Candy Collector

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment.

Earth HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

Earth HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. (reinforcing)

Environmental Science HS-EVS1-1 Analyze and interpret data to identify the factors that affect sustainable development and natural resource management in Louisiana. (reinforcing)

Solar Oven

K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.

NGSS K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

NGSS 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen. (reinforcing – this isn't really covered as written unless you are adding discussion about air and food molecules absorbing solar energy, molecules moving faster, the thermal energy heating the food, drawing a model of the oven with arrows to show how the sun light enters, molecules are moving, etc.)

8-MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

8-MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

Chemistry HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

Physical Science HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles/objects and energy associated with the relative positions of particles/objects. (reinforcing, will meet the standard if students are drawing a diagram of their solar oven and labeling the flow of energy from radiant to thermal)

Physical Science HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

Physics HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles/objects and energy associated with the relative positions of particles/objects. (reinforcing, will meet the standard if students are drawing a diagram of their solar oven and labeling the flow of energy from radiant to thermal)

Physics HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

UV Bead Bracelet/Solar Chameleon

K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.

Nature Print Paper

K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.

Today in Energy (Energy I Used Today)

K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. (reinforcing)

Getting the Oil Out

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment. (you might discuss this during your oil activities)

5-PS1-3. Make observations and measurements to identify materials based on their properties. (reinforce)

8-MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. (only if you are discussing how petroleum is formed)

Earth HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (reinforcing if you are discussing how we use petroleum)

Environmental HS-EVS1-2 Obtain, evaluate and communicate information on the effectiveness of management or conservation practices for one of Louisiana's natural resources with respect to common considerations such as social, economic, technological, and influencing political factors over the past 50 years. (reinforcing)

Environment HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (reinforcing if you are discussing how we use petroleum)

Environmental HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. (you might discuss this while comparing oil rig designs or if you discuss preventing or cleaning up oil spills)

Life HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. (you might discuss this while comparing solutions for preventing or cleaning up oil spills, or discussing technologies used in drilling to prevent spills or contamination of water table)

Petroleum Ponder

8-MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. (reinforcing)

Earth HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (reinforcing if you are discussing how we use petroleum)

Environment HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (reinforcing if you are discussing how we use petroleum)

Energy House

NGSS K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. (reinforcing)

2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

5-PS1-3. Make observations and measurements to identify materials based on their properties. (reinforced if just building a house, if you're actively looking at the different insulation materials and comparing them you'll meet this standard)

NGSS 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

NGSS 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. (reinforcing. As written, we don't identify ways to improve the model Energy House. Will meet the standard if you discuss the insulation and offer an opportunity for students to redesign and change their insulation and test again.)

8-MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

Sidekick Circuits

4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

8-MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

Chemistry HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. (not reinforcing but MEETS this standard)

Physical Science HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles/objects and energy associated with the relative positions of particles/objects.

Physical Science HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. (not reinforcing but MEETS this standard)

Physics HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles/objects and energy associated with the relative positions of particles/objects.

Physics HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. (not reinforcing but MEETS this standard)

Nuclear – How a Reactor Works

4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.

7-MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

8-MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. (reinforcing)

Physical Science HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles/objects and energy associated with the relative positions of particles/objects.

Physics HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles/objects and energy associated with the relative positions of particles/objects.

Nuclear Information

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment.

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.

Chemistry HS-PS1-8. Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.

Chemistry HS-PS3-6. Evaluate the validity and reliability of claims in published materials about the viability of nuclear power as a source of alternative energy relative to other forms of energy (e.g., fossil fuels, wind, solar, geothermal). (reinforcing, may be covered in your presentation/discussions)

Earth HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (reinforcing if you are discussing how we use uranium)

Environmental HS-EVS1-2 Obtain, evaluate and communicate information on the effectiveness of management or conservation practices for one of Louisiana's natural resources with respect to common considerations such as social, economic, technological, and influencing political factors over the past 50 years. (may be covered in your presentation/discussions)

Environment HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (reinforcing if you are discussing how we use uranium)

Environment HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. (you may cover this if you discuss the different types of reactors or if you compare using nuclear energy versus other sources for electricity generation)

Physical Science HS-PS1-8. Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.