

Fuel From Cactus

Topic or Concept

Plant materials can be converted into fuels.

Objective

Student will be able to determine whether or not alcohol distilled from cacti could be used as a substitute for gasoline.

<p align="center">Materials Available at Region 20 Living Science Materials Center</p>	<p align="center">Enrichment Activity</p>
<p>LM-73 Cacti (Type varies with availability)</p>	<p>Problem Would it be feasible to farm large plots of desert land with one or more of the many varieties of cacti and/or other succulents (such as agaves), for the purpose of large-scale ethanol and methanol production as one of the many possible answers to our energy crisis?</p>
<p>Not Available from Region 20 Living Science Materials Center</p>	<p>Procedures</p> <ol style="list-style-type: none"> 1. Grow a small desert plot in your yard or in school lab under grow lights, using a soil mixture of sand and rock. 2. Conduct experiments with several types of cacti. 3. Diligently record amount of weight increases due to growth. 4. Set up a fermentation vat and distillation apparatus. 5. Regulate heat of distillation with a thermostat, if possible. (Would it be possible to use city refuse from sewage treatment plant as fuel for still?) 6. Measure the amount of alcohol and weigh each type of cactus from which it came. 7. Tacheometrically measure the extracted alcohol in model engine (platinum base) as compared to gasoline. 8. Coordinate your efforts with school auto mechanics shop to conduct tests on automobile engines. 9. Compute yield of alcohol-to-weight of cactus. Determine how much desert land would have to be planted, with each type of cactus tested, to produce 1.5×10^{11} of alcohol per year. (This is the government estimation of gasoline used each year by U.S. consumers).
<p>Fermentation Wine Kit – contains special Yeast Ferment Vat etc. Tachymeter Model gas engine with fuel</p>	