

Valuable Online Resources

Web pages are available that can serve as valuable informational resources for students wanting to make informed career choices. Web pages can also provide critical information for science teachers involved in the recruitment process. We recommend that teachers become familiar with the information found on the following Web sites:

For a PDF version of this teacher's guide and the companion student brochure, *A Career in Science Teaching? Think About It!*, visit the ISAAPT Pipeline Project Web site at www.phy.ilstu.edu/pipeline/. All documents may be freely duplicated and distributed without further permission so long as the text is not changed and the copyright notice is included.

U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook www.bls.gov/oco/ocoso69.htm

ERIC Clearinghouse on Teacher Education, ERIC Digest #19, So, You Want to be a Teacher www.ericdigests.org/pre-925/want.htm

Find out public school teacher salaries across the State of Illinois by examining The Champion's School Salary Database www.thechampion.org/

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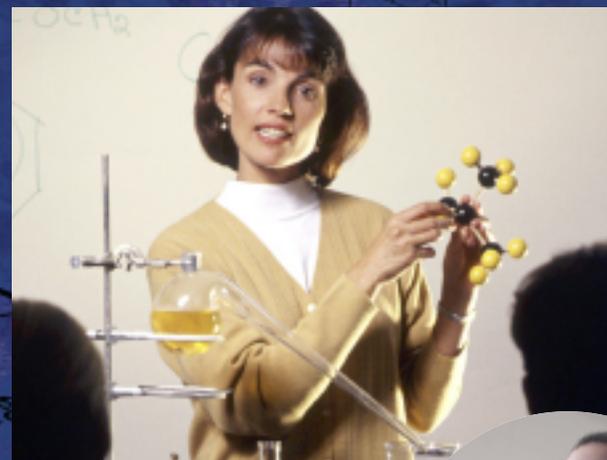
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Recruiting the Next Generation of Middle and High School Science Teachers



We need your help
to inspire, identify, and recruit
prospective science teacher candidates.

A GUIDE FOR RECRUITING SCIENCE TEACHER CANDIDATES

Something needs to be done to address the growing problem of not having enough qualified science teachers for our middle and high schools. Fortunately, there is a large supply of interested and altruistic individuals—today's science students—who can and will join the science teaching profession if only someone would encourage and promote this career choice. Without support from inservice teachers, community college, and university science faculty, solving the science teacher supply problem will not be possible. Your assistance is critically needed and urgently requested. The purpose of this guide is to help you—the science teacher—to inspire, identify, and recruit the next generation of science teachers.

A Looming Crisis in School Science Teaching

It has been noted with alarm that within the next decade half of all school teachers are expected to leave the profession due to retirement, relocation, and personal or family circumstances. Of even greater concern is the expectation that 40% of all school science teachers will leave the profession during the latter half of the decade. This is due in large part to the fact that many of today's science teachers are members of the “baby boomer” generation who started teaching in the 1970s and 1980s. There is no way that the loss of experienced science teachers can be stopped, and it certainly is not desirable to reduce the number of students enrolled in science courses or increase class sizes.

With a loss of experienced science teachers and growing enrollments in middle and high school science courses, more and more new science teachers will be needed to bridge the gap. In the State of Illinois, a significant number of science teaching positions are filled by cross-over science teachers (e.g., biology teachers with little or no physics background providing physics instruction). According to the State of Illinois, 2500 teaching positions will need to be filled by qualified science teachers during the next five years. The number of science teachers graduating from preparation programs is far less than the necessary 500 per year.

Inspiring Science Teacher Candidates

Most students make career choices on the basis of pertinent experiences and personal interest, and many students decide to become teachers before entering high school. Most of today's students will consider a career in science teaching, but only if provided with inspirational activities, proper encouragement, and suitable information. Science teachers at all levels, therefore, would do well to encourage their students to aspire to the

profession and provide them with all the resources they need to make an informed career decision. To help students understand whether or not they have what it takes to become a successful science teacher, they should first and foremost be provided with pertinent experiences that can help them develop personal interest in a science-teaching career:

- **Experience good science teaching...** Good science teaching consists of a hands-on, minds-on approach that puts and keeps excitement in the learning process. Exemplary science classrooms will have a learning environment that is student centered, knowledge centered, assessment centered, and community centered. The classroom will be student centered to the extent that the teacher helps students construct knowledge and understanding on the basis of experience. The classroom will be knowledge centered to the extent that the teacher helps students develop an organized understanding of important concepts and processes in the science discipline. The classroom will be assessment centered to the extent that the teacher makes students' thinking visible so that ideas can be tested and verified. The classroom will be community centered to the extent that students work under conditions where learning with understanding is valued, and that students are free to explore what they do not understand. Good science teaching will be inquiry oriented, and provide opportunities for students to learn from plentiful and varied learning experiences. Such classrooms will include authentic inquiry lessons and labs, interactive demonstrations, and instruction that clearly connects science concepts to everyday phenomena and the lives and interests of students.
- **Experience teaching first hand...** Nothing gets students thinking about a career in science teaching like experiencing the teaching process first hand. Inspirational activities will include student participation in various teaching practices that are both age and ability appropriate. Simple in-class tasks might include student-to-student tutoring, team teaching, class presentations, role-playing and cooperative learning activities. More advanced students might lead others in a lab activity, demonstration, or discussion. Outside-of-class activities might include using advanced students as lab assistants for introductory-level science courses, having students create lessons or labs, having students set up and take down labs, having students critique teaching, handouts, and lab guidelines, having students write questions for a test, and having students build and use demonstration devices in class, with younger school children, or at a science open house. These are just some of the many activities that can provide students with first-hand teaching experiences. Any of these activities can be helpful in getting students to gain confidence in the belief that they are well suited for a career in science teaching.

- **Experience situations that encourage teaching careers...** It is very important for teachers to get their students thinking about science-teaching careers before directly asking them to consider it. To do this, teachers can include any of the following classroom practices: speaking positively about the rewards of science teaching, addressing misconceptions about teaching as part of regular classroom activities, handing out informational brochures dealing with science teaching careers, and helping students see the need for new teachers and how they can make significant differences in the lives of others. Outside of class, teachers might consider bringing up the idea of a science teaching career at a science club meeting, organizing presentations about science teaching during career day events, speaking about science teaching at parent-teacher organizations, or forming a future teachers group at school. Lastly, teachers might consider taking selected students to a teaching conference at the local, state, or even national level, and encouraging students to enroll in summer science camps at local colleges or universities—especially those with science teacher education programs.



Identifying Qualified Science Teacher Candidates

Not every person is cut out to be a teacher, let alone a science teacher. As science teachers looking to recruit the next generation, we must keep in mind that a personal invitation is often pivotal in a student's career choice. Still, we must carefully consider who it is that should be recruited for these important positions. From a reflection on many years of science teaching and teacher candidate preparation, science teachers, science teacher educators, science department chairpersons, and high school administrators have identified five criteria that they believe are crucial for informing a selection process that is geared toward obtaining the best possible science teacher candidates. Teachers should ask themselves the following questions about a prospective teacher candidate before personally encouraging that student to become a school science teacher. Teachers should be able to answer "yes" to all of the key questions and most of the follow-up questions before encouraging a student to consider a school teaching career:

- **Does the student have good interpersonal skills?**—Does the student exhibit an altruistic, confident, and outgoing personality? Is the student well liked by peers? Is the student helpful, empathetic, and patient? Is the student a good speaker as well as a good listener? Does

the student have a good stage presence and a sense of humor? Does the student demonstrate a cooperative attitude and a positive outlook? Is the student open to new ideas? Teachers are first and foremost communicators; good interpersonal skills are a prerequisite for good teaching.

- **Does the student have an interest in science?** Is the student enthusiastic, and show interest in science subject matter? Is the student serious about learning, and a consistent performer? Is the student an active participant in class who appears to be strongly motivated to learn and who is capable of doing so? Does the student think critically about what the teacher and other students say? Does the student regularly ask questions? Does the student sometimes come into the science classroom early or after school just to talk, or otherwise appear to enjoy speaking with the teacher one-on-one? The best science teachers are passionate about their subject matter.
- **Does the student understand the content, processes, and values of science?** Is the student knowledgeable about the subject matter of the course? Does the student strive for conceptual understanding and not merely memorize for the sake of testing? Is the student able to approach and solve problems systematically? Is the student a capable and active inquirer in the laboratory setting? Does the student demonstrate appropriate scientific values such as curiosity, skepticism, objectivity, and intellectual honesty? Does the student understand the nature of science? Only those who understand science can pass on this understanding to others.
- **Is the student conscientious?** Does the student possess the intellectual and moral virtues required to be a teacher? Is the student mature, dependable, and trustworthy? Is the student level headed—calm in stressful situations—and able to adapt to new and changing conditions? Is the student able to multi-task without getting confused or frustrated? Is the student hard working, persistent, and committed? Does the student follow through on promises and obligations? Is the student present on time and ready to start work? Individuals who are committed to their students and their work make the best teachers.
- **Is the student a leader?** Is the student able to lead a group of peers and effectively challenge and motivate them? Is the student able to work well with others to get things done? Does the student demonstrate an appropriate amount of independence of thought and action? Is the student creative, well organized, and a good time manager? Does the student learn from interpersonal experiences? Is the student rightfully confident of his or her leadership abilities? Good teachers will lead by example rather than coerce desired behaviors.

Recruiting Science Teacher Candidates: Ten Steps

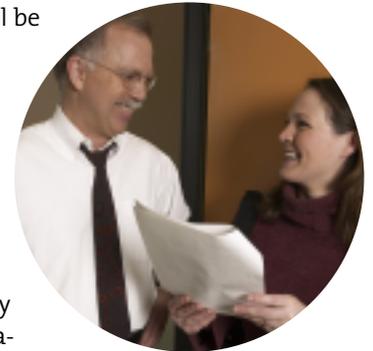
Once prospective teacher candidates have been inspired and identified on the basis of observations and other evidence, it is time to directly recruit those individuals for possible careers in school science teaching. It is suggested that a sequence of ten steps be followed over the course of one or more discussions:

1. Sincerely point out to the student that he or she possesses those intellectual abilities and character traits most closely associated with being a good science teacher.
2. Ask the student if he or she has ever considered a career in science teaching.
3. Tell your personal story—why you wanted to become a science teacher and what it has meant to you and others.
4. Speak positively about science teaching as a career, but be honest and frank about difficulties associated with the job.
5. Appeal to the student's sense of altruism and how he or she can make a meaningful difference in the lives of others. Teacher candidates point to this factor as being one of the two primary reasons why they want to become teachers—the other is having had several satisfying teaching experiences.
6. Encourage the student to consider seriously a school science-teaching career. Don't attempt to force a decision; it might take some time before the student can decide.
7. Share the companion brochure to this guide titled *A Career in Science Teaching? Think About It!* and briefly summarize its contents. Answer any questions that the student might bring up.
8. Make certain that the student knows where to turn for additional career information such as school counselors and Web pages. Be certain that the school counselors are engaged in and positively support the teacher candidate recruitment process. See the resources section of this brochure for national and regional teacher Web sites.
9. Suggest specific university programs to investigate, but don't overlook the potential of working with local community colleges, many of which are feeder schools for universities with science teacher education programs.
10. Encourage undecided students several times over the course of several weeks or months to consider a school science-teaching career. Sometimes a student won't realize he or she has a vocation in school science teaching unless he or she hears about their potential repeatedly and from a variety of different sources. Coordinate recruitment efforts with other science teachers and families. Have students speak with these science teachers and their parents or guardians to get their perspectives.

Community College and University Participation

Community colleges and universities have a number of critically important roles in the recruitment of school science teacher candidates. Without programs of excellence, it is doubtful that enough qualified school science teachers will be prepared. Post-secondary teacher education institutions should:

- offer an exemplary program leading to science teacher certification, and promote that program with appealing Web pages, posters, and brochures.
- get undergraduate college or university students involved as teaching or laboratory assistants, or in science education outreach projects.
- seek and obtain grant funds for summer camps for school students that have science teaching careers as one focus.
- nurture science teacher education majors by providing appropriate clinical experiences, specialized advisement, and ongoing support.
- encourage qualified students who seem to be losing interest in a science major to consider a science-related teaching degree instead.
- avoid thinking that the best science or science teaching majors are “too good” for science teaching in middle and high schools.



Recruiting the next generation of middle and high school science teachers can make a difference with your help. As a science teacher, you must not underestimate the value of your inspiration and recommendation on a student's decision to become a school science teacher. If the growing trend of not having enough school science teachers is to be reversed, it is critically important that you—a science teacher—become actively involved in the teacher candidate recruitment process. It is you who has daily contact with those students most likely to consider careers in school science teaching. It is you who gets to know students and their qualifications for becoming science teachers. It is you who has an influence and can impact a student's career choice perhaps like no other. It is you who will make a difference in determining whether or not future school students will have enough authentically qualified science teachers.