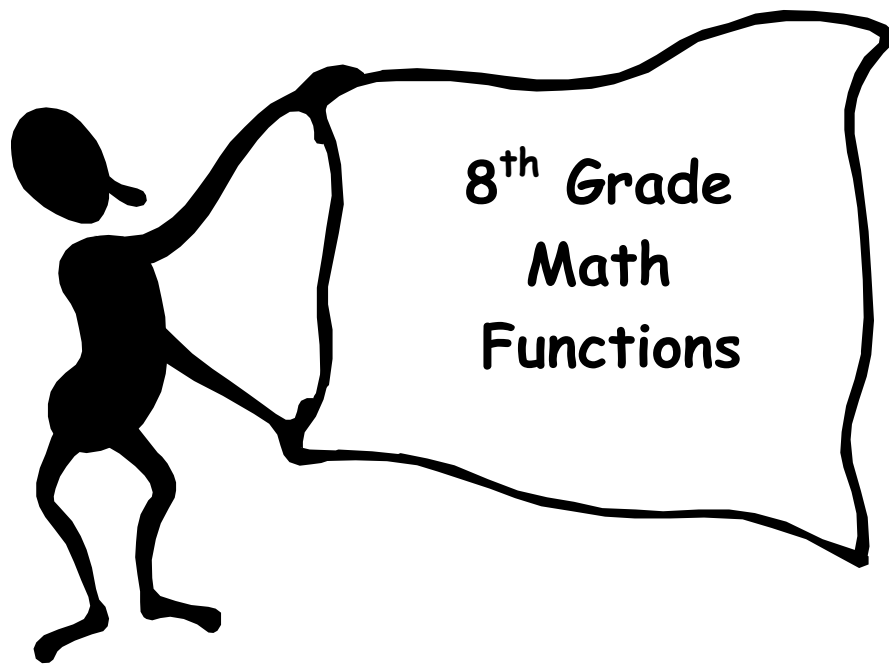


Backwards Design Unit Planning

Teacher/School: C. Atmadjaja / JHS185 Edward Bleeker ASPIRES Magnet Program

**New York City Department of Education
Magnet Program District 25 & 28**

JHS185Q Edward Bleeker ASPIRES Magnet Program



Essential Question: How are graphs used to present data related to social justice?

Suggested Time Frame: 2-3 weeks

Theme: Social Justice

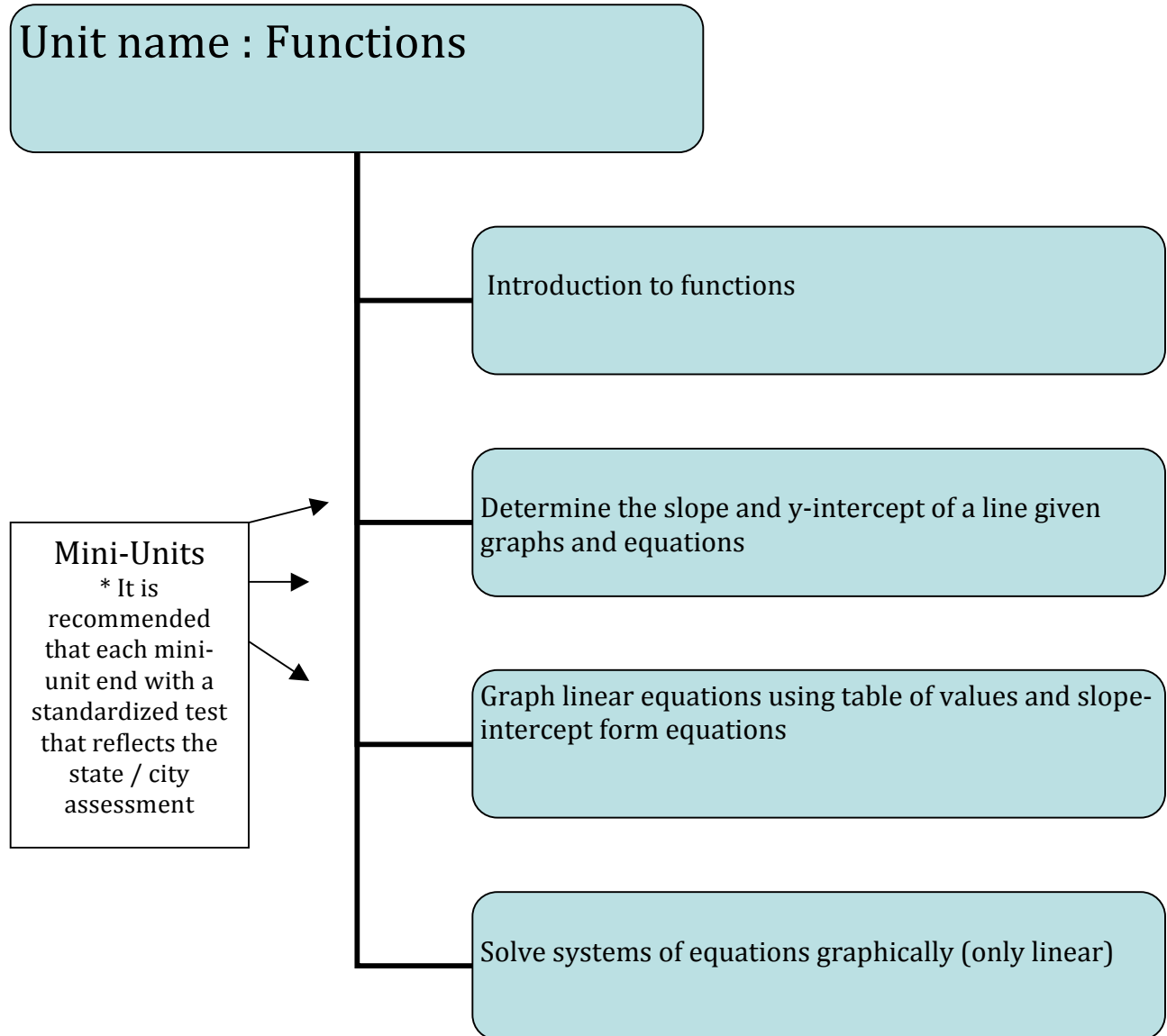
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Graphic Overview of Unit

Suggested Time Frame: 2 - 3 weeks

Essential Question: How are graphs used to present data related to social justice?



Unit's Culminating Project: (briefly explain in 2-3 sentences):

To make the ASPIRES magnet school more accessible to persons with handicaps, students will design and create a blueprint of access ramps for the school building and include it in a letter to

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their councilman asking for the ramps to make the school more accessible to handicapped persons.

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| Stage 1- Desired Results | |
|--|---|
| <p><u>Standards-Based Learning Goals:</u></p> <p>8.A.17. Define and use correct terminology when referring to function (domain and range)</p> <p>8.A.18. Determine if a relation is a function</p> <p>8.A.19. Interpret multiple representations using equation, table of values and graph</p> <p>8.G.13. Determine the slope of a line from a graph and explain the meaning of slope as a constant rate of change</p> <p>8.G.14. Determine the y-intercept of a line from a graph and be able to explain the y-intercept</p> <p>8.G.15. Graph a line using a table of values</p> <p>8.G.16. Determine the equation of a line given the slope and the y-intercept</p> <p>8.G.17. Graph a line from an equation in slope-intercept form ($y=mx + b$)</p> <p>8.G.18. Solve systems of equations graphically (only linear, integral solutions, $y =mx + b$ format, no vertical/horizontal lines)</p> | |
| Concepts | |
| <p>Big Ideas for this Unit Relationship, communication and equity</p> <p><i>Relationship:</i> when the value on the x-axis (independent value) increases, the y-value (dependent value) increases</p> <p><i>Communication:</i> students need to use graphs to communicate their ideas to others when they want to build ramps for handicapped access, skiing slopes, roofs, etc.</p> | <p>Magnet School Theme: Social Justice</p> <p>Relevant/Connected Big Idea:</p> <p>Using table of values or slope-intercept form equations to draw graphs to present data to address social justice issues, such as equal access to buildings for people with disabilities through ramps and salary differences between males and females.</p> |
| <p>Enduring Understandings Students will understand how to calculate and present data in different ways using table of values, graphs, slopes, slope-intercept form so that they can defend or persuade others to accept their ideas/opinions, such as the justice of providing wheelchair accessible entranceways.</p> | <p>Overarching Essential Question(s):</p> <ul style="list-style-type: none"> • How are graphs used to present data related to social justice issues? • What makes a data representation appropriate/useful? |
| Content and Skills | |
| <p>Content Students will know...</p> | <p>Skills Students will be able to...</p> |

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| | |
|---|---|
| <ul style="list-style-type: none">• Functions• Domain• Range• Table of values• Slope• Coordinate plane• X-axis• Y-axis• Y-intercept• Equation• Slope-intercept form• Linear graphs• Non-linear graphs• Systems of equations• Vertical line test | <ul style="list-style-type: none">• <i>Explain</i> what functions, domain and range to calculate salaries, total savings, etc.• <i>Determine</i> if a relation or a graph is a function• <i>Determine</i> the steepness of a line• <i>Analyze</i> and <i>explain</i> the behavior of a function• <i>Interpret</i> multiple representations using equation, table of values and graph to express themselves and communicate with others, such as proposing salary increase to an employers• Given a slope-intercept form, <i>graph</i> the line• <i>Apply</i> function in real life situation, such as in skateboarding• <i>Determine</i> the slope and y-intercept of a line to build a skiing slope, a ramp for somebody who has disabilities.• <i>Determine</i> the solution of a system of equations |
|---|---|

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Stage 2- Summative Assessment Evidence

If students understand, know and are able to do the items in Stage 1, they should be able to show their understanding by completing an authentic task found in the world beyond the classroom.

➤ Design the Culminating/Summative Task:

G- (goal)

Demonstrate understanding of a slope, graphs and how to use them to create a blueprint of a ramp that is wheelchair accessible

R- (role)

A person working for a non-profit organization or Office of Civil Rights/Disabilities

A- (audience)

Local Councilman

S- (situation)

Many parents and prospective students with wheelchairs are not able to come in to our schools for special events, such as open school night, concerts and many more, because they are no ramps. Students on crutches would also benefit from the ramps.

P- (purpose and product) A business letter or proposal that includes the graph and a blueprint of a ramp.

S- (standards for performance)

Clearly identify the struggles of people with wheelchairs and students on crutches. Design a blueprint for ramps into JHS 185

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Edward Bleeker.

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Student Task

In the space below, write the task exactly as students will see it.

You work in the Office of Civil Rights/Disabilities which serves handicapped people who use wheelchairs or crutches. The parents of students who use crutches and wheelchairs have come to you and complained that they are not able to come in for special events in JHS 185 Edward Bleeker due to the absence of access ramps. They asked if you could write a letter to Councilman Liu and convince him that safe ramps needs to be built at designated areas in JHS 185 Edward Bleeker. In your business letter or proposal, you need to provide him with the following supporting data:

1. Graph

Accidents per Year

| Year (x) | No. of accidents involving ramps (y) |
|----------|--------------------------------------|
| 1 | 5 |
| 2 | 7 |
| 3 | 9 |
| 4 | 11 |
| 5 | 13 |

- Determine the number of accidents per year as rate of change (slope)
- Determine the rule of the number of accidents per year

2. Blueprint of ramps that needs to be built

One of the ramps will be on the left hand side and the other one will be on the right hand side. Find out when these two ramps will be leading to the same point (main entrance).

3. Model of the ramps.

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Rubric For Culminating Project

| Scale | Understanding (60%) | Product (30%) | Presentation (10%) |
|--------------|--|---|---|
| 4 | Demonstrates full understanding of graph, slope, and slope-intercept form equation. | Letter/proposal, blueprint and model are well organized and supported | Culminating presentation is characterized by highly effective attention to the needs of the audience as well as creative use of visual aids to reinforce coherence, development, and persuasiveness. |
| 3 | Demonstrates good understanding of graph, slope, and slope-intercept form equation | Letter/proposal, blueprint and model are organized and supported | Culminating presentation is characterized by straightforward but underdeveloped approach, with some use of visual aids and generally a clear understanding and responsiveness to audience needs. |
| 2 | Demonstrates good understanding of graph, slope, and slope-intercept form equation | Letter/proposal, blueprint and model are partially organized and supported | Culminating presentation is brief and lacks overall evidence of attention to the needs of the audience; there is little use of visual aids. |
| 1 | Does not demonstrate understanding of graph, slope, and slope-intercept | Letter/proposal, blueprint and model are not organized and | Culminating presentation is inadequate, lacking any attention to the needs and background of the audience. |

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| | | | |
|--|----------------------|-------------------------|--|
| | form equation | supported at all | |
|--|----------------------|-------------------------|--|

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| Stage 2- Formative Assessment Evidence | |
|--|--|
| Throughout the unit how will you check to make sure students are mastering the knowledge, skills, and understandings they need to be successful at the summative/culminating task? | |
| Assessment Formats on the State Test | Weekly Formative Assessments |
| <p>Multiple Choice and Extended Response Questions</p> <ul style="list-style-type: none"> • Determine if a relation is a function • Determine the slope of a line from a graph and an equation • Determine the equation of a line given the graph • Graph a line from table of values • Graph a line from an equation in slope-intercept form • Determine the solution of systems of equations graphically | <p>For Content...</p> <ul style="list-style-type: none"> • Define a function • Define domain and range of a function • Determine if a relation is a function given table of values or graphs using vertical line tests • Determine the slope of a line from a graph • Determine the slope of a line from table of values • Determine the y-intercept from a graph and table of values • Graph a line using table of values • Graph a line from an equation in slope-intercept form • Given graphs, determine which a linear graph is • Determine the solution of a system of equation graphically |
| | <p>For Skills...</p> <ul style="list-style-type: none"> • Explain what functions are • Given salaries during a period of time, determine the domain and range • Determine if a relation or a graph is a function • Determine the steepness of a line • Given graphs, analyze and explain the behavior of the functions • Given two graphs, have students defend their opinions why one graph is better than the other when is used to propose salary |

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| | |
|--|--|
| | <p>increase.</p> <ul style="list-style-type: none">• Given a picture of a quarter pipe, students need to find the slope• Given a skiing slope, students need to determine the slope and y-intercept of a line• Given a slope-intercept form equation, graph a line• Determine the solution of a system of equations |
| | <p>For Understandings...</p> <ul style="list-style-type: none">• Draw two ramps with different steepness on a separate graph paper; explain why one ramp is better than the other ramp.• Given several tables of values, ask students to explain why graphing the data is necessary? |