

Unit Design Template

Subject: 7th Grade Science

Unit: Energy Resources

Part I: Clarity of Learning Targets

What are the grade level indicators that go with this unit? Place a star next to the grade level indicators that are Power Indicators. Are the indicators in student friendly language? Place the level of Bloom's Taxonomy next to each Power Indicator.

- A.) describe how renewable and nonrenewable energy resources can be managed and protected (ex. solar, geothermal, nuclear, fossil fuels). (Ess. Question #1) (Factual, Understand)
- B.) explain that fossil fuels, which take millions of years to form, originally came from the sun. (Ess. Question #1) (Factual, Understand)
- C.) explain that renewable energy sources (ex. wind, sun, water) will always be available. (Ess. Question #2) (Factual, Understand)
- D.) describe how electric energy can be made from a variety of sources (ex. sun, wind, and coal). (Ess. Question #3) (Conceptual, Understand)
- E.) explain how the needs and values of a culture influence how their technology is developed. (Ess. Question #4) (Conceptual, Understand)
- F.) recognize that science can answer some questions and technology can only solve some human problems. (Ess. Question #4) (Factual, Remember)
- G.) design and build a product or create a solution to a problem given two limits (ex. limits of cost and time or supply of materials and environmental effects). (Ess. Question #3, 4) (Metacognitive, Create)

What are the Big Ideas that go with this unit?

1. Non renewable resources are limited and must be managed wisely.
2. Renewable energy sources are available indefinitely.
3. Moving water, steam, or wind turns turbines which drive generators to produce electricity.
4. All countries have different needs and limitations that affect their development of technology.

What are the Essential Questions that go with this unit?

1. How can we wisely manage our energy resources?
2. Why are some energy resources available indefinitely?
3. How are energy sources used to produce electricity?

4. How do advances in technology in various cultures create competition between the environment and business?

What strategies will we use in order to make learning targets clearer for all students, before, during and after instruction? How will you communicate the learning indicators to students?

-Student handout

- Rate their understanding of the “I Can” statement before, during, and after instruction.
- Match the classroom activity with the “I Can” statement
- Smarboard presentations-The header will be the “I Can” statement
- Posters with the Essential Questions for the unit

Strategies for making learning targets clearer for students

- ✓ At the beginning of a unit, share the Big Idea or Essential Question with the students. Once you have taught a lesson, refer to the Big Idea or Essential Question and have the students make connections between the lesson and the Big Idea or Essential Question.
- ✓ Pose the Essential Question throughout or at the end of the unit. Have the students answer the Essential Question in their own words. The goal in this case is for the students to be able to respond to the Essential Question with the Big Idea stated in their own words.
- ✓ Share the grade level indicator with the students before, during, and after the lesson. Make connections between the grade level indicator and the Big Idea/Essential Question.
- ✓ Have the students summarize what they have learned in an exit slip.
- ✓ Introduce the language of a rubric to students by asking them what they already know and then linking their thoughts to the main concepts in the rubric.
- ✓ Create rubrics that are in student friendly language.
- ✓ Teach students how to use the rubric to evaluate models of strong and weak work samples.

Part II: Feedback and Assessments (Formative and Summative)

How will we provide students with feedback throughout the unit?

What formative assessments will we use? (Non-graded assignments that check for understanding and provide feedback to the students) Incorporate the 7 Strategies of Assessment for Learning here.

- Bell ringers (warm-up)-star, question, side ways arrow symbols
- “I Can” handout: Entire unit
- Windmill project ??
- Fly swatter activity
- **Section 1** Fossil fuels: Neon cards-students hold up oil, gas, and coal cards
- Exit slips

What I have learned....

Section 2: Renewable sources of energy-smartboard slide with pictures of solar energy, pg. 166

Section 3: Nuclear energy-common thread between how all energy sources can be transferred into electrical energy (transfer of energy)

To create electricity, we need a turbine to run a generator. How do we use the following energy resources to make the turbine spin?

- Wind
- Coal
- Nuclear

What will you do with the results of the exit slips?

- Review lesson

Ideas:

- Have the students trade and grade or self assess
- Snowball fight activity
- Have the students place their paper on the board under the self-assessment symbol

What summative assessments will we use? (Graded, evaluative assessments)

- Quizzes-1-2
- Unit test
- Darvill website-energy sources (grade the chart)
- Alternative energy house
- Jigsaw
- Inspiration/graphic organizer

Part III: Instruction and Student Activities

What instructional and student activities will we use for this unit? These activities should directly align with the indicators and assessments.

- Windmill project
- Fly swatter activity
- Brainpop
- Videos-Video field trip, Bill Nye on transportation, Bill Nye on Nuclear Energy, The Chernobyl video?
- Energy wheel
- Plotting pollution activity (Chernobyl)
- Fossil fuel jigsaw
- Computer lab-inspiration, Darvill energy resources/websites