Grade 8 Standards Parent Resource

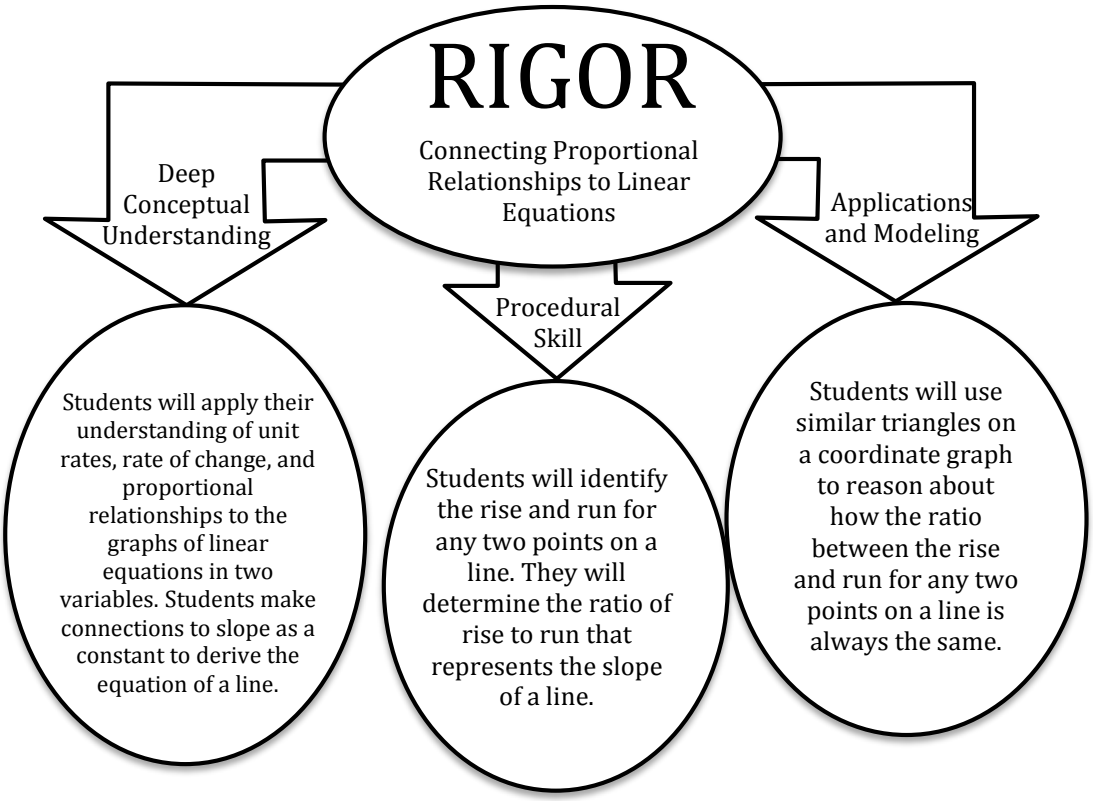
Unit 6: Functional Relationships and Linear Equations

Unit 6 includes 2 topics of study, listed below. This resource is for Topic 1.

Topic 1	*Topic 2*
Connecting Proportional Relationships to Linear Equations	Solving Linear Equations

Topic	**Learning Goals by Common Core State Standard** *Students will be able to...*
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. • 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. *Instructional videos in the hyperlinks above are meant to support C2.0 content, but may use vocabulary or strategies not emphasized by MCPS.*

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.



Grade 8 Standards Parent Resource

Unit 6: Functional Relationships and Linear Equations Topic 1: Connecting Proportional Relationships to Linear Equations

Learning Experiences by Common Core State Standard

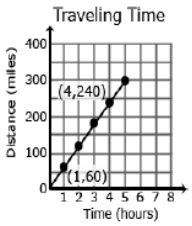
Topic 1: Connecting Proportional Relationships to Linear Equations

In school, your child will…

- 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.

  Scenario 1:

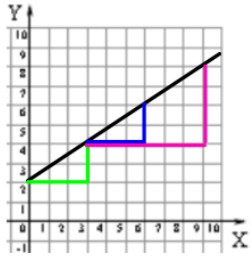
  

  Scenario 2:

  $y = 55x$
  x is time in hours
  y is distance in miles

- 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?

At home, your child can…

- 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)
- Grade 8 Standards Unit 6 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.