Big Idea: Solar Energy ***Quarter***					***1st***
Smart Tech	Grades: 3-6		Time Frame: 9 weeks **September 1- November 6th**		
Benchmarks	*Content/ Skills*	*Key Terms*	*Assessment*	*College and career Readiness Standards*	*CCCS*
Third Grade: ● Identify ways in which the sun's energy comes to them. ● Classify the different types of energy. ● Understand that all living things require the sun's energy. Fourth and Fifth Grade: ● Introduction to the atmosphere. ● Understand the cause of natural disasters. ● Understand that all living things require the sun's energy. Sixth Grade: ● Comprehensive overview of solar power as a form of energy	Third Grade: ● The purpose/importance of the sun ● The role of the sun in the water cycle ● The use of the sun's strength for energy ● Which type of light is best for plants to grow Activities: Sunlight and Plant Life (Plants to grow) Now We're Cooking (Solar Powered method) How Fast? (Rate of evaporation) Fourth and Fifth Grade ● Understand the workings of the atmosphere ● Discover the effects of light absorption ● Use cause and effect to identify natural disasters Activities:	Third Grade: Energy Heat Light Shadow Generate Rely Need Photosynthesis Strength Solar Power Evaporation Condensation Fourth and Fifth Grade: Atmosphere Conduction Convection Radiation Light absorption Natural disaster Sixth Grade: Photovoltaic cells Thermal power	Quizzes Classwork Projects Classroom Observations		

● Understand the importance of angle when implementing solar panels	Greenhouse on Wheels (Light Absorption) Atmospheric Process (Radiation) Exploring Cause and Effect Using Expository Texts (Natural Disasters) <u>Sixth Grade:</u> ● Investigation of Solar Energy ● How solar panels work ● Energy sources to run motors can be energy from the sun (solar) or energy stored in batteries (chemical). <u>Activities:</u> Photovoltaic Cells (Renewable vs. Non-Renewable Energy) Shingles (Light Absorption) Solar Race (Sun Angle)				

Big Idea: Wind Energy					***2nd Quarter***
Smart Tech	Grades: 3-6		Time Frame: 9 weeks **November 9th- January 22nd**		
Essential Questions	*Content/ Skills*	*Key Terms*	*Assessment*	*College and career Readiness Standards*	*CCCS*
<u>Third and Fourth Grade</u> ● How Can We Think Like an Engineer? ● How Do We Study the Wind? ● How Do We Use the Wind? <u>Fifth and Sixth Grade:</u> ● How Do We Use the Wind? ● How Do Geography and Community Influence Wind Power Projects? ● How Does Wind Inspire Creativity and Design?	<u>Third and Fourth Grade</u> ● Challenge: How Can We Design a Wind Powered Boat? ● Exploration: How Do We Observe and Measure the Wind (Parts 1&2) ● Investigation: How Does a Pinwheel Use Wind Power? ● Investigation: How Can We Design a Better Pinwheel? ● Challenge: How Can We Use Wind To Lift a Load? ● Challenge: Which Turbine Design Is Better for the Job? ● Challenge: How Can We Use Wind Power to Produce Electricity? ● Investigation: How Do Motors and Generators Work? <u>Fifth and Sixth Grade:</u> ● Challenge: Which Turbine Design Is Better for the Job? ● Challenge: How Can We Use Wind Power to Produce Electricity?	<u>Third and Fourth Grade</u>: Wind Energy Motor Potential energy Cyclone <u>Fifth and Sixth Grade:</u> Wind Energy Motor Potential energy Cyclone Anemometer Rotational Symmetry Turbine Rudder Rotor Mechanical Energy	Quizzes Classwork Projects Classroom Observations		

	● Investigation: How Do Motors and Generators Work? ● Exploration: Where and Why Does the Wind Blow? ● Exploration: Where Are the Wind Turbines? ● Exploration: What Are Some Facts About Wind Farms? ● Exploration: How Do Schools Use Wind Power? ● Exploration: How Does the Wind Move Through Art and Literature? ● What Innovative Design Can You Create?				

Big Idea: Hydroelectric Energy				***3rd Quarter***
Smart Tech	Grades: 3-6		Time Frame: 9 weeks **January 25th- April 8th**	
Essential Questions	*Content/ Skills*	*Key Terms*	*Assessment*	*CCCS*
What is the Water Cycle? How does water moves from state to state in the water cycle? How is Flowing Water an Energy Source? How Can Work Be Done With Water Power? How Can a Dam Affect a River?	<u>Third and Fourth Grade</u> 1. Introduction: The Water Cycle. ● http://studyjams.scholastic.com/studyjams/jams/science/ecosystems/water-cycle.htm ● Watch the water cycle song, and then create their own song about the water cycle. They will share their songs with the class. 2. "How Does a Waterfall Become Electricity?" http://www.youtube.com/watch?v=Yw275056JtA ● Draw a picture of the water cycle. 3. <u>Book</u>: Ocean, Tidal, and Wave Energy ● Students are broken into groups and are given one section of the photocopied page of the book. Students are in charge of their own section. They will take notes and create examples of the important parts of their section (sections are about 1-2 pages). They will then present their section to the class, so everyone will share an understanding. ● Teacher can model the expectation with the first section of the book 4. Students are broken into groups and are given one section of the photocopied page of the book. Students are in charge of their own section. They will take notes and create	evaporation precipitation transpiration condensation vapor groundwater run-off infiltration	Quizzes Classwork Projects Classroom Observations	

	examples of the important parts of their section (sections are about 1-2 pages). They will then present their section to the class, so everyone will share an understanding. Teacher can model the expectation with the first section of the book 5. http://www.youtube.com/watch?v=wtXz93Wzm4g ● Students will watch this video and using their notes on the book students will write about how hydroelectricity affects our life today. Or the importance of hydroelectric power to the world today. They will then draw a picture of something that is or can be controlled by hydroelectric power 6. http://www.ehow.com/info_8457637_energy-crafts-kids.html (water wheel activity) ● Create a waterwheel using two plastic plates and staple plastic cups along the rim of the plates, so that they are sandwiched between the plates. When the plate rolls like a wheel the cups can pick up water. Poke a hole at the center of the plates and insert a pencil. Place the waterwheel in a tub of water and see how it works. Students can hypothesize. The project states to have flowing water on top, students can pour water from the top using a cup. Fifth and Sixth Grade: 1. Introduction: The Water Cycle.			

	• http://studyjams.scholastic.com/studyjams/jams/science/ecosystems/water-cycle.htm • Watch the water cycle song, and then create their own song about the water cycle. They will share their songs with the class. 2. Hydropower Bingo • http://www.need.org/files/curriculum/guides/Energy%20of%20Moving%20Water%20Teacher.pdf 3. Water Cycle Activity A Can you identify the properties and states of water? Activity B Can you make dirty water clean? 4. Flowing Water Activity A Will water falling twice as high create a splash twice as large? Activity B Can water pressure influence water flow? Activity C Will changing the slope of falling water affect how fast it flows? 5. Using Water Power Activity A Can the force of falling water be used to lift a weight? Activity B Can a water wheel be used to generate electricity? Activity C Can a reservoir be used like a rechargeable battery? 6. Dams and Rivers Activity A Can you identify members of the food pyramid?			

	Activity B Do the same plants and animals that live a reservoir live in a river?			

Big Idea: Conservation/Recycling				***4th Quarter***
Smart Tech	Grades: 3-6		Time Frame: 9 weeks **April 11- June 17**	
Essential Questions	*Content/ Skills*	*Key Terms*	*Assessment*	*CCCS*
What is conservation? How can we practice conservation in our community? What is sustainability? What are some of our sustainability options? How can we implement the 3 R's at our school?	<u>Third and Fourth Grade</u> 1. Recycling ● Book: Where Does the Garbage Go? by Paul Showers ● YouTube video about Landfills ● What is Littering Activity? ● http://green.tunlane.edu/PDFs/williamslessons.pdf 2. Book: "Browning-Ferris Industries Mobius Curriculum: Understanding the Waste Cycle 3rd Edition" ● YouTube video: the landfills of Guatemala ● Write about how you could make a difference and change it to better the future. 3. <u>The Great Trash Bash</u> by Loreen Leedy ● How Can I Recycle Activity ● http://green.tunlane.edu/PDFs/williamslessons.pdf 4. The Three R's: Reuse, Reduce, Recycle: by Nuria Roca ● Reduce, Reuse, Recycle Activity ● http://learningtogive.org/lessons/unit145/lesson4.html#standards 5. <u>Kids Can Recycle</u> by Cecelia Minden ● Write and create a device or a sort which would help people recycle or	Reduce Reuse Recycle Landfills Natural resources Renewable resources Fumes Toxic Environment Compost Ecological footprint Greenhouse Sustainability Conservation	Quizzes Classwork Projects Classroom Observations	

	something that would be able to convert trash into something else instantly to reduce waste. Discuss how e have compost and cycling companies. 6. The Lorax by Dr. Seuss ● Watch and play http://www.childrenoftheearth.org/recyling-for-kids/recycling-for-kids-index.htm ● Create a poster as well as write a persuasive blurb to raise awareness about Reduce, Reuse, Recycle. <u>Fifth and Sixth Grade:</u> ***Recycling*** 1. Introduction to Recycling: ● https://www.brainpop.com/technology/scienceandindustry/recycling/ ● Categorizing Activity: review of items to be recycled versus trashed. 2. Being an Eco-Friendly Consumer ● http://www.pbs.org/parents/eekoworld/lessons4_1.html ***Sustainability*** 3. Garden Orientation / Card Hike & Garden Jeopardy Meet staff, learn routines and systems White Board Questions & Conversation ● http://edibleschoolyard.org/node/473 4. G6 - 2b Garden Work Review Respect in Garden Emphasize systems ● http://edibleschoolyard.org/node/473			

	5. Compost Lab Cycles of Matter FBI Think pair share One thing you learned or share one question ***Conservation*** 6. https://www.brainpop.com/science/energy/conservingenergy/ ● Brainpop Activity: Write a letter to the school administration as to why we should conserve energy in a specific way.			