

Mathematics 8 Standards Parent Resource

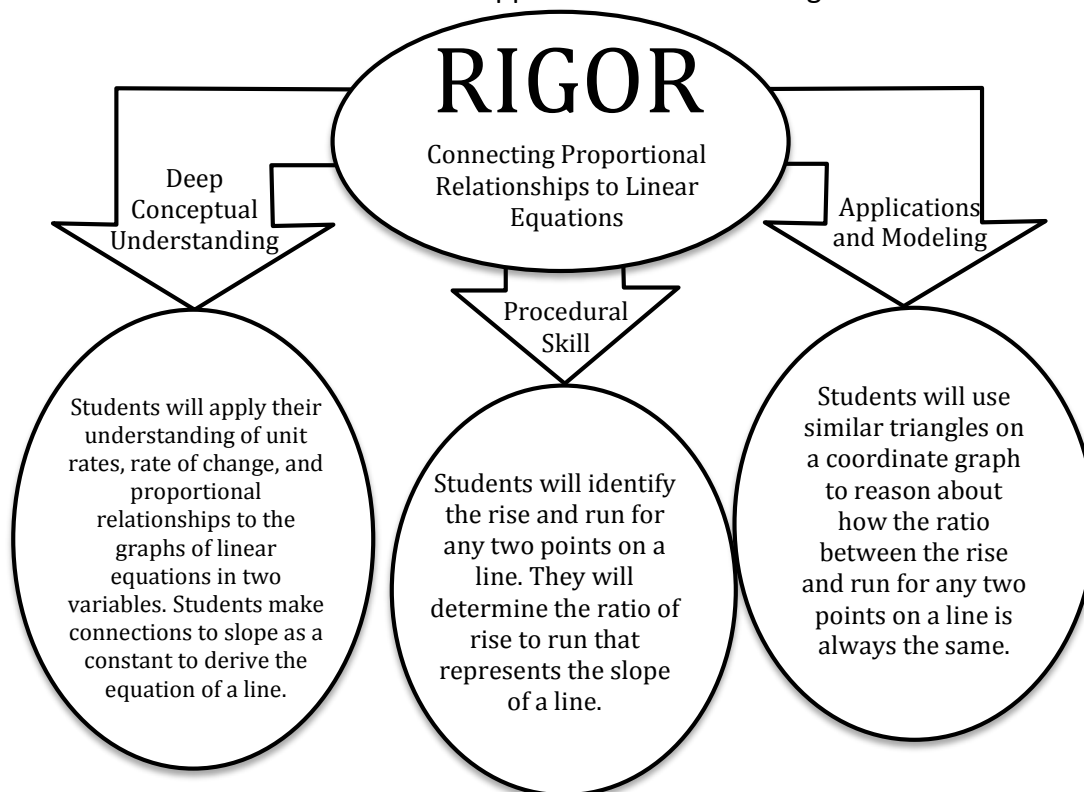
Unit 2: Linear Equations

Unit 2 includes 3 topics of study, listed below. This resource is for Topic 1.

Topic 1	Topic 2	Topic 3
Connecting Proportional Relationships to Linear Equations	Solving Linear Equations	Systems of Linear Equations

Topic	Learning Goals by Common Core State Standard <i>Students will be able to...</i>
Connecting Proportional Relationships to Linear Equations	<ul style="list-style-type: none"> Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b. <p><i>Instructional videos in the hyperlinks above are meant to support C2.0 content, but may use vocabulary or strategies not emphasized by MCPS.</i></p>

The Common Core State Standards require a balance of three fundamental components that result in rigorous mathematics acquisition: deep conceptual understanding, procedural skill, and mathematical applications and modeling.

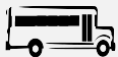


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Unit 2: Linear Equations

Topic 1: Connecting Proportional Relationships to Linear Equations

Learning Experiences by Common Core State Standard



In school, your child will...

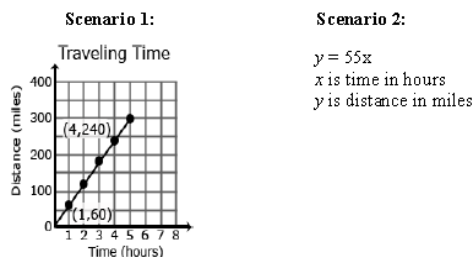


At home, your child can...

Topic 1: Connecting Proportional Relationships to Linear Equations

- Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

Compare the scenarios to determine which represents a greater speed.



- Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .

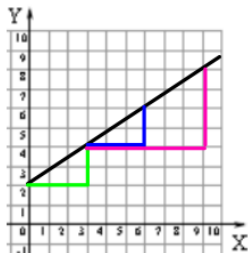


Image adapted from:
Illustrative Mathematics

Consider any two points (x_1, y_1) and (x_2, y_2) on the line shown. Draw a triangle with an equivalent ratio to the three triangles drawn.

- What is the slope between these two points?
- Why should this slope be the same as the slopes of the three other triangles?
- What is the equation of the line?

- Explore more about slope in the real world.
 - Investigate the rise and run ratio and compare different staircases in your home and around your community. View the online video, [Stairway Step](#), to get started.
 - Ramps help launch bikes, snowboards, and skis into the atmosphere. Investigate positive and negative slopes in sport. The video, [Skip Jumping: Understanding proportional relationships](#), investigates slope and its connection to the sport.
 - Visit a local bakery to see how similar triangles help create tiered cakes that are pleasing to the eye. Try it at home. Visit [Finding Math in cake artistry](#) to learn more.
- Visit the CK12 PLIX (Play Learn Interact Xplore):
 - [Slope: Mountain Train](#)
 - [Linear Equations: Cable Car Mountain Slope](#)

To access the PLIX, you will need to create a free user account.

Additional Resources

- [Understanding Slope using similar triangles](#) (video tutorial)
- [What does negative slope mean?](#) (video tutorial)
- [How do you graph a linear equation making a table?](#) (video tutorial)
- [IXL: Find the slope of a graph](#) (online check)
- [NCTM: Walk The Plank](#) (investigating negative slope)
- [NCTM: Plotter The Penguin](#) (online game)
- [Mathematics 8 Standards Unit 2 Topic 1 Connecting Proportional Relationships to Linear Equations](#) (flexbook)

Additional Practice links support C2.0 content, but may use vocabulary or strategies not emphasized by MCPS.