BIOLOGY HL1 IB 1,2 (6197, 6198)
SCIENCE: SITE-ADOPTED COURSE

Grades 10–12 (P). This two-semester college prep course forms the first year of a two-year sequence of courses that prepares students to take the IB Biology SL (Standard Level) and/or HL (Higher Level) exams, and satisfies the Group 4 (Experimental Sciences) requirement for the International Baccalaureate diploma. In this first year of study, students gain insight into the scientific concepts and principles that govern living organisms, using the techniques and approach of the scientific method.

Credit for this course counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Approved sites: School of International Studies at the San Diego High Educational Complex (originating site) and Mission Bay High School. This course is specific to the International Baccalaureate magnet program at these schools and is not available to other sites.

BIOLOGY HL2 IB 1,2 (6199, 6196)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12 (HP). Prerequisite: Biology HL1 IB 1,2.

This two-semester course forms the second year of a two-year (mandatory) sequence of courses that prepares students to take the IB Biology SL (Standard Level) and/or HL (Higher Level) exams, and satisfies the Group 4 (Experimental Sciences) requirement for the International Baccalaureate diploma. In the second year of study, students use the scientific method to explore real-life applications of the concepts and principles introduced in Biology HL1 IB 1,2, performing laboratory experiments, creating group projects, and demonstrating their knowledge of the fundamental concepts of biology, both orally and in writing.

Credit for this course is honors-weighted and counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Approved sites: School of International Studies at the San Diego High Educational Complex (originating site) and Mission Bay High School. This course is specific to the International Baccalaureate magnet program at these schools and is not available to other sites.

BIOTECHNOLOGY 1,2 (6458, 6459)
SCIENCE: PILOT COURSE

Grades 11–12 (P). Prerequisites: Biology 1,2 and Chemistry 1,2. **Note:** This course is identical to the ROP Biotechnology 1,2 course (8704, 8705), except it does not offer a community classroom (internship) experience. **Texts:** Daugherty, *Biotechnology: Science for the New Millennium,* Paradigm Publishing, 2007; Barnum, *Biotechnology: An Introduction*, Brooks/Cole, 2005.

Biotechnology 1, 2 is a two-semester, interdisciplinary advanced laboratory science course for students in grades 11-12 who are interested in a rigorous investigation of the fundamental principles of biotechnology, as well as possible employment in the biotechnology industry. Both academic laboratory science and career technical education standards are infused into the course curriculum. Students in this course will be introduced to current laboratory science research practices in the field of biotechnology, and will explore the various uses and applications of biotechnology principles and processes in forensics, medicine, drug discovery, pharmacology, bioinformatics, genomics, agriculture, ecology, environmental science and biomedical ethics. Laboratory investigations and industry field trips will complement and reinforce core areas of study.

Credit for this course counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Pilot sites: Crawford CHAMPS and Serra High School.

CHEMISTRY OF NUTRITION 1–2 (6178, 6179)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12 (P). This is a yearlong, interdisciplinary college prep course in which students use the scientific method to study the chemical basis of nutrition through food preparation, preservation and processing. Written and oral presentations, interactive technology, and teacher and student laboratory demonstrations and experiments are part of the curriculum of the course. This course helps students make the connection between scientific concepts and real-world phenomena by applying theoretical knowledge to practical matters.

Credit for this course counts toward the elective credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Approved site: Morse High School.

CHEMISTRY HL1 IB 1,2 (6295, 6296)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12 (P). Prerequisites: Algebra 1-2 and concurrent enrollment in Intermediate Algebra or equivalent; teacher or counselor recommendation.

This college prep course forms the first year of a two-year sequence of courses that prepares students to take the IB Chemistry SL (Standard Level) and/or HL (Higher Level) exams. In this first year of study, students gain insight into the principles and concepts of chemistry and organic chemistry—the chemical and physical properties of materials in our environment and how they interact. This course satisfies the Group 4 (Experimental Sciences) requirement for the International Baccalaureate diploma.

Credit for this course counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Approved site: School of International Studies at the San Diego High Educational Complex. This course is specific to the school's International Baccalaureate magnet program and is not available to other sites.

CHEMISTRY HL2 IB 1,2 (6297, 6298)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12 (HP). Prerequisite: Chemistry HL1 IB 1,2.

This honors-level course represents the second year of a two-year (mandatory) sequence of courses that prepares students to take the IB Chemistry SL (Standard Level) and/or HL (Higher Level) exams. This second year of study provides more in-depth instruction in the principles of chemistry introduced in Chemistry HL1 IB 1,2, with a particular focus on organic chemistry. Students in this course will perform laboratory experiments, create group projects, and demonstrate their knowledge of fundamental chemistry concepts, both orally and in writing. This course satisfies the Group 4 (Experimental Sciences) requirement for the International Baccalaureate diploma.

Credit for this course is honors-weighted and counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Approved site: School of International Studies at the San Diego High Educational Complex. This course is specific to the school's International Baccalaureate magnet program and is not available to other sites.

EARTH SCIENCE 1,2 ADVANCED (6027, 6028)
SCIENCE: PILOT COURSE

Grades 9–12. Prerequisite: Successful completion of Algebra 1-2, and completion of or concurrent enrollment in Geometry 1-2. **Note:** This course **does not** currently meet UC/CSU subject-area admission requirements.

This two semester, standards-based laboratory science course is a more rigorous version of the regular Earth Science course currently offered to students in grade 9. This course will address additional state standards in Earth Science, including some of the more difficult ones. Topics covered will include: astronomy, dynamic earth processes, energy in the earth systems, biogeochemical cycles, structure and composition of the atmosphere, and California geology. Emphasis will be placed on the use of mathematics and graphical analysis in each of these major content areas.

Credit for this course counts towards the elective credits required for high school graduation.

Pilot site: Mira Mesa High School.

ENVIRONMENTAL AND SPATIAL TECHNOLOGY 1,2 (6307, 6308)
SCIENCE: SITE-ADOPTED COURSE

Grades 10–12. **Note:** Although this course has been assigned a number in the science sequence of courses, it is part of the technology strand of courses in the industrial technology education department's science and technology career path.

Environmental and Spatial Technology (EAST) is a second-year computer-applications course in which students acquire experience in high-end professional design and engineering software in a corporate learning environment. Students use tutorials, guides and lessons to learn the new software, and then work closely with business partners to design and execute projects that use the applications to benefit the surrounding community. This course is designed to act as a capstone course in the technology-themed path of courses at the School of Science and Technology at the San Diego High Educational Complex.

Credit for this course counts toward the elective credits required for high school graduation.

Approved site: School of Science and Technology at the San Diego High Educational Complex.

ENVIRONMENTAL SCIENCE 1,2 (6451, 6452)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12 (P). Prerequisite: Successful completion of a biology and/or chemistry course.

This two-semester course provides students with a comprehensive but detailed overview of the global environment and humans' impact upon it. The course helps students grasp the nature, magnitude and implications of current environmental issues, and discover what roles they can play in finding solutions to these problems.

Credit for this course counts toward the elective credits required for high school graduation. The course also meets elective ('g') subject-area requirements for admission to the University of California/California State University systems.

Approved site: Morse High School.

FORENSICS 1–2 (6435, 6436)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12. Prerequisites: Passing grade of C minus or better in physics, chemistry, and biology.

This course is designed for students following the law career pathway of courses at the School of Law and Business at the Crawford High Educational Complex. It is designed to provide students with an introduction to forensic science as applied to the field of criminal justice.

Credit for this course counts toward the elective credits required for high school graduation.

Approved site: Crawford Law and Business (originating site), and San Diego LEADS.

INTEGRATED SCIENCE 1,2 (6053, 6054)
SCIENCE: SITE-ADOPTED COURSE

Grade 9 (P). **Note:** This is the required ninth-grade science course at the approved sites.

Integrated Science 1,2 is the first-year course in a series of laboratory-based integrated science courses that meet select state standards in physics, chemistry, biology and earth science, as well as the investigation/experimentation strand of all sciences. The standards addressed in this course present the foundation of each science discipline and build the knowledge base that prepares students for the next three years of integrated science courses. Students in this course utilize the richness and diversity of California to explore a blend of concepts in each core science, which they will revisit in greater depth in future years.

Credit for this course counts toward the science credits required for high school graduation. The course also meets elective ('g') subject-area requirements for admission to the University of California/California State University systems.

Approved sites: Crawford IDEA and Morse High School.

INTEGRATED SCIENCE 3,4 (6055, 6056)
SCIENCE: PILOT COURSE

Grades 10–11 (P). **Prerequisite:** Integrated Science 1,2. **Note:** This course is the required tenth-grade science course at the pilot sites. The course is in its second pilot year (fall 2008).

Integrated Science 3,4 is the second-year course in a series of laboratory-based integrated science courses that meet select state standards in physics, chemistry, biology and earth science, as well as the investigation/experimentation strand of all science disciplines. The standards addressed in this course build on the standards taught in Integrated Science 1,2, and include the following:

- Physics: energy, and Newton's laws
- Chemistry: solutions, chemical reactions, and organic chemistry
- Biology: molecules, cells, protein synthesis, cell reproduction, and Mendelian genetics
- Earth Science: planetary motion, solar radiation, energy transformations at the Earth's surface, and geological and climatic changes

These concepts are further enhanced by having students perform careful scientific investigations. The course also offers conceptual extensions into the engineering pathway at the pilot site.

Credit for this course counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Pilot sites: Crawford IDEA and Morse High School.

INTEGRATED SCIENCE 5,6 (6057, 6058)
SCIENCE: PILOT COURSE

Grades 11–12 (P). **Prerequisites:** Integrated Science 1,2 and Integrated Science 3,4. **Note:** This course will be offered to all eleventh-grade students at the pilot site starting fall 2008.

Integrated Science 5,6 is the third-year course in a series of laboratory-based integrated science courses that meet select state standards in physics, chemistry, biology and earth science, as well as the investigation/experimentation strand of all science disciplines. The standards addressed in the third year build on the standards studied in Integrated Science 1,2, and Integrated Science 3,4, and include the following:

- Physics: motion and forces, conservation of energy and momentum, and electric and magnetic phenomena
- Chemistry: conservation of matter and stoichiometry, gases and their properties, acids and bases, solutions and reaction rates, and chemical equilibrium
- Biology: cell biology, genetics, and evolution

The earth science standards, which relate to the study of the Earth's atmosphere, provide the foundations upon which each of the foregoing science disciplines are taught. The course also offers conceptual extensions into the engineering pathway at the pilot site.

Credit for this course counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the UC/CSU systems.

Approved pilot site: Crawford IDEA.

MARINE SCIENCE 3,4 (6443, 6444)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12 (P). Prerequisites: Marine Science 1,2; Chemistry 1–2; and Physics 1,2.

This two-semester course takes an in-depth look at living and nonliving things that affect the marine environment. The course focuses on the origin of the earth and the oceans, marine geology, sea-floor spreading and plate tectonics, as well as chemical, physical, botanical, and biological oceanography. It also provides an opportunity for yearlong investigations of plankton populations and earthquake epicenters by students. The curriculum includes science-fair projects and field trips.

Credit for this course counts toward the elective credits required for high school graduation.

Approved site: University City High School.

OCEAN SCIENCES 1,2 (6447, 6448)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12. Prerequisite: Successful completion of biology and chemistry courses.

This two-semester course is designed to provide students with a strong background in marine science. It is designed to be a capstone honors course that integrates the three sciences taught in high school (physics, chemistry and biology), and its curriculum is on a par with introductory college-level courses in oceanography/marine biology. Students' knowledge of other sciences is brought to bear in the course work, which includes lab exercises, field studies and class projects.

Credit for this course counts toward the science credits required for high school graduation.

Approved site: La Jolla High School.

PHYSICS HL1 IB 1,2 (6395, 6396)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12 (P). This college prep course is the first year of a two-year sequence of courses that prepares students to take the IB Physics SL (Standard Level) and/or HL (Higher Level) exams. In this first-year of study, students focus on the concepts of matter; forces and motion; waves; electricity; and thermal and nuclear physics. The course emphasizes problem solving through familiarity with classical applications in the lab. This course satisfies the Group 4 (Experimental Sciences) requirement for the International Baccalaureate diploma.

Credit for this course counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Approved site: School of International Studies at the San Diego High Educational Complex. This course is specific to the school's International Baccalaureate magnet program and is not available to other sites.

PHYSICS HL2 IB 1,2 (6397, 6398)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12 (HP). Prerequisites: Physics HL1 IB 1,2.

This two-semester course is a continuation of and forms the second (mandatory) year of a two-year sequence of courses that prepares students to take the IB Physics SL (Standard Level) and/or HL (Higher Level) exams. This second year of study provides more in-depth instruction in the physics concepts and applications introduced in Physics HL1 IB 1,2, and explores the additional topics of optics and Einstein's theories of relativity. Lab work continues, with an increasing emphasis on student experimental designs. The course satisfies the Group 4 (Experimental Sciences) requirement for the International Baccalaureate diploma.

Credit for this course counts toward the science credits required for high school graduation. The course also meets science ('d') subject-area requirements for admission to the University of California/California State University systems.

Approved site: School of International Studies at the San Diego High Educational Complex. This course is specific to the school's International Baccalaureate magnet program and is not available to other sites.

PRINCIPLES OF TECHNOLOGY 1–2 (6303, 6304)
SCIENCE: SITE-ADOPTED COURSE

Grades 11–12. Prerequisite: Algebra 1–2 or equivalent.

Principles of Technology is a yearlong, laboratory -based course in physics and electronics taught through hands-on experience. Instruction focuses on the application of physical principles to four energy systems—mechanical, fluid, thermal, and electrical—and uses both simple and complex technological devices to develop an understanding of these principles. The curriculum also covers the math skills that are needed in order to understand and apply these physics principles.

Credit for this course counts toward the elective credits required for high school graduation.

Approved sites: All schools in the Kearny High Educational Complex.

PROJECTS—MESA (8059)
SCIENCE: PILOT COURSE

Grades 7–8. This two-semester course is part of the statewide Math, Engineering and Scientific Achievement (MESA) program, which seeks to increase the number of middle and high school students who excel in math and science. The program is administered through an agreement with San Diego State University, and all associated costs are borne by the pilot site. During the first semester of the course, students focus on designing, implementing, and analyzing an experiment to enter in the Greater San Diego Science Fair. In the second semester, they follow MESA-developed curriculum that reinforces California state mathematics and science standards through hands-on projects. The course culminates in a local MESA Days competition, in which these grade-specific projects vie for awards with those from other local MESA-program schools.

Pilot site: Montgomery Middle School.

SCIENCE AND TECHNOLOGY 6TH IB (6086)
SCIENCE: SITE-ADOPTED COURSE

Grade 6. Note: This is a required course for all sixth-grade students at the approved site. **Texts:** *Holt Science and Technology: Earth Science,* Holt, Rinehart and Winston, 2001.

This course is the first in a three-year series of integrated courses designed to meet the science and technology requirements of the International Baccalaureate (IB) Middle Years Programme (MYP). Each year focuses on a different science discipline, with earth science being the focus of the first year. In this foundational course, students acquire basic computer literacy skills by using computer technology to extend their ability to conduct scientific experiments and develop explanations based on evidence. In order to satisfy the IB MYP 50-hour technology requirement, this course is taught during a 70-minute extended period every day for the entire year.

Approved site: Pacific Beach Middle School. This course is part of the International Baccalaureate Middle Years Programme at the school, and is not available to other sites.

SCIENCE AND TECHNOLOGY 7TH IB (6087)
SCIENCE: SITE-ADOPTED COURSE

Grade 7. Note: This is a required course for all seventh-grade students at the approved site.

This course is the second in a three-year series of integrated courses designed to meet the science and technology requirements of the IB Middle Years Programme. The scientific focus of this second year is life science. This course builds on skills developed in the first-year course, with course content taught through the means of guided scientific inquiry. Technology use and design are embedded into the curriculum so that students can master the computer-literacy competencies required for high school graduation. In order to satisfy IB MYP time requirements, this course is taught during a 70-minute extended period every day for the entire year.

Credit: Successful completion of this course satisfies the district's computer literacy requirement for high school graduation.

Approved site: Pacific Beach Middle School. This course is part of the International Baccalaureate Middle Years Programme at the school, and is not available to other sites.

SCIENCE AND TECHNOLOGY 8TH IB (6088)
SCIENCE: SITE-ADOPTED COURSE

Grade 8. Note: This is a required course for all eighth-grade students at the approved site. **Texts:** *Constructing Ideas in Physical Science,* 2003.

This course is the last in a three-year series of integrated courses designed to meet the science and technology requirements of the IB Middle Years Programme. The scientific focus of the third year is physical science. While this course continues to build on the technology competencies mastered by students in the second-year course, the emphasis is on scientific inquiry. Students in this course participate in hands-on explorations and experiments, manipulate models and simulations, research and read about the work of other scientists, and create graphic organizers in preparation for taking Advanced Physics in ninth grade. In order to satisfy IB MYP time requirements, this course is taught during a 70-minute extended period every day for the entire year.

Approved site: Pacific Beach Middle School. This course is part of the International Baccalaureate Middle Years Programme at the school, and is not available to other sites.

SCI-TECH 1,2 (6305, 6306)
SCIENCE: SITE-ADOPTED COURSE

Grade 11. **Prerequisite:** Passing grade or concurrent enrollment in Intermediate Algebra.

This course explores topics in biology, chemistry and physics by challenging students to solve real-world problems rather than engaging in lab-based learning exercises. The course starts with a measurement unit in which students learn how to estimate quantities through their senses, recognize volume by sight, isolate mass by lifting and shaking, and feel forces through pushing and pulling. Subsequent units use equally novel approaches to teach concepts in biophysics, chemistry and biology. This course is the only mandatory course in the sequence of courses that make up career paths at the approved site.

Credit for this course counts toward the elective credits required for high school graduation.

Approved site: San Diego SciTech.

UCCP AP ENVIRONMENTAL SCIENCE (6457)
SCIENCE: PILOT COURSE

Grades 11–12 (HP). Prerequisites: One year of life science, one year of physical science, and algebra. **Note:** This course is in its second pilot year (2008-09).

This one-semester course is part of the University of California College Prep (UCCP) online program. This course is designed to acquaint students with the physical, ecological, social, and political principles of environmental science. Scientific method is used to analyze and understand the interrelationships between humans and the natural environment. This course shows how ecological realities and the material desire of humans often clash, leading to environmental degradation and pollution.

Credit: This course earns 1 semester of honors-weighted graduation credit in science. The course also receives 0.5 units (one-half of a unit) of credit in the science ('d') subject-area for admission to the UC/CSU systems.

Pilot sites: ALBA, Garfield, Mission Bay, Muir, SCPA, and Twain High Schools; and all schools in the Crawford, Kearny, and San Diego High Educational Complexes.