

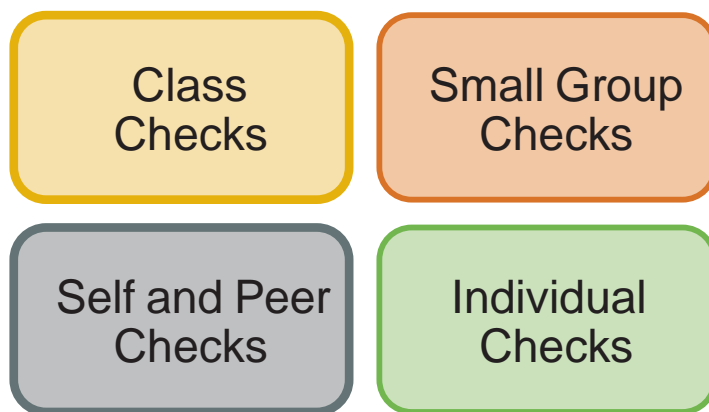
Integrating Science And Language For All Students With A Focus On English Language Learners

Brief 7 of 7

FORMATIVE ASSESSMENT IN THE SCIENCE CLASSROOM

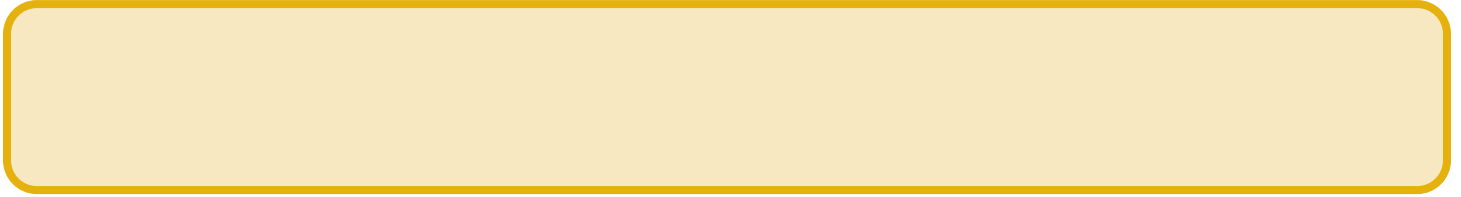
Produced for the New York State Education Department by
Lorena Llosa, PhD, Scott Grapin, PhD, and Alison Haas, PhD

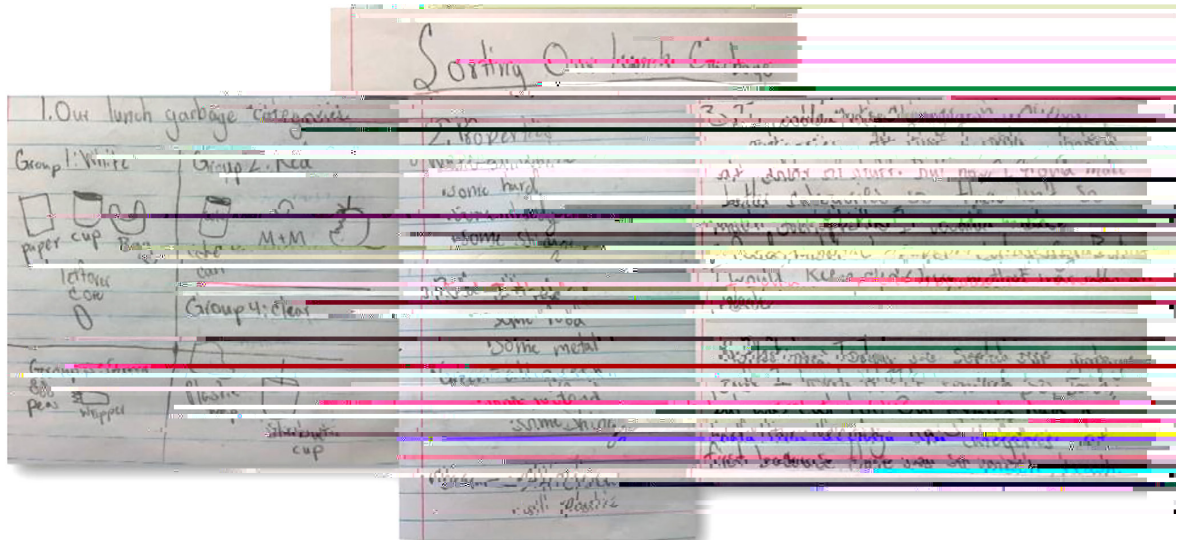
Formative assessment is an essential practice for supporting all students, including English language learners (ELLs), in the science classroom. Formative assessment is assessment that takes place during the course of instruction.



The four types of embedded formative assessment are explained and illustrated in the context of a 5th-grade science unit aligned to the new science standards and designed with a specific focus on ELLs. In this unit, students explain the phenomenon of garbage in their home, school, and community while developing their understanding of key physical and life science ideas. The complete unit is available at nyusail.org for teachers to download and use.

CLASS CHECKS





Next, the teacher reads students' responses to get a sense of their initial ideas about properties. The criteria focus specifically on whether students are able to distinguish materials between categories and whether they are able to identify patterns in the properties within and across categories. The purpose of this Class Check is not to grade or correct individual students' responses, but rather for teachers to get a sense of where the class is, overall, in developing understanding. Also, teachers can use Class Checks to identify particular students who may need additional support during instruction.

Finally, the teacher uses this information to modify instruction. For example, if the class is having difficulty applying the crosscutting concept of patterns or the disciplinary core idea related to properties, the teacher will review these concepts and ideas with additional examples during the next class period.

About Class Checks

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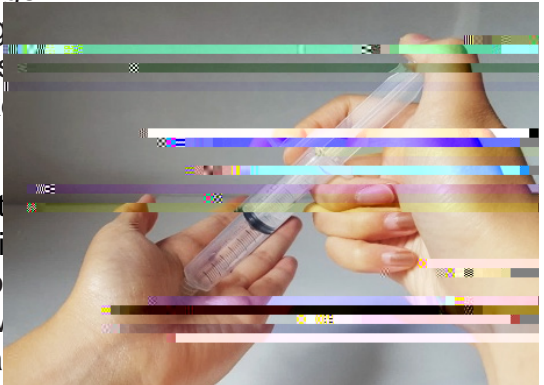
SMALL GROUP CHECKS

The purpose of Small Group Checks is to assess student understanding and promote deeper discussion among students when they are working in small groups.

Over the course of the unit, students carry out an investigation where they put food and non-food materials in land II bottles and observe changes over time. The purpose of the investigation is to find out whether the properties of the food and non-food material change. Also, students keep one land II bottle open and the other closed to find out whether the amount of matter in each bottle changes over time. Students make observations at the beginning of the land II bottle investigation and then again 1 week later. By this time, students start to notice an unpleasant smell coming from the open land II bottle system and ask, "What is that smell?"



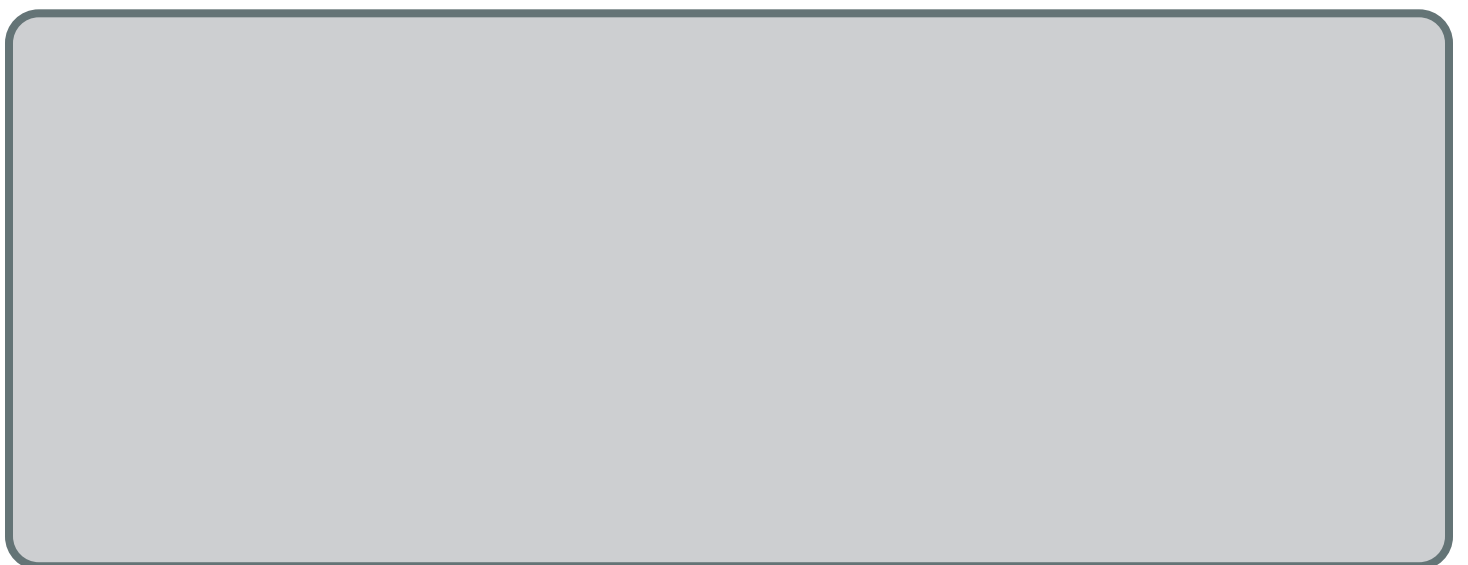
To answer their questions about smell, students engage in a series of investigations. In one investigation, they compress air in a syringe. This investigation produces evidence that air is in fact something which will eventually lead to the idea that air and smell are gases made of particles too small to see. The particle nature of gas is a key disciplinary core idea in fifth grade.



As students carry out the syringe investigation in small groups, the teacher engages students in a Small Group Check. The teacher circulates around the class and listens to each group's discussion to get a sense of students' current thinking. Then, the teacher draws explicitly on the probing questions to promote deeper discussion and to move students' thinking forward.

SMALL GROUP CHECK! Gases

- How does the amount of matter in a closed system change over time?
- How does the amount of matter in an open system change over time?
- How does the amount of matter in a closed system change over time when the system is heated?
- How does the amount of matter in a closed system change over time when the system is cooled?
- How does the amount of matter in a closed system change over time when the system is compressed?
- How does the amount of matter in a closed system change over time when the system is expanded?





About Individual Checks

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Conclusion

To summarize, we have presented four types of formative assessment that can be embedded in science instruction to support the learning of all students, including ELLs.

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Ultimately, to enact instruction aligned to the new standards, we must think about assessment differently. First, we need to think about assessment as ongoing rather than something that happens only at the end of instruction. When formative assessments are embedded throughout science instruction, teachers can use assessment information to improve teaching and learning. With ELLs in particular, teachers can collect real-time information about their science and language learning and use that information to modify instruction accordingly. See [Appendix B](#) for more information on formative assessment and its use in science instruction.

