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| Teacher:  | Subject/Grade: 7th grade students |
| Objective/Standard: Teach students the definition of sustainability. Teach students how to live a more sustainable life and why this is crucial for our future. Teach students about renewable types of energy and get students thinking about how future sustainable cities could look like. | Materials: Color pencils, paper, markers, pencils, pens, crayons |
| Length of Lesson: 1 hour and a half | Goal: Students at the end of the lesson will understand the definition of sustainability and how to live a more sustainable life. At the end of the lesson, students will be assigned a design your own future, sustainable city project that they must complete. In their design, to assess their understanding of the material, they must implement the main topics introduced in the lecture portion of the class. |

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| Engage: *Video/ present problem/ questions to hook students.* * *Today, we are going to talk about sustainability. We are going to see this concept means and discuss whether we think our lives and cities are sustainable. First, all students will take a carbon footprint calculator assessment online found in this link:* [*https://www.conservation.org/carbon-footprint-calculator#/*](https://www.conservation.org/carbon-footprint-calculator#/)
* *This will get students thinking about the sustainability of their lifestyles*
* *Ask students the following questions regarding the activity:*
	+ *Were you surprised by your results?*
	+ *What do you think you can do to decrease your carbon footprint?*
	+ *What activities that you currently do have kept your carbon footprint at a low level?*
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| Explore:  *Ask question to gather student knowledge- hands on activity students can do to activate prior knowledge and begin to connect to new learning** *Begin asking essential questions to students:*
	+ *What is sustainability?*
	+ *Why is it important to live a sustainable life?*
	+ *Do you think YOUR life is sustainable? How can you tell if your life is sustainable?*
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| Explain: *Meat of the lesson- where you teach what you want them to learn** *Definition of sustainability:*
	+ *Sustainable development : “meets the needs of the present without compromising the ability of future generations to meet their own needs”.*
* *Definition of ecological carbon footprint:*
	+ *Our ecological footprint allows us to calculate how much pressure our lifestyle is putting on the planet.*
* *Teach students ways they could make their live more sustainably*
	+ *Reduce, reuse, recycle*
	+ *Reduce plastic use*
	+ *Boycott products that endanger wildlife*
	+ *Buy organic foods when you can*
	+ *Conserve water whenever possible*
	+ *Drive less or drive green instead*
	+ *Reduce meat consumption*
* *Show video:” Sustainability in everyday life” (*[*https://www.youtube.com/watch?v=kZIrIQDf1nQ*](https://www.youtube.com/watch?v=kZIrIQDf1nQ)*)*
	+ *Key points from video: use LED lights instead of regular lights ( they use less energy), ride your bicycle instead of driving your car, look at clothing labels when shopping and buy fair trade products.*
* *How can cities in the future be more sustainable?*
	+ *Cities can grow their own organic foods. Cities can help cut food waste by growing perishable produce right in town, boosting individuals’ connections to food and reducing spoilage-promoting lengthy transit distance and time.*
	+ *Promoting urban agriculture*
	+ *Finding ways to manage and reduce food waste*
	+ *Encourage city people to eat healthy diets; encourage people to consume less meat and eat organic, locally grown foods*
	+ *Reconnect cities with surrounding rural areas*
	+ *Utilize renewable energy in cities*
		- *Go over renewable types of energy:*
* *Wind Energy – wind turbine blades use the moving air to power an electric generator that supplies an electric current.*
* *Biomass Energy – produces energy and heat by burning crops like corn.*
* *Solar Energy – works by using photovoltaic cells to absorb sunlight that can then be converted.*
* *Hydroelectric Energy – leverages water to generate electricity using a turbine.*
* *Geothermal Energy – energy produced by underground steam and hot water reservoirs.*
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|  Elaborate: *Connect to real world- where or how will they see this concept in life** *Open up discussion again so students can make connections between what they learned and their everyday life*
* *Questions:*
	+ *When have you seen renewable energy being used in your everyday life?*
	+ *Which activities that you do on a daily basis are actually not sustainable? How can you change them?*
	+ *What are you going to do now to make your lifestyle more sustainable?*
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| Evaluate: *How will you assess that they learned it- project- quiz- daily question to gather that they are making progress.* * *Design a future sustainable city Project*
	+ *Students will partner up in groups of four to design a future, sustainable city*
	+ *For the project, the students will need to make a drawing of what their future city will look like and include a written portion that describes this future city*
	+ *Students will need to give this city a name. They will need to implement material from the class content to design this sustainable city. Students must think of these following questions when designing their cities:*
		- *How will you make your city transportation sustainable?*
		- *How will you manage your city’s use of energy?*
		- *How will you make your city’s food production and transportation sustainable?*
	+ *Students will present their design to the class*
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Sources:
<https://sustainability-innovation.asu.edu/sustainabilitysolutions/wp-content/uploads/sites/15/2016/06/Defining-Sustainability.pdf>

<http://cdn.worldslargestlesson.globalgoals.org/2016/06/Understanding-Sustainable-Living.pdf>

<https://ensia.com/notable/sustainable-cities/>

<http://www.fao.org/fao-stories/article/en/c/1260457/>

https://energycurriculum.com/topic/the-lesson-plan-renewable-energy-grade-5/