Curriculum Sample Template – 8 Pages Max. (12 pages for integrated ELA sample)

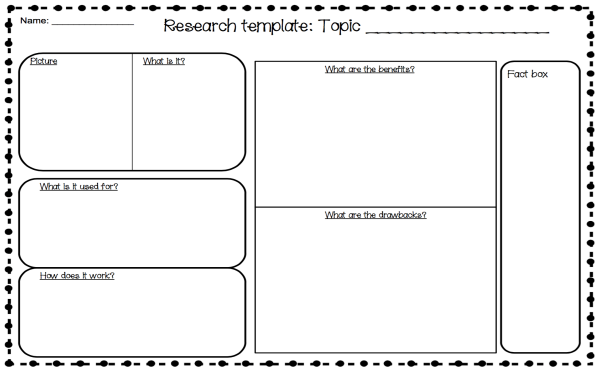
Grade Level	Fourth Grade	**Content Area**	Science
Course Title (grades 9-12 Only)	N/A		
Expected Prior Knowledge *List the knowledge/skills mastered earlier in the year that are foundational to the mastery of the Required Standard(s).*	Synergy students will engage in inquiry based science throughout the school year, science safety will be taught prior to this lesson, they will have been taught to compare and contrast, students will understand how to write short responses. Students will be familiar working with the engineering process.		
Alignment to Program of Instruction *Describe how the methods of instruction found in this sequence of lessons align to the Program of Instruction described in the application package.*	Synergy teachers will engage students in cooperative learning structures throughout the lesson. Lessons will be built using the Gradual Release of Responsibility. Synergy teachers will monitor student understanding and adjust instruction based upon student responses. Instructional strategies such as cooperative learning, differentiation, questioning, and meta-cognition will be used consistently during instruction. Science will consist of hands on inquiry based lessons and lessons that incorporate English Language Arts Standards.		
Standard Number* and Description *The standard number and description of the Required Standard(s) being instructed and assessed to mastery in the curriculum sample.*	**4th grade Strand 4, Concept 3, PO 3 Analyze the effect in which resources (e.g., natural gas, minerals) may have on an environment.** **4th grade Strand 4, Concept 3, PO 4 Describe ways in which resources can be conserved (e.g., by reducing, reusing, recycling, finding substitutes).**		
Materials/Resources Needed *List all items the teacher and students will need for the entire sequence of instruction (excluding common consumables)*	Graphic organizers, article *Renewable and Nonrenewable Energy*, orange juice containers, foam balls, index cards, computer paper, popsicle sticks, string, tape, straws, portable fan, small Dixie cups, centimeter cubes, scissors, notebook, skewers,		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Cluster, Standard (e.g., 6.EE.B.7). For HS Math, use Conceptual Category-Domain, Cluster, Standard (e.g., A-REI.C.6).*

Lesson (add as needed)	**Instructional Strategies -** *List and describe teacher actions, lesson by lesson, which will provide students with opportunities to engage the grade-level rigor defined by the Required Standard(s). Indicate alignment of instructional strategies to specific component(s) or content/skill(s) of the Required Standard/component.*	**Student Activities -** *Describe the activities, lesson by lesson, in which students will engage to allow them to master the grade-level rigor defined by the Required Standard(s). Indicate alignment of student activities to specific component(s) or content/skill(s) of the Required Standard/component.*
1	**Objective: The students will learn about renewable and nonrenewable resources and their effects on the environment.** **Introduction:** Teacher will switch the light switch on and off. Have you ever thought of what it takes for everyday for us to have light in our houses or schools. Today we will learn about different energy sources. **I-Do (Modeling):** The teacher will review with students previous background knowledge on conserving resources through reducing, reusing and recycling. The teacher will present the article Renewable and Nonrenewable Energy and tell students we will be describing ways that conserving resources is related to renewable and nonrenewable energy. The teacher posts a chart defining renewable and nonrenewable. I am going to read the first paragraph. As I read I will be looking for information. I want to find different energy sources and if they are renewable or nonrenewable. The teacher will read the paragraph out loud and underline key information about resources. The teacher will read the second paragraph and ask students to help identify the resources. **We Do (Guided Practice):** Students will continue to read the text to find additional energy sources. Each student will underline the information they acquire from the text. **Check For Understanding:** The teacher will check for students highlighting. The teacher will question students to ensure that they know the difference between renewable and nonrenewable. If 80% of the students get it then they move to independent practice and the other 20% assemble in a small group for re-teaching or more we-do practice. **You-Do (Independent Practice):** The teacher will give students a Venn diagram to fill out independently categorizing characteristics that are similar and different between the different types of energy. **Discussion Circle:** Using your Venn Diagram tell your partner one difference between the energy sources. Students will return to discussion circle to share their answers.	Students will define reduce, reuse and recycle Students will suggest items for the teacher to underline. Students will partner read the text. Students will highlight energy sources. Students will determine if the sources are nonrenewable or renewable. Students will fill out their Venn Diagram. Students will use the Mix and Freeze structure to share answers with members of the class.
2	**Objective: The students will learn about substitute energy sources and how resources can be conserved.** **Introduction:** Yesterday we talked about renewable and nonrenewable resources. Another category is alternative energy resources. It is a type of renewable resource. Renewable resources can be conserved. Some of you may notice that a lot of shopping centers or even parking lots have solar panels.	

	Solar panels use the energy that comes from the sun. Today we are going to investigate another type of energy, wind energy. **I-Do (Modeling):** Teacher will show a clip from https://www.brainpop.com/science/energy/windenergy/. What were some reasons from the video that we may want to use wind energy? How does conserving energy through reducing, reusing and recycling apply to wind energy? Today we are going to conduct an investigation to determine if we can design a windmill that will perform work. When I say work I mean that our windmill will be able to use its energy to perform a job for us. In the experiment we will conduct over the next few days we will design a windmill that can lift a cup full of weights. Today you will draw a technical drawing in your science notebook. Remember your drawing must be Accurate, Big, Colorful, and Detailed. (The ABC's of technical drawings will be posted). Think about what you have observed about windmills and what you may need to add to your design. Remember our first drawing is just a start when we are designing we may need to revise our design after testing. **We Do (Guided Practice):** The teacher asks students to discuss what key elements that their design should include and why. What shapes they will use? The length of the blades compared to the windmills base. The teacher will have students share their ideas with the class. **Check For Understanding:** The teacher will ask probing questions to the students as they construct their windmill. How will the length of the blades effect the windmills ability to perform the job we need done? Will the blades go straight on the foam ball or will you need to angle them? How many blades did you add to your design? Which materials did you select for your design? **You-Do (Independent Practice)**: The teacher will have students work with a partner to design a windmill that will lift the greatest amount of weight (when the windmill spins it should lift the cup with weights). They will be able select a variety of items that will best suit their design. **Discussion Circle:** What information was most needed to help you produce the best windmill design? The teacher will have students share their ideas with the group. Students will defend their point of view.	Students will Think, Pair, and Share response with a partner. Students write on white boards reasons to use wind energy. Students write on white boards ways wind energy can help conserve. Students will talk with partners about their ideas for the windmill design. Students will draw their technical drawing in their notebook. Students will agree or disagree with classmates and give reasons for their claim. Students will construct their windmill with a partner. Students will use Stand Up Hand Up Pair up to share ideas with classmates.

3	**Objective: The students will design a windmill to perform a job and reduce the need for traditional energy sources.** **Introduction:** Yesterday we planned and built our windmill designs. They look amazing but we need to make sure they can perform the job we need them to do. Today we will use these fans (teacher will have portable fans available) so we can use their energy to work for us. **I-Do (Modeling):** The teacher has a windmill that she created as an example. To test your windmill you will bring your windmill over to one of the fans since our classroom doesn't have wind available. The fans will act as our wind source. I will make sure that the skewer I used to attach the blade goes straight through to the back of my windmill. On the back side I should attach a string that is attached to the Dixie cup. If my windmill works properly as it spins the string will wind around the skewer and lift the cup. After I observe the windmill is able to lift the cup I can start adding weight to determine how effective my design is. The teacher will turn on the fan and show the students how to test their design. We have used the engineering process throughout the school year so what should I do if I am unhappy with the results my design can produce? Teacher will share answers. That is correct. If our design doesn't work we make revisions that may include changing materials and retest. **We Do (Guided Practice):** The teacher will have students finish building their windmills if they need additional time. When the design is ready to test students will use the fans to test. The students will determine how many weights their design can lift. They will post results on a class chart. After they test the students will be able to redesign or make adjustments to their design. After adjustments are made students may retest their design. **Check For Understanding:** Teacher will ask probing questions. If your design is not working what adjustment could you make before retesting? How did the material you select effect your windmill's ability to spin smoothly? What might you change to increase the amount of work your windmill could produce? **You-Do (Independent Practice):** Now that we have seen that wind energy could be used as an alternative energy source answer the following questions: How would adding wind energy as a more widely used energy source impact our lives? How would this help to conserve energy resources?	Students will use numbered heads to come up with a team answer. Students will test their design. Students will log their designs effectiveness. Students will modify design. Students will retest their design. Students will write a short response to "How would adding wind energy as a more widely used energy source impact our lives?" How would this help to conserve energy resources?

4	**Objective: Students will create an advertisement to propose which energy source is best for the environment and how its use will impact the environment and help conserve resources.** **I-Do (Modeling):** Over the past few days we have been learning about conserving resources and what impact they have on the environment. After everything we have learned this week you are going to write an advertisement to convince your readers which resource you think should think has the least impact on the environment. The teacher will show the graphic organizer that students will fill out. The teacher will have a graphic organizer for which she has selected coal as the resource. The teacher will have students read along with her the items she has filled out in her chart. After I have my graphic organizer filled in I will use key points to make a poster to let others know why I chose this energy source as the least harmful to the environment. **We Do (Guided Practice):** The teacher will have students pair up to research a resource on the computer They will fill out the graphic organizer. (This may take several class sessions). **Check For Understanding:** Teacher will check student's graphic organizers for progress and to determine which students need additional support. **You-Do (Independent Practice):** The teacher will have students use their knowledge from the collection of research to create a poster to show the resource that they selected. **Discussion Circle:** Today we will use our posters to convince our partner that our resource is least harmful to the environment.	 Name: _____ Research template: Topic _____ Picture What is it? What are the benefits? Fact box What is it used for? What are the drawbacks? How does it work? Students will work in partnerships to complete graphic organizer and research. Students will create an individual poster arguing why their resource is least damaging to the environment and how it can be conserved. Students will share posters during discussion circle.
S.A.	*Provide an opportunity for the student to complete the summative assessment items which is clearly separate from instruction and guided or independent practice, and in which the student is assessed independently. In the Student Activities column, provide a brief description of the summative assessment (S.A.) items that will allow students to demonstrate mastery of the rigor of the Required Standard(s)/components, and the context in which the items will be administered.*	The summative assessment includes 4 items that will test student knowledge and understanding of the standards on the effect in which resources (e.g., natural gas, minerals) may have on an environment and how they can be conserved. In order to demonstrate proficiency students will need to apply their knowledge of these standards in questions and writing. Students will be highly proficient when they understand the standard well enough to propose alternatives for energy sources.

Summative Assessment Items and Scoring: *Below, provide at least three Summative Assessment Items that together accurately measure student mastery of the application of the content and/or skills as defined by the grade-level rigor in the Required Standard(s). For each assessment item, provide an answer key or scoring rubric which clearly describes how assessment items are to be scored and how points will be awarded, such that mastery of the application of the content and/or skills as defined by the grade-level rigor in the Required Standard is clearly demonstrated by an acceptable score.*

Summative Assessment Item 1 (clearly identify answer key/scoring rubric, and acceptable score): (1 pt. for correct answer) 1 point total

Which of the following best conserves natural resources that are used to make a television?

A. repair your broken television
B. buy a television that is on sale
C. throw old televisions in the trash
D. donate a new television to your school

Summative Assessment Item 2 (clearly identify answer key/scoring rubric, and acceptable score): (1 pt. for correct answer) 1 point total

Electricity to play your radio can be made using renewable or nonrenewable resources.

Which of the following resources are renewable?

A. wind and oil
B. wind and sunlight
C. natural gas and oil
D. natural gas and coal

Summative Assessment Item 3 (clearly identify answer key/scoring rubric, and acceptable score): (1 pt. for each way resources can be conserved) 2 points total

List and describe two ways in which resources can be conserved. Sample Answers: In order to conserve resources alternate energy sources such as wind or solar power can be used. Another way to conserve resources is to recycle.

Summative Assessment Item 4 (clearly identify answer key/scoring rubric, and acceptable score): (1 point for opening statement, 1 point or closing statement, 1 point for each detail, 1 point for naming a source) 6 points total

Write a short essay that includes 3 details to tell the drawbacks of relying on fossil fuels for energy and propose a better energy source. Cite your evidence.

Sample Answer: Examples of details could include fossil fuels cause air pollution. They are limited and non-renewable. They could cause acid rain. They can cause damages to the environment. Examples for better energy resources could include: solar power, hydropower, wind power.

Scoring Guide

Highly Proficient	10/10	100%
Proficient	8/10	80%
Minimally Proficient	6/10	60%
Not Proficient	<6/10	<60%