To: Participants in Iowa Academy of Science Sponsored meetings on teacher certification.

Re: Report to Academy

From: Dorothy C. Matala

Enclosed is a draft of the report on recommednations on science and mathematics teacher certification that will be presented at the Academy business meeting. Friday afternoon, April 14, 1961. If you have any comments be ready to make them or tell me before the meeting. Thank you for your interest and contribution.

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Certification of Teachers in Iowa

Iowa issues a professional certificate to all qualified teachers. This is the same for all teachers but is endorsed for services of different types within the schools. The "endorsements" indicate the areas of competence of the individual and the levels and areas for which the individual may be employed. The following endorsements are available:

Elementary - to teach in grades K - 9
Secondary - to teach in grades 7 - 14 (junior college)
Elementary-secondary - to teach in special subjects or serve in special areas K - 14
(art, industrial arts, music, physical education, librarian, special education)
Elementary supervisor - to teach or supervise teachers grades K - 9
Elementary-secondary school supervisor - for special subjects
Elementary-school Principal - to serve as principal, supervisor or teacher, K- 9
Secondary-school Principal
Superintendent

Certain minimum requirements are set for the certificate. These include:

1. Four years of approved college preparation
2. A baccalaureate degree from a recognized institution (advanced degrees required on some endorsements)

The approved program refered to above is the mechanism now in operation in Iowa by which the colleges recommend their graduates for certification. If the college is an institution with an "approved program" the certificate is awarded without question. A college receives approval for this procedure by submitting its program for teacher preparation to the State Department of Public Instruction for approval. When the approval has been granted, graduates receive their certificates on the recommendation of the college. This applies to the endorsements, also. The standards of the National Council for Accreditation of Teacher Education are accepted by the State Department, although institutions are encouraged to go beyond this in their programs and requirements.

Some minimum standards for approval are suggested. These include: (items pertinent only to the certification of secondary math and science teachers are included)

General education 40 semester hours
Area of concentration in an academic field 30 semester hours
Professional education
Common professional education (elem. and sec.) 20 semester hours
Supervised student teaching 5 semester hours

At the secondary level a second set of standards exist. The term "endorsement" in general refers to the level at which a person may teach. The term "approval " is used to identify the subjects at the secondary level which a student may teach. These apply to grades 9-12 and in some cases to the junior college. They do not apply to grades 7-8 in which a person may teach any subject as long as he holds a certificate endorsed for either the elementary or the secondary school level. Again minimum requirements have been set, but colleges are encouraged to set programs and standards beyond these. Because a student has met the stated minimum does not require the college to recommend him for endorsement in that area. This means that as soon as the faculties of the colleges are willing to insist on better preparation of their graduates before they are recommended for certification that soon will the certification standards be raised.

Minimum hour requirements that are now used (these may be changed at the discretion of the State Department) are:

Mathematics	15 semester hours in the field
Science	15 semester hours in the science field and 6 semester hours in the subject taught, except that a teacher with 30 semester hours of preparation, including credits in chemistry, physics and biology shall be approved to teach all typical high school subjects in science (Botany and Zoology may substitute for biology) General Science teachers must present hours in a physical and a biological science.

These minima are not quite the same as those required for teachers in a high school belonging to the North Central Association. These are:

Mathematics	18 semester hours
Science	18 hours in the field with at least 10 semester hours in each subject taught. General Science teachers shall have 18 hours in science with at least a course in physical science and one in biological science

Recommendations on Science and Math Teacher Certification

Report of the study made by the Science Teaching Committee and the Committee on Teacher Certification

The Iowa Academy of Science during the past year has sponsored a study of recommendations concerning requirements for certification of teachers in science and mathematics in Iowa. All of the colleges in Iowa, including junior colleges, were invited to send representatives to one of four regional meetings held at Drake on Oct. 15, Buena Vista on Oct. 22, ISTC on Nov 12 and SUI on March 3. Sixty-one persons representing science or mathematics departments from 21 institutions participated in the meetings. At each meeting a statement of present certification policies and standards was available. Discussion then developed recommendations of what the participants thought are the desireable requirements for certification in each area.

The accompanying chart summarizes these recommendations. It is recognized that these are possibly not feasible of attainment at the present time. The left hand side indicates the subject being taught and the level - junior college or high school. The top indicates the science area. So it should be read, for example; a teacher of high school mathematics needs to have a bachelor's degree with a math major which includes 10 sem. hours above calculus; a year of physics and the general education courses in chemistry and biology.

The recommendations concerning the general science teacher vary more for the other areas. Hence the two patterns suggested.

If the patterns here suggested meet the approval of the Academy, the next problem is an analysis of the desireable distribution of credits within the areas. For example, what should be in the 30 hours minimum for the biology teacher? Should we try to define the understandings we want developed or accept traditional course designations? Are the traditional courses those most needed by the teacher? If there is sufficient interest further study along this line can be developed.

SUGGESTED REQUIREMENTS FOR TEACHER CERTIFICATION

Teacher ... Science Area

Teacher		Mathematics	Chemistry	Physics	Biology
Mathematics	JC	M.S. or M.A. in Mathematics (30 hrs. at least 10 at grad. level)	Gen. Ed. Courses	1 year	Gen. Ed. Courses
	HS	B.S. or B.A. Math major - 10 cr. above calculus	Gen. Ed. Courses	1 year	Gen. Ed. Courses
Chemistry	JC	Calculus	M.S. or M.A. in Chem. (30 hrs. at least 10 at grad. level)	2 years	Physiology
	HS	1 year	B.S. or B.A. major in Chem. (20 hr. minimum)	1 year	Physiology
Physics	JC	Calculus + 6 hrs.	1 year	M.S. or M.A. in Physics (30 hrs. at least 10 at grad. level)	Gen. Ed. Courses
	HS	Calculus differential equations	1 year	B.S. or B.A. major in Physics (20 hr. minimum)	Gen. Ed. Courses
Biology	JC	1 year + probability theory	Gen. Chem. organic & biochem.	1 year	M.S. or M.A. in Biol. (30 hr. at least 10 at grad. level)
	HS	1 year + probability theory	Gen. Chem. organic chem.	1 year	B.S. or B.A. major in Biol. (30-32 hr. minimum)

General Science - for teachers of grades 7 - 9

1. B.S. or A.B. Major in science to include both physical and biological science
2. Math. General Education Courses
   60 hrs. of sci. distributed among physics, chemistry, biology, and earth science, with a minimum of 10 hrs. in each.

Notes:

1. The term "General Ed. Courses" refers to introductory, survey, or broad training courses of the type required of all students.
2. This outline will need to be considerably modified when a master's degree is required for a permanent professional certificate.

The following actions are recommended to the Academy:

1. That the Iowa Academy of Science endorse the certification recommendations and copies be sent to the State Department of Public Instruction and to each of the colleges of the state.

2. That the Iowa Academy of Science recommend to the State Department of Public Instruction: That the item "all sciences" on the application blank for a teaching certificate be deleted and approval be granted only for the specific sciences.

3. That the Iowa Academy endorse the following recommendations for transmission to the State Department of Public Instruction and as widely as possible to local school systems:

   a. That salary increments for additional training be allowed only when the additional work can be readily shown to be valuable to the teacher in his work.
   b. That if the junior high school is departmentalized, the science should be taught by a person with a science major.
   c. That if a qualified teacher is not available courses in science or mathematics should not be offered. (No one should teach these subjects without background in the subjects).
   d. That consideration be given to endorsement at two levels in the secondary schools - lower secondary (grades 7-9) and upper secondary (grades 10-12).