Let it Blow
4th Grade

Overview
Students learn about the concept of wind erosion in the desert and use a model to test the effects of three different types of ground cover on rates of wind erosion. They then design and test their own engineering solution to reduce soil erosion by wind on a model construction site or disturbed area.

Phenomenon
How do changes to the amount of ground that is covered in the Chihuahuan Desert affect the amount of dust created from wind erosion, and how can we use different ground covers to reduce wind erosion.

Next Generation Science Standard
4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate or erosion by water, ice, wind, or vegetation.
3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Asombro lessons are aligned with the three-dimensional learning model of the Next Generation Science Standards.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and carrying out investigations Developing and Using Models Asking Questions and Defining Problems Constructing Explanations and Designing Solutions Analyzing and Interpreting Data	ESS2.E: Biogeology ETS1.A: Defining and Delimiting Engineering Problems ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution	Cause and effect Influence of Engineering, Technology, and Science on Society and the Natural World

Common Core State Standards
Math
MATH.4.NBT.A.2 - Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

MATH. 4.NBT.B.4 - Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Date: _____   *Asombro staff: _____*

CCSS.MATH.CONTENT.4.MD.A.2
Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale

English Language Arts
ELA-Literacy.RI.4.4 - Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

ELA-Literacy.W.4.7 - Conduct short research projects that build knowledge through investigation of different aspects of a topic.

CCSS.ELA-LITERACY.SL.4.1
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.L.4.6
Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., *wildlife, conservation,* and *endangered* when discussing animal preservation).

Date: _____   *Asombro staff: _____*