Non-conventional sources of energy

80MINUTES

Overview: in this lesson, students will be challenged with an optimization problem. they will identify a town of india that has decided to replace coal, their current source for electricity, with more sustainable energy sources. in designing that town's sustainable energy future, students must consider the geographic constraints of various renewable energy options–wind energy, hydroelectric power, geothermal energy, and solar energy by locating the town on google earth search and studying demography.

subject/topic:

chemistry/environmental chemistry

learning objectives:

- students will examine some of the benefits and drawbacks to using renewable energy sources instead of coal.
- students will explore the geographic conditions that favor or restrict the use of various renewable energy technologies in a particular place.
- students will create an optimal renewable energy plan for a a specific town that

grade level:

6-7th grade

lesson summary:

- engage: why might we want to replace fossil fuels with renewable energy sources to power our cities?
- explore: what are the benefits and drawbacks of different renewable energy technologies?
- what are the geographical conditions required for using each type of renewable energies
- explain: strategize an optimal renewable meets specific constraints and criteria. •
- energy plan for a selected town
- revise: discuss findings in small groups.
- apply: strategize to replace conventional sources of energy by unconventional sources of energy

materials needed:

- access to google earth.
- student copies of the
- study paper - conventional sources of energy
- student internet access.

inquiry:

- strategy to replace conventional sources of energy by un conventional sources of energy

sustainable development goals: culminating task/assessment:

- students will locate a town allotted to them on google earth and understand the demography of the place. they will apply their knowledge of geographical requirement for use of unconventional

source to strategize a sustainable energy plan . gather evidences of various other places where the selected source of energy is successfully used discuss the reasons for the success story for the place .

lesson plan

engage (20 minutes) print out pages 1-2 of the for each student.
https://www.calacademy.org/sites/default/files/assets/docs/pdf/flipsideenergy_fossilfuels_scienceextswdiagrams.pdf

explore (20 min) 1.prompt students to complete the see, think,fill in the benefits and drawbacks of fossil fuels chart on page 2

explain (30 min) sharing video of renewable sources of energy
http://www.calacademy.org/educators/renewable-energy-clean-tech-solutions
students go through the given study material and fill up the chart for advantages and disadvantages in the shared print of the pdf
https://www.calacademy.org/sites/default/files/assets/docs/pdf/flipsideenergy_renewablessciencetextswdiagrams_small.pdf

teacher shares a google voyager story future of energy

https://earth.app.goo.gl/h4ftup

students research the success stories of the towns/cities using unconventional sources of energy. they strategize a plan for sustainable energy model for their allotted town . they present google project containing following information

1. location and demography of the town allotted through google search
2. plan for unconventional source of energy chosen

3. using following google map to pin some cities / town using the source successfully https://www.google.com/maps/d/edit?mid=1xqmk-ogpan73hrj4bylvwxzi1tcrqy3n&usp=sharing

Potential energy maps of india
Solar energy
https://www.researchgate.net/profile/Kunwar_Pal6/publication/315065896/figure/fig2/AS:839188802977797@1577089610263/Map-showing-solar-energy-potential-of-India-7.ppm
Wind energy
https://www.evwind.es/wp-content/uploads/2014/05/india-wind-atlas-672x372.jpg
Geothermal energy
https://www.tutorialspoint.com/general_knowledge/images/geothermal_map.jpg

revise (10 min) in their small groups, ask students to discuss the following questions: • best strategy to replace non renewable sources of energy with renewable sources of energy

evaluate: culminating task rubric

knowledge content student demonstrates mastery of key student demonstrates mastery of key concepts -renewable and non renewable sources of energy, student	demonstrates mastery of key student demonstrates mastery of key concepts -renewable and non renewable sources of student demonstrates partial understanding of key concepts concepts -renewable and non renewable sources of energy, their	exceeding meeting approaching beginning student lacks understanding of key concepts concepts -renewable and non renewable sources of energy, their advantages their advantages ,disadvantages and conditions required	claim and evidence student provides a clearly stated claim naming many in success stories of use of unconventional sources of energy.identifying the most important

reasons for success giving several pieces of specific evidence. student is able to explain how each piece of evidence supports their claim and strengthens their argument	naming many in success stories of use of unconventional sources of energy.identifyin g the most important reasons for success giving 1-2 pieces of specific evidence. student is able to explain how each piece of evidence supports their claim and strengthens their argument	provides a clearly stated claim naming many in success stories of use of unconventional sources of energy.identifyi ng the most important reasons for success giving 1-2 pieces of specific evidence. student is not able to explain how each piece of evidence supports their claim and strengthens their argument	clearly stated claim naming many in success stories of use of unconventional sources of energy.identifyi ng the most important reasons for success.eviden ce is either absent or does not support the student's claim.
presentation presentation clearly and creatively communicates the goals, strategy and successes of one use of renewable source of energy why this is the best treaty and the ways that other ' strategies fall short. action steps encouraging others to get involved are included.	presentation clearly and creatively communicates the goals, strategy and successes ofuse of renewable source of energy why this is the best treaty and the ways that other ' strategies fall short	presentation clearly and creatively communicates the goals, strategy and successes use of renewable source of energy y but does not give reasons why this is best treaty	information about the goals, strategy and successes of use of renewable source of energy does not include reasons why this is the best treaty and the ways that other ' strategies fall short. action steps do not encourage others to get involved are included.
energy, their advantages ,disadvantages and conditions require	advantages ,disadvantages and conditions require	,disadvantages and conditions require	
student provides a clearly stated claim	student	student provides a	

additional resources

https://www.evwind.es/topics/news-menu/other-renewables
https://www.mapsofindia.com/maps/nonconventional/

https://www.smithsonianmag.com/innovation/interactive-mapping-renewable-energy-around-world-180947914/?no-ist

credits

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