Activities versus Scientific Inquiry & Engineering Design Examples

Focusing on a Well-defined Question or Problem Makes the Difference!

Exploratory Activities	→	**Scientific Questions & Engineering Problems**	→	**Scientific Inquiry & Engineering Design**
Characteristics: • Simple activity or confirmation lab • Question or problem not clearly stated in advance • Exploration of natural or man-made materials or phenomena • Little organized data gathered		Characteristics: • Questions are generated by students or teacher • No limit on questions • Should be mostly student directed but teachers provide clues		Characteristics: • **Student** proposes possible answers to the question or solutions to the problem • Includes a design based on important science background knowledge • Investigation allows students to collect data that can be analyzed
Water evaporates		SQ: How does temperature affect the speed that water evaporates?		SI: Evaporation is proportionate to temperature.
Make a air-pressure rocket and launch		EP: How can we make a rocket go straight up?		ED: The placement and shape of the rocket's fins affect the stability of the rockets flight.
Magnets can attract metals		SQ: What types of materials can magnets attract or not attract?		SI: Magnets attract metals that contain iron but don't attract materials that lack iron.
Newspaper slows the transfer of heat		EP: How can we efficiently use everyday materials to be used to form effective insulation?		ED: Arranging materials to impede the circulation of air over a particular distance will produce good insulation and use materials efficiently.
Solids dissolve in water		SQ: Which materials dissolve slowly or quickly?		SI: Surface area affects the *rates* that solids dissolve.
Wind Turbines and how they work		EP: How can wind turbines produce more electrical energy?		ED: The shape and angle of the a turbine's blades affect its efficiency.
Bugs stand on water		SQ: How many drops of water will fit on a penny?		SI: Different substances have different surface tensions.
Plant a seed and watch it grow		EP: How can we maximize plant growth?		ED: The right combination of light, moisture, and nutrients will produce maximum growth with the minimum use of energy and materials.

These are NOT state-required topics for Scientific Inquiry or Engineering Design.
Teachers are encouraged to create their own topics for classroom use.
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