Subject area/course: Mathematics/Algebra 1
Grade level/band: 8-9
Task source: Providence Schools; Authors: Philip Marshal and Sorng Sun

Theme Park

TEACHER'S GUIDE

A. Task overview:

Students will work independently to design a theme park and determine a variety of measurements using both Algebra and Geometric skills. They will construct viable arguments concerning their design of a theme park and model with mathematics while using appropriate tools strategically. Finally they will make sense of the problems and independently complete the assignment.

B. Aligned standards:

1. Common Core State Standards

CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.
CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others.
CCSS.Math.Practice.MP6 Attend to precision.
CCSS.MATH.CONTENT.8.EE.C.8.C Solve real-world and mathematical problems leading to two linear equations in two variables.
CCSS.MATH.CONTENT.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
CCSS.MATH.CONTENT.7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

2. Critical abilities

Research: Students will do online research to identify the typical design and cost of theme parks. The research will primarily involve Internet research.
Communication in Many Forms**:** Students will create a theme park design (map) along with answers to questions about distance between attractions.
Modeling, Design, and Problem Solving: Students will engage in these activities as they design a theme park.

C. Time/schedule requirements:

The following schedule is an estimate of the number of school days required for students to complete this task. Time requirements will vary based on grade level, schedule constraints, class size, class length, and academic readiness.

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Part 1: Research on theme park	Creating blue print and teacher check in with students	Finish up Part 1.	Some students will start working on Parts 2 and 3, while others are trying to catch up.	Continue Parts 2 & 3. Teacher check-in with students. Some students will start on Parts 4 & 5.
Week 2	Finish up Parts 4 & 5.	Students will research about admission tickets.	Students will work on Part 6.	Students will last minute touch up on the project.	Students share out and explain their park.

D. Materials/resources:

- Colored pencils
- Graph paper
- Rulers
- Pencils
- Calculators
- Computers

E. Prior knowledge:

Students will need to be familiar with theme parks to engage in this task. The teacher can prepare a short slide show with pictures from a theme park along with a map showing a general layout for a theme park. Students will need to understand that the design they will be creating will likely not include 3-D representations of attractions, as is common on theme park maps they will see online.

F. Connection to curriculum:

None listed.

G. Teacher instructions:

- Introduce the task by preparing a slide show with images from a theme park. Visuals such as pictures of attractions (rides and games) will likely grab students' attention and also provide a visual for English Learners to understand the term "attraction."
- The slide show should also show a theme park map. Many of the maps are shown from an angle and include drawings of the attractions. Explain to students that they will be creating a different map that is more like a blueprint.
- Finally, show the students a sample of different admission prices at the theme park such as day passes, VIP season passes, or something in the middle like a discount season pass. (Using a local theme park might be a nice way to connect to students' interests, though this might also lead the discussion off track if students have stories to share about the park).

- Explain to students that in this project they will be designing a theme park and also coming up with a set of prices for passes.

Part 1: Students will research and write about various theme parks to get the gist of design and cost issues.
Part 2: Students will design a theme park on a coordinate system and write an explanation of how their park is designed to make the most money.
Part 3: Students will apply the skill of identifying and naming the coordinates of their attraction site.
Part 4: Students will be calculating midpoint between attractions sites for benches.
Part 5: Students will convert dimensions to actual dimensions using appropriate scales.
Part 6: Students will calculate the distance between a variety of attraction sites by using the best method possible.
Part 7: Students will write linear equations for three admission passes using linear equations.

H. Student support:
None listed.

I. Extensions or variations:
None listed.

J. Scoring:
Student work can be scored using the Theme Park Rubric.