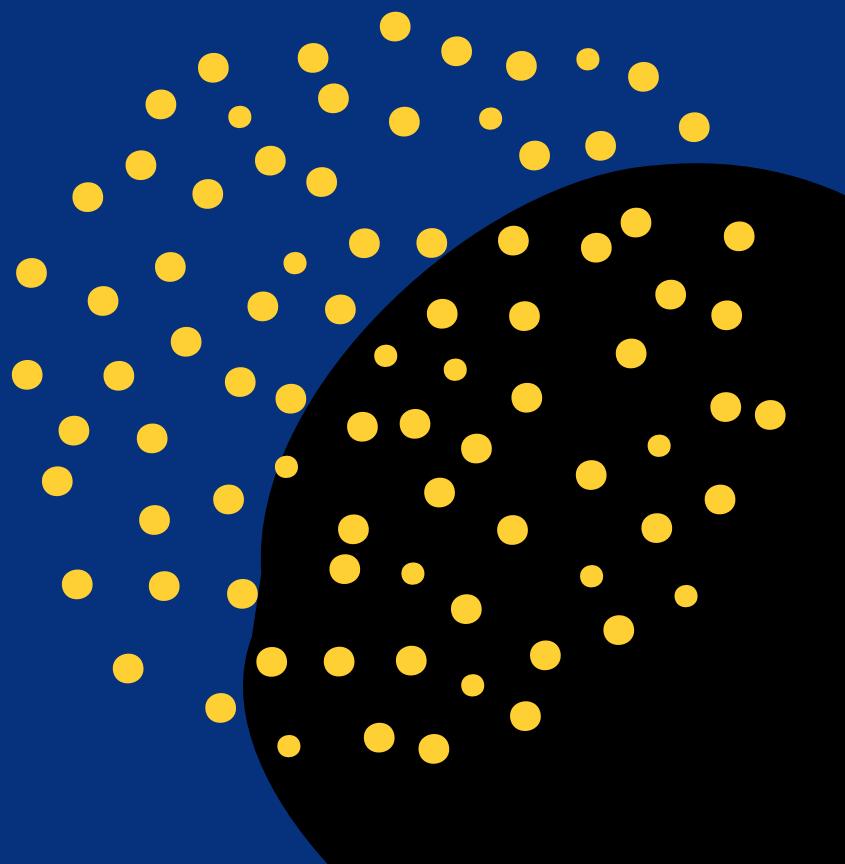
Culturally Responsive Mathematics

with Applied Technologies



Final Project
Course Development

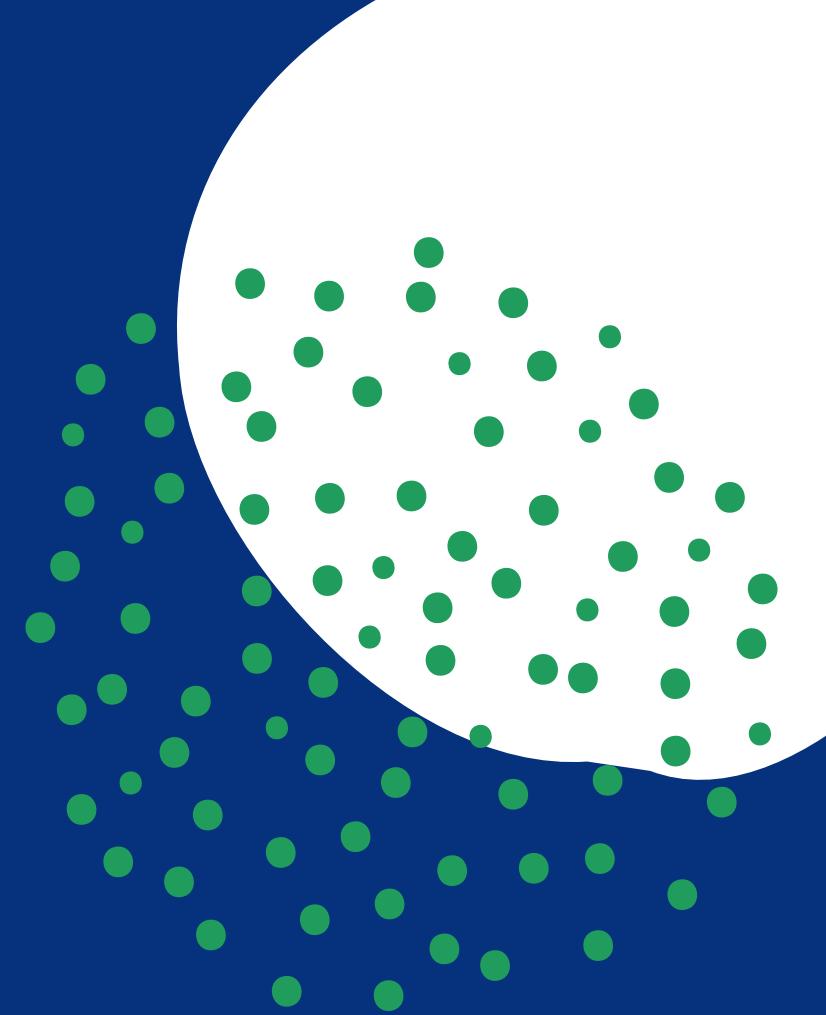
Presentation by Idrissa Presley-Peterson, Jordyn Haines, Hongze Zhu



Presentation Overview

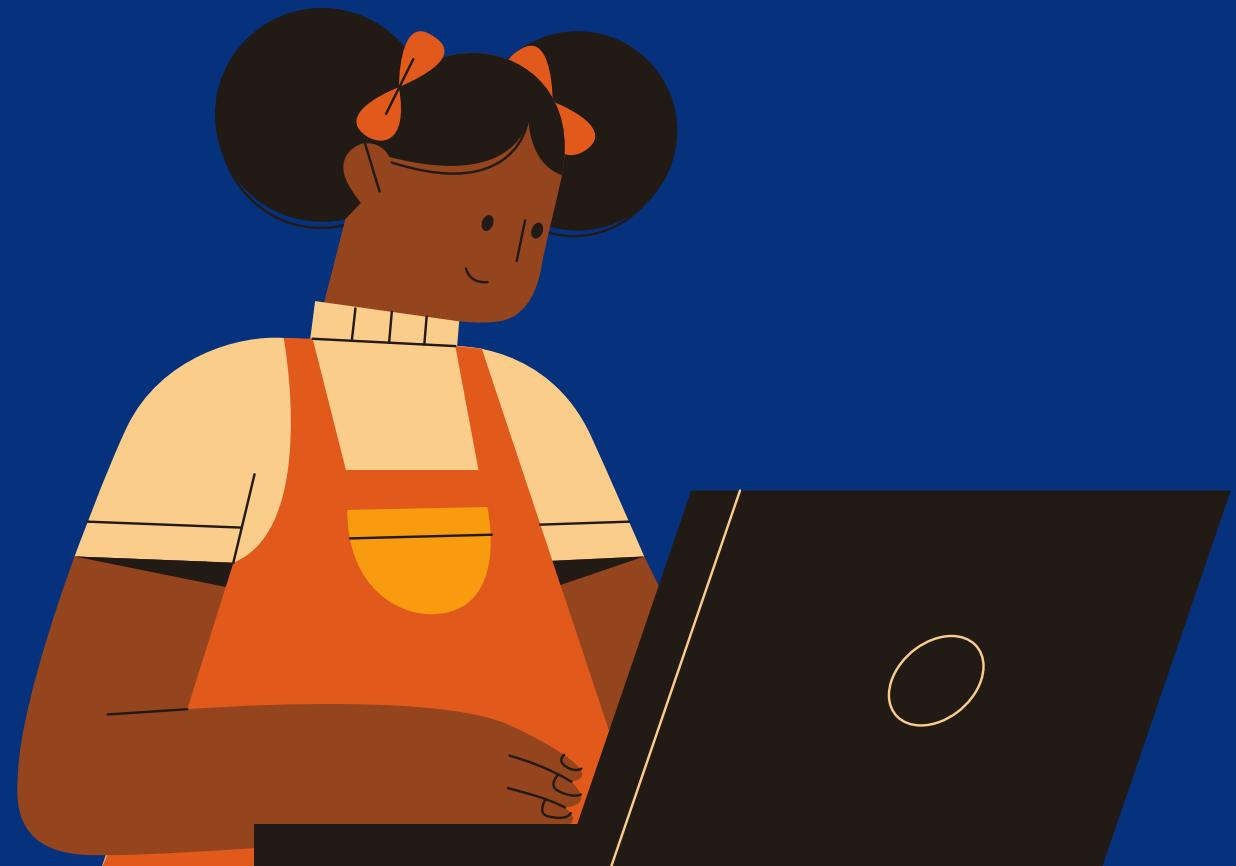
Discussion Points

- Technology + Math + Culture
- Course Overview
- Game-Based Learning & Accessibility
- STEM Identity Development
- Social/Economic Contexts in Education
- Teaching Methods & Collaborative Learning



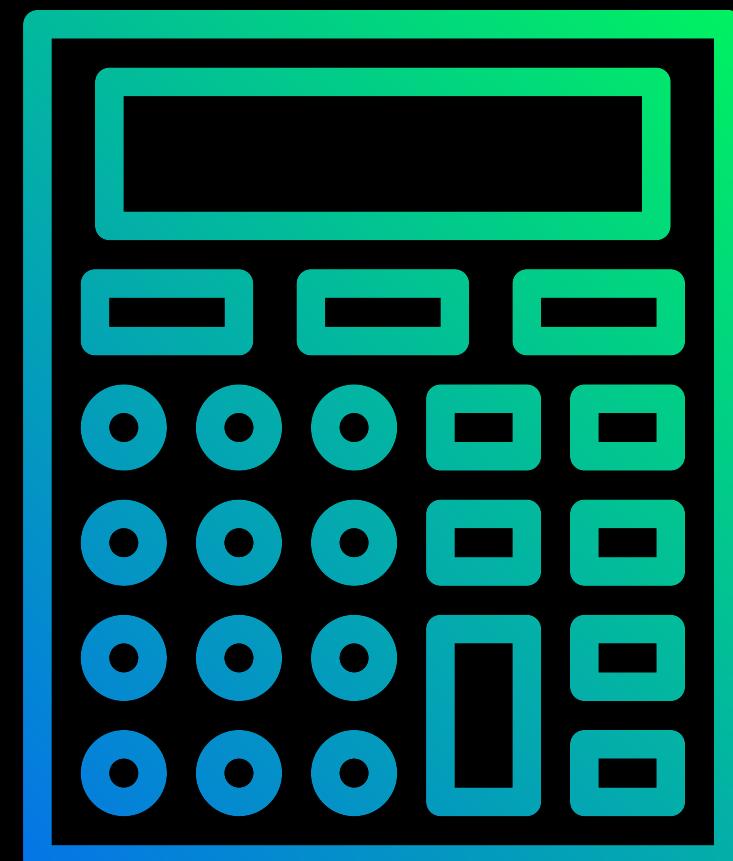
Tech + Math + Culture

Why is the integration of Technology with Math & Culturally Responsive Teaching important?



Integration Improves:

- Customization of Learning
- Active Engagement/Agency
- STEM Identity Development
- Problem Solving
- Accessibility



Course Overview

This Course is:
Hybrid Course
Mathematics-Focused
Applicable for Any Student
Adapts to Student's Needs
Application Focused

EDG6931 - Culturally Responsive Mathematics with Applied Technologies

TECHNOLOGY ENHANCED LEARNING



→ Start Here | Syllabus | Modules

About This Course:

Culturally Responsive Mathematics with Applied Technologies is a graduate-level course designed to incorporate technology and culturally sustaining pedagogy in mathematics education, allowing for a customized learning experience that fosters active engagement.

We will study the methods that can help math educators utilize technology to enhance student learning, engagement, cultural relevance, STEM identity development, and real-world problem solving.

Students will learn how to translate traditional mathematics into technology-based teaching. The software used throughout the class is freely available or does not require a purchase to complete the course.

- Start Here - Course Info, Syllabus, Resources, Q&A
 - Getting Started
 - EDG6931 Syllabus
 - Course Resources
 - Questions - Post on Padlet
 - Technical Help Desk
- Week 1: 12.2 | Introduction To Applied Technology
 - Assignments
 - Introduction to Applied Technologies
 - Introductions & Networking
 - Class Survey

A Canvas Graduate Level Course Template

Game-Based Learning



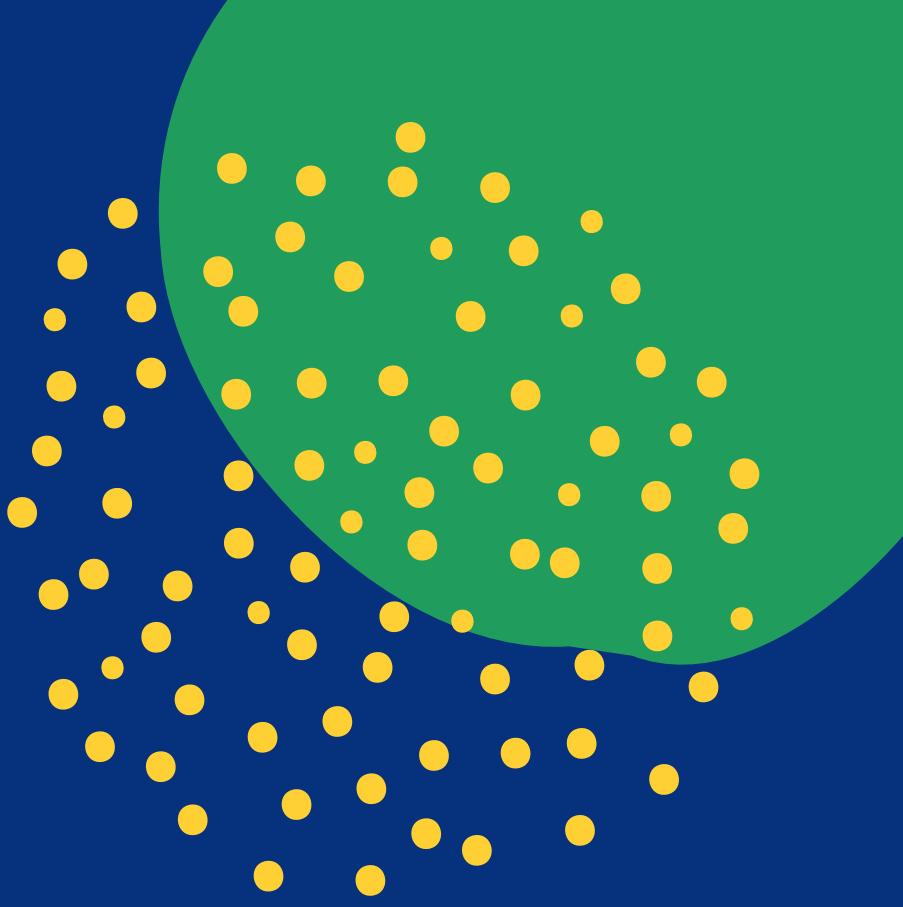
Games such as Minecraft: Education Edition allow students to learn traditional mathematics in a virtual environment.

How do Video Games Make Learning Accessible?

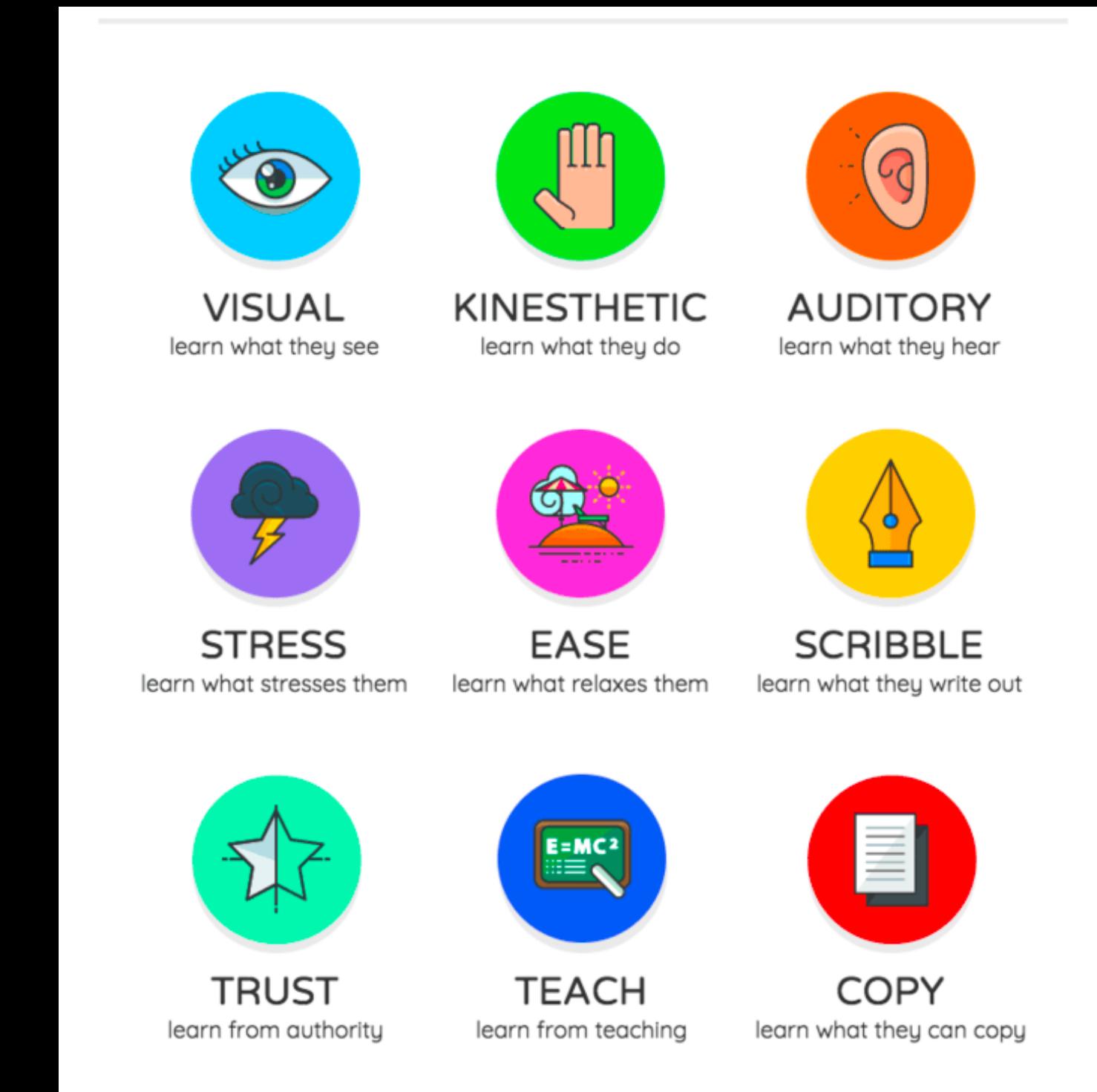




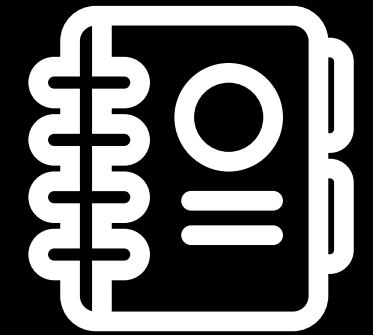
Learning Math & Culture



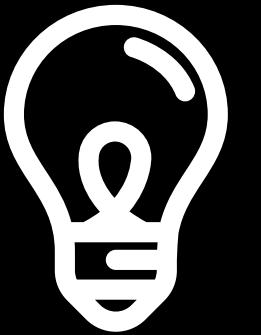
- Types of learners
- Factors for success



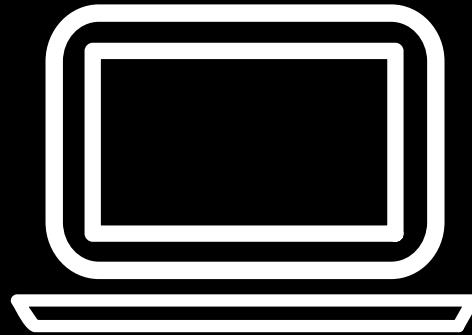
Factors for Success



Motivation



Curiosity



Play

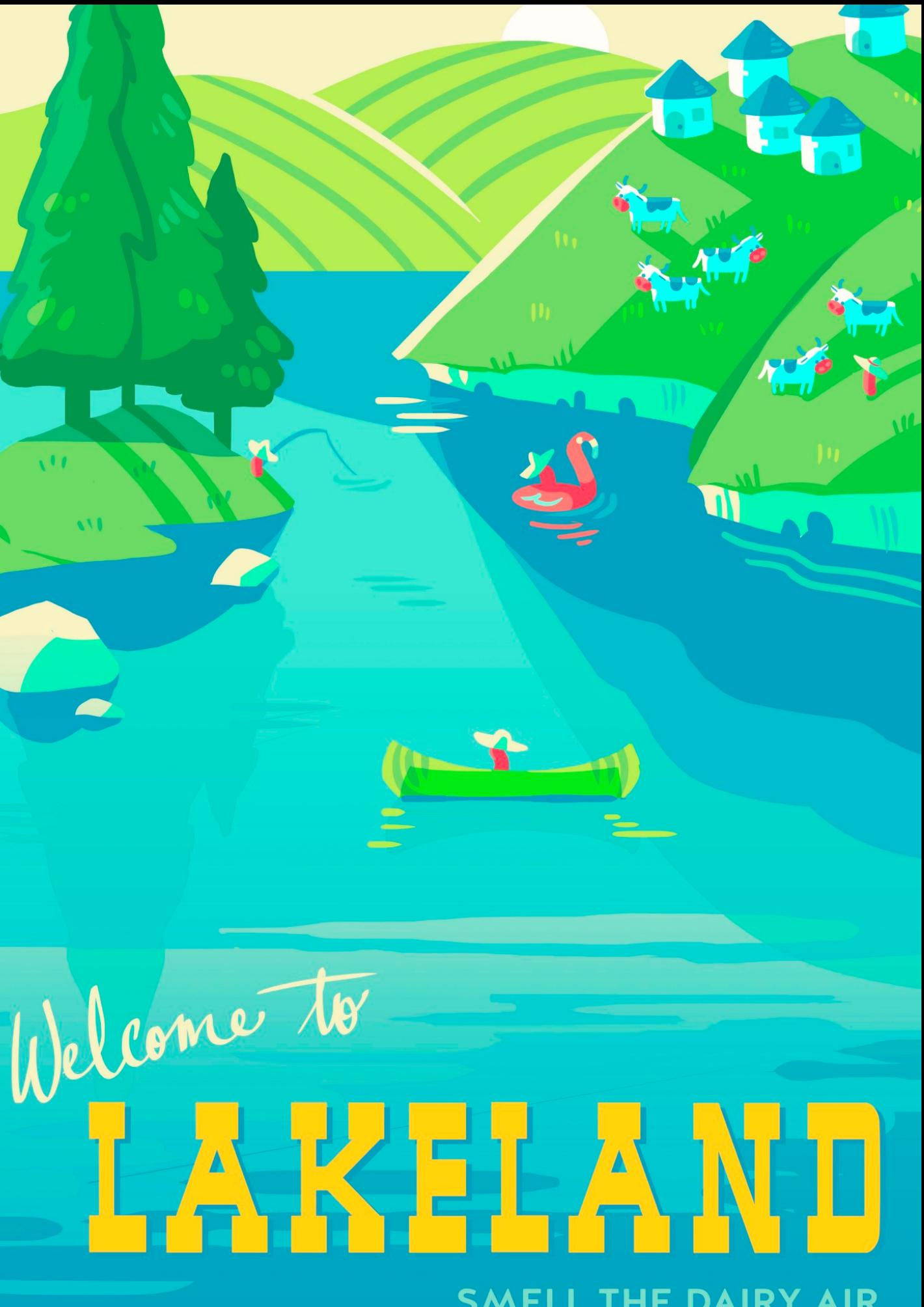
Case Assignment Study: Lakeland Educational Game



- Made by Field Day Lab's in collaboration with UW - Madison
- Teaches the impacts of the dairy industry on the environment.
- Students play a town-building game where they are told to build houses, have villagers move in, and grow crops and have dairy cows.
- The main issue in the game is seeing how your town-building pollutes the lakes in the town
- Inspired by Madison's own phosphorus pollution from the dairy industry.

Connection to Mathematics & Culture

- Also introduces kids to complex systems and how changing something can affect many other things both directly and indirectly.
- Promotes risk-free failure, students can simply restart the game and try again if their lakes get too polluted.
- Students must balance time, money, and commerce to have a successful town while also being aware of the environmental impact they are leaving.
- Students can work individually on their own towns or collaboratively to make decisions they think would benefit the town



Technology in Teaching and Learning

Technology to Support
Teaching



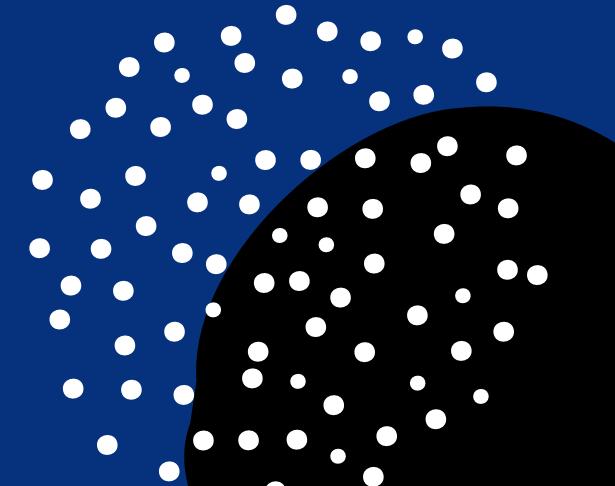
Enacting Instructional Activities



How Do Teaching Methods & Strategies Affect Students?

Teaching Methods

- Discussion
- Demonstration
- Lectures
- Laboratory Work
- Flipped Classroom
- Project-based/Problem-based
- Inquiry-based
- Discovery
- Field Trip



Teaching Strategies

- Questioning
- Grouping
 - Collaborative
 - Cooperative
- Individualized
- Modeling
- Metaphors
- Reading
- Role Play



Collaborative Teaching and Learning

Technology - Tinkercad

What is Tinkercad?

- Browser-based 3D design and modeling program



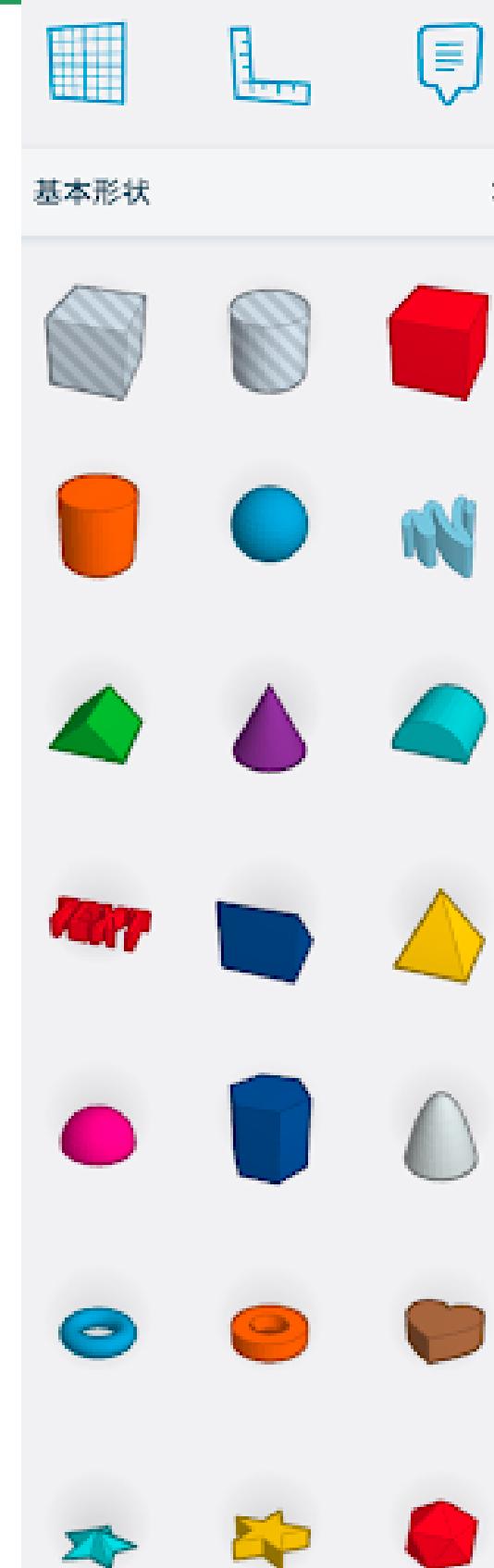
Why is Tinkercad Useful?

- Low Production Costs
- Quick Product Completion
- User-Friendly Interface

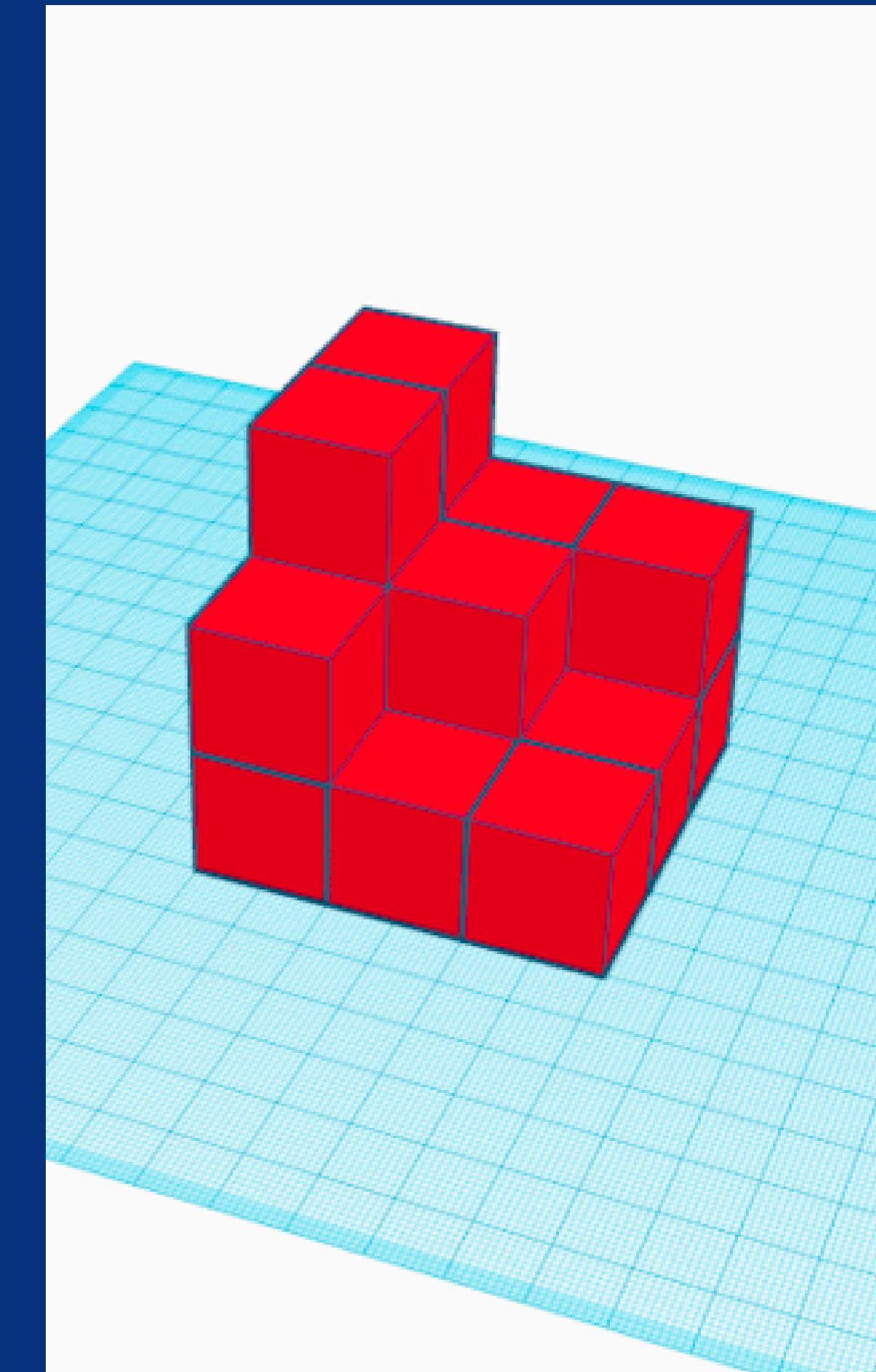


Tinkercad in the Classroom

- Organize students into classes
- Review and edit students' designs and profile
- Moderate students' activities
- Browse a class gallery for an overview of all student designs
- Invite co-teachers to view and evaluate student designs



Design Examples

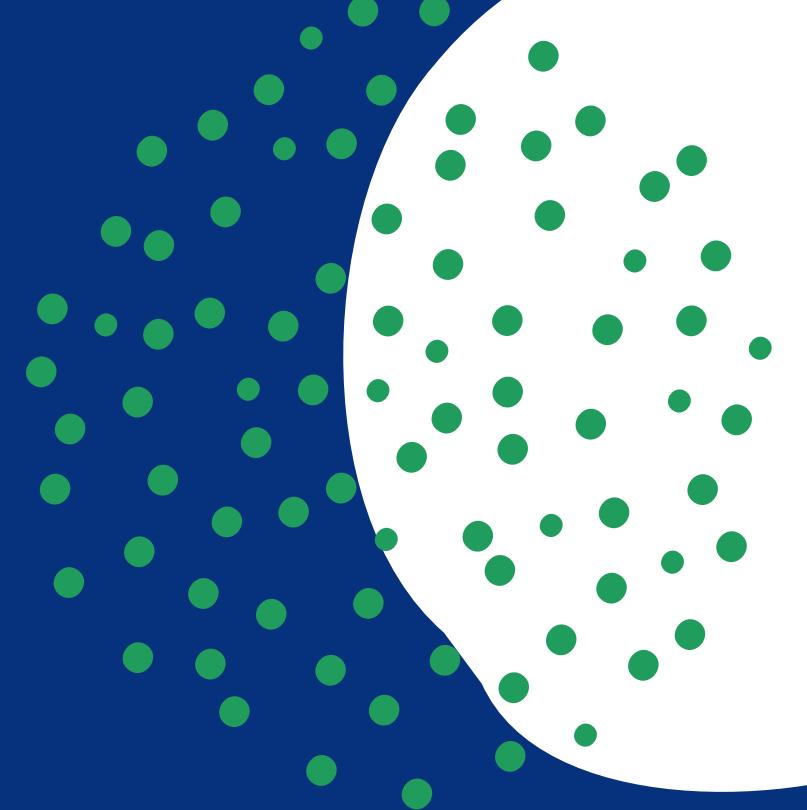
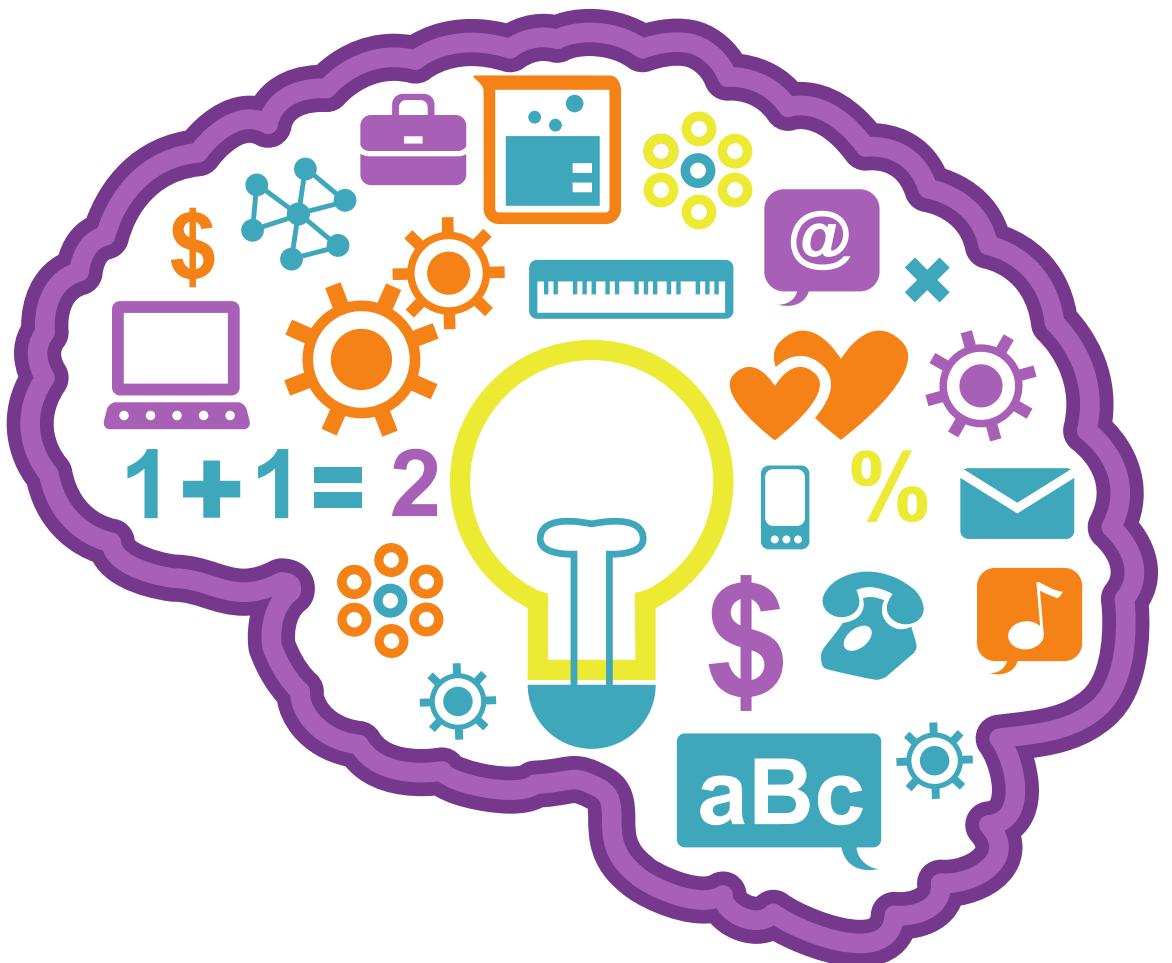


Rethinking Technology

Technology and Education in the 21st Century

What is the purpose of technology in education?

What discussions exist surrounding technology in education?



Motivations

- Does the lesson promote students' wonderings?
- Does the lesson address students' wonderings?
- Does the lesson connect to students' experiences, interests, or goals?

Prior Knowledge

- Students are aware of their own prior knowledge?
- Students share reasons for how they were thinking?
- All students' funds of knowledge are appropriated?

Engagement

- are focused on relevant aspects?
- are aware of new feelings, values and interests?
- are provided specific opportunities for application and integration – skills of practice, critical thinking skills, connections to other subject areas including real life etc.?

Sense-making

- connect what they learn in the instruction to the broader goals?
- compare their emerging understanding to their prior ideas?
- Make explicit connection and application beyond the immediate experiences?

Foundational Knowledge

- Is the content accurate?
- Is there sufficient use of out-of-Class Time?
- In what form will the content be provided?
- Do students have the appropriate prerequisite knowledge and skills?

Assessment

- In what ways will your assessment support students' continued learning?
- How will you use data from the assessment to support your teaching?
- To what extent are your assessment related to the learning goals?

Final Words

**Thank you for attending!
Any questions?**

Idrissa Presley-Peterson, Jordyn Haines, Hongze Zhu