

## LEGO® DNA Learning Center

The DNA Learning Center LEGO sets were developed by Dr. Kathleen M. Vandiver, Co-Director of the Community Outreach and Education Core at the MIT Center for Environmental Health Sciences and a former public school teacher. Unlike most teaching tools, the sets are designed to teach processes, in addition to structure. The LEGO molecules are made to be manipulated, so participants can perform the cellular functions involved in protein synthesis. Diverse populations including biology students, teachers, engineers, judges, and nurses have all found the learning experience interesting and memorable.



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## Partners

### MIT Center for Environmental Health Sciences (CEHS)

MIT Center for Environmental Health Sciences is an interdisciplinary network of biologists, chemists, civil and environmental engineers, biological engineers and microbiologists. CEHS developed the LEGO® DNA Learning Center Workshop in partnership with the MIT Museum.

The Center's mission is to investigate how environmental agents affect human health. A solid grounding in molecular biology underlies this approach to studying health and the environment, including knowledge of processes involving DNA, RNA, and protein synthesis, as illustrated in the LEGO® DNA Learning Center Workshop. Please contact us if your organization is interested in replicating this program.

### For biology curriculum questions contact CEHS:

Dr. Kathleen M. Vandiver  
CEHS Director of Community Outreach and Education Core  
617-324-0252  
kathymv@mit.edu  
cehs.mit.edu/COEP/COEC\_teacher.html

### MIT Museum

The mission of the MIT Museum is to engage the wider community with MIT's science, technology and other areas of scholarship in ways that will best serve the nation and the world in the 21st century. The Museum offers a range of educational programs and workshops.

### For workshop information contact the MIT Museum:

Erika Reinfeld  
Education Coordinator  
617-253-9607  
ereinfeld@mit.edu  
web.mit.edu/museum/education

Photo credits: Dan Armendariz, Jennifer Wu, Kathleen M. Vandiver, and Donna Coveney.



LEGO® DNA

Learning Center

Workshop

Use LEGO bricks to learn about DNA, RNA and proteins

Workshops for students, teachers, and adult learners

## Student Workshops

The LEGO models are perfect for teaching concepts to many different ages because of their universal appeal.

### Middle school science students will:

- Assemble proteins from subunits
- Discover the DNA base pairing rule
- Decode messages in DNA genes

### High school students will do the above, plus:

- Copy DNA into mRNA messages (transcription)
- Produce proteins from mRNA messages (translation)
- Build proteins to illustrate protein structure

### Advanced or AP biology students will do the above, plus:

- Compare mutations for genetic outcomes
- Learn higher-level terminology and discuss DNA damage and repair
- Use StarBiochem 3D protein viewer software (optional)



## Teacher Workshops

Sharpen your cell biology concepts while enjoying the LEGO construction tasks. Teachers will be able to ask questions about the molecular processes to supplement existing knowledge of DNA and proteins.

## Adult Learners

Forgotten your earlier biology lessons, or want to take it further? Workshops are also available for special interest groups or corporations by arrangement. Content emphasizes health, aging, and cancer, as group interest dictates.

## Schedule a Workshop

To reserve a workshop for your school or adult group, please go to <http://web.mit.edu/museum/education/reservations.html> and fill out an online registration form at least 3 weeks in advance. Workshops are 2 hours long and include a guided gallery tour of relevant MIT Museum exhibits. Workshops can accommodate up to 24 participants and can be scheduled during regular MIT Museum hours (subject to the availability of the instructor). Time outside regular Museum hours is available at the discretion of MIT Museum staff and instructors.

### Costs

**Adult/corporate rate:** \$400/workshop    **Schools rate:** \$200/workshop

Workshop rates include admission to the MIT museum.

Subsidies from Howard Hughes Medical Institute are available for underserved student populations. Please ask about discounts on the reservation form.

### Additional Offerings

Regularly scheduled workshops for middle and high school teachers are available. Contact Dr. Kathleen Vandiver (back panel) for dates and registration information.

## Acknowledgements

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- National Institutes of Environmental Health Sciences grant ES002109
- MIT Office of Educational Innovation and Technology
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- The Concord Consortium
- LEGO® Education
- NASA

## MIT Museum

Open daily 10 a.m. - 5 p.m. Closed major holidays.  
265 Massachusetts Ave. Cambridge, MA 02139