Curriculum Map

Course Title: Science **Grade:** Grade 5

Unit 1: Structure and Properties of Matter	**Engineering Design** **Science and Engineering Practices** ● ***Asking Questions and Defining Problems*** ● ***Planning and Carrying Out Investigations*** ● ***Constructing Explanations and Designing Solutions*** **Disciplinary Core Ideas** ● ***Defining and Delimiting Engineering Problems*** ● ***Developing Possible Solutions*** ● ***Optimizing the Design Solution*** **Crosscutting Concepts** ● ***Influence of Science, Engineering, and Technology on Society and the Natural World***
Unit 2: Matter and Energy in Organisms and Ecosystems	
Unit 3: Earth and Space Systems	

Unit (Name/Number): Unit 2- Matter and Energy in Organisms and Ecosystems	**Pacing:**
Essential Question(s): How is energy transferred and conserved? (5-PS3-1) How do organisms live, grow, respond to their environment, and reproduce? (5-PS3-1), (5-LS2-1) How and why do organisms interact with their environment and what are the effects of these interactions? (5-LS2-1)	

Content/Key Concepts	**Standards**	**Key Vocabulary**	**Learning Activities/Resources**	**Evidence of Learning** (Assessments; Performance Tasks)
Energy released from food was once energy from the sun that was captured by plants in the chemical process that forms plant matter.	5-PS3-1 (NG) 4.1.7.C (SAS)	● Energy flow ● Flow chart ● Model ● Photosynthesis	Use a model to describe that energy in animal's food was once energy from the sun.	
Food provides animals with materials needed for body repair and growth.	5-PS3-1 (NG) 3.1.7.A8 (SAS)	● Food chain ● Food web	Use a model to describe that energy in animal's food was once energy from the sun.	
Food provides animals with	5-PS3-1 (NG)	● Food chain	Use a model to describe that energy	

materials needed for energy and to maintain body warmth and for motion.	3.1.7.A8 (SAS)	• Food web	in animal's food was once energy from the sun.	
Plants acquire their material for growth primarily from air and water.	5-PS3-1 (NG) 5-LS1-1 (NG) 3.1.7.A8 (SAS)	• Argument • Evidence • Minerals	Using evidence, present an argument that plants get the materials they need for growth primarily from air and water. **Activity: Biodomes Engineering Design Project** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	
Animals and plants alike take in gases and water and release waste matter into the environment; animals must take in food, and plants need light and minerals.	5-LS2-1 (NG) 3.1.7.A8 (SAS)	• Ecosystem Food webs	Construct and communicate models of food webs that demonstrate the transfer of matter and energy among organisms within an ecosystem. **Activity: Dissecting Owl Pellet** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20 **Activity: Weaving the Web** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	
Organisms can survive only in environments in which their particular needs are met.	5-LS2-1 (NG) 3.1.6.A2 (SAS)	• Researchable • Species • Web of life	Ask researchable questions about the ways organisms obtain matter and energy across multiple and varied ecosystems. **RCC: Lesson 13** **RCC: Lesson 22** **Activity: Dissecting Owl Pellet** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20 **Activity: Weaving the Web** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	
A healthy ecosystem is one in which	5-LS2-1 (NG)	• Ecosystem	Construct a model of a food web to	

multiple species of different types are each able to meet their needs in a relatively stable web of life.	3.1.6.A2 (SAS)	• Transfer energy	demonstrate the transfer of matter and energy among organisms within an ecosystem. **RCC: Lesson 15** **Activity: Dissecting Owl Pellet** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20 **Activity: Weaving the Web** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	
Newly introduced species can damage the balance of an ecosystem.	5-LS2-1 (NG) 3.1.6.A2 (SAS)	• Ecosystem • Invasive • Noninvasive • Species • System	Identify a newly introduced species to an ecosystem and provide evidence that it is an invasive species or noninvasive species. **Activity: Dissecting Owl Pellet** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20 **Activity: Weaving the Web** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	
Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.	5-LS2-1 (NG) 3.1.6.A2 (SAS)	• Cycles • Matter • Microbes	Use models to trace the cycling of particles of matter between the air and soil and among plants, animals, and microbes. **Activity: Dissecting Owl Pellet** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20 **Activity: Weaving the Web** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	
Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.	5-LS2-1 (NG) 3.1.6.A2 (SAS)	• Decomposers • Decomposition • Microbes	Use models to describe how decomposition eventually restores (recycles) some materials back to the soil for plants to use.	

			Activity: Dissecting Owl Pellet http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20 **Activity: Weaving the Web** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	
A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.	5-LS2-1 (NG) 3.1.6.A2 (SAS)	• Ecosystem • Components • System • System models	Describe a healthy ecosystem as a system in terms of the components and interactions. **Activity: Dissecting Owl Pellet** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20 **Activity: Weaving the Web** http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	
			http://ngss.nsta.org/DisplayStandard.aspx?view=topic&id=20	

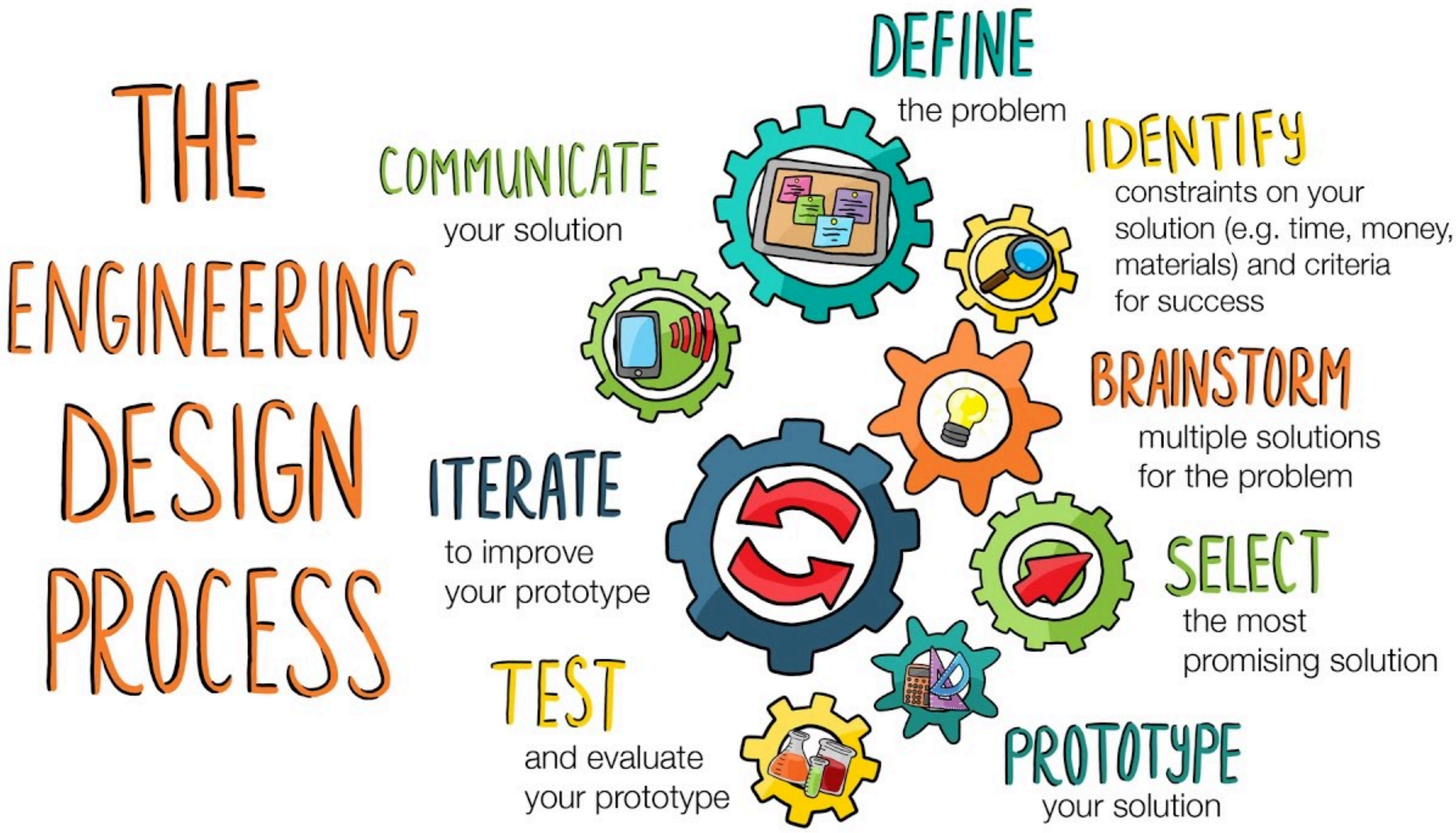
5.Matter and Energy in Organisms and Ecosystems

Students who demonstrate understanding can:

5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [Clarification Statement: Examples of models could include diagrams, and flow charts.]

5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]



Video to accompany chart: https://www.youtube.com/watch?v=MAhpfFt_mWM

Resources to use when integrating Engineering Design:

- TeachersPayTeachers: Search "NGSS Engineering Design" and use resources already available
- PBS Teaching NGSS Engineering Design Through Media: https://witf.pbslearningmedia.org/collection/ngss-eng-k-5/#.WzEeradJFPY
- https://www.teacherspayteachers.com/Product/Engineering-Design-Process-Posters-Freebie-888579 (Poster Freebie)