Science 30	Unit D: Energy and the Environment
Lesson 3 - Sustainability	84 mins

Sustainability

 capable of being maintained at length without interruption, weakening, or loss of essential characteristics (such as matter and energy) 	 Ecosystems, sun shine. Etc. not sustainable - Garbage Dumps, Fossil Fuels
Sustainable Development: the development of industrial and natural resources that meets the needs of the present generation without compromising the ability of future generations to meet their own needs	 Okotoks Alberta - restricts development to ensure sustainability

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Types of Sustainability

 ecological sustainabi way as to not advers biodiversity of organi 	lity: functioning in such a ely affect air, water, land, sms, or natural ecosystems	An energy technology that demonstrates ecological sustainability is based on a renewable energy source maintains the quantity of surface water maintains the quality of surface water does not contribute to acid deposition does not contribute to the presence of persistent organic pollutants in water, soil, or air does not contribute to the presence of heavy metals in water, soil, or air recycles liquid and/or solid waste products does not contribute to deforestation or habitat destruction does not contribute to emissions of particulate matter does not contribute to emissions of particulate matter does not contribute to the destruction of fragile ecosystems does not contribute to the destruction of fragile ecosystems does not contribute to the release of ionizing radiation does not contribute to the release of radioactive waste produced
 societal sustainability support adequate livi members; includes h respect and maintena 	y: the ability of a group to ng standards for its ousing, health care, and ance of cultural values	An energy technology that demonstrates societal sustainability does not decrease life expectancy through exposure to pollution stimulates a healthy economy, enabling adequate health care requires a highly trained workforce requires the workforce to adapt to change through continuous training reduces excessive land use (e.g., urban sprawl) encourages per capita energy consumption to be reduced stimulates a healthy economy, enabling affordable housing requires co-operation of diverse cultural groups in decision making
 economic sustainabil employment opportu goods and services i decrease the availab 	lity: the ability to provide nities and have access to n a manner that does not ility of natural resources	An energy technology that demonstrates economic sustainability supports full-time employment for the population enables a higher proportion of the workforce to be paid reasonable wages has a relatively low cost per megajoule (MJ) enables development of other industry or opportunity reduces the import of energy, contributing positively to the GDP enables the export of energy, contributing positively to the GDP can be used in a variety of locations that are well-suited to industry allows for continuous, around-the-clock production does not decrease the availability of natural resources

Science 30 - Lesson 39 - Unit D - Sustainability

Name:

- 1) Identify the natural resource that was chosen when the town of Okotoks established limits on its maximum size.
- 2) Describe some of the strategies used to ensure the long-term sustainability of the resource identified in your answer to question 1.

3) Identify the renewable-energy technologies used to meet the energy needs of municipal buildings in Okotoks.

4) Describe how the design of municipal buildings has allowed for renewable-energy technologies to be used.

5) Drake Landing Solar Community in Okotoks has taken a unique approach to utilizing the Sun's energy. Obtain the "Drake Landing Solar Community" handout. Match the labels provided on the handout with locations on the diagram of the energy capture and distribution system used at Drake Landing.

6) Describe other features of the homes in Drake Landing Solar Community that enable them to reduce annual greenhouse emissions by 83%.

- 7) Sustainable development involves consideration of other aspects of human activity in addition to energy. Communities like Drake Landing Solar Community can be rated in terms of how close they come to perfectly illustrating sustainable development. A score of 10 out of 10 represents the ideal sustainable-development community, and a score of 0 represents the complete opposite.
 - a. List the activities designed to reduce environmental impact in which the citizens of Okotoks participate.

b. Determine a score out of 10 for the Drake Landing Solar Community in terms of its ability to incorporate sustainable development. Justify your score.

c. Determine a score out of 10 for the community where you live in terms of its ability to incorporate sustainable development. Justify your score.