Illinois Learning Standards - High School
Sample Report Profile

Mathematics: State Goal 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operation (addition, subtraction, multiplication, division), patterns, ratios and proportions.

A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.

Converts hp into Watts using multiplication.
Identifies trends using a table of tangent values.
Extracts data from power generation tables and makes value comparisons.
Selects heat resistivity (R) values of materials from a table.
Assesses the properties of insulating materials for effectiveness and value for money.
Calculates the value of power saved by an energy efficient house.
Calculates the efficiency percentage of a wind powered generator.

Mathematics: State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

A. Measure and compare quantities using appropriate units, instruments and methods.

States the units used to measure work, heat and power.
Calculates work done using the formula work = force x distance.
Uses the formula Power = Work/Time to solve problems.
Calculates the power output of a wind generator using the formula W = A x V.
Describes the methods by which energy transformation can be measured.
Determines actual size from measured using a scale.
Calculates the multimeter range setting required to measure the voltage across batteries in series.
Determines the value of resistors by reading color coded bands and by measurement.
Detects faulty resistors by comparing measured value with the color coded band.
Describes the units of measure relating to velocity.
Uses the maglev system to measure impact.
Uses the formula for speed to calculate distance and time.
Uses formula to evaluate realistic unit prices.
Describes the action of adding a formula to a spreadsheet and calculating calorific values.
Identifies how drag is measured.
Identifies how to measure forces using the Aerostream Monitor.
Uses simple mathematic formulae to calculate area, wind speed and drag.
Uses a clinometer to measure altitude.
Uses formula to calculate the height of model rockets.
Uses velocity formula with data on moving rockets.
Applies mathematical formulae to the motion of rockets.
Examines the impact of measurement errors on predictions about rocket flights.
Calculates distances of images and objects using lens formula.
Uses photographic data to measure height.
Uses formulae to calculate height and velocity of model rockets.
Uses a formula to calculate the speed of orbiting satellites.
Uses a formula to calculate the orbital period of satellites.

Performs calculations using orbital mechanics formula.
Interprets measurements used in Computer Aided Publishing.
Interprets formula and symbols used by a high level control language to perform calculations.
Interprets formula and symbols used by a high level control language to perform sort operations.
Interprets formula and symbols used by a high level control language to perform swap routines.
Applies gear ratio formula to observed results.
Applies the gear ratio formula to a timing pulley system.
Interprets the formula for calculating Mechanical Advantage.
Uses formula to calculate rotational speed of a pulley wheel.
Recognizes pressure as a measurement of force in fluids.
Investigates the measurement of pressure.
Uses the formula F= P x A.
Applies formulae to calculate the resistance of resistors in series and in parallel.
Applies formulae to calculate the capacitance of capacitors in series and in parallel.
Uses the formula for calculating the time constant of a capacitor and resistor combination.
Applies the formula for calculating the gain of inverting operational amplifier.
Uses formula to calculate electrical power.
States how a multimeter is used to measure physical quantities in an electronic circuit.
States how an oscilloscope is used to measure physical quantities in an electronic circuit.
Uses a multimeter to measure voltage and resistance.
Recognizes torque and power as measures of engine performance.
Calculates engine data using engine measurements.

B. Estimate measurements and determine acceptable levels of accuracy.

Calculates work done using the formula work = force x distance.
Measures the velocity of a model rocket.
Calculates average velocity and fuel consumed for a model rocket from given data.
Interprets information to relate mass of water and applied force.
Recognizes that forces cause structures to deform.
Investigates the effect of dynamic forces on structures.
Identifies how buildings can be designed to resist dynamic forces.
Describes the units of measure relating to velocity.
Determines the difference between average and actual velocity.
Recognizes different types of force.
Investigates how force, mass and acceleration are related.
Describes the link between forces and motion and their relationship to energy.
Identifies how to measure forces using the Aerostream Monitor.
Identifies how down force is produced by various objects.
Determines down force and drag forces on a sports car model.
Identifies greatest lift force produced for various wing designs.
Describes how lift force is dependent on wing span and chord length.
Calculates lift coefficient and lift force.
Investigates the effect of turbulent air flow on down force production.
Measures turning forces produced by propellers.
Interprets graph of turning force produced by various propellers.
Calculates the lift force produced by one rotor blade.
Compares the force of wind against buildings at different angles.
Identifies drag forces created by models of structures.

Calculates forces acting on structures.
Measures aerodynamic forces on a ballistic object.
States the effect of down force.
Indicates how lift force is produced, and used by aircraft.
Uses velocity formula with data on moving rockets.
Calculates average velocity of model rockets from given data.
Demonstrates forces acting on model rockets.
Examines the forces acting on rockets in flight.
Performs a test to demonstrate forces acting on a projectile.
States the force produced by pressurized gases that powers rockets.
Uses potential energy to determine the velocity of rockets on landing.
Examines the concept of escape velocity.
Identifies the difference between speed and velocity.
Uses formulae to calculate height and velocity of model rockets.
Identifies the forces that are important in space technology.
Estimates the angle of a slope of a communication system from an elevation diagram.
Calculates magnitude of amplification of a sound wave.
Calculates moments of forces for lever systems.
Recognizes pressure as a measurement of force in fluids.
Solves force, pressure & area problems.
Defines pressure as force per unit of area.
Calculates fluid velocity.

C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.

Calculates the height of objects using tangents.
Predicts shadow length at a particular time of day, using a table of values.
Identifies the height of a cloud from a comparative diagram.
Uses offset distances to calculate the radius of a circle.
Calculates distances on the plot of a mechanical component.
Uses the formula for speed to calculate distance and time.
Calculates differences in distance traveled and speed, for points on propeller blades.
Uses software to predict the height of a model rocket.
Calculates height using angles and trigonometry.
Obtains tangent values for angles used to calculate height.
Uses formula to calculate the height of model rockets.
Rearranges the equation for calculating the height of a model rocket.
Calculates the average height reached by a launched item after several launches.
Calculates distances of images and objects using lens formula.
Uses photographic data to measure height.
Uses formulae to calculate height and velocity of model rockets.
Calculates and compares journey times using speed and distance variables.
Uses Pythagoras' theorem to calculate the length of cable required to connect two buildings on a
Uses Pythagoras' theorem to calculate the distances in communication systems.
Creates a proportional graphical image.
Converts rpm into distance and speed achieved by a vehicle.
Uses an orienteering compass to design and follow a route plan that involves bearings and
Obtains the real distance between two places by using the scale of a map.

Converts a given distance on a 1:62,500 scale map into a real distance.
Finds the bearing and distance of each leg of a journey from a map.
Adds distances to find the total distance of a journey on a map
Uses the scale of a map of a classroom to find real distances.
Uses a map of a classroom to plot routes given by bearings and distances.
Uses bearings and distance to navigate a submarine in a software simulation.
Applies Pythagoras' Theorem to find distances of routes.
Uses Pythagoras' Theorem to find the length of the hypotenuse on a right-angle triangle.
Obtains bearings and distances from plans to plan single-legged routes for a submarine.
Obtains bearings and distances from plans to plan two-legged routes for a submarine.
Explains how a route plan was created using bearings and distances.
Describes how distances and bearings were found while planning a route.
Uses scales to find real distances and distances on maps.
Adds distances together to find the total length of a journey.
Evaluates light intensity at various distances and angles from a light source.
Extracts wind speed and direction information from a weather map.
Identifies the conventions used to show air pressure on a weather map.
Uses software to convert infrared information into color coded temperature maps.
Applies weather front symbols to a weather map.
Extracts forecast information from a weather map.
Interprets a contour map and issues a warning to sites at risk from flooding.
Extracts information from a precipitation distribution map of the map U.S.
Interprets a contour map to produce a cross-section of a construction site.
Constructs line of sight elevation diagrams from contour maps.
Constructs elevation diagrams of landscapes from contour maps.
Extracts information about communication links from maps and tables.
Analyzes potential line of sight communication links from information on a map.
Follows written instructions on a map.
Creates a Course Map for a multimedia presentation.
Finds the distance and direction of a direct route between two places on a computer map.
Finds the number of legs that form a route drawn on a map.
Uses a six figure grid reference to locate a place on a map.
Uses an orienteering compass to obtain the bearing to a place on a map.
Obtains the real distance between two places by using the scale of a map.
Converts a given distance on a 1:62,500 scale map into a real distance.
Plans the shortest journey between six places by marking them on a map.
Finds the bearing and distance of each leg of a journey from a map.
Adds distances to find the total distance of a journey on a map
Uses the scale of a map of a classroom to find real distances.
Uses a map of a classroom to plot routes given by bearings and distances.
Identifies locations on a map using latitude and longitude references.
Uses data with latitude and longitude grid references to identify a polluted region on a map.
Creates a map using supplied GPS survey data.
Uses scales to find real distances and distances on maps.
Relates six figure grid references to points on a map.
Relates latitude and longitude to places on maps.
Converts Btus into Joules by selecting data from a table.
Converts between different units of energy.

Converts hp into Watts using a units conversion table.
Converts hp into Watts using multiplication.
Converts tangent values into angles to find the angle of the sun.
Converts a temperature reading from Fahrenheit to Celsius.
Uses software to convert infrared information into color coded temperature maps.
Measures actual dimensions on a component and converts this information into a 2D working
Converts milliamps into amps.
Converts decimal numbers to hexadecimal numbers.
Describes the process of converting mechanical energy into electrical energy.
Converts between standard and non standard units of length.
Converts centimeters into meters.
Converts units of length.
Investigates how engines convert energy and transform motion.
Converts standard temperature to Kelvin's.
Uses a conversion table to convert between units in the SI system.
Converts mass from grams to kilograms.
Converts between units in the SI system.
Converts model rocket launch instructions into flow diagram components.
Converts from positive to negative angles.
Uses a table of values to convert from decimal to binary coded decimal.
Converts numbers from decimal to binary.
Converts decimal and binary numbers to ASCII.
Converts ASCII to decimal numbers.
Uses the 'Divide by Two' method to convert decimal numbers into binary.
Converts binary code into decimal and decimal to binary.
Converts text to speech using a computer.
Converts milliseconds to seconds.
Recognizes the processes required for converting an application to being voice activated.
Identifies how a computer can convert text to speech.
Converts a flowchart that compares key press values into a computer program.
Converts from one computer number system into another.
Converts traffic light sequences into computer code.
Converts rpm into distance and speed achieved by a vehicle.
Converts milliseconds to seconds to help read an oscilloscope display.
Converts a given distance on a 1:62,500 scale map into a real distance.
Converts torque values between metric and customary units.

Mathematics: State Goal 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

A. Describe numerical relationships using variables and patterns.

Converts fractions into decimals.
Converts decimal numbers to hexadecimal numbers.
Uses a table of values to convert from decimal to binary coded decimal.
Converts numbers from decimal to binary.
Converts decimal and binary numbers to ASCII.
Converts ASCII to decimal numbers.
Uses the 'Divide by Two' method to convert decimal numbers into binary.

Converts binary code into decimal and decimal to binary.
Solves an algebraic equation.
Calculates the answers to algebraic equations.
Calculates the strength to weight ratio of a material using division, and correcting the value to 3 decimal places.
Calculates and compares journey times using speed and distance variables.
Identifies and uses patterns of bits to interpret and produce binary codes.
Identifies flowchart symbols.
Interprets flowcharts to solve mathematical problems.
Identifies meanings of variable declarations.
Recognizes appropriate symbols and conventions by interpreting a flowchart.
Recognizes appropriate symbols and conventions by identifying the type of flowchart box an 'If' statement is represented by.
Interprets formula and symbols used by a high level control language to perform calculations.
Interprets formula and symbols used by a high level control language to perform sort operations.
Uses software to write a control program to sort two variables.
Interprets formula and symbols used by a high level control language to perform swap routines.
Uses route planning software to predict variables for a road journey.
Predicts the effects of changing input variables when using route planning software.
Compares the performance of an engine using variable valve timing with that of a standard engine.
Interprets tire codes and tire tread wear patterns.

Mathematics: State Goal 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

A. Demonstrate and apply geometric concepts involving points, lines and space.

Uses basic geometrical shapes to create a drawing.
Determines how to add a wide variety of dimensions.
Measures actual dimensions on a component and converts this information into a 2D working
Solves problems using geometry.
Determines how humans perceive 3-dimensional objects.
Creates 3-dimensional text using perception techniques.
Mathematics: Understands different dimensioning systems in 2-D.
Mathematics: Understands different dimensioning systems in 3-D.

B. Identify, describe, classify and compare relationships using points, lines, planes and solids.

Uses basic geometrical shapes to create a drawing.
Measures actual dimensions on a component and converts this information into a 2D working
Solves problems using geometry.
Recognizes how to add dimensions to a drawing.
Calculates the size of a real bridge from a scale model.
Recognizes the internal dimensions of an engine cylinder.
Identifies the dimensions of tires and wheels by reading tire codes.
Mathematics: Understands different dimensioning systems in 2-D.
Mathematics: Understands different dimensioning systems in 3-D.

Mathematics: State Goal 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

A. Organize, describe and make predictions from existing data.

Interprets data from a graph relating to energy costs.
Extracts data from tables of the origin of pollutant gases.
Constructs a bar chart to compare data relating to pollutant gases.
Identifies trends using a table of tangent values.
Plots a graph of Sun angle against time of day.
Predicts shadow length at a particular time of day, using a table of values.
Extracts data from power generation tables and makes value comparisons.
Determines radiation emission levels from a half-life decay graph.
Selects the most effective insulating material from a table of data.
Interprets information on heat insulating materials presented graphically.
Plots a graph of temperature against time to compare single and double glazing.
Selects the most powerful wind powered generator from a table.
Plots graphs of weather data.
Plots a graph comparing inside and outside temperature.
Identifies temperature estimate from graph.
Interprets a graph showing the strength to carbon ratio of steel.
Plots a graph to chart the progress of a construction project.
Interprets information from a table in a CAD manual.
Calculates the multimeter range setting required to measure the voltage across batteries in series.
Determines lamp properties from a table.
Identifies the conductor of highest conductivity from a table.
States the purpose of the symbols used in flow charts.
Extracts information from a graph showing pulse rate over a period of time.
Uses a word processor to produce information tables.
Uses data from a spreadsheet to create a chart of results.
Uses ICT to communicate information and statistics.
Interprets information from a graph.
Calculates percentage weight losses from growth charts.

Science: State Goal 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

A. Know and apply the concepts, principles and processes of scientific inquiry.

Makes informed decisions based on both given and researched information.
Demonstrates knowledge of early wind powered generators, gained from research in a book.
Makes a presentation to a group on Alternative Energy.
Makes a presentation to a group on Weather Monitoring.
Makes a presentation to a group on Construction Technology.
Makes a presentation to a group on Computer Aided Design.
Makes a presentation to a group on Basic Electricity.
States the purpose of research and the meaning of 'human factors engineering'.
Designs and tests a computer program to simulate a transport system operating in continuous
States the criteria to be reported on when evaluating a design project.
Writes a report on the tests carried out, and an evaluation of, design work.
Applies tests and improvement procedures to check the quality of systems.

Shows basic technical ability in the field of Research and Design technology.
Makes a presentation to a group on Research & Design.
Uses a database to research a given topic.
Uses ICT to communicate information and statistics.
Makes a presentation to a group on Health Management.
Extracts data from a graph of Polio statistics drawn by the student.
Follows written instructions to enable completion of a surgical procedure.
Interprets data from a table of sports injury statistics.
Makes a presentation to a group on Biomedical Technology.
Explains the technical content of a report on an industry that uses aerodynamics.
Makes a presentation to a group on Aerodynamics Technology.
Devises an experiment to test an aerodynamic principle.
Identifies procedures needed to carry out a model rocket launch safely.
Identifies procedures used when launching a model rocket safely.
Calculates acceleration caused by gravity from experimental results.

Science: State Goal 12: Understand the fundamental concepts, principles and interconnections of life, physical and earth/space sciences.

C. Know and apply concepts that describe properties of matter and energy and the interactions between them.

Identifies the operating parameters of a fossil fuel powered generating station.
Identifies the operating parameters of a nuclear powered generating station.
Calculates the potential energy and kinetic energy of a model rocket.
Calculates average velocity and fuel consumed for a model rocket from given data.
Interprets information to relate mass of water and applied force.
Describes the processes involved in nuclear fission.
Identifies the risks and problems of dealing with the waste products of nuclear power stations.
States the acceptable radiation limits of low level nuclear waste.
Describes the function of the major parts of a nuclear power plant.
Describes the operation of a nuclear power plant.
Describes the methods by which energy transformation can be measured.
States the principles behind nuclear power.
States the principles behind solar power.
States the principles behind wind power.
States how water power is obtained.
Compares energy, work and power.
States some of the problems pollution causes.
Identifies why energy conservation is important.
Identifies how alternative energy can be used in building designs.
Recognizes the properties of X-Rays as electromagnetic waves.
Calculates kinetic energy of rockets.
Converts mass from grams to kilograms.
Identifies wavelength, frequency, and amplitude properties of electromagnetic waves.
Quantifies wavelength, frequency, and amplitude properties of electromagnetic waves.
Investigates the wavelength of a microwave.