**GREENROOF [Step 4.1]**

This is the knowledge integration rubric used by the computer to score each student response and assign guidance.

**Key Ideas**

*Energy Transfer*: Energy from the sun (sunlight energy, light energy, solar radiation, solar energy) moves (transfers) from the sun to the plant through radiation (wave,ray, sun ray, space). …source and a destination

OR Energy is transferred from plant to animal

*Energy Transformation****:*** Energy from the sun is transformed (converted, changed) into heat energy when it reaches the roof (earth is fine)

OR Energy from the sun is transformed into chemical energy (usable energy, energy that plants can use, food energy, a different form of energy, energy for plants)

OR Energy from the sun, carbon dioxide and water are transformed into glucose (sugar, food).

*Energy Storage*: Energy (or chemical energy) is stored in glucose (sugar, food, plant, any parts of the plant)

*Energy Use:*Links 2 of the ideas:(a) Energy from the sun (light energy, sun rays, ) is absorbed (used, taken, transformed) by the plants instead of (b) being transformed into heat in the building’s roof which (c) keeps the building cool (or requires less use of AC)

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| Score | Criteria | Examples |
| 0 | Blank |  |
| 1 | Off-task | IDK |
| 2 | Scientifically non-normative OR irrelevant OR repeats the question | It helps reduce energy usage because you can get energy that you can use for your house through the plants |
| 3 | Partial link (see key links listed above) of normative ideas without a valid connection OR normative and non-normative ideas linked together | The sun gives light energy to the plants so they can photosynthisize and the plant give off oxygen and energy to the world. |
| 4 | 1 full link [okay if response also includes non-normative ideas, as long as not connected to link] | One day Brent and Emilio went to Walmart and thought they should randomly make a green roof, so they gathered all the supplies they needed and went back to their house. When they were done they observed the green roof. They noticed that the sun's light energy was being absorbed by the plants on the roof. They imagined that they can use the light energy from the sun as energy. They thought the plant turned the light energy to chemical energy. |
| 5 | 2 or more full links | The energy comes from the sun and transfers into chemical energy when it is absorbed by the chloroplast and then combines with water and carbon dioxide molecules to make glucose molecules. When there is no plants the roof will absorb all the light and heat energy warming the house causing them to use energy to cooling the house. |