



# YALE NATIONAL INITIATIVE

*to strengthen teaching in public schools®*

Curriculum Units by Fellows of the National Initiative  
2019 Volume IV: Energy Sciences

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## Preface

In March 2019 the Yale National Initiative to strengthen teaching in public schools® accepted teachers from eighteen public school districts in ten states and the District of Columbia to participate in five national seminars held at Yale University. The Initiative is a long-term endeavor to influence public policy on teacher professional development, in part by establishing exemplary Teachers Institutes for high-need schools in states around the country.

Teachers Institutes are educational partnerships between universities and school districts designed to strengthen teaching and learning in a community's high-poverty, high-minority public schools. Evaluations have shown that the Institute approach exemplifies the characteristics of high-quality teacher professional development, enhances teacher quality in the ways known to improve student achievement, and encourages participants to remain in teaching in their schools.

Thirty-two of the teachers, named Yale National Fellows, were from school districts that are planning or exploring the establishment of a new Teachers Institute for Chicago, IL; the Diné Nation, AZ and NM; the District of Columbia; Pittsburgh, PA; Richmond, VA; San José, CA, and Hearne, TX. Other National Fellows came from existing Teachers Institutes located in New Castle County, DE; New Haven, CT; Philadelphia, PA; and Tulsa, OK. Overall, more than half of the National Fellows were participating in national seminars for the first time.

The National Fellows attended an Organizational Session of the seminars held in New Haven on May 3-4. The seminars reconvened during a ten-day Intensive Session from July 8-19 and concluded in mid-August when the Fellows submitted their completed curriculum units. The five seminars were:

- “Reading for Writing: Modeling the Modern Essay,” led by Jessica C. Brantley, Professor of English;
- “Energy Sciences,” led by Gary W. Brudvig, Benjamin Silliman Professor of Chemistry;
- “The Problem of Mass Incarceration,” led by James Forman, Jr., J. Skelly Wright Professor of Law;
- “Perimeter, Area, Volume, and All That: A Study of Measurement,” led by Roger E. Howe, William R. Kenan Jr. Professor Emeritus of Mathematics; and
- “American Democracy and the Promise of Justice,” led by Ian Shapiro, Sterling Professor of Political Science.

The purposes of the program are to provide public school teachers deeper knowledge of the subjects they teach and first-hand experience with the Teachers Institute approach to high-quality professional development. This reinforces their leadership in an existing Teachers Institute or prepares them to lead the development of a new Teachers Institute. Each teacher writes a curriculum unit to teach their students about

the seminar subject and to share with other teachers in their school district and, through the website at [teachers.yale.edu](https://teachers.yale.edu), with teachers anywhere. The curriculum units contain five elements: content objectives, teaching strategies, examples of classroom activities, lists of resources for teachers and students, and an appendix on the district academic standards the unit implements. In these ways the curriculum units assist teachers in engaging and educating the students in their school courses.

The curriculum units National Fellows wrote are their own; they are presented in five volumes, one for each seminar. We encourage teachers who use the units to submit comments online.

The Yale-New Haven Teachers Institute® is a permanently endowed academic unit of Yale University, which undertook the National Initiative in 2004.

James R. Vivian

New Haven

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<https://teachers.yale.edu>

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