Incorporation of the GEMs item: ***A greener synthesis of creatine*** submitted by Carl S. Lecher into the General, Organic and Biochemistry (GOB) curriculum.

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Summary: This simple procedure for the synthesis of creatine is a student favorite, especially for student athletes. Creatine is commonly synthesized from sarcosine and cyanamide (used in excess) in the presence of concentrated ammonium hydroxide (NH_4OH). Students are led through this procedure and then are provided with suggestions to green the procedure by reducing the concentrations of both cyanamide and ammonium hydroxide. The effects of these changes can be investigated in the lab by looking at the effect they have on product yield.
In the context of the GOB course, this experience offers opportunity to discuss compounds containing nitrogen, synthesis of natural products, and the role of creatine in biochemistry. The procedure also contrasts the traditional with the greener synthesis, and involves students in the design of the synthesis itself.