



OCEAN EXPLORER

Teacher Manual

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Goals/Objectives

English Language Arts Standards

The listening accuracy and auditory sequencing skills addressed by this exercise precede those addressed by typical reading standards, but are essential for learners to:

- recognize rapidly changing sounds, which is important for phoneme discrimination
- recognize and remember the order of a series of sounds, which is critical for mapping sound sequences to letter sequences when decoding or spelling.

Language/ Reading Skills

Students will be able to...

- identify rapidly changing sounds (listening accuracy)
- correctly recognize and remember the order of a series of sounds (auditory sequencing)

Cognitive Skills

Students will be able to...

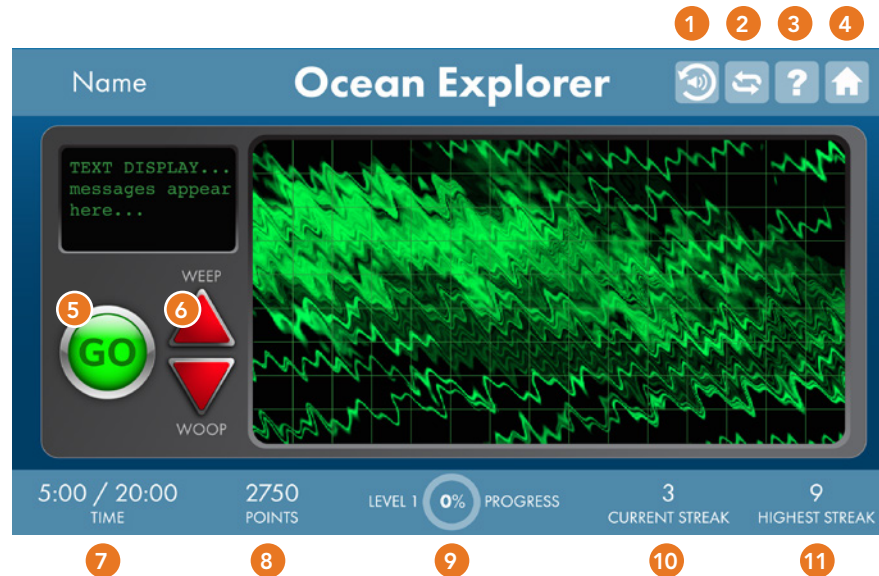
- hold a sound sequence in working memory while recalling visual symbol-sound associations from long-term memory (memory)
- focus and sustain attention (attention)
- process tonal sweeps (processing)

Social-Emotional/ Executive Function Skills

Students will be able to...

- selectively focus and sustain attention on a lesson or an activity
- inhibit impulsive responses
- build confidence in listening skills
- manage ability to process rapid, complex information

Exercise Screen



1 Replay

Repeats the sound or sequence of sounds.

2 Autoplay

Turns Autoplay on or off; when “on” each click of the Go button presents a series of three or more trials.

3 Help

Provides access to help options:

- **How to** replays initial instructions and provides a model trial.
- **Practice** allows students to listen closely to the current stimuli without affecting their progress.
- **Progress** displays progress for each level and the entire exercise.

4 Home

Returns the student to the Exercise Selector screen.

5 Go

Presents a question or series of Autoplay questions. When an Autoplay sequence is in progress, this counter shows how many questions remain.

6 Response Buttons

Responds to a question by clicking the up and down arrows in the right order, to match the sound or sequence of sounds presented.

7 Time

Shows Time Worked / Time Scheduled for the exercise.

8 Points

Shows total points awarded across all of a day’s sessions.

- **Correct answers:** 1 point for each correct answer
- **Autoplay bonus:** double the usual points if all questions in a set are answered correctly.

9 Level Progress

Displays the current level and percent completion of the level.

10 Current Streak

Shows the number of consecutive correct answers since the last incorrect answer (or since the beginning of the session, if no answers have been correct).

11 Highest Streak

Shows the highest number of consecutive correct answers in this session.

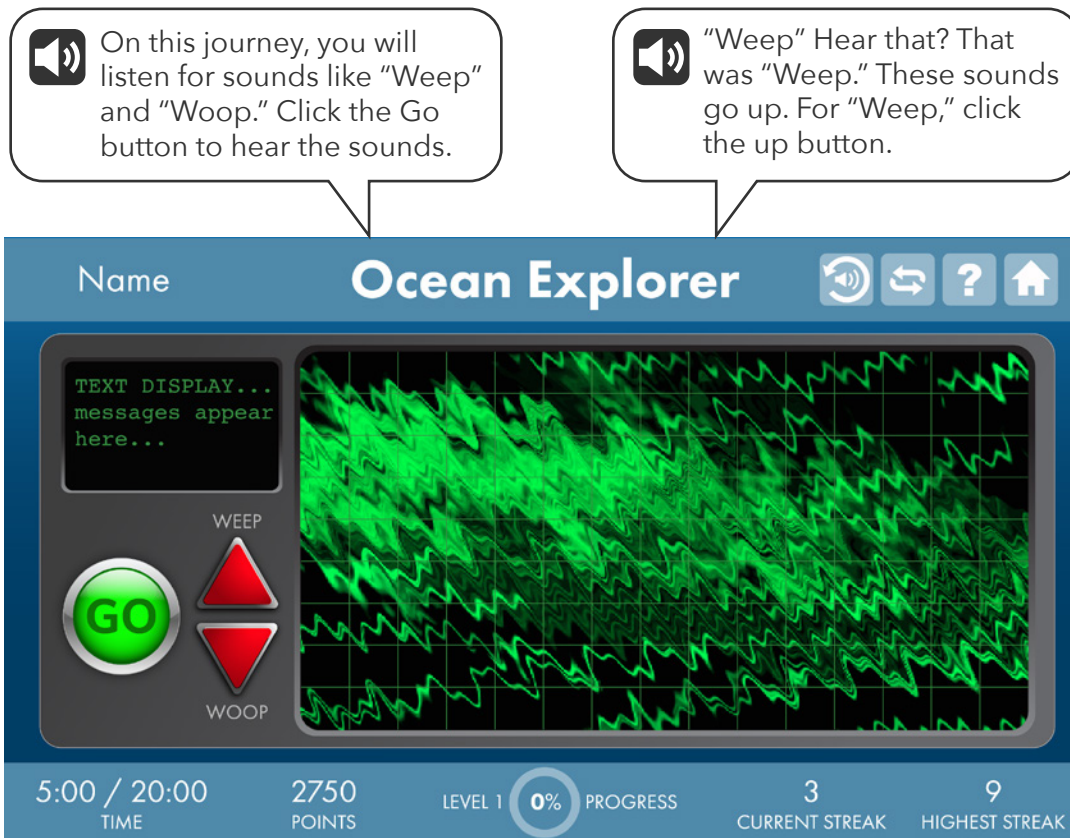
Exercise Overview

Task

In Ocean Explorer, students listen to frequency-modulated sweep sounds that change their pitch, going from low to high (an up sweep or “Weep”) or from high to low (a down sweep or “Woop”). Many speech sounds (phonemes) include sweeps. For example, to distinguish /b/ from /d/, one must be able to distinguish and recognize the sweep components of those speech sounds.

Ocean Explorer begins with single sweeps, then progresses to paired sweeps. Students must click the Go button to hear a sweep or a pair of sweeps. If they hear a single sweep, they must click the up or down arrow to match that sound. If they hear a pair of sweeps, they must click the up and down arrows in the right order to match the pattern of sounds.

While students work through the exercise, the screen shows a distorted image overlaid with a grid. At first, the image is completely obscured. Each time students get three correct answers in a row, cells within the grid reveal a clearer image. If students get answers incorrect, cells may revert to the distorted image.



Icon Key



Audio



Download



English Learner



Quick Check



Settings



Video

Exercise Overview

Content

As students progress in Ocean Explorer, the exercise presents paired sweeps that change in frequency, duration, and inter-stimulus interval (ISI—the between the paired sweeps).

Frequency: Each frequency sweep starts at a base frequency, measured in Hertz (Hz) or cycles per second. The exercise rotates through three base frequencies, to promote generalization to natural human speech.

- Low (500 Hz)
- Middle (1000 Hz)
- High (2000 Hz)

Duration: Each frequency sweep also varies in length or duration, measured in milliseconds (ms). As students progress, they move from longer to shorter sweeps, which increases the difficulty of the task. Changes to the sweep duration push the brain to process very rapid transitions, such as those found in natural speech.

- 80 ms
- 60 ms
- 40 ms
- 35 ms
- 30 ms

Inter-stimulus Interval (ISI): When a pair of frequency sweeps is presented, there may be a silent pause or gap between the two. This gap is also known as the inter-stimulus interval or ISI, and it is measured in milliseconds (ms). As students progress, the gap gets shorter (dropping from 500ms to 0ms—no gap at all). This increases the difficulty of the task. Changes to the ISI push the brain to process sounds more rapidly.

Ocean Explorer Progression

The task changes and gets more difficult in several ways:

- At first, students start by working through introductory levels that provide instructions, modeling, and supports (audio feedback and/or visual cues) to introduce the frequency sweeps and the tasks. As students progress through the introductory levels, the supports are gradually removed.
- In the standard levels, within each base frequency, students advance through 5 sets with progressively shorter durations. Within each set, students advance through 45 stages with progressively shorter ISIs. This progression challenges students to improve their rate of auditory processing.
- Ocean Explorer adapts to students' performance. If students are doing well, they may skip some stages; if they are struggling, they may need to work on more of the stages. If a student gets stuck for an extended period, they may be shifted to work on a different frequency or provided with targeted practice.

Exercise Overview

Content

Motivational Levels

Students work to reveal a different picture in each of five motivational levels. After each 20% of progress through the exercise, the picture for the current level is completely revealed. These motivational levels are not connected to content, only to percent completion.



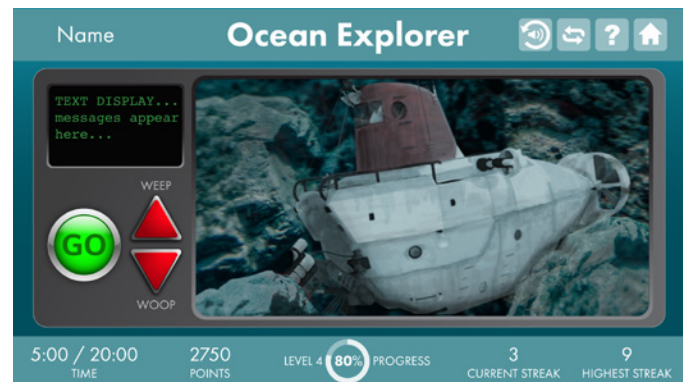
Level 1



Level 2



Level 3



Level 4



Level 5

Exercise Overview

Targeted Practice


This exercise uses built-in, responsive technology to detect when a student is struggling and administer targeted, inline instruction—right when the student needs it—without any external resources or assistance required. This helps reduce frustration as it quickly gets students back on track, so they can continue making progress.


Ocean Explorer provides a variety of in-product interventions, such as: coaching, modeling, extended sweeps, alternative instructions and tasks, and modified progressions.

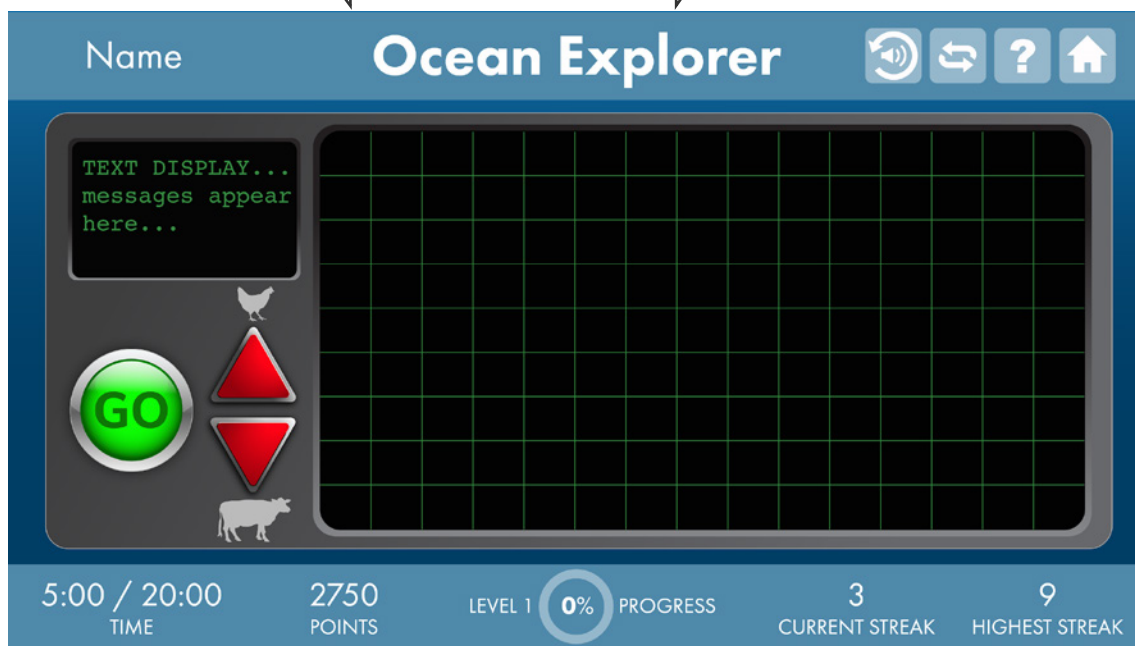
One type of intervention, Paired Sweep Alternate Stimuli, introduces the mechanics of the task and sound/button mappings using familiar, distinguishable animal sounds and words before progressing to frequency sweeps.

Students are provided immediate feedback as to whether their answer is correct or incorrect.

Students' progression in the exercise stops temporarily while working through an intervention, then resumes when they return to the regular exercise content.

 Let's try something new. See the chicken? The up button is now the chicken button. Click the chicken button. See the cow? The down button is now the cow button. Click the cow button. Nice job! Click Go to hear a sound. Click the chicken or cow button to make the same sound.

 Now, Go will make two sounds. Here's what you do. Listen carefully. What was the order? Click the buttons in the same order. First, let's practice. I will talk you through. Click Go. We heard a cluck, then a moo. So, click the chicken button, then click the cow button. Remember: Hear two sounds? Make two clicks.



Exercise Overview

Acoustically Modified Speech

Have you ever worked with a student who had modifications for additional think time, extra wait time, or for teachers to speak more slowly? All of these modifications provide the student with extra time to make sense of information, also known as processing time. For students who struggle with processing speed, and for those learning a new language, slowing down the rate of speech and emphasizing specific sounds can help them develop accurate phonological representations while increasing comprehension.

Fast ForWord's acoustically modified speech technology—sometimes referred to as “glasses for the ears”—slows and emphasizes speech sounds so that students can hear all sounds in a word.

This technology can even stretch out sounds that are physically impossible for human speakers to stretch on their own.

“Why does everything sound so strange?”

Some speech sounds, such as the /b/ sound in the word “bat,” have very fast transitional elements. When we say them aloud, these elements are easy to miss, but slowing them and emphasizing them (by presenting them at a higher volume) helps the brain process and respond to them more quickly.

The modified words and syllables in the Fast ForWord exercises may sound strange or mechanical to those who process sounds quickly. But for students who need a little extra time, the modified sounds and words will be easier to identify than natural speech. As students progress, the stretching and emphasis are reduced, pushing the brain to process at faster and faster rates until it can process natural speech.



Why Does Everything Sound So Strange? (Student) in [Student & Teacher Resources](#)



Why Fast ForWord Sounds the Way it Does (Teacher) in [Student & Teacher Resources](#)

Did you know?

In Ocean Explorer, students identify and sequence frequency sweeps—sounds that change in pitch from low to high (“Weeps”) or high to low (“Woops”). What does this have to do with being a good listener and reader? The frequencies and durations of the frequency sweeps resemble some of the rapid transitions in the sounds of the English language.

To understand speech, it's important to quickly be able to tell frequency sweeps apart. Although we are unaware of such frequency sweeps when we hear someone talk, many of the common speech sounds, such as /b/, /d/, /g/, /p/, and /t/, have a frequency sweep component. Our brains have to be able to identify these frequency sweeps in order to understand what someone is saying. For example, one sweep is all that differentiates /b/ from /d/, and that makes the difference between hearing *bad* and *dad*.

A frequency sweep that passes by in a fraction of a second can be critical for correctly identifying a speech sound, recognizing a word, and understanding a sentence. It can be especially difficult to hear these sounds when the language is unfamiliar or the speaker is unclear or when listening in a noisy environment. Robust and rapid auditory processing is critical for students who are learning through spoken language. It is also critical for building the speech sound representations that are the basis of early reading skills like phonological awareness and phonics. Ocean Explorer improves students' ability to recognize frequency sweeps quickly and accurately.

Facilitate and Encourage

Introduce

Engage

To introduce the exercise to your students, you can start by explaining to students that they will be listening to frequency-modulated sweep sounds. Say: Have you ever had a song you know so well that you can recognize it after just a few notes have been played? The human auditory system can do amazing things when it is well tuned. It has to be well tuned to understand speech sounds, because it has to process more than 700 sounds per minute in typical spoken language! This exercise tunes your auditory system to quickly distinguish one of the important components of many speech sounds—frequency sweeps. The sounds presented are actually sound sweeps that cover the frequencies in human speech. The object is to listen carefully and determine whether the sound sweeps you hear are up or down sweeps. We will listen together and share strategies you might use to tell the difference.

Demo

1. Say: Today, we're going to practice matching the sound or sequence of sounds presented to you. Together, we'll work on an exercise called Ocean Explorer. I'll get us started, and then I'd like for you to try.
2. Project the Ocean Explorer Introduction (English or Spanish) demo.
3. Follow along with the demo, which explains how the exercise works.
4. Encourage choral response or hand-raising. Ask those who can hear the difference to share their strategies (i.e. closing their eyes, humming to themselves, assigning an environmental sound to the sweeps for a memory association). Have students encourage each other by seeing who can get the most correct answers in a row.
5. Keyboard shortcuts:
 - Go button: Space bar
 - "Weep" answer: Up arrow
 - "Woop" answer: Down arrow

Direct students to log in and work individually on the Ocean Explorer Demo for approximately 10 minutes. This time period mimics the timing of the exercise once it's assigned. Debrief with students to ensure they understand the task and objective of the exercise. Ask, **What did you notice?** Have students share anything that they have questions about.



Ocean Explorer includes instructional audio for the exercise introduction, instructions, and targeted practice.

By default, these are presented in English. You can, however, select Spanish instructions for all, some, or individual students on the Manage page in mySciLEARN.

Facilitate and Encourage

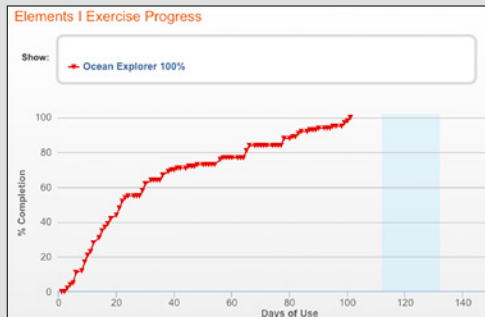
Monitor Student Progress

Review Ocean Explorer reports regularly to monitor student progress. Use the data to determine which students are succeeding and which students might be struggling to make progress.

Where to look...

PROGRESS: Elements I Exercise Progress - Ocean Explorer

The colored line shows student progress and their percent complete. Each dot indicates a day the student worked on the exercise.



What to look for... what it means

Is the line going up?

The student is completing content accurately and making progress.

Is the line flat across several dots?

The student may be struggling and you need to find out why.

Are there long lapses between dots?

The student may be skipping this exercise.

USAGE: Usage Details - Schedule

Schedule		Minutes/Trials	Start Time	Total Min	
Days of Use	Date	AI Assistant	Ocean Explorer	SonoLab	Space Sal
127	07/09/2020		○	○	
126	07/08/2020	●			
125	07/07/2020	●	●		
124	07/06/2020		●		
123	07/05/2020	●	○		
122	07/03/2020	●	○		
121	07/02/2020		○		

Schedule

See if the student has met their daily schedule, and check what's planned for the next few days:

- Time completed
- Time not completed
- Exercise Skipped
- Planned for day

Do you see half-filled gray circles?

The student is working on this exercise, but not meeting the scheduled time. Make sure that they have time to complete their daily schedule. If fatigue is an issue, taking breaks is okay.

Do you see red circles?

The student is skipping this exercise. Provide support to help them re-engage.

USAGE: Usage Details - Minutes/Trials

Schedule		Minutes/Trials		Start Time		Total	
Days of Use	Date	AI Assistant Min	Ocean Explorer Min	SonoLab Min	Space Salvage Min	AI Assistant Trials	Ocean Explorer Trials
30	03/29/2020	-	-	20	85	18	124
29	03/25/2020	12	61	-	-	0	-
28	03/24/2020	-	-	7	9	7	32
27	03/22/2020	12	42	-	-	7	15
26	03/21/2020	9	43	7	19	5	33
25	03/13/2020	-	-	-	-	-	-
24	03/12/2020	-	-	15	26	9	67
23	03/11/2020	12	61	-	-	8	56
22	03/10/2020	-	-	7	14	7	31

Are many days highlighted in red?

The student is not meeting their daily schedule.

Is the student answering fewer questions than usual?

They may be distracted or losing focus. In comparison to their previous activity, a low number of trials to minutes may indicate the student is not applying themselves to the task.

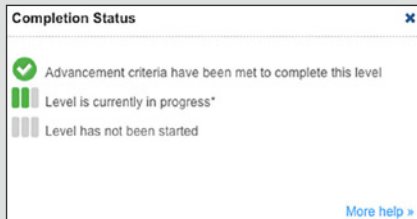
Is the student answering more questions than usual?

They may be rushing. In comparison to their previous activity, a high number of trials to minutes may indicate the student is trying to amass points which can result in careless answers and mistakes. Ask them to turn Autoplay off. Remind them that making progress depends on accuracy, not speed.

Facilitate and Encourage

Where to look...

PROGRESS: Progress Details - Ocean Explorer Completion Status



Number of Trials

The number trials needed varies by level:

Introductory Levels

Minimum trials:

- Identify Single Sweeps: 27
- Sequence Paired Sweeps with Audio Feedback and Visual Cues: 9
- Sequence Paired Sweeps with Audio Feedback: 63
- Sequence Paired Sweeps: 27

Standard Levels

- Minimum trials = 69.
- As students progress to more difficult levels (shorter sweeps), the number of trials required to master a level generally increases.

Level	Completion Status	Number of Trials
Introductory Levels		
Identify Single Sweeps	✓	35
Sequence Paired Sweeps with Audio Feedback and Visual Cues	✓	9
Sequence Paired Sweeps with Audio Feedback	✓	90
Sequence Paired Sweeps	✓	582
Standard Levels		
500 Hz 80 ms	☐☐☐	0

What to look for... what it means

Has the student taken too many trials without passing a level?

Students who need more than 3 to 4 times the minimum trials to pass the introductory levels, or more than 200 trials to pass a standard level with 80ms sweeps may be struggling to understand the task, or they may be having auditory processing and/or memory difficulties. As students progress to shorter sweeps, they typically need 200 or more trials to complete a level. At these levels, it is important to maintain motivation and make sure the student is applying themselves.

When students reach content that is especially difficult for them, their progress will slow and completing a level will take more trials. At these times, monitor the student's progress graph and celebrate even small increases.

The "Adjust Instruction/Intervene" section in this teacher manual provides suggestions for how to support students who might be struggling with Ocean Explorer.



Elements I Progress Monitoring Chart in [Student & Teacher Resources](#)

Facilitate and Encourage

Adjust Instruction/Intervene

Differentiation Activities

Differentiating instruction requires continually striving to know and to respond to each student's needs in order to maximize learning. Use the data in Ocean Explorer reports to adjust instruction to meet each student's needs and respond to variance among learners. The activities below are suggestions to support students who might be struggling with their progress in Ocean Explorer.



Does the student understand the exercise goal/task?

Observe the student as they work through the exercise demo to determine where their understanding may be breaking down. Make sure the student clearly understands the task of the exercise. Ask: *Can you tell me what this exercise wants you to do?* If needed, explain how the exercise works. Say, *The computer will play a sound. If you hear a single sweep, you must click the up or down arrow to match the sound. If you hear a pair of sweeps, you must click the up and down arrows in the right order to match the pattern the computer played.*



Is the student aware that this exercise uses the *3-Forward/1-Back Rule* to make forward progress?

The *3-Forward/1-Back Rule* means the student needs to get 3 responses correct in a row to move forward. When they get a wrong answer it will move them back. Highlight streaks with the student to show them the importance of consistency and accuracy. Use the Three-in-a-Row Worksheet to help the student visualize their progress and become more focused on accuracy and consistency.



Does the student have simple sequencing skills?

Start by using pairs of words, such as *orange-apple*, *big-little*. Say the word pair and have the student repeat it back to you in the same order. Vary the order of the words in the pair: *orange-apple*, *apple-orange*, *apple-apple*, *orange-orange*. Then switch to "Weep-Woop" as the word pair, and randomly speak one of the four possible variations with the student repeating the sequence for you. Next, using a small sheet of paper, draw an arrow pointing up and a downward pointing arrow below. Again, say the "Weep-Woop" variations and have the student point at the appropriate arrow sequence.

Facilitate and Encourage



Does the student have the skills needed to detect the different directions and frequencies of the sweeps?

Practice with the student focusing on sweep sequence identification. This can best be done by having the student use the Early Level Ocean Explorer demos. Have the student close their eyes while you control the exercise and they focus on listening to each sound sweep sequence. In Practice mode, randomly select different sequences until the student can demonstrate a high rate of accuracy, then allow the student to work in the demo. If the student's accuracy dips, repeat these steps before allowing them to work independently.



Does the student struggle to differentiate between tones?

Sit with the student while they work on the exercise. Ask the student what they hear. If they can't verbalize the sounds correctly, have them find a word that they can equate with the low tone and the high tone (a popular option is *Me* and *Joe*). Once students have created their own vocabulary word for each tone, direct the student to listen for them as they play along with the computer.



In later levels, as the sweeps get shorter with less time in between them, is the processing load beyond what the student can handle?

An extended flat line on a student's progress graph is evidence that they may not yet be able to handle the increased processing load. Encourage them by reminding them that they have made excellent progress and that many students hit a plateau just like this in Ocean Explorer. Remind the student of the best practices for making progress in this exercise: focus, listen intently, and identify the sequence BEFORE clicking the answer. If Autoplay is on, have the student turn it off so that they can choose when to start each trial. This can help prevent students from getting incorrect answers, feeling discouragement, and giving in to frustration. Encourage the student to use the Replay feature to get their ears used to the shorter and closer together sweep sequences.

Facilitate and Encourage

Adjust Instruction/Intervene

Student Resources

You may decide to use any or all of these monitoring sheets with your students:



Three-in-a-Row Worksheet in [Student & Teacher Resources](#)

Explain to students that accuracy is the key to moving through the content in this exercise. Students make progress based on the *3-Forward/1-Back Rule*: they move forward when they get 3 answers in a row correct, but they move backward when they get 1 answer incorrect. Because streaks record the number of correct answers in a row, this sheet can help students self-monitor for correct answers by providing the visual feedback that some students need to register their number of correct answers in a row. This sheet is useful for daily monitoring. Students will likely need one copy per day.



Elements I Streaks & Completion Chart in [Student & Teacher Resources](#)

Explain to students that accuracy is the key to moving through the content in Fast ForWord. Because streaks record the number of correct answers in a row, this chart can help students self-monitor for accuracy. After they complete their exercises for each day, have students record their highest streaks and percent complete in each exercise, then challenge them to exceed those numbers tomorrow. Students will need one copy every 5 days.



Elements I Completion Chart in [Student & Teacher Resources](#)

Students can self-monitor their progress in each Elements I exercise by filling in the bar each day with their actual completed percentage. This provides students with an overall view of how much content they've completed compared to how much they have left to do. Students will need one copy.