

NSTA Position Statement

Induction Programs for the Support and Development of Newly Hired Teachers of Science

Introduction

The National Science Teaching Association (NSTA) recommends that newly hired science teachers participate in high-quality induction programs that can strengthen their instructional practice and ultimately improve student learning (Ingersoll and Strong 2011). High-quality induction programs contribute to the decrease in turnover of early career science teachers (Ronfelt and McQueen 2017), addressing the shortage of science teachers.

Induction programs can occur in a variety of settings—face-to-face, online, or a hybrid of both. They should involve trained mentors in the discipline to ensure a supportive transition and enculturation into a new school setting (Smith and Ingersoll 2004) and involve some form of collaboration among other science teachers (NASEM 2015). They should provide adequate time to support the continual learning of new teachers of science throughout their first three years of teaching. During the induction program, new science teachers should have an opportunity to develop their comprehensive professional development learning plans that ensure their ongoing improvement of knowledge, skills, and attributes.

To facilitate the ongoing development of newly hired science teachers, it is important that induction programs support the vision of the *Framework for K–12 Science Education* (NRC 2012) and its application in the *Next Generation Science Standards (NGSS, NGSS Lead States 2013)*¹. It is equally important that they emphasize the learning of *all* students in science, address national guidelines for new teacher development (e.g., INTASC), recognize local and state requirements that ensure teacher quality, attend to the context of the new teacher’s school (e.g., demographics of the students, setting of the school), and build one’s professional repertoire (Luft et al. 2015). Supplementing these areas should be an awareness of how to use materials and equipment safely and effectively in classroom, laboratory, and field settings.

Therefore, NSTA recognizes that science induction programming is critical for the initial and ongoing growth of teachers of science. While the vision for these programs is focused on the induction period, NSTA recognizes that experienced teachers new to science teaching or individuals coming to teaching from other professions also will benefit from such programs.

Declarations

NSTA supports the development of science-specific induction programs for all new K–12 teachers of science. These programs should focus on the content and teaching of science and the context in which the teacher works. They also can be stand-alone programs specifically for

¹ These standards are critical for high-quality instruction that supports student learning. These or versions similar to these documents should guide the content and learning experiences in a science induction program.

science teachers or be carefully configured experiences that complement existing induction programs designed to serve all new teachers. The elements, along with the desired outcomes, of a science induction program are described in the following sections.

Key Elements of a Newly Hired Teacher of Science Program

Induction programs can vary in content, duration, format, and process depending upon the needs and roles of the teacher. NSTA provides the following recommendations for these induction programs.

NSTA recommends that high-quality induction programs include the following foundational elements:

- The induction program should provide a clear vision and well-articulated goals for what newly hired science teachers should know and be able to do at different points in their induction period.
- The induction programming should involve content, collaboration with other teachers, and be coherent with the teacher's assignment and context.
- Mentors should be prepared to work with newly hired science teachers. Mentors should have experience in teaching science and they should participate in specialized professional development programs that cultivate their knowledge and abilities to support and strengthen the learning of newly hired teachers;
- The induction program should provide opportunities for timely and necessary communication between the newly hired teacher and those supporting the learning of the teacher, and a mechanism for communication between mentors or staff if there are multiple programs.
- The induction program is designed to be responsive and intentional to the learning of the newly hired science teacher, includes purposefully selected resources or activities specific for the grade level of the teacher (elementary, middle, secondary), and is content appropriate.
- Data about the program materials, mentor teacher, growth of the new teacher, and support of school administrators should be continually collected to document, modify, and enhance the program.
- Sustainable fiscal plans associated with induction programs are critical in ensuring teacher and student success and the stability of the science teacher workforce.

NSTA recommends that high-quality induction programs include the following elements specific to science:

- Induction programs for science teachers should focus on the *Framework for K–12*

Science Education (NRC 2012) or the *NGSS* (NGSS Lead States 2013) and local science standards.

- Elementary and secondary science teachers need to know how to ensure laboratory safety and how to locate resources.

NSTA recommends that high-quality induction programs include the following elements specific for elementary teachers:

- Newly hired elementary teachers should have science-specific induction programming that supplements their general induction program. Teachers who are science specialists and only teaching science should have induction programming aligned with secondary teachers.
- Induction programs should recognize that elementary teachers are often less confident in their knowledge about science content, may not be teaching science extensively, or may not have positive attitudes about teaching science. Induction programs should be designed to develop the basic understanding of science among elementary teachers, allow elementary teachers to have positive experiences in science, offer opportunities to consider how to integrate science into other areas, and develop sound instructional approaches in terms of teaching science.
- Elementary teachers who teach science should build professional communities that can support their science teaching. These communities can be found at conferences, in the school district, or in different professional learning settings.

NSTA recommends that high-quality induction programs include the following elements specific for secondary teachers:

- Induction programs for secondary science teachers should have opportunities to reinforce their knowledge about science in general and the science discipline they are assigned to teach. Secondary science teachers may have a degree in a science discipline, but they may be teaching outside of this discipline. Induction programs need to be configured to provide support, as well as strengthen their knowledge and practices in specific disciplines.
- Newly hired secondary science teachers often have discrete bundles of content knowledge that may not align with the content that is taught in their schools. Furthermore, they may not have experience with the instructional materials used to support student learning in their discipline area. Induction programs should be designed to help newly hired science teachers develop a connected understanding of the content they are teaching and support their use of the instructional materials they will use. Some secondary teachers may not have experienced a science methods course and will need support to enact science and discipline-specific pedagogies.
- Newly hired secondary science teachers should attend and participate in professional

organizations to build their learning community and enhance their knowledge, skills, and attributes.

Roles and Responsibilities of Program Participants

For induction programs to be effective, newly hired teachers, mentors, instructional coaches, principals, higher education faculty, and policy makers must be aware of their roles.

NSTA recommends that newly hired teachers

- identify areas in which they want to improve and seek assistance in developing these areas;
- be open and receptive to feedback, incorporate the feedback into one's science teaching, and reflect on if and how the instructional change improved student learning;
- seek out additional professional learning opportunities that are important to one's development; and
- recognize that learning to teach takes time, and patience as teachers refine and build their science teaching skills.

NSTA recommends that mentors and instructional coaches

- be appropriately prepared to work with newly hired science teachers and have expertise and knowledge in adult learning theory, an understanding of student learning in science, and how science progresses;
- be exemplary in their knowledge of the school, science instruction, working with diverse students, adult learning theory, as well as in their ability to reflect upon their practice and support the reflection on practice by the new teacher;
- be provided with adequate time to prepare to work with the newly hired teacher both inside and outside of the classroom, to identify appropriate materials that could support the newly hired teacher, and to connect with others who are also involved in working with the newly hired teacher;
- be clear about their roles in working with newly hired teachers, be aware that newly hired teachers of science have different needs and abilities that require personalized mentoring, and be prepared to work with newly hired teachers who are at different levels and have different areas of expertise, preparation, and understanding;
- help build the capacity of new teachers of science by giving feedback that reinforces the accurate and effective presentation of science content, student learning, an equitable learning environment, classroom safety, and that supports the professionalism and ongoing professional development of the newly hired teacher;

- provide logistical assistance, such as showing the location of science supplies, helping the teacher acquire materials or resources, offering suggestions about science instruction, and orienting the new teacher of science to the environment of the school;
- be empathic and concerned with the success of the newly hired science teacher—such as taking time to listen to the concerns of the newly hired teacher and contemplating successful work plans—and be advocates for newly hired teachers to ensure they are supported by administrators and colleagues; and
- communicate with other mentors and instructional coaches if a newly hired teacher is participating in multiple induction programs.

NSTA recommends that school administrators and teacher leaders

- provide mentors and newly hired science teachers with resources and regularly scheduled meeting times, which could include conferring in person or electronically during the school day, or observing the new teacher;
- ensure that mentoring and induction activities are clearly separated from procedures for evaluating new teachers or making decisions on retention and tenure;
- intentionally match mentors and new science teachers on characteristics such as grade and subject area; and
- be knowledgeable about sound science instruction (e.g., *NGSS Lead States 2013*; *NRC 2012*), which is essential in supporting mentors and new teachers.

NSTA recommends that higher education faculty

- coordinate with the local schools to ensure that those supporting newly hired teachers are knowledgeable of the standards for teaching science (*NGSS Lead States 2013*; *NRC 2012*);
- work with local school personnel to provide additional support for new teachers;
- provide resources to new teachers to ensure they have access to ideas and materials as they continue their professional development;
- work with schools to help ensure there is a sustainable induction program for science teachers; and
- continue to study the induction process of newly hired science teachers, as it is essential in developing new program models and preservice programs that cultivate new teachers.

NSTA recommends that policy makers

- ensure that funding is provided to induction programs that support science teachers in developing their knowledge, practice, and attributes in terms of teaching science;
- access the expertise in the education and research community to develop guidelines that support science teacher and student learning;
- support funding for research and dissemination pertaining to newly hired science teachers as this knowledge helps ensure that teacher preparation and induction programs are well-designed; and
- ensure that all levels of policies are aligned.

*Adopted by the
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References

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