

Groundwork:

Background on the 51 Flavors of Secondary Certification in Content Areas

Why are secondary teacher candidates required to complete content area majors?

For decades, teacher preparation and higher education reformers have attempted to improve the rigor of undergraduate preparation programs by promoting the requirement of academic majors for prospective teachers as a complement to professional coursework. Research generally has supported this effort, as strong subject-matter expertise has been found to improve teacher effectiveness, especially at the high school level, and particularly for teachers of mathematics and science. With the passage of the federal No Child Left Behind Act in 2001, the requirement that districts ensure that their teachers are “highly qualified” by either completing a major in the subject they teach or passing a rigorous test in their subject has generally institutionalized content area major requirements for secondary teachers.

How is secondary teacher certification structured?

The structure of teacher certification varies greatly across the states.

First, the range of grades that can be taught with any given secondary certification is not standardized. One state may offer “secondary”¹ certification that permits instruction in grades 6-12, while another state may divide certification into “middle level” (grades 5-9), and “high school” (grades 8-12). The lack of standardization is evident when looking at just a handful of states.

Table 1. Certification Grade Ranges in Seven Western States

STATE	Middle Level	High School/Secondary
Arizona	6-8 Endorsement on elementary certification	6-12
California	Not available	K-12
Idaho	Not available	6-12
Nevada	7-9	7-12
Oregon	Not available	PK-12
Utah	Not available	6-12
Washington	4-9	5-12

In addition to disparate grade ranges, there is the larger issue of what can be taught with each certification. Secondary certifications can be placed into two categories: single-subject certifications, allowing a candidate to teach only one specific subject area, and multiple-subject certifications, which allow a candidate to teach two or more subject areas.

Table 2. Common Certifications

Single Subject	Multiple Subject (possible teaching assignments)
English, Mathematics, Biology, Chemistry, Earth and Space Science, Physics, History, Political Science, Economics, Psychology	Physical Science (physics and chemistry) General Science (biology, chemistry, earth science, physics) Social Science (U.S. and world history, political science/government, economics, psychology, geography, sociology)

¹ “Secondary” in this instance refers to the certification that combines the middle level and high school grades. In all other instances in this paper, “secondary” will be used to refer to both combined middle level/high school certification and certification that covers only the high school grades. Certifications covering only the middle grades will not be discussed.

The major a candidate completes and the possible teaching assignments match for single-subject certifications. Take English as an example: If a candidate wants to teach English, he or she would complete a major in English, pass an English licensing test, become certified as a secondary English teacher, and then be assigned to teach only English courses.

Multiple-subject certifications, on the other hand, offer school districts flexibility in teaching assignments by permitting individual teachers to provide instruction in more than one subject area. But by their nature, they make it highly unlikely that teacher candidates are fully and equally prepared in all areas they will be certified to teach. In New York, for example, Social Studies certification is the only option available to teach any of the social sciences, making it possible for a teacher candidate to major in Anthropology, pass the general social studies content knowledge test, be issued the general Social Studies certification, and then be assigned to teach History.

On top of those two aspects of secondary certification, each state offers a unique combination of single- and multiple-subject certifications. The figure below highlights these disparate combinations when looking at available social science certifications in just a handful of states:

Figure 1. Available Social Science Certifications in Seven Atlantic Coast States

State	History	Political Science	Economics	Psychology	Geography	Sociology	Anthropology	Social Studies
Delaware								
Georgia								
Maryland								
New Jersey								
North Carolina								
South Carolina								
Virginia								

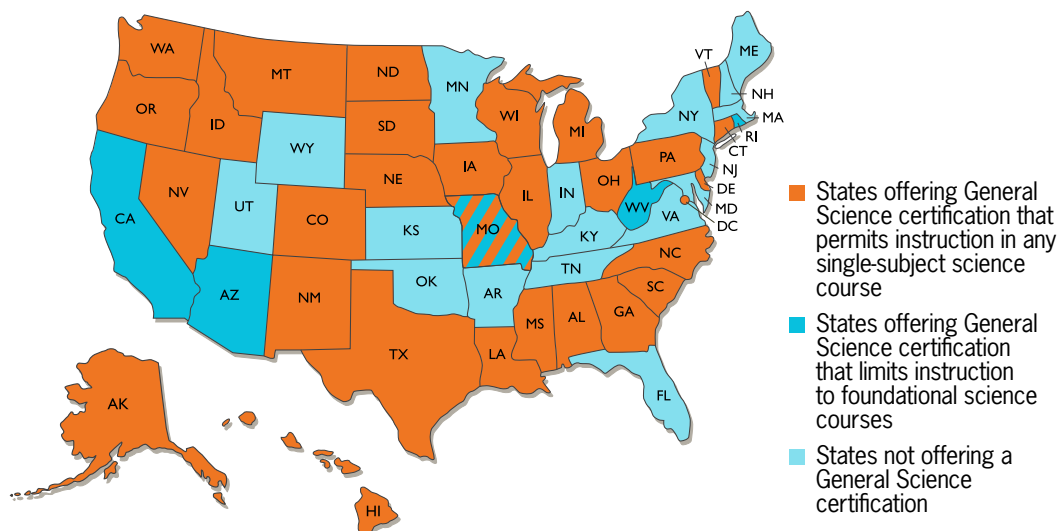
Green cells represent certifications that are offered.
White cells represent certifications that are not offered.

If general social science or “Social Studies” certification appears nearly ubiquitous in the figure above, it is because it is found in all but four states.² In fact, this “teach everything” certification is the only option for teaching any of the social sciences in 26 states. As a comparison, certification in History, which limits instruction to only History courses, is found in just 23 states.

General Science certification, which most often permits instruction in biology, chemistry, and physics, can be found in 33 states. In most cases, this “teach everything” certification allows for assignment in any science course. Five states, however, limit teaching assignments to foundational science courses, which makes the certification equivalent to single-subject certification.³ The categorization of general science certification for all states is depicted in Figure 2:

2 The exceptions are Arizona, Georgia, Indiana, and Tennessee.
3 “Introductory Science,” which focuses on global science topics such as the scientific process, terminology, use of lab equipment, etc., is an example of a “foundational science” course.

Figure 2. Availability of General Science Certification by State



Note: Illinois does not offer a specific General Science certification, but because all science certifications are permitted to teach everything within the field, all science certifications are equivalent to a General Science certification. Missouri offers a General Science certification that limits instruction to foundational science courses and also offers a series of “Unified Science” certifications that permit instruction in any single-subject science course; however, unlike all other states offering “teach everything” certifications, Missouri requires teacher candidates to pass individual licensing tests in each of the sciences.

The sum of the disparate grade ranges, the mixture of single-subject and multiple-subject certifications, and variation in certifications offered in each state makes secondary certification very complex. Detailed information on the certification structure in each state can be found in this comprehensive collection of [state certification infographics](#).

The role of coursework prep and licensing tests to ensure content mastery

For evaluation purposes, we note that we consider either a content major (or its equivalent) or a subject-specific licensing test sufficient to ensure content mastery. Even better as insurance that candidates have content mastery is a combination of adequate coursework preparation and a licensing test with rigorous content and cut-score. For single-subject certifications, candidates typically have majors in their content area and if licensing tests are required, they are almost uniformly single-subject.⁴ However, for multiple-subject certifications even the combination of program coursework requirements and a licensing test often does little to ensure that candidates will have demonstrated sufficient content mastery in subjects they will be certified to teach.⁵

Consider the case of the Physical Science certification, which permits instruction in chemistry and physics. With only two subjects to address, it would be reasonable to expect that candidates would have at least a minor (15 semester credit hours) in both chemistry and physics and be required to take a licensing test in each.⁶ In most cases, however, teacher

4 There are exceptions. For example, Wisconsin’s required licensing test for its single-subject certification in Economics, which limits instruction to Economics, contains questions on U.S. and world history, political science/government, geography, economics and behavioral science. The passing score is determined by the overall performance on the test, with no information provided on the individual categories, each of which requires too few questions (13-26) to assure mastery. That same licensing test is also used for certification in History, Political Science and Citizenship, Geography, Psychology, and Sociology.

5 For example, our review of coursework in *Teacher Prep Review 2014* indicates that nearly 40 percent of more than 350 programs offering a general social studies major as a route to Social Studies certification require fewer than 15 semester credit hours in history

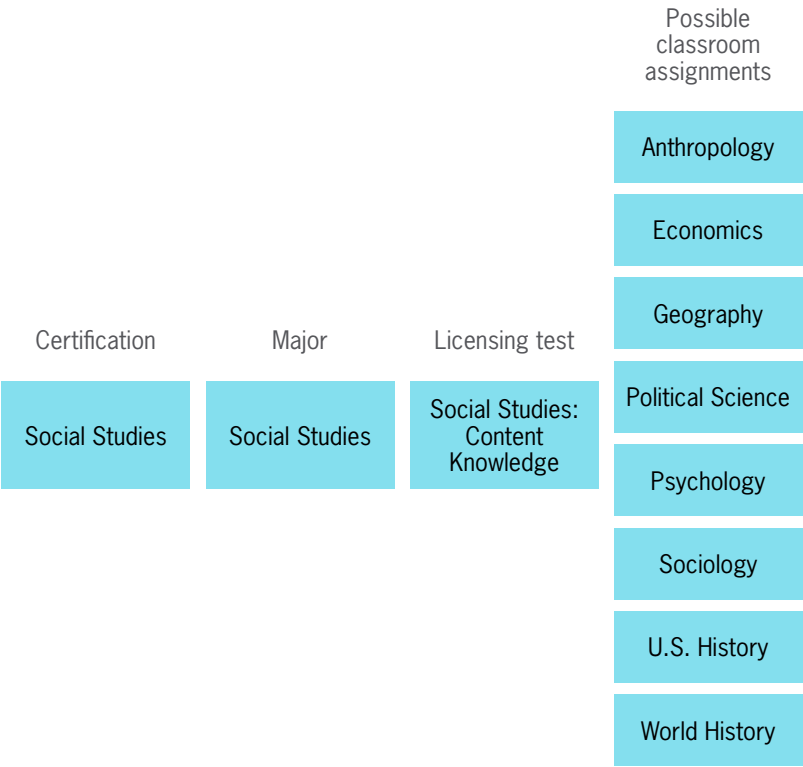
6 There are a few instances in which this multiple-test structure is achieved with what appears to be a single test. Such tests require candidates to pass multiple sub-tests that address the various subjects covered under the certification.

candidates are not required to have at least a minor in each subject, and in addition, they are only required to pass a general science or a physical science licensing test, neither of which reports the candidates' subscores for chemistry or physics.⁷ Without subscore information, there is no way to assure a candidate's competency in both subject areas.

Physical Science is a relatively straightforward multiple-subject certification, but General Science and general Social Science certifications present many more variations. These variations fall into one of four approaches.

In the first approach, a teacher candidate pursuing a multiple-subject certification (in this example, Social Studies) completes a general major consisting of coursework across all disciplines. Candidates take a course or two in each subject they could be assigned to teach, with additional coursework in one or two of those subjects. Upon completion of this mixed-subject major, candidates are most often required to pass a general licensing test, which does not require the candidate to independently pass each subject area. Once that test is passed, the teacher candidate is certified to teach all social science subjects.

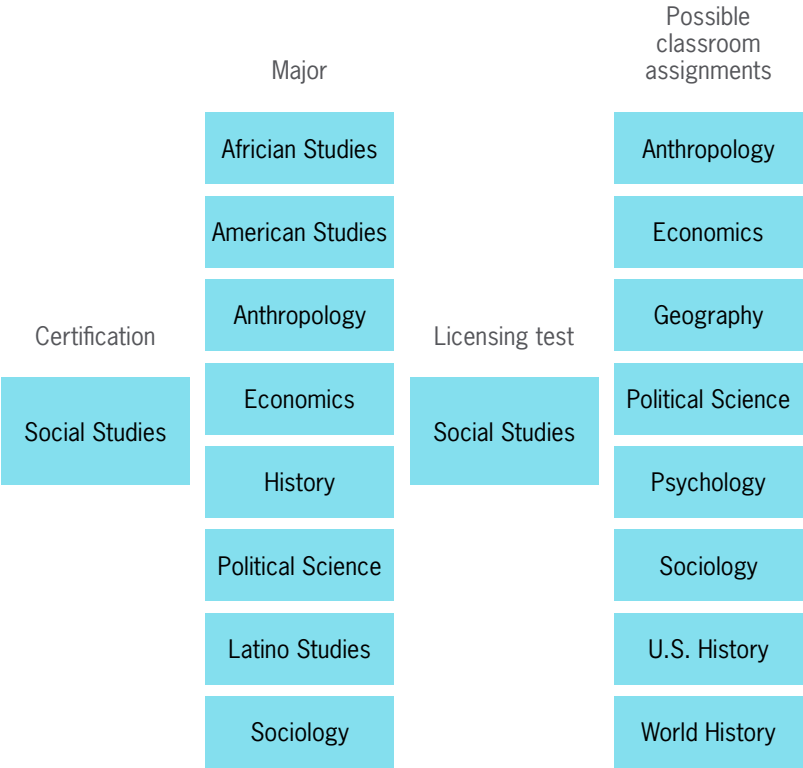
Figure 3. Multiple-Subject Certification Approach #1



In the second category, Social Studies certification can be earned by completing any one of several possible single-subject majors.

⁷ Some states have recently begun to require physical science candidates to pass either the chemistry or physics licensing test, which again supports the ability for a candidate to specialize in one subject, pass the test that best matches his or her knowledge, and then be assigned to teach the other subject.

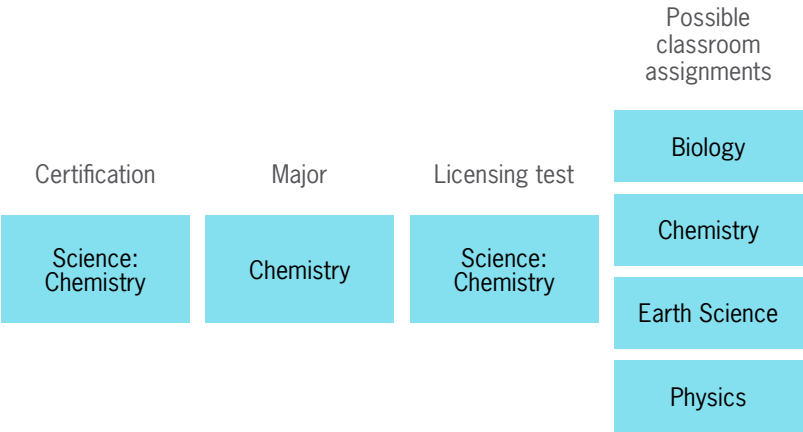
Figure 4. Multiple-Subject Certification Approach #2



The example above is based on a program in New York, which allows teacher candidates to select from eight majors, pass the general Social Studies licensing test that reports only a single score across all subjects on the test, and then be assigned to teach any course in the social sciences. A candidate pursuing Social Studies certification with a sociology major from this specific program is required to take just one course in history, yet would most likely be assigned to teach a U.S. or world history course, the most common high school assignments for Social Studies certification.

In the third approach (a model found in Illinois), the certification appears to be single-subject, but actually allows for instruction across all of the sciences. Candidates in Illinois prepare for any science certification – chemistry is shown here — with the equivalent of a single-subject major, and are required to pass a similarly focused licensing test. As a result, much like the second approach above, teacher candidates focus their content preparation in one science subject, but can receive a teaching assignment in any of the sciences without any independent evaluation of candidates’ content knowledge in each subject area.

Figure 5. Multiple-Subject Certification Approach #3



Lastly, there is the case of the multiple-subject certification that requires adequate licensing tests to ensure teacher candidates have knowledge in all subjects they are certified to teach. Missouri provides an example of this approach. For Missouri’s Unified Science certifications, while candidates need not have a major or minor in every subject they will be certified to teach, they must pass a licensing test for each subject they will be certified to teach. This multiple-test design is the only approach in which a multiple-subject certification ensures sufficient content mastery.⁸

Figure 6. Multiple-Subject Certification Approach #4

		Licensing test	Possible classroom assignments
Certification	Major	Biology	Biology
		Unified Science: Chemistry	Chemistry
		Unified Science: Earth Science	Earth Science
		Unified Science: Physics	Physics

Recommendations for policymakers on multiple-subject certification

The sciences: In the annual *State Teacher Policy Yearbook*, NCTQ suggests regulations that would lead to better preparation of general science teachers.⁹ When general science certification is offered, the state should require candidates to pass a subject-specific test in each science discipline they will be licensed to teach.

The social sciences: History is the most common social science course taught at the secondary level. All high school students are typically required to complete two years of history courses, most often a year each of United States and world history. Additionally, high school students are typically required to take at least one semester of political science/government. For this reason, history and political science/government should be addressed by single-subject certifications, with certification to teach economics, psychology, geography, sociology, and anthropology available by add-on endorsements providing they are offered in the state’s high school curriculum. If general social science certification is preserved, any candidate wishing to be eligible for assignment to a history or political science classroom should be required to take the relevant single-subject licensing test.

Three states (Arizona, Georgia and Indiana) utilize a model approach to social science certifications: None offers a general certification and all require candidates to pass licensing tests for each subject area.

8 There are a few instances where this multiple-test structure is achieved with what appears to be a single test. Such tests require candidates to pass multiple sub-tests that address the various subjects covered under the certification. Because teacher candidates are required to independently pass all sections, and the performance on each section is reported, such tests fit under the multiple-subject certification structure #4.

9 NCTQ *State Teacher Policy Yearbook: Rationales and Supporting Research; Section 1-G: Secondary Teacher Preparation in Science*.

Table 3. The Best Approach to Single-Subject Certification in the Social Sciences

Certification	Licensing test	Teachers with this certification can teach
History	History	History
Political Science	Political Science	Political Science
Economics	Economics	Economics
Psychology	Psychology	Psychology
Geography	Geography	Geography
Sociology	Sociology	Sociology

Alternatively, states can maintain some aspects of general certification, but ensure that candidates have sufficient expertise in history and political science by using single-subject certifications in those areas. This “mixed model” is shown below:

Table 4. The Mixed Model of Single and Multiple-Subject Certifications in the Social Sciences

Certification	Licensing test	Teachers with this certification can teach
History	History	History
Political Science	Political Science	Political Science
Social Studies (with specific endorsements)	Social Studies*	Economics, psychology, geography, sociology, and anthropology

* The social studies licensing test comprises multiple sub-tests covering all subjects in the field other than history and political science. Candidates can receive endorsements for all sub-tests passed.



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