

Integrating Braille Literacy Tasks and Technology: What Students Should Know and Do

To help teachers integrate technology and literacy to improve students' results, below are braille reading and writing tasks and activities that are important for overall braille literacy and for developing skills in the use of assistive technology tools. The lists do not include all braille skills, but focus on the use of technology to promote students' knowledge and skills. The age ranges are aligned with and influenced by the International Society for Technology in Education Standards (2007a) and Student Profiles (2007b).

EARLY CHILDHOOD: EMERGENT LITERACY

Learning Tasks

1. Displays an interest in tactile graphics.
2. Understands and gains meaning from information represented in a tactile two-dimensional format (tactile graphics).
3. Displays an interest in three-dimensional tactile images.
4. Develops shape discrimination skills (matching, sorting, naming) with tactile graphics.
5. Develops size discrimination skills (matching, sorting, naming) with tactile graphics.
6. Understands spatial concepts (such as top, bottom, left, right) in a two-dimensional format.
7. Displays an interest in braille.
8. Discriminates likenesses and differences in isolated braille cells (match, sort, name).
9. Discriminates likenesses and differences in isolated braille words (match, sort, name).
10. Develops tactile tracking skills (left to right, top to bottom).
11. Gains meaning through tactile books.
12. Experiments with braille writing by making dots, scribbling, and writing on a variety of braille tools.
13. Experiments with drawing and tactile graphics.
14. Writes random letters in braille on a variety of braille tools.
15. Interprets simple tactile pictures.

Daily Living Activities

1. Uses braille and braille tools during play activities.
2. Uses tactile graphics in a variety of play activities.

3. Engages in pretend play with braille, braille tools, and tactile graphics.
4. Imitates adult reading and writing activities using braille and braille tools.
5. Plays simple games with braille and tactile graphics.

Tasks and Activities Providing Access to Content

1. Plays on a QWERTY keyboard and emphasizes commonly used keys such as Enter, Backspace, and Arrows.
2. Plays on a touch screen and emphasizes commonly used motions, such as swiping and tapping.
3. Explores approved early childhood websites.
4. "Reads" and listens to electronic books.

STEM Tasks and Activities

1. Displays an interest in:
 - a. Braille numbers and signs of operation in pretend play activities.
 - b. Braille and tactile counting books.
 - c. Books with maps and tactile graphics.
2. Plays with an abacus.

GRADES PRE-K-2

Learning Tasks

1. Reads and writes letters of the alphabet.
2. Reads and writes literary numbers.
3. Develops mechanics of braille writing using a variety of tools.
4. Reads and writes all braille symbols and contractions.
5. Spells in uncontracted and contracted braille.
6. Expands tactile tracking patterns.
7. Develops tactile scanning techniques.
8. Interprets tactile graphics.
9. Creates simple tactile graphics.
10. Gains meaning from three-dimensional tactile images.
11. Creates braille documents.
12. Creates print documents from braille tools.
13. Drafts, proofreads, and revises written assignments in braille.
14. Continues braille keyboarding.

GRADES 6–8

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SIDEBAR 6.1 *continued*

15. Begins using electronic tools with refreshable braille displays.

Daily Living Activities

1. Pretends to read and write in play activities using braille.
2. Writes messages for personal use.
3. Makes lists in braille.
4. Writes messages to others.
5. Creates tactile and braille materials for play.
6. Uses tablet technology with a braille interface to play games and access information for leisure activities.

Tasks and Activities Providing Access to Content

1. Locates and uses commonly used QWERTY keys, such as enter, backspace, and arrows.
2. Uses QWERTY keyboard to access electronic information for braille reading and writing with a braille interface.
3. Uses Apps for reading electronic books with refreshable braille access to device.
4. Shows an interest in QWERTY keyboarding skills with refreshable braille displays.
5. Begins to use multimedia tools to share content, such as presentation tools.
6. Is interested in image descriptions.

STEM Tasks and Activities

1. Reads and writes Nemeth numbers.
2. Reads and writes symbols of operation.
3. Uses braille measurement tools.
4. Understands spoken mathematics notation and concepts in the grade-level curriculum.
5. Understands a variety of tactile images, such as graphs and charts.
6. Explores and plays with a variety of talking calculators.
7. Explores and plays with tools with sonification.

GRADES 3–5

Learning Tasks

1. Reads and writes contracted braille in content areas.
2. Understands and uses a variety of unique braille formats for reading and writing.
3. Interprets tactile graphics in content areas.
4. Creates braille documents with appropriate formatting.

5. Creates print documents with appropriate formatting.
6. Drafts, proofreads, and revises written assignments independently.
7. Completes tests and exams in a variety of formats and media.
8. Develops note-taking skills.
9. Uses electronic tools with refreshable braille efficiently and effectively.
10. Accesses and shares information electronically.
11. Organizes electronic information using a variety of tools.
12. Conducts research activities.
13. Converts text into braille.
14. Converts braille into text.
15. Participates in solving access problems with technology.

Daily Living Activities

1. Completes homework assignments in braille.
2. Builds a personal library of hard copy and electronic braille books.
3. Uses braille in extracurricular activities.
4. Uses braille tools for personal correspondence.
5. Writes notes to family members.
6. Sends special occasion cards.
7. Uses electronic tools with a braille interface to participate in leisure activities, such as games and leisure reading and writing.

Tasks and Activities Providing Access to Content

1. Develops formal keyboarding skills on a QWERTY keyboard and a refreshable braille device to access information efficiently.
2. Locates and downloads books and documents for learning tasks.
3. Locates and uses web-based content for learning tasks.
4. Understands a variety of image descriptions.
5. Uses a variety of electronic tools with braille interface.

STEM Tasks and Activities

1. Understands and uses Nemeth code materials for STEM tasks.
2. Uses speech-adapted tools for laboratory tasks and calculating.
3. Increases skills in using spoken mathematics.

SIDEBAR 6.1 *continued***GRADES 6–8**

Learning Tasks

1. Understands and uses a variety of braille formats for reading and writing.
2. Expands note-taking skills in the content areas.
3. Accesses and shares information electronically.
4. Selects and uses appropriate braille tools for a variety of tasks.
5. Solves problems related to access and technology independently.

Daily Living Activities

1. Creates and follows a schedule.
2. Creates a personal address book.
3. Keeps a personal journal.
4. Accesses materials for community activities.
5. Conducts personal correspondence.

Tasks and Activities Providing Access to Content

1. Is proficient in QWERTY keyboarding skills and refreshable braille displays.
2. Understands and uses a variety of print formats for sharing information using braille access tools.
3. Understands and uses a variety of web-based documents and information.

STEM Tasks and Activities

1. Understands and uses higher level Nemeth code symbols for STEM tasks.
2. Uses electronic tools for laboratory tasks, such as microscopes and speech-adapted data collection tools.
3. Understands spoken mathematics equations, expressions, and notations.

4. Interprets and understands sonification in STEM content.

GRADES 9–12

Learning Tasks

1. Understands and applies special braille symbols and codes.
2. Understands and uses a variety of braille and print formats routinely and efficiently.
3. Creates quality print and braille documents routinely and efficiently.

Daily Living Activities

1. Takes notes on a job interview.
2. Accesses and shares information professionally.
3. Schedules personal commitments and appointments.
4. Uses braille tools for managing and communicating personal and professional information.

Tasks and Activities Providing Access to Content

1. Selects and uses electronic information and tools for research activities.
2. Accesses and shares information electronically routinely and efficiently.

STEM Tasks and Activities

1. Uses electronic resources to research Nemeth code symbols for use in higher level mathematics and scientific notation coursework.
2. Accurately interprets, uses, and creates a variety of images and graphics, such as charts, graphs, illustrations, diagrams, and symbols.

SOURCE: Developed by Donna McNear.

using a standard, or QWERTY, keyboard. Speech recognition software refers to the capability of devices to recognize and use speech to control input into the device, for example, by dictating e-mails and documents, voice dialing, and speaking commands to control operations and functions of devices. Some stand-alone devices, such as digital recorders, support voice input. Some touch screen devices have built-in accessibility features that enable students who are blind to use the device without any special attachments. In addition, smartphone apps can be downloaded that enhance

the basic accessibility features and usability of a device for students who are blind—for example, an app that scans barcodes and reads aloud product information that has been printed on a label enhances the everyday usability of the device. Print can also be scanned and translated by specialized software so that it may be embossed into braille, presented on a refreshable braille display, or read aloud by a screen-reading program. Depending on their needs, it will be important for students to develop skills in the use of these devices and equipment.