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The Effects of Using Word Sorts in Combination with iPad Spelling Applications on Spelling Acquisition of a Student with a Specific Learning Disability

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The Effects of Using Word Sorts in Combination with iPad Spelling Applications on Spelling Acquisition of a Student with a Specific Learning Disability

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Abstract

This research studied the effects of using word sorts in combination with iPad spelling applications on the spelling acquisition of a third grade student with a Specific Learning Disability. The researcher measured the effects on spelling acquisition using pre- and post-assessments. The informal assessments used included a *Words their Way Spelling* assessment, a Nonsense word assessment from Teaching Phonics and Word Study in Intermediate Grades, and a questionnaire. The student engaged in word sorts prior to completing a spelling application on the iPad. The strategies implemented with gains in spelling skills and had a positive effect on the student's attitude towards spelling. The research also showed positive effects in the student's reading of nonsense words. More research applying these techniques to students with and without disabilities should be conducted to further explore these approaches.

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CHAPTER ONE: Introduction

Statement of the Problem

Research in literacy has long shown that spelling, decoding, written language, and reading abilities have been linked together (Wiseman, 1980). Spelling can be described as identifying or reproducing an accurate progression of letters in either oral or written form (Santoro, Coyne, & Simmons, 2006). Spelling is a complex skill, one in which students are required to cognitively juggle multiple mental processes in order to produce a desired outcome. Phonemic awareness can be defined as hearing and manipulating sounds. Morphophonemic sounds are the ability to apply sounds to make words. When individuals learn to spell, they are required to use their memory skills, phoneme-grapheme awareness, phonemic awareness, and morphophonemic sounds. The ability to spell involves the precise combination of the phonological and alphabetic ability of beginning to read. Like beginning reading skills, a person's writing fluency, reading skills, written expression, and perception of writing skills is affected by their spelling acquisition.

An individual learning to spell is affected by a person's ability to communicate effectively through written language, and it affects the individual's ability to read. In the school environment, many children who have reading and writing challenges also have spelling challenges. Researchers similar to Werefl and Schuele (2012), Evmenova, Graff, Jerome, & Behrmann, (2010), and Wood, Jackson, Hart, Plester, and Wilde (2011) have completed research to support students with spelling challenges in order to improve writing.

Throughout my five years of teaching experience, I have used a variety of different techniques to teach spelling to elementary students. As a special education teacher, I have worked with a variety of teachers in how to assist students to increase their spelling skills and be

successful writers. In working with various teachers, each one employs a different way to teach spelling and spelling strategies. Some educators teach spelling using phonics and high frequency sight words, and other educators used a traditional spelling book method. In other classrooms, other teachers has selected three to five basic sight words that were commonly misspelled in the students' writing and assign those words as their spelling words for the week. Also, a handful of teachers assessed the students' ability to write two sentences using a pervious spelling word. While working with variety of spelling strategies, I felt overwhelmed balancing the different expectations, differentiation, and scaffolding for the students' instructional needs.

With all of these complex instructional techniques, I found a focus when one teacher started to use *Words Their Way* (Bear, Invernizzi, Templeton, Johnston, 2008) in place of her high frequency word lists and sentences during the 2011-2012 school year. During the 2012-2013, five out of seven classroom teachers with which I shared students implemented *Words Their Way* as portion of their literacy instruction. They implemented it with fidelity including pre- and post-assessments. In each of the classrooms using *Words Their Way*, the classroom teacher had up to five different spelling lists each week. Other general education teachers throughout the district also implemented *Words Their Way*.

Along with using *Words Their Way (Bear et.al*, 2008) my school district took on the philosophy of learning for the 21st Century which includes the effective use of instructional technology. The school district has the goal of preparing the students for college and career readiness. After high school, students will be required to use technology independently in a variety of forms. Back mapping from that ultimate goal, many of the classrooms have a SMARTBOARD, half of the classrooms have iPads, and all of the classrooms have laptops and

CD players to listen to stories. All of the elementary students in the district also have access to the use of a laptop two times a week in the library.

Another major transformation the school district executed during the 2012-13 school year was the Math and English Language Arts/Literacy Common Core State Standards (CCSS) (National Governors Association Center for Best Practices & Council of Chief State School Officers. 2010). The district worked throughout the last two years to train teachers on the Common Core State Standards. In 2010, forty-five states, including five of the United State territories, adopted the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers 2010). The Common Core State Standards provide universal benchmarks for students in each grade level, K-12. Researchers, educators, and leading experts have designed the standards. In the state of Wisconsin, prior to the Common Core State Standards (CCSS), the standards were the Wisconsin Model Academic Standards (Wisconsin Department of Public Instruction 2013), broken down into three grade levels, including fourth, eighth, and twelfth grade. In contrast, the CCSS are organized by grade level at the elementary level. The CCSS assist teachers in ensuring students have the appropriate skills and knowledge to be successful in their learning. Similar to the 21st Century technology initiative, the district's implementation of the new standards is expected to assist students to be better prepared for a four-year university, technical college, or go straight to the work force.

As an educator in the district which has the goal of having students prepared for the 21st Century technology and using the CCSS, the students on my caseload should be prepared for the 21st Century technology as well, including students with a variety of learning styles and needs. A third grade student who was identified with a Specific Learning Disability in the area of reading, writing, and math was selected for this particular research study. The student was

identified at the beginning of December 2011. The student had modified spelling lists which consisted of words at his reading, writing, and spelling levels during his second grade and third grade years. Throughout the week, the student was able spell his weekly words correctly on the tests; however, he was not able to use his spelling strategies while writing daily without prompts.

One of the Reading Anchor Standards in the CCSS is "Phonics and Word Recognition," which requires third graders to identify and apply phonics and word study skills in decoding words. This standard has four subsections which require student to identify and know prefixes and suffixes. Third graders are also expected to decode words and multisyllabic words. The fourth area in the standards requires third graders to read grade level irregularly spelled words.

Due to my role as a special education teacher who works with students in third grade, the students have been identified to having challenges in learning at the same rate as students without special needs; however the students are expected to continue to grow in literacy. Similar to the classroom teachers, I have also implemented *Words Their* Way strategies, a variety of technology, and the CCSS. I was interested in researching how one of my students with a Specific Learning Disability would grow using *Words Their Way w*ith iPad spelling applications. Therefore, I formulated the research question, what are the effects of using word sorts in combination with iPad spelling applications on spelling acquisition of a student with a Specific Learning Disability?

Key Terms

Applications (Apps): Computer software intended for use on small mobile electronic devices such as the iPad, tablets, and iPod.

Blends: Two or three consonants written together and create a particular sound

Consonant Vowel Consonant (CVC) Words: Words that consists of a consonant followed by a vowel then another consonant

iPad or other mobile electric devices: A small mobile electronic device which allows users to access resources without the retrains of a traditional desktop computer

E-Word Wall: Electronic versions of the word wall with words and/or pictures

Handheld Devices: Electronic devices such as iPads, tablets, iPods, and/or mobile phones

iPad: Small mobile electronic device able to complete similar tasks as a computer

Phonological Awareness: Learners' knowledge of sound structure through listening to an isolated sound and verbally producing a target word, and segmenting words presented orally

Pull-out Setting: Alternative setting where a child who has been identified as having a disability in school performance can learn strategies and support to complete tasks

Specific Learning Disability: A disability in learning differently than typically developing peers in the areas of reading, writing, or math

Spelling: Identifying or reproducing an accurate progression of letters, whether it is in oral or written form

Text Messaging (SMS): Sending written communication from one mobile device to another

Word Reading: Reading single words

Word Sort: Sorting words into common themes

Chapter TWO: Review of Literature

Introduction

The ability to spell affects the ability of an individual to communicate effectively through written language, and it can even affect the individual's ability to read. Spelling is linked to reading, written language, and phonemic awareness. A person's ability to spell correctly in a formal and informal academic setting is influenced by how a pupil learned to spell. In the school environment, many children who have reading and writing challenges also have spelling challenges. Researchers have completed studies to support students with spelling challenges in order for them to be successful in spelling and improve their writing skills. In order to assist students who have literacy difficulties, teachers have been implementing a variety of spelling activities in addition to a traditional spelling book for students to learn how to spell and how to generalize the principles of spelling. They are teaching students how to spell using the principles of spelling; researchers have been studying and testing their theories of the activities, such as E-Word Wall, the cover-copy-compare spelling strategy, the error self-correction strategy, and a variety of other spelling strategies that will be discussed throughout this chapter.

The first part of the chapter will examine recent research who conducted several studies in the areas of literacy and the effectiveness of a variety of spelling strategies being taught to students. Werfel and Schuele (2012) as well as Santoro, Coyner, Simmons (2006) examined the effectiveness and the use of a variety of spelling strategies with students who were and who were not identified with a disability. Werfel and Schuela (2012) examined kindergarteners' skills when segmenting and representing consonant blends. The purpose of Werfel and Schuela's study was to explore the growth of kindergarteners' ability to represent and segment consonant blends, specifically the initial and final blends in words that were a required first step in learning

how to spell. Santoro, Coyne, and Simmons (2006) examined the relationship between spelling and reading in beginning spellers who may be at risk for developing a reading disability. Students' ability to understand phonological awareness and alphabetic understanding was directly connected to their ability to spell accurately, understand spoken language, and the general principles of the writing (Santoro, Coyne, & Simmons, 2006), which directly linked to this study to improve students' ability to spell who have a learning disability.

The second part of the chapter will examine the research that examined spelling strategies of students with disabilities. Nies and Beliore (2006), have studied the effects of spelling strategies on students with learning disabilities using the cover-copy-compare strategy versus the copy-only strategy. The cover-copy-compare strategy used the following sequence of instruction with students. First, the student stated the word. Second, the student then pointed to the word used as a spelling word. Third, the student restated the word and then hid the spelling word. After that, he/she wrote the word on paper comparing the spelling word to the accurate model. Finally, the student edited the spelling word if needed. The copy-only strategy consisted of the student stating the word, then pointing to the spelling word, restating the spelling word, and writing the spelling word.

Additional researchers, such as Viel-Ruma, Houchins, & Fredrick (2007), examined error self-correction and the connection to spelling with secondary students with disabilities. The error self-correction model assisted the students in checking for accuracy after each spelling word. Narkon, Wells, and Segal (2011) examined the use of the E-Word Wall with a student who had a learning disability and a student with Autism Spectrum Disorder. E-Word Walls assisted students with disabilities, such as learning disabilities and autism, and other researchers,

McClanaham, Williams, Kennedy, and Tate (2012) researched the effectiveness of iPads with a student with Attention Deficit Hyperactivity Disorder (ADHD) on reading and academics.

The final section of this review of literature will examine the research related to the use of technology associated with an individual's ability to use spelling strategies effectively. Wu and Zhang (2010) examined the effects of handheld devices with learners. Handheld devices are examples of technology that can be held in the hand, such as the iPod, phone, or iPad. In addition, researchers examined the effects of text messaging with students who were 9- and 10-years old and who had not possessed a cell phone prior to the study on their spelling skills. Currently, researchers are starting to examine the effectiveness of using handheld technological devices. However, the effectiveness of using handheld technology has not been fully explored due to the newness of this technology. Crichton, Pegler, and White (2012) researched how personal electronic devices, such as iPods and iPads, work in the school setting and how the learning could change for educators as well as students. Similar to Crichton, Pegler, and White (2012), Rossing, Miller, Cecil, and Stamper (2012) examined using technology in education with students and its effectiveness.

The Importance of Developing Spelling Skills with Students without Disabilities

A recent and highly relevant study by Werfel and Schuela (2012) examined the spelling skills of students in kindergarten and their ability to segment and represent consonant blends along with which linguistic features manipulated segmenting and symbolization of consonant blends. The researchers examined how spelling skills were influenced by early reading skills in kindergarteners.

Spelling is developmental and includes the following stages, which are going through each stage of spelling that includes pre-communicative spelling, semi-phonetic spelling, phonetic spelling, transitional spelling and correct spelling. The researchers explored kindergarteners' ability to segment and represent each of the 26 different two-phoneme consonant blends. The spelling words that were evaluated consisted of three different word lists. Each of the word lists included one word for every 26 blends /st/, /sm/ and /sk/. In this study, forty kindergarteners with English as their primary language were selected. A total of 21 males and 19 females were part of this experiment, and none of students had received services for speech and language, specially designed instruction for articulation and language. The study's participants categorized themselves as being Caucasian (85%), African American (10%), other ethnic groups (2.5%), and Asian (2.5%). The kindergarteners attended two private schools in Nashville, Tennessee, from a number of classrooms. Twenty-seven students were released from the study because they were received speech and language services in the past or were not native English speakers.

The researchers were two licensed speech and language pathologists and two graduate students in the area of speech and language. Each of the kindergarteners completed three tests at school during one individual session and one group session between November and May. One of the assessments was the subtest of Letter Sound from PALS-K; every child was awarded one point for each correct answer with the possibility of 26 points. A scoring guide was established to identify the likely sounds the kindergarteners might write down for the 26 blends and to develop a standard of scoring procedures. The students were also asked to read as many words as they could in one minute from a list of 100 words. The students were given 11 cards with a signal letter on each card and were asked to create silly words that the administrator presented to the kindergarten with the letters EP at the end of the word. Based on the word reading score, the

students were divided into groups to complete the spelling assessment. Lower case and capital letters were printed at the top of the paper, so it would not hinder the students' ability to recall letters. The words were repeated to the students twice unless they requested the word again. If the examiner was not able to read the letters, the examiner asked the students what the letters were written down on their papers.

The examiners reviewed the items together in order to come to a consensus on the kindergarteners' results. The kindergarteners were able identify most of the letters and sounds of the letters when presented in a consonant vowel consonant (CVC) patterned word. The students showed incremental development throughout the experiment with blends, combination of two or more letters together to make a specific sound. Children were able to complete and be successful with nonnasal blends than nasal blends. Blends were defined as two or three consonants together creating a distinct sound. Based on this study, many of the kindergarteners were capable of subdividing and symbolizing consonant blends. The main findings of the study showed that children require a foundation of blends in to understand and apply this to their oral reading.

While Werfel and Schuela (2012) examined the spelling ability of students in kindergarten, Santoro, Coyne, and Simmons (2006) explored the connection between spelling and reading, with students who may become at risk for a reading disability. Spelling can be described as identifying or reproducing an accurate progression of letters whether it is in oral or written form. The researchers defined the ability to spell as the significant combination of phonological and alphabetic abilities when beginning to read. Spelling is an instructional tool to understanding the alphabetic writing system and its relationship to the spoken language. Santoro, Coyne, and Simmons (2006) assessed the effects of spelling interventions within the context of a large-scale experimental study with kindergarten students who were identified as

being at risk. Their teachers experienced difficulties with onset recognition, fluency, and letter naming. Being below the 25th percentile in the district assessments, their teachers confirmed that these students were at risk for having reading struggles. At the start of school in the fall, 116 students from seven elementary schools were identified at risk by their lack of ability to perform phonological awareness and letter naming activities.

Kindergarteners were assessed on their fluency to name letters along with onset recognition fluency measures. When students are able to demonstrate their knowledge of letters and onset recognition fluency, they have greater success in reading, written language, and spelling. If the child had extreme visual or hearing difficulties and the school district employees determined if the child had limited English ability, the child was disqualified from the study. In order to determine each kindergartener's baseline level in the area of receptive vocabulary knowledge, the student was tested with the Peabody Picture Vocabulary Test-Revised. Each of the seven elementary schools received Title I services along with 32 to 63 percent of the students receiving free and reduced lunch. The enrollment of students in the participating elementary schools ranged from 319 to 683 children. The time allotted for each elementary school, was two and half-hours in length. Most of the students participating were Caucasian (83.93%); two individuals were African American; one student did not specify his/her race, and 13.39% of the population was Hispanic. Thirty-two percent of participants were female, and 58% of the kindergarteners were male. The age ranges of the students were from 5 years to 6 years 9 months. The students were randomly assigned to one of the three groups in November; one group was the comparison group, and there were two groups of experimental groups. The experimental groups' interventions focused on developing early reading skills. One of the experimental groups received intervention related to spelling. The second experimental group

received lessons centering on building words and reading understanding using read alouds. The third group, the comparison group, received a premade reading program that focused on developing early reading skills using sound and letter components. Every group of students experienced 108, 30-minute segments of instructional lessons between the months of November to May during their kindergarten year, and each group consisted of no more than five students. The students were part of an extended kindergarten program, and the intervention did not disrupt the general education classroom instruction. All three groups had two intervention components that lasted for fifteen minutes each. One component of the intervention was the same for the experimental groups and the comparison group. That intervention highlighted alphabetic understanding along with phonological awareness that progressed throughout the lessons. Students worked on developing their skills of phonological awareness, learners' knowledge of sound structure through listening to an isolated sound, and verbally producing a target word, segmenting words presented orally. Kindergarteners also worked on alphabetic understanding tasks which included word reading, reading single words, which included identifying sounds and names of letters. Students were explicitly taught how to read irregular words. The first experimental group emphasized building vocabulary, comprehension, and the read aloud during their second component of the intervention. The second experimental group continued alphabetic skills and phonological awareness highlighting writing and spelling. In this experimental group, students were expected to isolate or segment the sounds at the beginning and end of words, then physically write the letters from memory. The second experimental group was scaffolded, meaning that specialized instructional supports needed for students at a variety of levels were provided and controlled; the students were only required to isolate the beginning sounds and were only able to pick from the letter sounds that had been taught to the

kindergarteners. Kindergarteners were given activities to practice identifying and writing the first sounds in words. The students were able to receive feedback immediately because the intervention that took place in a small group.

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) test was used to assess kindergarteners' knowledge prior to and after the intervention, using the DIBELS initial sound fluency and letter name fluency assessment. DIBELS is an assessment that allows educators to gather information about children's literacy skills. The other two assessments that were used were a pre- and post-test with the Berninger letter writing dictation and an adapted edition of the Tangel and Blachman's spelling measure. Students were assessed at the beginning of the study to develop a baseline of their receptive language skills. Other post assessments used to gather information from the study participants were nonsense word reading fluency, Woodcock Reading Mastery Test-Revised using the subtests of word attack and word identification, and phonemic segmentation.

The experimental group that received instruction for early reading skills and spelling, preformed better than the other two groups in the areas of spelling and letter dictation. The results may be higher for the students in the early reading skill/spelling intervention because they received supplementary practice in reviewing letters; there was emphasis on letter names as the kindergarteners wrote the letters and spelling words. Students may have also had more opportunity as they practiced handwriting while spelling words. Kindergarteners in the spelling intervention group demonstrated higher performance on word attack reading tasks and nonsense and/or fake word reading assessments. The students in the early reading/spelling intervention also performed better in the real word readings. When compared to the other experimental group and the compared group, the early reading/spelling intervention group performed better on

reading and decoding word without assistance. Spelling instruction assisted beginning readers' abilities to learn early reading skills and spelling skills.

The Importance of Developing Spelling Skills with Students with Disabilities

Developing spelling skills with students with disabilities is just as important as developing and establishing students' skills in the area of spelling for those who have been identified without a disability. Nies and Belfiore (2006) have studied spelling skills with students with learning disabilities and the enhancement of their spelling skills. The authors wanted to study the effectiveness of cover-copy-compare strategy versus copy-only intervention on the achievement and maintenance of spelling words for two individuals in third grade who were identified with a learning disability.

The researchers picked two individuals, one boy and one girl, in the third grade. Each participant chosen also received service for special education in a pullout setting. A pullout setting is an alternative site where a child who has been identified as having a disability can learn strategies and supports to complete tasks. The children were identified as having learning disabilities in the area of language arts. Both children had a discrepancy between their achievement score and IQ; however, both of the participants in the study also received education in the general education classroom for classes, including music, art, physical education, social studies, and science. Their class size in the general education classroom was 11 students. While in the special education classroom, the two individuals received instruction in language arts and math for a total of two hours per school day.

The words selected for the spelling intervention came from a fourth grade series developed by Trophies Harcourt Spelling. The students were given a weekly spelling list that

contained 12 spelling words; the list was randomly selected to be divided into half with six words in each group. During the intervention, the students received one group of six words to learn using the copy-only spelling strategy. The copy-only strategy asked the student to state the word, to point to the spelling word, to restate the spelling word, and then to write the spelling word again. The second set of six words was assigned to the students to complete using the cover-copy-compare spelling strategy. The cover-copy-compare (CCC) strategy required that the students state the word, point to spelling word, restate the word, then cover the spelling word, write the spelling word, compare the spelling word to the model, and finally correct the spelling if needed. The two students received the same list of spelling words. The third graders worked on learning "ar," "or," and "er" words. Each of the pupils was given the 12 words on the assessment with the adaptive alternative design.

Each of the individuals was assessed and instructed for 20 minutes during the morning language arts block. The language arts block consisted of instruction in reading and writing academic tasks. Daily, the students received a spelling assessment with the 12 weekly words, and then they would have instruction using the copy-only and CCC lessons. The two individuals took a spelling assessment Monday through Friday with instruction in both strategies Monday through Thursday; the students did not receive instruction after the assessment on Friday. When the students were presented with the spelling assessment, the teacher stated the word orally, used the word in a sentence, and repeated the spelling word. On Mondays, the students were assessed with the pervious weeks' words.

Before the students took their first assessment, they were given half of the first list and asked to use the CCC strategy, and the other half of the list was given to the students using the copy-only strategy. The educator orally presented the words until each of the words were

presented once per class period. The teacher stated every word as the pupils pointed to each word on their sheets of paper. Next, the teacher stated the word, and the students pointed to the spelling word and repeated the word. Then the teacher stated the spelling word again, and the third graders pointed to the word, stated the word, covered the word, wrote the word, and checked their work. The next step of CCC was for the teacher to state the word, and the students pointed to the word, stated the word, and spelled the word. During the copy-only activity, the teacher stated the spelling word while the students pointed to the word. Then the educator stated the word while the students pointed to the word and stated the spelling word. The third step of the copy-only strategy consisted of the educator stating the spelling word as the students pointed to the spelling word, stated the word, and then wrote the word. The final step of copy-only strategy was that the teacher stated the word, and the students pointed to the word, stated the word, and then spelled the word. The first, second, and fourth steps of both interventions were the same. The students completed a survey on the last day of the intervention that asked them about their satisfaction about using the intervention. The classroom educator and an independent spectator in the selected classroom scored the assessments. The second individual in the classroom was an author or the para-educator in the selected classroom where the intervention was administered.

The female, receiving the CCC intervention, learned 13 new spelling words during the three-week intervention which was 4.3 words per week on average, and she only learned five new spelling words using the copy-only intervention which was 1.7 spelling words on average each week. The male receiving the intervention strategies learned more words with the CCC intervention, nine new spelling words than with the copy-only strategy while he learned six new spelling words in the three-week intervention. Together the two third graders learned 22 new

words during the three-week intervention using the CCC strategy and 11 new words with the copy-only strategy. The following Monday after the conclusion of the intervention, the students took another assessment to monitor what they had learned over the last three weeks. The female was able to retain 100% of the words learned during the CCC strategy, and she was able to retain 80% of the words she learned using the copy-only intervention. The male participant was able to retain eight out of nine words learned using the CCC strategy and half of the words he learned using the copy-only strategy. Nies and Beliore (2006) studied how to enhance spelling skills with students with disabilities using the CCC strategy and found it was effective.

Similar to Nies and Beliore (2006), a study was conducted by Viel-Ruma, Houchins, & Fredrick (2007) that examined the error self-correction and spelling and how to improve students' spelling skills with students with disabilities. A requirement to be a successful student is to be able to write using a paper and pencil. The ability to spell words precisely is an essential part of becoming a good writer. There is relationship between spelling words correctly and writing performance due to its language and literacy basis (Viel-Ruma, Houchins, & Fredrick, 2006), which means improving students' ability to spell should improve their skills in writing. A person with a lack of organization, spelling ability, and ability to generate ideas in writing will have a lower rating from educators on the individual's writing samples. An individual who may struggle with spelling, such as a student with learning disabilities (LD), may stay away from writing situations and hinder his or her writing skills for the future (Viel-Ruma, Houchins, & Fredrick, 2006).

Many children with learning disabilities (LD) have greater difficulties with the ability to spell. When compared to peers without LD, students with LD spell a significantly fewer words correctly, and when students with LD use spelling strategies, they are using strategies the

incorrect way resulting in reduced writing sample (Viel-Ruma, Houchins, & Fredrick, 2006). Children with LD need to learn to use an effective spelling strategy that means they require explicit instruction in the use of spelling strategies. Research indicates that students with and without LD go through the identical phases of spelling development; however, students with LD go through the phases at a much slower rate.

Three individuals were asked to participate in this study. The individuals included one 18-year-old individual who was in twelfth grade along with two 16-year-old individuals who were in the tenth grade. Each of the students needed to qualify for special education services in order to be selected for this study. All three individuals were identified as having a learning disability and received services in the special education setting. Participants in the study had an IQ in the average range but showed a discrepancy between their achievement and IQ, and they had writing skills three or more years below their grade level.

One method of learning how to spell words correctly is called error self-correction, which is showing the student the misspelled word along with the correctly spelled word and having the student spell the word correctly. The error self-correction method is different from the traditional method that consists of writing the words from a spelling list in alphabetical order and then copying the word from an example. The researchers studied the results of error self-correction with students who had a writing disability and discrepancy in spelling. The teacher in this study was a certified special education teacher. The study took place in a suburban area, and the students had not had guidance in error self-correction instructional strategy before this study. The students received the intervention daily in the special education classroom. The spelling words centered on words from the students' textbooks used in their classroom, the *Grammar and Composition Handbook, High School*. The students were not given a formal assessment;

however, students were required to memorize the correctly spelled words. The students practiced using the vocabulary words in cloze sentence activities along with writing the vocabulary words in sentences independently.

The researchers created an alternating design that allowed them to compare two spelling methods. Each week, the students were provide with 16 new vocabulary words, and the students used the traditional practice of spelling with eight vocabulary words and the error self-strategy with the other eight vocabulary words. The different spelling methods were implemented first. The error self-correction intervention was implemented first during the first week of the intervention. The students were pre-tested to determine the 16 words from the composition book, *Grammar and Composition Handbook, High School* (2000), used in the special education classroom; the words were chosen from terms that the individuals would be learning normally during that semester. If all three students spelled the words incorrectly, those vocabulary words were chosen for the word master list of 64 spelling words. The words were separated into eight lists with eight words on every list. The researchers made sure that the word lists were equal including number of syllables and phonetic patterns; then the lists were arbitrarily placed on to the error self-correction or the traditional lists. The students did not receive individualized lists. They only used the words in a group instruction setting. The practice sheet for the error self-correction practice was separated into four labeled columns with eight blank lines. There were four columns, so the students were able to use to practice every word two times daily. The traditional practice allowed the students to view eight words before attempting to spell the word by the student. The students were given a sheet with printing of the words on each of the paper along with three blank spaces next to the words; the students practiced writing the words three times with two opportunities to practice the vocabulary words two times during the spelling

session. The error self-correction intervention provided the students with answer keys using cardstock. The students moved a strip of paper over the answer key that allowed them to see only one word at a time. The students took a pre-assessment each Monday along with a post-assessment on Fridays. Every student was asked to study the same words using the same conditions. The special education teacher administered the pre and post- tests to the students orally in a random word order. While the special education teacher presented the words to the students, the teacher would state the vocabulary word, then pause, state a sentence using the word, then pause again, and state the word a final time.

During the traditional practice, the students took out a piece of paper with the correct spelling of the eight words and practiced writing each word three times. The individuals returned it to the teacher for correction and completion and then repeated the same steps on the opposite side of the paper. During the error self-correction method, the students used a cassette player, listened to all eight words, and then attempted to spell the words prior to being presented with the correctly spelled vocabulary words. After the pupils attempted to spell the words, they checked for the accuracy of their spelling using the answer key. If the student did not spell the word correctly the first time, then the student wrote the word again correctly adjacent to the first attempt. If the student spelled the word correctly the first time, the student placed a star in the second column. When completed with all eight words, the student returned the paper to the special education teacher to be checked; then the teacher folded the paper in half and next asked the students to repeat the exercise in the third and fourth columns. The cassettes were audio taped by the researcher every week. On the audiotapes, the researcher stated the vocabulary words along with sentences including the eight words. The teacher was trained in both of the spelling procedures using role-playing with the researcher for one hour in a training session. The

special education teacher acted as the student and reversed the role to be the teacher until there was 100% accuracy. Prior to implementing the research, the teacher taught the students how to use the practices sheets for the traditional, error self-correction, and the cassette players. The students practiced with activities using familiar words until they were 100% accurate. Each of the tests was assessed for spelling accuracy.

The researcher asked the teacher to check off the checklist when the students had completed a task each day. The researcher was in the classroom 29% of the time to monitor the activities for accuracy and reliability. The baseline came from each week's pre-assessment of the 16 words that occurred each Monday during the four-week intervention. The students practiced the traditional and error self-correct strategies Tuesdays through Thursdays with the post assessment being on Fridays. Over the four-week intervention, the student practiced and studied 64 vocabulary-spelling words. Following the intervention stage of the study, one of the spelling strategies was more effective; the error self-correction strategy was concluded as being more beneficial for students. The students studied the traditional 32 words again in the follow up stage by means of the error self-correction. The follow up stage lasted for only two weeks. Students were allowed to practice and learn the words that they had not mastered earlier. The researcher wanted to determine if the students could support the spelling words by having the three individuals take an additional assessment four weeks after the intervention and eight weeks after the intervention. The researched picked 32 words randomly from the 64 words learned by the students. The first 16 words were assessed four weeks after the intervention and then again eight weeks after the intervention. The students and special education teacher were given a questionnaire to complete after the intervention regarding the likelihood of continuing with either spelling practice.

The researchers found that error self-correction strategy could be used as an effective spelling study method for students in high school with a learning disability in the area of written language to improve each student's spelling skills. Before this study was completed, other studies had determined that elementary and middle school aged students with and without disabilities were able to expand their knowledge of spelling by using error self-correction strategy. These researchers implemented error self-correction along with alternating activities with traditional spelling strategies. Every individual with a learning disability enhanced his or her performance using error self-correction strategy when compared to the traditional method of learning spelling. The students were able to spell more words correctly using the error self-correction strategy than the traditional method. One student's mean score using the traditional repeated strategy was 10%; however, with the error-self correction method, the mean score was 28%. Another student's mean score for traditional repeated strategy was 72%; the student's error self-correction mean score was 82%. The third student's mean score for the traditional repeated strategy was 44%, and the error self-correction mean score was 82%. The maintenance phase was conducted four weeks after the end of the study, and the researchers followed up with the students. The three high school students showed improvement compared to baseline performance; however, one student did not meet the 70% criteria, but he did improve to 63%.

Viel-Ruma, Houchins, and Fredrick (2006) found that the error self-correction strategy was more effective for students with disabilities compared to the traditional method of teaching spelling. Narkon, Wells, and Segal (2011) approached spelling in another study using an interactive activity via the E-Word Wall. Individuals identified with learning disabilities (LD) tend to have fewer vocabulary words at their disposal. Often times, students with LD find it challenging to secure words from reading without structured instruction. Students with LD

require additional experience to expand their skills in reading. A way to increase experiences with words is by using a word wall. A word wall is a tool used for literacy that allows students to increase their knowledge of high frequency words.

Students interact with word walls during their literacy and writing blocks in school. The words are high frequency words that are written in large print for students to read from their desks. Many times elementary school teachers use word walls to introduce words or provide an interactive display of words in the classrooms. The traditional word wall is not interactive, but using the E-Word Wall is an interactive way to learn to spell. It provides students with opportunities to engage in manageable and multisensory study of words. The special education teacher instructed her students daily in reading and written language including vocabulary. Prior to reading, the special education teacher would review new vocabulary word that in the reading passage.

An E-Word Wall is new model of the classic word wall which allowed students to interact with word a new away with technology. It is used digitally, independently, and as an engaging tool for students to study words with students with special needs. At school, the teacher can easily create the E-Word Wall using power point program. The study completed by Narkon, Wells, and Segal (2011) looked at using the E-Word Wall with two children with special needs. One of the children was identified with a learning disability. The other participant was identified with autism spectrum disorder. Each of the children required addition exposure to words. The words found on both a standard word wall and an E-Word Wall were in alphabetical order when presented to students. E-Word Walls can be auditory; a word can be paired with a picture; a word can be used in a sentence and viewed alphabetically on the computer. The pictures in the E-Word Wall can be meaningful and changed for each student.

The first step to creating an E-Word Wall is to create a power point slide that develops the word wall. A page needs to be created for each letter on the E-Word Wall. Then links should be added to the slides and chosen vocabulary should be added to the slides. By creating and adding words to E-Word Walls during the students' instruction, the E-Word Wall can enhance children's ability in spelling. The E-Word Wall provides students with disabilities multiple opportunities for reinforcement of vocabulary. The examiner realized that students with disabilities in the areas of learning and autism were more actively engaged in their own learning. The examiner allowed the students to actively add words to their word walls. The researchers, Narkon, Wells, and Segal (2011) found that the E-Word Wall was a stimulating learning activity, and the students were actively involved in the task. The students were active in the activities, such as practicing the sounds and words. The students were allowed to add their own words to their E-Word Wall and add their own pictures and sentences.

E-Word Walls assisted students with disabilities, such as learning disabilities and autism. Other researchers such as McClanaham, Williams, Kennedy, and Tate (2012) researched the effectiveness of iPads with a student with Attention Deficit Hyperactivity Disorder (ADHD) on reading and academics. McClanahan, Williams, Kennedy, and Tate (2012) examined how iPads could facilitate reading improvement for a child with Attention Deficit Hyperactive Disability (ADHD). The student was in fifth grade; however, his reading ability was at a second grade level, and the individual had attended the same school the entire time he has been in school. The student attended a small rural school district in southeast Oklahoma, and it was located in one of the most depressed rural areas in the country with very little technology available for students to use. The child had received pullout services for students who had been identified and qualified for specialized educational services and had an Individual Education Plan (IEP) with

accommodations and modifications. The individual who participated in this intervention had accommodations and modifications, such as shortened assignments, extra time, breaking work into smaller pieces, oral administration of tests, and giving consistent reminders. The child's parents made the choice not to use medication for his ADHD. The individual was identified with ADHD at the age of nine.

Based on an assessment, the STAR reading assessment, administered to the individual in second grade, the student made one year's growth. At the start of his second grade year, the student went from the end of kindergarten to the end of first grade by the end of his second grade year. Other years were not available for the researchers. On statewide assessments, the student showed very little growth during his third and fourth grade years. Modifications and accommodations were implemented during his fourth grade year.

One of the researchers determined the student's instructional level after the examiner reviewed and analyzed the child's data from the Informal Reading Inventory (IRI). On the baseline data, the student scored 96% word accuracy and answered 75% of the comprehension questions correctly on a second grade passage. The passage was at his instructional level. On the third grade passage, the student had 88% word accuracy and answered 90% comprehension questions correctly which was his frustration level. While reading, the child would read with very little phrasing and did not pay attention to punctuation. The student also paid attention to the first part of words; however, he would guess the rest of the word. When an asked comprehension question, the child overlooked details and was not able to sequence details from the passage. After the analysis of the IRI, the examiner developed a plan that consisted of word recognition strategies for decoding along with recognizing compound words. The examiner also added strategies to the plan to assist the student with miscues and focused on sequencing to

enhance comprehension skills. The examiner found applications for the iPad that the research team thought would be beneficial for the student to use to enhance his skills in reading, such as the use of graphic organizers.

The instructional time was divided into two sessions based on the advice of the individual's teacher. The first session was divided in half, and a traditional approach was taken with the individual that consisted of the use of sentence strips to assist with context clues; however, this was unsuccessful. At the end of the first session, the student was allowed to use the iPad application with which the child was familiar, and the student sat perfectly still for 10 minutes and stayed focused on the activity. The second half of the lesson, two days later, focused on context clues, and the student used an activity on the iPad that the examiner had downloaded to the device. The examiner noted the student was more responsive when using the new method. Another activity used on the iPad was an eBook, a book at his reading level. The eBook allowed the student to read the book aloud, and he could replay the reading and listen for the errors. After hearing the repeated reading, the student realized that he needed to slow down, and he needed to make the story make sense. When he read it a second time, the individual slowed down and pronounced the words clearly. The individual had developed a new comprehension for reading.

For the next five weeks, one of the examiners and the student worked together for at least twice a week for twenty-minute sessions. The iPad was used primarily as a tool to present the information to the student. At times, the student led the lessons. For example, when the examiner and fifth grader were going to work on compound words, the individual stated that it was hard for him to read words when there were two words together. The examiner found an application quickly called FlashCards+ and quickly created flash cards to assist the student. The

student learned how compound words were formed, and then he played a game on the iPad to develop his skills with compound words. During another lesson, the student was asked to read another passage at his reading level and record it on the iPad. The student took his time; the examiner thought it was because the student understood he would hear it back; the fifth grader made significantly fewer errors when compared to the first session. After reading, the student listened to himself and listened to the examiner read the book; however, he had a difficult time following along.

The student also worked on comprehension with the examiner using the iPad. Some activities to improve comprehension were sorting main ideas from details, sequencing, and making conclusions. To address the paper- and- pencil tasks, the examiner taught the student to use a stylus to assist the individual in making marks similar to the iPad. After the introduction of the stylus, the individual was able to use it independently after the fourth session with the examiner.

The assessment completed at the end of the intervention showed that the student was able to read at an independent level through fourth grade. The first and second grade reading assessments showed that the student was able to recognize 100% of the words correctly. The student's comprehension skills were at 75% and 100% on the first and second grade assessment. This showed that the student's new independent reading level was second grade. The student was able to read a third grade passage with 98% word accuracy and 85% comprehension, and the third grade passage became the individual's new instructional level. When the student read the fourth grade passage, four lines were passed over, and the word accuracy score dropped to 85%. The comprehension score was 60%, and it showed that it was at his frustration level. The

individual improved greatly within six weeks when provided with one-on-one intervention and tools and strategies that kept the individual's attention.

Similar to McClanaham, Williams, Kennedy, and Tate (2012) who researched the effectiveness of iPads with a student with Attention Deficit Hyperactivity Disorder (ADHD) on reading and academics, Evmenova, Graff, Jerome, and Behrmann (2010) researched phonetic spelling support and journal writing for student with difficulties in writing. The researchers examined word predication using software programs that supported inventive spelling with students with poor and severe writing and spelling difficulties. The purpose of the research was to examine the effectiveness of a word prediction software program that would support students' skills in phonetic spelling.

The participants in the study were between third grade and sixth grade and were attending a four-week summer writing camp that was technology based located at a northeast university. The parents of these students indentified them as having difficulties with writing skills. Many of the students were identified as having learning disabilities. Prior to going to the camp, the parents were required to fill out a parent questionnaire to determine the students' familiarity with the keyboard and Word Processing System. Word Processing System is software that assists individuals in creating documents, such as letters, reports, papers, and stories. On the questionnaire, the parents also reported the following information about their children: special education services, age, ethnicity, disability category, and level of their writing skills. Many of the parents reported their children as being the middle class and Caucasian. Throughout the camp, the students were able to practice their word processing skills. The students' keyboarding skills was determined using TypetoLearn 3 software that reported the students' words per minute, accuracy, and errors while they were practicing. To develop a baseline, each participate

used Microsoft Word for journal writing. Each of the participants was not allowed to use grammar or spell check.

Baseline information was collected during the first week of camp using a minimum of three data points. The students were randomly assigned to the word predication programs that allowed all of the students to try all three programs before the end of the session. The students would rotate through the programs during the week, so they did find a way to master the program. The students were not allowed to use spell check while the information was being collected. Based on the students' skills with the computer, they may or may not have received instruction on how to use the computer. A requirement to participate in the study was the ability to type at least six words per minute and pass the Young/Easily frustrated level that measured words per minute. The students also received instruction on how to use the word prediction programs via a PowerPoint seminar. The participants were randomly assigned the predication programs; however, they were given an additional instruction during the week they were working on that particular program.

All of the students were required to write for 20 minutes in their journals, and many were able to write for 15 to 20 minutes; however, a few of the students were only able to write for 10 minutes. Next, other students would write for 25 minutes or more. The students were given a journal prompt. The students used the following word predication programs: Co-Writer, WordQ, and WriteAssist. As the student typed, the programs started to predict the word, and when the word appeared, the student was able to click on it. Then it was entered into their writing. Each of the programs provided verbal feedback to the students. The spell check was disabled on the programs. Co-Writer SOLO Edition was the most recent when the research was conducted and picked words based on phonetic and inventive spelling. WordQ used a standard word processor

and was based on the students' creative writing. The WordQ program offered words that were typically misspelled. WriteAssist was a program that was a word-predicator for dyslexia. The students were offered words without the individual typing a letter because of the context-dependent prediction ability. Later in the day, students would write once again; however, the students would engage in brainstorming activities, drafting, editing, and production. If the students only wrote three sentences or less, the researchers asked them to elaborate on their writing. Each of the students was also asked to pick a word from a prediction list and spell it without assistance.

The students' number of words spelled correctly, total number of words, and composition rate were collected throughout the study. Students were able to perform better using the word prediction program better than just word processing alone. The students were able to increase the total number of words from 21 to 36 across every pupil and the word predication software. Five students were able to double their word production using word predication skills with at least one software program; however, one of the students was able to double his word skills with all three programs. The average spelling accuracy went from 58% to 96% across all of the software programs. The students were able to improve their rate of words per minute on all three programs. Students were able to improve their spelling skills by using the predication programs compared to the word processing. Based on the student feedback, the students enjoyed the word predication programs and stated that using the programs made writing much easier.

The Importance of Developing Spelling Skills using Technology with Students with and without Disabilities

Many researchers have examined spelling with students with and without disabilities; however, recently a few researchers have examined how technology has affected children's ability to spell accurately. Wu and Zhang (2010) examined the effects on spelling using handheld technology. Schools have increased their handheld technology devices over the recent years. A handheld technology device is a small computer that can fit in the hands of the students. Educators are using handheld devices to assist in educating, learning, and assessing students; many children show more interest in academics when allowed to use or are taught to use a handheld device. Researchers, such as Wu and Zhang, have shown interested in the relationship between educating and learning using handheld technology. According to Wu and Zhang, teachers are starting to give students pre-assessments via the use of handheld devices that provide students with quick grading and feedback. The devices also provide the students with real-time scoring and security. Other teachers are using the devices with students with special needs to perform spelling tasks.

Researchers Wu and Zhang (2010) studied whether the handheld technology was increasing students' achievement in the area of spelling and raising test aptitude in area of mathematics. The first experiment completed by Wu and Zhang examined the achievement of English vocabulary by a set of pupils. The students used handheld computers and a grouping of pupils who learned English vocabulary through a conventional method. The group of students for the first experiment consisted of 47 fourth grade students that attended a mid-southwestern public school in the United States. Every child that participated in this study was a native English speaker. A group of 22 students learned English vocabulary using a handheld

technology device. The other 25 fourth graders learned English vocabulary without using a computer or handheld device. The teacher who created and planned the assessments taught all of the students. Each of the groups was given a 20-word test with every word valued at a five points each.

In order to be consistent with both groups of students, the same educator taught the groups the same vocabulary words; each group was given the same amount of time. The group with the handheld device used NotePad to learn the spelling words with a partner. The procedure used with the group with the computer devices was that one student would call out the word, and the partner would spell the same word. The partner would send out the word to the other partner, and the other partner would check to see if the word was spelled correctly. After the first partner was able to demonstrate spelling the words, the partners would switch activities. The students practiced the words for two class periods. The results of the test (Independent-Sample T) pointed out that the results from the students who used the handheld devices showed significantly high results when compared to the students that did not use a hand held device.

Wu and Zhang (2010) also studied the difference between a paper-and-pencil task test and a test using a handheld device in the area of mathematics. The researchers believed there would not be a difference between the two different groups. The group of students for the second experiment consisted of 97 fifth grade students. A group of 39 students used the handheld device. The other 58 fifth graders took the same test using the paper-and-pencil technique. The same educator created the mathematics test for the experimental group as for the control group. The test consisted of eight fraction problems. Every student was asked to divide the fraction and reduce it into the lowest form. Students were able to receive a total of 100 points. The same teacher with the same lessons taught the students. The students received the

same amount of instruction time prior to the assessment. Every child took the same test; however, 58 students took the test using paper-and-pencil, and the other 39 students took the assessment using a handheld device. The individuals who used the handheld technological device scored significantly higher on the assessment compared to the students who took the test using paper and pencil. The results also showed the positive possibility of using technology in different elementary academics especially mathematics and language arts.

Wu and Zhang (2010) found that students were more successful in spelling using handheld technology with students without disabilities. Wood, Jackson, Hart, Plester, and Wilde (2011) completed another study that focused on evaluating the effects of text messaging on children's ability to spelling, read, and phonologically process. Recently, children have been exposed to technology more than ever before. A large number of children in the age range of 8 to 15 obtain their first cell phone as young as five years old. Wood et al. (2011) investigated the effects of young children's spelling and phonological processing using cell phones and texting. The study examined 114 students in the specific age range of 9- and 10-year-olds. None of the students who were part of the Wood, Jackson, Hart, Plester, and Wilde study had obtained their own cell phones prior to the study. The 114 students were from twelve schools in the United Kingdom from the Midland area. The researchers obtained written permission from the parents and/or guardians of the students before starting the study. After the permission was granted, the group of 114 children was divided into two smaller groups: an intervention group and a control group. The intervention group was the group with the cell phones. The control group did not have cell phones. The groups were uneven; the intervention group had 56 students, and the control group had 58 children who participated.

Each of the children was assessed using the short version of the Wechsler Abbreviated Scale of Intelligence to establish every child's IQ score and a reading test to establish the child's reading ability using the British Ability Scale II Word Reading Subtest. Students were also assessed using certain subtests of the Phonological Assessment Battery that assessed each child's knowledge of phonological awareness. Permission was granted from parents of the students that have not had their individual cell phones prior to the study. Each child was asked to participate in the research, knowing that he or she may or may not receive a cell phone to use during the experiment. Every child was randomly selected to be part of the experimental and control group. Once the assessments were completed, the students who received the cell phones were taught how to use them on a Friday afternoon. The children with the cell phones were asked to send and receive text messages; they were given the cell phones during the weekends and during the week break for a total of ten weeks. Every child in the cell phone group received a cell phone after school on Fridays and handed the cell phones back before school on Mondays. Credit was put onto the cell phones prior to the children receiving the phones, and additional credit for texting was added during break from school. Children participating in the experiment with the cell phones were provided with phone numbers of the other students; however, many of the individuals had friends with cell phones. After the students with cell phones returned them in, the text messages were transcribed by hand from the cell phones along with the number of messages received and sent from each phone. Each child of both groups was tested in reading and spelling once per week to monitor the negative effects on individuals with the cell phones. When the ten weeks were finished, each of the students was tested once again using the phonological awareness and reading tests.

Both of groups of research participants in the experimental group with access to text messaging and the control group did not have differences in their literacy development. At the beginning of the experiment, the texting group of students sent an average of 45 texts per week; however, it dropped suddenly by the end of the study to an average of six text messages. The researchers also stated that the intervention was not long enough to show the benefits of using technology and text messaging. At the end of the study, students showed some improvement with phonological awareness compared to the group that was texting. The group of students with technology had fewer text messages sent and received; however, the authors believed this was due to student inexperienced using texting prior to the study.

Similar to Wood, Jackson, Hart, Plester, and Wilde (2011), Powell and Dixon (2011) examined the effects of adults' knowledge of spelling using a short message system while texting. In recent years, educators reported that students have been handing in work with text messaging or short messaging system (SMS). .The short-messaging system (SMS) is a method of sending messages using a mobile device. Some researchers stated that texting enables students to write with easy communication with peers; however, it does not provide a learning opportunity for formal writing. Other researchers stated that it is difficult to communicate within 160 characters. However, for students to be able to read and write text messages, they must possess some knowledge of phonological awareness and understanding of language. The researchers examined the effects of commonly used words during text messaging on adults' ability to spell. Recently, students have had more opportunities to use technology in the classroom and in the everyday life. Text messaging is a form of writing using technology; however, it had the possibility to hinder one's ability to spell accurately, and it did not.

Throughout the research of technology applications, it could have a positive effect on spelling as well.

The individuals in this study were undergraduate students, 94 students including 23 males and 71 females, who were enrolled a university located in London. The participants of this study were average age of the population for the study was 24.4 years old. The individuals were randomly assigned to different groups. Prior to assigning individuals to a group, the undergraduates were given a 20 word-spelling test using the Schonell Standardized Assessment. In the experiment, students were tested twice, prior to and after the exposure phase, with the same 30 word spelling text. Every participant in the study read the same words during two sessions. Half of the group was given the words in text form, and the other half of the group shaped a baseline using standard form of spelling. The texting groups decided whether participates saw fifteen exam items as misspelling or as texting words during the exposure phase.

Words were selected for the 30-word list, based on a word being commonly misspelled and phonetically misspelled along with a short version for texting. Students were given the list prior to and after the exposure phase. A test of 20 words called, the Schonell Standardized Word List, was used as the pre-exposure word list. During the first session (the pre-exposure stage), the undergrads took a dictated spelling test that consisted of 20 words from the Schonell assessment along with the 30 words assigned from the researchers. The spelling test consisted of stating the word, using the word in a sentence, and repeating the word. A second assessment was given to the undergrads in a small group consisting of five to ten individuals. During the second meeting, the individuals completed the exposure phase and the second spelling assessment. The exposure phase of the study consisted of viewing half of the misspelled words or the texting version of the spelling word on a computer. When presenting the misspelled words, the words

were presented in lower case letters, and when the texting version of the words was presented, they were presented in lower case and upper case letters including numbers. After the exposure phase, the undergrads completed the second spelling assessment presented in the same fashion as the pre-assessment. The group who was exposed to misspelled vocabulary words decreased; however, their performance increased after the exposure of properly spelled words and texting version of words. The texting version of the words had a positive impact of the undergrads' spelling ability.

While Powell and Dixon (2011) examined the effects of adults' knowledge of spelling using a short message system while texting, Crichton, Pegler, and White (2012) researched how personal electronic devices, such as iPods and iPads, work in the school setting and how the learning derived from the use of such electronic devices could change for educators and with students. Conducted in an urban Canadian school district, all fulltime educators received a laptop computer and professional development opportunities that focused on using the internet. The district's initiative had been demonstrated to other districts across Canada.

Collaborating with the local university to develop graduate course assisting with their professional development, the district's initiative was modeled and demonstrated to other Canadian school districts. Many of the classrooms had SMART Boards or interactive whiteboards in the classroom. In addition to the interactive whiteboards, the students and teacher had access to wireless internet if they brought their personal devices to school when using their personal technological devices at school. Five classrooms were chosen from the school district.

Participation in this research study was based on the willingness of the educational staff, parents, and students. Students were chosen from a diversified selection of grade levels and

socioeconomic backgrounds. Each student received an iPod during the first phase of the research, and the teacher received a laptop for the classroom, a syncing cart, and a document camera. An iPod is a portable device that plays music and allows individuals to browsing the internet and use applications. A laptop is a portable computer. A syncing cart is a cabinet that allows individuals to plug in their electronic devices, such as iPods, to synchronize them together. A document camera is an electronic camera that displays items on the SMART Board or on the wall of a classroom to visualize it by a large group. Every teacher was assigned an iPod and asked to become familiar with it. Two months prior to the students receiving their iPods, the students received their devices; the teachers spent a day exploring the iPods as learners. The teachers with the iPods met monthly to reflect and share their experiences. At the meetings, the researchers addressed concerns and provided support.

Phase 2 consisted of three classrooms receiving 61 iPads. The teachers were required to participate in professional development. Like Phase 1, the teachers became learners of the iPad to become familiar with the device. The Phase 2 group had to apply to the Information and Communication Technology group to be part of the research and state their knowledge of the device. The researchers worked with the Phase 1 and Phase 2 groups at the same time.

The Phase 1 members completed a survey on the devices. The students, educators, and Information Technology (IT) participants preferred different technology devices for different tasks. Students, educators, and IT participants in Phase 1 thought the iPod was effective for recording voices, listening to podcasts, and playing games. Many of the individuals believed the laptops were effective for the internet use, creating different medias, and checking email. The individuals in the Phase 1 also thought that paper/pencil tasks were best used for drawing and

reading. Phase 1 teachers needed to become more knowledgeable about synchronizing the devices and charging them for the next usage.

The Phase 2 members completed a survey also. Phase 2 participants had similar results as did Phase 1 in believing that each technology device was useful for a different purpose; however, the elementary and junior high students demonstrated great interest towards iPods. The younger-aged students liked that iPods had games and art activities. The high school-aged students enjoyed that they could access their textbooks on the iPads; however, the second social studies class that was not able to access their textbooks on the iPods completed other tasks on the iPods. They viewed the iPod course work as not real work.

Technology continues to change over time, and education facilities continue to incorporate technology into the school setting to prepare students for the real world. Comparable to Crichton, Pegler, and White (2012), Rossing, Miller, Cecil, and Stamper (2012) examined using the effectiveness of technology in education with students. Rossing, Miller, Cecil, and Stamper (2012) researched students' awareness of learning with iPads. Completed at Indiana University located in Indianapolis, Indiana, sixty faculty members applied for this study; however, only eight were selected as participants. Each of the participants met twice a week during the fall semester of 2010-2011 school year. The following semester the faculty members shared their observations and reflected on their experiences with the handheld devices, the iPads; then they designed the study. Two hundred nine students were chosen to participate voluntarily and anonymously in the study from the university based on the instructors that were also participants of the study. The participants' ages ranged from 18 to 44. The students' course grade had no bearing based on the being a participant in the study. Before starting with the iPads, the faculty members requested particular applications (apps) to promote learning.

Individually, or in small groups, students were loaned an iPad prior to starting an activity. After completing the activity, the students were expected to share their work via email or through Dropbox applications. Depending on the course, students were able to access the iPads up to seven times.

In the Rossing, Miller, Cecil, and Stamper (2012) research, the participants completed a survey using the Likert Scale and an open-ended response at the completion of the class. The collection of data was qualitative and quantitative. The open-ended questions asked the participants what assisted them in their learning the content, what they liked the best, what they liked the least, and suggestions for other usages of the iPad. The Likert-Scale Survey asked the participants to rate the activities they completed on the iPad using a five- point scale from strongly disagree to strongly agree. Five consistent themes emerged from the Likert-Scale survey administered to the study participants: access of information, collaboration, novelty, learning styles, and conveniences. The participants were required to use the internet browser through the university. That was seen as a positive and a negative by the students. The students liked that they were able to find information and share with each other quickly, and others liked that they were not limited to the textbook. The negatives to the iPad use were that individuals were checking social networks and emails. Another area the participants commented on was the collaboration that allowed the students to share items quickly and effectively; however, it was difficult to look at one screen with multiple people. Novelty of iPad use was another area that the participants commented on during the survey. The students believed that, at first, it was a little confusing determining on the role of the iPad in their learning; however, it was a different take on learning when they became proficient at the tasks. Learning style was another theme that emerged from the survey results. The students believed the learning style gave participants gave

an alternative method of learning and participating in a lecture or group activity. The emergent theme of the survey was convenience. The students quickly learned how the easy use of the iPad allowed them to find information for the class.

Conclusion

A person's ability to spell accurately is affected by an individual's ability in reading and written language. Reading, writing, and phonemic awareness are linked to spelling and one's ability to spell. Researchers Santoro, Coyne, and Simmons (2006) have proven if a child is lacking in reading and written language, the student will be lacking or be challenged in spelling correctly. A variety of researchers, such as Werfel and Schuela (2012), had researched kindergarteners' ability to segment and represent consonant blends. Santoro, Coyne, & Simmons (2005) have examined the connection between spelling and reading with children who were at risk for developing reading disabilities.

Other researchers have examined spelling strategies with students identified with a variety of disabilities. One research study completed by Nies and Belfiore (2006) examined the spelling strategy of cover-copy-compare with students in the third grade students with disabilities. Viel-Ruma, Houchins, & Fredrick (2007) conducted a study focusing on the use of the error self-correction spelling method and improving students with disabilities' spelling skills. Another study by Narkon, Wells, & Segal (2011) examined students with Learning Disabilities and Autism Spectrum Disorder and the effectiveness of using E-Word Walls for learning how to spell and the development of their spelling skills. E-Word Walls assisted students with disabilities, such as learning disabilities and autism, and other researchers, McClanaham,

Williams, Kennedy, and Tate (2012), researched the effectiveness of iPads with a student with Attention Deficit Hyperactivity Disorder (ADHD) related to reading and academics.

Researchers have also studied the relationship between student use of technology and its effect on spelling. Two researchers who examined technology and its effect on learning how to spell were Wu and Zhang (2010), who examined the effects on spelling. Wu and Zhang found that spelling improved with the use of handheld devices. Wood, Jackson, Hart, Plester, & Wilde (2011) examined the effects of text messaging on nine and ten year olds' spelling skill development. They found that texting does not adversely affect their spelling skills or students' spelling skill development. Powell and Dixon (2011) also examined the effect of text messaging on adults' spelling. The researchers found text messaging had a positive effect on spelling unlike misspelling that did not have a positive effect on spelling skills. Crichton, Pegler, and White (2012) researched how personal electronic devices, such as iPods and iPads, work in the school setting, how learning could change for educators along with students, and how the learning derived from the use of these electronic devices could change educators and students. Similar to Crichton, Pegler, and White (2012), Rossing, Miller, Cecil, and Stamper (2012) examined the use technology in education with students and its effectiveness.

The research question that emerged was based on the reviewed literature and encompassed technology, spelling, and students with Learning Disabilities. What are the effects of using word sorts in combination with iPad spelling applications on spelling acquisition of a student with a Specific Learning Disability?

CHAPTER THREE: Implementation

Introduction

Spelling has been linked to reading skills and written language. A child who struggles with reading and writing typically struggles with spelling acquisition. In order to enhance a child's spelling skills, educators have introduced students to spelling strategies in a variety of ways in schools over many years. Teachers have taught spelling using traditional spelling books, word sorts, students' writing prompts, and a variety of spelling strategies. Many elementary educators have changed their instruction of spelling from the traditional spelling book approach, where the students are introduced to twenty spelling words and a few challenge words on the first day of the week and required to memorize the words by the end of the week. Finding the most effective way to teach a child spelling has been challenging for many educators. Using the traditional method of spelling, many educators have not link spelling and literacy; however Wefel and Schuele (2012) and Santoro, Coyne, and Simmons (2006) examined how reading, written language, and spelling skills intersect.

As Wefel and Schuele (2012) and Santoro, Coyne, and Simmons (2006) examined how spelling is linked to literacy. Finding the appropriate strategy to assist students with special needs in developing their spelling skills can be challenging. Many researchers have explored the effects of a variety of spelling strategies on students with special needs, such as Viel-Ruma, Houchins, and Fredrick (2007) who examined written expression with secondary students with special needs. Nies and Belfiore (2006) explored spelling performance with students with learning disabilities using cover, copy, compare and copy only versus cover, copy, compare strategies. The researchers found the cover, copy, compare, and copy method was more effective due to more exposure to the spelling word. The examiners found by exposing to correct spelling

multiple time has been beneficial to students with special needs. Other researchers, Narkon, Wells, and Segal (2011) examined and found that interactive word walls with students with learning disabilities and autism were more engaging and allowed students to develop a personalized word wall. Having the student interact with the words made it more concrete for the student.

Along with finding the appropriate way to introduce and teach students spelling strategies, educators also implemented the strategies to introduce and use technology in their classrooms. Recently, many classrooms have implemented SMARTBoards, computers, laptops, iPads, and other technology devices. Teachers have used the technology devices to introduce lessons, to reinforce materials, and to expand lessons. Teachers have used applications and technological devices to enhance students' learning in variety of areas and topics in education. Handheld devices have enhanced reading skills and writing skills (Wu and Zhang, 2010). Wu, Zhang (2010); Powell, Dixon (2011), and Rossing, Miller, Cecil, and Stamper (2012) are a few researchers who have examined how technology impacts a learner's ability to acquire knowledge using technology devices, such as iPads, iPods, and phones. Researching a variety of spelling strategies and technology studies led the examiner to study the use of word sorts and iPad applications on a student with a specific learning disability.

After reflection, it seemed promising to look at a modern and appealing activity to increase the spelling skills of a student with a learning disability using iPad applications and word sorts. The research showed that students with a specific learning disability benefit from being exposed to spelling words multiple times in a variety of ways to influence reading skills, and they are more engaged by technology.

Participant

The participant in the study was third grade Caucasian male. The student was enrolled in a public elementary school located in a small city in Midwestern United States. The student's age during the study was eight years, ten months old. The individual received special education services in the areas of reading, written language, and mathematics. The student was identified with a Specific Learning Disability a year prior to the start of this study when he was in second grade. At the time of the study, the student was approximately one year behind in his reading, writing, and mathematic skills, as measured by the curriculum-based assessments. On the Wisconsin Knowledge and Concepts Examination, which was taken in the fall prior to the intervention, the participant was in the minimal performance range with a score of 270, and in the first percentile in the state of Wisconsin. At the beginning and in the middle of the student's third grade year, the participant was not able to score, using a Lexile scoring scale, on the Scholastic Reading Inventory. The Scholastic Reading Inventory, an assessment the district has chosen to give as one of the reading assessment to gauge the students' reading ability in the school district. A typical third grade student generally scored between levels 550 to 700 at any point during the school year. A few of his accommodations outlined in his Individual Education Plan included modified spelling lists and tests, oral reading of assessments in a small group outside of the general education classroom, and speech and language services. The participant received 45 minutes of reading, written language, and mathematics special education services each school day in the special education classroom within a small group setting. The research was completed on an individual basis. The child also received a modified spelling list from his special education teacher; his spelling list included ten words with similar spelling chunks or spelling patterns when his classmates received twenty words with up to four word chunks. The

student had permission from his parent/guardian to participate in the study (see Appendix PP). He had good attendance and participation in the activities implemented, only missing four days from the start of year school through the end of the study.

The student, who was a part of the study, completed the tasks while in the special education classroom, three times a week for six weeks. The student participated in the word sorts and iPad spelling application activities for 20 minutes per day. The timeframe of the study was built around the time period the child had open in his schedule after specials such as art, music, and physical education and the time period he would be in the special education classroom.

All activities implemented were developed around the strengths and weaknesses of the student's pre-assessment. The researcher selected the spelling word sorts from *Words Their Way* (Bear et al., 2008*)* based on how the student improved or required more assistance throughout the week and based on the pre-assessment completed using *Words Their Way* spelling inventory. If the student was able to decrease the time to complete the word sorts, the student received more challenging words to sort. The student had each of the word sorts for three days a week to categorize. After each week, the student received a new set of words.

Data Collection

The first point of data collected in this study was the pre-assessment using the *Words Their Way* spelling assessment; the directions for the assessment can be seen on Appendix A. The word list for the *Words Their Way* spelling assessment consisted of 26 words (see Appendix B). *The Words Their Way* spelling assessment information provided the researcher with information on the student's particular skills, such as short vowels, long vowels, blends, and diagraphs. For the pre- and post-assessments, the researcher stated the word, used the word in a

sentence, and restated the spelling word. The student wrote the spelling word on his paper (see Appendix B). The *Words Their Way* spelling assessment divided each word into spelling skills. Examples of spelling skills were short vowel sounds, long vowel sounds, blends, and diagraphs (see Appendix D). The examiner completed the Spelling Inventory Feature page after the pre-assessment was completed which is located in *Words Their Way* (see Appendix D). The student received points for the assessment based on both writing parts of the word correctly and writing the entire word correctly (see Appendix D). The Spelling Inventory Feature page allows educators to determine the strengths and weakness of a person's spelling skills. The student was asked to spell 17 spelling words on the pre-assessment (see Appendix C) and 24 spelling words on the post-assessment (see Appendix E). He was tested on more words during the post-assessment because he was able to write more of the words correctly. The words came from the *Words Their Way* spelling list (see Appendix B). The second data point of the pre-assessment consisted of a *Nonsense Word* assessment, which is from *Teaching Phonics & Word Study in the Intermediate Grades* (Blevins, 2001) (see Appendix G). The student was given a *Nonsense Word* list and asked to read the fake words aloud to gauge the student's knowledge how to apply phonic skills to literacy which is linked to spelling (see Appendix H). The researcher recorded in writing his oral responses and collected how many fake words were read correctly for the pre-assessment (see Appendix I). The purpose of the *Nonsense Word* list was to see how the intervention with word sorts and spelling applications on the iPad improved the child's spelling acquisition and reading skills. The third data point of the pre-assessment and post-assessment consisted of the student completing a questionnaire asking him how he felt toward his acquisition of spelling strategies (see Appendix K). The researcher/examiner created the spelling questionnaire survey which consisted of six questions. The purpose of the pre-assessment and

post-assessment spelling questionnaire survey was to gauge the student's personal thoughts about spelling and his feelings regarding spelling. The student answered the questions verbally, and researcher wrote his responses on the student survey questionnaire (see Appendix K). The pre-assessments took approximately 45 minutes to complete.

The post-assessment was completed in the same fashion as the pre-assessment. Each of the pre- and post-assessments took 45 minutes to complete. The student completed the pre- and post- assessments, *Words Their Way* spelling assessment (see Appendix E), an informal *Nonsense Word* assessment, and a spelling questionnaire survey created by the examiner. The Spelling Inventory Feature page was completed by the examiner after the post-assessment was completed (see Appendix F). He was given a word orally; the word was used in a sentence verbally, and the word was restated orally (see Appendix B). The *Words Their Way* spelling assessment assisted the examiner in determining the strengths and the weaknesses of the student's spelling skills (see Appendix E). After the spelling assessment, the student read words from the *Nonsense Word* list; the researcher wrote down his responses (see Appendix J). The Nonsense Word list was used as an assessment to determine how the student connects spelling strategies to literacy. The student also answered questions from the researcher-developed spelling survey questionnaire. His responses were recorded (see Appendix L). The spelling survey questionnaire was used to determine the perception of the student towards spelling. The examiner explored other surveys related to spelling to develop the spelling survey questionnaire developed for this study.

Along with the assessments, the researcher collected data based on how the student preformed during the intervention to monitor the student's growth in spelling acquisition (see Appendix M for example of examiner's notes). The researcher timed how long it took the

student to sort the words each day along with the amount of time the student was able to use the iPad spelling application in order to examine the student's growth. The researcher recorded the number of words the student created on the iPad. Appendix G is a sample of the examiner's notes from the word sort and iPad application activities. The purpose of timing the word sorts and how long the student had access the iPad was to see if there was measured improvement with the word sorts throughout the week. Timing the intervention also allowed the examiner to monitor the time the student was participating in the intervention each day of the study in order to gauge engagement.

Procedures

The study took place during the student's specialized instruction in reading, writing, and spelling while the student was in the special education classroom. The duration of the intervention was six weeks. Because the individual met with examiner each day, the student worked on the word sort three of five days a week for 20 minutes each day. The spelling word sorts that the individual used each week were chosen based on his missing skills from the *Words Their Way* spelling assessment that was completed at the beginning of the intervention during the pre-assessment. The words given for each week to the student were chosen based on the skill gaps revealed by the pre-assessment. The researcher also took notes regarding the student's ability to read and place the words in the sorts correctly or if the student needed assistance in order monitor for growth of the student's skills. Including the words sorts activity, the examiner also took notes on the student's ability to perform on the iPad, such as his ability to create words, if the student made errors or self-corrected while creating words on the iPad, and if the student had any comments while completing the study. The notes taken during the intervention were meant to assist the examiner in monitoring the student's growth while sorting words and creating

word on the iPad. By jotting notes, it allowed the researcher to notice if there was patterns of strengths and weaknesses.

The first week consisted of Days One, Two, and Three. During the first week, the student was given his picture word sorts and asked to state each word of the picture words while he glued them own under the correct short vowel sound in a notebook. The student was given 17 picture words during the first week; five word pictures were short /a/; five word pictures were short /i/, and seven word pictures were short /u/. The words the examiner gave the student to sort during the first week were the following: cat, pig, sun, mud, flip, cap, bat, crib, run, jump, ship, plant, tack, zipper, stump, van, sink, glass, cup, and skull. The three short vowel sounds that were chosen were the short /a/, short /i/ and short /u/ sounds. The student missed the short /u/ sound on the pre-assessment, and the student had correctly spelled the short /a/ and short /i/ words on the pre-assessment. The sample of participant's word sort for Day One can be seen Appendix N. See Appendix O for notes regarding student's response for the paper word sorts. Notes were taken by the examiner while the student was completing the word sort for Day One (see Appendix P). After the student completed the word sort activity, he was asked to create words on the iPad using the application *Spelling Magic 2* to incorporate technology to the study. The student was given the iPad with instructions on how to use the application using a moveable alphabet with the letter sound feature turned on. He was asked to create short /u/ words on the iPad. The student would hit the picture every time he needed to hear the sounds in the word. Notes taken by examiner regarding the words the student created using the iPad for Day One are found the appendix (see Appendix P). During Day Two, the student created words using the short /u/ sound along with the short /i/ and short /a/ sounds. The student glued his words into his notebook (see Appendix Q). Notes were taken while the student was completing the word sort

by the examiner to monitor the student's growth with the word sort activity (see Appendix R). The examiner documented the words created by the participant while using *Spelling Magic 2* on the iPad (see Appendix S). During Day Three, the individual completed five short sound categories on the iPad. The student glued the words in his journal (see Appendix T). The examiner took notes while the student was completing the word sort activity to monitor the student's growth with the word sort activities (see Appendix U). He created words with the short /u/ first, then moved to short /a/, short /i/, short /e/, and finally to short /o/. Notes were taken by the examiner while the participant was creating words (see Appendix V). During Week One, the letter hint feature, letter sound, and double letter helper was turned on. When the research was planned, the researcher did not intend to have different features turned off or on when using the iPad application; however, using the *Spelling Magic* 2 application allowed the examiner to increase or decrease the level of skills for the student. The letter hint feature allowed the student to hit the letter box and hear the sound that goes in the word. The letter sound feature allowed the student to hit letters in the moveable alphabet and hear the sound that particular letter makes. The double letter feature automatically would fill in the second consonant if it were the same as the previous letter.

During Week Two, the student was given word sort words with the –sh and –ch as the ending sounds. Week Two consisted of Day Four, Day Five, and Day Six. He was given ten words with digraph –sh and eight words with the digraph –ch. The sounds were chosen because the student did not have a clear understanding of one of the digraphs. The words the student was given were the following words: smash, fresh, such, rich, much, rush, trash, speech, dish, which, dash, each, flush, bleach, blush, coach, wish, and fish. The student glued the words into his journal after sorting the words (see Appendix W). The student used the words in an oral

sentence after reading the words and while he was gluing them into his notebook. The examiner took notes regarding the student's responses (see Appendix X). After the student completed the word sort, he was given the iPad and asked to create words using *Spelling Magic*. He created words on the iPad in the following categories on with the application: people, animals, actions, and outdoors. The student was able to select his own categories on the iPad. While the student was working on the iPad, the examiner was taking notes on how the student created the words on the iPad to monitor growth of the student (see Appendix Y). On Day Four, the student created words in the following categories: people, animals, actions, and outdoors with consonant blends. The student was able to select the categories on the iPad. Prior to attempting the word, the student would hit the picture to hear the word, and then he would bring down the letters from moveable alphabet. When unsure of the correct letter, the student would hit the letter box in the word to hear the sound prior to bringing down the letter from the moveable alphabet. On Day Five, the student completed the word sorts and then received the iPad. Prior to receiving the iPad, the student read the words and sorted each word into the correct word sort. He used the words in a verbal sentence after reading the words. The student glued his words into his notebook after sorting the words (see Appendix Z). Notes were taken by the examiner while the student was sorting the words during the word sort activity to monitor growth of the student (see Appendix AA). After the word sort activity, the student used the iPad application. The student created words on the iPad in the following categories: animals, work, actions, and items. While the student was using the iPad, the examiner was taking notes about his participation with the iPad in the examiner's notebook (see Appendix BB). On Day Six, the student sorted the words for the third time. He glued the words in his notebook (see Appendix CC). The examiner took notes about the student's response while he completed the word sort (see Appendix DD). On

Day Six, the student created words on the iPad application, *Spelling Magic 2* which were in the categories: animals, work, items, and actions. Each of the words was at least four letters to five letters in length. After completing the word sort, the student completed three different categories on the iPad application, *Spelling Magic 2.* The student completed consonant blends with the categories of outdoors and work. He also completed words with double blends on the iPad. During Week Two, the letter hint feature, letter sound, and double letter helper were turned on. The letter hint feature allowed the student to hit the letter box and hear the sound that went into the word. The letter sound feature allowed the student to hit letters in the moveable alphabet and hear the sounds that a particular letter made. The double letter feature automatically would fill in the second consonant if it were the same as the previous letter. The examiner took notes regarding the student's activity on the iPad to monitor growth of the student (see Appendix EE).

During Week Three of the intervention, the student used /sh/ and /th/ digraph words with his word sorts. The student was missing one of the digraphs, which was present on the pre-assessment. Week Three consisted of Day Seven, Day Eight, and Day Nine. The student was given the following words to sort during Week Three: ship, thick, this, than, shack, shall, shell, shed, then, that, thin, and them. On Day Seven, the student sorted the words and used the words in an oral sentence. He glued the words into his notebook after sorting (see Appendix FF). The examiner noted his responses (see Appendix GG). After he completed the word sorts, on Day Seven, the student completed three categories, work, action, and home. When completing the iPad *Spelling Magic* 2 activity, the student was able to pick the categories on the application, which allowed the student to have control of the activity and his own learning. Notes were taken by the examiner while the student completed the iPad portion of the intervention (see Appendix HH). On Day Eight, the student completed the word sort for the second time. He was used the

words in a sentence and sorted the words. After sorting the words, the student glued them into his notebook (see Appendix II). The examiner took notes while the student was completing the word sort (see Appendix JJ). On Day Eight, the student created words in three categories: people, animals, and triple blends. Notes were taken while the student was completing the iPad activities by the examiner (see Appendix KK). On Day Nine, the student read the words, sorted the words, and used the words in a sentence. After sorting the words, the student glued them into his notebook (see Appendix LL). While the student was completing the word sort activity, the examiner was taking notes based on the word sort activity to monitor the student's growth (see Appendix MM). After the word sort activity on Day Nine, the student completed four categories: double blends, animals, triple blends, and items. Notes were taken by the examiner based on the student's responses on the iPad (see Appendix NN). Prior to the student receiving the iPad, application features were turned off since the student showed growth with the application. By turning off some features, the student was required to show more of his knowledge and skills. This was not a part of the original design; however, the researcher felt the need to adjust based on the student's performance. These changes will be discussed more in Chapter Four.

Throughout the fourth week of the intervention, which consisted of Day Ten, Day Eleven, and Day Twelve, the student received vowel-consonant-vowel words using a-e words and vowel, vowel words using ai- words. Based on the *Words Their Way* spelling inventory pre-assessment, the student was not able to spell ai- words correctly. The student had five a-e words, and he had seven ai- words. The words the student was given on the word sort activity during Week Four were the following: wade, brain, paint, mail, tail, blame, shake, male, trade, wait, chain, and said. While reading each word during day ten, the student divided the words into

parts and sounded out each syllable. After the student read the words with the researcher, he defined the word or used the word in a sentence. When the student completed sorting the words, he glued them into his notebook (see Appendix OO). Notes were taken by the examiner while the student was completing word sorts (see Appendix PP). When the word sort was completed, the student used the iPad. On Day Ten, the student created words on the iPad using *Spelling Magic 2* under the categories: animals, triple blends, and items. During Day Ten, the letter hint feature and letter sound were turned on; however, the double letter helper was turned off. Notes were taken while the student used the iPad by the examiner to monitor the growth of the student (see Appendix QQ). On Day Eleven, the student read the words, sorted the words, used the words in a sentence, and glued the words into his notebook (see Appendix RR). Notes were taken by the examiner while the student completed the word sort activity (see Appendix SS). On Day Eleven, the student created words in the following categories on the iPad: outside, home, people, triple blend, and double blends. The student was allowed to select the categories on the iPad within the spelling application, *Spelling Magic 2*. Notes were taken by the examiner while the student was using the iPad (see Appendix TT). On Day Twelve, the student completed the word sort. The student read and used the words in a sentence, sorted the words, and glued the words in his notebook (see Appendix UU). The examiner took notes regarding the student's response with the word sorts (see Appendix VV). Then he created words on the iPad in the categories of animals, people, triple blends, and work. The examiner took notes regarding the amount of time the student took to complete the word sort activity using the remaining time for the iPad activity (see Appendix WW).

Week Five consisted of Day Thirteen, Day Fourteen, and Day Fifteen. The student worked on vowel, consonant, vowel words using o-e words along with vowel, vowel words

using oa- words. The student was assigned five words with oa- words and six o-e words. The words the student was assigned during Week Five were the following: phone, road, tone, move, rope, float, oak, loan, roast, toad, dome, and owe. During Week Five, the letter hint feature, letter sound, and double letter helper were turned off on the iPad application. On day thirteen, the student read the words and used the words in an oral sentence. Then he sorted the words and glued them into his notebook (see Appendix XX). The examiner took notes regarding the student's response with the word sorts (see Appendix YY). On Day Thirteen, the student created words on the iPad in the categories animals, double blends, and people. Notes were taken by the examiner regarding the student's responses on the iPad application (see Appendix ZZ). The student read the words and used the words orally in a sentence on Day Fourteen. He sorted the words and glued them into his notebook (see Appendix AAA). Notes were taken while the student was completed word sort activity by the examiner (see Appendix BBB). On Day Fourteen, the student created words on the iPad in the categories of animals, items, triple blend, and home. While the student used the iPad, the examiner took notes regarding his participation creating words (see Appendix CCC). On Day Fifteen, the student read the words, used the words in a sentence, and sorted the words. After the sorting the words, the student glued them into his notebook (see Appendix DDD). Notes were taken by the examiner, while the student participated in the word sort activity (see Appendix EEE). During Day Fifteen, the student created words in the categories of items, double blends, people, outside, and home. Notes were taken by the examiner while the student completed the iPad application (see Appendix FFF).

Week Six consisted of day Sixteen, Day Seventeen, and Day Eighteen. The student worked on the vowel, consonant, vowel words using i-e words and vowel, consonant, consonant words using the letters –igh words. The student missed the i-e and –igh words on the pre-

assesssment. He was assigned seven i-e words and seven –igh words. During the sixth week of the intervention, the student was assigned the following words for the word sort activity: tide, file, bright, sigh, high, might, light, wipe, prize, rice, glide, white, right, and slight. During Week Six, the letter hint feature, letter sound, and double letter helper were turned off. On Day Sixteen, the student read the words, used the words in a sentence, and sorted the words. After sorting the words, he glued them into his notebook (see Appendix GGG). Notes were taken by the examiner as the student sorted and read the words (see Appendix HHH). After the word sort on Day Sixteen, the student chose the categories triple blend items and double blend words. A few examples of triple blend words are scrub, sprint, and sculpt. Notes were taken by the examiner regarding the participation of the student on the iPad to monitor the student's growth on the iPad application (see Appendix III). On Day Seventeen, the student read the words for the second time this week. He used the words in a sentence, sorted the words, and glued the words into his notebook (see Appendix JJJ). While the student completed the word sort activity, the examiner took notes (see Appendix KKK). After the word sort activity, the student created words in categories items, people, work, animals, and triple blends. Notes were taken by the examiner regarding the student's participation on the iPad (see Appendix LLL). On Day Eighteen, the participant read the word sort words, used the words in a sentence and sorted the words. After sorting the words, the student glued them into his notebook (see Appendix MMM). The examiner took notes regarding the student's response with the word sort activity (see Appendix NNN). Notes were taken regarding the student's participation on the iPad application by the examiner (see Appendix OOO).

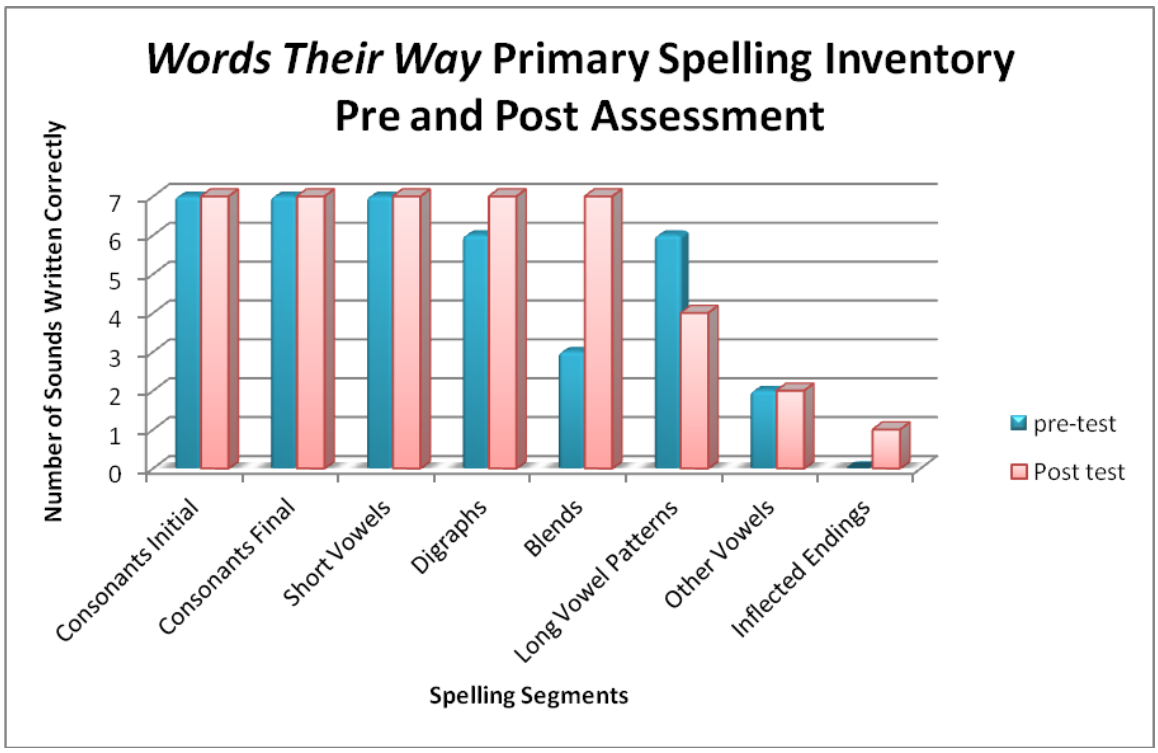
Summary

The review of research conducted prior to this study by McClanaham, Williams, Kennedy, and Tate (2012) studied the effectiveness of iPads with a student with ADHD on reading. Additionally, Narkon, Wells, and Segal (2011) examined the use of interactive word walls with students with special needs. Research conducted by McClanaham, Williams, Kennedy, and Tate (2012) conducted a study with a child with special needs to acquire spelling along with technology. Based on the recent research in spelling using word sorts and technology, the study was designed to foster learning for a child that has difficulties learning how to follow the spelling patterns in the English language. One participant was used in this research study. His growth was measured with short assessments, such as a *Nonsense Word* assessment, *Words Their Way* spelling inventory, and a questionnaire designed by the researcher about how the student felt toward spelling. The results of the procedures described above and the data collected were discussed in the next chapter.

CHAPTER FOUR: Results

This study examined the effects of spelling acquisition while using word sorts and iPad applications with a student who had a specific learning disability. The researcher developed word sorts based on the pre-assessment of *Words Their Way* spelling assessment (Bear, Invernizzi, Templeton, Johnston, 2008), *Nonsense Word* assessment (Blevins 2001), and a researcher-created spelling survey questionnaire asking how the child felt towards spelling. After the pre-assessment and the six-week intervention were completed, the student participated in the post-assessments. The post-assessments consisted of the *Words Their Way Spelling* assessment, the *Nonsense Word* assessment, and the student questionnaire on spelling. While the intervention was conducted, the researcher noted the length of time it took the student to complete the word sorts and the length of time he was able to work on the iPad application *Spelling Magic* 2. She also noted the time taken by the student for each individual item. The examiner took notes regarding the amount of time the student took to complete the word sort activity and the time for the iPad activity. The researcher also took notes regarding the student's ability to read and sort the words correctly or if the student needed assistance. Including the word sort activity, the examiner also took notes on the student's ability to perform on the iPad, such as his ability to create words, if he made errors or self-corrected when creating words on the iPad, and if he had any comments while completing the study. The researcher selected the questions for the spelling survey. Each of the questions were selected to gauge the student's knowledge of spelling and his feelings towards spelling.

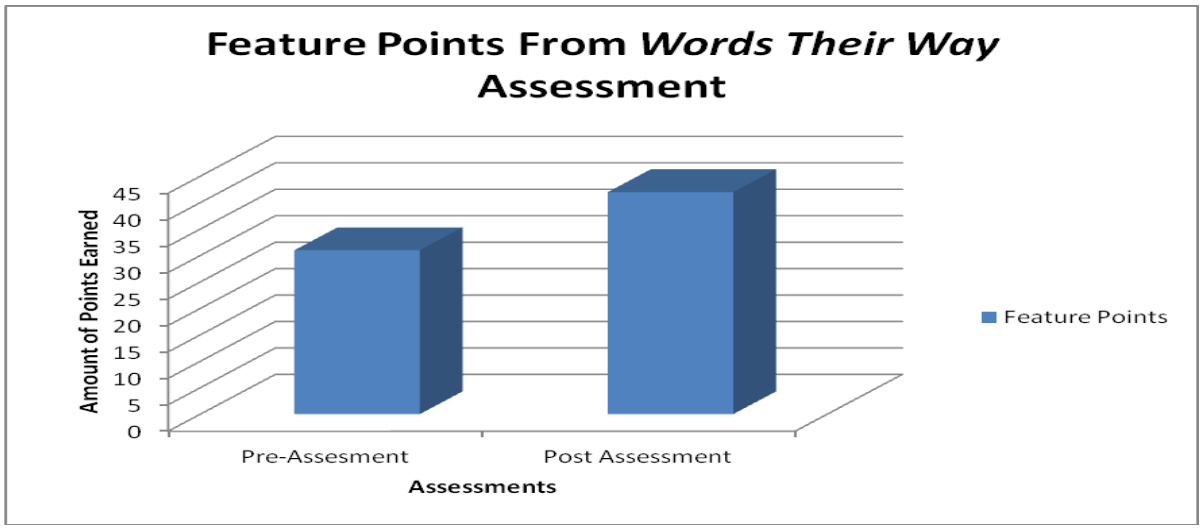
Figure 4.1: *Words Their Way Primary Spelling Inventory*: Pre- and Post- Assessment



The first assessment was the *Words Their Way Primary Spelling Inventory*. In comparing the result from the pre and post *Words Their Way Primary Spelling Inventory* pre- and post-assessments, as illustrated in Figure 4.1, the participant demonstrated growth in all areas or had consistent results where he was not able to earn more points (see Appendix D and F). The student earned seven out of seven points on the consonant initial, consonant final, and short vowels portions of the test on the pre-and post assessment. The student was able to earn six points out of seven on the digraphs on the pre-assessment, and he increased his score to seven out of seven on the post-assessment. The student gained three out of seven points on the blends on the pre-assessments, and he increased his score on the blends to seven out of seven on the post-assessment. He decreased his skills in the area of long vowel patterns. On the pre-assessment, he earned six points out of seven points, and on the post-assessment, he decreased to

four out of seven points. On the other vowel portion of the assessment, he stayed consistent, gaining two points out of seven on the pre- and post-assessment. However, on the inflected endings, the student earned one point on the post-assessment compared to not earning any points on the pre-assessment. Overall, the student increased his skills on the *Words Their Way Primary Spelling Inventory*. When the student took the pre-assessment, he earned 38 points. On the post-assessment, the student earned 42 points in all subsections.

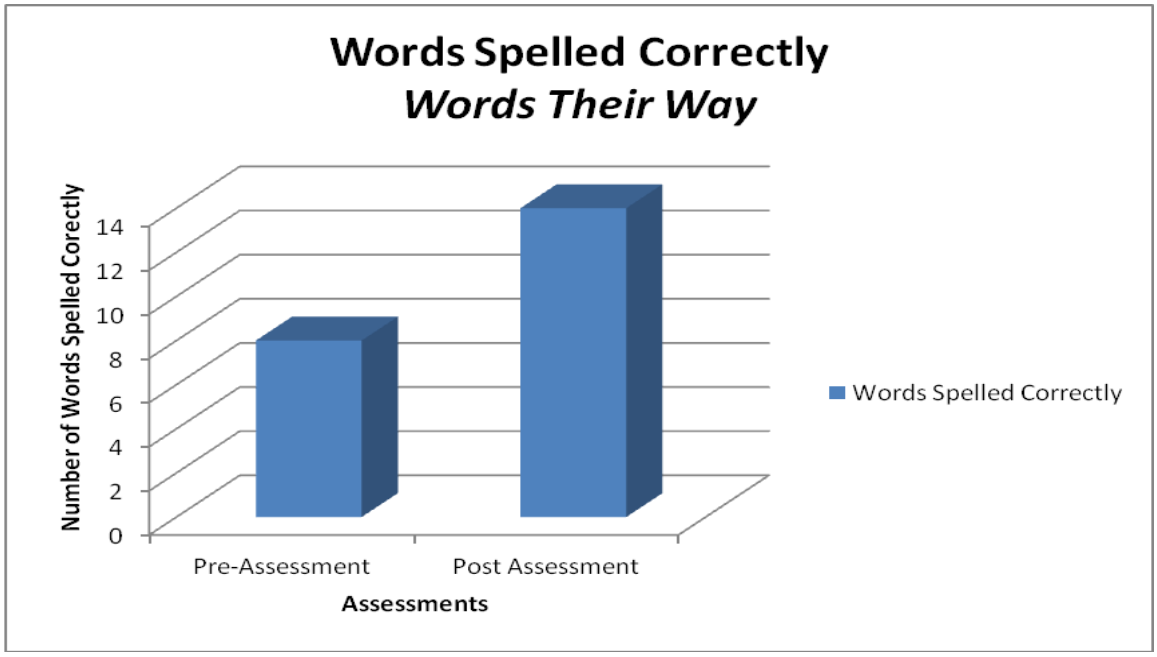
Figure 4.2: Feature Points from *Words Their Way*: Assessments



Another aspect of the *Words Their Way* assessment dissects the test in feature points. When the student completed the *Words Their Way Spelling Inventory Assessment,* the examiner was able to fill in the *Words Their Way Primary Spelling Inventory Feature Guide* for the pre-assessment (see Appendix D) and post-assessment (see Appendix F). In order to gather the feature points information, the examiner filled in a chart provided by *Words Their Way* (see Appendix D and F). In comparing the result from the pre and post *Words Their Way Spelling Inventory,* with the feature points as illustrated in Figure 4.2, the participant demonstrated growth

with words spelled correctly on the assessments. The feature points allowed the educator and/or examiner to understand which areas the individual required instruction. On the pre-assessment, the student was able to earn 31 feature points correctly (see Appendix D). He was able to earn 42 feature points correctly on the post-assessment (see Appendix F).

Figure 4.3: Words Spelled Correctly: *Words Their Way* Pre- and Post- assessments



In comparing the results from the pre and post *Words Their Way Spelling Inventory*, as illustrated in Figure 4.3, the participant demonstrated growth with words spelled correctly on the assessments. On the pre-assessment, the student was able to spell seven words correctly (see Appendix C). He was able to spell thirteen words correctly on the post-assessment (see Appendix E).

Figure 4.4: Spelling Survey Questionnaire

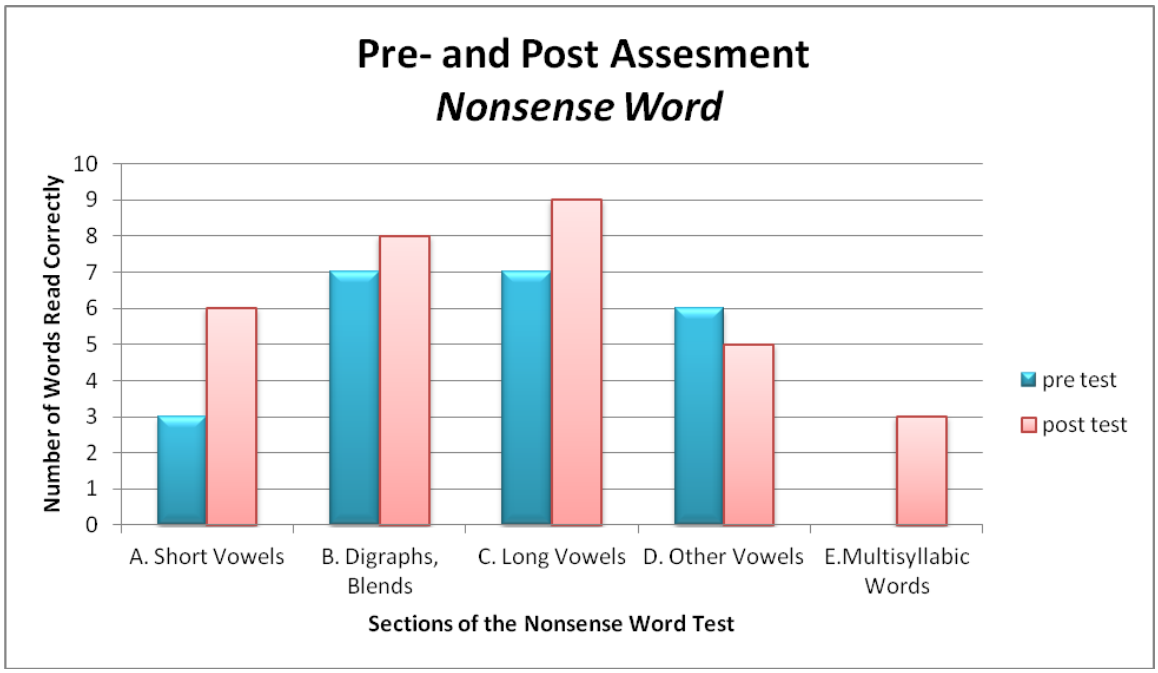
Questions	Pre-Assessments Responses	Post-Assessment Responses
Are you or are you not a good speller? Why do you think so?	*Kind of in the middle because if there is words I can't sound out or get messed up about something.*	*I am a good speller, but sometimes if it is a long word, I don't spell it completely right.*
What do you do when you don't know how to spell a word?	*Raise my hand- try to ask a teacher or sound it out*	*I sound out the letters or I try to figure out the letters, by myself and if I get it wrong it is ok.*
If someone is having trouble spelling a word, how could you help that person?	*Whisper to them how to spell it or help them sound it out.*	*Help them sound the word or tell them the letters*
What three things help you learn to spell a word?	1. *My spelling journal* 2. *Someone else- my teacher- tells me to sound it out* 3. *I sound it out*	*1. Teachers- tell me words- help you find it in the dictionary.* *2. My mom and dad- tell me new words/ how to spell it* *3. Myself- sounding out the words.*
What things have you tried that do not help your spelling?	*Getting Distracted- like paying attention to others.* *Writing the word over and over again.*	*I don't know what doesn't help me.*
Tell me any other comments you feel about spelling or writing?	*I love to write because it makes me actually do something.*	*Really great- I'm spelling new words and writing. I might see my spelling words in a book. When I do see my words I can sound out the words.*

After the *Words Their Way* assessment, the student participated in the spelling survey. In order to compare the student's perception of his spelling skills from the pre-assessment (see Appendix K) and the post-assessment (see Appendix L), the student was asked a series of questions about what he felt about spelling using a survey created by the examiner. The student responded to the questions verbally, and the examiner wrote down his responses. The student responses to this spelling questionnaire are illustrated in Figure 4.4. The first question asked of the student was if he felt that he was a good speller or not and requested him to explain his

answer. During the pre-assessment, the student thought he was, "in the middle" because he can spell some words; however, it is difficult to sound out words. After the intervention and on the post-assessment, the student stated that he was "a good speller, but it can be difficult to write long words correctly." He stated, "If it is a long word I don't spell it completely right." The second question posed to the student on the pre- and post-assessment as follows; "What do you do when you don't know how to spell a word?" The student's response during the pre- and post-assessments was that he should "sound it out;" however, on the pre-assessments he thought he could ask a teacher as well. On the post-assessment, the student believed it was all right to make a mistake while spelling. Thirdly, the student was asked the following questions on the pre- and post- assessments: "If someone is having trouble spelling a word, how could you help that person?" His answers for both of the assessments were similar; on the pre-assessment survey, the student stated, "Whisper to them how to spell it or help them sound it out." During the post-assessment survey, the student stated, "Help them sound out the word or tell them the letters." Then the student was asked the question: "What three things help you learn to spell a word?" The student responded similarly on the pre- and post-assessments with one response that he was able to sound out the words. In addition, on the pre-assessment, the student stated his "spelling journal" assisted him in spelling. Another strategy the student stated that a "person, like a teacher," could tell him to sound out the words; however, on the post assessment, a "teacher" could help him use a dictionary to find the correct spelling. On the post-assessment, the student also stated he learned how to spell from his parents. When asked the fifth question, "What things have you tried that do not help your spelling?" during the pre-assessment, the student stated that he liked to pay attention to other students and that writing the words consistently over and over again has not worked for him. On the post-assessment, the student stated he does not

know what has worked for him. The last question the student was able to state any addition thoughts about spelling and writing that he was not able to address in the other questions. The question the student was asked was as follows: "Tell me any other comments you feel about spelling or writing." On the pre-assessment, the student stated that he loved to write because it makes him actually do something. However, during the post-assessment survey, the student stated that he felt really great about spelling and writing. He stated, "I'm spelling new words and writing. I might see my spelling words in a book. When I do see my words, I can sound out the words."

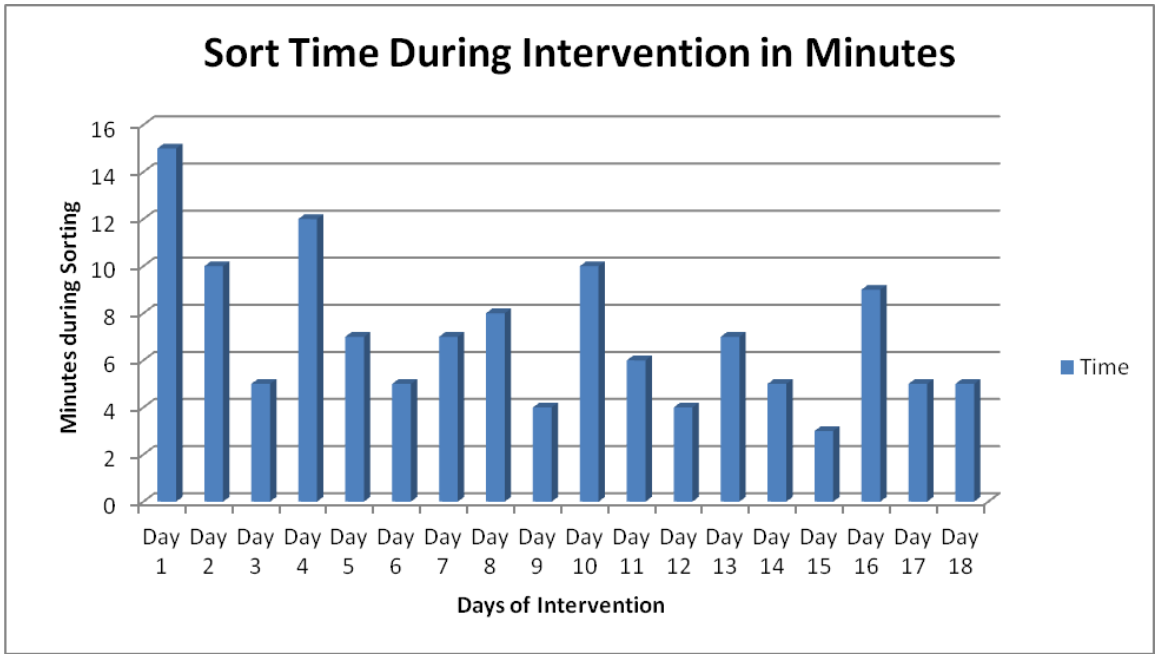
Figure 4.5: Pre- and Post-Assessments of *Nonsense Words*



After the spelling assessment and spelling survey, the student participated in a nonsense word assessment. The student orally read the *Nonsense Word List* (see Appendix H) from the *Nonsense* pre-assessment, and the responses were recorded (see Appendix I). The examiner also

recorded the responses of the student for the post-assessment (see Appendix J). In comparing the results from the pre and post *Nonsense Word* assessment, as illustrated in Figure 4.5, the participant demonstrated a growth in five out of six areas. The student was asked to read ten words from five different subtest of the assessment. The student showed an increased skill in short vowel words by three words; he was able to read three fake words, and he increased to being able to read six nonsense words correctly. When asked to read the digraph/blend fake words, the student was able to read seven words correctly during the pre-assessment, and he was able to read eight nonsense words correctly when assessed with the post-assessment. The student was asked to read long vowel nonsense words during the pre-assessments, and he was able to read seven correctly. During the post-assessment, the student was able to read nine correctly. While reading the nonsense words in the category other vowels, he showed a decrease in ability. When the student read the other vowel section of the pre-assessment fake words, he was able to read six words correctly while he was only able to read five nonsense words correctly. The student showed growth while reading multisyllabic words. He was not able to read words correctly with the nonsense multisyllabic words during the pre-assessment; however, he was able to read three words correctly during the post assessment. Overall, during the pre-assessment, the student was able to read 23 nonsense words out of 50 correctly, which was 46% words read correctly. When the student read the post-assessment nonsense words, he was able to read 31 nonsense words out of 50 correctly, which resulted in 62% of the words read correctly. He increased his ability to read nonsense words by 16% during the six-week intervention using the *Nonsense Word* Assessment (Blevin, 2001).

Figure 4.6: Sort Time During Intervention



Along with comparing the minutes on the iPad activity, a comparison of the time involving the word sort activity was necessary. A comparison of the result with the amount of time the student required to complete the word sorts is illustrated in Figure 4.6. Each week the student participated in the intervention for three days. Week one consisted of Day One through Day Three. On Day One, the student was able to complete the word sort in fifteen minutes, and he was able to decrease the time spent on the word sort each day of Week One. On Day Two, the student took ten minutes to complete the word sort, and he required five minutes on Day Three. Week Two consisted of Day Four through Day Six. On Day Four, he took twelve minutes to complete the word sort and decreased his time over the week. On Day Five, he took seven minutes on the word sort task, and on Day Six he took five minutes. Week Three consisted of Day Seven through Day Nine. During this week, the student took seven minutes to complete the word sort, and on Day Eight, he took Eight minutes. There was an increase in time

that it took him to complete the iPad tasks during Week Three. On Day Nine, the student took four minutes during the word sort.

Week Four consisted of Day Ten through Day Twelve. On Day Ten, the student took ten minutes to complete the word sort. He decreased his time during the Fourth Week. He decreased his word sort time from ten minutes on Day Ten to six minutes on Day Eleven and four minutes on Day Twelve.

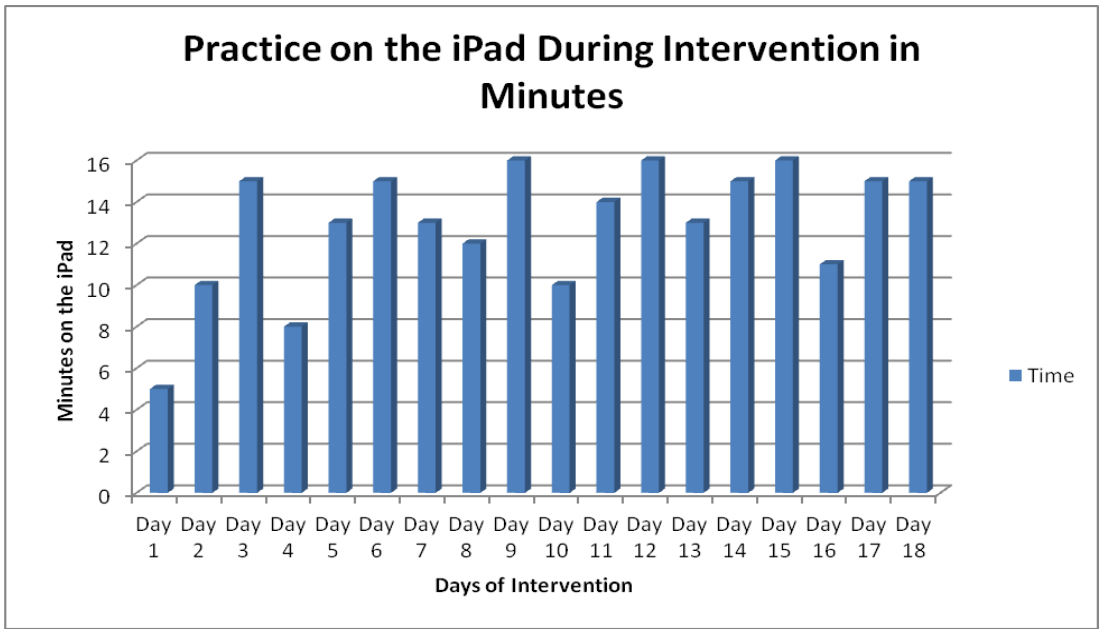
Week five consisted of Day Thirteen through Day Fifteen. On Day Thirteen, he took seven minutes to complete the word sort activity. He decreased his time to five minutes on Day Fourteen and decreased to three minutes on Day Fifteen.

Week Six consisted of Day Sixteen through Day Eighteen. On Day Sixteen, the student required nine minutes to complete the word sort. He decreased his time on the word sort activity to five minutes on Day Seventeen and on Day Eighteen. As each week progressed, the student was able to increase his amount of time spent on the iPad and decreased the time to complete the word sort activities. The student used a total of 128 minutes to complete the word sort activities during the intervention, which was 36% of the total intervention time allotted.

Additionally, the examiner documented the time it took the student to sort the words. The student would read the words, use the words in a sentence, and sort the words. When he had completed the sorting of the words, he glued his words in notebook. He glued all of his word sort words in his notebook (see Appendix N). The researcher also recorded how the student responded to the activities (see Appendix M). The notes taken during the intervention were converted to be readable by outsiders (see Appendix O). The notes documented the student's ability to read the words in the word sorts, which was another documentation of the student's skills beyond his notebook. As the student read the words, the examiner made a daily notes if he

used the word in the sentence correctly or if used the incorrectly. The examiner wrote the word down and the student's response and placing a check mark by the word when he was correct placing a check next to the word or by writing down his response when incorrect. After reading the word, the student would use the word in a sentence, to demonstrate understanding of the word. Also, noted by the examiner was the amount of time it took the student to complete the word sort activity. After the student had completed the word sort activity, the student was able to access the application on the iPad, *Spelling Magic 2* for the remaining time during the intervention. An example of the notes can be seen on Appendix JJ. When the student had a comment about the word sort activity or the iPad application, the examiner detailed his words or topic of his thought (see Appendix M).

Firgure 4.7: Practice on the iPad During Intervention

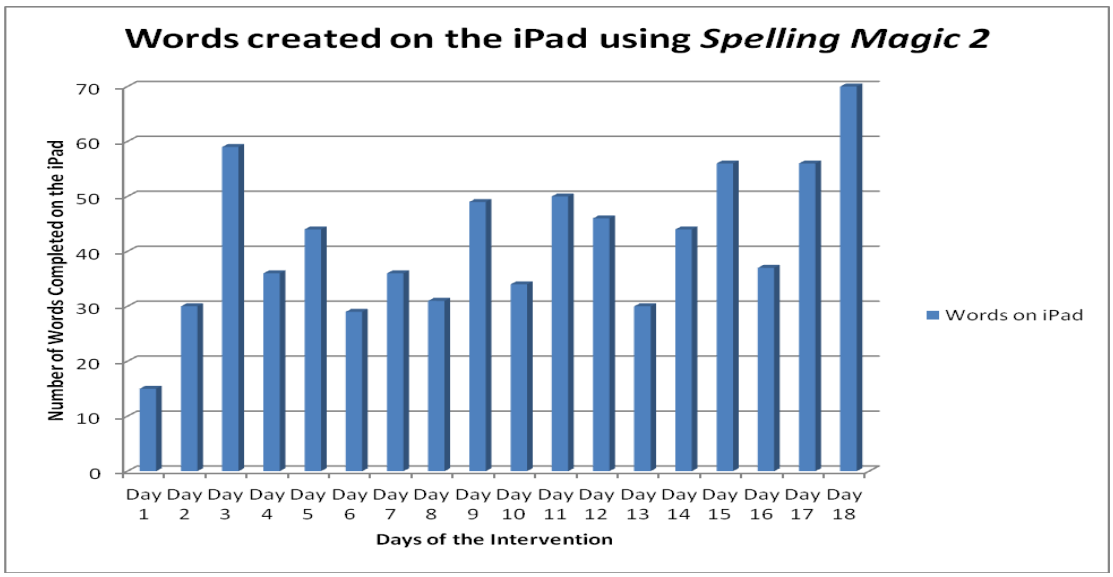


After the pre-assessments, while the student participated in intervention, the examiner took notes when he was using the iPad application (see Appendix M and O). Comparing the

results with the amount of time the student was able to use the iPad is illustrated in Figure 4.7. Each week the student participated in the intervention for three days. Week One consisted of Day One through Day Three. On Day One, the student was able to have the iPad for five minutes, and by the Third Day, he was able to use the iPad for fifteen minutes. Week Two consisted of Day Four through Day Six. On the first day of this week, the student was able to use the iPad for eight minutes and increased his time on the iPad to fifteen minutes. Week Three consisted of Day Seven through Day Nine. During this week, the student began having the iPad on the Day Seven with thirteen minutes and decreased the iPad time to twelve minutes on Day Eight; however, he increased to sixteen minutes on Day Nine. Week Four consisted of Day Ten through DayTtwelve. On Day Ten, he used the iPad for ten minutes and increased his time on the iPad to sixteen minutes by Day Twelve. Week Five consisted of Day Thirteen through Day Fifteen. On Day Thirteen, the student used the iPad for thirteen minutes, and by Day Fifteen he increased his time to sixteen minutes. Week Six consisted of Day Sixteen through Day Eighteen. On Day Sixteen, the student used the iPad for a total of eleven minutes and on Day Seventeen and Eighteen, the participant used the iPad for fifteen mintues, which is an increase by four minutes.

The six-week intervention consisted of six hours or 360 minutes. The student was able to use the iPad for a total of 232 minutes. He used the iPad 64% of the intervention. Over the course of the weeks, student completed the intervention word sorts with less time and had more time on the iPad applications.

Figure 4.8: Words on iPad



While the student was using the iPad, the examiner took notes regarding the words he created on the iPad application (for an example of iPad notes see Appendix R). In comparing the number of words created on the iPad, the student's results are illustrated in Figure 4.8. Each week the student participated in the intervention for three days. Week One consists of Day One through Day Three. The student completed fifteen words on the iPad on Day One, created 30 words on the iPad on Day Two, and created 59 words on Day Three. Week Two consisted of Day Four through Day Six. On Day Four, the student created 36 words and increased the words made on the iPad to 44 on Day Five. He decreased his word score to 29 during Day Six. Week Three consisted of Day Seven through Day Nine. During the Third Week, his number of words created on the iPad application, *Spelling Magic* 2 decreased from Day Seven with 36 words corrected to 31 words on Day Eight. However, he increased the words he created on Day Nine to 49 words. Week Four consisted of Day Ten through Day Twelve. On Day Ten, the student created 34 words on the iPad. Then he increased the number to 50 words on Day Eleven; however, he decreased the number to 46 words on Day Twelve. Week Five consisted of Day

Thirteen through Day Fifteen. On Day Thirteen, the student was able to create 30 words on the iPad. He increased the words created on the iPad on Day Fourteen to 44 words and again increased the number on Day Fifteen to 56 words. Week Six consisted of Day Sixteen through Day Eighteen. On Day Sixteen, the student created 37 words. Then he increased the number of words created on the iPad on Day Seventeen to 56 words and increased again on Day Eighteen to 70 words. Over the course of the intervention, the student was able to create more words on the iPad using *Spelling Magic 2*.

Over the course of the intervention, the student increased his ability to create words on the iPad using *Spelling Magic 2*. Compared to the first day on the iPad when the student created fifteen words, he was able to create 70 words by the last day of the intervention. Over the course of each week, the student created more words on the iPad. Overall, the student was able to increase his spelling skills and ability to increase words on the iPad. The student was able to spell more words correctly on the *Words Their Way* spelling assessment. He was able to increase his ability to read nonsense words on the Nonsense Word assessment overall. The student was able to increase his time throughout the week on the iPad activity and decrease his time sorting words each week.

CHAPTER FIVE: Conclusion

Over the course of the study, the researcher kept going back to the primary research question: What are the effects of using word sorts in combination with an iPad spelling application on spelling acquisition of a student with a Specific Learning Disability? Data was collected through the use of word sorts and an iPad application, *Spelling Magic 2*, to build and increase spelling skills for a third grade student diagnosed with specific learning disability. By using the iPad and word sorts, the student's spelling skills and his perception of his spelling abilities were positively enhanced. He reported improvement in his spelling ability; however, the student was not able to express the skill in the area of spelling that had impacted his spelling proficiency. The third grade participant made gains in his acquisition of spelling skills using word sorts and an iPad application, *Spelling Magic 2*, thus increasing his ability to strengthen phonics skills.

Connections to State Standards

In designing this study, the Common Core State Standards (CCSS) were considered due to the district requirement to apply the CCSS by the end of the school year. The Common Core State Standards for English and Language Arts (National Governors Association Center for Best Practices & Council of Chief State School Officers 2010) replaced the Wisconsin Model Academic Standards for English (Wisconsin Department of Public Instruction 2013) in 2013. One targeted standard for this research was the use of the Reading Anchor Standard: ELA Literacy: RF. 3.3 in the CCSS "Phonics and Word Recognition," which requires third graders to identify and apply phonics and word study skills through decoding words. This study incorporated the phonics skills that influenced the student's spelling skills to enhance the student's learning in reading and writing. Another essential component of the study was the

researcher's method of guiding the student during the intervention to use word sorts and to find patterns in spelling and writing. In this study the researcher facilitated the student's use of the application, *Spelling Magic 2,* on the iPad to create words.

Connections to Existing Research

Prior to the study's design and implementation, in addition to the Common Core State Standards, recent research in the area of spelling instruction and literacy skills was examined. Wiseman (1980) noted there is a link between reading, written language, and spelling; however, more recently Werfel and Schuele (2012) researched kindergartners' ability to segment and represent consonant blends. These researchers explored how segmenting and representing consonant blends affected kindergartners' use of beginning and final blends. Another set of researchers, Santoro, Coyne, and Simmons (2006) examined spelling interventions for kindergarten students who were at risk for a reading disability. The students in Santoro, Coyne, and Simmons's research showed more growth if the students participated in the spelling intervention by addressing word attack skills and nonsense word measures. Researchers such as Santoro, Coyne, and Simmons (2012) and Werfel and Schuele (2012) demonstrated students need to understand the syntax of English and oral development of the English language prior to understanding written language.

Many researchers have examined spelling interventions. Researchers Viel-Ruman, Houchins, and Fredrick (2007) learned that students with disabilities, such as learning disabilities, required more exposure with practice in spelling skills to progress in spelling and literacy. Viel-Ruma, Houchins, and Fredrick (2007) explored spelling performance with students with disabilities in high school using the error of self-correction compared to the traditional method of spelling. These researchers found the error of self-correction produced

better results for these students as compared to the traditional spelling instructional method. Nies and Belfiore (2006) conducted a study with students with special needs. These researchers compared the cover, copy, compare method versus the copy only method. The cover, copy, compare method was more effective for the students noted in Nies and Belfiore's research. Students with specific learning disabilities required a more concrete, repetitive method to develop literacy and spelling skills.

In another study, Narkon, Wells, and Segal (2011), assisted students with special needs in learning how to use words effectively with an alternative tool. The researchers examined how word walls could be used on a computer with special needs students as compared to using paper and pencil tasks or traditional word walls. Technology provided a more engaging environment for students through providing repetition of spelling skills. The data in the study showed the students were willing to attempt activities that were more challenging for them to learn. An additional set of researchers who examined technology interventions with students with special needs was Evmenova, Graff, Jerome, and Behrmann (2010). These researchers worked with students who had difficulties with writing skills and compared writing programs with desktop computers. The writing programs with computer software assisted students in writing more efficiently and effectively. McClanahan, Williams, Kennedy, and Tate (2012) examined how an iPad application could be effectively used with a child with ADHD. During instruction, the participant was able to increase his reading skills and show added engagement with the software and computer enhancement.

While the researchers Williams, Kennedy, and Tate examined the use of technology in education, researchers Wu and Zhang (2010) studied whether handheld technology would increase students' achievement in the area of spelling and test aptitude in mathematics. Wu and

Zhang (2010) found that students were more successful in spelling with the use of handheld technology devices with regular education students. Another study conducted by Wood, Jackson, Hart, Plester, and Wilde (2011) examined how text messaging influenced 9- to 10- year old children and their literacy skills. The research results showed there was no hindrance to the children's literacy skills by using text messaging. The improvement of learning through technology on a daily basis during academics influenced this study. Allowing students to have more exposure to concepts enhanced students' skills in literacy strategies. An additional group of researchers, Powell and Dixon (2011), examined text messaging with a group of adults resulting in positive effects on academics and spelling skills. Their study affected this research by showing how spelling impacted one's ability to communicate using written language. Crichton, Pegler, and White (2012) researched how personal electronic devices, such as iPods and iPads work in the school setting and how learning derived and enhanced education for students through the use of electronic devices. Crichton, Pegler, and White (2012) researched the significance of an iPad for a student with a specific learning disability. An additional set of researchers who examined the effects of iPads was Rossing, Miller, Cecil, and Stamper (2012). They researched students' awareness of learning with iPads. Many of the students enjoyed using iPads, finding them effective learning tools. The students in the study were exposed to a variety of academic skills with numerous technology tasks in writing. The study completed by Rossing, Miller, Cecil, and Stamper (2012) influenced this study by demonstrating how technology could be used as an instructional tool for many individuals.

Explanation of Results

In the area of spelling acquisition, the participant in this research study made positive gains. The pre- and post-assessment, *Words Their Way* (see Appendixes C, D, E, and F),

Nonsense Word List (see Appendices I and J), and spelling questionnaire survey (see Appendices K and L) demonstrated that the student's spelling skills showed growth. According to the *Words Their Way* assessment, the student was able to write eight words correctly on the pre-assessment (see Appendix C) and on the post-assessment he was able to write 14 words correctly (see Appendix E). The student increased his spelling ability by writing six additional words correctly. In addition, the student's pre- and post-assessment was divided into feature points. On the pre-assessment, the student in this research study was able to earn 31 feature points (see Appendix D). On the post-assessment, the student in this research study was able to earn 42 feature points on the *Words Their Way* spelling test (see Appendix F). He raised his feature points by 11 points over six weeks. According to the pre- and post- *Nonsense Word* assessment, the student made growth in this study. The student increased his ability to correctly read nonsense words by thirteen percent, moving from reading 23 to 31 words. The research showed the student was able to apply the phonic skills he learned during the intervention to the spelling assessment, resulting in the ability to spell additional words correctly. The student was able to apply phonics skills and letter patterns in his writing despite his inability to spell the entire word correctly. The research suggested the student gained the skills required to move to the next level, a beginning third grade placement, in the spelling curriculum. By the student participating in this intervention, the student gained more knowledge in how to use spelling skills to benefit him in reading and writing.

The objective pre- and post-assessment indicated that the student made gains toward spelling acquisition and literacy skills. The student was able to correctly create more words throughout the six-week intervention. He also demonstrated his spelling growth by spelling six more words correctly on the *Words Their Way* post-assessment (see Appendix E), when

compared to the *Words Their Way* pre-assessment, spelling seven words correctly (see Appendix C). He was able to correctly spell nearly double the words on the *Words Their Way* post-assessment. The student also showed gains on the points earned on the post assessment, *Words Their Way.*

In addition to the *Words Their Way* assessments, the student participated in the *Nonsense Word* list assessment. The student decreased in the 'Other Vowels' subsection of the assessment on the *Nonsense Word* list. When asked to read the subtest 'Other Vowels' on the *Nonsense* Word post-assessment as seen on Appendix J, the student did not orally read the last word correctly, compared to the pre-assessment *Nonsense Word* list seen in Appendix I. The student demonstrated growth on the *Nonsense Word* assessment in the subtests: Short Vowel, Diagraphs/Blends, Long Vowels, and Multisyllabic. These subtest words were linked to the Common Core State Standard: CCSS ELA-Literacy: RF.3.3 required of third graders to be able to demonstrate at the end of their grade. One of the Reading Anchor Standards in the Common Core State Standards (CCSS) is "Phonics and Word Recognition," which requires third grade students to identify, apply phonics, word study skills, and in decoding words. The data from the spelling assessment indicated the student was able to apply the phonics skills to spelling words correctly. The student was placed at the second grade level in spelling, having holes within Letter Name-Alphabetic and Within Word Pattern. After the intervention the student had a proficient understanding of Letter Name-Alphabetic and Within Word Pattern moving to the beginning of third grade placement in spelling.

In addition to the *Words Their Way* and *Nonsense Word* assessments, the student participated in a spelling questionnaire which demonstrated the student's perception of his spelling skills at the end of the study. His ability to describe strategies that were effective or

ineffective was challenging for the student at the beginning of the study. Upon reflection, the researcher realized that greater instructional attention regarding the type of skills used with the iPad application should have been given to the student during the interventions. The researcher also could have shown the student how to use the iPad prior to the intervention. The student viewed his skills as being a better speller when asked the questions, "Are you or are you not a good speller? Why do you think so?" The student's response for the pre-assessment (see Appendix K) was, "Kind of in the middle because if there is a word I can't sound out or get messed up about something," suggesting the student believes he is not a good speller. The post-assessment of the spelling survey as seen on Appendix L stated, "I am a good speller but sometimes if it is a long word I don't spell it completely right." The quotes suggest to this researcher that the student had become more confident in his spelling skills and had increased his willingness to try words that were more challenging. As the intervention continued, the examiner watched the student attempt to use more difficult words in his daily writing. The examiner also noticed that the student used words in his daily reading which he saw in the daily word sorts. The observed behaviors suggested the student's willingness to use more complex words and word patterns in this daily writing.

The *Words Their Way* spelling assessment and *Nonsense Word* list demostrated additional growth in spelling knowledge as compared to the spelling survey questionnaire. The student was able to communicate new or added knowledge of spelling on the post-survey questionnaire compared to the pre- survey questionnaire. The student was able to state three different methods that helped him spell words correctly. More importantly, the student was more comfortable with his spelling acquisition skills. During the pre-assessment, the student believed he was "kind of in the middle of being a good speller and not so good speller." When the post-

assessment data was collected, the student felt he was a good speller, based on his response from the spelling survey. At the beginning of the intervention, the student believed if he did not know how to spell a word he would ask a teacher how to spell the word. The student could be observed asking a teacher before trying to spell a word himself during the intervention. When an individual attempts to spell words on their own it demonstrates their understanding of phonics and spelling skills. The student continued to believe it was acceptable to assist others when he was unsure how to spell a word after the intervention. Asking for assistance to spell a word correctly is acceptable; however, asking for assistance consistently and not attempting to spell demonstrates to this examiner that the student did not have the skills to spell words. A highly important item the student learned through the intervention was to recognize and apply words he was learning to spell in his daily reading and writing. The student was connecting the word sort and iPad application activities to his daily work.

Over the course of the six-week intervention, the student developed the ability to read and sort words, increasing his time on the iPad during the word sort portion of the intervention. While accuracy of spelling skills was a critical indicator of the success of the intervention, time spent on the word sorts and on the iPad application were also key elements in the research. During the first day of the intervention, the student took 15 minutes to complete words sorts. The student took 5 minutes to complete the last word sort during the intervention. This suggested that the student improved his ability with the use of the iPad throughout the weeks of intervention with each word sort. The student took less time each time he was exposed to the word sorts which demonstrated the student was able to improve his ability to notice and understand spelling patterns within different words. Out of six different word sorts throughout the six-week intervention, the participant was able to decrease the time period completing the

word sort activity which required sorting and gluing words in his notebook. On Day One of the intervention, the student completed the first word sort in 15 minutes, and he received the iPad for five minutes. He required more instruction on how to use the device and application during the first week of intervention. Since the word sort only took five minutes on Day Eighteen, the student had the iPad to create words for a total of 15 minutes, and he did not require instruction on how to use the iPad with the *Spelling Magic 2* application. Due to the student completing the word sort activity quickly and efficiently, the student was able to have the iPad for further activities beyond the word sort activity. The student's time spent on the iPad demonstrated the student was able to sort the words more efficiently throughout the week. The student was able to see the spelling patterns swifter over the course of each week with the use of the iPad, and he demonstrated growth towards spelling skills. Over the course of the intervention, the student was able to increase the number of words created on the iPad that allowed him to make increased progress in the area of spelling skills. As the student took less time to complete the word sorts, he had additional time on the iPad to create additional words and the student showed more confidence with his spelling acquisition. Based on the student decreasing his word sort time and increasing iPad application, the student was able to apply spelling skills to the tasks presented to him during the intervention.

Despite the complicated nature of analyzing and interpreting the spelling survey data gathered in this study, some conclusions can be drawn comparing the survey results on how the child felt about spelling. McClanahan, Williams, Kennedy, and Tate (2012) researched the effects of the iPad on a student's engagement related to literacy with a student with special needs. In this study, the participant's engagement in spelling was influenced by using an iPad and his confidence increased. The student asked questions to understand which letters and

sounds went together throughout the use of the iPad intervention with word sort activities. During the intervention, the student was able to connect the spelling skills learned and he also applied his knowledge of phonics to nonsense words. The findings confirmed the previous studies linking spelling with literacy growth through the use of technology.

Strengths

During reflection, the study exposed a number of strengths. First, the decision to use an application on the iPad was a strength of the intervention because it made a connection for the student with spelling skills to technology which was highly motivating for the student. The iPad application, *Spelling Magic 2,* was the method tying technology into the intervention. The student showed engagement while he was completing word sorts, as is evident in the notes taken during the intervention by the examiner. For example, the student sounded out words and asked the difference between mail and male as shown in Appendix PP; however, he especially showed engagement and willingness to participate in the intervention when the iPad was placed in front of him. These observations demonstrated to the researcher that when providing the student with materials that engage him, he is willing to attempt tasks, such as spelling skills that may be more challenging. The researcher observed the student's positive facial expressions when he was able to create words on the iPad throughout the intervention. As predicted, the iPad engaged the student in a manner similar to other technology activities addressing spelling instruction. Thus, engagement was a major strength of the study, which has influenced instruction. The researcher will continue to use technology to instruct students with tasks that are more challenging, both for the student who participated in the research and for future students. Also, the data collected through the use of the spelling survey questionnaire supported the student's perception of his spelling skills through the comments made by the student as seen in Appendix L. For example

the student believed he was, “a good speller,” after the intervention. The spelling questionnaire can be designed to address various academic questions, examining how students feel towards topics or materials. It, in turn, would give educators insights into the students they are working with on a particular task. This may also help gauge student’s metacognitive skills.

An additional strength of the study was its predictability for the student. Because the routine was consistent throughout the study, the student could predict which step would come next while going through the intervention. The researcher was consistent with the procedures throughout this study. The intervention was held three times per week in a one-to-one setting by the researcher. For a struggling reader and writer, and a student with a specific learning disability, the routine is especially helpful to develop their spelling skills and instructional methodology. By completing this research one-on-one, the student was allowed to ask questions freely about the material presented to him. In the future, the researcher recommends the strategies be conducted with the student for further growth in spelling skills and with other students with similar challenges in spelling ability.

Just as engagement and predictability were major strengths of the study, so too was the student’s ability to demonstrate his increasing spelling skills to the researcher. The student was in a comfortable setting allowing him the confidence to show his ability and strengths to the examiner. As the student became comfortable with showing his knowledge, he was also comfortable with asking questions when unaware of the next step in the intervention, as supported in the following two observations:

(1) The student was able to ask questions about a word in the word sort and

(2) He was also willing to sound out the words in the word sorts.

The student increased his willingness to work with the researcher because he was familiar with the examiner's instructional plan. The engagement and predictability had a positive impact on the student's growth in spelling skills.

Limitations

While the strengths of this study contributed to the outcomes that showed its effectiveness, there were also a number of limitations. First, the study was conducted at the start of the second semester. The student had already been working on spelling skills that did not include the iPad; however, the student practiced using words sorts once a week, where the intervention called for three times a week. The student had limited exposure to the iPad. He had not been exposed to the iPad regularly prior to the intervention; however, if the student had been exposed to the iPad on a regular basis, he may have had a better performance with the application, *Spelling Magic 2*. He had used the iPad a few times at the start of the intervention without using the application *Spelling Magic 2*. Upon deeper reflection, it appeared conducting the intervention three times a week might have been too few days. If the student was presented with the word sort and iPad application, *Spelling Magic 2*, every day he might have had more growth with spelling skills. In addition, the actual sample of one male Caucasian student with a learning disability lacked sufficient diversity to generalize the results to the larger population.

Aside from the logistical limitations, there were also a number of instructional issues that arose. For example, it became clear over the course of the study that the student might have required deeper leveled scaffolding and explicit instruction during Week 3. The student may have benefited from further modeling, sorting, and reading of the words, because the student took more time to sort the words on Day Eight when compared to Day Seven. In addition, during Week Three the words became much harder than the student had previously been exposed

to in the first two weeks of the intervention. Modeling may have given the student a concrete awareness of how to read and sort the words and spend time thinking about how to determine to sort the words. In addition to more direct instruction with word sorts, the student would have also benefited from more explanation of how to use the iPad application, *Spelling Magic 2*. The student may have increased his productivity if the researcher would have given more instruction on how to navigate the application, *Spelling Magic 2*. The individual may have shown more awareness of strategies to determine how to decide which letters to use while creating words on the application.

Recommendations for Further Research

While the results of this study featuring all of the aforementioned strengths and limitations seem encouraging, it is suggested that further examination needs to be conducted with a larger, more diverse sample which includes students with and without special needs. A larger and more diversified sample would permit the outcome of the study to be generalized to a larger population including students with and without special needs, and males and female students. This would offer increased reliability. In addition, implementing this research at various times of the school year and making comparisons between time periods would offer data that would present more accurate information about the effectiveness of the procedures used. Implementing the strategies for the duration of one semester or one year would allow for more accurate data collection.

A recommendation for this reseacher/examinier would be to continue to work with this student using words sorts and applications on the iPad. It is also recommended to use the strategies in this study with other students with and without disabilities, because there is a

demonstrated connection between the spelling skills and other academics such as reading and writing.

Along with conducting more studies with participants that are more diverse and for longer periods of time, further research might explore the effectiveness of the strategies implemented in this study using other age students and answering further questions. Would students with more or less advanced spelling skills and advanced spelling knowledge benefit more or less from the combination of these strategies? Would students without a learning disability benefit from the strategies and tools used in this research? Would students do as well with different word sorts? Would the strategies be as effective in the general education classroom or other classroom settings? Would this be effective for English Language Learners?

Further research in metacognitive processes would produce essential data. The student in this study appeared to have skewed ideas of spelling skills. If the student had been more knowledgeable of the strategies he was using during instruction, deeper questions may have been addressed research. There has been a significant amount of research completed on metacognition. This researcher would encourage further examination on the instruction between metacognition and technology usage. To what extent must students be aware of their metacognition in order to maximize their own learning? More studies need to be conducted to gain answers to these questions.

This research study also led to questions regarding the use of the *Spelling Magic 2* application on the iPad. Further research could study whether other applications on the iPad are more effective than the one used in this study. Are there certain features unique to the *Spelling Magic 2* application that facilitated learning more effectively than other spelling applications? Similarly, would the strategies used in this research have been as effective if they had been

conducted in a more traditional manner, such as pencil paper tasks? More research would need to be implemented to determine the specific aspects of *Spelling Magic 2* application that may or may not make it a more effective instructional tool than other options on the iPad.

Finally, further research needs to be conducted to determine the effectiveness of the instructional strategies in the study. The student in this study had common misconceptions of how to use the strategies while spelling and reading words. One main goal of this study was to address spelling skills in meaningful ways. The use of the iPad or handheld technology similar to the past research completed by McClanahan, Williams, Kennedy, and Tate (2012) has proven to be successful in other areas of reading and written language. Continued research would need to be conducted order to determine in what ways the structure of this study would be effective in other academic areas such as reading and written language.

Summary

Overall, the study confirmed that learning how to use word sorts and spelling applications on an iPad would develop spelling skills and be an effective method for increasing a student with specific learning disabilities' spelling skills. Further research would be needed to confirm these findings across larger populations, but results are promising to develop spelling skills using words sorts and iPad applications. The interventions were implemented both with the student's spelling acquisition and ability to apply phonics while reading nonsense words. Additionally, the study had noteworthy limitations. Spelling instruction that incorporates the aforementioned instructional strategies has the potential to guide other teachers' instruction in spelling through the effective merging of spelling, technology, and literacy strategies to improve students' knowledge of spelling and literacy skills.

Appendix A

Words Their Way Directions for Assessment

From: Words Their Way
Written by Bear, D. R., Invernizzi, M., Templeton, S. & Johnston, F. (2008)
APPENDIX A

Assessment Materials

General Directions for Administering the Inventories

Students should not study the words in advance of testing. Assure students that they will not be graded on this activity, and that they will be helping you plan for their needs. Following is a possible introduction to the assessment.

> *I am going to ask you to spell some words. Spell them the best you can. Some of the words may be easy to spell; some may be difficult. When you do not know how to spell a word, spell it the best you can.*

Ask students to number their paper (or prepare a numbered paper for kindergarten or early first grade). Call each word aloud and repeat it. Say each word naturally, without emphasizing phonemes or syllables. Use it in a sentence, if necessary, to be sure students know the exact word. Sample sentences are provided along with the words. After administering the inventory, use a Feature Guide, Class Composite Form, and, if desired, a Spelling-by-Stage Classroom Organization Chart to complete your assessment. An Error Guide form is available on the Assessment CD-ROM.

Scoring the Inventory Using the Feature Guides

1. Make a copy of the appropriate Feature Guide (PSI p. 267, ESI p. 271, USI p. 274) for each student. Draw a line under the last word called if you called fewer than the total number and adjust the possible total points at the bottom of each feature column.
2. Score the words by checking off the features spelled correctly that are listed in the cells to the left of each word. For example, if a student spells *bed* as *bad*, he gets a check in the initial *b* cell and the final *d* cell, but not for the short vowel. Write in the vowel used (*a*, in this case), but do not give any points for it. If a student spells *train* as *trane*, she gets a check in the initial *tr* cell and the final *n* cell, but not for the long vowel pattern. Write in the vowel pattern used (*a–e* in this case), but do not give any points for it. Put a check in the "Correct" column if the word is spelled correctly. Do not count reversed letters as errors but note them in the cells. If unnecessary letters are added, give the speller credit for what is correct (e.g., if *bed* is spelled *bede*, the student still gets credit for representing the short vowel), but do not check "Correct" spelling.
3. Add the number of checks under each feature and across each word, double-checking the total score recorded in the last cell. Modify the ratios in the last row depending on the number of words called aloud.

Use the Assessment CD-ROM to fill in feature guides. Totals and a class composite will be created for you.

Interpreting the Results of the Spelling Inventory

1. Look down each feature column to determine instructional needs. Students who miss only one (or two, if the features sample 8 to 10 words) can go on to other

features. Students who miss two or three need some review work; students who miss more than three need careful instruction on this feature. If a student did not get any points for a feature, earlier features need to be studied first.

2. To determine a stage of development, note where students first make two or more errors under the stages listed in the shaded box at the top of the Feature Guide. Circle this stage.

Using the Class Composite and Spelling by Stage Form

1. Staple each Feature Guide to the student's spelling paper and arrange the papers in rank order from highest total points to lowest total points.
2. List students' names in this rank order in the left column of the appropriate Classroom Composite (PSI p. 268, ESI p. 272, USI p. 275) and transfer each student's feature scores from the bottom row of the individual Feature Guides to the Classroom Composite. If you do not call out the total list, adjust the totals on the bottom row of the Classroom Composite.
3. Highlight cells where students make two or more errors on a particular feature to get a sense of your groups' needs and to form groups for instruction.
4. Many teachers find it easier to form groups using the Spelling-by-Stage Classroom Organization Chart. List each student under the appropriate spelling stage (the stage circled on the Feature Guide) and determine instructional groups.

NOTE: See Chapter 2 for more detailed directions for choosing, administering, scoring, interpreting, and using the inventories to form instructional groups.

Appendix B

Words Their Way Spelling Inventory Word List

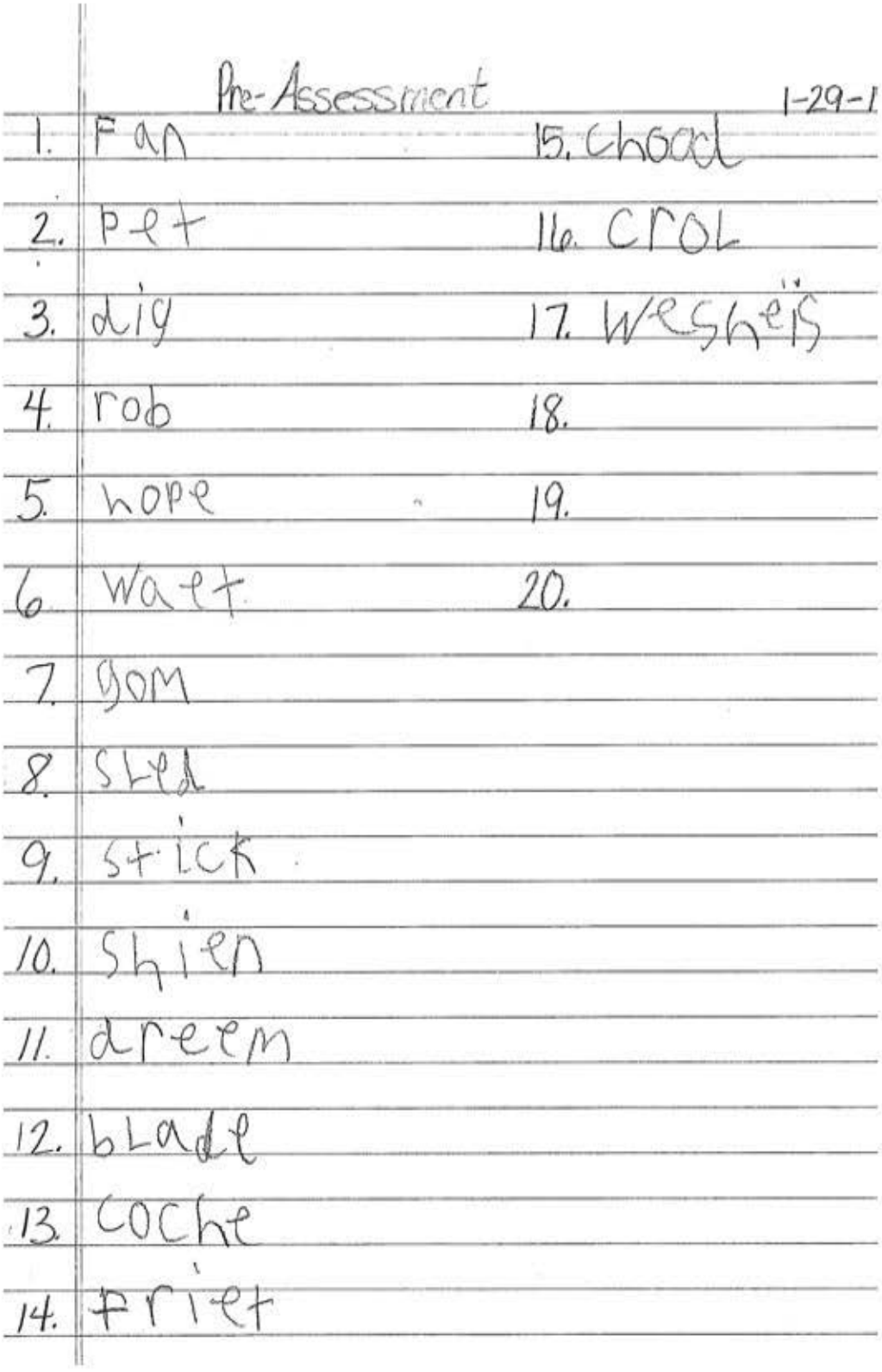
Primary Spelling Inventory (PSI)

The Primary Spelling Inventory (PSI) is used in kindergarten through third grade. The 26 words are ordered by difficulty to sample features of the letter name–alphabetic to within word pattern stages. Call out enough words so that you have at least five or six misspelled words to analyze. For kindergarten or other emergent readers, you may only need to call out the first five words. In late kindergarten and early first grade classrooms, call out at least 15 words so that you sample digraphs and blends; use the entire list for late first, second, and third grades. If any students spell more than 20 words correctly, you may want to use the Elementary Speling Inventory.

1. fan	I could use a fan on a hot day. *fan*
2. pet	I have a pet cat who likes to play. *pet*
3. dig	He will dig a hole in the sand. *dig*
4. rob	A raccoon will rob a bird's nest for eggs. *rob*
5. hope	I hope you will do well on this test. *hope*
6. wait	You will need to wait for the letter. *wait*
7. gum	I stepped on some bubble gum. *gum*
8. sled	The dog sled was pulled by huskies. *sled*
9. stick	I used a stick to poke in the hole. *stick*
10. shine	He rubbed the coin to make it shine. *shine*
11. dream	I had a funny dream last night. *dream*
12. blade	The blade of the knife was very sharp. *blade*
13. coach	The coach called the team off the field. *coach*
14. fright	She was a fright in her Halloween costume. *fright*
15. chewed	The dog chewed on the bone until it was gone. *chewed*
16. crawl	You will get dirty if you crawl under the bed. *crawl*
17. wishes	In fairy tales wishes often come true. *wishes*
18. thorn	The thorn from the rosebush stuck me. *thorn*
19. shouted	They shouted at the barking dog. *shouted*
20. spoil	The food will spoil if it sits out too long. *spoil*
21. growl	The dog will growl if you bother him. *growl*
22. third	I was the third person in line. *third*
23. camped	We camped down by the river last weekend. *camped*
24. tries	He tries hard every day to finish his work. *tries*
25. clapping	The audience was clapping after the program. *clapping*
26. riding	They are riding their bikes to the park today. *riding*

Appendix C

Pre-Assessment *Words Their Way* Spelling Inventory

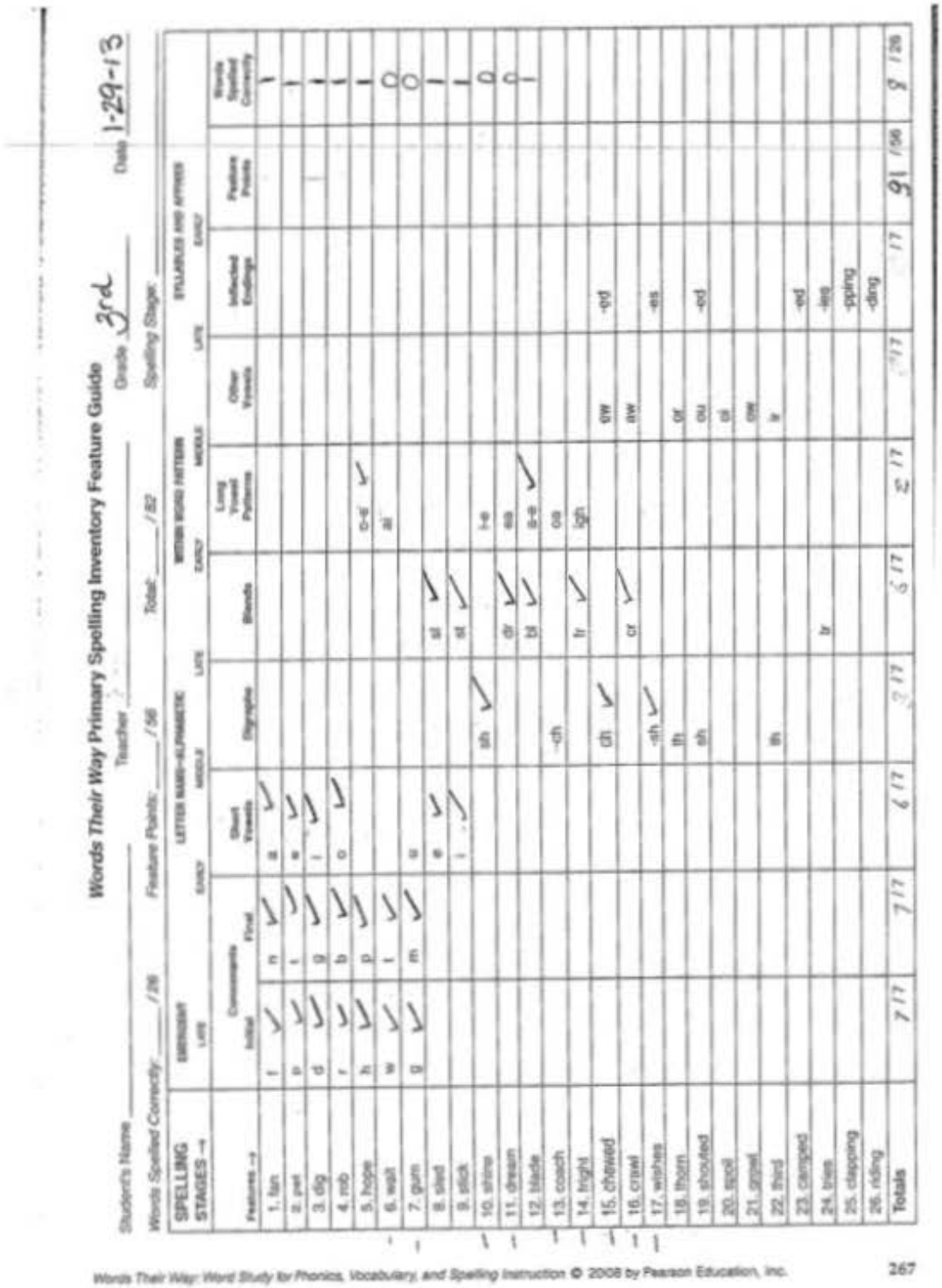


Pre-Assessment 1-29-1

1. Fan
2. Pet
3. dig
4. rob
5. hope
6. wait
7. gom
8. sled
9. stick
10. shien
11. dreem
12. blade
13. coche
14. friet
15. choact
16. crol
17. wesheis
18.
19.
20.

Appendix D

Words Their Way Primary Spelling Inventory Feature Guide Pre-Assessment



Words Their Way Primary Spelling Inventory Feature Guide

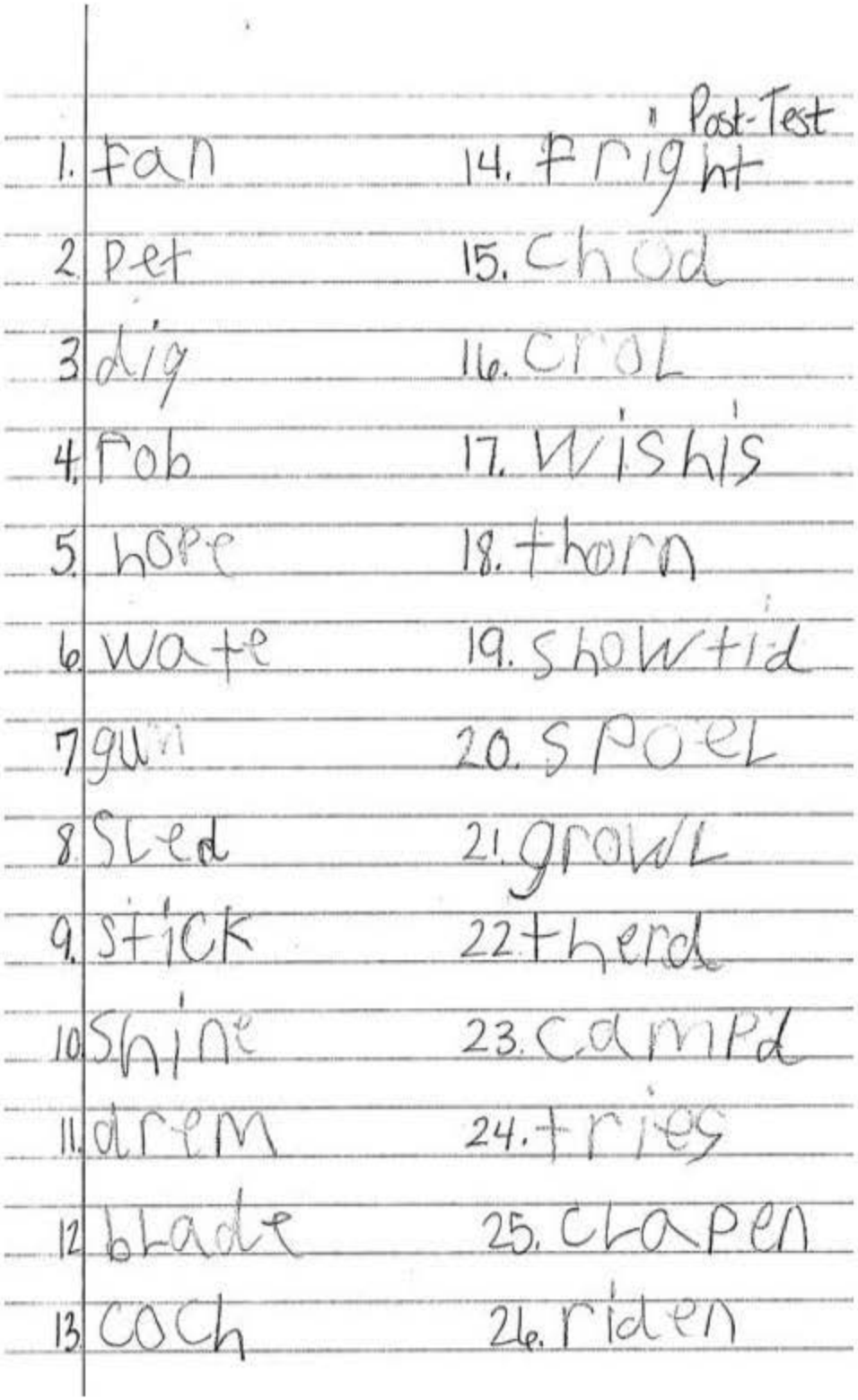
Student's Name _____ Teacher _____ Grade 3rd Date 1-29-13

Words Spelled Correctly: _____ /26 Feature Points: _____ /56 Total: _____ /82 Spelling Stage: _____

SPELLING STAGES →	CONSONANT			LETTER NAME–ALPHABETIC				WITHIN WORD PATTERN				SYLLABLES AND AFFIXES				
	EMERGENT LATE		EARLY	EARLY MIDDLE		LATE		EARLY	MIDDLE		LATE	EARLY			Feature Points	Words Spelled Correctly
Features →	Initial	Final	Short Vowels	Digraphs		Blends		Long Vowel Patterns		Other Vowels	Inflected Endings					
1. fan	f ✓	n ✓	a ✓													1
2. pet	p ✓	t ✓	e ✓													1
3. dig	d ✓	g ✓	i ✓													1
4. rob	r ✓	b ✓	o ✓													1
5. hope	h ✓	p ✓						c-e ✓								1
6. wait	w ✓	t ✓						ai								0
7. gum	g ✓	m ✓	u													0
8. sled			e ✓			sl ✓										1
9. stick			i ✓			st ✓										1
10. shine				sh ✓				i-e								0
11. dream						dr ✓		ea								0
12. blade						bl ✓		a-e ✓								1
13. coach				-ch				oa								
14. bright						fr ✓		igh								
15. chewed				ch ✓						ew	-ed					
16. crawl						cr ✓				aw						
17. wishes				-sh ✓							-es					
18. thorn				th						or						
19. shouted				sh						ou	-ed					
20. spoil										oi						
21. growl										ow						
22. third				th						ir						
23. camped											-ed					
24. tries						tr					-ies					
25. clapping											-pping					
26. riding											-ding					
Totals	7/7	7/7	4/7	2/7		5/7		2/7		1/7	1/7				9/56	8/26

Appendix E

Post-Assessment *Words Their Way* Spelling Inventory

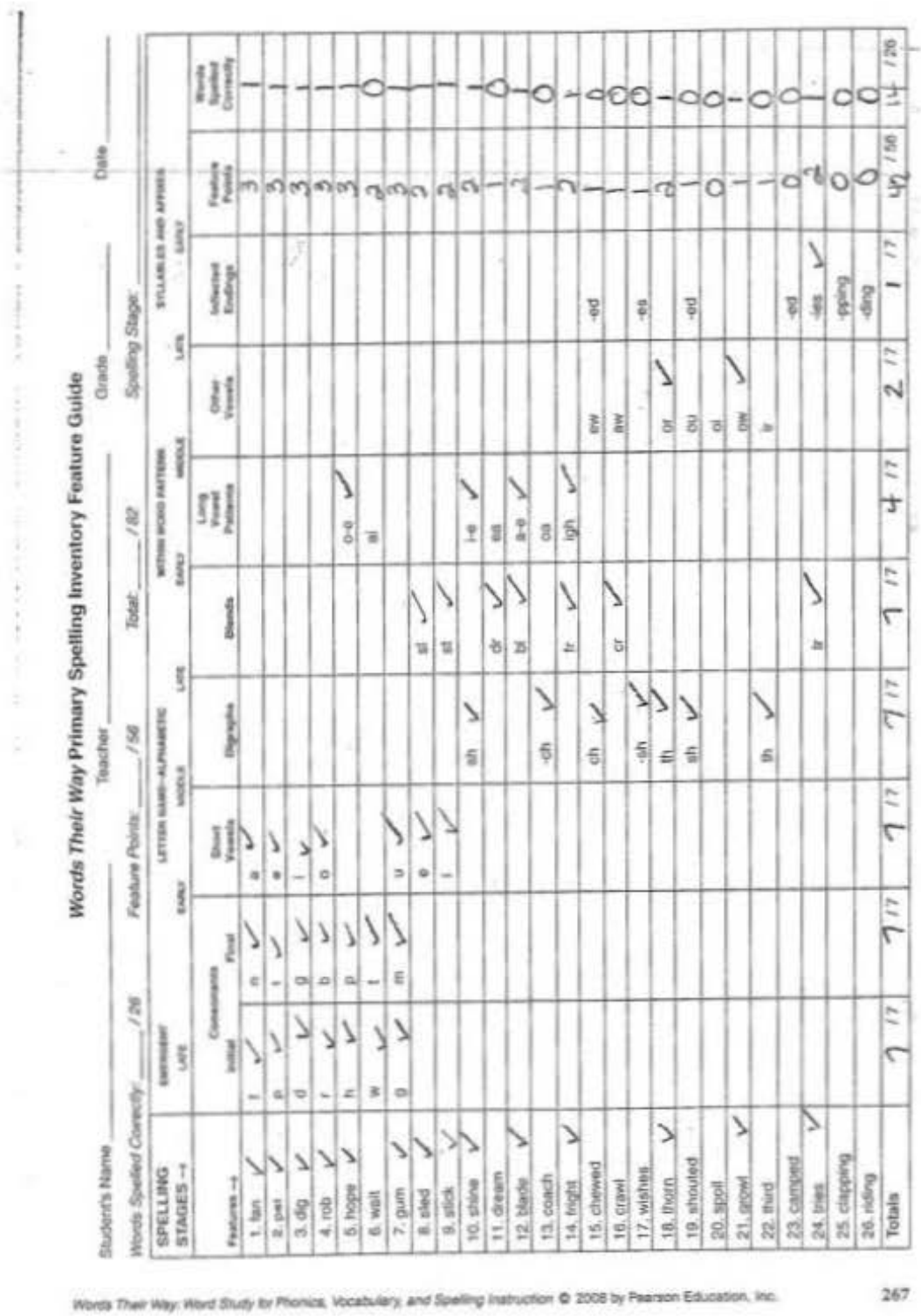


Post-Test

1. fan
2. pet
3. dig
4. Pob
5. hope
6. wate
7. gum
8. sled
9. stick
10. shine
11. drem
12. blade
13. coch
14. fright
15. chod
16. croL
17. wishis
18. thorn
19. showtid
20. spoel
21. growL
22. therd
23. camPd
24. tries
25. claPen
26. riden

Appendix F

Words Their Way Primary Spelling Inventory Feature Guide Post- Assessment



Words Their Way Primary Spelling Inventory Feature Guide

Student's Name _____ Teacher _____ Grade _____ Date _____

Words Spelled Correctly: ____ / 26 Feature Points: ____ / 56 Total: ____ / 82 Spelling Stage: _____

SPELLING STAGES →	LETTER NAME—ALPHABETIC						WITHIN WORD PATTERNS				SYLLABLES AND AFFIXES			
	EMERGENT LATE		EARLY		LATE		EARLY		MIDDLE	LATE		EARLY		
Features →	Consonants Initial	Consonants Final	Short Vowels	Digraphs	Blends		Long Vowel Patterns		Other Vowels		Inflected Endings		Feature Points	Words Spelled Correctly
1. fan	f ✓	n ✓	a ✓										3	1
2. pet	p ✓	t ✓	e ✓										3	1
3. dig	d ✓	g ✓	i ✓										3	1
4. rob	r ✓	b ✓	o ✓										3	1
5. hope	h ✓	p ✓					o-e ✓						3	1
6. wait	w ✓	t ✓					ai						2	0
7. gum	g ✓	m ✓	u ✓										3	1
8. sled			e ✓		sl ✓								3	1
9. slick			i ✓		sl ✓								2	1
10. shine				sh ✓			i-e ✓						2	1
11. dream					dr ✓		ea						1	0
12. blade					bl ✓		a-e ✓						2	1
13. coach				ch ✓			oa						1	0
14. fright					fr ✓		igh ✓						2	1
15. chewed				ch ✓					ew		-ed		1	0
16. crawl					cr ✓				aw				1	0
17. wishes				sh ✓							-es		1	0
18. thorn				th ✓					or ✓				2	1
19. shouted				sh ✓					ou		-ed		1	0
20. spoil									oi				0	0
21. growl									ow ✓				1	0
22. third				th ✓					ir				1	0
23. camped											-ed		0	0
24. tries					tr ✓						-es ✓		2	1
25. clapping											-pping		0	0
26. riding											-ding		0	0
Totals	2 /7	7 /7	7 /7	2 /4	4 /7		1 /4		2 /7		1 /7		42 /56	11 /26

Appendix G

Nonsense Word List Directions for Assessment

Intermediate Grades
Scholastic Professional Books
www.scholastic.com/content/collateral-resources/pdf/r/reading_bestpractices_phonics_nonsensewordtest.pdf

The Nonsense Word Test

Preparing the Test

- Type or print the test and make a copy to record the student's responses.

Administering the Test

- Administer the test to one student at a time.
- Explain to the student that she is to read each word. Point out that the words are nonsense, or made-up, words.
- As the student reads the entire list, put a check mark on the answer sheet beside each word she reads correctly. (The word is correct if the student's pronunciation is correct according to common sound-spelling relationships.)

Scoring the Test

- Total the number of words the student read correctly. Analyze the mispronounced words, looking for patterns that might give you information about the student's decoding strengths and weaknesses.
- Focus future instruction on those sound-spelling relationship categories (short vowels, long vowels, etc.) in which the student made three or more errors.

Teaching Phonics & Word Study in the Intermediate Grades • Scholastic Professional Books

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Appendix H

Nonsense Word List of Words

The Nonsense Word Test

A. Short Vowels

1.	lat	6.	fim
2.	ped	7.	hep
3.	sib	8.	yot
4.	mog	9.	rud
5.	vun	10.	cag

B. Digraphs, Blends

1.	sheg	6.	bruck
2.	chab	7.	cliss
3.	stot	8.	smend
4.	whid	9.	thrist
5.	thuzz	10.	phum

C. Long Vowels

1.	sote	6.	shain
2.	mabe	7.	dright
3.	foap	8.	hupe
4.	weam	9.	heest
5.	flay	10.	sny

D. Other Vowels

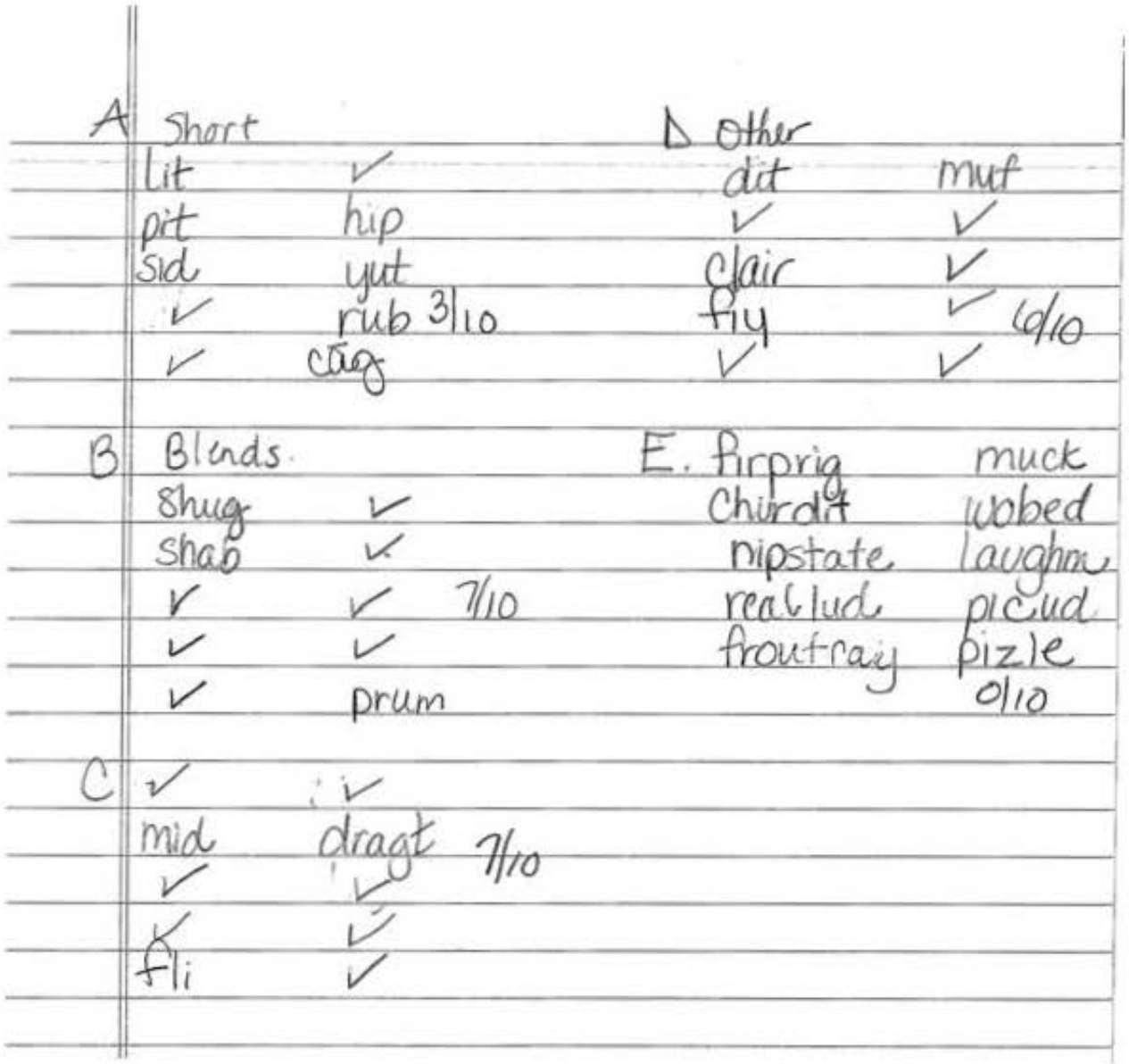
1.	doit	6.	moof
2.	spoud	7.	lurst
3.	clar	8.	porth
4.	foy	9.	stook
5.	jern	10.	flirch

E. Multisyllabic Words

1.	rigfap	6.	moku
2.	churbit	7.	wolide
3.	napsate	8.	lofam
4.	reatloid	9.	pagbo
5.	foutray	10.	plizzle

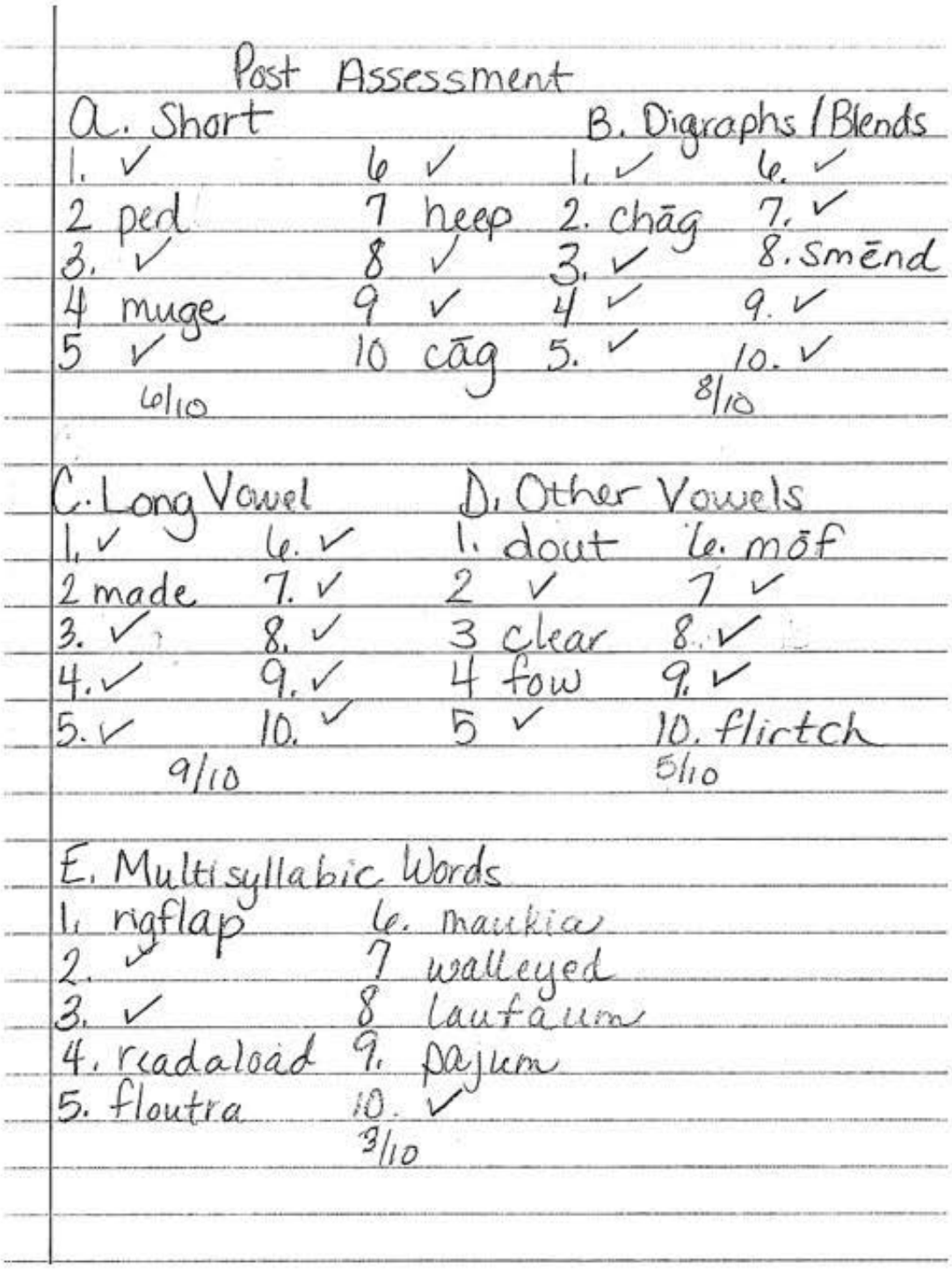
Appendix I

Nonsense Word List: Pre-Assessment



Appendix J

Nonsense Word List: Post-Assessment



Post Assessment

A. Short

1. ✓
2 ped
3. ✓
4 muge
5 ✓
6 ✓
7 heep
8 ✓
9 ✓
10 cāg

6/10

B. Digraphs / Blends

1. ✓
2. chāg
3. ✓
4 ✓
5. ✓
6. ✓
7. ✓
8. smēnd
9. ✓
10. ✓

8/10

C. Long Vowel

1. ✓
2 made
3. ✓
4. ✓
5. ✓
6. ✓
7. ✓
8. ✓
9. ✓
10. ✓

9/10

D. Other Vowels

1. dout
2 ✓
3 clear
4 fow
5 ✓
6. mōf
7 ✓
8. ✓
9. ✓
10. flirtch

5/10

E. Multisyllabic Words

1. rigflap
2. ✓
3. ✓
4. readaload
5. floutra
6. maukia
7 walleyed
8 lautaum
9. pajum
10. ✓

3/10

Appendix K

Spelling Survey Questionnaire: Pre-Assessment

Spelling Survey

Name: _____ Date: 1-29-13

Please read through each question and answer every question on how you feel towards spelling at this time.

1. Are you or are you not a good speller? Why do you think so?
Kind of in the middle because if there is words I can't sound out or get messed up about something.

2. What do you do when you don't know how to spell a word?
raise my hand - try to ask a teacher or sound it out.

3. If someone is having trouble spelling a word, how could you help that person?
whisper to them how to spell it or help them sound it out.

4. What three things help you learn to spell a new word?
1. My spelling journal
2. Someone else - my teacher - tell me sound it out
3. I sound it out.

5. What things have you tried that do not help your spelling?
getting distracted - like paying attention to others. writing the word over and over

6. Tell me any other comments you feel about spelling or writing.
I love to write because it makes me actually do something

Appendix L

Spelling Survey Questionnaire: Post-Assessment

Spelling Survey Post-Assessment

Name:_____ Date: 3·7·13

Please read through each question and answer every question on how you feel towards spelling at this time.

1. Are you or are you not a good speller? Why do you think so?
   I am a good speller. but sometimes if it is a long word I don't spell it completely right.
2. What do you do when you don't know how to spell a word?
   I sound out the letters or I try to figure out the letters by myself and if I got it wrong it is ok.
3. If someone is having trouble spelling a word, how could you help that person?
   help them sound out the word or tell them the letters.
4. What three things help you learn to spell a new word?
   teachers - tell me words - help you find it in the dictionary.
   my mom and dad - tell me new words/how to spell it
   myself - sounding out the words.
5. What things have you tried that do not help your spelling?
   I don't know what doesn't help me.
6. Tell me any other comments you feel about spelling or writing.
   really great - I'm spelling new words & writing. I might see me spelling words in a book, when I do see my words I can sound out the words

Appendix M

Samples of Examiner's Notes from Day 11

Day 11

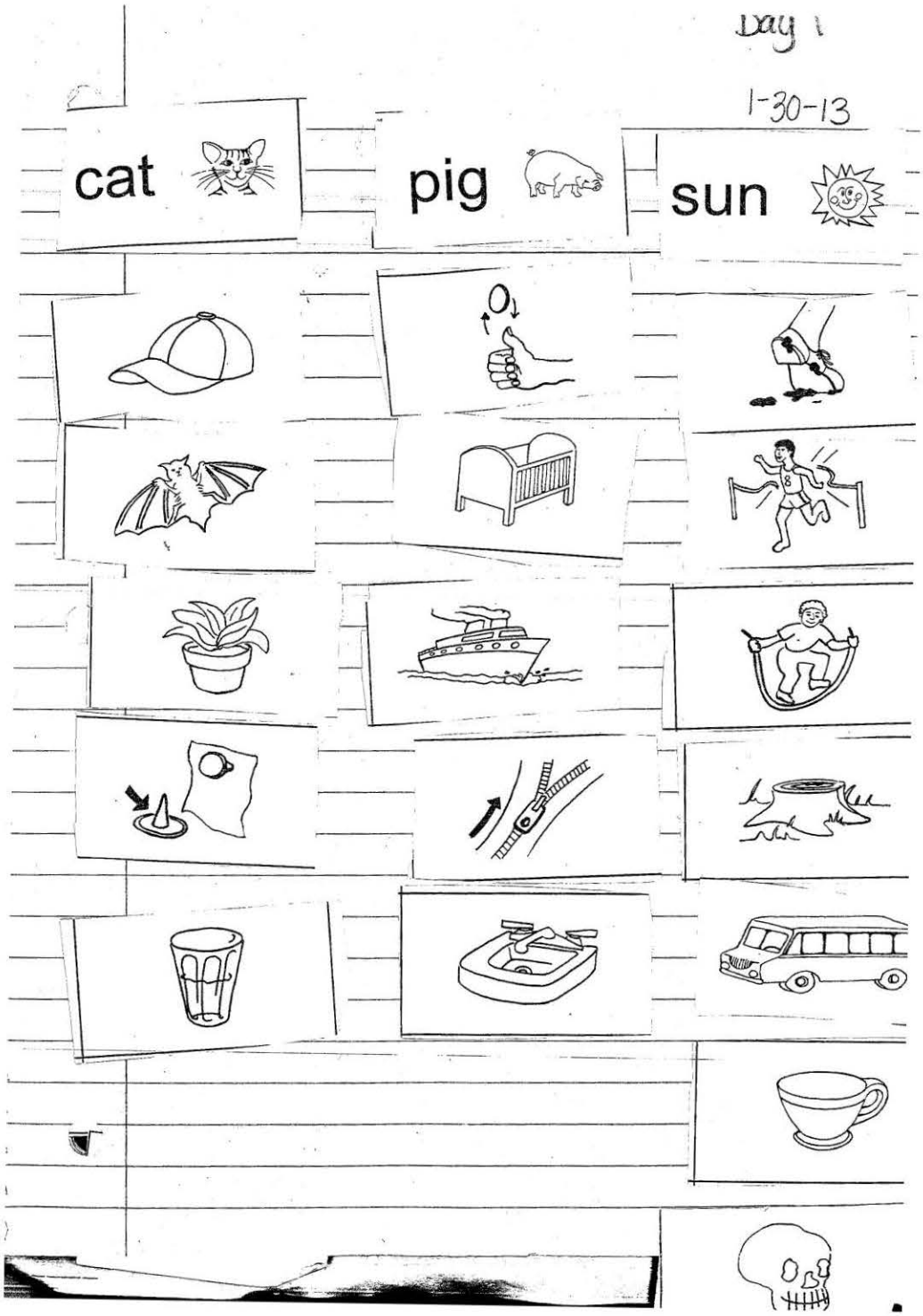
male ✓ Started off using mail bird (SC)
wade ✓ used weighted in a sentence
wait ✓ used weight in a sentence
brain ✓
chain ✓ ① outside (lemin)
blame ✓ raft ✓ tent ✓
trade ✓ nest ✓ swim ✓
tail ✓ golf ✓ pond ✓
shake ✓ land ✓ crop ✓
said ✓ dump ✓ jump ✓ 12
paint ✓ camp ✓ sand ✓

② home ③ people ④ triple blends
bunk ✓ drop ✓ scrub b→d
list ✓ band d→b sculpt u→a t→d t→b
crib ✓ wept ✓ strep ✓
drip ✓ grill ✓ strum ✓ ⑤ double blends
sink ✓ hunt ✓ splat ✓ blank ✓
spot ✓ film ✓ split ✓ crank ✓
lamp ✓ glad ✓ sprint ✓ spend ✓
bank ✓ trim ✓ strap ✓ stamp ✓
belt ✓ trip ✓ strip ✓
vest ✓ gift ✓ scraps ✓ 14
plum ✓ twins ✓ (30)
damp ✓ skit ✓
24

asked if there is a lot of words w/ ✓ @ beginning
@ beginning

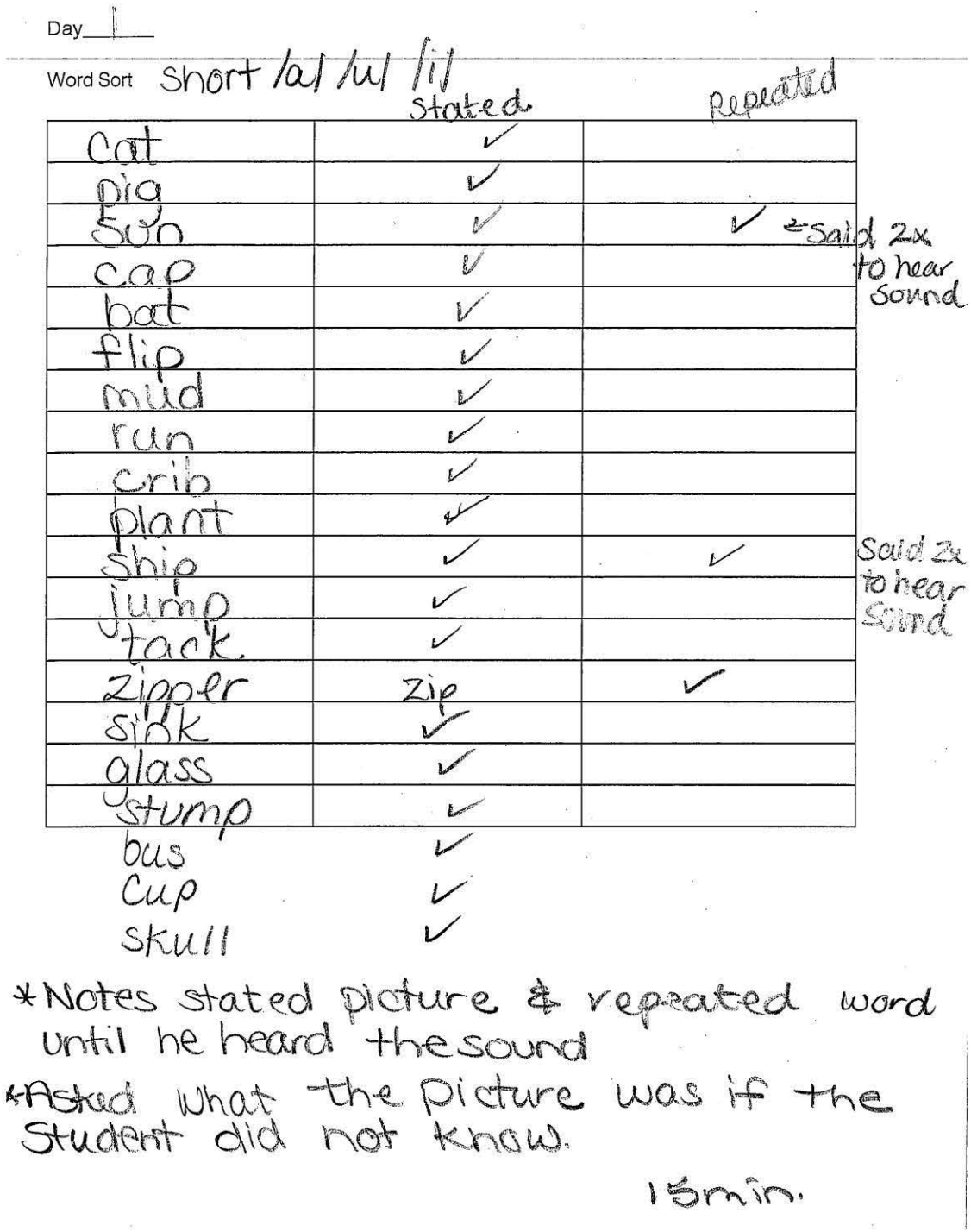
Appendix N

Student's Word Sort Day 1



Appendix O

Examiner's Notes from Word Sort Day 1



Day 1

Word Sort Short /a/ /u/ /i/

	Stated	Repeated	
Cat	✓		
pig	✓		
Sun	✓	✓	← Said 2x to hear sound
cap	✓		
bat	✓		
flip	✓		
mud	✓		
run	✓		
crib	✓		
plant	✓		
ship	✓	✓	Said 2x to hear Sound
jump	✓		
tack	✓		
zipper	zip	✓	
sink	✓		
glass	✓		
stump	✓		
bus	✓		
Cup	✓		
skull	✓		

*Notes stated picture & repeated word until he heard the sound

*Asked what the picture was if the student did not know.

15min.

Appendix P

Examiner's Notes from iPad Words Day 1

Day 1
iPad Words

Short /u/

word	correct	
tub	✓	
nut	✓	
Sun	✓	
Cut	✓	
gum	✓	
hug	✓	
rug	✓	
cup	✓	
run	✓	
hut	✓	
bus	✓	
cub	✓	
tub	✓	
nut	✓	
Sun	✓	

iPad - Spelling Magic
Moveable Alphabet
Letter Sound ✓
hut picture if needed.

5 minutes.

Appendix Q

Student's Word Sort Day 2

Appendix R

Examiner's Notes from Word Sort Day 2

Day 2

Word Sort Short /u/ /a/ /i/

	stated	repeated
Sun	✓	
pig	✓	
cat	✓	
run	✓	
cup	✓	
ship	✓	
cap	✓	
crib	✓	
plant	✓	
jump	✓	
mud	✓	
flip	✓	
glass	✓ corrected	on own
stump	✓	
bus	✓	
sink	✓	
zipper	✓	

bat ✓
tack ✓
skull ✓

* stated words out loud before placing it
* stated word multiple times under breathe to hear sounds when needed.
* corrected the word glass on own
* read pictures w/ examiner after completing task

10 min

Appendix S

Examiner's Notes from iPad Words Day 2

Day 2
iPad Words

Short /u/	Short /a/	Short /i/
cup ✓	ram ✓	fix → fis/fic/ fik/ fix
nut ✓	hat ✓	
bus ✓	tag ✓	kit ✓
run ✓	map ✓	sit ✓
cub ✓	cap ✓	rip ✓
gum ✓	pin ✓	bib ✓
tub ✓	cat ✓	dig ✓
hut ✓	pad ✓	
rug ✓	bat ✓	
cut ✓	van ✓	
hug ✓	fan ✓	
sun ✓	can ✓	

*pressed picture before moving a letter on spelling Magic
* tapped on word after completing a word.
* became more quick at making words

Appendix T

Student's Word Sort Day 3

Appendix U

Examiner's Notes from Word Sort Day 3

Day 3 — 5minutes

Word Sort

Short /u/ /a/ /i/

sun	✓	
cat	✓	
pig	✓	
cup	✓	
jump	✓	
cap	✓	
ship	✓	
flip	✓	
bat	✓	
skull	✓	
bus	✓	
stump	✓	
plant	✓	
sink	✓	
glass	✓	
zipper	✓	
crib	✓	

mud ✓
jump ✓
tack

✓ placed tack aside - said he would do that word las

* Independently glued sorts down

Examiner: "Are you saying the words in your head?
Student: "Yes"

Appendix V

Examiner's Notes from iPad Words Day 3

Day 3
iPad Words

① Short u	② Short /a/	③ Short /i/
tub ✓	pad → pab/pad ✓	pig ✓
gum ✓	cap ✓	pin ✓
run ✓	pan ✓	dig ✓
cub ✓	can ✓	lid ✓
hut ✓	cat ✓	zip ✓
cut ✓	ram ✓	kit ✓
bus ✓	bat ✓	fix ✓
sun ✓	fan ✓	six ✓
rug ✓	tag ✓	rip ✓
cup ✓	map ✓	bib ✓
nut ✓	van ✓	sit ✓
hug ✓	hat ✓	mix ✓
④ Short /e/		
web ✓	bed ✓	jet ✓
ten ✓	men ✓	vet ✓
net ✓	hen ✓	
beg ✓	pet ✓	
pen ✓	ref ✓	

* noticed when it was one of his word sort words
* would hit picture if unsure of sounds.
* would tap on sound if not sure to re hear it
✓ hit picture to hear word again

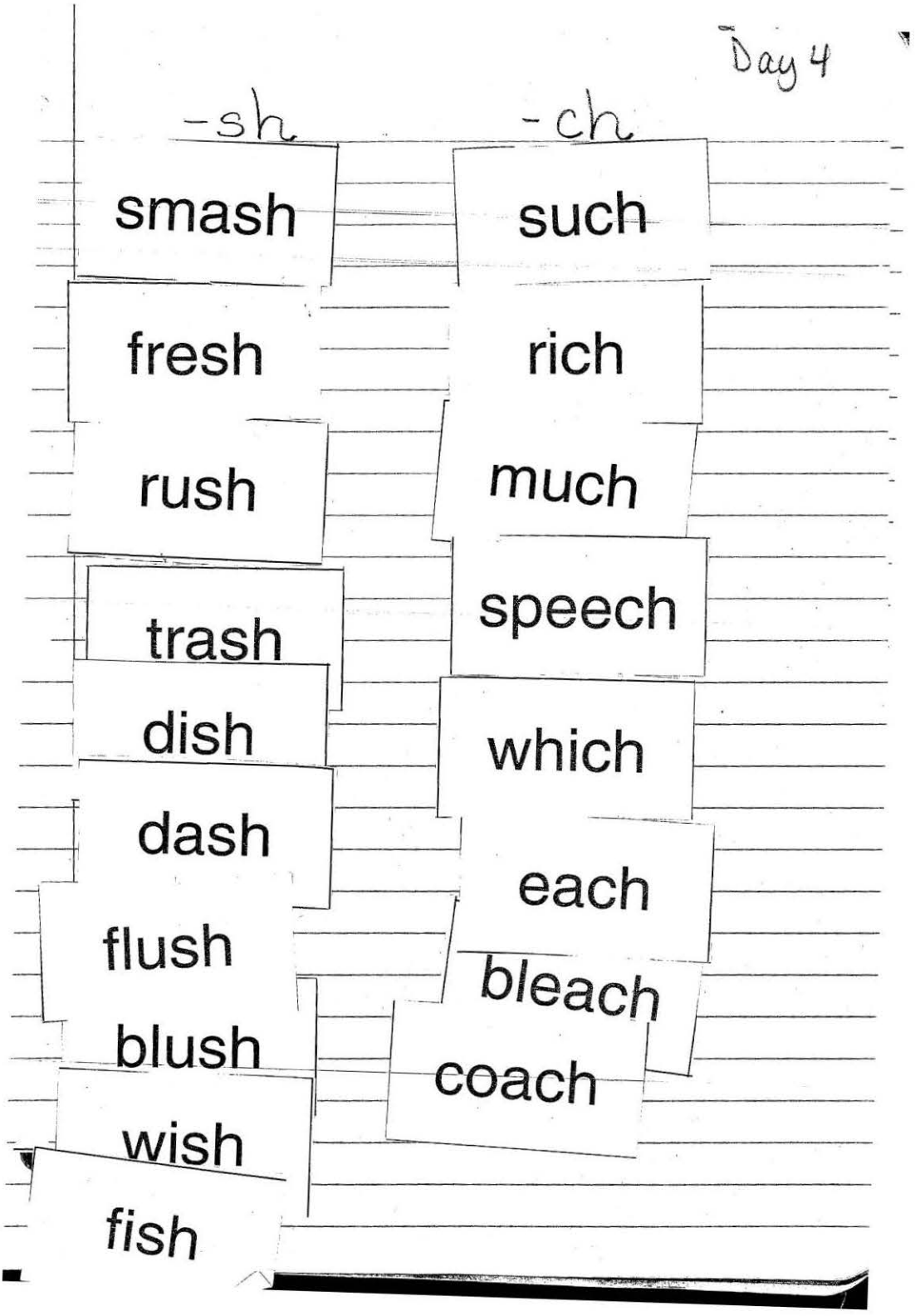
Day 3

iPad Words

⑤		
Short /o/		
top ✓		
mom ✓		
rod ✓		
log ✓		
hop ✓		
box ✓		
fox ✓		
pod ✓		
pot ✓		
dog ✓		
mop ✓		
log ✓		

Appendix W

Student's Word Sort Day 4



Appendix X

Examiner's Notes from Word Sort Day 4

Day 4

Word Sort

endings of words /sh/ /ch/

smash	✓	
fresh	✓	
such	✓	
rich	✓	
much	✓	
speech	✓	
rush	✓	
trash	✓	
dish	✓	
dash	✓	
which	thought it was a witch	
each	✓	
flush	✓	
blush	✓	
bleach	added a /t/ at the end	✓
wish	✓	
fish	✓	
coach	✓	

Appendix Y

Examiner's Notes from iPad Words Day 4

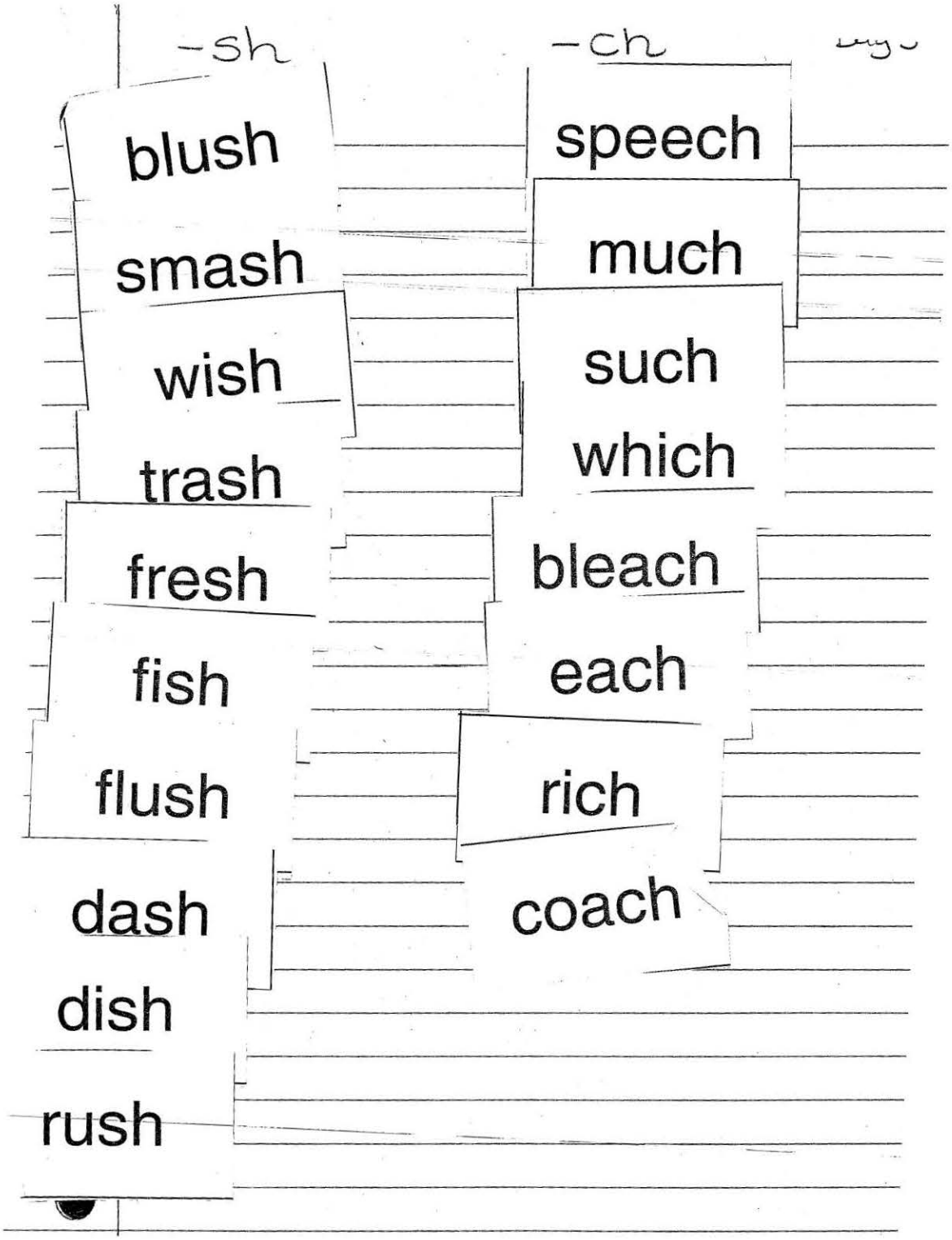
Day 4
iPad Words

Categories on iPad

① people	② animals	③ actions
trim ✓	trot ✓	grab ✓
skit ✓	yelp ✓ put u 1st self corrected	bend ✓
drop ✓	plant ✓	rest ✓
glad ✓	slug ✓ skipped u at 1st	smell ✓
grill ✓	stag ✓	floss ✓
trip ✓	tusk→tusc→tusk	skip ✓
band ✓	hump	spin spe→ri touched i spoe
twins ✓	crab ✓	dunk ✓
gifts ✓	clam ✓	flip ✓
wept ✓	frog ✓	weld ✓
hunt ✓		clap ✓
film ✓		snap ✓
④ outdoor		
land → tried s for n		corrected self
camp ✓		

Appendix Z

Student's Word Sort Day 5



Appendix AA

Examiner's Notes from Word Sort Day 5

Day 5

Word Sort ends of words /sh/ /ch/

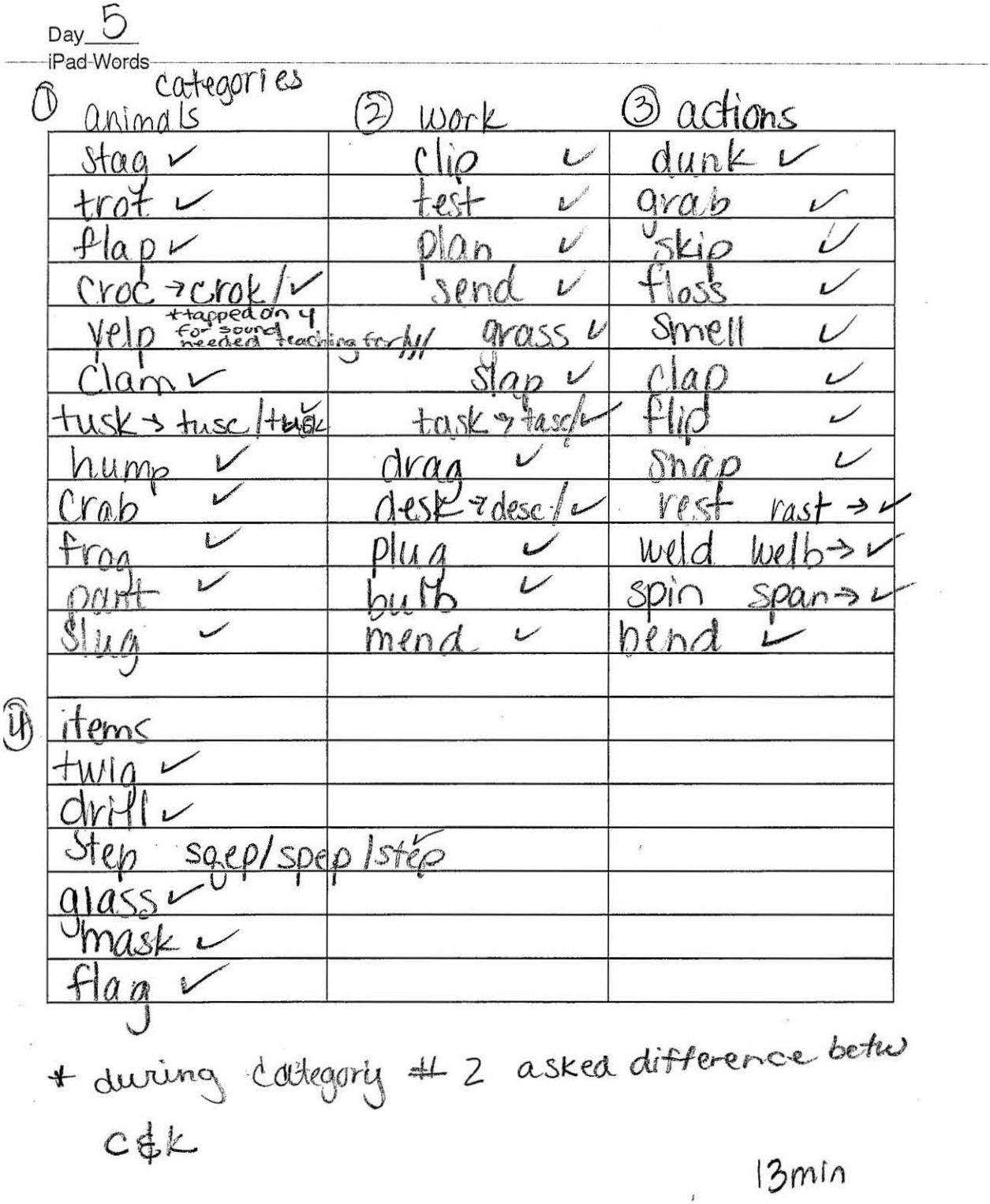
Speech	needed to sound out word
much	✓
blush	✓
smash	✓
wish	✓
such	✓
trash	✓
which	thought it was witch / wish ✓
fresh	frash → Corrected ✓
fish	✓
bleach	✓
each	✓
flush	✓
rich	stated it 2x ✓
dash	✓
dish	✓
coach	cash ✓
rush	

* reviewed chunks
* reviewed words at end

7min.

Appendix BB

Examiner's Notes from iPad Words Day 5



Day 5
iPad Words

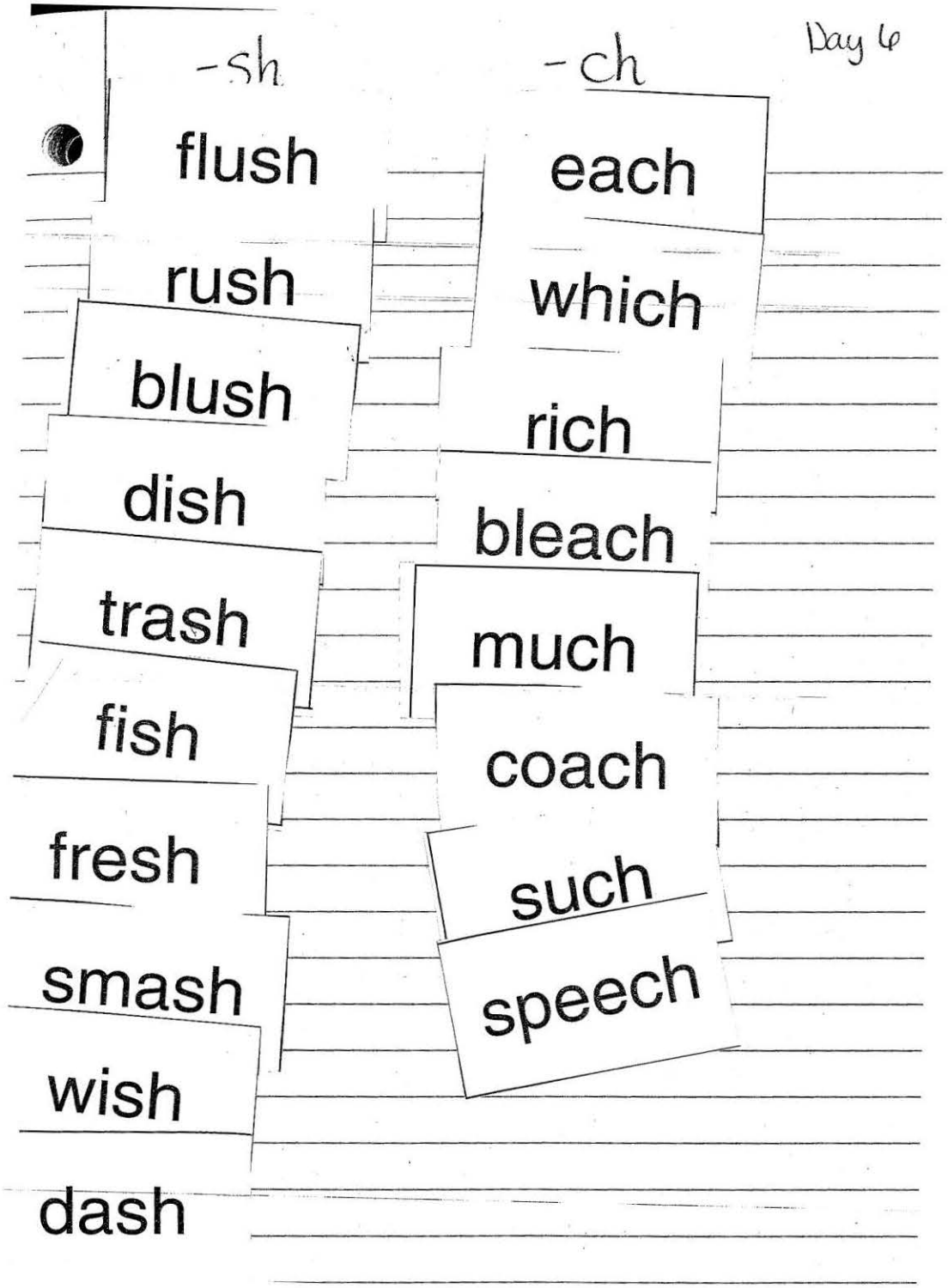
① categories animals	② work	③ actions
stag ✓	clip ✓	dunk ✓
trot ✓	test ✓	grab ✓
flap ✓	plan ✓	skip ✓
croc → crok/✓	send ✓	floss ✓
yelp *tapped on 4 for sound needed teaching for /l/	grass ✓	smell ✓
clam ✓	slap ✓	clap ✓
tusk → tusc/tusk	task → tasc/✓	flip ✓
hump ✓	drag ✓	snap ✓
crab ✓	desk → desc/✓	rest rast → ✓
frog ✓	plug ✓	weld welb → ✓
cart ✓	bulb ✓	spin span → ✓
slug ✓	mend ✓	bend ✓
④ items		
twig ✓		
drill ✓		
step sqep/spep/stép		
glass ✓		
mask ✓		
flag ✓		

* during category #2 asked difference betw c&k

13min

Appendix CC

Student's Word Sort Day 6



Appendix DD

Examiner's Notes from Word Sort Day 6

Day 6

Word Sort

Word endings -sh -ch

each	✓	
which	✓	
flush	✓	
rush	✓	
rich	✓	
blush	✓	
dish	✓	
bleach	✓	
trash	✓	
much	✓	
fish	✓	
Coach	✓	
fresh	✓	
smash	✓	
Such	✓	
wish	Which	✓Self corrected
speech	✓	
dash	dish	self corrected✓

*reviewed chunks
*used words in a sentence
*reviewed words.

Appendix EE

Examiner's Notes from iPad Words Day 6

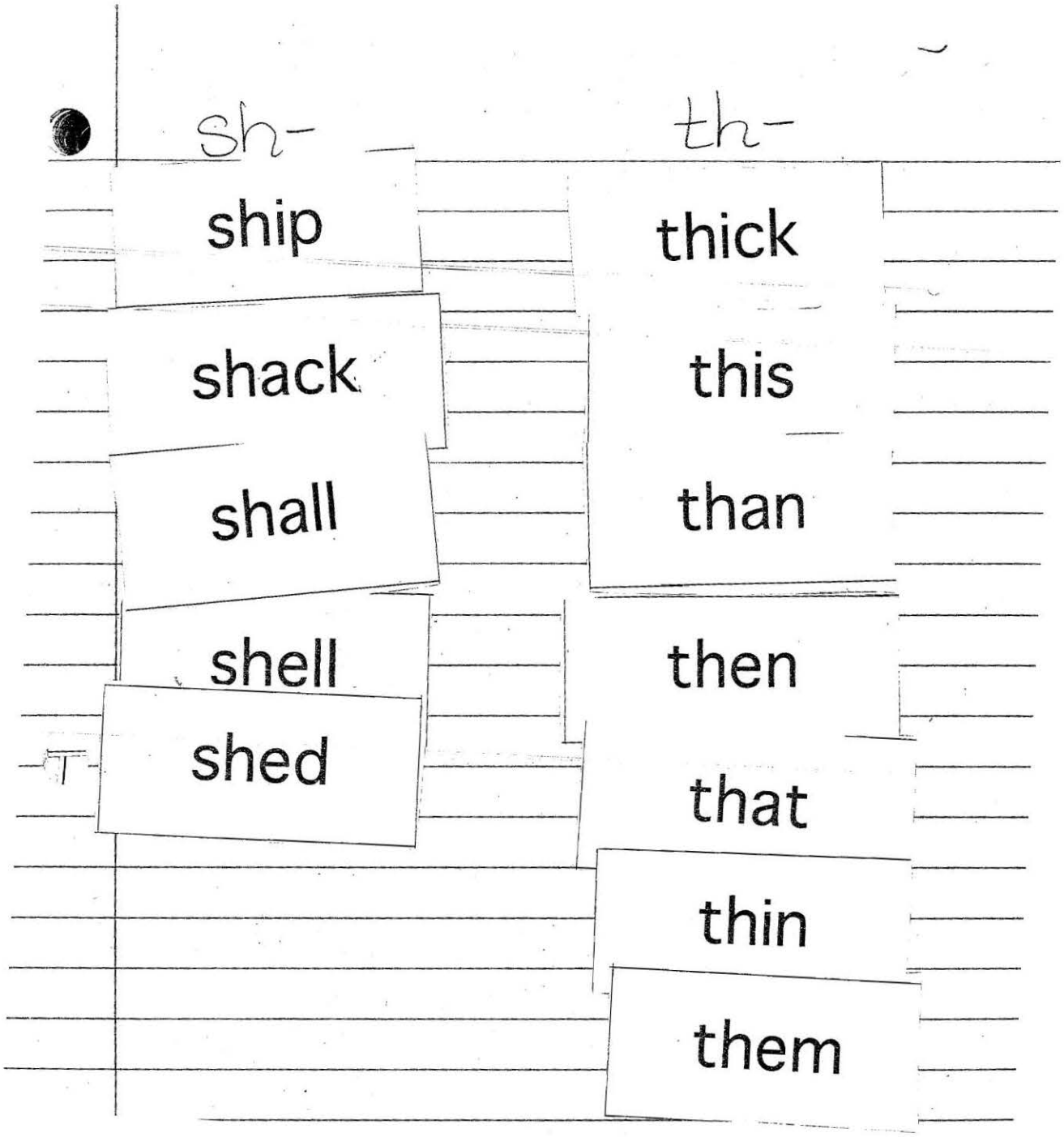
Day 6
iPad Words

① Catergories Outdoors	② double blends	③ work
land land/✓	spend ✓	drag r→s/✓
swim ✓	blast ✓	mend u→n/✓
sand ✓	crank Kark→ ✓	plan ✓
crop ✓	stamp ✓	slap ✓
tent ✓	slept d→t/✓	clip k→l/✓
camp ✓	clasp ✓	bulb o→u/✓
dump ✓	blink e→i/✓	plug ✓
pond ✓	blank ✓	task ✓
lump ✓	twist r→s ✓	test a→e/✓
raft Checked a j sl for f ✓	grasp ✓	send ✓
nest tried o→e nost→nest ✓	crust	grass ✓
goff goff→gok ✓	swept b→t/✓	desk ✓
	stump ✓	
	stand b→d/✓	
	stink ✓	
④ triple blends		
scrub g→b/✓		
sprint m/n ✓		

*needed to tap on individual sounds

Appendix FF

Student's Word Sort Day 7



Appendix GG

Examiner's Notes from Word Sort Day 7

Day 7

Word Sort

beginning of words sh- th-

thick	✓	
ship	✓	
shack	✓	
this	these	needed reteaching
shall	never heard of	this word
than	then	✓
shell	✓	
then	✓	
that	✓	
thin	✓ reread	2x.
shed	✓	
them	✓	

*stated the word & used it in a sentence.

*noticed then & than are similar in spelling.

Appendix HH

Examiner's Notes from iPad Words Day 7

Day 7

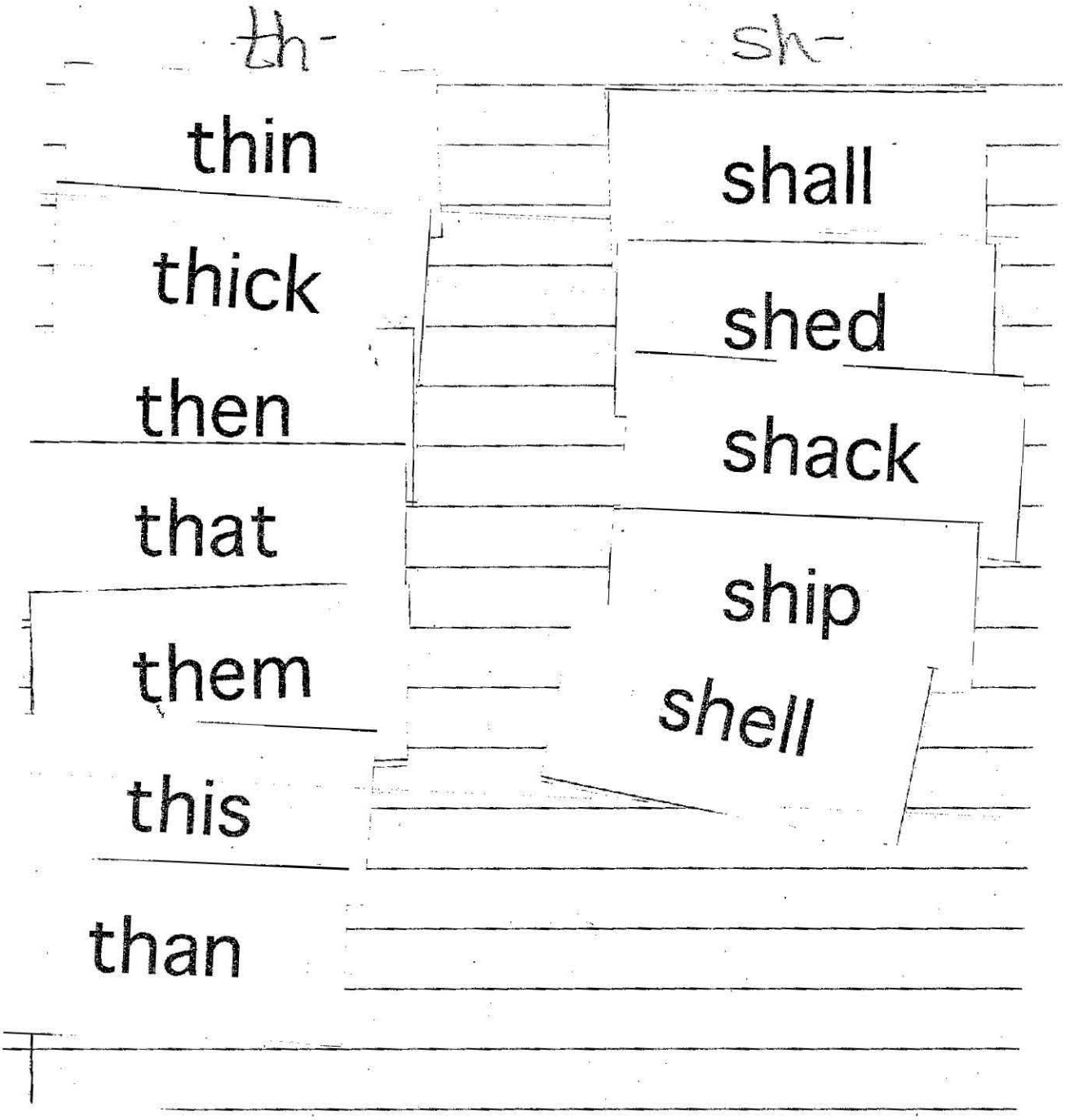
iPad Words

Categories

#1 Work	#2 Actions	#3 home
task ✓	dunk ✓	spot ✓
bulb u→e/✓	rest ✓	belt ✓
clip ✓	flip ✓	damp ✓
plug ✓	spin ✓	fist ✓
drag ✓	smell ✓	bunk ✓
grass ✓	snap ✓	drip ✓
plan ✓	bend ✓	plum ✓
send ✓	weld d→b/✓	bank ✓
test ✓	clap ✓	vest ✓
desk ✓	grab ✓	sink ✓
mend d→b/✓	floss ✓	crib r→i/✓
slap ✓	skip ✓	lamp ✓

Appendix II

Student's Word Sort Day 8



Appendix JJ

Examiner's Notes from Word Sort Day 8

Day 8

Word Sort beg of words th- Sh-

Shall	✓	
thin	✓	
shed	✓	
shack	✓	
thick	✓	
then	✓	
ship	✓	
that	✓	
them	✓	
shell	✓	
this	✓	
than	started w/ /th/ ✓	

*Shall- could read it but couldn't use it in a sent. asked what a shack was.

8min

Appendix KK

Examiner's Notes from iPad Words Day 8

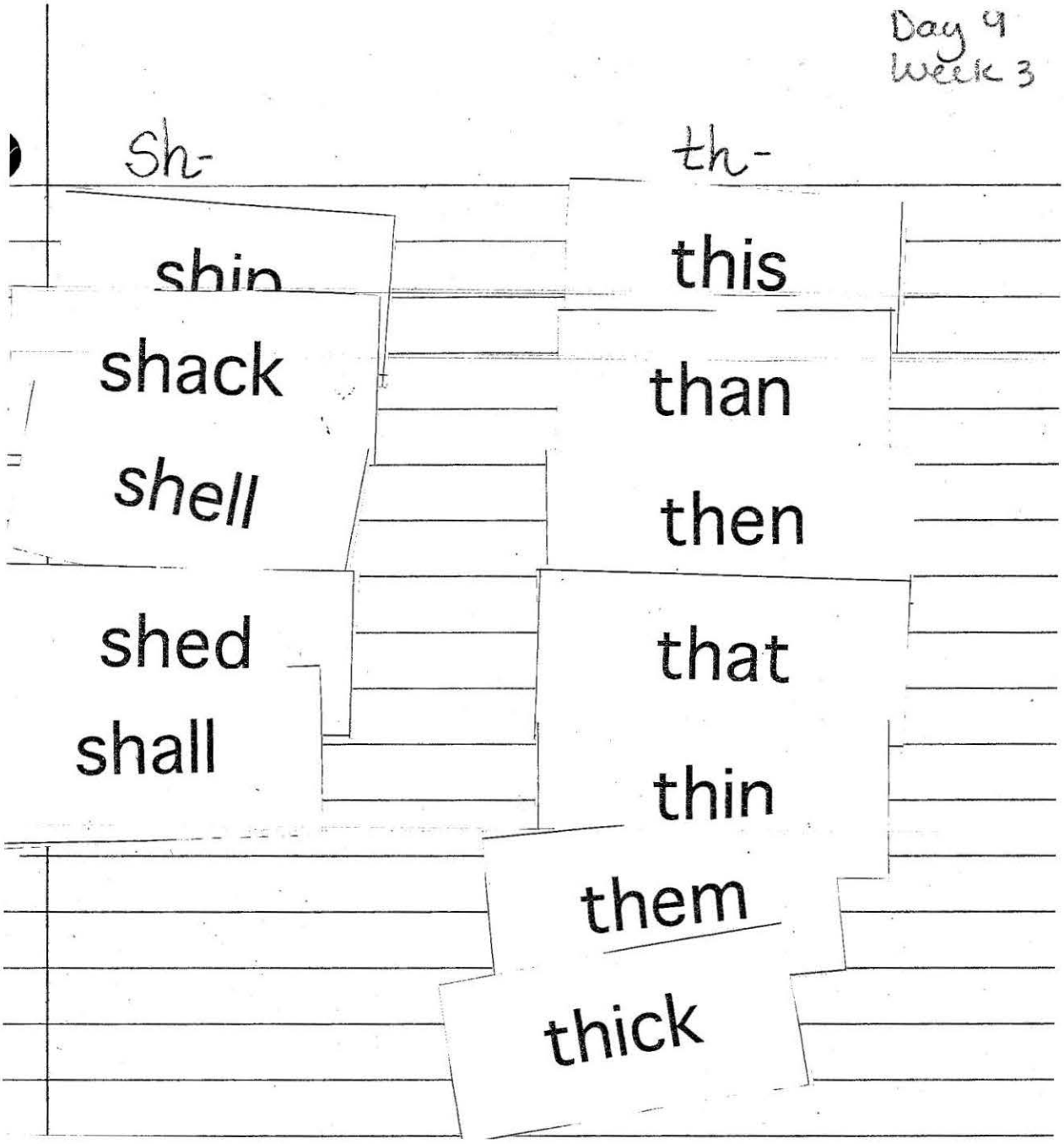
Day 8
iPad Words

Categories #1 people	#2 animals	#3 triple bends
trim ✓	slug ✓	sculpt ur→o/✓
twins ✓	clam ✓	strep ✓ ✓
wept p→g/✓	flap ✓	splat ✓
trip ✓	trot ✓	sprint ✓
gift ✓	yelp ✓	split ✓
hunt ✓	tusk ✓	strum ✓
glad glab→ ✓	frog ✓	strip ✓
grill ✓	crab ✓	
band banb/✓	hump ✓	
drop ✓	pant ✓	
film l→m/✓	stag ✓	
skit K→c/✓	croc c→k/✓	

* didn't use double letter feature
* asked why they needed a kin skit

Appendix LL

Student's Word Sort Day 9



Appendix MM

Examiner's Notes from Word Sort Day 9

Day 9

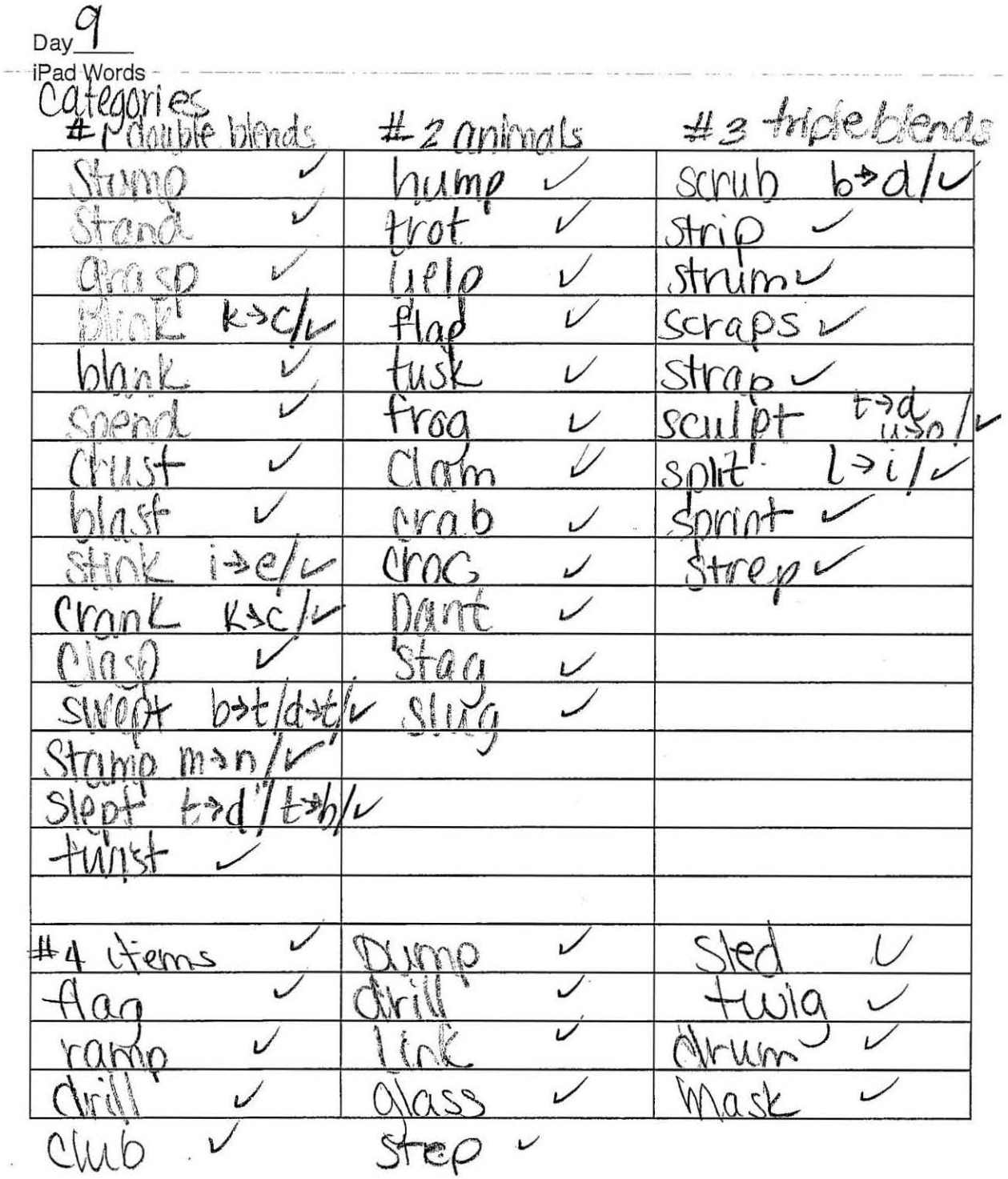
Word Sort beginning of words sh- th-

this	✓	
than	✓	
Ship	✓	
then	✓	
that	✓	
Shack	✓	
Shell	✓	
thin	✓	
Shed	✓	
them	✓	
thick	✓	
Shall	✓	

*reviewed sounds 4min

Appendix NN

Examiner's Notes from iPad Words Day 9



Day 9

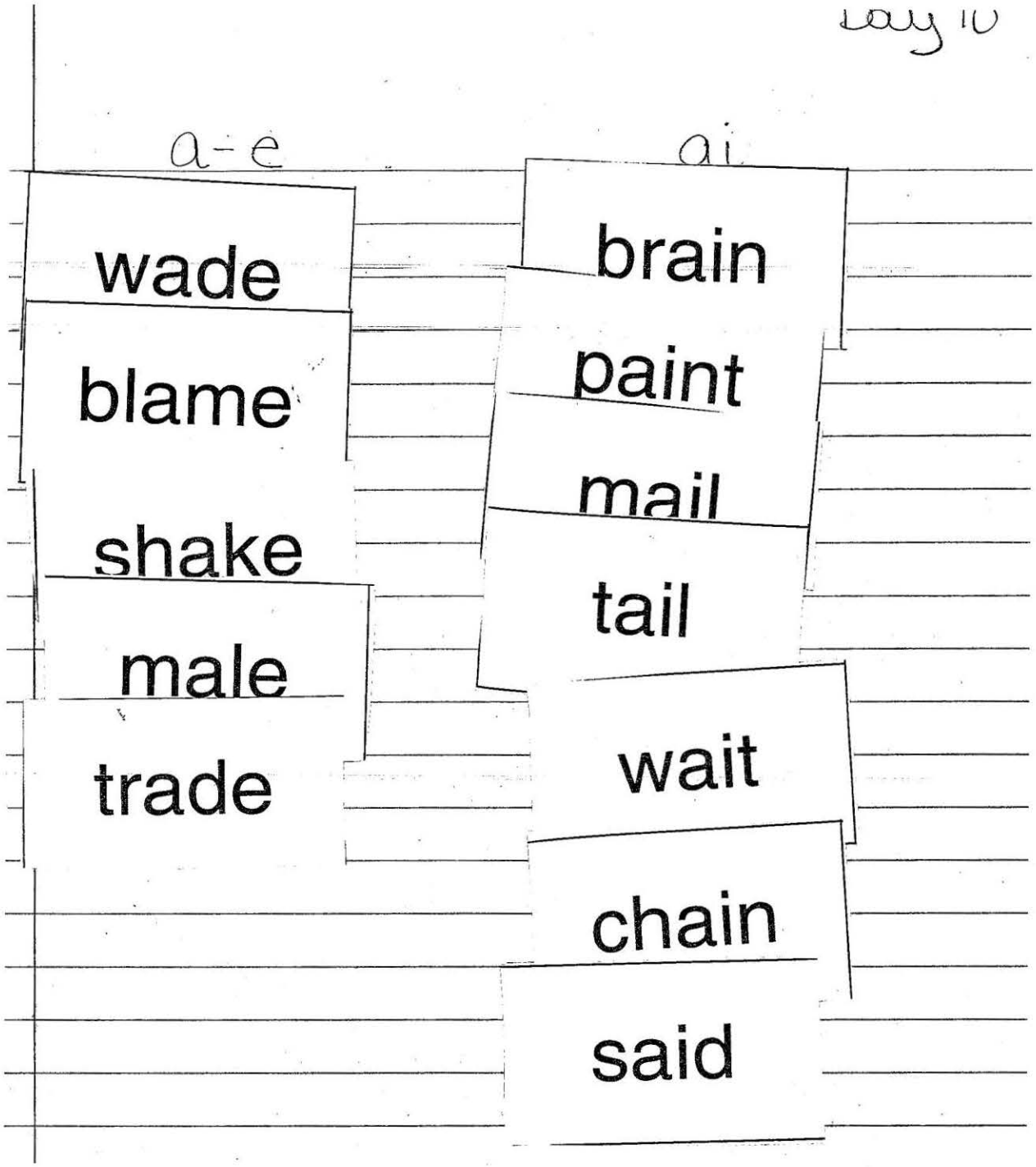
iPad Words

Categories

#1 Double blends	#2 animals	#3 triple blends
Stump ✓	hump ✓	scrub b→d/✓
Stand ✓	trot ✓	strip ✓
grasp ✓	yelp ✓	strum ✓
Blink k→c/✓	flap ✓	scraps ✓
blank ✓	tusk ✓	strap ✓
spend ✓	frog ✓	sculpt t→d use o/✓
crust ✓	clam ✓	split l→i/✓
blast ✓	crab ✓	sprint ✓
stink i→e/✓	croc ✓	strep ✓
crank k→c/✓	dart ✓	
clasp ✓	stag ✓	
swept b→t/d→t/✓	slug ✓	
stamp man/✓		
slept t→d"/t→h/✓		
twist ✓		
#4 items ✓	pump ✓	sled ✓
flag ✓	drill ✓	twig ✓
ramp ✓	link ✓	drum ✓
drill ✓	glass ✓	mask ✓
club ✓	step ✓	

Appendix OO

Student's Word Sort Day 10



Appendix PP

Examiner's Notes from Word Sort Day 10

Day 10

Word Sort a-e or ai words

Wade	✓	
brain	✓	
blame	✓	
male	✓	
Shake	✓	
paint	✓	
trade	✓	
mail	✓	
tail	✓	
wait	✓	
Chain	✓	
said	sad	✓

*explained the letter sorts
*sound out many of the words
+explained Difference betw. male & mail
read words again after sort

Appendix QQ

Examiner's Notes from iPad Words Day 10

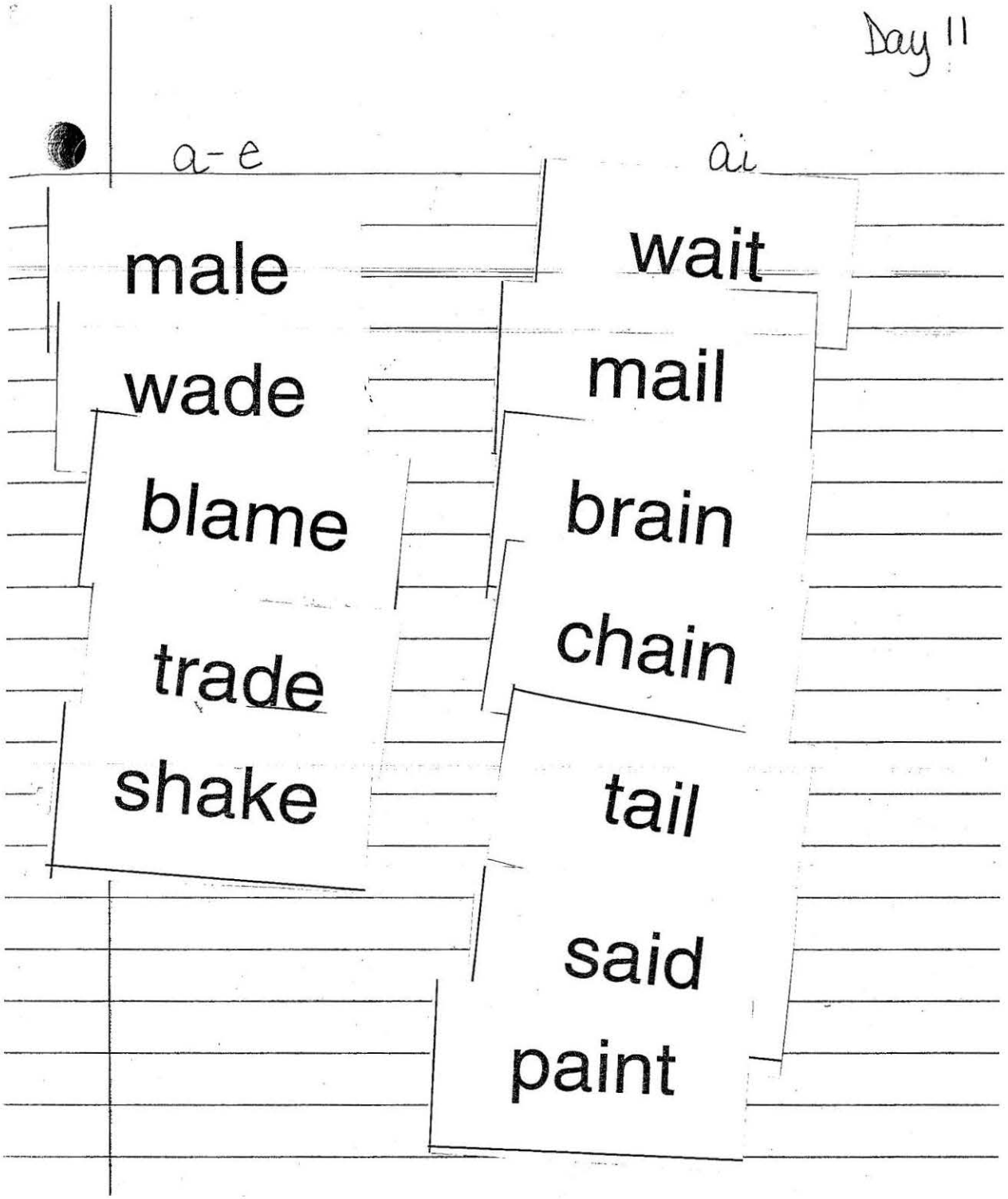
Day 10
iPad Words

Categories ± Animals	#2 triple blend	# 3 items
slug ✓	scrub b→d/✓	twig ✓
flap ✓	split ✓	glass ✓
croc ✓	sculpt t→d w→o/✓	step ✓
pantr	strum ✓	flag ✓
yelp ✓	sprint ✓	sled ✓
crab b→d/✓	strap ✓	club ✓
clam ✓	splat ✓	ramp ✓
stag ✓	scraps ✓	mask ✓
frog ✓	strip ✓	drum ✓
trot ✓	stre[illegible] ✓	pump ✓
tusk k→c/✓		link ✓
hump ✓		drill ✓

*Letter hint turned off on App

Appendix RR

Student's Word Sort Day 11



Appendix SS

Examiner's Notes from Word Sort Day 11

Day 11

Word Sort a-e ai words

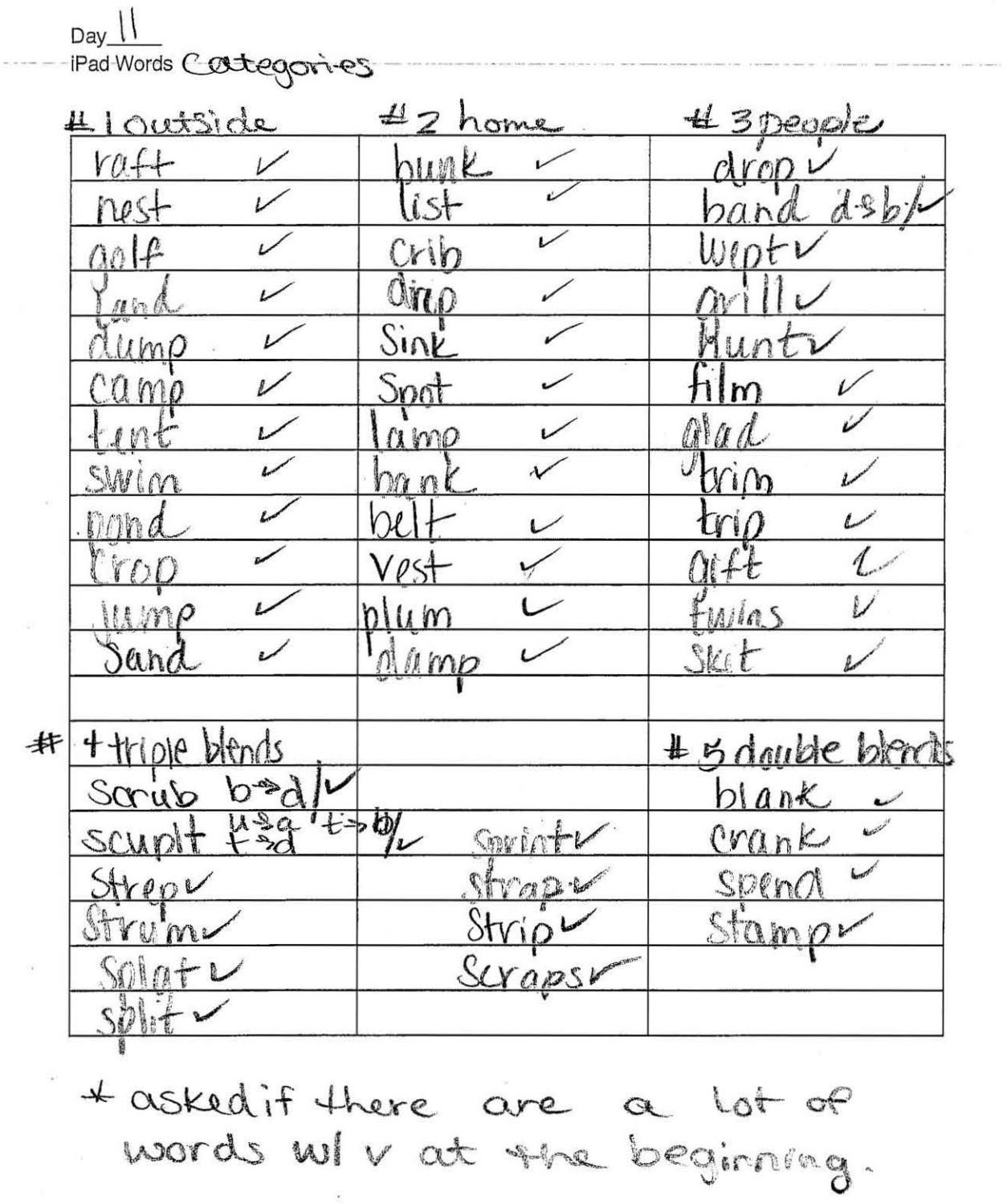
male,	✓	
wade	✓	
wait	✓	
brain	✓	
chain	✓	
blame	✓	
trade	✓	
tail	✓	
Shake	✓	
Said	✓	
paint	✓	

Stated to use mail in a sent instead of mate -self corrected

lemin.

Appendix TT

Examiner's Notes from iPad Words Day 11



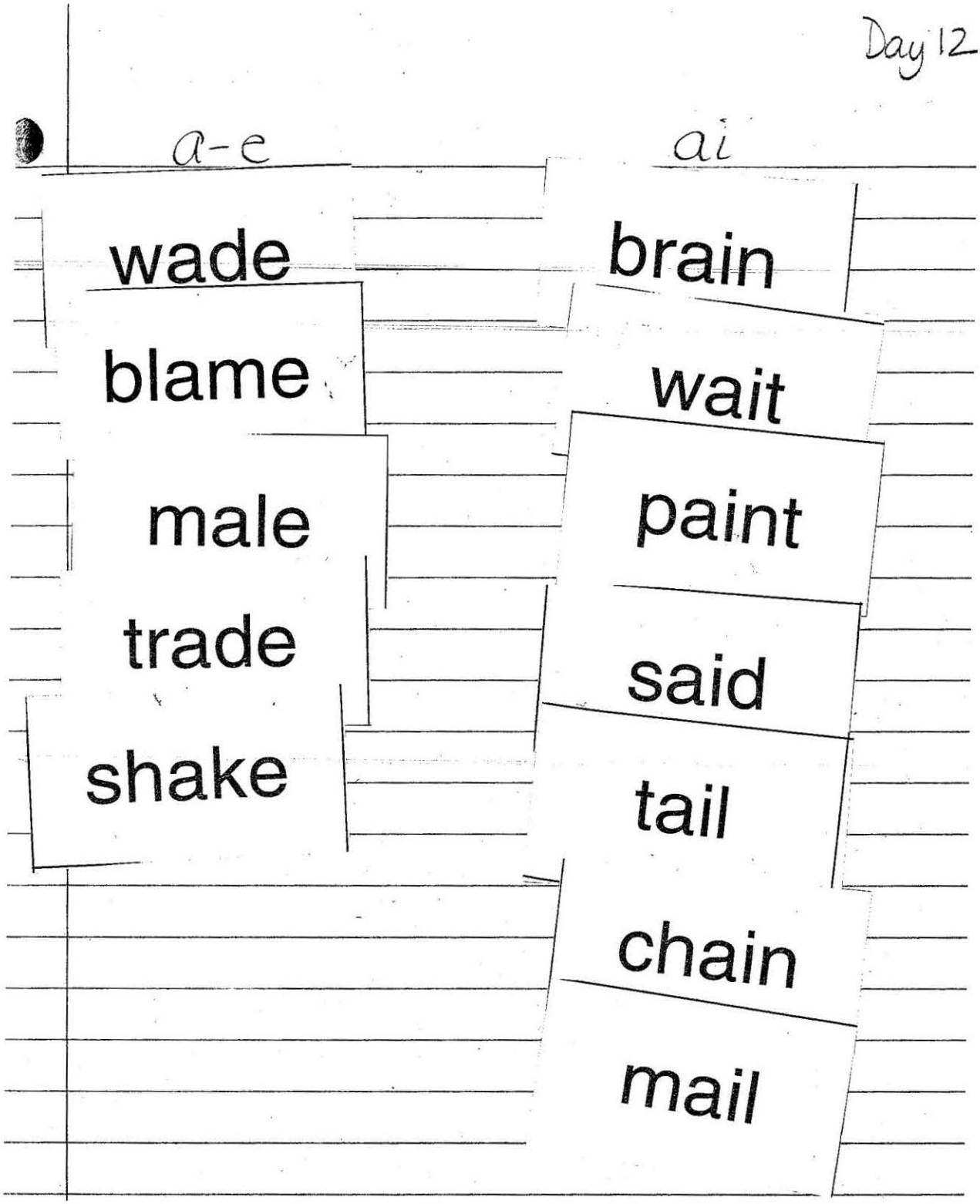
Day 11
iPad Words Categories

#1 outside	#2 home	#3 people
raft ✓	bunk ✓	drop ✓
nest ✓	list ✓	band d-b ✓
golf ✓	crib ✓	wipt ✓
Yard ✓	dimp ✓	grill ✓
dump ✓	Sink ✓	Hunt ✓
camp ✓	Spot ✓	film ✓
tent ✓	lamp ✓	glad ✓
swim ✓	bank ✓	trim ✓
pond ✓	belt ✓	trip ✓
trop ✓	Vest ✓	gift ✓
Jump ✓	plum ✓	twins ✓
Sand ✓	dump ✓	Skit ✓
#4 triple blends		#5 double blends
Scrub b⇒d ✓		blank ✓
sculpt u⇒a t⇒d t⇒b ✓	Sprint ✓	crank ✓
Strep ✓	strap ✓	spend ✓
Stru'm ✓	Strip ✓	Stamp ✓
Splat ✓	Scraps ✓	
split ✓		

* asked if there are a lot of words w/ v at the beginning.

Appendix UU

Student's Word Sort Day 12



Appendix VV

Examiner's Notes from Word Sort Day 12

Day 12

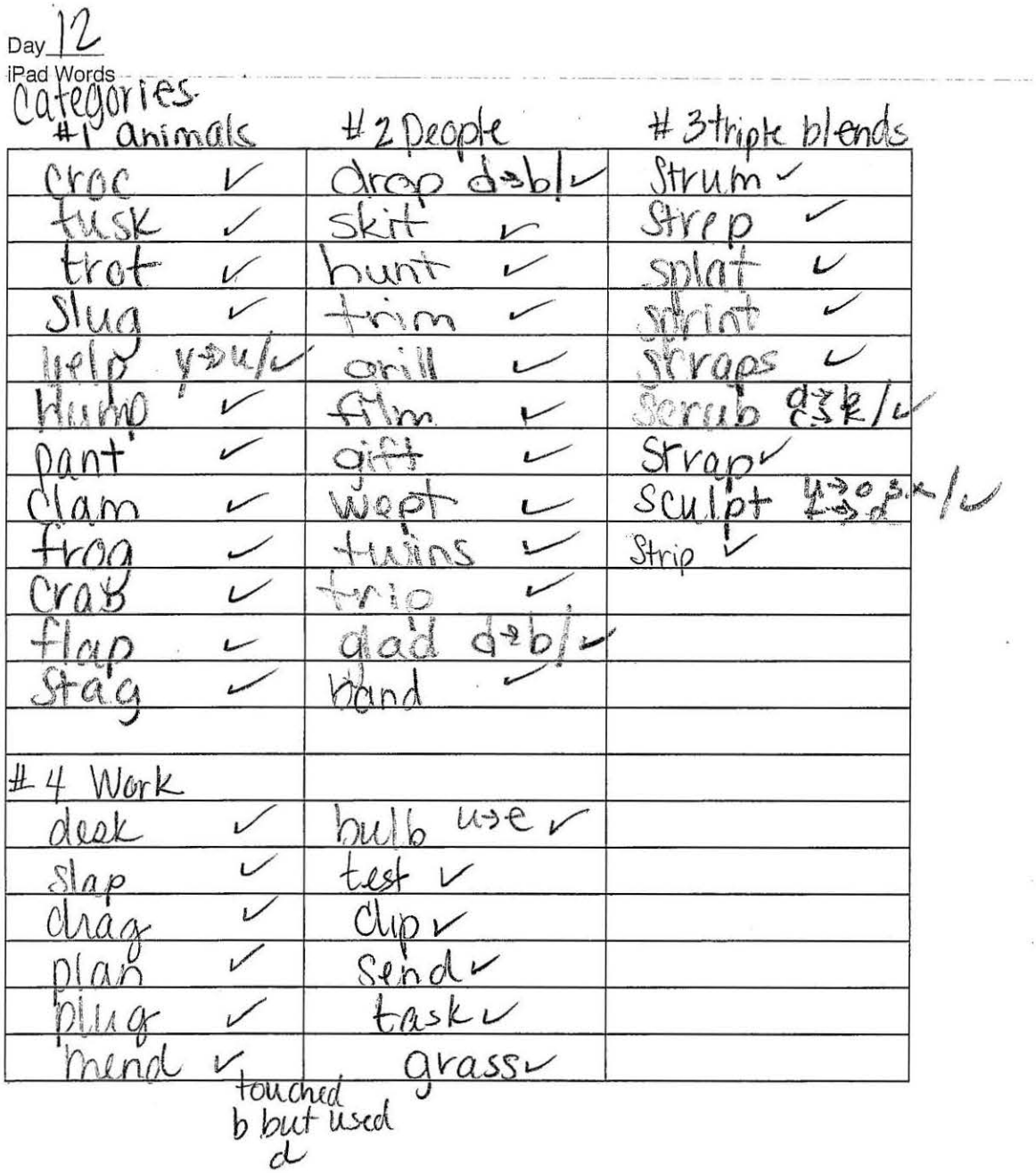
Word Sort ai & a-e words

brain	✓	
wade	✓	
wait	✓	
blame	✓	
male	✓	
paint	✓	
said	✓	
tail	✓	
chain	✓	
trade	✓	
mail	✓	
shake	✓	

4 minutes.
Used words in a sentence, also reviewed word at end.

Appendix WW

Examiner's Notes from iPad Words Day 12



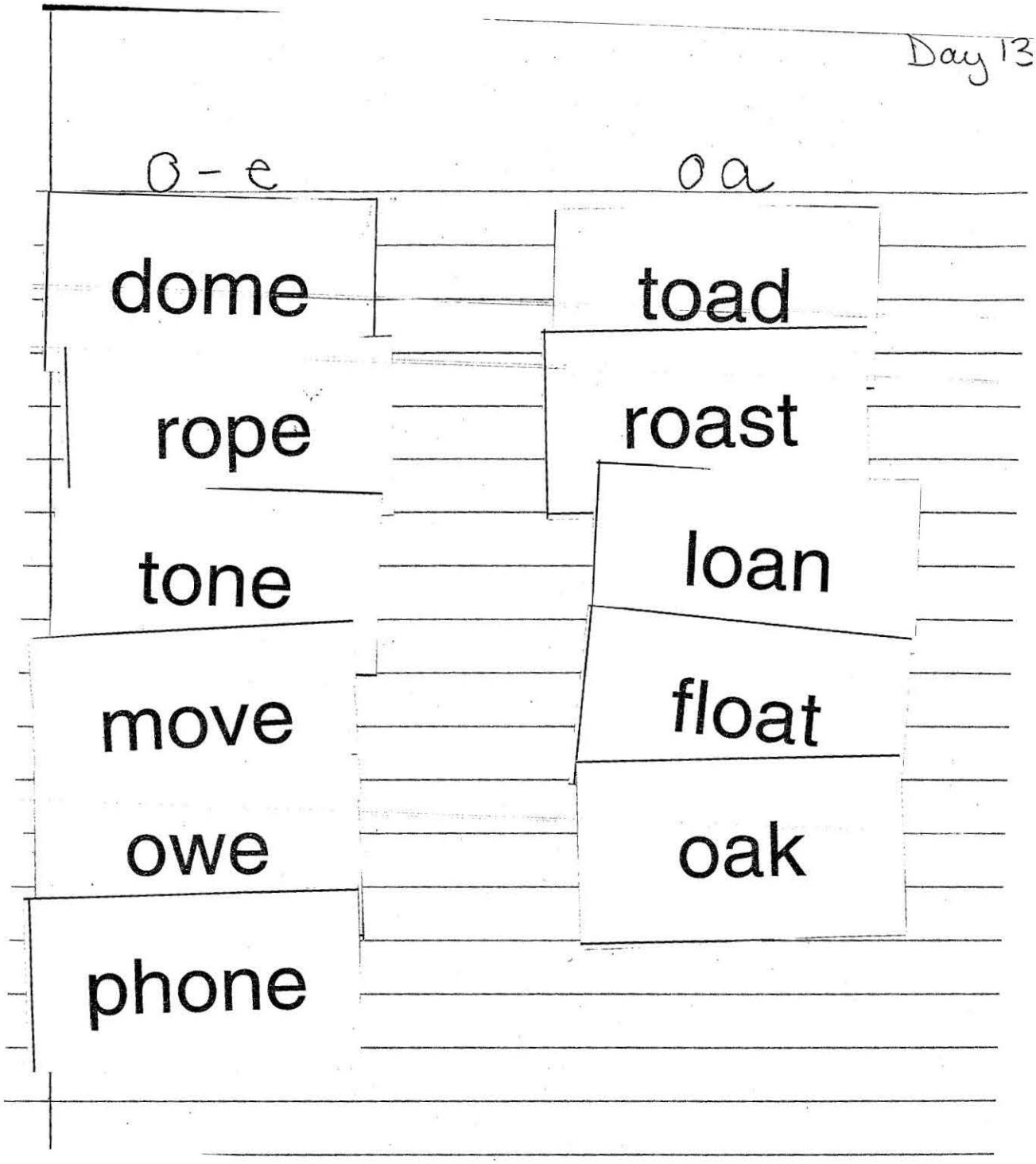
Day 12
iPad Words
Categories

#1 animals	#2 People	#3 triple blends
croc ✓	drop d→b ✓	strum ✓
tusk ✓	skit ✓	strep ✓
trot ✓	hunt ✓	splat ✓
slug ✓	trim ✓	sprint ✓
whelp y→w ✓	drill ✓	straps ✓
whump ✓	film ✓	scrub dʒ→k ✓
pant ✓	gift ✓	strap ✓
clam ✓	wept ✓	sculpt ʌ→ɔ p→k ✓
frog ✓	twins ✓	strip ✓
crab ✓	trio ✓	
flap ✓	glad d→b ✓	
stag ✓	hand ✓	
#4 Work		
desk ✓	bulb u→e ✓	
slap ✓	test ✓	
drag ✓	clip ✓	
plan ✓	send ✓	
plug ✓	task ✓	
mend ✓	grass ✓	

touched b but used d

Appendix XX

Student's Word Sort Day 13



Appendix YY

Examiner's Notes from Word Sort Day 13

Day 13

Word Sort o-e & oa words 7minutes

dome	✓	
rope	✓	
tone	✓sounded	under breathe
toad	✓	
roast	✓	
move	✓	
loan	✓	
owe	✓	
phone	✓	
float	✓	
oak	Okay	✓

Took time to sound out words.

Appendix ZZ

Examiner's Notes from iPad Words Day 13

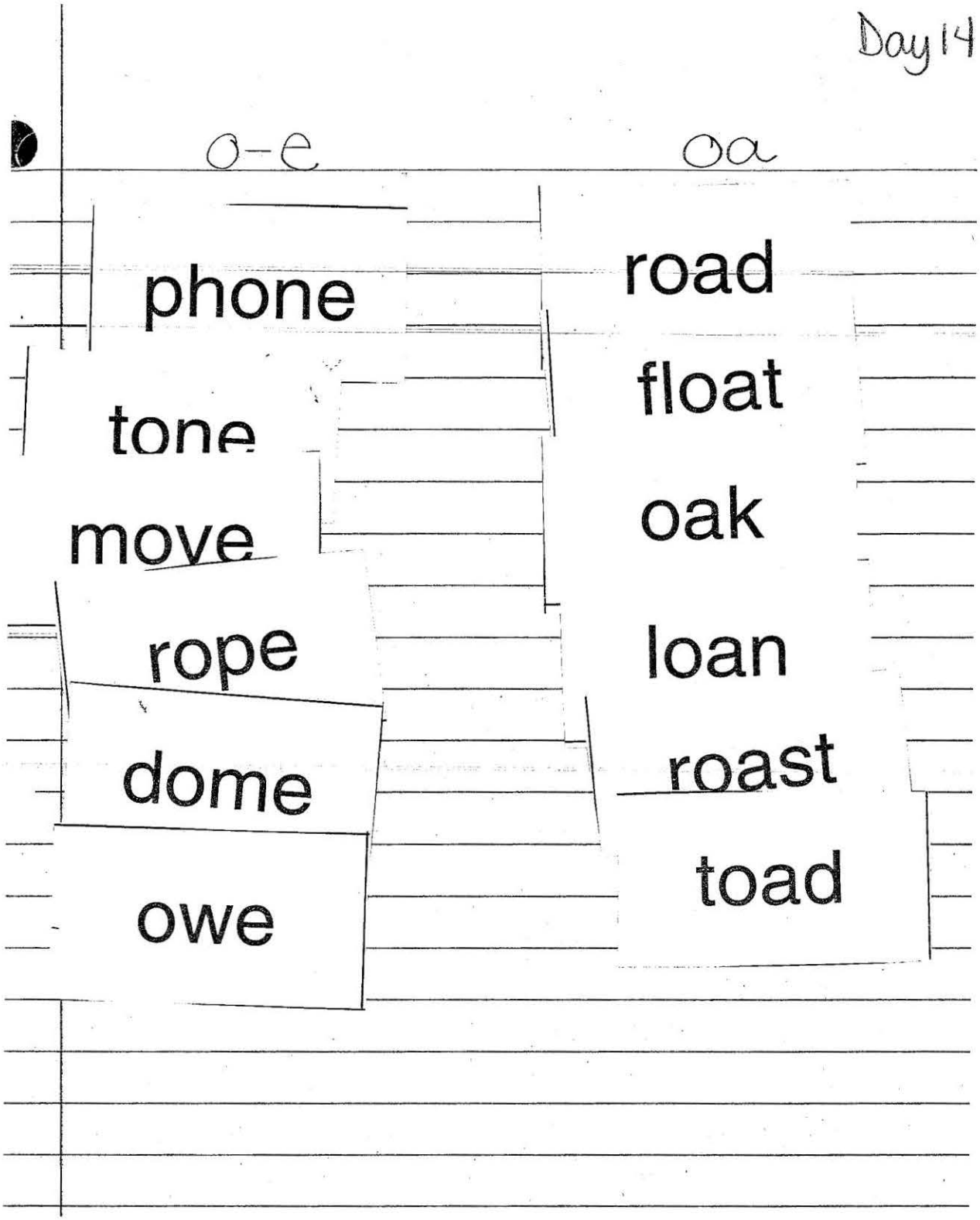
Day 13
iPad Words
Categories

#1 animals	#2 double blend	#3 people
yelp ✓	crust	glad ✓
stag ✓	twist	drop ✓
part ✓	stand	gift ✓
tusk ✓	spend	
flap ✓	slept	
slug ✓	clasp	
croc ✓	stamp	
trot ✓	blast t→s/✓	
clam ✓	blink i→o→e/✓	
frog ✓	swept t→d/b/✓	
hump ✓	blank ✓	
crab ✓	stump ✓	
	stink i→o→e→a/✓	
	grasp ✓	
	crank ✓	

talked blink & swept out

Appendix AAA

Student's Word Sort Day 14



Appendix BBB

Examiner's Notes from Word Sort Day 14

Day 14

Word Sort o-e words & oa words

road	✓	
phone	✓	
float	✓	
tone	✓	
oak	✓	
move	movie	✓
loan	✓	
roast	✓	
rope	✓	
dome	✓	
toad	✓	
Owe	owl	✓

Went through words after sort was done. 5min.

Appendix CCC

Examiner's Notes from iPad Words Day 14

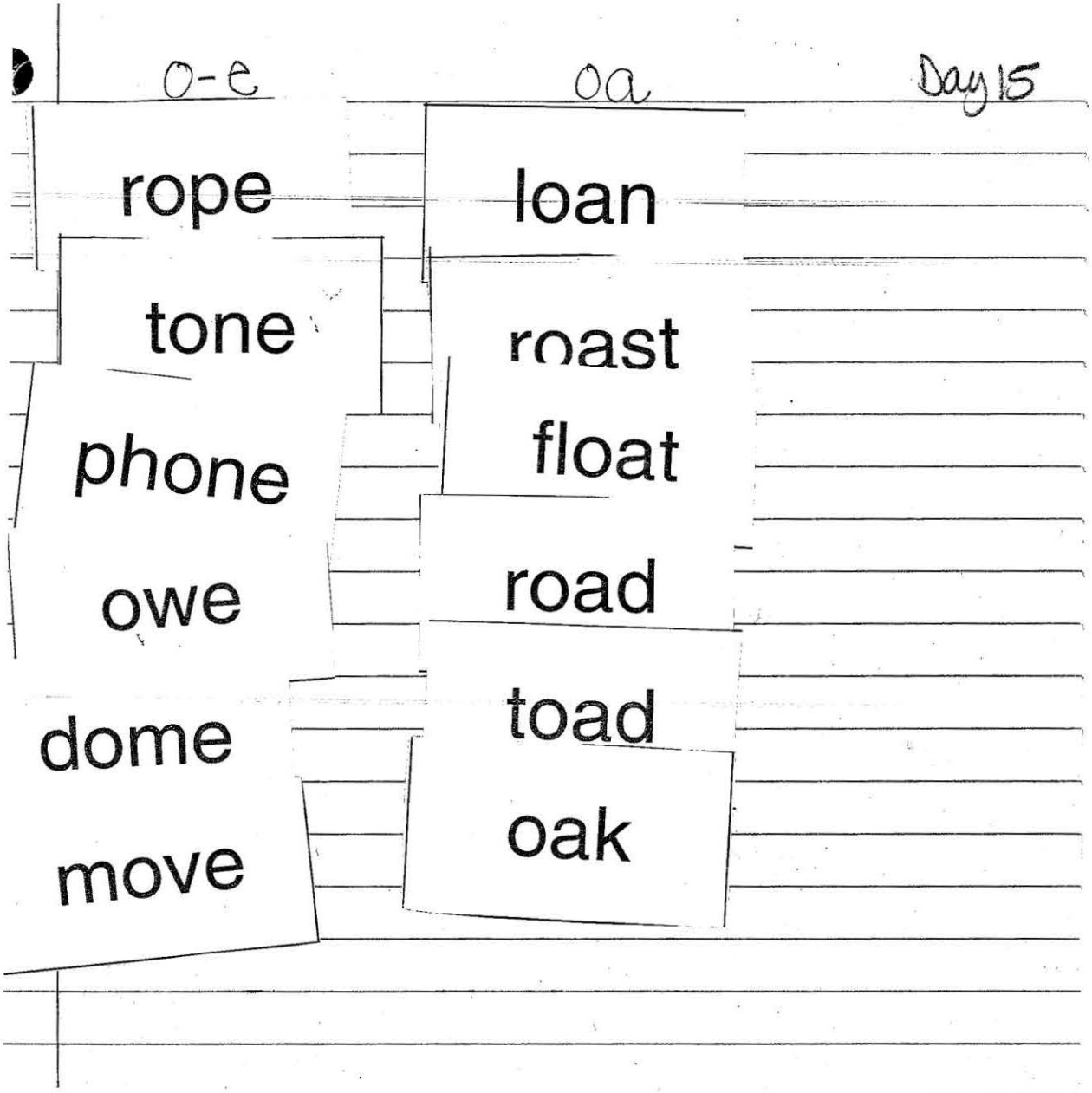
Day 14
iPad Words Categories

#1 animals	#2 items	*3 triple blend
Slug ✓	glass ✓	Scraps p→b s→d/✓
Flap ✓	step ✓	Sprint ✓
frog ✓	mask ✓	Strep ✓
trot ✓	drill ✓	Strip ✓
hump ✓	drum ✓	Scrub u→e ✓
mart ✓	Sled ✓	Strap ✓
Flam ✓	club b→d/✓	split ✓
yelp ✓	link ✓	Scrupltt→d/✓
Musk k→c/✓	pump ✓	splat ✓
Crab ✓	twig ✓	strum ✓
croc ✓	ramp ✓	
Stag ✓		
#4 home		
Crib ✓	damp ✓	
drip ✓	list ✓	
Sink k→c/✓	belt ✓	
Vest	hunk ✓	
Plum ✓	lamp ✓	
bank ✓		

*hit word again to hear sound

Appendix DDD

Student's Word Sort Day 15



Appendix EEE

Examiner's Notes from Word Sort Day 15

Day 15

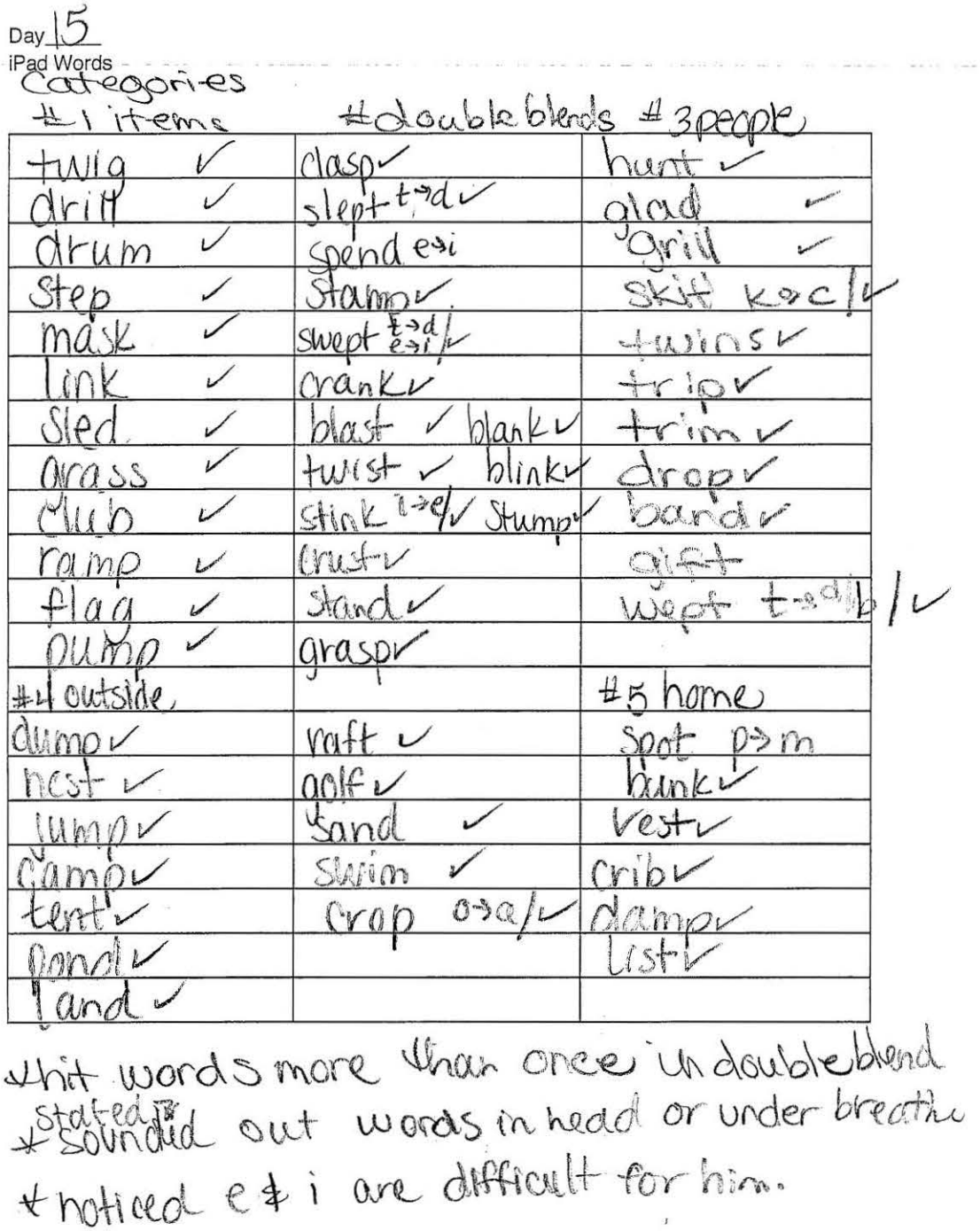
Word Sort

loan	✓	
roast	✓	
rope	✓	
float	✓	
tone	✓	
phone	✓	
road	✓	
toad	✓	
oat	✓	
owe	✓	
dome	✓	
move	✓	

reread words when done - all correct

Appendix FFF

Examiner's Notes from iPad Words Day 15



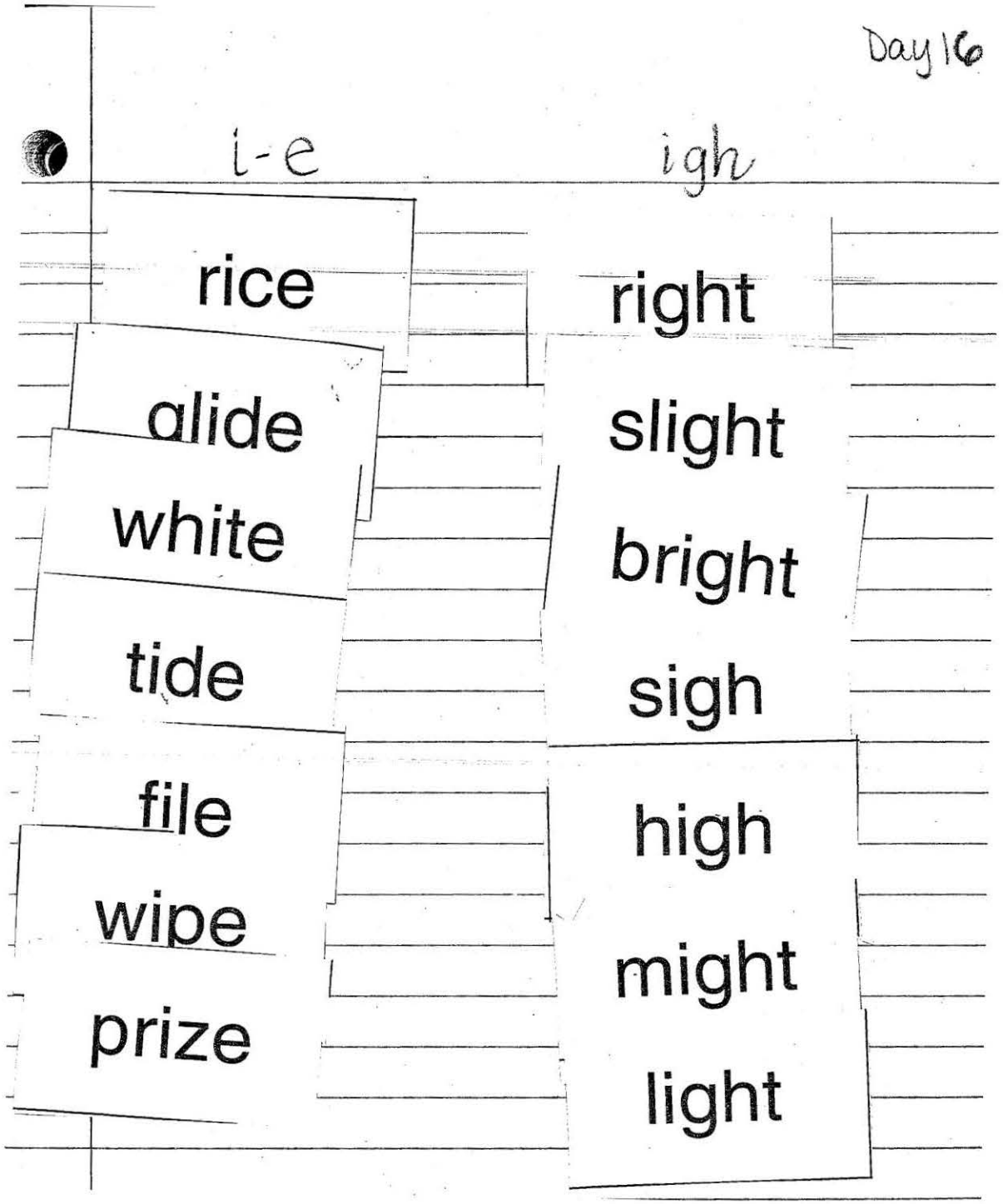
Day 15
iPad Words
Categories

#1 items	#double blends	#3 people
twig ✓	clasp ✓	hunt ✓
drill ✓	slept t→d ✓	glad ✓
drum ✓	spend e→i	grill ✓
step ✓	stamp ✓	skit k→c ✓
mask ✓	swept t→d e→i ✓	twins ✓
link ✓	crank ✓	trip ✓
sled ✓	blast ✓ blank ✓	trim ✓
grass ✓	twist ✓ blink ✓	drop ✓
club ✓	stink i→e ✓ stump ✓	band ✓
ramp ✓	crust ✓	gift
flag ✓	stand ✓	wept t→d b ✓
pump ✓	grasp ✓	
#4 outside		#5 home
dump ✓	raft ✓	spot p→m
nest ✓	golf ✓	hunk ✓
jump ✓	sand ✓	vest ✓
camp ✓	swim ✓	crib ✓
tent ✓	crop o→a ✓	damp ✓
pond ✓		list ✓
land ✓		

*hit words more than once in double blend
*stated & sounded out words in head or under breath
*noticed e & i are difficult for him.

Appendix GGG

Student's Word Sort Day 16



Appendix HHH

Examiner's Notes from Word Sort Day 16

Day 16

Word Sort i-e & igh words

rice	✓	
right	✓	
glide	✓	
Slight	asked for help	
White	✓	
bright	✓	
tide	✓	
file	stated fall	✓
wipe	✓	
sigh	✓	
high	✓	
might	✓	
prize	✓	
flight	✓	

Sounded out words

reread words.

8min.

Appendix III

Examiner's Notes from iPad Words Day 16

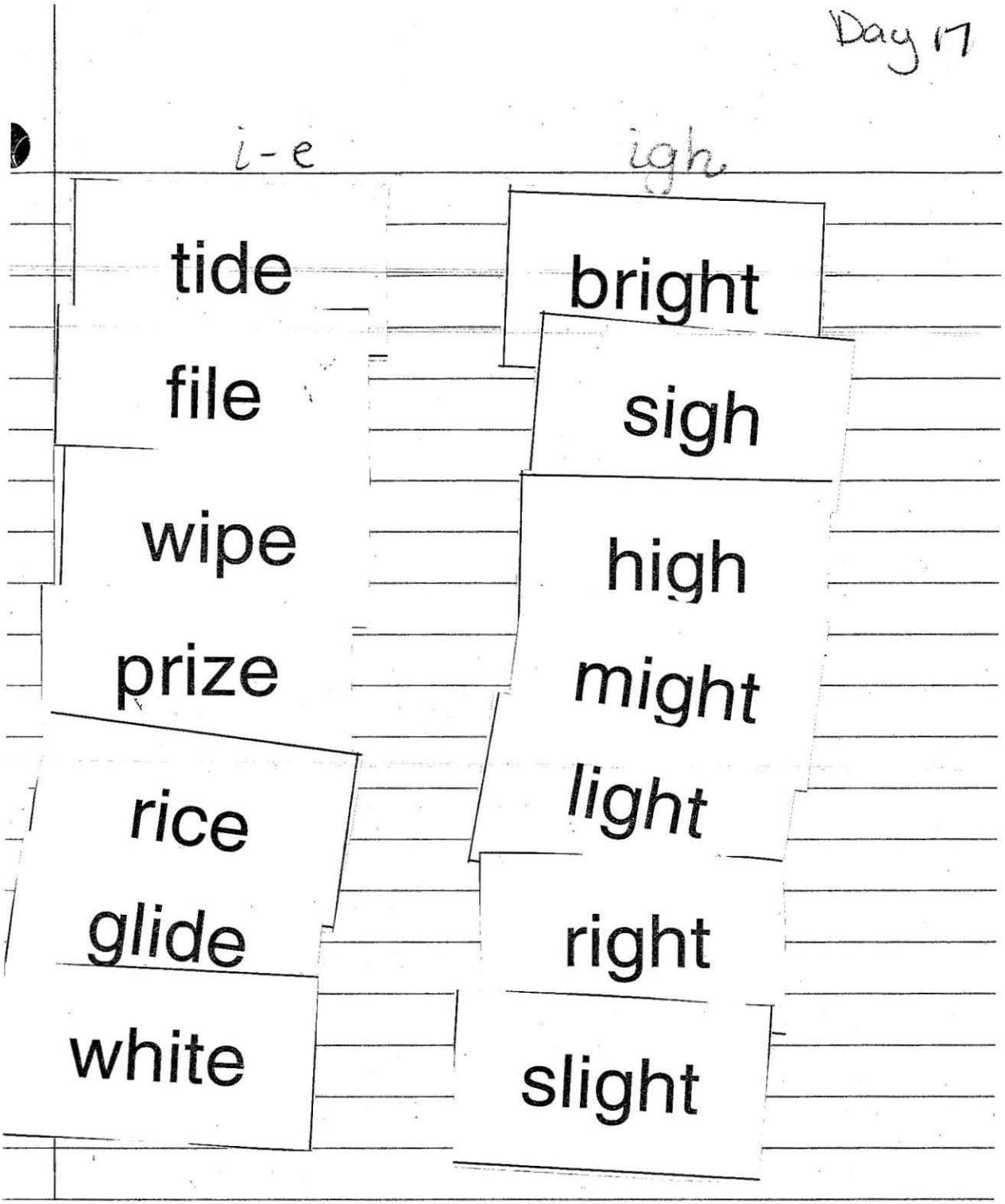
Day 16
iPad Words

#1 triple blends	#2 Hems	#3 double blends
Strip ✓	twig ✓	crank ✓
sculpt t→d/ ✓	glass ✓	stomp ✓
Scrub ✓	sled l→e/ ✓	spend ✓
Strap ✓	drum ✓	clasp ✓
Sprint ✓	drill ✓	blast t→i/ ✓
Strep ✓	club ✓	stump ✓
Split ✓	flag ✓	swept ✓
Scraps ✓	step ✓	blink ✓
Strum ✓	link ✓	stand ✓
splat ✓	pump ✓	grasp ✓
	mask ✓	blank ✓
	ramp ✓	slept t→d/b/ ✓
		stink ✓
		crest ✓
		twist ✓

Student asked when to use c vs. S.

Appendix JJJ

Student's Word Sort Day 17



Appendix KKK

Examiner's Notes from Word Sort Day 17

Day 17

Word Sort igh & i-e words

bright	✓	
tide,	✓	
file	✓	
sigh	✓	
high	✓	
wipe	✓	
mighty	✓	
prize	✓	
light	✓	
rice,	✓	
right	✓	
glide	gide	✓
Slight	✓	
White	✓	

+ Sound out words

* reread word at the end added + to sigh -> changed to sight

Appendix LLL

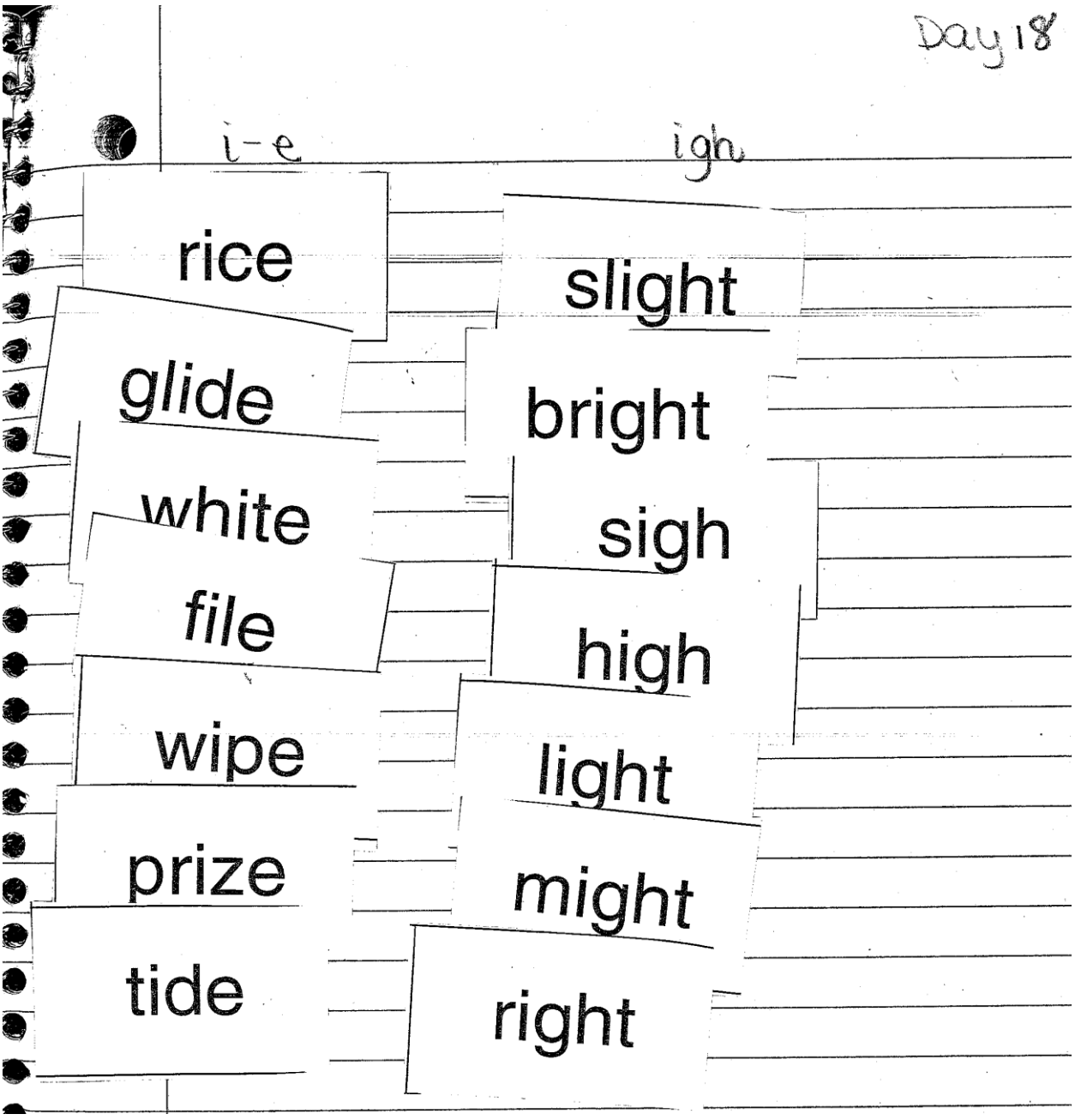
Examiner's Notes from iPad Words Day 17

Day 17
iPad Words Categories

#1 items	#2 people	#3 work
club ✓	wept ✓	drag ✓
sled ✓	gift ✓	bulb u→o
step ✓	skit ✓	clip ✓
flag ✓	grill ✓	desk ✓
ramp ✓	drop ✓	slap ✓
bump ✓	film ✓	plan ✓
glass ✓	trim ✓	test ✓
mask ✓	band ✓	send ✓
drum ✓	hunt ✓	grass ✓
link i→e/✓	twins ✓	plug
drill ✓	glad ✓	task ✓
		mend ✓
#4 animals.	crab ✓	#5 triple blends
hump ✓	clam ✓	scraps ✓ strip ✓
slug ✓	flap ✓	strep ✓ strum ✓
croc ✓	stag ✓	splat ✓ split ✓
pant ✓	trot ✓	sculpt u→o/✓
yelp ✓		scrub ✓
tusk ✓		strap ✓
frog ✓		sprint ✓

Appendix MMM

Student's Word Sort Day 18



Appendix NNN

Examiner's Notes from Word Sort Day 18

Day 18

Word Sort igh & i-e words

Slight	✓	
rice	✓	
glide	✓	
white	✓	
bright	✓	
file	✓	
sigh	✓	
high	✓	
wipe	✓	
prize	✓	
light	✓	
tide	✓	
might	✓	
right	✓	

Sounded out words bit faster than yesterday

reread words after sort

Appendix OOO

Examiner's Notes from iPad Words Day 18

Day 18
iPad Words categories

#1 home	#2 outside	#3 actions
plum ✓	tent ✓	snap ✓
lamp ✓	nest ✓	flip ✓
vest ✓	swim ✓	grab ✓
belt ✓	golf ✓	bend ✓
damp ✓	pond ✓	floss ✓
bunk ✓	crop ✓	dunk ✓
bank ✓	raft ✓	weld ✓
spot ✓	camp ✓	skip · k→c ✓
list ✓	land ✓	smell ✓
drip ✓	sand ✓	clap ✓
crib ✓	jump ✓	spin ✓
sink ✓	dump ✓	vest ✓
#4 animals		
crab ✓	slug ✓	
hump ✓	clam ✓	
pant ✓	flap ✓	
trot ✓	tusk ✓	
croc ✓	stag ✓	
frog ✓	yelp ✓	

Day 18

iPad Words

Categories Continued

#5 items	#6 People	
drill ✓	trip ✓	
flag ✓	hunt ✓	
grass ✓	wept ✓	
step ✓	twins ✓	
link ✓	gift ✓	
ramp ✓	glad ✓	
pump ✓	skip ✓	
twig ✓	grill ✓	
club b→d/✓	thin ✓	
drum ✓	film ✓	
sled ✓		
mask ✓		

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