Name:_____ Date:_____

UNIT 3
Heat and Temperature

UNIT OVERVIEW

During the heat and temperature unit, you will look at three major areas.

1. Exploring and discovering what heat and temperature is. You will look at how heat and thermal energy is used by humans and our increasing reliance on it and energy resources.

2. You will learn to describe the nature of thermal energy and its effects on different forms of matter, using informal observations, experimental evidence and models.

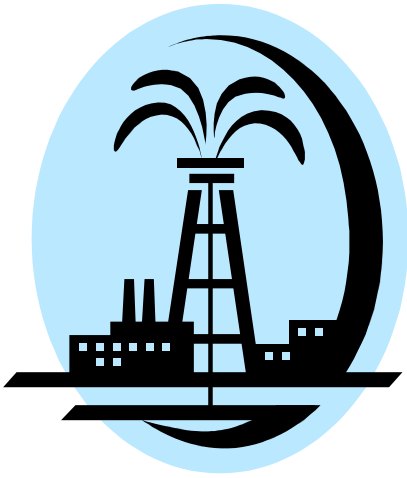
3. Analyze issues related to the selection and use of thermal technologies, and explain decisions in terms of advantages and disadvantages for sustainability.

As you work this unit, you will need to provide evidence of your understanding of concepts that related to heat and temperature. Use this table to keep track of your progress and where you have shown clear understanding.

Unit C: Heat & Temperature

Name:_____ Date:_____

Science 7 Heat and Temperature Knowledge Outcomes		Still Learning	On My Way	With Ease
1. Illustrate and explain how human needs have led to technologies for obtaining and controlling thermal energy and to increased use of energy resources.				
	The big ideas/Enduring Understandings (Rocks)	**Include evidence.**		
	Can I identify and explain uses of devices and systems to make, move or control heat? *(e.g., describe how a furnace and wall thermostat keep a house at a constant temp.)*			
	Important to know and be able to do (Sand)	**Include evidence.**		
	Can I identify examples of choices in using energy resources and technology? *(e.g., the daily amount of hot water used; choices in how that water is heated)*			
	Can I determine why we developed heat-related materials and technologies? *(e.g., development of clothes dryers; development of protective clothing, such as oven mitts)*			
	Can I investigate and interpret examples of heat-related technologies and energy use in the past? *(e.g., investigate uses of heat for cooking, home heating, and for industrial processes, such as ceramics and metallurgy)*			



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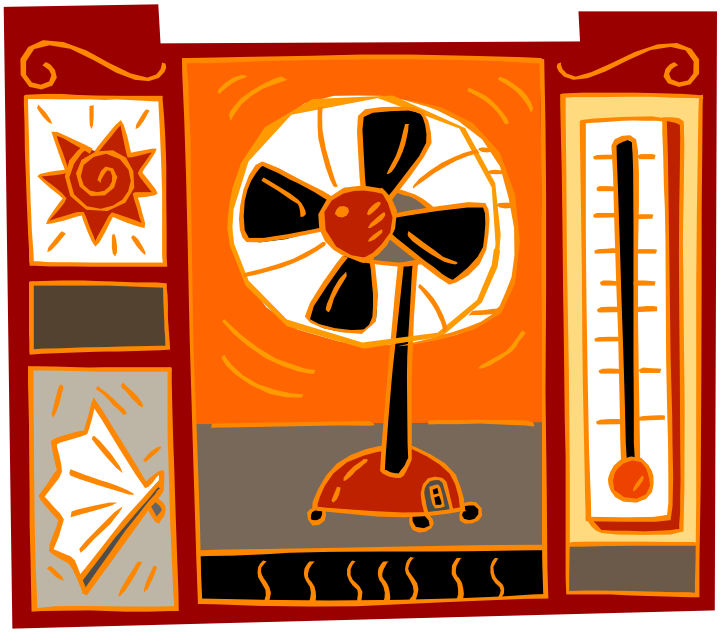
Name:_____ Date:_____

Science 7 Heat and Temperature Knowledge Outcomes		Still Learning	On My Way	With Ease
2. Describe the nature of thermal energy and its effects on different forms of matter, using informal observations, experimental evidence and models.				
	The big ideas/Enduring Understandings (Rocks)	**Include evidence.**		
	Can I describe the effect of heat on the motion of particles?			
	Can I explain changes of state, using the particle model of matter?			
	Can I distinguish between heat and temperature?			
	Can I explain how heat is transmitted by conduction, convection and radiation in solids, liquids and gases?			
	Important to know and be able to do (Sand)	**Include evidence.**		
	Can I compare heat transmission in different materials? *(e.g., compare conduction of heat in different solids or the absorption of heat by different surfaces)*			
	Can I investigate and describe the effects of heating and cooling on the volume of different materials, and identify applications of these effects? *(e.g., use of expansion joints on bridges and railway tracks)*			



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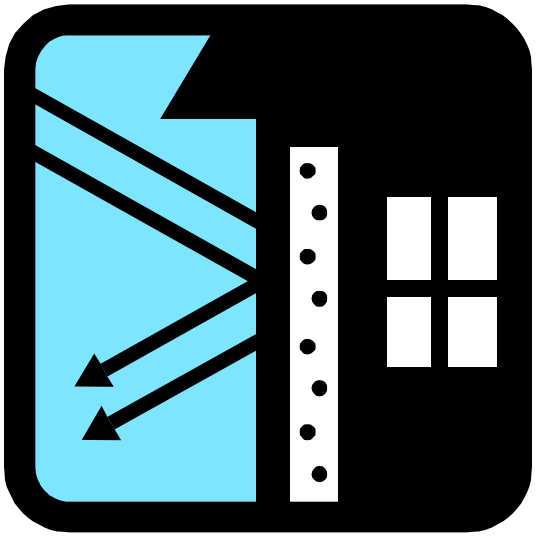
Name:_____ Date:_____

Science 7 Heat and Temperature Knowledge Outcomes		Still Learning	On My Way	With Ease
3. Apply an understanding of heat and temperature in interpreting natural phenomena and technological devices.				
	The big ideas/Enduring Understandings (Rocks)	**Include evidence.**		
	Can I describe ways in which thermal energy is produced naturally? *(e.g., solar, living things, geothermal and composting)*			
	Can I explain the operation of devices that respond to temperature change? *(e.g., thermometers, thermostatic systems)*			
	Can I describe examples and principles of passive and active solar heating?			
	Important to know and be able to do (Sand)	**Include evidence.**		
	Can I describe and interpret the function of household devices and systems for making, moving or controlling heat energy? *(e.g., describe the operation of furnaces and refrigerators)*			
	Can I investigate and describe practical problems in controlling and using thermal energy? *(e.g., heat losses, energy consumption, risk of fire)*			
	Can I compare and evaluate materials and designs that maximize or minimize heat energy transfer?			



Unit C: Heat & Temperature

Name:_____ Date:_____

Science 7 Heat and Temperature Knowledge Outcomes		Still Learning	On My Way	With Ease
4. Analyze issues related to the selection and use of thermal technologies, and explain decisions in terms of advantages and disadvantages for sustainability.				
	The big ideas/Enduring Understandings (Rocks)	**Include evidence.**		
	Can I identify and evaluate different sources of heat and the environmental impacts of their use? *(e.g., adv. and disadv. of fossil fuel use; renewable vs nonrenewable sources)*			
	Important to know and be able to do (Sand)	**Include evidence.**		
	Can I identify positive and negative consequences of energy use, and describe examples of energy conservation in my home or community?			
	Worth being familiar with (Water)	**Include evidence.**		
	Can I compare the energy consumption of alternative technologies for heat production and use? *(e.g., compare the energy required in alternative cooking technologies)*			