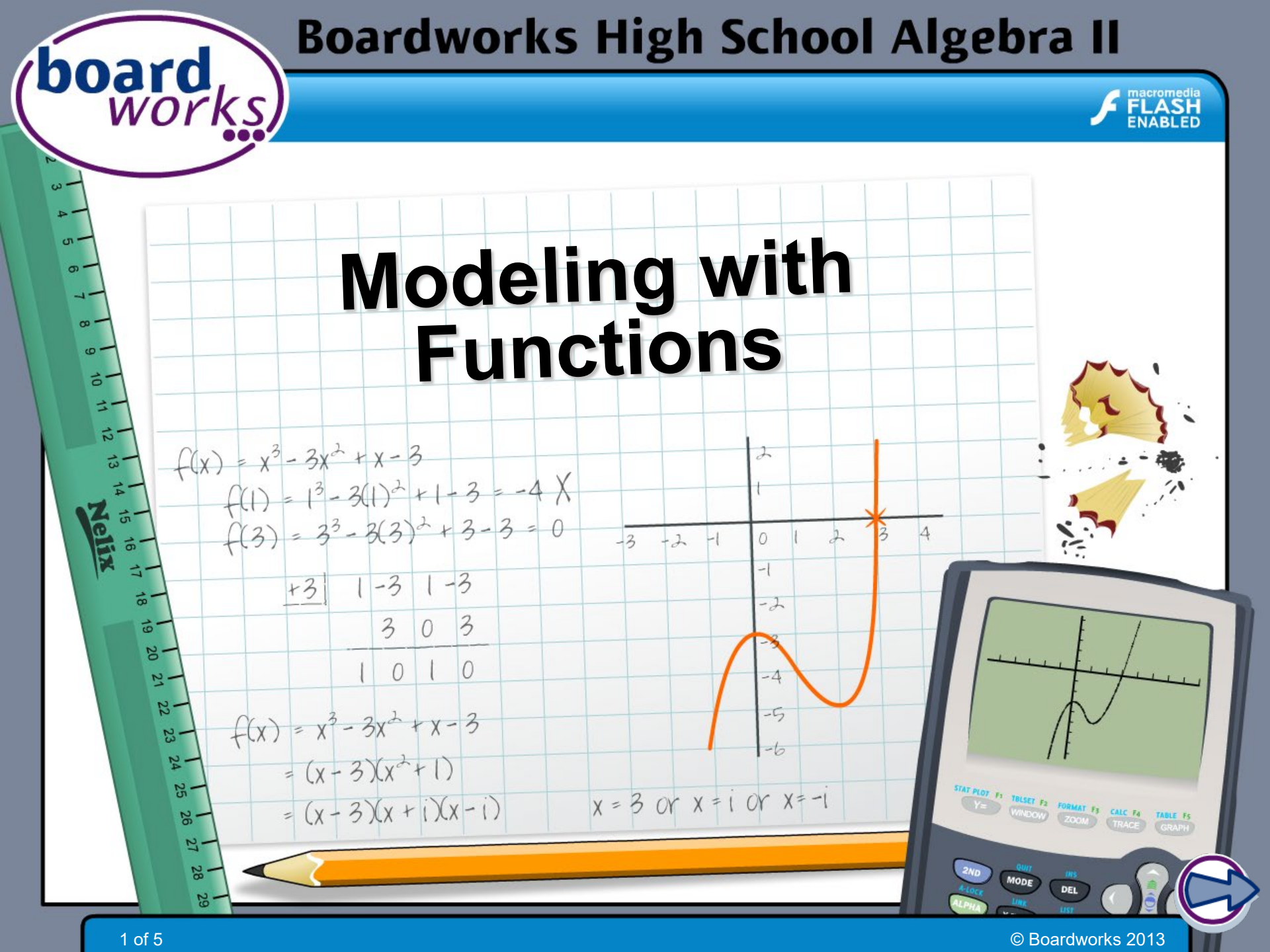
Modeling with Functions



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.

Carbon emissions

Carbon emissions have been increasing worldwide over the last sixty years. Test your knowledge of linear, quadratic and exponential models by analyzing this data.

Press **start** to see how much you know.

start

Minimizing car weight

A new hybrid gas/electric car has been commissioned by the president of Cleaner Cars Corporation.

The gas tank needs a capacity of 9.3 gallons or approximately 1.243 cubic feet.

The car needs to be light so that it uses less energy. The best way to minimize the weight is to minimize the amount of material needed, by limiting the surface area of the gas tank.

Assume the gas tank is cylindrical, what radius will minimize the surface area and so keep the weight of the car down?

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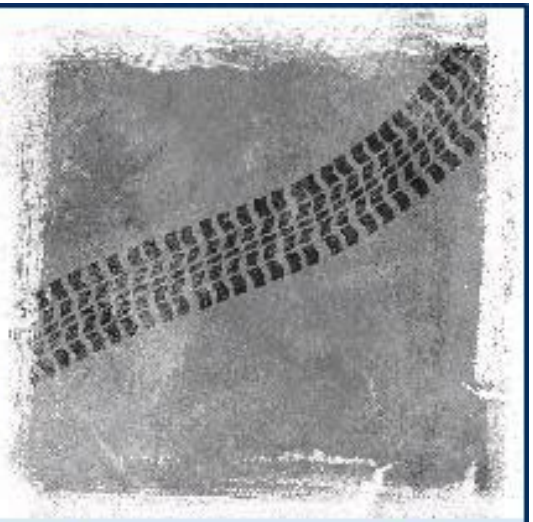
Stopping distances

When an automobile accident occurs, the police often investigate the car speed by measuring the stopping distances.



Press the info button to view data on the distance in feet it takes for cars at different speeds to stop under normal conditions.

1. Draw a scatter plot of the data and investigate linear, quadratic and exponential regressions.

2. Ann Marie is in an area with a 25 mph speed limit when she has to break suddenly. She travels 56.25 meters before stopping. Was she over the speed limit?