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(54) **LITERACY SYSTEM**

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(57) **ABSTRACT**

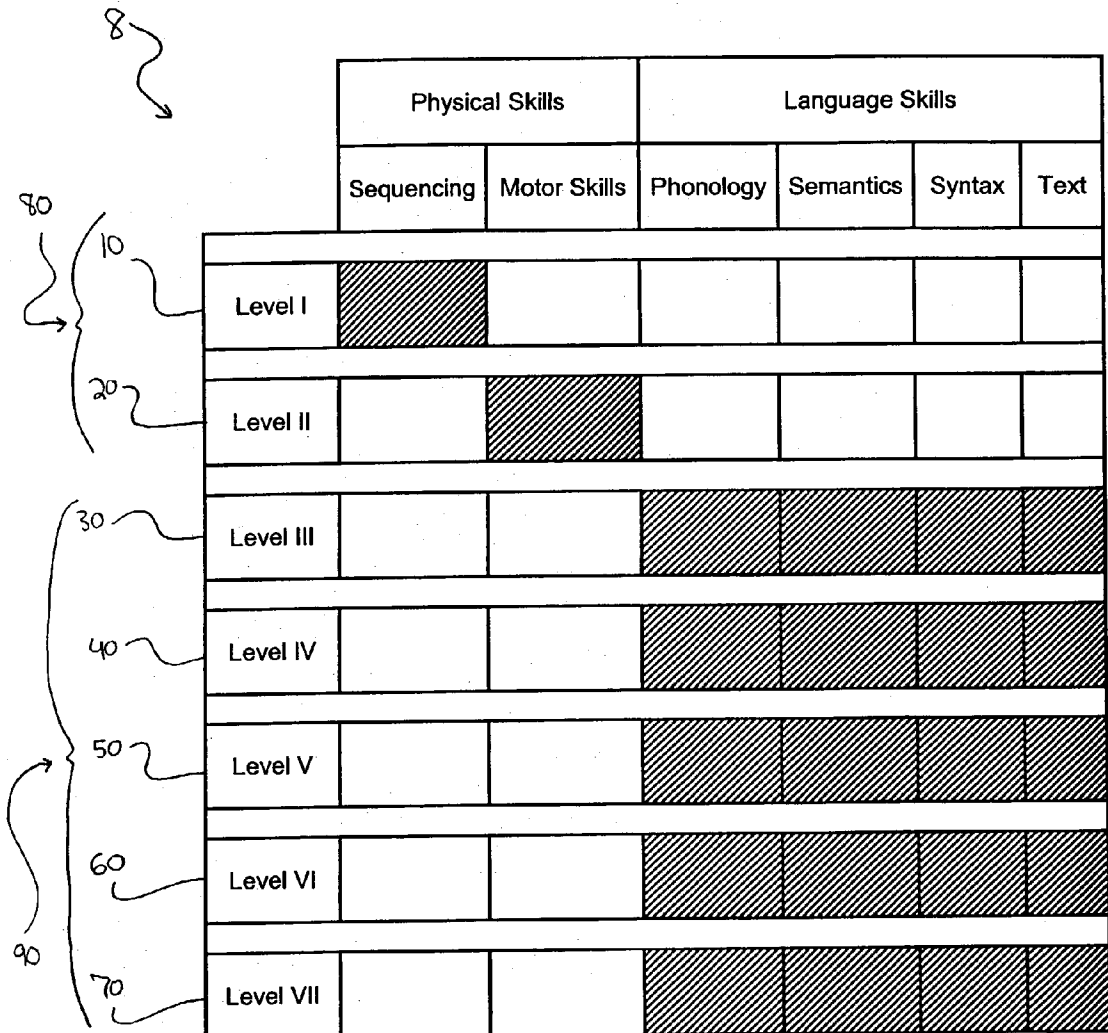
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Related U.S. Application Data

(60) Provisional application No. 60/362,749, filed on Mar. 7, 2002.

A literacy system provides teaching for reading and writing skills. In one embodiment, the literacy system may include exercises for teaching visual sequencing, motor skills, phonology, semantics, syntax, and text. The literacy system may have a pre-reading section, which includes exercises for developing visual sequencing skills and motor skills prior to teaching the skills of reading and writing words.



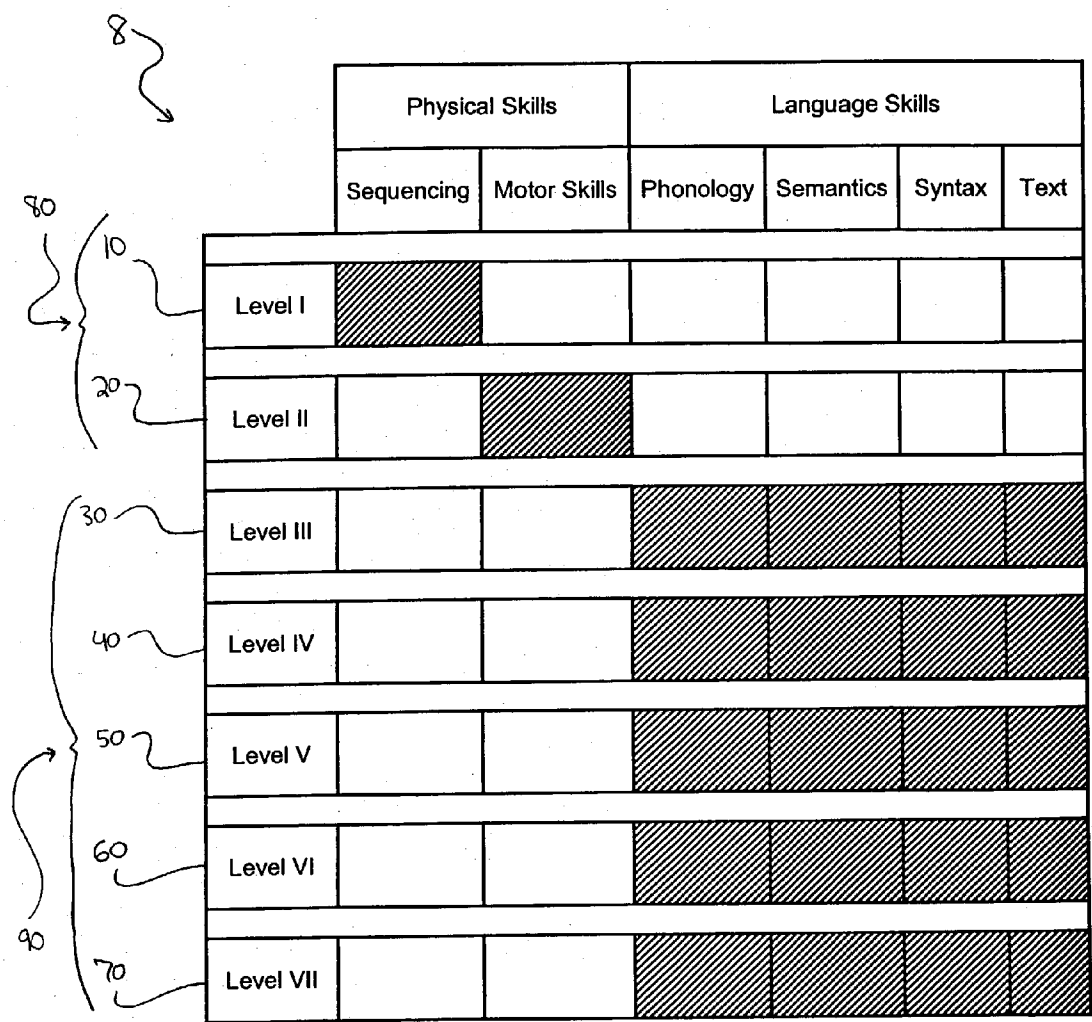


FIG. 1

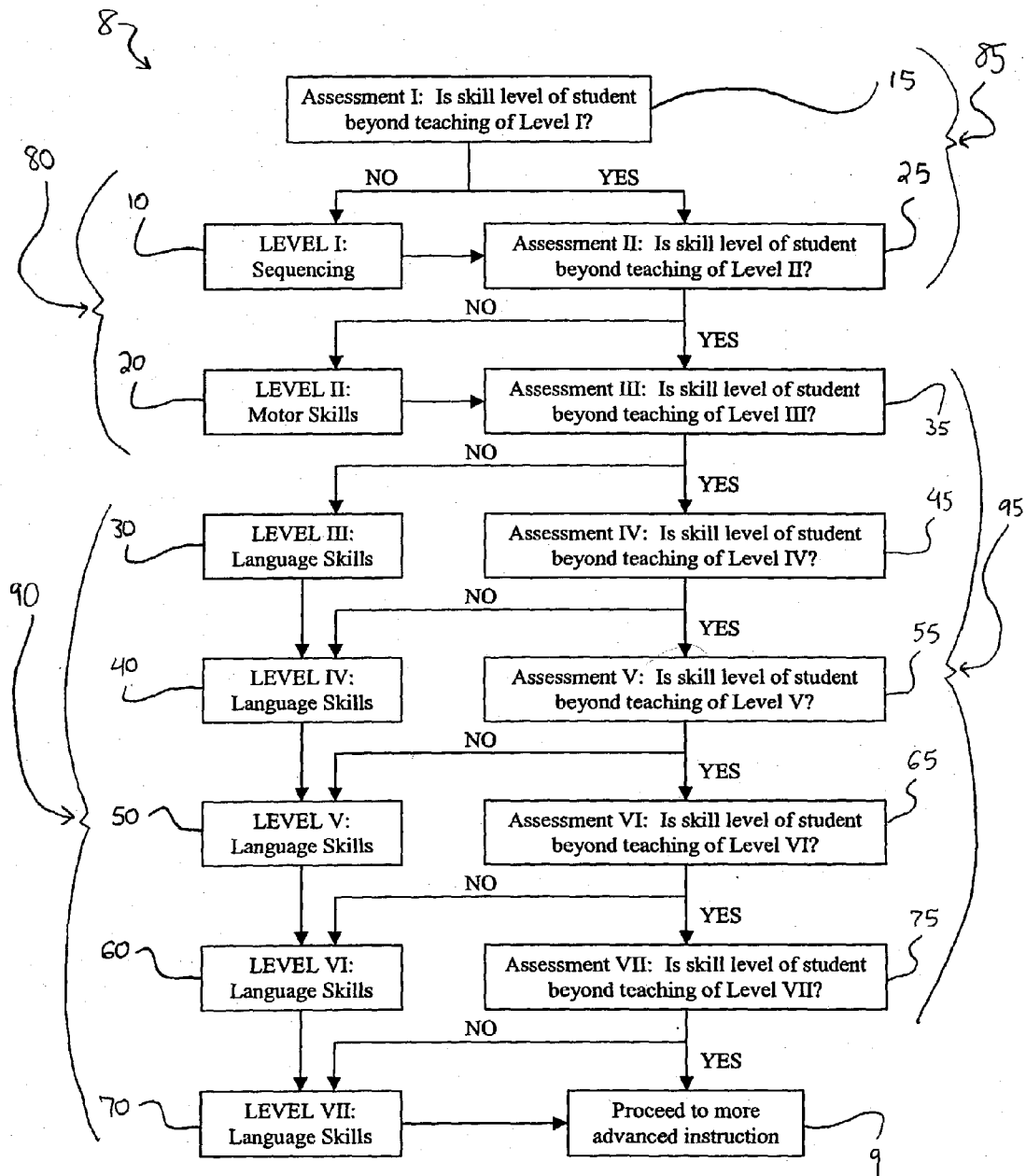


FIG. 2

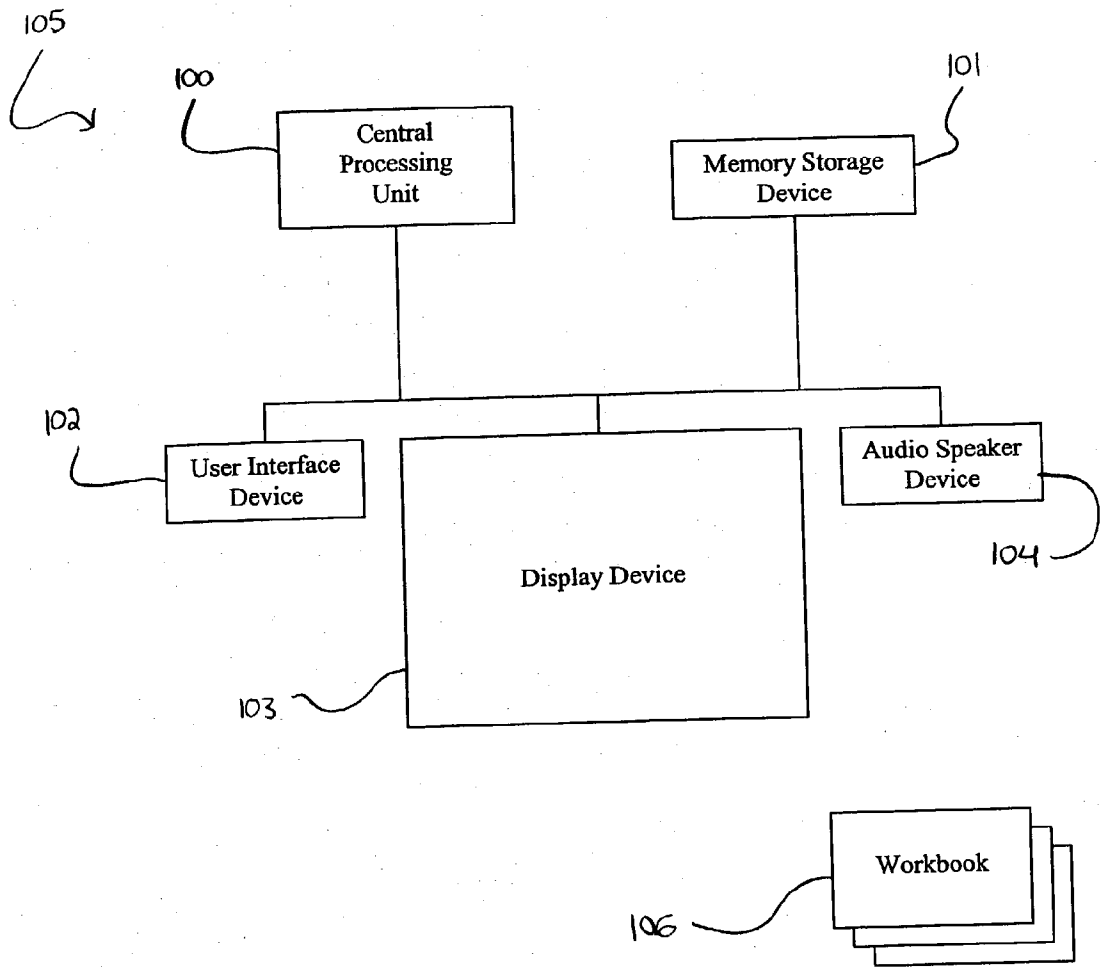
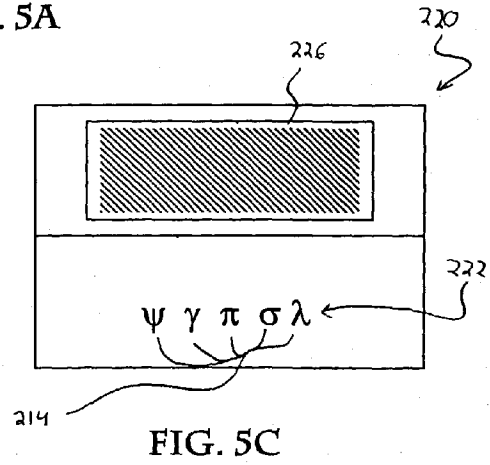
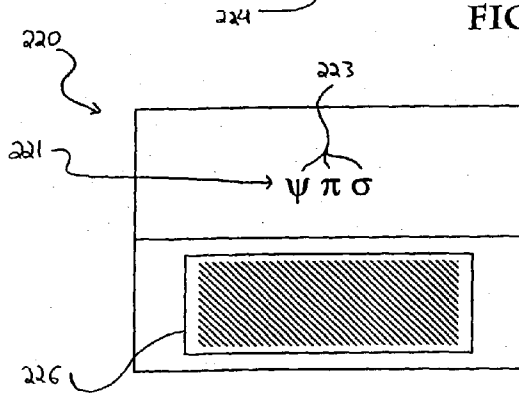
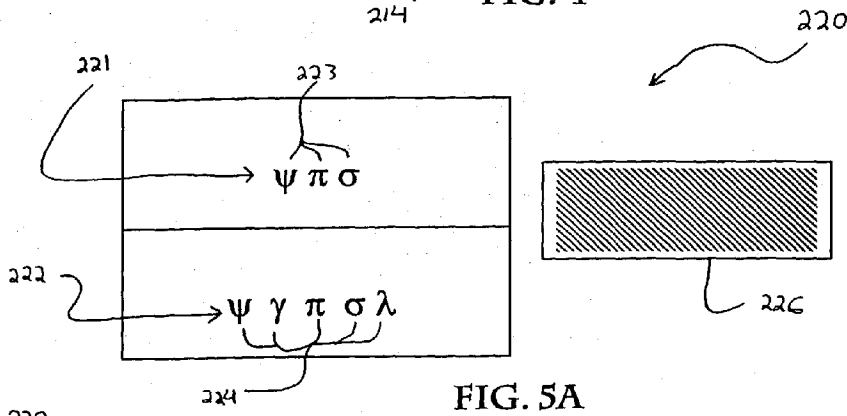
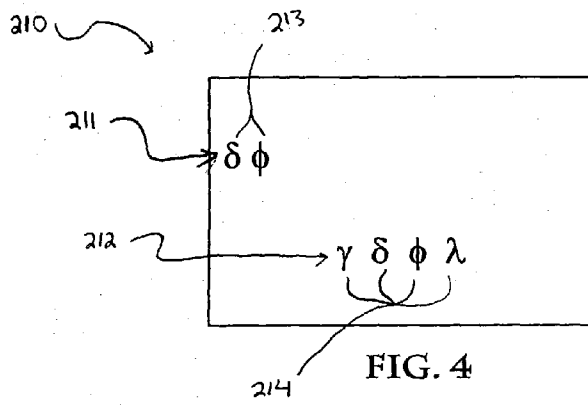


FIG. 3



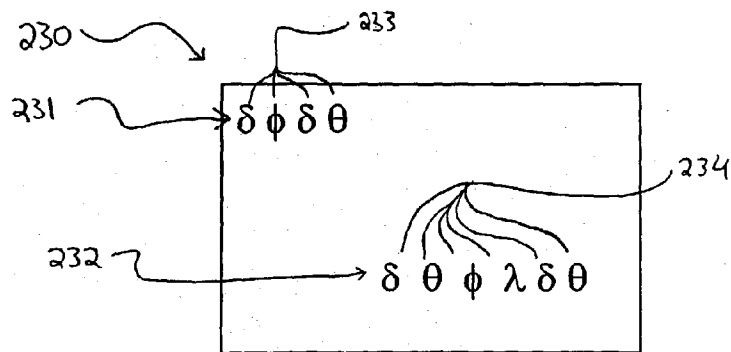


FIG. 6

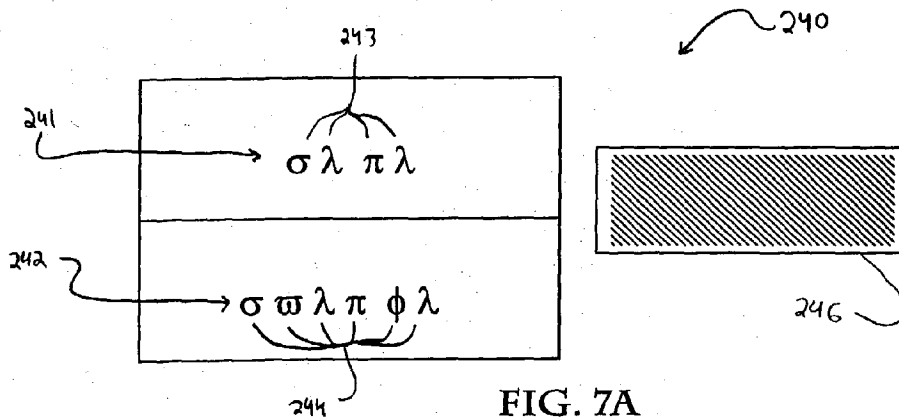


FIG. 7A

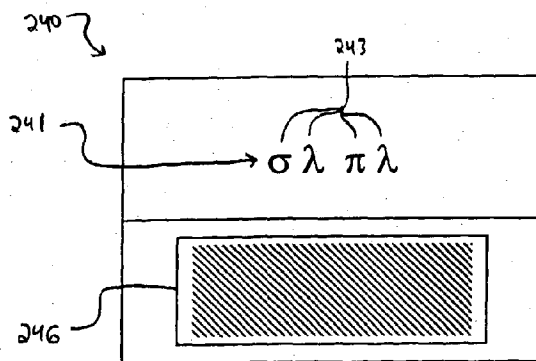


FIG. 7B

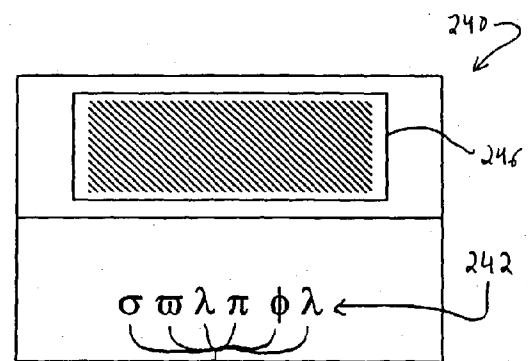


FIG. 7C

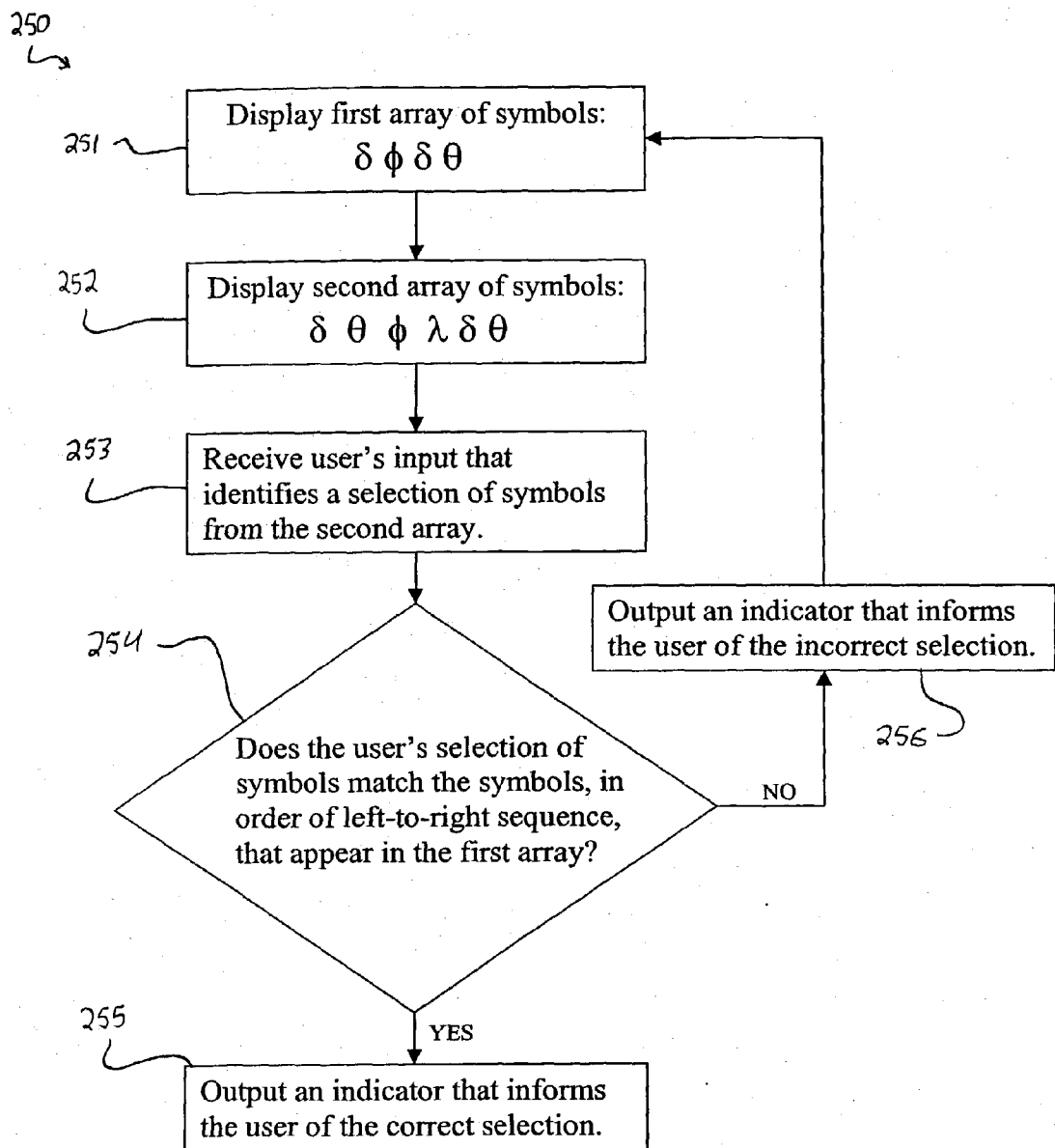


FIG. 8

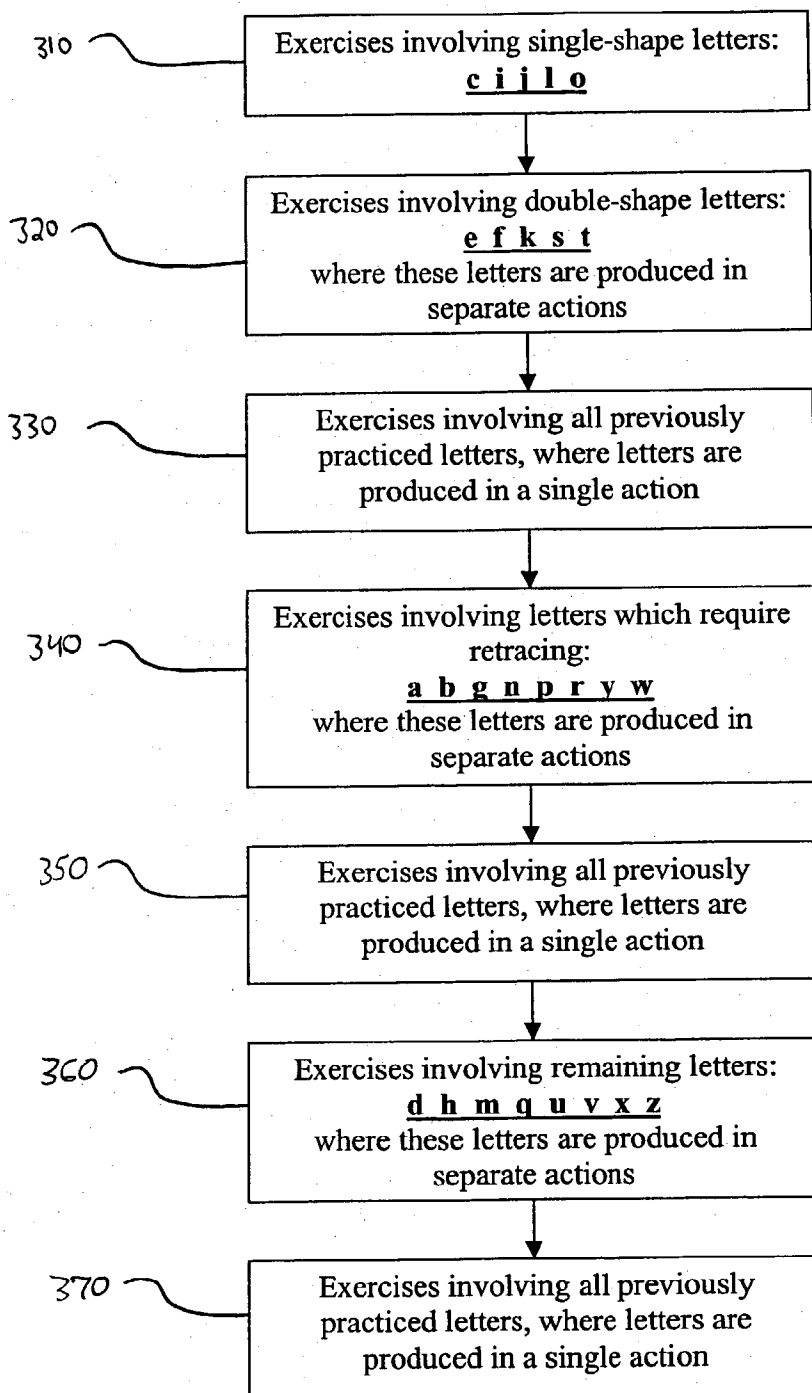


FIG. 9

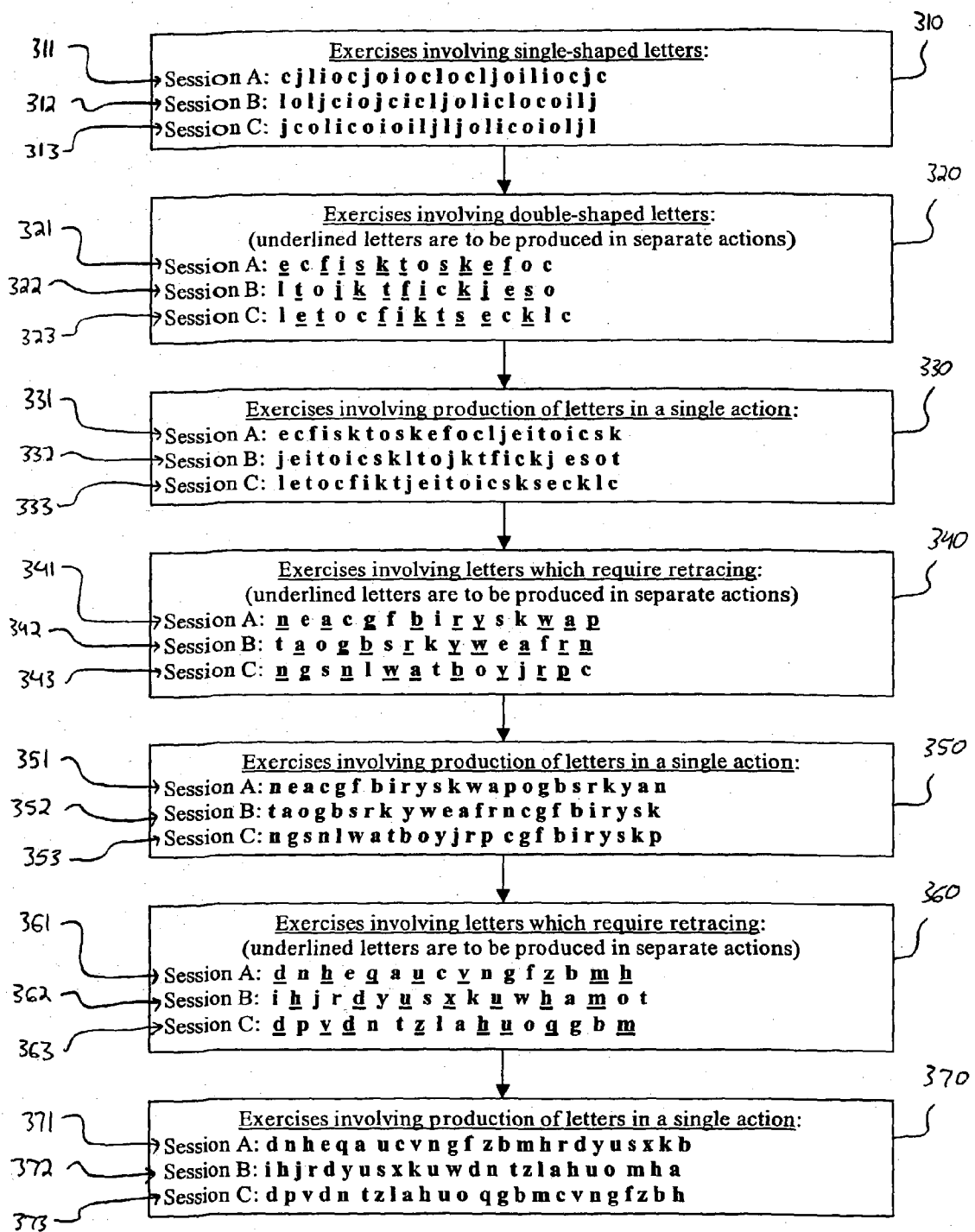


FIG. 10

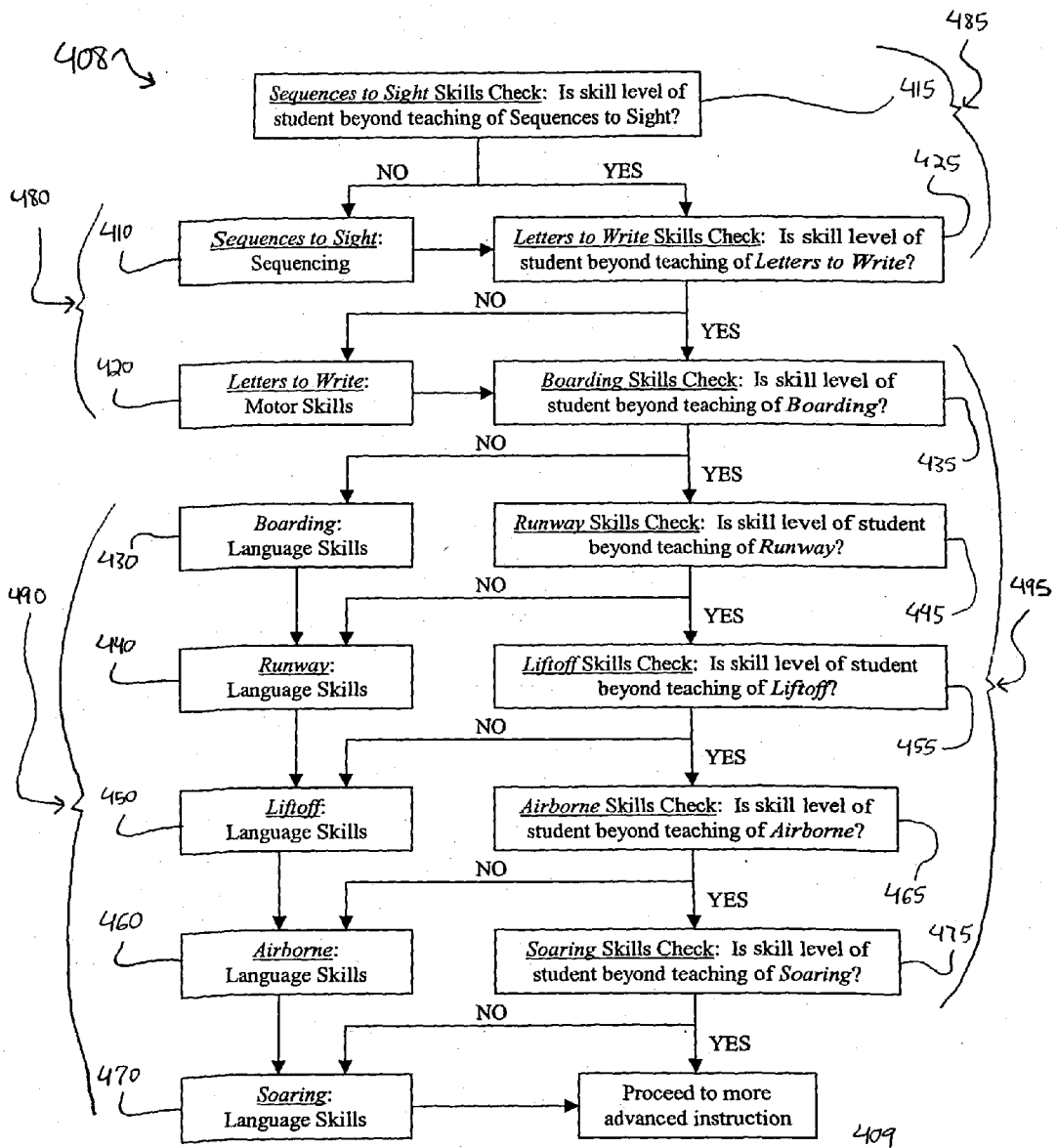


FIG. 11

LITERACY SYSTEM

REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to U.S. Provisional Application Serial No. 60/362,749 entitled "Literacy System," filed on Mar. 7, 2002, which is herein incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] This invention relates to a system of literacy education, and more particularly to methods and systems for teaching reading and writing skills.

BACKGROUND

[0003] Literacy is a skill often taken for granted even though mastery of that skill eludes millions of people from all age groups. For those that are literate, an intricate set of skills enable reading and writing to be smooth and automatic processes. This set of skills, referred to as "hidden abilities," generally appear first at a young age when a person begins to comprehend the speech of others and when that person begins to speak. For example, even a young child may know that the statement "I am looking at she" is incorrect while the statement "I am looking at her" is proper. Generally, any individual does not know the technical reason behind the proper version, but instead, may offer the rationale that "it just sounds right." (The technical reason is that when a pronoun referring to a feminine individual is used as the object of a preposition, the correct form of the pronoun is "her," not "she.") This example illustrates the essence of the hidden abilities that allow a literate person to do amazingly intricate constructions with language without knowing why. These same abilities are constantly operating in written language as well. For example, in a sentence such as The soldier decided to desert in the desert. a skilled reader automatically uses different pronunciations for the two instances of the identically spelled word. For people who are not literate, and especially for young children, these hidden abilities must be developed via literacy education. However, modern systems for teaching literacy fail to address the full range of necessary skills to promote the development of hidden abilities.

[0004] In general, two major systems dominate the literacy education field: phonics and whole language. Phonics emphasizes the skill of converting the letters on a page into sounds that become real words (i.e. teaching children to read a word by "sounding out" each letter so that c-a-t becomes "cat"). The processing of sounds falls under a language category known as phonology. The phonics system seems logical because phonology is a significant element in reading, but in practice, phonics teaching is hindered by the complexities of the English language. Phonics relies on teaching that each letter makes a single, distinctive sound. The reality, however, is that this concept holds true for only a tiny fraction of English words. Indeed, of the seventeen words in the preceding sentence, not a single one meets this criterion. The problem is illustrated by the fact that, under the phonics system of teaching, the word "phonics" itself should be spelled "foniks." In order to overcome this problem, the system relies on children memorizing hundreds of rules, such as the "silent e" rule, the double vowel rule, and the consonant combination rules. However, the memoriza-

tion of these rules and "sounding out" individual letters may cause reading and writing to be a laborious process and may discourage individual students. The whole language system of teaching literacy focuses on complete stories or groups of words to form meaningful messages, which is different from the phonics system that concentrates on the dissection of individual words. However, children in early stages of reading may encounter a wider range of words that they can manage. As such, the situation may appear overwhelming to the student.

[0005] The prevailing assumption is that these two systems, in combination, address all of the skills necessary to literacy. Unfortunately, these two systems, alone or in combination, cover only a portion of the skills that reading requires. The skills that are not addressed by these systems may leave gaps in the literacy education that many students are able to overcome. For those students who are not able to overcome the gaps of the current literacy systems, reading and writing may become a frustrating activity that is to be avoided.

[0006] Among the components needed for an effective literacy system are ones that develop the pre-reading skills of visual sequencing and fine motor abilities.

SUMMARY

[0007] In one embodiment, a system for teaching skills associated with literacy can include a pre-reading section having visual sequencing exercises. The visual sequencing exercises can include foreign symbols.

[0008] In another embodiment, a system for teaching skills associated with literacy can include a pre-reading section having motor skills exercises. The motor skills exercises can teach handwriting of letters in order of motor skill simplicity. For example, the motor skills exercises may begin teaching handwriting with single-shaped letters.

[0009] The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0010] FIG. 1 is a chart depicting aspects of one embodiment of a literacy system in accordance with the invention.

[0011] FIG. 2 is a flow diagram of the literacy system of FIG. 1.

[0012] FIG. 3 is a diagram of a computer system that may be used to operate the literacy system in accordance with one embodiment of the invention.

[0013] FIG. 4 is an image of a visual sequencing exercise in accordance with one embodiment of the invention.

[0014] FIGS. 5A-C is a series of images showing another visual sequencing exercise in accordance with one embodiment of the invention.

[0015] FIG. 6 is an image of a visual sequencing exercise in accordance with one embodiment of the invention.

[0016] FIGS. 7A-C is a series of images of a visual sequencing exercise in accordance with one embodiment of the invention.

[0017] FIG. 8 is a flow chart of instructions for a visual sequencing exercise in accordance with one embodiment of the invention.

[0018] FIG. 9 is a flow diagram of motor skills exercises in accordance with one embodiment of the invention.

[0019] FIG. 10 is a flow diagram of a further embodiment of the motor skills exercises of FIG. 9.

[0020] FIG. 11 is a flow diagram of a further embodiment of the literacy system of FIG. 2.

[0021] Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0022] Certain embodiments of the invention teach one or all of the following skills associated with total competence in literacy:

- [0023] (1) sequencing—the ability to read, and retain, letters in the appropriate order,
- [0024] (2) motor skills—the hand-eye coordination required for writing,
- [0025] (3) phonology—the ability to recognize and produce the sounds of letters,
- [0026] (4) semantics—comprehension of the meaning of words,
- [0027] (5) syntax—the ability to recognize and use grammar, and
- [0028] (6) text—combining words to form meaningful messages.

[0029] Sequencing and motor skills are both types of physical skills associated with reading and writing, as described later in more detail. Briefly, visual sequencing exercises may be used to teach left-to-right scanning and memorization of symbols, letters, and words. Motor skills exercises may be used to develop handwriting abilities in a student such that subsequent reading and writing skills may be taught in tandem.

[0030] Phonology is a language skill relating to the processing of sounds, such as the sounds of individual letter combinations in a word. For example, a literate reader may know that “ph” has the sound of “f” in certain instances (i.e. elephant), but not in other instances (i.e. uphill is not pronounced as “ufill” and shepherd is not pronounced as “sheferd”). The skill of recognizing the proper sounds of letter combinations falls under the category of phonology.

[0031] Semantics is another language skill and is associated with the meaning of words. For example, in the statement “the girl did not hear the band,” the word band refers to a group of musicians, while the word band in the sentence “the girl did not wear the band” refers to a piece of jewelry that can be put on one’s body. The skill of phonology may be used to show that the pronunciation of “band” and “band” are identical, but the language skill of semantics enables a student to recognize the different meanings.

[0032] The language skill relating to the grammar of sentences is referred to as syntax. One example of a syntax skill is the proper usage of the words “they’re,” “there,” and “their” in a sentence such as “they’re there at their house.”

In another example, the word “read” may be pronounced as “red” or “reed” depending upon the grammatical construction of the sentence (i.e. “yesterday, they read the magazine,” or “usually, they read the magazine”).

[0033] Lastly, the language skill of text is associated with the ability to use combinations of words and sentences to form meaningful messages. In the early stages of learning to read, a student may be able to read only several words, and those words may not be combined so as to form a statement or sentence. As that student learns to read additional words, that student must also develop textual skills of combining those words in the appropriate order in order to express a desired message.

[0034] In one embodiment of the invention, as shown in FIG. 1, a literacy system 8 comprises two sections 80 and 90, which focus on teaching physical skills and language skills, respectively. The literacy system 8 is divided into distinct levels. By way of example, the literacy system shown in FIG. 1 comprises seven levels 10, 20, 30, 40, 50, 60, and 70, but the literacy system 8 may include any number of levels. Each level teaches particular skill sets that may be used as building blocks for the following level in the literacy system 8. For example, the sequencing and motor skills taught in level I 10 and level II 20, respectively, may be used as foundations for the language skills taught in subsequent levels 30, 40, 50, 60, and 70.

[0035] In general, sequencing and motor skills are physical skills that may be taught to a student before the student actually begins to read words. Level I 10 teaches sequencing skills that are fundamental to the subsequent skills of reading and writing. Sequencing skills developed in level I 10 include the concept of scanning in a left to right pattern and retaining in memory sequences of letters or symbols. Level II 20 teaches the motor skills of writing letters of the alphabet in a manner that removes the mental “roadblocks” developed by traditional handwriting systems. The section 80 of the literacy system that includes level I 10 and level II 20 is referred to as the pre-reading section 80 because the skills taught in level I 10 and level II 20 may be developed before the student learns to read.

[0036] Section 90 of the literacy system 8 includes level III 30, level IV 40, level V 50, level VI 60, and level VII 70. Each of these levels 30, 40, 50, 60, and 70 develops the language skills of phonology, semantics, syntax, and text in the context to teaching the student to read and write. Thus, section 90 is referred to as the early reading section 90, or the language skills section 90, and may include both reading and writing exercises. The difficulty of the reading and writing exercises in each level 30, 40, 50, 60, and 70 increases as the student progresses to the subsequent level. Although the reading and writing exercises of each level may be the same, the words used by the literacy system increase in difficulty due to the length, meaning, and grammatical category. The reading and writing exercises of each level may be used to teach the student particular rules or words and develop hidden abilities generally possessed by literate people.

[0037] Referring to FIG. 2, one embodiment of the literacy system 8 includes a series of assessment tests 15, 25, 35, 45, 55, 65, and 75 to enable the student to bypass particular levels of teaching where the student has already learned that material. The literacy system 8 may be indi-

vidually tailored to the needs of particular students using the assessments **15**, **25**, **35**, **45**, **55**, **65**, and **75**. For example, if a student possesses satisfactory sequencing and motor skills but not necessarily language skills, then the assessment-I **15**, assessment-II **25**, and assessment-III **35** may be completed to show that the student should bypass the pre-reading section **80** and begin learning from the literacy system **8** at level III **30**.

[0038] As shown in **FIG. 2**, the student first completes assessment-I **15** to determine if the student's abilities surpass the sequencing skills taught in level I **10**. The assessment-I **15** may include several example and practice exercises similar to those that are used in the actual teaching of level I **10** (described in further detail below). If the student performs satisfactorily during the assessment-I **15**, the literacy system **8** may recommend that the student should bypass the teaching of level I **10** and proceed to assessment-II **25**. However, if the student's performance during assessment-I **15** is not satisfactory, then the literacy system **8** may recommend that the student should begin receiving instruction from level I **10**.

[0039] After the student satisfactorily completes assessment-I **15**, or after the student satisfactorily completes level I **10**, the student then proceeds to assessment-II **25** to determine if she already possesses satisfactory motor skills as taught in level II **20**. Again, if the student's motor skills are beyond the teaching of level II **20**, then the student should proceed to assessment-III **35**. Otherwise, the student should complete level II **20** before continuing on to assessment-III **35**. Alternatively, the student may perform both assessment-I **15** and assessment-II **25** at the same time before proceeding to level I **10**, level II **20**, or both. Because a student may have a solid grasp of some pre-reading skills and not others, the assessment-I **15** and assessment-II **25** are not necessarily dependent on one another. For this reason, the assessment-I **15** and assessment-II **25** may be grouped as pre-reading assessments **85**. For example, a student may need further instruction on sequencing skills, but that same student may have a satisfactory understanding of the alphabet and handwriting skills. As such, the student may complete assessment-I **15** and assessment-II **25** prior to working on any levels **10** or **20** so as to determine which levels **10** or **20**, if any, should the student bypass before proceeding to assessment-III **35**.

[0040] If the student satisfactorily completes assessment-III **35** to show that she possess language skills beyond the teaching of level III **30**, then that student should proceed to assessment-IV. This pattern continues until the student does not satisfactorily complete an assessment **35**, **45**, **55**, **65**, or **75**, in which case that student proceeds to receive instruction from the appropriate level **30**, **40**, **50**, **60**, or **70**. If the student satisfactorily completes all of the early reading assessments **95**, then that student should proceed to more advanced instruction **9** beyond the early reading sections **90**.

[0041] Because level III **30** through level VII **70** teach the same type of skills while increasing in difficulty, the early reading assessments **95** may be developed to be dependent on one another. For example, if a student satisfactorily completes assessment-III **35** but fails to perform as well on the subsequent assessment-IV **45**, then that student should begin to receive instruction from level IV **40**. After that student successfully completes level IV **40** instruction, then

the student proceeds directly to level V **50** without the need to complete assessment-V **55**, which results is a more productive use of time. Because level V **50** provides instruction on language skills similar to level IV, but having a greater degree of difficulty, the early reading assessments **95** may be developed so that there is no need to return to the assessments **95** after the student has not satisfactorily completed a particular assessment. One reason for this is that a student who does not possess language skills for a particular set of words is unlikely to possess those same language skills (phonology, semantics, syntax, and text) for words having a greater degree of difficulty. Alternatively, the early reading assessments **95** may be implemented such that the student does return to an assessment corresponding to the subsequent level after completing the prior level.

[0042] Once the early reading assessments **95** lead the student to the appropriate starting level **30**, **40**, **50**, **60**, or **70** for that individual, the student proceeds through the levels in order. For example, if the early reading assessments **95** lead the student to begin instruction at level III **30**, then the student should proceed to level IV **40** after successfully completing level III **30**. This pattern continues through completion of level VII where the student may then proceed to more advanced instruction **9** beyond the early reading levels **90**.

[0043] The teaching of the literacy system **8** may be delivered to the student in the format of paper workbooks, video or classroom presentations, computer software, or a combination thereof. For example, the individual reading and writing exercises may be presented in a conventional workbook format such that the exercises occupy individual worksheets in the workbook. As shown in **FIG. 3**, the literacy system **8** may alternatively be used as a computer software such that the student interacts with the computer system **105** to complete some or all of the exercises. In one embodiment, the literacy system **8** may be executable as a software program stored on a computer readable medium in a computer memory storage device **101**, such as a computer hard drive, a floppy disk drive, a CD-ROM drive, or other conventional devices. The user may utilize a user interface device **102**, such as a keyboard, computer mouse, touch-screen, or a combination thereof, to execute the literacy system **8** from the computer memory storage device **101** using a central processing unit **100** (CPU). The display device **103** may be used to display the various images, instructions, and exercises of the literacy system **8**. The computer system **105** may include an audio speaker device **104** for delivering audible instructions or feedback to the user. In addition to the computer system **105**, a workbook **106** may be used in conjunction with the computer system **105** to provide the student with further instructions and a tangible medium for particular reading and writing exercises.

[0044] Returning to the description of the pre-reading section **80** of the literacy system **8**, the physical skill of sequencing may be developed through repetition of carefully constructed exercises. In one embodiment of the literacy system **8**, sequencing exercises may be taught by the literacy system in level I **10** of the pre-reading section **80**, as shown in **FIGS. 1 and 2**. While scanning from left to right to read letters may seem automatic to most literate people, the skill of sequencing is not necessarily a natural skill possessed by non-literate students. This is especially true for young chil-

dren. Unlike the sequencing of letters to form words, most other objects that people visually perceive do not require left-to-right sequencing. For example, a car is still a car regardless of whether the student visually perceives it from the left or the right. From the perspective of a young child who has spent her past 4 or 5 years learning to overlook the left-to-right sequencing of objects, learning a language in which the sequence of objects forms the basis of understanding may be a daunting task. Even minute changes in the left-to-right sequence of letters may cause critical changes to the meaning of the letter or word. For example, left-to-right sequencing plays an important role in the difference between the letters "b" and "d", the letters "p" and "q", or the words "top" and "pot". Despite the fact that left-to-write sequencing is a critical skill required for reading and writing, the dominant view among literacy systems is that students will "pick it up." While some students do glean the necessary skills without instruction, those students who do not "pick it up" often experience frustration and displeasure with learning to read and write.

[0045] A student who cannot read may be familiar with the letters of the alphabet and give the appearance of knowing how to read sequences of letters. Without the physical skill of sequencing, however, actual reading may not be taking place. This is due to the fact that the student may rely on memorizing the letter names rather than on visually retaining the set of symbols during the sequencing exercises. As such, the use of foreign symbols which cannot be named by the child is one component that may be used by the literacy system 8 to teach visual sequencing. Foreign symbols may be any symbols that are not associated with the letters of the written language taught by the literacy system. In one example, a literacy system that teaches the English language may use symbols of the Greek language (α , β , γ , and so forth) as foreign symbols in the sequencing exercises. The use of foreign symbols in sequencing exercises mirrors certain aspects of reading without requiring actual reading.

[0046] Visual sequencing may be so novel to a student that even sequences of two elements may be problematic. Therefore, the initial sequencing exercises of the literacy system 8 begin with short patterns of two or three symbols that will be easiest for the student, as shown in FIG. 4. In one embodiment of a sequencing exercise 210, the student is shown two rows 211 and 212 of symbols with the top row 211 presenting a short sequence of two symbols 213 ($\delta\phi$). The symbols 214 ($\gamma\phi\lambda$) of the bottom row 212 includes the same two symbols intermingled with additional ones. Thus, the bottom row 212 includes all of the symbols as the top row 211 in left-to-right sequence, but the bottom row 212 includes additional symbols intermingled with those from the top row 211. The student is instructed, via an instructor, a workbook, a computer system, or other instructional means, to view the symbols on the top row 211. Then the student is instructed to identify the symbols in the bottom row 212 that are the same as the symbols in the top row 211. To successfully complete the individual exercise 210, the student must identify, in the correct left to right order, to the same two symbols 213 in the bottom row 212 that appear in the top row 212. This type of sequencing exercise 210 is repeated over several sessions until the student displays a high level of skill. At this point, the student has begun to develop an important hidden ability possessed by literate people. The student is scanning, in a left-to-right order, short sequences of symbols that are not necessarily easy to label.

[0047] One embodiment of the next type of sequencing exercise 220 is shown in FIGS. 5A-C. This sequencing exercise 220 may be used to develop the skill of retaining in short term memory the sequence of symbols. The exercise 220 includes a top row 221 and a bottom row 222 of symbols 223 and 224. In addition, the exercise 220 may use a covering element 226, which may be used to cover either the top row 221 or the bottom row 222 of symbols. The sequencing-memory exercise 220 may be practiced using a workbook format, a flash card format, a computer system format, or another convention format. Certain formats, such as a computer format, might eliminate the need of the covering element 226.

[0048] To successfully complete the exercise 220, the student is instructed to view the symbols 223 in the top row 221 while the symbols 224 of the bottom row 222 are not displayed, as is shown in FIG. 5B. The covering element 226 may be used to cover the bottom row 222. Then, the symbols 223 from the top row 221 are hidden from the student's view, and the symbols 224 in the bottom row 222 are displayed, as shown in FIG. 5C. Without looking back to the symbols 223 in the top row 221, the student is instructed to select, in left to right order, the same symbols from the top row 221 that included in the bottom row 224. At this point, the student is working from memory. Without being able to see the top row 221, the student is forced to make the correct selection is by retaining an image of the original pattern, which develops a hidden ability possessed by literate people to memorize sequences of symbols.

[0049] After the student has become accustomed to retaining sequences of two and three symbols, the patterns increase to four symbols. While four symbols are merely one more than three, it may represent a significant leap in difficulty for the student. When the longer patterns are introduced, the literacy system 8 may revert back to sequencing exercises of direct matching with no memory demands, similar to that of FIG. 4. This is an example of a teaching principal that uses review of prior material with steady additions of new material. In such a case, the literacy system 8 begins to incorporate new, slightly more complex content after the student has shown a mastery of less complex content. However, the literacy system 8 continues to systematically use the less complex skills attained by the student when exposing the student to slightly more complex content.

[0050] As shown in FIG. 6, one embodiment of such a sequencing exercise 230 includes two rows 231 and 232 of symbols with the top row 231 presenting a sequence of four symbols 233. Similar to the embodiment shown in FIG. 4, the bottom row 232 includes all of the symbols as the top row 231 in left-to-right sequence, but the bottom row 232 includes additional symbols intermingled with those from the top row 231. The student is instructed to identify the symbols in the bottom row 232 that are the same as the symbols in the top row 231. To successfully complete the individual exercise 230, the student must identify, in the correct left to right order, to the same two symbols 233 in the bottom row 232 that appear in the top row 232.

[0051] FIGS. 7A-C show another embodiment of a sequencing exercise 240 using a sequence of four symbols. In this exercise 240 the student progresses to memorization of sequences having four symbols. The exercise 240

includes a top row **241** and a bottom row **242** of symbols **243** and **244**. Similar to the exercise **220** shown in FIGS. 5A-C, the student is instructed to view the symbols **243** in the top row **241** while the symbols **244** of the bottom row **242** are not displayed, as is shown in FIG. 7B. The covering element **246** may be used to cover the bottom row **242**. Then, the symbols **243** from the top row **241** are hidden from the student's view, and the symbols **244** in the bottom row **242** are displayed, as shown in FIG. 7C. Without looking back to the symbols **243** in the top row **241**, the student is instructed to select, in left to right order, the same symbols from the top row **241** that included in the bottom row **244**.

[0052] In accordance with one embodiment of the literacy system **8**, the visual sequencing exercises may be implemented using a computer system. As shown in FIG. 8, a series of functions **250** may be preformed by the computer system so as to enable the student to practice the sequencing exercises. The computer system may display a first array of symbols, as shown in step **251**. In this example, the symbols are the same foreign symbols shown in FIG. 6. The next step **252** displays a second array of symbols. Depending on the type of visual sequencing exercise that is used, the first array may be displayed while the second array is also displayed such that the student performs direct matching exercises. Otherwise, the first array of symbols may be removed from display while the second array is displayed such that the student performs the sequencing exercise using memorization of the symbols. The student is instructed to identify, in left-to-right order, the symbols in the second array that match those of the first array. In step **253**, the computer system receives the student's selection of symbols. The student may input the selection using a user interface device, as previously described. In step **254**, the computer system determines whether the student's selection of symbols from the second array correctly matches, in left-to-right order, the symbols from the first array. As shown in step **255**, if the student's selection was correct, then the computer system outputs an indicator informing the student of the correct selection, such as a visual indicator on a computer screen or an audible indicator from a speaker. If the student's selection was incorrect, then the computer system outputs an indicator informing the student of the incorrect selection, as shown in step **256**. In such a case, the computer system may repeat the steps **251**, **252**, **253**, and **254** so that the student may retry the identical sequencing exercise.

[0053] Other physical skills that may be taught in the pre-reading section **80** of the literacy system **8** are the motor skills associated with writing. In one embodiment of the literacy system **8**, the motor skills exercises may be taught in level II **20** of the pre-reading section **80**, as shown in FIGS. 1 and 2. One reason for teaching a student to effectively write letters prior to reading, or at the start thereof, is that the student may then be able to write any word that she reads. Reading and writing may then be practiced in tandem, each promoting the other. Unlike the skills of visual sequencing, the alphabet generally receives significant attention in the area of early literacy instruction. For example, young children are exposed to the alphabet via letters printed on toys, discussed in songs, or used in children's games. While exposing young children to the alphabet may encourage their tendency to learn reading, the act of writing those same letters calls upon a range of intricate motor skills, which may be difficult to master. As described below, the literacy system **8** may include certain

aspects to develop these intricate motor skills, such as an early emphasis on lower case letters (in contrast to the emphasis on upper case letters in most early instruction) or sequencing handwriting exercises from simple to complex letter shapes (not by letters in alphabetical order).

[0054] In accordance with one aspect of the inventive literacy system **8**, the student is not necessarily instructed to practice handwriting of letters in alphabetical order. Learning to write letters in alphabetical order (i.e. practicing the letter "a" prior to practicing the letter "b") may seem more instinctual to a literate person who was previously instructed in this manner or to prior art systems, but the letters "a" and "b" are relative complex shapes compared to other letters. Instead, the literacy system **8** may use exercises of handwriting the letters in order of motor skill simplicity. As such, letters with simpler shape, size and placement may be practiced during the initial steps of the motor skills exercises, and after the student has successfully learned to write these letters, the exercises proceed to teaching letters of more complex shape.

[0055] In accordance with another aspect of the inventive literacy system **8**, the motor skills exercises emphasize the use of lower case letters in writing. In prior art systems, capital letters dominate the early handwriting training, or at least play an overly-prominent role, which cause students to focus on the less commonly used capital letters and to develop poor habits. By some estimates, less fewer than 1% of the letters on pages read by early reading students appear as capital letters, which may lead to conflict between their reading systems and writing systems. The inventive literacy system **8** highlights the similarities between reading and writing, not necessarily the differences.

[0056] One embodiment of motor skills exercises of the literacy system **8** is shown in FIG. 9. The motor skills exercises are divided into seven steps **310**, **320**, **330**, **340**, **350**, **360**, and **370**, wherein four steps **310**, **320**, **340**, and **360** introduce new letters of the alphabet to the student. Letters composed of single shapes (c, i, j, l, and o) are introduced to the student in the first step **310**. The student may produce each letter by modeling movements of an instructor, such as a human instructor, an image displayed from a computer system, or the like. In the next step **320**, the student is introduced to exercises involving double-shape letters (e, f, k, s, and t), but these letters are produced in separate actions. For example, the letter "e" may be constructed with two separate actions: a small horizontal line (-) and a curved shape (C). In such a case, the student would model the horizontal line (-) after the instructor's line, and then the student would model the curved shape (C) after the instructor's action. In keeping with the teaching principal of reviewing prior materials with steady additions of new material, the single-shaped letters that were practiced in the previous step **310** are continued in the handwriting exercises of step **320**.

[0057] The third step **330** does not introduce new letters, but instead the letters from steps **310** and **320** are produced by the student using a single action. Unlike the previous example of using separate actions to produce the letter "e," this step **330** of the motor skills exercises requires the student to model the letter "e" in a single action after the instructor initially produces the letter in a single action. The next step **340** in the motor skills exercises proceeds to more

complex letters that require a retracing action. For example, the letter “n” requires a vertical line (|) in the downward direction with a retracing action over part of the vertical line in the upward direction before completing the letter with a curved shape (J). The letters requiring a retracing action that are practiced in step 340 include a, b, g, n, p, r, y, and w. Each of these letters is produced by the student using separate actions, such as the downward vertical line (|) for the letter “n” followed by the vertical retracing action in combination with the curved shape (J). Again, the teaching principal of reviewing prior materials with steady additions of new material is utilized so that the letters from previous step 330 are continued in the handwriting exercises of step 340. Step 350 is similar to the previous step 330, in which all of the letters previously taught are practiced using single actions. However, step 350 includes the letters that were practiced in step 340 (a, b, g, n, p, r, y, and w).

[0058] So as not to overload the student, the letters which require retracing are introduced in two different steps 340 and 360. Step 360 introduces the remaining letters of the alphabet that have not yet been introduced (d, h, m, q, u, v, x, and z), including some letters that do not require retracing actions (x and z). Each newly introduced letter is produced by the student using separate actions, as described in previous examples. Also, previously practiced letters are included in the exercises of step 360 so as to review prior material with steady additions of new material. Subsequently, step 370 includes exercises involving all letters, but the student is required to complete each letter using a single action.

[0059] FIG. 10 shows one embodiment of the steps 310, 320, 330, 340, 350, 360, and 370 used in the motor skills exercises of the literacy system 8. Each step includes sessions in which the student produces certain letters in a particular order. For example, step 310 includes three sessions 311, 312, and 313, which provide exercises for writing the single-shaped letters in a certain order. The student is not necessarily required to write the same letter in a repetitive manner, but instead the student shifts from one single-shaped letter to the next so as to resemble actual reading and writing skills. In one embodiment, the student may be required to complete each session 311, 312, and 313 up to six times for a total of eighteen sessions, at which point the student may proceed to the next step 320.

[0060] The sessions 321, 322, and 323 of step 320 in FIG. 10 show the intermingling of single-shaped letters (c, i, j, l, and o) with double-shaped letters (e, f, k, s, and t) throughout the exercise. Certain letters in step 320 (i, j, e, f, k, s, and t) may be completed by the student using separate actions. Again, one embodiment of the motor skills exercises may require the student to complete each session 321, 322, and 323 up to six times for a total of eighteen sessions. After the student has completed the required sessions, then the student may proceed to the subsequent step 330. The pattern continues in a similar manner until the student has completed the required sessions through step 370, at which point the student has completed the motor skills exercises of the pre-reading section 85 of the literacy system 8.

[0061] An exemplary embodiment of a literacy system 408 is shown in FIG. 11, which may be implemented using a computer system, a workbook, an instructional video or classroom presentation, or a combination thereof. Similar to

the embodiment shown in FIG. 2, the literacy system 408 teaches the skills of visual sequencing, motor skills, phonology, semantics, syntax, and text via multiple levels of instruction. The first section, termed “Get Set” 480, teaches visual sequencing and motor skills of alphabet writing through two preparation levels: “Sequences to Sight” 410 and “Letters to Write” 420. While both levels 410 and 420 are building blocks for the subsequent levels, they may be independent from each other such that one does not build upon the other. For example, a student may already have the satisfactory motor skills in handwriting, but may not have satisfactory sequencing skills. In such a case, the “Sequences to Sight” Skills Check 415 and the “Letters to Write” Skills Check 425 would show that the student should complete “Sequences to Sight” 410 while bypassing “Letters to Write” 420.

[0062] The subsequent levels 430, 440, 450, 460, and 470 teach the language skills of phonology, semantics, syntax, and text while building upon the visual sequencing and motor skills covered in “Get Set” 480. The level progression includes “Boarding” 430, “Runway” 440, “Liftoff” 450, “Airborne” 460, and “Soaring” 470, and the exercises increase in difficulty with each subsequent level. These levels may not isolate each of the language skills in different exercises, but instead the language skills section 490 combines the four language skills (phonology, semantics, syntax, and text) in exercises using content words, non-content words, and books. The content steadily increases in complexity so that with each succeeding level, the words become more intricate, the concepts more abstract, the sentences longer, and the books richer.

[0063] A set of skill checks 415, 425, 435, 445, 455, 465, and 475 assess the student’s ability such that the student may bypass levels that teach content already known by the student. Similar to the literacy system 8 of FIG. 2, the student may bypass levels by successfully completing skill checks until a particular skill check suggests that the student completes a certain level. The literacy system 408 may be implemented such that the student progresses through the subsequent levels without returning to the skill checks. Alternatively, the literacy system 408 may be implemented such that the student returns to the skill checks on a regular basis to determine if any subsequent levels may be bypassed.

[0064] A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. Accordingly, other embodiments are within the scope of the following claims.

What is claimed is:

1. A literacy system comprising:

a pre-reading section that includes sequencing exercises, the sequencing exercises including foreign symbols that are not associated with letters of a written language taught by the literacy system; and

a language skills section that includes language exercises for teaching at least one language skill selected from a group consisting of phonology, semantics, syntax, and text.

2. The literacy system of claim 1, wherein the sequencing exercises teach the physical skill of visually scanning symbols in a left-to-right sequence.

3. The literacy system of claim 1, wherein the sequencing exercises teach the physical skill of memorizing sequences of symbols.

4. The literacy system of claim 1, wherein the foreign symbols are Greek symbols.

5. The literacy system of claim 1, wherein the pre-reading section includes motor skills exercises for teaching hand-writing letters of the written language.

6. The literacy system of claim 4, wherein the motor skills exercises introduce letters in order of shape, size, and placement simplicity.

7. The literacy system of claim 5, wherein the motor skills exercises introduce letters in a non-alphabetical order.

8. The literacy system of claim 1, wherein the language skills section includes language exercises for teaching both phonology and text skills.

9. The literacy system of claim 1, wherein the language skills section includes language exercises for teaching phonology, semantics, syntax, and text skills.

10. A literacy system comprising:

a pre-reading section that includes motor skills exercises for teaching handwriting letters of a written language taught by the literacy system, wherein the motor skills exercises introduce letters in order of shape, size, and placement simplicity; and

a language skills section that includes language exercises for teaching at least one language skill selected from a group consisting of phonology, semantics, syntax, and text.

11. The literacy system of claim 10, wherein the motor skills exercises introduce single-shaped letters before double-shaped letters.

12. The literacy system of claim 10, wherein the motor skills exercises introduce letters in a non-alphabetical order.

13. The literacy system of claim 10, wherein the pre-reading section includes sequencing exercises, the sequencing exercises including foreign symbols that are not associated with letters of a written language taught by the literacy system

14. The literacy system of claim 13, wherein the sequencing exercises teach the physical skill of visually scanning symbols in a left-to-right sequence.

15. The literacy system of claim 13, wherein the sequencing exercises teach the physical skill of memorizing sequences of symbols.

16. The literacy system of claim 10, wherein the language skills section includes language exercises for teaching both phonology and text skills.

17. The literacy system of claim 10, wherein the language skills section includes language exercises for teaching phonology, semantics, syntax, and text skills.

18. A method of practicing visual sequencing skills, comprising:

viewing a first array of foreign symbols;

viewing a second array of foreign symbols, wherein the second array includes:

all of the symbols of the first array in left-to-right sequence, and

additional symbols intermingled with those from the first array;

identifying the same symbols in the second array that appear in the first array in order of left-to-right sequence; and

receiving feedback regarding the proper or improper identification of the symbols.

19. The method of claim 18, wherein the first array of symbols is not viewable when viewing the second array of symbols such that the first array of symbols are memorized in order to identify those symbols in the second array.

20. A computer-readable medium having stored thereon instructions that when executed perform the following functions:

displaying a first array of foreign symbols;

displaying a second array of foreign symbols, wherein the second array includes:

all of the symbols of the first array in left-to-right sequence, and

additional symbols intermingled with those from the first array;

receiving a user's input that identifies a selection of symbols from the second array;

determining if the user's selection of symbols from the second array match the symbols that appear in the first array in order of left-to-right sequence; and

outputting an indicator to inform the user whether the user's selection of symbols from the second array match the symbols that appear in the first array in order of left-to-right sequence.

21. The computer-readable medium of claim 20, further comprising instructions stored thereon that when executed perform the following functions:

repeating the functions of claim 20 after determining the user's selection of symbols from the second array does not match the symbols that appear in the first array in order of left-to-right sequence.

22. The computer-readable medium of claim 20, wherein the first array of symbols is not displayed when displaying the second array of symbols.

23. The computer-readable medium of claim 20, wherein displaying the symbols is performed using a computer screen.

24. The computer-readable medium of claim 20, wherein outputting the indicator is performed using an audio speaker.

25. The computer-readable medium of claim 20, wherein outputting the indicator is performed using a computer screen.

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