

**FRAMEWORK-ALIGNED SCIENCE INSTRUCTION
ALIGNMENT WITH NORTH CAROLINA TEACHER EVALUATION PROCESS**

Standard III: Teachers know the content they teach.

a. Teachers align science instruction with content standards developed by professional organizations.

The *Framework for K-12 Science Education* has been developed by the **National Research Council (NRC)**, and promoted by the **National Science Teachers' Association (NSTA)**. The Framework identifies the “big ideas” in science that students must master to meet the forthcoming *Next Generation Science Standards*. Professional development for teachers in the 6th Grade Curriculum Study includes strategies for teaching science in a way that is consistent with the *Framework*.

Teachers incorporate literacy instruction into the content area of science.

The *Framework* calls for engaging students in the practices of writing explanations, making oral arguments, and communicating science findings. Teachers who engage in *Framework*-aligned instruction help students learn how to read complex content-rich texts; construct evidence-based explanations orally and in writing; evaluate and critique the reasoning of peers; and engage in argumentation.

b. Teachers know science content appropriate to their teaching specialty.

The *Framework* emphasizes knowing science by doing science. It requires teachers to have richness and depth of content understanding, by knowing both “what” and “how” scientists know. Teachers teach science by engaging students in scientific practices; they model “scientific curiosity” and encourage students to learn science by investigating scientific phenomena.

Standard IV: Teachers facilitate learning for students.

In Framework-aligned classrooms...

a. Teachers know the ways in which learning takes place.

The *Framework* is based on research about how students learn science effectively. It emphasizes a focused set of *disciplinary core ideas* that are fundamental to understanding and doing science. *Core ideas* are taught over many years (as in a spiral curriculum) and at increasing levels of depth and sophistication in different grade levels.

c. Teachers use a variety of instructional methods.

The *Framework* calls on teachers to teach by engaging students in various scientific practices. Students learn by doing science in a manner that resembles the work of scientists and engineers. Students ask questions about the natural world, formulate investigations, design and create models, analyze data, construct explanations, and communicate what they are learning.

d. Teachers integrate and utilize technology in their instruction.

In *Framework*-aligned classrooms, teachers help students learn how to use mathematics and computational thinking as tools for various tasks, such as constructing simulations and statistically analyzing data. Using computational tools helps students test predictions, and the use of statistical techniques helps students assess the significance of quantitative patterns and correlations.

e. Teachers help students develop critical thinking and problem solving skills.

In *Framework*-aligned classrooms, students ask questions and define problems; plan and conduct investigations; construct, evaluate, and revise models; analyze and interpret data; construct explanations; and present arguments in class related to scientific ideas.

g. Teachers encourage students to develop effective communication skills.

In *Framework*-aligned classrooms, teachers establish a variety of instructional practices that help students learn how to communicate effectively in science. Students learn to obtain, evaluate, and communicate complex information; report findings from investigations; and write explanations with clear claims, evidence, and reasoning.

What can you expect to see TEACHERS doing in a Framework-aligned Science classroom?

- Supporting students in planning and conducting investigations
- Asking open-ended questions to elicit student ideas related to the core disciplinary concepts
- Having students create, evaluate, and compare conceptual models, not just demonstrate models in front of class for students
- Demanding that students present evidence to support their claims
- Probing the evidence and reasoning behind students' answers, whether they are right or wrong
- Allowing some wrong answers to be challenged by students, not just by the teacher
- Facilitating whole class discussions
- Monitoring small group work, asking questions to support students' investigations
- Introducing key science ideas in whole class- and small group- discussions

What can you expect to see STUDENTS doing in a Framework-aligned Science classroom?

- Planning, performing, monitoring and revising their investigations
- Writing explanations with a clear claim, evidence, and reasoning
- Presenting arguments in class related to scientific ideas
- Constructing, evaluating, and revising conceptual models of scientific phenomena
- Reporting on the process and results of their investigations
- Working in pairs or small groups and developing joint work products
- Using each other's ideas to better understand science concepts and phenomena
- Sharing what they are learning with each other
- Using technology tools to maximize learning

Framework-aligned Science classrooms are:

- Busy –students move around in the classroom during hands-on investigations.
- Lively – students learn by posing questions, debating ideas, and communicating with one another about what they are learning.