IPC Curriculum Bundle #4

Title	Suggested Dates
Work, Power, and Simple Machines	10/26 – 11/13/2009 (12 days)

Big Idea/Enduring Understanding	Guiding Questions
Machines make work easier and faster by manipulating force and distance. Work input will always exceed work output.	How is the meaning of "work" different in science from the common definition? How do simple machines make work easier & humans more powerful?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)
4 The student knows concepts of force and motion evident in everyday life. **4A** Calculate speed, momentum, acceleration, work, and power in systems. Including • The human body • Moving toys • Machines	Such as • Solve for different variables in problems of speed, work, force, momentum, power, and acceleration	
4 The student knows concepts of force and motion evident in everyday life. **4C** Analyze the effects caused by changing force or distance in simple machines. Including • Household devices • The human body • Vehicles	Classify simple machines as • Levers, Pulleys, Inclined Planes, Wheels and axles (gears), Wedge, and Screws. • Identify first-class, second-class, and third-class levers. • Describe the combination of simple machines that make up different complex machines.	Rube Goldberg Machines Lab – project Rube Goldberg Power Point Rube Goldberg Internet Activity Honda Cog Video (in resource folder)
4 The student knows concepts of force and motion evident in everyday life. **4D** Investigate and demonstrate mechanical advantage and efficiency of various machines. Such as • Levers • Motors	Including • Inclined planes (screws) • Gears • Define and calculate "mechanical advantage and efficiency "of various machines. • Describe how each of the simple machine types makes work easier.	Forces in Machines Lab - Investigations in Physics and Chemistry Lever Lab –Investigations in Physics and Chemistry Lever Lab

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• Wheels and axles • Pulleys		Machine Lab Horsepower Lab
6 The student knows the impact of energy transformations in everyday life. **6A** Describe the law of conservation of energy.	Describe the relationship between work and energy. • Compare work input to work output • *recognize and demonstrate that objects and substances in motion have kinetic energy such as vibration of atoms, water flowing down a stream moving pebbles, and bowling balls knocking down pins* • *demonstrate common forms of potential energy, including gravitational, elastic, and chemical, such as a ball on an inclined plane, springs, and batteries* • *investigate the law of conservation of energy*	