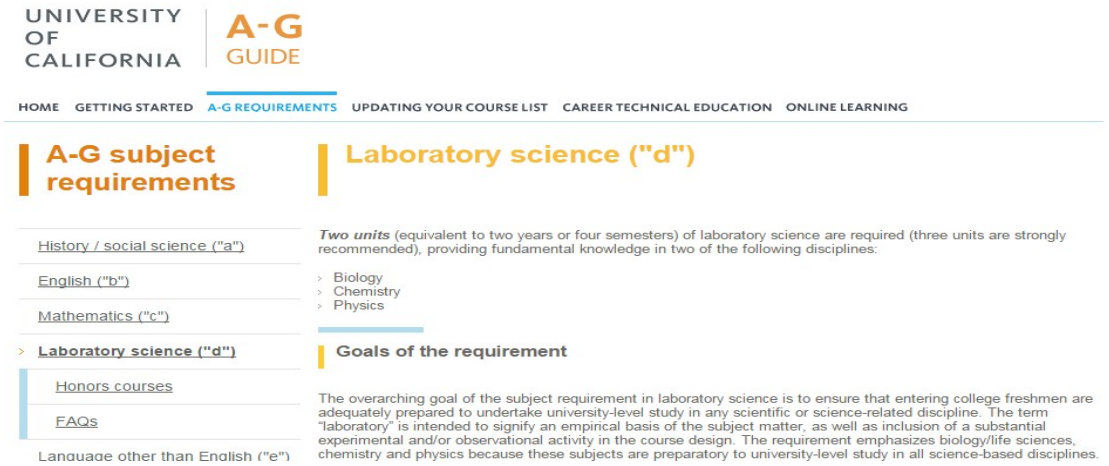
SCIENCE PATHWAYS AT TORREY PINES: SUGGESTIONS FOR SUCCESS

This chart is intended to be used as a guide to assist students with planning their academic future. These recommendations are based on CA state sequencing and staff expertise. The pathways chart represents suggested sequences to present opportunities for success for the student profiles listed. Other possibilities do exist. It is our goal to help students construct their knowledge sequentially at a course pace that is appropriate for the intended ability and skill level. Selecting courses that are appropriate for a student's current ability and skills is a crucial step for student success. **Please check the detailed course descriptions here https://tp.sduhsd.net/Academics/Course-Profiles--Outlines/index.html**

Note→AP (Advanced Placement) courses are college level courses designed for accelerated students to gain exposure to the rigor and pace of a collegiate science curriculum (i.e they are equivalent in workload, rigor, breadth, and pace of an equivalent 4 year university course). For success at the AP level in high school, science staff recommends students have the required science skills, prior coursework, a history of academic success, and appropriate math skills for the course they are enrolling in.



UC/CSU recommendations for prospective university students, from the University of California website:

All courses approved in the laboratory science subject area should be designed with the explicit intention of developing and encouraging scientific habits of mind important for university-level studies, and aligned with the eight practices of science and engineering identified by the National Research Council Framework and detailed within the Next Generation Science Standards:

1. **Asking questions (for science) and defining problems (for engineering)**. Students should develop a perception of science or engineering as a way of understanding the world around them, not as a collection of theories and definitions to be memorized.
2. **Developing and using models**. Students should understand that scientific models are useful to represent phenomena in the physical world, and should routinely develop or use multiple representations and models to solve scientific problems and to communicate science concepts. They should appreciate that models and theories are valuable only when rigorously tested against observation.
3. **Planning and carrying out investigations**. Students should emerge from high school embracing an ease in using their scientific knowledge to perceive patterns and regularity, make predictions, and test those predictions against evidence and reason.
4. **Analyzing and interpreting data**. This includes developing and maintaining openness to using technological tools appropriately, including graphing calculators and computers, in gathering and analyzing data. Students should be aware of the limitations of these tools, and should be capable of effectively using them while making sound judgments about when such tools are and are not useful.
5. **Using mathematics and computational thinking**. In particular, students should recognize that measurements and observations are subject to variability and error, and that these must be accounted for in a quantitative way when assessing the relationship between observation and theory.
6. **Constructing explanations (for science) and designing solutions (for engineering)**. Students should recognize that abstraction and generalization are important sources of the power of science.
7. **Engaging in argument from evidence**. Students should understand that assertions require justification based on evidence and logic, and should develop an ability to supply appropriate justifications for their assertions. They should habitually ask "Why?" and "How do I know?"
8. **Obtaining, evaluating, and communicating information**. Student should be able to read a variety of domain-specific scientific and technical texts and to write using the language conventions of scientific discourse, including but not limited to laboratory reports. Useful guidelines for promoting scientific literacy can be found in the Common Core State Standards for Literacy in History/Social Studies, Science and Technical Subjects

Path & Profile of a typical successful student	FRESHMAN	SOPHOMORE	JUNIOR	SENIOR
I. Accelerated / Advanced Science Sequence **Δ *Exceeds*** UC/CSU requirements. **Δ 2 years required/ 3years recommended** **Δ For students with excellent understanding and passion for science, and highest marks in math and science. For freshman, these are typically students that earned "A's" and "B's" in both life and physical science. These are also students that have good organization and well developed study skills.**	**Biology** (*recommend enrollment in or have credit in integrated math I or integrated math 2*) ***(*=students should have passed Bio & Chem.)***	**Honors Chemistry** (*recommend enrollment in or have credit in Integrated math 2 or higher) **specifically geared for students that plan on taking AP Courses)*** **College prep. Physics** *(recommend enrollment in or have credit in integrated math 2 or higher)* **AP Physics 1** *recommend enrollment in or have credit in integrated math 2 or higher i.e pre-calc/integrated math 3)* ***(* =students should have passed Bio & Chem.)***	**AP Chemistry** (*recommend enrollment in or have credit in integrated math 2 or higher i.e, pre-calc/integrated math 3)* **College prep. Physics** *(recommend enrollment in or have credit in integrated math 2 or higher)* **AP Physics 1** *(recommend enrollment in or have credit in integrated math 2 or higher i.e. pre-calc/integrated math 3)* **AP Physics 2** *(should have passed AP Phy 1 and passed integrated math 2 or higher i.e. pre-calc/integrated math 3)* **AP Physics C** *(should have passed AP Phy 1or 2 and be enrolled in or have credit in calculus)* **AP Biology* or Biotech** **AP Environmental Science*** **Anatomy/Physiology***	**AP Chemistry** (*recommend enrollment in or have credit in integrated math 2 or higher i.e, pre-calc/integrated math 3)* **College prep. Physics** *(recommend enrollment in or have credit in integrated math 2 or Alg 2)* **AP Physics 1** *recommend enrollment in or have credit in integrated math 2 or higher i.e pre-calc/integrated math 3)* **AP Physics 2** *(should have passed AP Phy 1 and passed integrated math 2 or higher i.e. pre-calc/integrated math 3)* **AP Physics C (***should have passed AP Phy 1 or2 and be enrolled in or have credit in calculus)* **AP Biology or Biotech** **AP Environmental Science*** **Anatomy/Physiology***
II. College-prep Sequence **Δ *Meets UC/CSU admission*** requirements. Path for many students preparing for 4-yr university entrance. **Δ 2 years required/ 3years recommended** **Δ** For students with good to high marks in math and science	**Biology** (*recommend enrollment in or have credit in integrated math I or integrated math 2, or higher*) **Earth & Space Science** (*recommend enrollment in or have credit in Integrated Math 1)* ***(*=students should have passed Bio & Chem.)***	**Chemistry** (*recommend enrollment in or have credit in Integrated math 2 or higher)* **Biology** (*recommend enrollment in or have credit in integrated math I or integrated math 2, or higher*) ***(*=students should have passed Bio & Chem.)***	**Honors Chemistry** *recommend enrollment in or have credit in Integrated math 2 or higher) **specifically geared for students that plan on taking AP Courses)*** **AP Physics 1** **Chemistry** (*recommend enrollment in or have credit in Integrated math 2 or Alg. 2)* **College prep. Physics** *(recommend enrollment in or have credit in integrated math 2 or higher)* **AP Biology* or Biotech** **AP Environmental Science*** **Marine Bio/Biotech** (electives) **Anatomy/Physiology***	**College prep. Physics** *(recommend enrollment in or have credit in integrated math 2 or Alg 2)* **AP Physics 1** *recommend enrollment in or have credit in integrated math 2 or higher i.e pre-calc/integrated math 3)* **AP Chemistry** *recommend enrollment in or have credit in integrated math 2 or higher i.e pre-calc/integrated math 3)* **AP Biology* or Biotech** **AP Environmental Science*** **Marine Biology** (elective) **Anatomy/Physiology*** **Biotech** (elective)
III. Community College / General High School Science **Meets TPHS graduation requirements for science- (20 credits/ 2 years)** **Δ Life (10 credits/ 1 year)** **Δ Physical (10 credits/ 1 year)** **Δ strengthens science foundation for other science courses** **Δ May or may not meet UC/CSU lab science requirements.** For students with average to below average marks in math and science.	• **Earth & Space Science** (*recommend enrollment in or have credit in Integrated Math 1)* • **Marine Biology** (*should be enrolled in or have credit in Int Math 1)* • ***No Science*** (Students need ***two years*** of science -one year of life and one year of physical science ***to graduate***)	• **Earth & Space Science** • **Marine Biology** • **Biology** • **No Science** Earth/Space is ***physical science credit***, while Biology and marine Biology earn ***life science credit***.	**Physics***(recommend enrollment in or have credit in integrated math 2 or Alg 2* **Biology** (*recommend enrollment in or have credit in integrated math I or integrated math 2, or higher*) **Chemistry***(recommend enrollment in or have credit in integrated math 2 or higher* **Marine Biology** (elective) **Biotech** (elective) (Chemistry and Physics are both ***physical science credit*** courses.)	**Biology** *(recommend enrollment in or have credit in integrated math I or integrated math 2, or higher*) **Physics***(recommend enrollment in or have credit in integrated math 2 or higher)* **Chemistry***(recommend enrollment in or have credit in integrated math 2 or higher)* **Marine Biology** (elective) **Anatomy/Physiology*** **Biotech** (elective) ***(* students should have passed Bio & Chem.)***