



SWEETWATER HIGH SCHOOL PROFESSIONAL LEARNING COMMUNITY

PHYSICAL SCIENCE 1 PACING GUIDE

	STANDARDS	BIG IDEA	ESSENTIAL QUESTIONS
1 st Progress Reporting Period	1. Investigation and Experimentation- Explain how scientific progress is made by asking questions and conducting investigations.	Student understands that scientific progress is made by asking meaningful questions and conducting careful investigations.	
	1.1 Select and use appropriate tools and technology (such as computer probes) to perform tests, collect data, analyze data.	Learn the use and terminology of scientific tools	What are the SI units for mass, volume, and length, and temperature
	1.2 Recognize the need for controlled tests and identify and communicate reasons for inconsistent results.	The Scientific Method	How do we form a hypothesis? How do we gather data? How do we perform experiments? How do we analyze data?
	1.3 Formulate explanations by using logic and evidence, and recognize the cumulative nature of scientific evidence.	The Scientific Method	What are the steps of the scientific method?
	1.4 Distinguish between hypothesis and theory as scientific terms and recognize the usefulness and limitations of models.	The Scientific Method	What is the difference between a scientific theory and a scientific law? What is a scientific model?
	2. Describe how Newton's laws predict the motion of most objects.	Ch.1 What is motion? What is speed? What is velocity? What is acceleration?	Define motion. What is a reference point? What is the difference between constant speed and average speed and how do you calculate them? What is the difference between speed and velocity? How do you analyze the motion of an object? Draw and label a motion graph.

		What is deceleration? How can an object accelerate if it is traveling at constant speed? Draw and label an acceleration graph.
Common Assessment Date: August 6 2007 Scientific Method & Ch.1 Motion Date to Meet and Analyze: August 20		

	STANDARDS	BIG IDEA	ESSENTIAL QUESTIONS
End of Quarter 1	2. Describe how Newton's laws predict the motion of most objects.		
	2.1 Recognize that when forces are balanced no acceleration occurs, and thus an object continues to move at a constant speed or stays at rest (Newton's First Law).	Describe Newton's 1 st Law. The law of inertia	What is a force? What are the SI units? What is a net force? What is the effect of balanced forces? What is the effect of unbalanced forces? What is inertia? How is mass related to inertia?
	2.2 Apply the law $F=ma$ to solve motion problems involving constant forces (Newton's Second Law).	Solve problems using Newton's 2 nd Law $F=ma$	Define Newton's 2 nd Law in words. What is the relationship between force, mass and acceleration? What are the SI units?
	2.3 Explain how when one object exerts a force on a second object, the always exerts a force of equal magnitude and opposite direction(Newton's 3 rd Law)	Describe Newton's 3 rd Law. The law of Action/reaction	Why do action and reaction forces cancel each other? What causes a rocket to lift off?
	2.4 Describe the relationship between the universal law of gravitation and the effect of gravity on an object at the surface of the Earth	What is the universal law of gravitation?	What is gravity? What is the difference between mass and weight? What two factors affect the force of gravity? What is the value for acceleration due to gravity at the surface of the Earth?
	3.1 Calculate the momentum of an object as the product of its mass and velocity. Momentum = mass x velocity	What is momentum and how do you calculate it?	What is the formula to calculate momentum? What is meant by conservation of momentum? What are the SI units for momentum?
	3.2. Calculate work using the formula: Work = Force	Perform calculations for work	How is work defined in science? What are the SI units for work?

	x Distance		How is power defined in science? What are the SI units?
	3.3 Calculate kinetic energy using the formula $E=(1/2)mv^2$	Perform calculations for kinetic energy	What is kinetic energy? What two factors affect KE? Which factor has the most influence? What are the SI units for energy (KE)?
	3.4 Calculate changes in gravitational potential energy near the Earth using the formula (change in potential energy) =mgh.	Perform calculations for potential energy	What is potential energy? What factors affect potential energy? What are the SI units for PE?
Common Assessment Date: August 30: Ch.2 Forces Sept. 13: Ch. 4&5 Work & Power Date to Meet and Analyze: October 15			



SWEETWATER HIGH SCHOOL PROFESSIONAL LEARNING COMMUNITY

SEMESTER 1 PACING GUIDE CONT.

	STANDARDS	BIG IDEA	ESSENTIAL QUESTIONS
3 rd Progress Reporting Period	4. Explain how energy cannot be created or destroyed although in many processes energy is transferred to the environment as heat.		What does the law of conservation of energy mean?
	4.1 Describe how thermal energy consists of random motion and the vibrations and rotations of atoms and molecules.	Understand the difference between thermal energy and temperature	What are the 3 common scales used for measuring temperature? What is the difference between thermal energy and temperature? What is absolute zero? What are the characteristics of the 4 states of matter? Why does temperature not change during a change of state?
	4.2 Recognize that heat, similar to work, is a form of energy transfer between systems-includes conduct., convec, radiation.	Understand that heat is a transfer of energy	What is heat in science? How is heat related to thermal energy? What are the 3 types of heat transfer? Which direction does heat move?
	4.3 Explain how the work done by a heat engine that is working in a cycle is the difference between the heat flow into the engine at high temperature and the heat flow out at a lower temperature (First Law of Thermodynamics).	Understand the workings of a heat engine	What is a heat engine? What is the 1 st law of thermodynamics?
	4.4 Demonstrate how most processes tend to decrease the order of a system over time (entropy)--2nd Law of Thermodynamics.	Most processes decrease the order of the system over time	What is the 2 nd law of themodynamics?
	5. Explain why waves have characteristic		

	properties that do not depend on the type of wave.		
	5.1 Describe how waves carry energy from one place to another and there are two types of waves in mechanical media: transverse and longitudinal waves	Waves are a transfer of energy	What is a wave? Name and describe the 3 types of waves. In what ways can you transfer energy? What are mechanical waves?
	5.2 Explain why sound is a longitudinal wave whose speed depends on the properties of the medium in which it is propagated.	Sound is a longitudinal wave that requires a medium	What type of wave is a sound wave? What factor affects the speed of sound? What is the doppler effect?
	5.3 Know that radio waves, light and X-rays are different wavelength bands in the spectrum of electromagnetic waves whose speed in vacuum is approximately 3.0×10^8 m/s (186,000 miles/second).	The electromagnetic spectrum does not require a medium and travel at the speed of light	What is the speed of EM waves in a vacuum? What is the electromagnetic spectrum? Draw and label the EM spectrum?
Common Assessment Date: Oct. 9: Midterm Oct. 25 Ch. 6 Thermal Energy Nov.8 Waves Date to Meet and Analyze: Nov. 19			

	STANDARDS	LEARNING GOALS	RESOURCES
End of Semester	6. Recognize that electric and magnetic phenomena are related and have many practical applications.	Magnetism and electricity are related	
	6.1 Predict the voltage or current in simple direct current electric circuits using Ohm's Law.	Ohm's Law	What is Ohms Law? What is voltage? SI units? What is current? SI units? What is the difference between a conductor and an insulator? What is the difference between a series and parallel circuit? What is the difference between AC & DC ? What is the difference between a fuse and a circuit breaker?

<p>6.2 Describe how magnetic materials and electric currents (moving electric charges) are sources of magnetic fields</p>	<p>Magnets and electromagnets and electric motors</p>	<p>What is magnetism? What produces magnetic fields? How are magnetic domains arranged in a permanent magnet? What is the difference between a solenoid and an electromagnet? What is a galvanometer? What is an electric motor?</p>
<p>6.3 Investigate why magnetic fields produce electric fields, thereby inducing currents in nearby conductors.</p>	<p>Induction of electric currents How generators work Batteries</p>	<p>What is a generator? What is a transformer & how does it work? What is a battery? How does an electrochemical cell work?</p>
<p>6.4 Recognize the properties of transistors and their role in electric circuits.</p>		<p>What function does a transistor serve?</p>
	<p>Plasma as ions can be a source of electricity</p>	<p>Describe plasma</p>
<p>Common Assessment Date: Dec. 6 Magnetism & Electricity Dec. 11 Finals EOC Date to Meet and Analyze: Jan. ?????</p>		



SWEETWATER HIGH SCHOOL PROFESSIONAL LEARNING COMMUNITY

SEMESTER 2 PACING GUIDE

5 th Progress Reporting Period	STANDARDS	LEARNING GOALS	RESOURCES
Common Assessment Date:		Date to Meet and Analyze:	

End of Quarter 3	STANDARDS	LEARNING GOALS	RESOURCES
Common Assessment Date:		Date to Meet and Analyze:	



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SEMESTER 2 PACING GUIDE CONT.

7 th Progress Reporting Period	STANDARDS	LEARNING GOALS	RESOURCES
Common Assessment Date:		Date to Meet and Analyze:	

End of Year	STANDARDS	LEARNING GOALS	RESOURCES
Common Assessment Date:		Date to Meet and Analyze:	