

## The Launch

The MSL launch took place on November 26, 2011. Blasting from the Earth at a speed of 12,582 miles per hour, the rockets that broke free of Earth's orbit and sent the Mars-bound spacecraft with the rover on its way were the most routine part of the mission. For decades NASA has specialized in space launches, drawing on some of the brightest minds on the planet to determine what it takes to bring a spacecraft to the stars.

Planning the rover's trip to the red planet (Mars's nickname, due to its color)—a voyage lasting about 36 weeks at maximum cruise velocity—was also not exactly a new challenge for engineers working on the MSL mission. NASA had already landed two rovers, named "Spirit" and "Opportunity," on the surface of the red planet. Based on the principles of astronomy, the launch engineers at JPL had very precise requirements for making the journey from Earth to Mars.

The key to these requirements was an understanding of orbits. Although Mars is significantly farther from the sun than Earth, both planets orbit the same star. Their distance from each other changes during each cycle, but Earth comes into alignment with Mars once every 26 months—"lapping" it in a perpetual race around the sun. Observing this pattern, astronomers can work with engineers to pinpoint the optimal month, day, and time for a spacecraft to leave Earth on a speedy one-way trip.

Drawing on centuries of knowledge of the laws of physics, scientists designed rockets and a spacecraft to accommodate Curiosity. Years of calculation, construction, careful planning and computer modeling resulted in a vessel that cruised purposefully through space, reaching the orbit of Mars at just the right time to attempt a landing.

Through it all, the margin for error was nearly non-existent. The movement of interplanetary bodies in space is much more demanding than the movement of cars on a highway, or even airplanes in the stratosphere. Miscalculating a vector or failing to account for any aspect of the orbits could lead to a \$2 billion failure.

Fortunately, NASA had taken on this challenge before. Its engineers had both the experience and the tenacity to succeed again. What came after the launch was a different story.

## The Landing

Spirit and Opportunity, the two NASA rovers that landed on Mars in 2004, used a combination of parachutes, rockets, and hi-tech airbags to protect themselves. Much like launch and spaceflight, each step of the landing sequence was planned and simulated to the very last

## Phonics Intervention Strategy - Sound (Elkonin) Boxes

**For:** Students in Grade 1 and above who are having difficulty hearing the individual sounds (phonemes) in words and writing the corresponding letters to make the words. These students may score below benchmark in AIMSweb Letter Sound Fluency, Phoneme Segmentation Fluency, Nonsense Word Fluency, R-CBM, or another phonics assessment (e.g. CORE Phonics) or Spelling Inventory.

**Materials:** laminated sound box mats (see attached—cut apart on the dotted line), dry erase markers, eraser (or the attached sound box worksheets may be used)

**Recommended Duration and Frequency:** This intervention should be conducted at least 3 times per week for 10 – 15 minutes per session. Students should advance to the next word list when s/he can write the letters in sound boxes to correctly spell words a variety of words on a list with 95% accuracy overall for at least 3 consecutive days. Monitor the student's progress once a week or twice monthly using the AIMSweb Nonsense Word Fluency or R-CBM. When the child's score is at the benchmark/target for 3 consecutive monitors and teacher observation confirms the skill has been transferred to classroom work, the intervention may be discontinued.

### Steps for Intervention:

1. Select an appropriate word list to use with the student. The lists get progressively harder, so choose one based on the student's beginning skill level for this task. (See attached for word lists.) You do not need to teach words in the order they are listed, but make sure the student experiences a wide variety of words from the list you are using.
2. Give each student a laminated Sound Box Mat (attached) that is appropriate for the list being used, a dry erase marker, and an eraser (or use the attached sound box worksheets). If you are starting with 2-phoneme words, use the 2-box mat or the 2-box worksheet, etc.
3. At first, pronounce a word from your list slowly. Each sound should be stretched so the student hears the individual sounds (i.e. ssssssss-oooooooo). (Later in the intervention, you will want to be able to say the word normally and have the student do the segmenting.)
4. Have the student repeat the word, counting on his/her fingers the number of sounds s/he hears in the word. If needed, use your fingers to count the sounds for the student.
5. Have the student repeat the word again, phoneme by phoneme, and write the letter corresponding to each phoneme heard in a box from left to right. (You may demonstrate the writing of letters in boxes for a couple words, if the child doesn't understand.)
6. Record student's progress on the attached sheet by listing a percentage of words boxed correctly. A word is boxed correctly when the student can spell a word correctly without help, placing one letter (or letter combination) representing a phoneme in each box.
7. When a student has achieved at least 95% accuracy for at least 3 consecutive days on a variety of words (a mixture of vowels or vowel combinations) from one list, begin working on the next word list.

### Sample:

Example: "duck" - /d/, /u/, /k/

d	u	ck
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**Short i:** mitt, brim, crib, drip, grid, grim, grip, grit, trim, trip, skid, skin, skit, snip, spin, swim, blip, clip, flip, slid, slim, slip, slit, hiss, miss, kiss, milk, silk, hill, will, bill, kill, dill, fill, mill, pill, till, tiff, fist, list, mist, gift, lift, sift,

**Short o:** crop, drop, frog, prod, prop, trot, smog, snob, spot, stop, blob, blot, clod, clog, flop, glob, plod, plot, slot, cost, lost, boss, toss, moss, loss, robs, fogs, logs, rots, moms, lots, dog, bogs, cops, pops, cob, dots, tops, bobs, cots, pots, jobs, lobs, mobs, sobs, cogs, hogs, jogs, tots

**Short u:** drug, drum, grub, snug, club, plug, plum, slug, dust, cuff, bust, must, rust, dust, runs, rugs, suns, hugs, tubs, cups, cuts, guns, puns, bugs, lugs, mugs, tugs, cubs, rubs, subs, bums, pups, guts, huts, nuts

**List D: 3-Phoneme Words (CCVC or CVCC with digraphs) -**

**Short a:** chat, chap, that, bath, hang, gang, bang, wrap, bash, rash, cash, dash, gash, hash, lash, mash, sash, gnat, math, path, rang, fang, pang, sang, path, back, rack, pack, sack, lack, tack

**Short e:** then, them, when, deck, neck, peck, mesh, Beth

**Short i:** chip, chin, rich, inch, wish, ship, fish, dish, this, thin, sing, king, ring, whip, whiz, whim, knit, kick, lick, pick, tick, Rick, sick, wick, with, ping

**Short o:** chop, shop, shot, long, song, knot, knob, dock, lock, mock, rock, sock, tock, moth, gong, pong, gosh, Josh, posh

**Short u:** much, chum, such, chug, shut, rush, luck, buck, duck, puck, tuck, gush, hush, lush, mush, rung, sung, hung, lung

**List E: 3-Phoneme Words (CVCe) -**

**Long a:** mate, same, race, rate, fate, mane, made, cake, rake, sake, bake, wave, tape, pane, hate, Kate, base, date, gate, late, came, fame, game, lame, name, tame, cane, lane, sane, vane, fade, wade, cave, Dave, gave, pave, rave, save, cape, nape, tape

**Long e:** Pete

**Long i:** fine, ripe, line, site, ride, mile, file, dime, hide, pine, time, bite, kite, tire, wipe, dine, line, mine, vine, pipe, wipe, mite, bide, side, tide, wide, pile, tile, vile, lime, mime, dire, fire, hire, mire

**Long o:** robe, nose, note, cope, joke, hose, lobe, pose, rose, tote, vote, dope, hope, lope, nope, pope, rope, Coke, poke, woke, bone, cone, hone, lone, pone, tone, dome, home, code, rode, hole, mole, pole, sole

**Long u:** huge, tube, cube, cute, lube, jute, lute, mute, fuse, muse, duke, Luke, tune, dune, June, fume, dude, Jude, rude, mule, rule, Yule

## Sample Sound Box Script

### Script to Use When Beginning the Intervention

**Teacher:** Today we are going to listen and write letters that stand for the sounds in words. Being able to hear and write all the sounds in a word will help you to be a better reader and speller. I will say the word to you, and we will count the sounds we hear. Then we will write a letter into a box every time we hear a sound. Are you ready for a practice word? "at. /a/ /t/". Now you say it.

**Student:** /a/ /t/

**Teacher:** Let's count the number of sounds we hear. /a/ (hold up 1 finger) - /t/ (hold up a 2<sup>nd</sup> finger)". I hear two sounds. You try it.

**Student:** /a/ (have the student hold up a finger) - /t/ (have the student hold up a 2<sup>nd</sup> finger)".

**Teacher:** Good. We both heard two sounds. The first sound was /a/. What letter says /a/?

**Student:** A.

**Teacher:** A says /a/, so write an "a" in the first box. (Student writes "a".)

**Teacher:** The second sound was /t/. What letter says /t/?

**Student:** T.

**Teacher:** Yes, T says /t/, so write a "t" in the second box. (Student writes "t".)

**Teacher:** /a/, /t/. What is the word?

**Student:** At.

(Continue in this way until the student understands the task.)

### Script to Use After Student Understands the Task

**Teacher:** Are you ready to count more sounds in words and write letters in boxes for each sound? Here we go! Your first word is "fin". Make each sound you hear and tell me how many there are.

**Student:** /f/ /i/ /n/. Three sounds.

**Teacher:** Great, there are three sounds. Make the sounds again, and write a letter in each box for each sound.

**Student:** /f/ (Student writes an "f" in the first box on the left.) /i/ (Student writes an "i" in the second box.) /n/ (Student writes an "n" in the last box.)

**Teacher:** Good work. /f/, /i/, /n/. What was the word?

**Student:** "fin"

**Sound (Elkonin) Boxes - 2-Phoneme Words**

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## Phonics Intervention/Sound (Elkonin) Boxes - Recording Sheet

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

List Used (circle one):    List A    List B    List C    List D    List E    List F

A word is counted as correct when the student can spell a word correctly, placing one letter (or letter combination) representing a phoneme in each box

Word	Score	
	(Circle "1" only if the student has spelled the word correctly without help and written only one phoneme in each sound box.)	
1.	0	1
2.	0	1
3.	0	1
4.	0	1
5.	0	1
6.	0	1
7.	0	1
8.	0	1
9.	0	1
10.	0	1
11.	0	1
12.	0	1
13.	0	1
14.	0	1
15.	0	1

TOTAL SCORE (add 1's) = \_\_\_\_\_

PERCENTAGE OF ACCURACY (TOTAL SCORE/TOTAL # OF WORDS X 100) = \_\_\_\_\_

# High Impact Literacy Routines

## Keystone AEA 2015

- **Phonemic Awareness**
  - Phoneme Blending
  - Phoneme Segmentation
- **Phonics**
  - Continuous Blending
  - Multisyllabic Words
  - Irregular Words
- **Fluency**
  - Fluency Flags
- **Vocabulary**
  - Tier Two Vocabulary
- **Comprehension**
  - 5 Finger Retelling
  - Think Aloud
  - Think Aloud-Expository Text

**Instructional Routine**  
**Phonemic Awareness – Phoneme Blending**

<p>Procedure:          1. Show a picture of the word or check to make sure the students know the meaning of the word. Say the word. Have the students say the word.</p>	<p>Look at this picture. What is it? Yes, it is a sun. We are going to blend the sounds to make the word sun. Say sun.           Students say sun.</p>
<p>2. Have students listen as teachers say the sounds of the word leaving a pause in between each sound. Blend the sounds without a pause. Then say the word naturally.</p>	<p>Listen. /sss/ /uuu/ /nnn/. I will blend the sounds ssuunn, sun. When you blend the sounds /sss/ /uuu/ /nnn/ together, the word is sun.</p>
<p>3. Have the students blend the sounds with the teacher without a pause. Then have the students say the word with the teacher naturally.</p>	<p>Say the sounds with me. /sss/ /uuu/ /nnn/. Blend them together with me /ssuunn/. Say the word, sun.</p>
<p>4. Have the students blend the sounds silently in their heads and say the word.</p>	<p>Students listen to the teacher say the sounds, /sss/ /uuu/ /nnn/. Say the word. Sun.</p>
<p>5. Use the word in a sentence.</p>	<p>The sun is shining.</p>



**Instructional Routine**  
**Phonemic Awareness – Phoneme Segmentation**

<p>Procedure: 1. Show a picture of the word or check to make sure the students know the meaning of the word. Say the word. Have the students say the word.</p>	<p>Look at this picture. What is it? Yes, it is a sun. We are going to segment this word into sounds. Say sun.</p> <p>Students say sun.</p>
<p>2. Have students listen as teachers say the sounds of the word leaving a pause in between each sound. The teacher taps thumb to fingers as each sound is said.</p>	<p>The word is sun. Listen and watch. The sounds in sun are /sss/ /uuu/ /nnn/ (hold each sound for two seconds) (Tap thumb to finger for each sound).</p>
<p>3. Have the students say the sounds with the teacher. Have the students tap thumb to fingers as each sound is said.</p>	<p>Say <i>sun</i>. Sun. Now say each sound in sun with me. Tap your thumb to each finger for each sound. /sss/ /uuu/ /nnn/ (hold each sound for two seconds)</p>
<p>4. Use the word in a sentence.</p>	<p>The sun is shining.</p>

## Instructional Routine Continuous Blending

<p>Procedure: 1. Say the word. Have the students say the word.</p>	<p>Say <i>sat</i>. Students say <i>sat</i>.</p>
<p>2. Display the letter cards or write the letters for the word. Say the word. Have the students say the word.</p>	<p>Display <i>sat</i>.  s a t</p>
<p>3. Have students listen as you blend the sounds of the word "stretching out" the word while pointing to each letter in a sweeping motion. Then say the word naturally.</p>	<p>Point to <i>sat</i> and say <i>sssaaat, sat</i>.  sat →</p>
<p>4. Repeat step 2, this time having students blend the word with you.</p>	<p>Students blend <i>sat</i> with you, saying <i>sssaaat, sat</i>.</p>
<p>5. Have students blend the sounds on their own and then say the whole word naturally.</p>	<p>Students blend <i>sat</i> on their own, <i>sssaaat, sat</i>.</p>
<p>6. Now have the students blend the word silently in their heads. After they say the whole word aloud, have them use it in a sentence.</p>	<p>Students look at the letters and then:</p> <ul style="list-style-type: none"> <li>• Blend the sounds in their heads, saying <i>ssaaat</i>.</li> <li>• Say the whole word <i>sat</i> aloud.</li> <li>• Use <i>sat</i> in a sentence.</li> </ul> <p>The cat sat down on the step.</p>
<p>7. Say each sound in the word. Have the students write each letter or letters that represent that sound. Have the students read the word.</p>	<p><i>/c/ /a/ /t/</i>  Read the word.  cat</p>

1. Say the word. Have students say the word.	The word is departing. Say departing. Students say departing.
2. Write the word. Have the students write the word.	Write the word departing. Students write the word departing.
3. Have students identify common word beginnings. Have them say the word beginnings and circle them.	Look at the beginning of the word. Is there a common word part you recognize? Say it and circle it. de
4. Have students identify common word endings. Have them say the word endings and circle them.	Look at the end of the word. Is there a common word part you recognize? Say it and circle it. ing
5. Identify vowel sounds in unknown word parts by underlining vowels. Students say the syllable.	Find the vowel sound in the unknown part. Under /ar/ and say the sound. ar Say the syllable. part
6. Have the students touch and say each syllable in the word.	Touch and say each syllable in the word with a pause between them de - part - ing
7. Have the students say the syllables with no pauses.	Say the syllables with no pause between them. departing
8. Have the students say the word fast.	Say the word fast. departing
9. Have the students use the word in a sentence.	The boat is departing from the dock – it is leaving the dock.
10. Say each syllable part. Have the students write each syllable as it is said. Have students read the word.	I am going to say the syllable in departing. When I say a syllable, write it down. de (students write de) part (student write part) ing (students write ing) Say the word. Departing

1. Say the word. Have students say the word.	The word is <i>the</i> . Say <i>the</i> , the
2. Write the word naming each letter as it is written. Have the students write the word naming each letter as they write it.	"T" "h" "e" is the. You do it. "T" "h" "e" is the.
3. Touch each letter and say the name of each letter and say the word. Have students touch each letter and say the word.	Touch t, "t", touch h, "h" touch e, "e" the You do it. Touch t, "t", touch h, "h", touch e, "e" the
4. Have the students use the word in a sentence.	The dog ran down the road.
5. Have the students say the word. Have the students spell the word and write each letter as they say it. Have students read the word.	Say the. Spell-write the word the. "t", write t, "h", write h, "e" write e. the

<p>Explanation of fluency</p>	<p>Today we are going to practice our oral reading fluency. Good readers are fluent readers. To be fluent readers, we need to read smoothly with appropriate rate, accuracy and we also need to pay attention to our expression and rhythm. So, as we practice today, we will practice looking at different things in our text that let us know what we should do to make our reading more fluent.</p> <p>We will be reading this text four times, each time for one minute. Before each reading we will practice a sentence. After you finish reading the first time, you will place your number 1 flag on the word where you stopped. You will continue placing the flags on the words where you stopped in the next three readings. Our goal is to not only read more words with each reading but to also pay attention to the punctuation and other clues in the text as we read.</p>
<p>Read aloud a sentence from the passage.</p>	<p>The first sentence I want you to practice is:</p>
<p>Have students repeat the sentence.</p>	<p>Great. Let's begin our first reading.</p>
<p>Silent read for one-minute.</p>	<p>After one minute, students stop reading and place a colored flag on the word where they stopped.</p>

Repeat 3 times

<p>1. Say the word. Have the students say the word.</p>	<p>Write <i>compulsory</i> where students can see it. This word is <i>compulsory</i>. Say the word <i>compulsory</i>. (If the word is difficult to pronounce or unfamiliar, have the students say it a number of times).</p> <p><i>compulsory</i></p>
<p>2. Introduce the meaning of the word with a student-friendly explanation.</p>	<p>"When something is required and you must do it, it is <u>compulsory</u>. So if it is required and you must do it, it is _____."</p>
<p>3. Illustrate the word with examples and non-examples.</p>	<p>"Coming to school as 8th graders is <i>compulsory</i>."</p> <p>"Stopping at a stop sign when driving is <i>compulsory</i>."</p> <p>"Going to the store to buy a new toy is not compulsory"</p> <p>"Eating cookies as a snack is not compulsory."</p>
<p>4. Check for understanding.</p>	<p>"Many things become <i>compulsory</i>. Why do you think something would become compulsory?"</p> <p>"Is going to school in 8th grade <i>compulsory</i>?" Yes</p> <p>"How do you know it is <i>compulsory</i>?" It is required.</p> <p>"Is going to college when you are 25 <i>compulsory</i>?"</p> <p>"Why is it not <i>compulsory</i>?" It is not required. You get to choose to go to college.</p>

#### **4. Let me do it.**

- This is often referred to as independent practice. Once the students have demonstrated that they understand how and when to apply the strategy, we let them do it. This is where the students work without your help and practice using the strategy. Independent practice does not necessarily mean that they work alone. I will let you know if we are focusing on listening or reading comprehension and if the students are to work alone, with a partner, or in a small group.

#### **Using the provided template**

- Remind them that they will complete the organizer and write their own version of the story as if they are retelling it to a friend who has never heard it before.
- **Before Reading** have them take a picture walk and make their own predictions.
- Remind them that **During Reading** they will look to see if their predictions are correct. They should notice the setting, characters, problem, events, solution/ending, and what the theme is.
- Read the story to the students (if we are focusing on listening comprehension) OR have the student(s) read silently (if the goal is reading comprehension).
- **After Reading** have them complete the organizer and write their retelling.

#### **5. Check my understanding.**

- As students work independently, frequently check to make sure they are correctly applying the strategy.
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## **Think Aloud Routine- Expository Text**

Choose a short selection of text (students will each need a copy).

Select the one or two comprehension skills for focus work.

Prior Knowledge

Visualizing

Self-Questioning

Inference

Monitoring

Retelling

State the purpose for reading- what will the students be listening for.

The teacher reads aloud while the students follow along, silently.

The teacher verbalizes his/her thoughts and how they attack the text. After (the teacher) completes the excerpt, students' will then pair up and continue reading the text. The pair would dialogue and "think aloud" as demonstrated by the teacher.

### **Models of statements to support a think aloud**

- So far, I've learned...
- This made me think of...
- That didn't make sense.
- I think \_\_\_ will happen next.
- I reread that part because...
- I was confused by...
- I think the most important part was...
- That is interesting because...
- I wonder why...
- I just thought of...