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# 2H

## Information

### *Professional Services Committee*

#### **Proposal to Establish a Single Subject Teaching Credential in General Science (Foundational-Level)**

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**Executive Summary:** This agenda item provides additional information requested by the Commission at the December Commission meeting regarding a proposal for a new Single Subject credential subject area: General Science (Foundational-Level).

**Recommended Action:** For information only

**Presenter:** Teri Clark, Administrator,  
Professional Services Division.

**Strategic Plan Goal: 1**

**Promote educational excellence through the preparation and certification of professional educators.**

- ◆ Sustain high quality standards for the preparation and performance of professional educators and for the accreditation of credential programs.

April 2008



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# Proposal to Establish a Single Subject Teaching Credential in General Science (Foundational-Level)

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## Introduction

This agenda item continues the discussion begun at the December 2007 Commission meeting (<http://www.ctc.ca.gov/commission/agendas/2007-12/2007-12-3H.pdf>) regarding a proposal for an additional subject area science credential: General Science (Foundational-Level). A General Science (Foundational-Level) credential has the potential to allow additional individuals to earn an authorization to teach science and reduce the number of individuals on waivers, permits and local teaching assignment options. The General Science (Foundational-Level) credential would be a limited authorization authorizing the holder to teach general, introductory, and integrated science (integrated science through grade 8 only).

## Background

In California, preparing a teacher involves three separate phases: subject matter preparation, preliminary preparation, and induction into the profession. An individual must meet the prerequisite subject matter requirement prior to student teaching and earning the preliminary teaching credential. For the single subject teaching credentials, there are usually two routes an individual may select among to satisfy the subject matter requirement: an approved subject matter program or examination. No matter which route is selected by an individual to satisfy the subject matter requirement, the individual must also complete the preliminary preparation program.

Since 1995, the Single Subject credential for K-12 science has been divided into four major areas: Biological Science, Chemistry, Geosciences, and Physics. Each of these content areas has a specific science credential that an individual may earn. Within each area of science, the appropriate science credential allows an individual to teach introductory science across all four areas, integrated science grades 7-12 and departmentalized classes in the specified area at the high school level. For example, with a Science: Biological Science credential, the individual may teach general science, introductory K-12 science, integrated science, and departmentalized Biology. Integrated science is a method of organizing science courses in life and physical science in an integrated manner rather than as separate content area courses. At the high school level, the traditional one year of Biology, followed by a year of Chemistry, followed by a year of Physics is instead taught over 1, 2, or 3 years in an integrated manner. The high school integrated courses can be on the CSU/UC approved courses list. For more information on the classes authorized by the science credential, see Table 8 on page 9.

To satisfy the subject matter requirement for Biological Science, Chemistry, Geosciences, or Physics, an individual may choose to complete an approved subject matter program or pass the three required California Subject Examination for Teachers (CSET) subtests (see Table 1). For all four areas of science, two general science subtests of the CSET must be passed and, in addition, an individual must pass the area specific subtest. One of the general science subtests addresses Astronomy, Dynamic Processes of the Earth, Earth Resources, Waves, Forces and

Motion, Electricity and Magnetism (Subtest 118) and the second subtest addresses Ecology, Genetics and Evolution, Molecular Biology and Biochemistry, Cell and Organismal Biology, Heat Transfer and Thermodynamics, and Structure and Properties of Matter (Subtest 119).

**Table 1: CSET Examinations Required by Science Credentials**

| <b>Credential</b>                 | <b>CSET Subtest</b> | <b>Title(s) of Required Examination(s)</b>  | <b>Passing Score</b> |
|-----------------------------------|---------------------|---|----------------------|
| Science: Biological Science       | 118                 | CSET General Science                        | 220                  |
|                                   | 119                 | CSET General Science                        | 220                  |
|                                   | 120                 | Concentrations: Biology                     | 220                  |
| Biological Sciences (Specialized) | 120                 | Concentrations: Biology                     | 220                  |
|                                   | 124                 | Biology/Life Science (Specialized)          | 220                  |
| Science: Chemistry                | 118                 | CSET General Science                        | 220                  |
|                                   | 119                 | CSET General Science                        | 220                  |
|                                   | 121                 | Concentrations: Chemistry                   | 220                  |
| Chemistry (Specialized)           | 121                 | Concentrations: Chemistry                   | 220                  |
|                                   | 125                 | Chemistry (Specialized)                     | 220                  |
| Science: Geosciences              | 118                 | CSET General Science                        | 220                  |
|                                   | 119                 | CSET General Science                        | 220                  |
|                                   | 122                 | Concentrations: Earth and Planetary Science | 220                  |
| Geosciences (Specialized)         | 122                 | Concentrations: Earth and Planetary Science | 220                  |
|                                   | 126                 | Earth and Planetary Science (Specialized)   | 220                  |
| Science: Physics                  | 118                 | CSET General Science                        | 220                  |
|                                   | 119                 | CSET General Science                        | 220                  |
|                                   | 123                 | Concentrations: Physics                     | 220                  |
| Physics (Specialized)             | 123                 | Concentrations: Physics                     | 220                  |
|                                   | 127                 | Physics (Specialized)                       | 220                  |

In 2002, as part of the task of aligning the subject matter programs with the new K-12 Student Academic Content Standards, the Commission charged its Subject Matter Advisory Panels in Science and Mathematics with exploring possible changes in the existing single subject credential structures that might encourage more individuals to obtain science and mathematics certification. As a result, that year the Commission added four new credential options for science teachers; one in each of the above mentioned areas of science. These credentials are called specialized science credentials and the requirements and authorizations are defined in Coded Correspondence 03-0010, <http://www.ctc.ca.gov/notices/coded/030010/030010.html>. The authorization provided by each of the specialized credentials is more narrow than the science credentials discussed above. The authorization statement for the specialized science credentials is as follows:

This document authorizes the holder to teach in the specific science area listed on the document in grades twelve and below, including preschool, and in classes organized primarily for adults.

An individual may satisfy the subject matter requirement for the specialized science credential through examination or coursework. Unlike the full science credential, there are no approved programs for the specialized science credentials. Instead an individual must hold a graduate degree in the subject or a minimum of 30 semester (or 45 quarter) post graduate units or to pass the appropriate CSET examinations. An individual would need to pass the appropriate Concentrations subtest listed above in the selected science area as well as the Specialized Science subtest in the same area. There are 8 separate single subject science teaching authorizations currently available. Each of the authorizations requires the individual to satisfy a specific subject matter requirement and complete a preliminary preparation program. Each credential authorizes teaching specific science classes. For more information on the classes authorized by the specialized science credential, see Table 8 on page 9.

When the specialized science credential was developed in 2003, a Foundational-Level Mathematics credential was also developed. The Foundational-Level Mathematics credential authorizes an individual to teach mathematics courses up through Algebra and Geometry. The total number of mathematics (Foundational-Level and full Math) credentials awarded in 2006-07 is shown in Table 2 below. The vast majority of these credentials are earned via the examinations route. It should be noted that the prior to the Foundational-Level Math credential, the Commission was processing approximately 950 single subject credentials in mathematics annually.

**Table 2: Single Subject Credentials in Mathematics, 2006-07**

| <b>Total Credentials—IHE,<br/>District and Out of State</b> | <b>Total Credentials<br/>Awarded</b> |
|---|--------------------------------------|
| Math  | 932                                  |
| Foundational-Level Math                                     | 484                                  |
| <b>Math Total</b>   | <b>1,416</b>                         |

**Proposed New Science Credential: General Science (Foundational-Level)**

At the December 2007 Commission meeting, the possibility of a General Science (Foundational-Level) credential was introduced. For the first time credential candidate, this credential could be earned by passing the two CSET General Science subtests (see Table 3) **and** completing an approved teacher preparation program. This level of content knowledge would allow an individual to teach general science or introductory science, but not a departmentalized Biology, Chemistry, Geoscience, or Physics courses (see Table 9 on page 9).

**Table 3: Proposed Examinations Required for a General Science  
(Foundational-Level) Credential**

| <b>CSET Subtest</b> | <b>Title(s) of Required Examination(s)</b>   | <b>Passing Score</b> |
|---------------------|--|----------------------|
| 118<br>Subtest I    | CSET General Science: Astronomy; Dynamic Processes, of the Earth; Earth Resources; Waves; Forces and Motion; Electricity and Magnetism (58 multiple-choice and 2 constructed-response items)   | 220                  |
| 119<br>Subtest II   | CSET General Science: Ecology; Genetics and Evolution; Molecular Biology and Biochemistry; Cell and Organismal Biology; Heat Transfer and Thermodynamics; Structure and Properties of Matter (58 multiple-choice and 2 constructed-response items) | 220                  |

To provide additional assignment options, an individual with a single subject teaching credential in a different subject (mathematics, social science, English, art...) would be able to add a General Science (Foundational-Level) authorization to his or her credential by passing the two science subtests. An individual with a multiple subject credential would be able to earn a single subject credential in General Science (Foundational-Level) by passing the two CSET subtests and completing a single subject pedagogy course (Table 4).

**Table 4: Subject Matter and Pedagogical Requirements for a General Science  
(Foundational-Level) Credential**

| <b>Individual Requirement</b> | <b>Individual</b>                      |                                       |                              |
|-------------------------------|--|---------------------------------------|------------------------------|
|                               | <b>does not hold a Credential</b>      | <b>holds a MS Credential</b>          | <b>holds a SS Credential</b> |
| <b>Subject Matter</b>         | CSET Subtests 118 & 119                | CSET Subtests 118 & 119               | CSET Subtests 118 & 119      |
| <b>Pedagogy</b>               | Complete a teacher preparation program | One course in single subject pedagogy | -                            |

Teachers who are credentialed via this route and who teach courses within this authorization would be considered “Highly Qualified” for the purpose of No Child Left Behind as they would have been required to demonstrate subject matter competence through examination. Furthermore, if an individual were to earn the General Science (Foundational-Level) credential, he or she would be able to earn a full science authorization by passing one of the Concentration subtests (subtests 120-123) listed in Table 2.

At the December meeting, the Commission posed a number of questions about science credentials, science courses offered in the public schools and the usefulness of a General Science (Foundational-Level) credential. This agenda item presents additional information related to the teaching of science and science credentials to assist the Commission’s discussion of an additional science authorization:

- The total number of science credentials awarded in 2006-07—full science credentials and specialized science credentials
- Information on the science subject matter subtests and the pass rates

- Science courses offered in the public school and the number of science teachers employed in the public schools

### Science Credentials Awarded in 2006-07

Provided below is the information on Science credentials awarded in the 2006-07 year. This includes all preliminary documents recommended from July 1, 2006 through June 30, 2007.

**Table 5: Science Credentials awarded 2006-07**

| Total Credentials—IHE, District and Out of State | Total Credentials Awarded | Satisfied Subject Matter Through |            | Percentage Satisfied Through |            |
|--|---------------------------|----------------------------------|------------|------------------------------|------------|
|  |                           | Program*                         | Exam       | Program*                     | Exam       |
| Biology  | 747                       | 302                              | 445        | 40%                          | 60%        |
| Chemistry  | 226                       | 100                              | 126        | 44%                          | 56%        |
| Geosciences                                      | 130                       | 34                               | 96         | 26%                          | 74%        |
| Physics  | 116                       | 66                               | 50         | 57%                          | 43%        |
| Biology- Specialized*                            | 65                        | 10                               | 55         | 15%                          | 85%        |
| Chemistry- Specialized*                          | 30                        | 7                                | 23         | 23%                          | 77%        |
| Geosciences- Specialized*                        | 13                        | 2                                | 11         | 15%                          | 85%        |
| Physics- Specialized*                            | 9                         | 6                                | 3          | 67%                          | 33%        |
| <b>Science Total</b>                             | <b>1,336</b>              | <b>527</b>                       | <b>809</b> | <b>39%</b>                   | <b>61%</b> |

\* For the specialized science credentials, the program option for satisfaction of subject matter is that the individuals holds a Master's degree or higher in science from a regionally accredited postsecondary institution.

Information presented in Table 2 shows that in mathematics an additional 484 individuals were awarded the Foundational-Level Mathematics credential. This is 34.2% of the mathematics credentials that were issued in 2006-07. These numbers suggest that this new pathway has been successful in increasing the pool of qualified individuals available to teach Foundational-Level Mathematics. It is impossible to predict how many individuals would choose to earn a General Science (Foundational-Level) credential if it were available, however, providing a new pathway would allow for the possibility of increasing the pool of qualified individuals to teach General Science.

In 2003, the Specialized science credentials were developed to allow a prospective teacher with a specific type of science content knowledge—very extensive and deep knowledge in one area of science—to teach in the public schools. According to the information in Table 5, above, the option of Specialized credentials allowed 117 individuals to satisfy subject matter for specialized science and earn a single subject teaching credential in 2006-07. The creation of a General Science (Foundational-Level) credential has the potential to allow prospective teachers with a broad general level of science knowledge across all four major science areas to satisfy the subject matter requirement and earn a single subject credential.

### Science Subject Matter Subtests

The Commission's subject matter examination contractor, NCS Pearson, has provided information on all administrations of the science subtests since they were developed. Table 6a

provides pass rate information for all examinees for the last year and cumulative over the life of the science examinations. Table 6b provides the pass rate for the subject specific subtests for individuals who have also taken and passed both general science examinations (Subtests 118 and 119).

Using the two general science subtests (# 118 and #119) would provide sufficient evidence of a candidate's subject matter competence with respect to a General Science credential because the scope and sequence of the content assessed by these two subtests are sufficiently broad in scope and cover all of the major science areas. Since the third subtest is taken in one particular area of concentration, and not in general science, an individual who passes the first two subtests has demonstrated a broad knowledge of all science areas sufficient for a General Science credential regardless of whether the individual then proceeds to get a more specialized Science credential. Using these two subtests together would provide valid evidence of a candidate's knowledge, skills and abilities with respect to General Science.

**CSET Science Tests (January 2003-January 2008 Administrations)**

| <b>Table 6a: Pass Rates on Individual Science Subtests by all Individuals</b> | <b>September 2006-July 2007</b> |                             | <b>January 2003-July 2007</b> |                             |
|---|---------------------------------|-----------------------------|-------------------------------|-----------------------------|
|   | <b>First Attempt</b>            | <b>Cumulative Pass Rate</b> | <b>First Attempt</b>          | <b>Cumulative Pass Rate</b> |
| 120-Biological/Life Science   | 56.2                            | 64.0                        | 60.9                          | 78.2                        |
| 121-Chemistry   | 73.3                            | 78.4                        | 71.7                          | 82.9                        |
| 122- Earth Science  | 67.4                            | 73.3                        | 71.6                          | 82.5                        |
| 123-Physics   | 54.1                            | 60.8                        | 56.0                          | 71.4                        |
| 124-Biology Specialized*  | 58.0                            | 63.2                        | 67.5                          | 77.3                        |
| 125 Chemistry Specialized*  | 80.7                            | 86.4                        | 88.0                          | 91.3                        |
| 126 Earth Science Specialized*  | 80.7                            | 86.4                        | 82.5                          | 89.2                        |
| 127-Physics Specialized*  | 90.9                            | 90.9                        | 92.5                          | 93.7                        |

| <b>Table 6b: Pass Rates on Subject Specific Subtests if the Individual has also Passed BOTH Subtests 118 and 119</b> | <b>N</b> | <b>% Pass</b> |
|--|----------|---------------|
| 120-Biological/Life Science  | 4,225    | 93            |
| 121-Chemistry  | 1,536    | 86            |
| 122- Earth Science   | 1,124    | 93            |
| 123-Physics  | 894      | 74            |
| 124-Biology Specialized*   | 288      | 91            |
| 125 Chemistry Specialized*   | 115      | 90            |
| 126 Earth Science Specialized*   | 70       | 86            |
| 127-Physics Specialized*   | 45       | 91            |

In addition, NCS Pearson provided the pass rate for each of the 8 subject specific subtests for individuals who have also passed both General Science subtests (118 and 119). NCS Pearson has also provided information on how many of the subject specific subtests have been passed by individuals that have passed **both** General Science subtests. The majority of individuals who passed both the General Science subtests and have taken one, or more, of the subject specific

subtests, have passed one or more of the subject specific subtests. Of the 5,135 individuals who have passed both General Science subtests AND taken one or more of the subject specific subtests, only 341 (6.6%) have not passed at least one subject specific subtest. All 4,794 other examinees (93.4%) have passed at least one subject specific subtest and satisfied the subject matter requirement for a science credential. If the General Science (Foundational-Level) credential were available, these 341 individuals who are not currently qualified for a science credential would be eligible for the General Science (Foundational-Level) credential. Table 7 combines information from Tables 6a and 6b and shows that the pass rates on the Concentration examinations are significantly higher for the subject areas for individuals who have passed both General Science subtests than the general examinee. This data could mean that those individuals who pass both General Science subtests are more knowledgeable about science than the general science examinee.

| <b>Table 7: Pass Rates for All Science Test Takers and those Who Passed Both General Science Subtests</b> | <b>All Individuals</b> | <b>Passed Subtests 118 and 119</b> |
|---|------------------------|------------------------------------|
| 120-Biological/Life Science   | 78.2%                  | 93%                                |
| 121-Chemistry   | 82.9%                  | 86%                                |
| 122- Earth Science  | 82.5%                  | 93%                                |
| 123-Physics   | 71.4%                  | 74%                                |

#### **Science Courses and Teachers in the Public Schools, 2006-07**

Data from the California Department of Education is presented in Table 10 (page 10) on the number of science courses taught in the public schools during 2006-07. The table shows that over 80,000 science courses were offered in 2006-07. Almost 36,000 of these courses are on the UC/CSU approved course listing. An individual holding a General Science (Foundational-Level) credential would **not** be authorized to teach any of these courses.

But there are over 43,000 courses in the public schools that are not on the UC/CSU approved course list and these courses are the ones that an individual who holds a General Science (Foundational-Level) credential would be authorized to teach. These courses are taught by approximately 8,000 science teachers. If individuals holding a General Science (Foundational-Level) credential fill some of these 8,000 positions, the individuals that are currently in these assignments and have full science credentials could then teach the UC/CSU courses.

#### **Local Teaching Assignment Options and Misassignments for Science Teachers (2003-07)**

A local teaching assignment option allows an employer to place a fully-credentialed teacher, with their consent, in an assignment for which he or she is not credentialed based on specific criteria in the Education Code. This criteria usually is a specified number of units in the subject area. The most commonly used local assignment options are listed on page 11.

During the 2003-2007 years, a total of 1,456 science local assignment options were reported to the Commission. There were 10,112 total assignment options in these years. General science assignments accounted for 14% of the total assignment options for 2003 - 2007 monitoring cycle.

A misassignment is when a teacher is placed in an assignment for which he or she is not credentialed and there is no local assignment option available. Misassignments not corrected at the local level are reported to the Commission for follow-up corrective action. During the 2003-2007 time period 467 general science misassignments were reported to the Commission out of a total 21,996 misassignments. The misassignment in general science accounted for 2% of all misassignments.

### **Provisional Internship Permits (PIPs) and Short Term Staffing Permits (STSPs) (2006-07)**

The Provisional Internship Permit (PIP) was created in response to the phasing out of emergency permits and became effective on July 1, 2005. It allows an employing agency to fill an immediate staffing need by hiring an individual who holds a bachelor's degree and basic skills requirements but has not yet met the subject matter competence requirement needed to enter an internship program. Prior to requesting a PIP, the employing agency must verify that a diligent search has been made and a fully-credentialed teacher cannot be found. Holders of the PIP are restricted to service with the employing agency requesting the permit. (For more information refer to <http://www.ctc.ca.gov/credentials/leaflets/cl856.pdf>). During 2006-07, the Commission issued 211 PIPs in Science which is 10.2% of the total 2,067 PIPs issued over the past year.

The Short-Term Staff Permit (STSP) was created to allow an employing agency to fill an acute staffing need when local recruitment efforts have been made but a fully-credentialed teacher cannot be found. The STSP is only available at the request of an employing agency. Holders of the STSP are restricted to service with the employing agency requesting the permit (<http://www.ctc.ca.gov/credentials/leaflets/cl858.pdf>). During 2006-07, the Commission issued 221 STSPs in Science which is 5.9 % of the total 3,764 STSPs issued over the past year.

### **Information to Consider when Discussing a General Science (Foundational) Credential**

- The Foundational-level Math credential has allowed about 50% more individuals to earn an authorization to teach mathematics in 2006-07.
- There are 341 individuals who have passed both General Science subtests and would theoretically be eligible for a General Science (Foundational) Credential.
- Of the 80,000 science courses taught in the public schools in 2006-07, over 43,000 courses were at the foundational level and an individual with a General Science (Foundational) credential would be prepared to teach these courses.
- The California Department of Education reports over 15,000 FTE individuals were teaching science in 2006-07 and about 8,000 of them were teaching general science courses.
- Local Teaching Assignment Options were requested for 1,456 teachers to teach science during 2003-07. An additional 467 individuals were reported as in a misassignment in that they were teaching general science without an authorization during these same years.
- In 2006-07, PIPs were issued to 211 individuals to teach Science.
- In 2006-07, STSPs were issued to 221 individuals to teach Science.

### **Next Steps**

If the Commission supports the concept of a General Science (Foundational-Level) credential, the staff would bring an action item to the Commission and begin the Title 5 regulation process.

**Table 8: Current Single Subject Science Teaching Credentials and Authorized Classes**

(service in grades preschool, K - 12, and adults)

| <b>Authorized Classes →<br/>Type of Credential ↓</b> | <b>Biological<br/>Science</b> | <b>Chemistry</b> | <b>Physics</b> | <b>Earth/<br/>Geosciences</b> | <b>Integrated<br/>Science</b> | <b>Intro/General<br/>Science</b> | <b>Intro Life<br/>Science</b> | <b>Intro Physical<br/>Science</b> |
|--|-------------------------------|------------------|----------------|-------------------------------|-------------------------------|----------------------------------|-------------------------------|-----------------------------------|
| Science: Biological Science                          | X                             |                  |                |                               | 7-12                          | X                                | X                             | X                                 |
| Science: Chemistry                                   |                               | X                |                |                               | 7-12                          | X                                | X                             | X                                 |
| Science: Physics                                     |                               |                  | X              |                               | 7-12                          | X                                | X                             | X                                 |
| Science: Geoscience                                  |                               |                  |                | X                             | 7-12                          | X                                | X                             | X                                 |
| Biological Sci (Specialized)                         | X                             |                  |                |                               |                               |                                  |                               |                                   |
| Chemistry (Specialized)                              |                               | X                |                |                               |                               |                                  |                               |                                   |
| Physics (Specialized)                                |                               |                  | X              |                               |                               |                                  |                               |                                   |
| Geoscience (Specialized)                             |                               |                  |                | X                             |                               |                                  |                               |                                   |

**Table 9: Proposed General Science (Foundational-Level)  
Single Subject Teaching Credential and Authorized Classes**

(service in grades preschool, K - 12, and adults)

| <b>Authorized Classes →<br/>Type of Credential ↓</b> | <b>Biological<br/>Science</b> | <b>Chemistry</b> | <b>Physics</b> | <b>Earth/<br/>Geosciences</b> | <b>Integrated<br/>Science</b> | <b>Intro/General<br/>Science</b> | <b>Intro Life<br/>Science</b> | <b>Intro Physical<br/>Science</b> |
|--|-------------------------------|------------------|----------------|-------------------------------|-------------------------------|----------------------------------|-------------------------------|-----------------------------------|
| General Science<br>(Foundational)                    |                               |                  |                |                               | Through<br>Grade 8            | X                                | X                             | X                                 |

**Table 10: Statewide Science Course Listings\***

| <b>2006-07</b>                       | <b>Total # schools</b> | <b>Total Enrollment in course</b> | <b>Number of Classes</b> | <b>Number of UC/CSU Classes</b> | <b>FTE Teachers</b> | <b>Teachers of NON UC/CSU courses</b> |
|--------------------------------------|------------------------|-----------------------------------|--------------------------|---------------------------------|---------------------|---------------------------------------|
| Astronomy                            | 49                     | 2293                              | 81                       | 47                              | 16.58               | 7                                     |
| Aerospace education                  | 28                     | 2465                              | 135                      | 6                               | 32.02               | 31                                    |
| Biology                              | 1328                   | 424705                            | 14044                    | 13106                           | 2762.42             | 185                                   |
| Advanced biology                     | 248                    | 22349                             | 738                      | 701                             | 146.66              | 7                                     |
| Botany                               | 6                      | 99                                | 6                        | 6                               | 1.37                | 0                                     |
| Zoology                              | 35                     | 2376                              | 88                       | 80                              | 16.75               | 2                                     |
| Chemistry                            | 1044                   | 240559                            | 7951                     | 7755                            | 1561.66             | 38                                    |
| Advanced chemistry                   | 139                    | 12536                             | 410                      | 401                             | 79.17               | 2                                     |
| Oceanography                         | 130                    | 11934                             | 389                      | 334                             | 74.51               | 11                                    |
| Physical science                     | 1090                   | 202805                            | 7043                     | 1639                            | 1298.51             | 996                                   |
| <b>General science</b>               | <b>1039</b>            | <b>482632</b>                     | <b>16463</b>             | <b>0</b>                        | <b>3018.58</b>      | <b>3019</b>                           |
| Environmental studies                | 235                    | 14159                             | 541                      | 384                             | 105.69              | 31                                    |
| Physics                              | 904                    | 82877                             | 3003                     | 2903                            | 577.7               | 19                                    |
| Advanced physics                     | 72                     | 4898                              | 167                      | 161                             | 32.59               | 1                                     |
| Conservation                         | 3                      | 84                                | 3                        | 2                               | 0.79                | 0                                     |
| Earth science                        | 879                    | 158436                            | 5391                     | 2323                            | 1026.48             | 584                                   |
| Energy education                     | 6                      | 142                               | 7                        | 2                               | 1.13                | 1                                     |
| Geology                              | 64                     | 7389                              | 233                      | 207                             | 47.38               | 5                                     |
| Life science                         | 1044                   | 171884                            | 6005                     | 409                             | 1097.39             | 1023                                  |
| Meteorology                          | 3                      | 158                               | 5                        | 3                               | 0.96                | 0                                     |
| Physiology                           | 1                      | 1                                 | 1                        | 1                               | 0.11                | 0                                     |
| Science projects                     | 45                     | 1673                              | 77                       | 12                              | 13.78               | 12                                    |
| Space science                        | 13                     | 877                               | 32                       | 4                               | 5.3                 | 5                                     |
| Coordinated/integrated science I     | 393                    | 100835                            | 3490                     | 2883                            | 680.22              | 118                                   |
| Coordinated/integrated science II    | 119                    | 20175                             | 704                      | 556                             | 135.84              | 29                                    |
| Coordinated/integrated science III   | 37                     | 5392                              | 187                      | 164                             | 37.19               | 5                                     |
| Coordinated/integrated science IV    | 8                      | 853                               | 33                       | 33                              | 7.46                | 0                                     |
| Conceptual chemistry                 | 14                     | 1093                              | 40                       | 34                              | 7.22                | 1                                     |
| Conceptual physics                   | 60                     | 8078                              | 267                      | 256                             | 54.28               | 2                                     |
| <b>Gen Science: Earth Sci (Gd 6)</b> | <b>250</b>             | <b>50354</b>                      | <b>1694</b>              | <b>0</b>                        | <b>302.59</b>       | <b>303</b>                            |
| <b>Gen Science: Life Sci (Gd 7)</b>  | <b>393</b>             | <b>85678</b>                      | <b>2860</b>              | <b>0</b>                        | <b>526.19</b>       | <b>526</b>                            |
| <b>Gen Science: Phys Sci (Gd 8)</b>  | <b>381</b>             | <b>88837</b>                      | <b>2937</b>              | <b>124</b>                      | <b>535.91</b>       | <b>513</b>                            |
| Anatomy and Physiology               | 507                    | 42489                             | 1441                     | 1397                            | 282.17              | 9                                     |
| Other science course                 | 746                    | 102211                            | 4019                     | 880                             | 756.07              | 591                                   |
| <b>Total Science</b>                 |                        | <b>2,353,326</b>                  | <b>80,485</b>            | <b>36,813</b>                   | <b>15,242.67</b>    | <b>8,076</b>                          |

\*California Department of Education: Educational Demographics Unit

### **Most Commonly Used Assignment Options**

- **Education Code §44256(b)** allows the elementary credentialed teacher, by resolution of the governing board and with the consent of the teacher, to teach subjects in departmentalized classes below grade 9 if the teacher has completed twelve semester units, or six upper division or graduate semester units in the subject to be taught.
- **Education Code §44258.2** allows the secondary credentialed teacher to teach, by resolution of the governing board and with the consent of the teacher, classes in grades 5 through 8 in a middle school, provided that the teacher has a minimum of twelve semester units, or six upper division or graduate semester units in the subject to be taught.
- **Education Code §44258.3** allows local school districts to assign credentialed teachers to teach departmentalized classes in grades K-12, irrespective of the designations on their teaching credentials, as long as the teacher's subject matter competence is verified according to policy and procedures approved by the governing board and with the teacher consents to the assignment.
- **Education Code §44258.7(c) & (d) (Committee on Assignments)** allows a full-time teacher with special skills and preparation outside his or her credential authorization and with their consent to be assigned to teach in an "elective" area (defined as other than English, math, science, or social science) of his or her special skills, provided the assignment is approved by the local Committee on Assignments prior to the beginning of the assignment.
- **Education Code §44263** allows the credential holder, by resolution of the governing board and with the consent of the teacher, to teach in a departmentalized class at any grade level if the teacher has completed eighteen semester units of course work, or nine semester units of upper division or graduate course work in the subject to be taught.