ARC 0449C

EDUCATIONAL EXAMINERS BOARD[282]

Adopted and Filed

Pursuant to the authority of Iowa Code section 272.2, the Board of Educational Examiners hereby amends Chapter 13, "Issuance of Teacher Licenses and Endorsements," Iowa Administrative Code.

This amendment is adopted because of input from the field and issues generated by the Basic Educational Data System (BEDS) reporting. The first change revises wording in paragraph 13.28(17)"e" and more specifically defines the requirements to obtain the basic science endorsement. The second change removes the physical science endorsement option in paragraph 13.28(17)"f" that has been incorporated in other endorsement areas. The third change strikes paragraph 13.28(17)"h" to remove an outdated endorsement that should have been removed several years ago. The last change spells out in more detail the requirements for the all science endorsement in paragraph 13.28(17)"i" and also decreases the total number of hours needed for an all science endorsement from 48 to 36.

Notice of Intended Action was published in the Iowa Administrative Bulletin on September 5, 2012, as **ARC 0312C**. A public hearing on the amendment was held on Wednesday, September 26, 2012. No one attended the public hearing. One written comment was received from Christy Hickman, staff counsel for the Iowa State Education Association, expressing concern that this amendment appeared to lower standards for science teachers. This amendment is identical to that published under Notice.

Upon analysis and review of this rule making, minimal positive impact upon jobs has been found. The amendment creates a basic science endorsement that candidates for employment may obtain to make them more attractive to school districts that need a teacher qualified to work in several subject areas.

This amendment is intended to implement Iowa Code section 272.2(1)"a."

This amendment will become effective December 19, 2012.

The following amendment is adopted.

Amend subrule 13.28(17) as follows:

13.28(17) *Science.*

a. *Science—basic.* K-8.

(1) No change.

(2) ~~Competencies~~ Pedagogy competencies.

1. to 4. No change.

b. to *d.* No change.

e. ~~*General*~~ *Basic science.* 5-12. ~~Completion of 24 semester hours in science to include coursework in biological science, chemistry, and physics.~~ Completion of 24 semester hours of credit in science to include the following:

(1) Six semester hours of credit in earth and space science to include the following essential concepts and skills:

1. Understand and apply knowledge of energy in the earth system.

2. Understand and apply knowledge of geochemical cycles.

(2) Six semester hours of credit in life science/biological science to include the following essential concepts and skills:

1. Understand and apply knowledge of the cell.

2. Understand and apply knowledge of the molecular basis of heredity.

3. Understand and apply knowledge of the interdependence of organisms.

4. Understand and apply knowledge of matter, energy, and organization in living systems.

5. Understand and apply knowledge of the behavior of organisms.

(3) Six semester hours of credit in physics/physical science to include the following essential concepts and skills:

1. Understand and apply knowledge of the structure of atoms.

2. Understand and apply knowledge of the structure and properties of matter.

3. Understand and apply knowledge of motions and forces.

4. Understand and apply knowledge of interactions of energy and matter.

(4) Six semester hours of credit in chemistry to include the following essential concepts and skills:

1. Understand and apply knowledge of chemical reactions.

2. Be able to design and conduct scientific investigations.

~~*f. Physical science.* 5-12. Completion of 24 semester hours in physical sciences to include coursework in physics, chemistry, and earth science.~~

g. No change.

~~*h. All science I.* 5-8. The holder of this endorsement must also hold the middle school endorsement listed under rule 282—13.27(272).~~

~~(1) Required coursework. Completion of at least 24 semester hours in science to include 6 hours in chemistry, 6 hours in physics or physical sciences, 6 hours in biology, and 6 hours in the earth/space sciences.~~

~~(2) Competencies.~~

~~1. Understand the nature of scientific inquiry, its central role in science, and how to use the skills and processes of scientific inquiry.~~

~~2. Understand the fundamental facts and concepts in major science disciplines.~~

~~3. Be able to make conceptual connections within and across science disciplines, as well as to mathematics, technology, and other school subjects.~~

~~4. Be able to use scientific understanding when dealing with personal and societal issues.~~

i. All science ~~II~~. 9-12.

~~(1) Required coursework.~~

~~1. Completion of one of the following endorsement areas listed under subrule 13.28(17): biological science 5-12 or chemistry 5-12 or earth science 5-12 or physics 5-12.~~

~~2. Completion of at least 12 hours in each of the other three endorsement areas.~~

(1) Completion of 36 semester hours of credit in science to include the following:

1. Nine semester hours of credit in earth and space science to include the following essential concepts and skills:

- Understand and apply knowledge of energy in the earth system.
- Understand and apply knowledge of geochemical cycles.
- Understand and apply knowledge of the origin and evolution of the earth system.
- Understand and apply knowledge of the origin and evolution of the universe.

2. Nine semester hours of credit in life science/biological science to include the following essential concepts and skills:

- Understand and apply knowledge of the cell.
- Understand and apply knowledge of the molecular basis of heredity.
- Understand and apply knowledge of the interdependence of organisms.
- Understand and apply knowledge of matter, energy, and organization in living systems.
- Understand and apply knowledge of the behavior of organisms.
- Understand and apply knowledge of biological evolution.

3. Nine semester hours of credit in physics/physical science to include the following essential concepts and skills:

- Understand and apply knowledge of the structure of atoms.
- Understand and apply knowledge of the structure and properties of matter.
- Understand and apply knowledge of motions and forces.
- Understand and apply knowledge of interactions of energy and matter.
- Understand and apply knowledge of conservation of energy and increase in disorder.

4. Nine semester hours of credit in chemistry to include the following essential concepts and skills:

- Understand and apply knowledge of chemical reactions.
- Be able to design and conduct scientific investigations.

(2) ~~Competencies~~ Pedagogy competencies.

1. to 4. No change.

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EDITOR'S NOTE: For replacement pages for IAC, see IAC Supplement 11/14/12.