

# Using Color to Enforce the Law



**STEM Ambassadors**

**Cristina Padilla-Cintron**  
*Cristina.Padilla-Cintron@pnnl.gov*

Scientists at PNNL are using the science of color to help enforce fuel tax law. Clear diesel is taxed to pay for roads and bridges and is used by commercial or passenger vehicles. Red-dyed diesel is not taxed because it is to be used by off-road vehicles only, like tractors and other heavy machinery. In the laboratory, scientists can use spectrophotometry to identify the specific fuel type and detect illegal use of red-dyed diesel. Spectrophotometry is a method to measure how much a chemical substance absorbs light, by measuring the intensity of light as a beam passes through the sample.



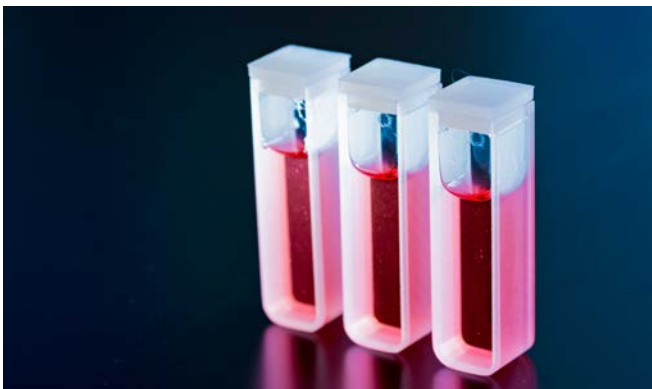
By detecting the illegal use of red-dyed diesel fuel, PNNL scientists are helping ensure taxes are collected correctly so roads, bridges, and other public transportation projects can be funded for the community.



For more information, visit:  
[www.pnnl.gov/stem](http://www.pnnl.gov/stem)



or email:  
[stem.education@pnnl.gov](mailto:stem.education@pnnl.gov)



*How do we see color?*

*How can we measure color?*

*How is this used to enforce the law?*