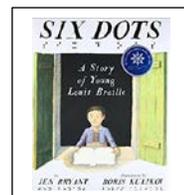


## Six Dots a Braille STEAM Lesson



**Lesson duration:** 60 minutes with Read Aloud

**Suggested Age Range:** 4-12

**STEM Activity:** Create names or messages in Braille; Librarian's choice of materials and method

- Use folded 8 ½ x 11" copy paper or cardstock laid on cardboard to create raised letters with a pen pushing through the paper. {\*Note: This results in the letters coming out "backwards." Although this is consistent with the book, it may or may not be the best choice since children will have to make each letter "backwards."}
- Create a name or message with written letters first, then underneath each letter use lentils or small beans and glue to create the raised Braille matching letters. [See link below.] Read the word with your finger.
- Create a name or message with written letters first, then underneath each letter use small pieces of Wiki Sticks to create the raised Braille matching letters. [See link below.] Read the word with your finger.
- Create sets of Braille alphabet tiles with a 3D printer . Have children rub a closed marker or pencil eraser gently over the raised dots to make a name or message. [See link below.] {\*Note: You would need at least 10 sets for 20 children, partners sharing a set for the project.)

**Objective:** Children will be able to create their name or other short message using a raised dot Braille lettering method with 80% or greater accuracy.

**Supplies/Resources/Tech:** \*Options dependent on Braille Alphabet method chosen

- **Six Dots** by Jen Bryant
- copy of the Braille Alphabet for each child [See links below.]
- copy paper and/or cardstock
- pencils, pens, markers
- bags of lentils or small beans
- white glue
- WikiStixs
- plastic tubs or baskets, per table, to organize and provide materials/supplies
- Premade sample names and messages to model for children

\*If available 3D printer and filament for Braille alphabet tile sets printed ahead of time with one set being printed so children can see the 3D printer in action [see link below]

**Read Aloud:** stop to discuss at talking points and point out any parts that will support understanding of the story/informational text and/or the chosen STEM challenges

**Introduction:** "Louis Braille was an inventor who never gave up. His strong desire to read to learn like anyone else helped him succeed in having access to books and millions more over the decades. Anyone can be a 'Maker' and an inventor for fun or maybe to create something that can help others." Ask: "What other ways, besides writing with letters or Braille Alphabet do you know?" Have children turn-and-tell-a-friend any ideas they have. Have volunteers share ideas. [Discuss additional ideas, if children don't mention them, including Morse code; other codes or secret message symbols; sign language; body language; facial expressions; naval flag signaling; train light signaling; stop lights or street signs; park signs; art, illustrating or music; computer icons; emojis....]

“Today you are going to try Louis Braille’s invention of a raised dot alphabet to create your name or some messages.”

Show select YouTube or other videos [See resources below.] Give children explicit purpose whenever watching a video. Example: “While watching this video watch for how the same pattern of dots are used again and again in the whole Braille Alphabet. Try to remember the special sentence that will help you create the letters.” Repeat these prompts again after watching the video and have children discuss the answers to the focus questions.

**Children Ask Questions:** Encourage children to ask questions. Answer procedure questions directly but not creating questions. Record these, if able, to revisit later. (Some questions may be answered today and others another visit. You might have to read to find out an answer to your questions. You might look on the Internet or find a YouTube video answer. Some questions just can’t be answered and that’s okay.)

**Engineering Challenge:** Using a Braille Alphabet Guide, create your full name (first, middle and last) or write a short message (a sentence or two) with the raised dot system.

**Guided Practice:**

1. Demonstrate: Show some sample names and short messages you’ve prepared ahead of time.
2. Demonstrate the chosen method by creating one more name.
3. Pass out materials and have children try a practice one on their own.

**Independent Practice:**

1. Discuss: Have children share what is easy about creating Braille written language and what is difficult.
2. Ask children to share how the difficulties might be solved. Have children share the ideas. Only share solutions if children are not able to help each other and collaborate after at least 15 minutes.
3. Have children choose a final project. This can be the same one they are working on or a new idea.
4. Circulate to guide individuals, as appropriate. Prompt them to come up with ideas and solutions or to take a look at how another child is creating their Braille project. Try to have the child responsible for finding out answers on their own, not getting a quick answer from an adult.

**Children answer questions posed as able or researched:** Ask children to do a “mini clean up,” putting materials away in a tub or basket on their table.

**Children Share/Present:** Have children stand to show and describe what Braille writing they chose. Have children describe what was easy about creating Braille language and what was difficult. How did they solve any difficulties? Who did they ask for help and how were they helped?

- Have everyone applaud for each Braille writing or message.
- **Elaboration:** If time, show video of Middle School children who invented a Braille Writing Machine with a Lego Mindstorms EVO robot. [See links below.]

**Creating Braille written language:**

with beans or lentils from [The Preschool Toolbox](#)

using Wiki Stix pieces from [Wiki Stix.com](#)

Using 3D printed Braille Alphabet blocks from [Instructables](#)

[Touchsee.me 3D print braille written language](#) - messages, stories, information, etc..

**Braille Alphabet Guide Chart pdfs:**

[National Braille Press](#)

[Braille Authority.org](#)

**Additional Braille resources:**

[Professional Development and Research Institute on Blindness Braille Activities](#)

Make your own Braille Alphabet Tubs from [Wonder Baby.org](#)

Sample of Braille Alphabet Tiles from [Plan Toys Braille Alphabet A-Z](#)

[YouTube Video Learn Braille in One Lesson](#) 7:27

7th Grader Invents Braille Writer with Lego Mindstorms EVO Robot

[Make Magazine Article](#)

[USA Today Article](#)

[YouTube Video #1](#) - Shubham Banerjee describing his motivation 39 seconds

[YouTube Video #2](#) - Shubham Banerjee demonstrating it in action 4:24

[That All May Read](#): free books available for the visually impaired from the Library of Congress

[National Braille Week](#): Early October

[Games and Worksheets](#)

[braillealphabet.org activities and worksheets](#)

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