

## Zoo Exhibit Redesign and App Development!

### 7th Grade Integrated Content Areas:

Math, Science, Language Arts, Social Studies, Technology & Engineering, Computer Science

#### Standards

##### Technology & Engineering

- MS-ENGR-II-3
- MS-ENGR-II-4
- MS-ENGR-II-5
- MS-ENGR-II-6

##### Computer Science

- CSS.KC.K-2.2
- CSS.IDC.6-8.20
- CSS.IDC.6-8.21

##### Science

S7L4

##### Math

- MGSE7.G.1
- MGSE7.G.2
- MGSE7.G.4
- MGSE7.G.6

##### Social Studies

GSE: SS7G1

##### Language Arts

- ELAGSE7L1
- ELAGSE7L2
- ELAGSE7L3
- ELAGSE7W3

## Big Ideas

Zoological design requires architects to consider the physiological needs of the animals, the user experience of the patrons, and the financial outcome for the zoo.

App development requires a comprehensive understanding of targeted users in order to develop an app that is useful and enjoyable.

### Learning Objectives

At the conclusion of this PBL, STEM cohort members will be able to:

*Acting as an architect, redesign (and present to stakeholders) an entire zoo exhibit to better meet the species-specific physiological needs while simultaneously enhancing the experience for patrons. Justify all design elements.*

*Develop and maintain a budget that includes an exhaustive item-analysis of materials cost. Defend all decisions.*

*Create a 3D interactive model of a zoo exhibit redesign using rendering software.*

*Use a variety of coding languages and app development software to develop a user-friendly, interactive, useful mobile app for Zoo Atlanta patrons to use.*

### Key Terms

- Engineering Design Process
- Geometry
- Budgeting
- Physiology
- Algorithm
- 3D Rendering

### Process Based Thinking

- Engineering Design Process
- Design Thinking
- Evidence-Based Claims

### Formative Assessment

Formative assessments are used throughout all TMS STEM PBLs to ensure mastery of concepts/standards across all content areas and include the following strategies:

- Self-Assessment-Individual & Group level to be documented in The TMS STEM Notebook.
- Informal guided/leading questioning (*can you explain in more detail?, what evidence do you have?, etc.*).
- Discreet Observation

### Summative Assessment

Modified TMS STEM Rubric

## Community Connections and Partners

- TMS PTO
- Zoo Atlanta
- Mad-Learn

## Materials and Resources

- Resources will vary per proposal and will include spreadsheet, 3D rendering, and presentation software.
- All students will use the Mad-Learn online software platform to develop the mobile app.

## Lesson Procedures

### Real World Hook/ Introduction

- Students will find themselves reading a letter from Zoo Keeper Bob to introduce this PBL. The letter reads: *Hey TMS 7th Grade STEM students! Zookeeper Bob here down at Zoo Atlanta...and boy are we in a humdinger of a predicament. We're in need of an architect to redesign some of our animal exhibits! We're also looking for app developers to create a really cool app for us! With limited funds and space, we're hoping YOU can help us out. Welcome to our team...and GOOD LUCK!*
- *Students will visit Zoo Atlanta, meet with zookeepers, and tour the zoo!*

### Student Engagement through Process Based Thinking

Groups will be required to document the entire experience. Using the TMS STEM Notebook, each student will write, sketch, journal, plan, and collaborate using the Notebook to document this iterative journey from beginning to end.

### Student Presentation

Student groups will pitch their redesign proposals and Zoo Atlanta App to the Zoo Atlanta Exhibit Redesign & App Development Committee (all four STEM Cohort Subject Area teachers, the 7th Grade STEM Cohort Facilitator, the IB Coordinator, the 7th Grade AP, representatives from the PTO, representatives from Zoo Atlanta, and representatives from Mad-Learn. Groups are free to design their proposal using whatever platform(s) they deem most effective.

### Student Reflection

At the conclusion of the PBL, groups will be tasked with reflecting on both their individual journey AND the overall Cohort outcome with the following prompts:

- Which group's proposal was chosen? What merited this choice over other proposals?
- Given what you've learned throughout this experience, what actionable advice would you like to leave for next year's 7th Grade Cohort to ensure innovative redesign and app development?