

Exploring the Extreme

National Standards

Grades PK - 2 Mathematics

Source: National Standards Mathematics 2000

Lesson/Activity	Grades PK - 2 Mathematics Standards
Finding the Center of Gravity Using Rulers	relate ideas in geometry to ideas in number and measurement;
Finding the Center of Gravity Using Rulers	understand how to measure using nonstandard and standard units;
Finding the Center of Gravity Using Rulers	select an appropriate unit and tool for the attribute being measured.
Finding the Center of Gravity Using Rulers	use tools to measure;
Finding the Center of Gravity Using Rulers	pose questions and gather data about themselves and their surroundings;
Finding the Center of Gravity Using Rulers	organize and consolidate their mathematical thinking through communication;
Finding the Center of Gravity Using Rulers	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Finding the Center of Gravity Using Rulers	use the language of mathematics to express mathematical ideas precisely.
Finding the Center of Gravity Using Plumb Lines	recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another;
Finding the Center of Gravity Using Plumb Lines	relate ideas in geometry to ideas in number and measurement;
Finding the Center of Gravity Using Plumb Lines	understand how to measure using nonstandard and standard units;
Finding the Center of Gravity Using Plumb Lines	select an appropriate unit and tool for the attribute being measured.
Finding the Center of Gravity Using Plumb Lines	use tools to measure;
Finding the Center of Gravity Using Plumb Lines	organize and consolidate their mathematical thinking through communication;
Finding the Center of Gravity Using Plumb Lines	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Finding the Center of Gravity Using Plumb Lines	use the language of mathematics to express mathematical ideas precisely.
Changing the Center of Gravity Using Moment Arms	relate ideas in geometry to ideas in number and measurement;
Changing the Center of Gravity Using Moment Arms	understand how to measure using nonstandard and standard units;
Changing the Center of Gravity Using Moment Arms	select an appropriate unit and tool for the attribute being measured.
Changing the Center of Gravity Using Moment Arms	use tools to measure;
Changing the Center of Gravity Using Moment Arms	pose questions and gather data about themselves and their surroundings;
Changing the Center of Gravity Using Moment Arms	organize and consolidate their mathematical thinking through communication;
Changing the Center of Gravity Using Moment Arms	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Changing the Center of Gravity Using Moment Arms	use the language of mathematics to express mathematical ideas precisely.

Exploring the Extreme

National Standards

Grades 3 - 5 - Mathematics

Source: National Standards Mathematics 2000

Lesson/Activity	Grades 3 - 5 Mathematics Standards
Finding the Center of Gravity Using Rulers	represent the idea of a variable as an unknown quantity using a letter or a symbol;
Finding the Center of Gravity Using Rulers	investigate how a change in one variable relates to a change in a second variable;
Finding the Center of Gravity Using Rulers	understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems;
Finding the Center of Gravity Using Rulers	understand that measurements are approximations and how differences in units affect precision;
Finding the Center of Gravity Using Rulers	select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;
Finding the Center of Gravity Using Rulers	design investigations to address a question and consider how data-collection methods affect the nature of the data set;
Finding the Center of Gravity Using Rulers	collect data using observations, surveys, and experiments;
Finding the Center of Gravity Using Rulers	propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.
Finding the Center of Gravity Using Rulers	organize and consolidate their mathematical thinking through communication;
Finding the Center of Gravity Using Rulers	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Finding the Center of Gravity Using Rulers	use the language of mathematics to express mathematical ideas precisely.
Finding the Center of Gravity Using Plumb Lines	represent and analyze patterns and functions, using words, tables, and graphs.
Finding the Center of Gravity Using Plumb Lines	represent the idea of a variable as an unknown quantity using a letter or a symbol;
Finding the Center of Gravity Using Plumb Lines	investigate how a change in one variable relates to a change in a second variable;
Finding the Center of Gravity Using Plumb Lines	understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems;
Finding the Center of Gravity Using Plumb Lines	understand that measurements are approximations and how differences in units affect precision;
Finding the Center of Gravity Using Plumb Lines	select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;
Finding the Center of Gravity Using Plumb Lines	propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.
Finding the Center of Gravity Using Plumb Lines	organize and consolidate their mathematical thinking through communication;
Finding the Center of Gravity Using Plumb Lines	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Finding the Center of Gravity Using Plumb Lines	use the language of mathematics to express mathematical ideas precisely.
Changing the Center of Gravity Using Moment Arms	represent the idea of a variable as an unknown quantity using a letter or a symbol;
Changing the Center of Gravity Using Moment Arms	investigate how a change in one variable relates to a change in a second variable;
Changing the Center of Gravity Using Moment Arms	understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems;
Changing the Center of Gravity Using Moment Arms	understand that measurements are approximations and how differences in units affect precision;
Changing the Center of Gravity Using Moment Arms	select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;
Changing the Center of Gravity Using Moment Arms	design investigations to address a question and consider how data-collection methods affect the nature of the data set;

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National Standards

Grades 3 - 5 - Mathematics

Source: National Standards Mathematics 2000

Lesson/Activity	Grades 3 - 5 Mathematics Standards
Changing the Center of Gravity Using Moment Arms	collect data using observations, surveys, and experiments;
Changing the Center of Gravity Using Moment Arms	represent data using tables and graphs such as line plots, bar graphs, and line graphs;
Changing the Center of Gravity Using Moment Arms	propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.
Changing the Center of Gravity Using Moment Arms	organize and consolidate their mathematical thinking through communication;
Changing the Center of Gravity Using Moment Arms	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Changing the Center of Gravity	use the language of mathematics to express mathematical ideas precisely.
Jet Propulsion	investigate how a change in one variable relates to a change in a second variable;
Jet Propulsion	design investigations to address a question and consider how data-collection methods affect the nature of the data set;
Jet Propulsion	collect data using observations, surveys, and experiments;
Jet Propulsion	organize and consolidate their mathematical thinking through communication;
Jet Propulsion	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Jet Propulsion	use the language of mathematics to express mathematical ideas precisely.
Vectoring	investigate how a change in one variable relates to a change in a second variable;
Vectoring	select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;
Vectoring	design investigations to address a question and consider how data-collection methods affect the nature of the data set;
Vectoring	collect data using observations, surveys, and experiments;
Vectoring	propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.
Vectoring	organize and consolidate their mathematical thinking through communication;
Vectoring	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Vectoring	use the language of mathematics to express mathematical ideas precisely.
Center of Gravity, Pitch, Yaw	recognize and generate equivalent forms of commonly used fractions, decimals, and percents;
Center of Gravity, Pitch, Yaw	understand and use properties of operations, such as the distributivity of multiplication over addition.
Center of Gravity, Pitch, Yaw	select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools.
Center of Gravity, Pitch, Yaw	understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems;
Center of Gravity, Pitch, Yaw	understand that measurements are approximations and how differences in units affect precision;
Center of Gravity, Pitch, Yaw	develop strategies for estimating the perimeters, areas, and volumes of irregular shapes;
Center of Gravity, Pitch, Yaw	select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;
Center of Gravity, Pitch, Yaw	select and use benchmarks to estimate measurements;
Fuel Efficiency	understand and use properties of operations, such as the distributivity of multiplication over addition.
Fuel Efficiency	select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools.
Fuel Efficiency	represent the idea of a variable as an unknown quantity using a letter or a symbol;
Fuel Efficiency	model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.
Fuel Efficiency	investigate how a change in one variable relates to a change in a second variable;
Fuel Efficiency	understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems;
Fuel Efficiency	understand that measurements are approximations and how differences in units affect precision;
Fuel Efficiency	develop strategies for estimating the perimeters, areas, and volumes of irregular shapes;
Fuel Efficiency	select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;
Fuel Efficiency	select and use benchmarks to estimate measurements;
Fuel Efficiency	represent data using tables and graphs such as line plots, bar graphs, and line graphs;

Exploring Aeronautics

National Standards

Grades 6 - 8 Mathematics

Source: National Standards Mathematics 2000

Lesson/Activity	Grades 6 - 8 Mathematics Standards
Jet Propulsion	develop an initial conceptual understanding of different uses of variables;
Jet Propulsion	formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population;
Jet Propulsion	use conjectures to formulate new questions and plan new studies to answer them.
Jet Propulsion	organize and consolidate their mathematical thinking through communication;
Jet Propulsion	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Jet Propulsion	use the language of mathematics to express mathematical ideas precisely.
Vectoring	develop an initial conceptual understanding of different uses of variables;
Vectoring	understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;
Vectoring	draw geometric objects with specified properties, such as side lengths or angle measures;
Vectoring	understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.
Vectoring	select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision;
Vectoring	formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population;
Vectoring	use conjectures to formulate new questions and plan new studies to answer them.
Vectoring	organize and consolidate their mathematical thinking through communication;
Vectoring	communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
Vectoring	use the language of mathematics to express mathematical ideas precisely.
Center of Gravity, Pitch, Yaw	work flexibly with fractions, decimals, and percents to solve problems;
Center of Gravity, Pitch, Yaw	compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line;
Center of Gravity, Pitch, Yaw	develop meaning for percents greater than 100 and less than 1;
Center of Gravity, Pitch, Yaw	understand the meaning and effects of arithmetic operations with fractions, decimals, and integers;
Center of Gravity, Pitch, Yaw	select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods;
Center of Gravity, Pitch, Yaw	use common benchmarks to select appropriate methods for estimating measurements;
Center of Gravity, Pitch, Yaw	select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision;
Fuel Efficiency	work flexibly with fractions, decimals, and percents to solve problems;
Fuel Efficiency	understand the meaning and effects of arithmetic operations with fractions, decimals, and integers;
Fuel Efficiency	select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods;
Fuel Efficiency	represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules;
Fuel Efficiency	develop an initial conceptual understanding of different uses of variables;
Fuel Efficiency	model and solve contextualized problems using various representations, such as graphs, tables, and equations.
Fuel Efficiency	use common benchmarks to select appropriate methods for estimating measurements;
Fuel Efficiency	select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision;
Fuel Efficiency	solve simple problems involving rates and derived measurements for such attributes as velocity and density.