Next Generation
Physical Science and
Everyday Thinking

A guided-inquiry, physical science curriculum for pre-service and in-service K-5 teachers

Activate Learning
Next Gen PET is intended primarily for university courses in physics or physical science for prospective elementary teachers. There is sufficient material for a one-semester (quarter) course or a two-semester (two-quarter) sequence. Next Gen PET is also appropriate for general education courses on conceptual physics or physical science, science methods courses, or workshops for in-service teachers. Next Gen PET materials are flexible and modular, and instructors can use them in a variety of ways, depending on audience, time, and learning objectives.

**Studio-Style Class Version of Next Gen PET**

- For courses that meet ~5 hrs/week
- Lab or workroom where students can work in groups around tables and perform experiments.
- Students spend the majority of their time with their group of three or four peers.
- Make predictions, perform experiments, draw conclusions, answer questions in a workbook, and discuss their ideas both within their group and with the class.

**Lecture-Style Class Version of Next Gen PET**

- For courses that meet ~3 hrs/week in lecture style classrooms
- A guided-inquiry approach that can be used with large enrollments, or in courses with smaller enrollments with limited meeting time and facilities.
- Students watch videos of experiments or, as an option, may do some simple experiments on their desktops.
- Students respond to questions (using hand-held response devices) to share ideas with the whole class.
- The instructor manages the class time through a set of PowerPoint slides that align with the student materials.
Alignment with NGSS and Similar Standards
The Next Gen PET materials are aligned with the physical science disciplinary core ideas, crosscutting concepts, and science and engineering practices in the National Research Council K-12 Science Education Framework and Next Generation Science Standards (NGSS).

Next Gen PET students will be prepared for teaching elementary-level science in alignment with the NGSS or a similar set of standards.

Explicit Focus on Teaching and Learning
Included Teaching and Learning activities help students make explicit connections between their own learning, the learning and teaching of children in elementary school, and the core ideas, science and engineering practices, and crosscutting concepts of the NGSS.

Integrated Engineering Design Activities
Content units include Engineering Design Activities requiring use of the engineering design process and application of the physical science content.

Online Extension Homework
Next Gen PET includes extension homeworks for almost every activity or lesson within the curriculum. The first part of each extension engages students in an on-line tutorial-style activity, where they are presented with some information, watch a video, or run a simulation. They answer questions and receive (ungraded) feedback. The second part consists of a quiz with questions related to the content of the tutorial part of the extension. The quiz can be administered through the institution’s learning management system (LMS), so that students’ answers are automatically graded by the LMS and scores are posted on the LMS grade book.

nextgenpet.activatelearning.com
Research-Based and Proven

*Next Gen PET* has been developed over the past ten years by a team of scientists and science educators using design principles based on research on science learning. *Next Gen PET* uses a proven, guided-inquiry approach so that future teachers develop a deep understanding of core ideas of physics or physical science (physics and chemistry) by engaging in science practices. Preliminary data from learning impact studies suggest that both the Studio-Style Class and Lecture-Style Class versions of *Next Gen PET* promote significant growth in students’ conceptual understanding. Studies of the earlier versions of *Next Gen PET* found significant gains in students’ conceptual understanding of core ideas from physical science and significant positive shifts in their attitudes and beliefs about the nature of science and the learning of science.

**Faculty Online Implementation Resource**
nextgenpet.activatelearning.com

- Detailed information about *Next Gen PET* content, engineering design activities, and teaching and learning activities.
- Separate sections for the studio and lecture styles.
- Each section includes a list of equipment and materials, table of contents with time estimates for activities, summaries of all modules, units and activities, and links to extension homework activities and in-class videos of demonstrations and experiments.
- Comprehensive library of classroom video clips, showing both small group and whole class discussions.
- A password-protected part of the site includes test banks and keys to all activities, extension homework quizzes, and other information that should not be available to students or the general public.