

US National Standards	Generalized Wording	Activity 1 Percent Error	Activity 2 Next Generation Robots	Activity 3 Multi-directional Robot Bowling	Activity 4 Ocean Research Sensor	Activity 5 Assistive Device
Common Core Mathematics						
Ratios and Proportional Relationships						
7RP3 Use proportional relationships to solve multi-step ratio and percent problems. Examples: percent error.	Solve multi-step percent problems, including percent error.	✓				
Number System						
6NS7 Solve real world and mathematical problems by graphing points on all four quadrants for the coordinate plane.	Solve real world and mathematical problems by graphing points on all four quadrants of the coordinate plane.				✓	
Geometry						
7G1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Reproduce a scale drawing at a different scale.			✓		
7G6 Solve real world and mathematical problems involving area, volume, and surface area of two and three dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	Solve real world and mathematical problems involving area of triangles.			✓		
Statistics and Probability						
7SP1 Understand that statistics can be used to gain information about a population by examining a sample of the population.	Gather and examine statistics drawn from a sample population.		✓			
7SP4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.	Draw informal comparative inferences about two populations.		✓			

Next Generation Science Standards

Middle School Engineering Design

MSPETS1P1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MSPETS1P2 Evaluate competing design solutions using a systemic process to determine how well they meet the criteria and constraints of the problem.

MSPETS1P3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MSPETS1P4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

ETS1.C Optimizing the Design Solution. The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (MSPETS1P4)

Engineering Design

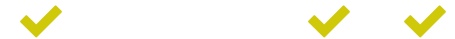
Define the criteria and constraints of a design problem.



Evaluate design solutions.



Analyze data from tests to identify the best characteristics that can be combined into a new solution that better meets criteria.



Develop a model to generate data for iterative testing to obtain an optimal design.



Complete an iterative process of testing and modification for an optimal solution.



Heredity Inheritance and Variation of Traits

MSPLS3P2 Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. (Clarification Statement: Emphasis is on using models such as Punnet squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and the resulting genetic variation.)

Develop use models, including Punnet Squares, to describe why sexual reproduction results in offspring with genetic variation and to represent gene transmission.



MSPLS4P6 Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Use mathematical representations to support how natural selection may lead to increases and decreases of specific traits in populations over time.



Motion and Stability: Forces and Interactions

MSPPS2P1 Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects. (Assessment is limited to vertical or horizontal interactions in one dimension.)

Design a solution to a problem involving the motion of two colliding objects vertically or horizontally in one dimension.



Cross-Cutting Concepts > Systems and System Models Models can be used to represent systems and their interactions – such as inputs, processes, and outputs.

Use models to represent systems and their interactions, such as inputs, processes, and outputs.



Science and Engineering Practices > Engaging in Argument from Evidence Construct and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

Construct written arguments supported by scientific reasoning to support a solution to a problem.

