ITSI-SU Activities and Topics

High School							
Course	**M/P**	**C/T**	**Topic**	**Unit**	**#**	**Model/ Probe**	**Investigate…**
Physics	M/P	C/T	Kinematics	Collisions	4	MW/Temp/ Forces	Force and collisions
	M	C/T	Electricity	Ohm's Law	3	PhET	The atomic representation of current & voltage
	M	C/T	Dynamics	Ramps & Friction	2	PhET	Acceleration on a ramp
	M/P	C/T	Waves	Sound Waves	5	PhET/ microphone	The wave nature of sound
	M	C/T	Light-matter Interactions	Light & Matter	2	MW/PhET	Energy levels & light spectra
	M/P	C/T	Magnetism	Magnetic Fields	2	PhET/ Voltage	Magnetic fields near magnets and wires
Chemistry	M	C/T	Phase Change	Global Warming	3	NetLogo	Reactions in the atmosphere
	M	C/T	Chemical Reactions	Stoichiometry	2	MW	Atomic connections to stoichiometry
	M/P	C/T	Bonding	Driving forces of Reactions	3	MW/Temp	Le Chatelier's Principle
	M/P	C/T	Solutions	Dissolving	3	MW/Temp	A model of dissolving
	M/P	C/T	Heats of Reaction	Heats of Reaction	3	MW/Temp	Temperature changes during a reaction
Biology	M	C/T	Protein Form and Function	Protein Structure	2	MW	DNA sequences and the shape of proteins
	M	C/T	Population Genetics	Evolution	3	NetLogo	Natural selection and evolution
	P	C/T	Homeostasis	Body Temperature	2	Temp	Body temperature under different conditions
	M	C/T	Ecosystems	Population Growth	3	NetLogo	Various population and predation models
	M	C/T	Ecosystems	Ecosystems	3	NetLogo	Indicators of ecosystem health

Key: M = Uses models. P = Uses probes.
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 # = Number of activities per unit.

Middle School							
Course	**M/P**	**C/T**	**Topic**	**Unit**	**#**	**Model/Probe**	**Investigate…**
Earth Science	M	C/T	Minerals	Introduction to crystals	2	MW	The effect of heating and cooling on crystals
	M/P	C/T	The Atmosphere	Global Warming	3	NetLogo/ Temp	The Greenhouse Effect
	M	C/T	Earthquakes	Seismic waves	3	Seismic Eruption	Earthquakes/volcanic plots for past eruptions
	P	C/T	Phase Change	Water cycle	4	Temp	The effect of temperature on states of water
	M	C/T	Solar System	Planetary orbits	4	PhET/ NetLogo	Kepler's Law
	P	C/T	Weather	Monitoring weather	2	Temp	Tracking weather changes
Physical Science	M/P	C/T	Thermodynamics	Heat & Temp	2	MW/Temp	Heating and cooling of liquids
	M/P	C/T	Phase Change	Phase Change	3	MW/Temp	Phase change at the atomic level
	P	C/T	Waves	Sound	4	Microphone	The properties of sound
	P	C/T	Kinematics	Motion	3	Motion	Velocity and acceleration
	M	C/T	Molecular Motion	Diffusion	3	MW	Diffusion & osmosis
	P	C/T	Energy	Energy Conversions	4	Temp/ Voltage	Ways various forms of energy are exchanged
Life Science	M	C/T	Macromolecules	Tree of Life	3	MW	The function of different kinds of molecules
	M	C/T	Genetics	Inheritance	1	BioLogica	Inheritance of dragons
	P	C/T	Plant Respiration	Transpiration	2	Rel.Humidity/ Light	The relationship between light and photosynthesis
	P	C/T	Human Physiology	Human Response	3	Temp/ Voltage	Galvanic skin response
	M	C/T	Ecosystems	Population Growth	3	NetLogo	Various population and predation models
	P	C/T	Ecosystems	Greenhouse	4	Light/Temp	Design and monitoring of a working greenhouse

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Upper Elementary School (grades 5-6)							
Course	**M/P**	**C/T/P**	**Topic**	**Unit**	**#**	**Model/Probe**	**Investigate…**
Earth Science	P	T/P	Seasons	Sunlight & Temperature	6	Light/Temp	The relationship of distance and tilt of the earth on the seasons
	M/P	T/P	Earth System	Heating with Sunlight	5	NetLogo/ Temp/Light	The heating of the Earth's surface with sunlight
	P/M	C/T	Phase Change	Water Cycle	5	MW/NetLogo Rel.Humidity	Evaporation, condensation, & freezing of water
Physical Science	P	C/T	Energy	Temp of Mixing Water and Air	6	Temp	Temperature changes when fluids are mixed
	P	T/P	Simple Machines	Levers & Pulleys	5	Force	Lifting with levers and pulleys
	P/M	C/T	Motion & Forces	Friction	4	Force/MW/ Temp	Frictional effect on matter
	P/M	T/P	Motion & Forces	Movement	5	Motion/ Camera/ PhET	The motion of objects, including humans
	P/M	C/T	Electricity	Testing Circuits	5	Voltage/ NetLogo/ PhET	Parallel and series circuits
Life Science	M/P	C/T	Ecosystem	Monitoring a Living Plant	5	NetLogo/ Rel. Humidity/ Camera	Basic needs of plants
	P	T/P	Design/ Technology	Design a Greenhouse	6	Temp/Light Rel.Humidity/ /Camera	Building & monitoring a working greenhouse
	M	T/P	Ecosystem	Food Web	3	NetLogo	Relationships between producers & consumers

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Elementary School (grades 3-4)							
Course	**M/P**	**C/ T/P**	**Topic**	**Unit**	**#**	**Model/Probe**	**Investigate…**
Earth Science	P	T/P	Weather	Journaling Weather	6	Temp/ Rel.Humidity/ Camera	Daily weather conditions
	M	T/P	Environment	Water Cycle	4	Flash	The formation of clouds
	M/P	T/P	Properties of Materials	Erosion	3	NetLogo/pH/ Camera	Changes in land forms
Physical Sci-ence	P	C/T	Sound	Making Music	5	Microphone	The properties of sound
	M	C/T	Electricity	Static Electricity	2	PhET	The behavior of like and unlike charges
	P	C/T	Electricity	Circuit Building	4	Voltage/ Genecon	Building & testing of a simple circuit
	P	T/P	Design & Technology	Playground Design	6	Force/Motion	Building & test of models of play-ground equipment
	P/M	C/T	Balance & Motion	Friction	5	Force/Flash/ Camera	Pulling & pushing objects on various surfaces
Life Science	P	T/P	Human Body	Sensing	5	Temp/Light	How we sense hot/cold & light
	M	C/T	Structure of Life	Stems, Roots, & Leaves	5	Flash/ Food-o-meter	Basic parts & needs of plants
	M/P	T/P	Characteristics of Organisms	Camouflage	3	NetLogo/ Camera/Light	How organisms survive

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