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The Secondary Science Teacher as an Elementary Science Consultant

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THE SECONDARY SCIENCE TEACHER AS AN ELEMENTARY SCIENCE CONSULTANT

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Helping the elementary science program grow in the environment in which we find it in our Iowa schools should be the aim of every high school science teacher in our state. Science teachers have too long divorced themselves from the problem of getting the program started right. They have sat back and shaken their heads at the seemingly insurmountable task of ingraining scientific thought and method into groups of seemingly under-critical, over-stuffed, and factually-oriented minds. It has given too many teachers of science a great deal of satisfaction to say, "Good heavens, how could anybody do anything with this?" Teachers are getting as bad as physicians who do not insist that their patients come in for periodic checkups and who then shake their heads and say, "Well you should know better." This you see, absolves us of any blame for the consequences.

Krohn

What does a practicing scientist do when he has a problem? Dare I say what he does to such a group? Would it seem superfluous? Redundant??? Unnecessary??? I am here today to tell you what our staff has done and to suggest that it is possible that all science teachers might discover a similar challenge.

The scientist first recognizes a problem: Is It Necessary That Science Teaching Be Improved in Our School System? This problem is not native to just your school system. It is the problem of all schools everywhere and it is not a characteristic of just the science department.

Next the scientist must collect some information about the problem. The following information is probably what you would find in your school system.

1. What is the preparation of the elementary staff in the field of science?

Ans: Probably less than two courses. See Table I

2. How do teachers feel about teaching science?

Ans: They like the area but feel insecure when teaching in many areas. See Chart II

3. How much time is spent in teaching science?

WEEKLY

7th & 8th	250 Min.
6th	200 Min.
5th	175 Min.
4th	150 Min.
3rd	75 Min.
2nd	60 Min.
1st	40 Min.
Kdg.	30 Min.

4. What resources are available?

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Ans: a. Generally, few references.
b. Few laboratory materials available for teacher use.

5. What helps are available from the staff?

Ans: Those trained in the area of science usually offer very little.

6. What type of articulation is there from kindergarten through grade twelve in the science curriculum?

Ans: None, except the teachers follow a basic text.

7. How many experiences are available to the student?

Ans: It depends upon the instructor. There is no set schedule of activities.

8. Are activities repeated?

Ans: Yes, in many instances. This is because the staff does not know what comes before or after.

9. Do teachers want help and direction?

Ans: Yes, and they are willing to spend time at it.

10. What are the possible suggestions for improvement?

Ans: Helping the staff to orient their instruction toward a unified and directed science program is highly desired.

Having collected the information, the scientist needs to reveal his bias by making a hypothesis which will direct his activity.

The science program can be improved by a cooperative effort of elementary staff and high school staff.

Having designed a tentative answer to the problem, the next step involves acting to substantiate the hypothesis. As in many cases, there is a good deal of evidence to indicate what the outcome will be.

The procedure should involve the following activities:

1. Decide with the administration and key teachers from each department in the grades what the philosophy of the science program should be.

2. Hold group meetings with the entire staff to discuss the philosphy and to engage their support for the proposed program.

3. Decide, administratively, how the program will be structured.

4. Hold departmental meetings to construct the course outline and discuss, as well as demonstrate, teaching techniques

Dan Carlson, high school science student and instructor's assistant, puts together a teaching device requested by a 4th grade teacher.

designed to stress the methods of science.

5. Hold grade meetings where curriculum outlines are developed.

6. After constructing the outline, design laboratory experiences that will not be repetitious; field trips that fit into the program of instruction; assign audio visual aids to certain grade levels; and secure reference materials for units.

7. After the outline and laboratory experiences are designed, hold further meetings to get materials for science centers. Secure these materials, inventory and place them in teaching centers.

8. Edit and print materials for use by the staff. Separate the printed materials into syllabi in three grade level units. (K-1-2) (3-4-5) (6-7-8)

9. Secure a summary of the effectiveness of the material after it has been used a year.

10. Re-edit for time, difficulty, and supply need after this period of time and continue surveillance of the program.*

*See Chart IV

The teacher of science, the scientist in this case, should now be ready to discard his or her hypothesis. Whether a definite conclusion could be forthcoming at this early date is somewhat debatable. The operation, however, will probably be a success. Not because the patient died but because teachers, administrators and students have found that there is plenty of life in the new curriculum they have developed.

In terms of time, preparation, money and emphasis, the charts listed below tell a story in themselves. For further information the staff of Spirit Lake invites your inquiry.

TABLE I. Amount of Training For Elementary Staff

Dept.	No. of Courses Taken									
	1	2	3	4	5	6	7	8	9	10
Primary										
K-1-2	*(1½)									
Intermediate										
3-4-5	**(2)									
Upper Elementary										
6	***(6)									

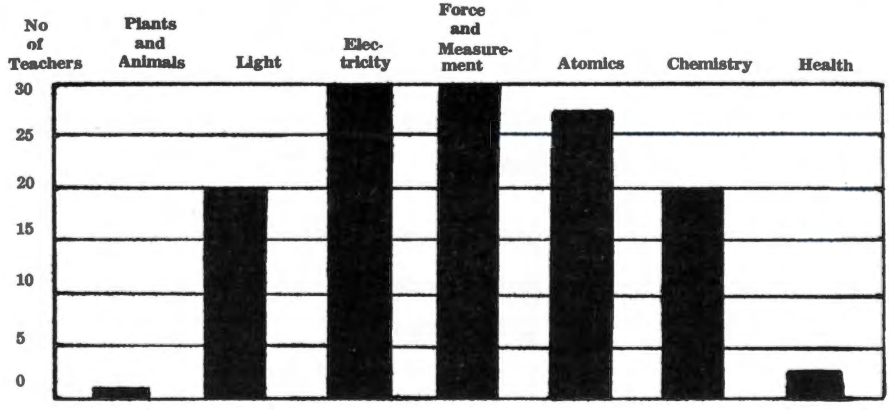
*No formal laboratory courses taken. Nature study and survey science only.

**It was several years since most of these teachers had taken a formal course in science. Again, no laboratory courses were evident.

***We are departmentalized here.

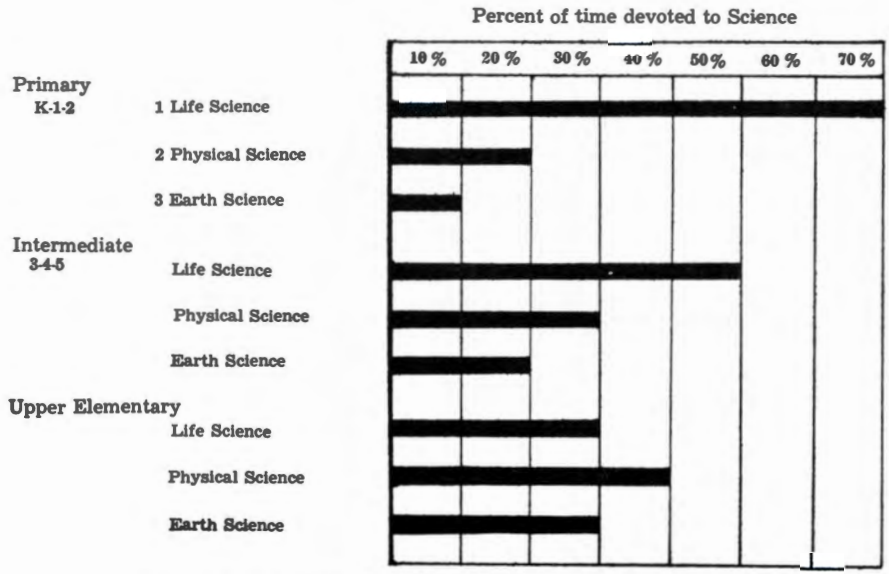
Mr. Krohn and Mrs. Vera Butler confer on a problem with 5th grade materials.

TABLE II. **Areas Listed as Most Difficult to Teach**
(30 Teachers Polled)



Mr. Krohn checks the resource center periodically, noting the teaching materials used most often by the teachers.

TABLE III. Time Devoted to Areas of Study



1 **Plants, animals**, health, safety and ecology.
2 **Physical forces**, waves, and measurement.
3 **Meteorology**, geology, astronomy, and oceanography.

TABLE IV. Time Spent by Staff in Preparing Curriculum Materials