

# How Speech Recognition Works in Lexia® English Language Development™

## Speech Recognition Engine

### When is speech recognition used in Lexia English?

While working in Lexia English, students will have frequent opportunities to practice their speaking skills through conversations with 17 diverse characters. During these conversations, students will click a microphone icon when it is their turn to speak, and will receive immediate feedback on the accuracy of their utterance. The speech recognition system stops listening when the student completes their attempt — student voices are only captured by the system after the microphone icon has been clicked.

### How does the speech recognition system know if the student is correct?

The speech recognition system was designed to make the same decision that would be given by a teacher implementing Lexia English's pedagogical approach in their classroom. To accomplish this goal, 24 former educators and Lexia English experts spent over 150 hours grading more than 2,900 student responses, all in accordance with a custom rubric developed with the program's key focus on grammar in mind. We then built and rebuilt the speech recognition system until it rated student speech the same way as these experts as often as possible.

### Why did speech recognition mark a seemingly correct attempt as wrong?

The speech recognition system will make occasional mistakes, and we are constantly working to improve its performance. In addition, please keep in mind that experts often disagree on

whether particular student attempts are correct or incorrect — in a study conducted with Lexia English, we found that former educators who were trained in the pedagogical philosophy used to design Lexia English could still disagree on almost one in every five student attempts. To account for this, students are given two attempts on each speaking item and will be marked correct in myLexia if they are correct on *either* their first *or* second attempt.

### Does background noise impact how students' speech is graded?

The speech recognition system has been field tested both in school and remote learning environments and is able to grade accurately with typical noise levels. We do recommend that students use a headset while working in Lexia English and that background speech during program use is reduced as much as practical.

### Is my student being marked wrong because of their accent or diction?

Lexia English's speech recognition system was designed to understand words as they are spoken by children who regularly use English in addition to (an)other language(s). While the system may make occasional mistakes, we do not expect students with any particular accent to encounter systematic difficulties using the program. We have, however, found some evidence that younger children (especially those in Kindergarten or 1st grade) tend to be scored somewhat less accurately than older students by the speech recognition system. This can often result from a student improperly using

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the headset/microphone or from pressing the microphone button too many times. We are working continuously to improve grading accuracy for all students.

### **How can I see my students' Lexia English speaking results?**

Educators can monitor students' speaking results by logging into [myLexia.com](https://myLexia.com) to access the Lexia English reporting. Each student's Overview report displays the student's accuracy on items of each skill type (speaking, listening, and grammar) as they work through an Activity. This information can be used to compare a student's performance in speaking to their listening and grammar skills. Reports also show their overall score on the Presentation of Knowledge for every Encounter.

### **Can students get "stuck" due to technical issues with speech recognition?**

Due to the possibility of encountering technical issues with speech recognition, we designed Lexia English to allow students to advance through the program even if they do not eventually get a speaking item correct. There are two key features to this design. First, students drop to instruction following two incorrect speaking attempts, but if they continue to make incorrect attempts after instruction they will advance to the next item. As mentioned above, students will be marked correct for the item in myLexia if they are correct on *either* their first or second attempt (before dropping to instruction).

Second, the speech recognition system uses a more permissive grading system during instruction that results in a higher chance of the student getting those items correct. This change is in line with a pedagogical approach for instruction in Lexia English that focuses on encouraging students to continue practicing their speaking with less emphasis on whether the attempt is correct. Together, these design elements encourage students to practice their speaking skills while minimizing frustration in the event of technical difficulties.

### **How will I as a teacher know if my students are having technical issues with the speech recognition?**

In addition to grading student attempts, the speech recognition system can also identify when a student may be encountering technical issues while using Lexia English. Students will be automatically prompted to recalibrate their microphone if their speech volume is too loud or too soft (typically caused by having the microphone too close or too far from their mouth). If you notice that a student is frequently being prompted to recalibrate, check that their headset is plugged in properly and that the microphone is positioned correctly while the student is speaking.

### **What are the best practices to communicate to students and parents/guardians to ensure the speech recognition functions accurately?**

To ensure accurate functionality of the speech recognition system, students should wear a headset while working in Lexia English and ensure that the microphone is close to their mouth. While the speech recognition system is capable of grading accurately even if there is background noise, students should try to work in a relatively quiet space. Students should be ready to speak when they click on the microphone button and begin speaking only after they hear the tone indicating that they can begin their attempt.

### **Can I use Lexia English with students with speech impairments?**

The speech recognition system can generally provide an accurate assessment of any student speech that you are able to understand. While the system may make occasional mistakes, we do not expect students who produce understandable speech to encounter systematic difficulties. Always encourage students to try their best, and to give it another try if they encounter technical difficulties.