

# Integrating Science And Language For All Students With A Focus On English Language Learners

Brief 4 of 7

## LANGUAGE INSTRUCTIONAL SHIFTS

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Enacting instruction aligned to the New York State brief focus on modalities, registers, and interactions. (NYS) P-12 Science Learning Standards with En-For each shift, we will address (1) what is the shift, English language learners (ELLs) requires shifts in how (2) what does the shift look like in science classrooms teachers think about language in the science classroom with ELLs, and (3) what can teachers do in their own is brief introduces language instructional shifts, or con- classrooms to begin enacting the shift. temporary ways of thinking about language that depart from more traditional thinking. Traditionally, science in Each shift is illustrated in the context of a fth-grade sci- struction with ELLs has emphasized learning discrete ence unit aligned to the standards and designed with a elements of vocabulary and grammar. In contrast, con- speci c focus on ELLs. In this unit, students explain the temporary thinking emphasizes using language, in com- phenomenon of garbage in their home, school, and com- bination with other meaning-making resources, to engage munity while developing their understanding of key phys- in purposeful communication in the science classroom. ical and life science ideas. roughout this brief, we will refer to this unit as “the garbage unit.” e complete unit is available at [nyusail.org](http://nyusail.org) for teachers to download and use.

### AT A GLANCE

#### MODALITIES

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#### REGISTERS

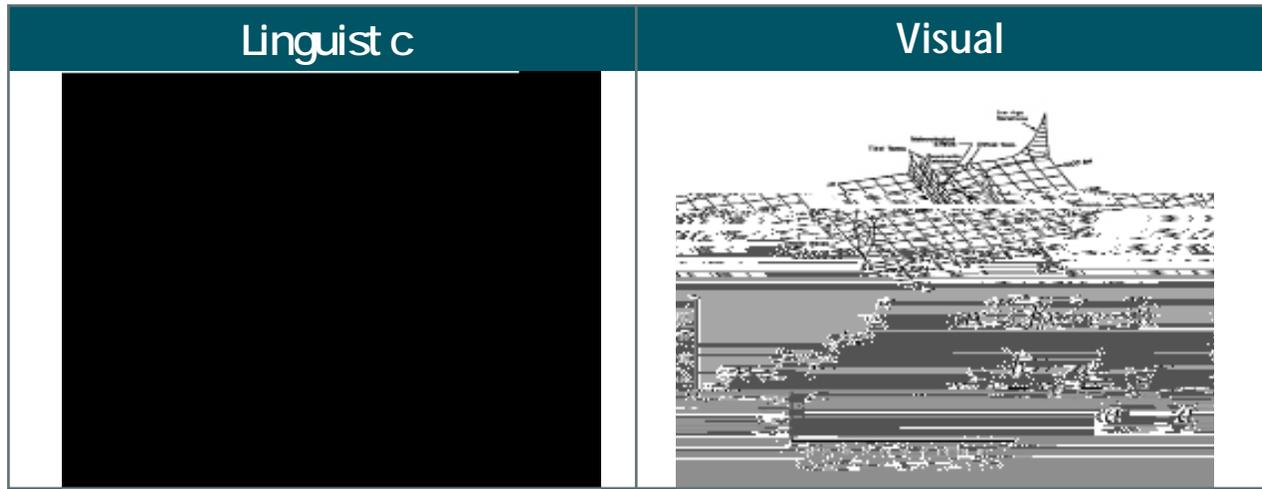
#### INTERACTIONS

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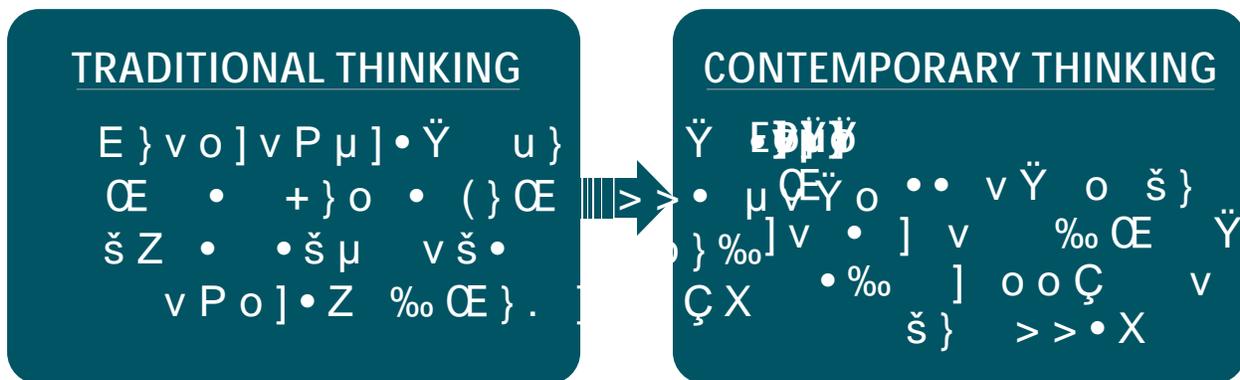
# MODALITIES

Modalities refer to the multiple and diverse channels through which communication occurs. These include the linguistic modalities of listening, speaking, reading, and writing as well as visual modalities, such as drawings, symbols, graphs, and tables. Engaging in science practices called for by the NYS P-12 Science Learning Standards involves using multiple modalities to communicate ideas. For example, students develop explanatory models of science phenomena using a combination of drawings, symbols, and written language.



## What is the shift?

Traditionally, nonlinguistic modalities (e.g., visuals) have been thought of as scaffolds for ELLs until these students develop English proficiency. For example, ELLs may be asked to draw their understanding of science ideas but only until they can communicate those ideas using linguistic modalities (e.g., a written explanation). Contemporary thinking suggests that nonlinguistic modalities are essential to engaging in science practices and especially beneficial to ELLs. In other words, drawings, symbols, graphs, and tables are not just scaffolds toward language; they are essential meaning-making resources of science disciplines. Thus, using multiple modalities to communicate ideas is important for all students in the science classroom and can be particularly beneficial to ELLs at the beginning levels of English proficiency.



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## What does the shift look like in the classroom?

In the garbage unit, students make observations of garbage materials over time. When they start to notice an unpleasant smell coming from the decomposing food materials, students wonder, “What is that smell?” and “How does it get to my nose?” As they engage in investigations to answer these questions, students use multiple modalities to communicate their emerging ideas. Alicia uses a combination of drawings, symbols, and written language to develop a model of smell made of gas particles. Isabel, a former ELL, writes a computer program that instructs gas particles from a decomposing banana to move freely around in space. Samuel, an ELL, is using a computer program to create a model of gas particles moving around in space.



# REGISTERS

Registers refer to ways of using language in different contexts or for different purposes. Registers exist on a continuum from everyday to specialized. Everyday language is the language used in daily life, for example, when giving a cup of coffee with a friend or writing a text message. Specialized language is the language used by members of a particular community to carry out their collective work, for example, the language used by sports announcers when calling a baseball game or by lawyers when drafting a contract. Specialized language also requires the precision necessary to communicate ideas with exactness. As students engage in science practices called for in the NYS P-12 Science Learning Standards, they use registers ranging from everyday to specialized in their science classroom communities.



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Traditionally, specialized language has been thought of as a precursor or prerequisite to learning science. For example, ELLs may be expected to master specialized science vocabulary (e.g., “particles”) at the beginning of a lesson or unit before they are deemed ready to engage in rigorous grade-level science instruction. However, this traditional thinking can exclude ELLs from the very opportunities for sense-making and interaction that they need to develop specialized language. Contemporary thinking suggests that, rather than being a precursor or prerequisite, specialized language is actually a product of learning science. In other words, as students develop a sophisticated science understanding over the course of instruction, they also develop the specialized language to communicate their ideas with precision.

## TRADITIONAL THINKING

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## CONTEMPORARY THINKING

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## What do you think?

In the garbage unit, students notice an unpleasant smell coming from the decomposing food materials. As s



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## INTERACTIONS

Interactions refer to the setting and participants involved in communication. In science classrooms that embrace the vision of the NYS P-12 Science Learning Standards, students work together as a community toward the common goal of explaining phenomena. In this classroom community, students engage in a range of different interactions. These include one-to-one interactions (e.g., one student talking to a partner), one-to-small group interactions (e.g., one student talking to a small group), one-to-many interactions (e.g., one student talking to the class), and small group-to-many interactions (e.g., a small group talking to the class). Each of these interactions requires students to use modalities and registers differently. For example, one-to-many interactions

Sara needs to be more explicit about what exactly is the same (i.e., the weight) and when (i.e., from time point 3). Sara's language use is different between these two interactions but equally effective, as it responds to each interaction's communicative demands.

