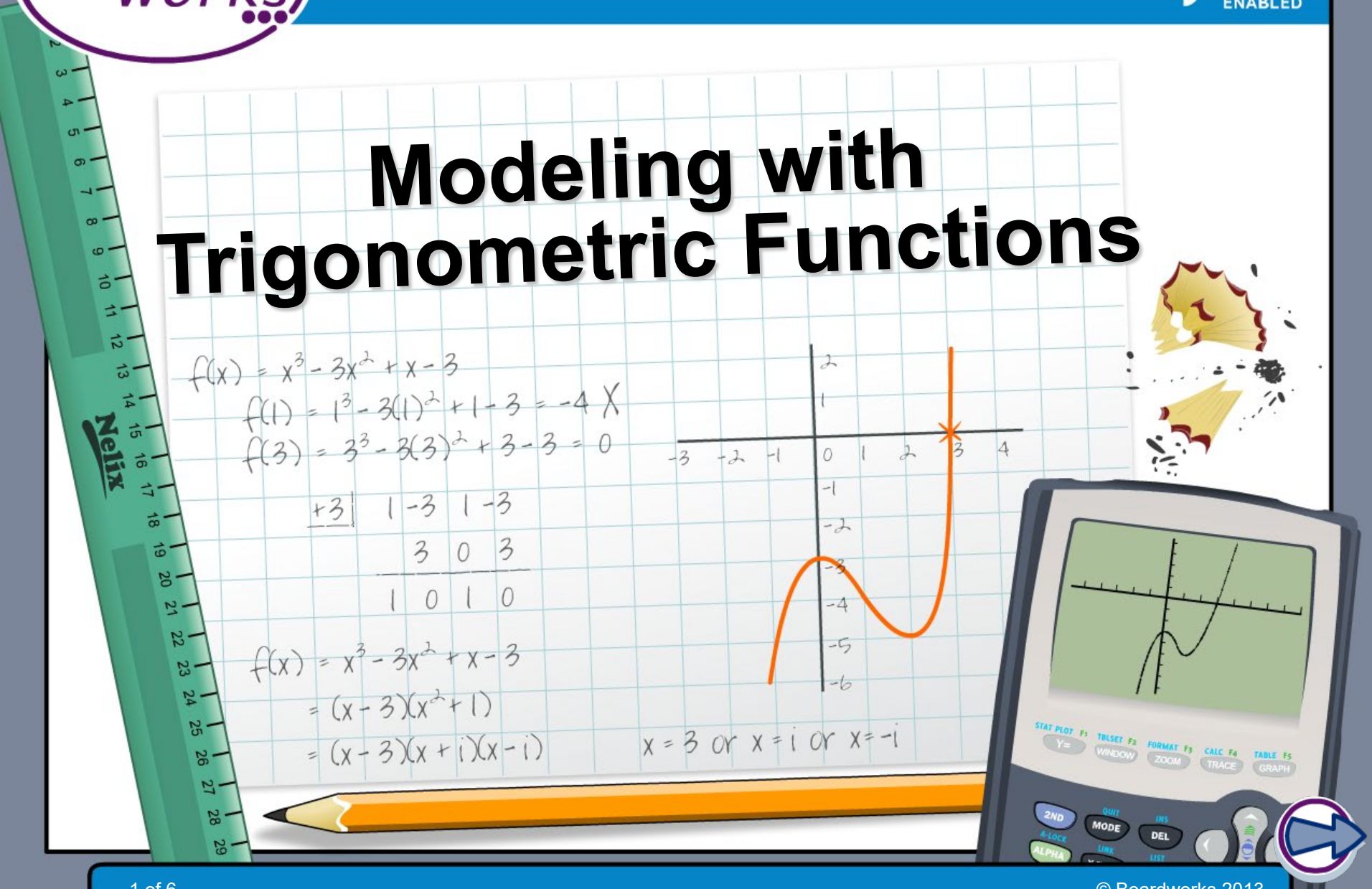
Modeling with Trigonometric Functions



Information

Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

1) Make sense of problems and persevere in solving them.

2) Reason abstractly and quantitatively.

3) Construct viable arguments and critique the reasoning of others.

4) Model with mathematics.

5) Use appropriate tools strategically.

6) Attend to precision.

7) Look for and make use of structure.

8) Look for and express regularity in repeated reasoning.

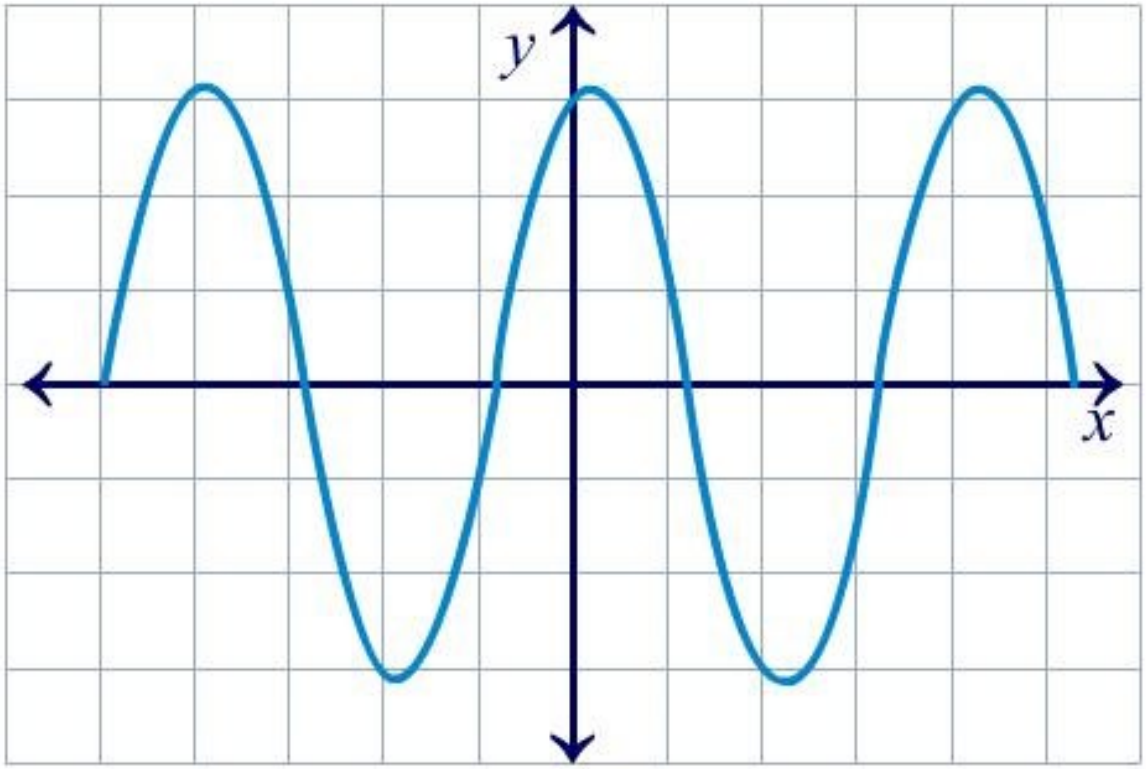
This icon indicates that the slide contains activities created in Flash. These activities are not editable.

This icon indicates teacher's notes in the Notes field.

Trigonometric modeling

Trigonometric functions are used to model situations that are periodic in nature.

Press "**play**" to find out more.

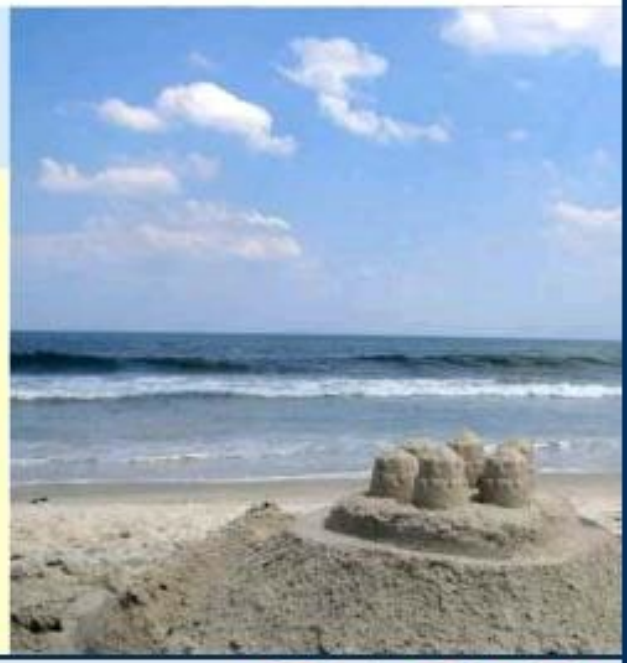


Rehoboth Beach tides

On July 10, 2012, high tide in Rehoboth Beach, Delaware, was at 2:48 p.m. The water level at high tide was 3.8 feet. Later, at low tide, it was 0.9 feet. Assume the next high tide is 12 hours later and the height of the water is given by a sin or cos curve.

Find a formula for water level at Rehoboth Beach as a function of time.

Press the "=" button to show the calculations step-by-step.



Colossus Ferris wheel

The Colossus Ferris wheel near St. Louis is 165 feet in diameter. It rotates around its center and makes 1.5 revolutions per minute. As the wheel turns, the height of a seat varies periodically. The lowest seat is 15 feet above the ground.

1. Write an equation to describe the changes in height, h, of the seat that was filled last before the ride begins in terms of time, t, in seconds.

2. Once you have your equation, find the height of the seat after 52 seconds.

Daylight in Buffalo

Press the info button to see a table showing how amount of daylight varied across the year in Buffalo, New York in 2011.

1. Using the data in the table, develop a model to show how the amount of daylight in Buffalo varies.

2. Use the model to predict the amount of daylight in Buffalo on the fifth of July.