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# CREATING OPPORTUNITIES FOR BLIND STUDENTS TO DEVELOP THEIR SPATIAL ABILITY

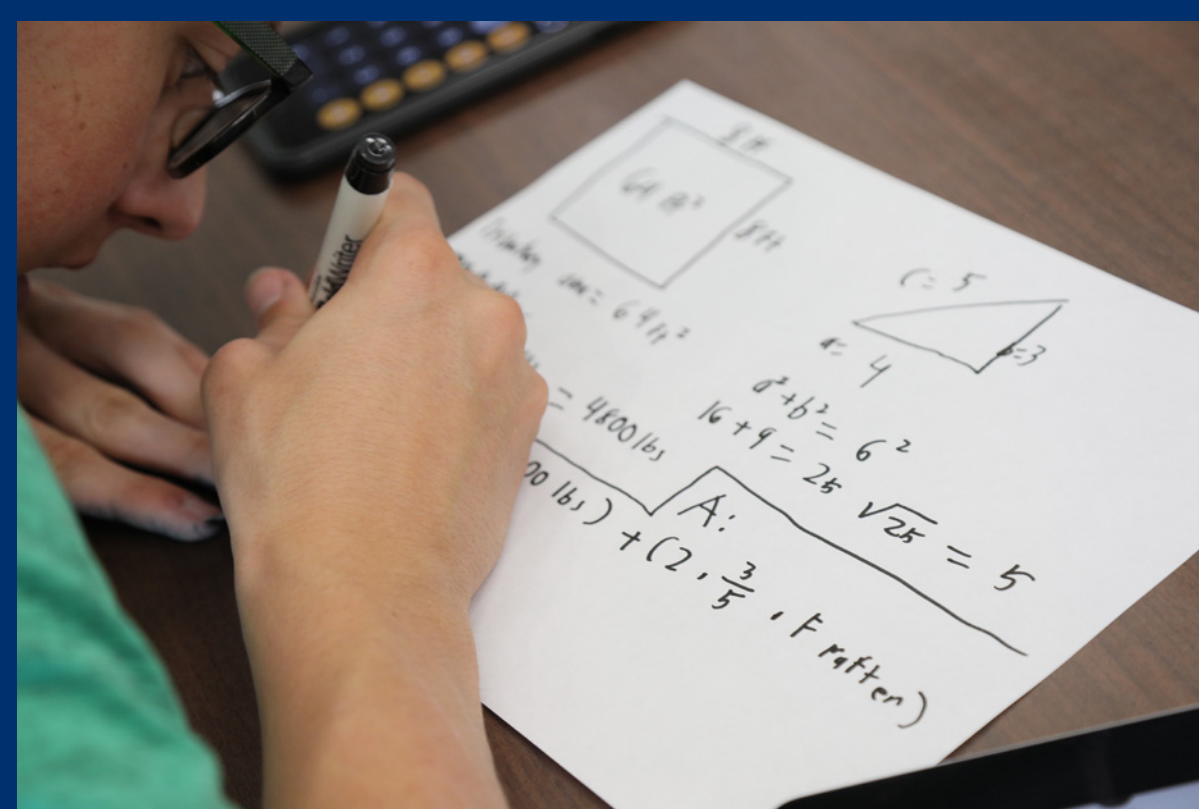
## Spatial Ability and Blind Engineering Research Project

**Spatial Ability:**  
the mental  
capacity to model  
and manipulate  
objects

- Blind people are underrepresented in STEM
- Spatial ability is connected to success in STEM<sup>[1]</sup>
- Spatial materials and activities are typically developed for sighted people
- There is a need for more accessible spatial learning opportunities for blind people

### What Works

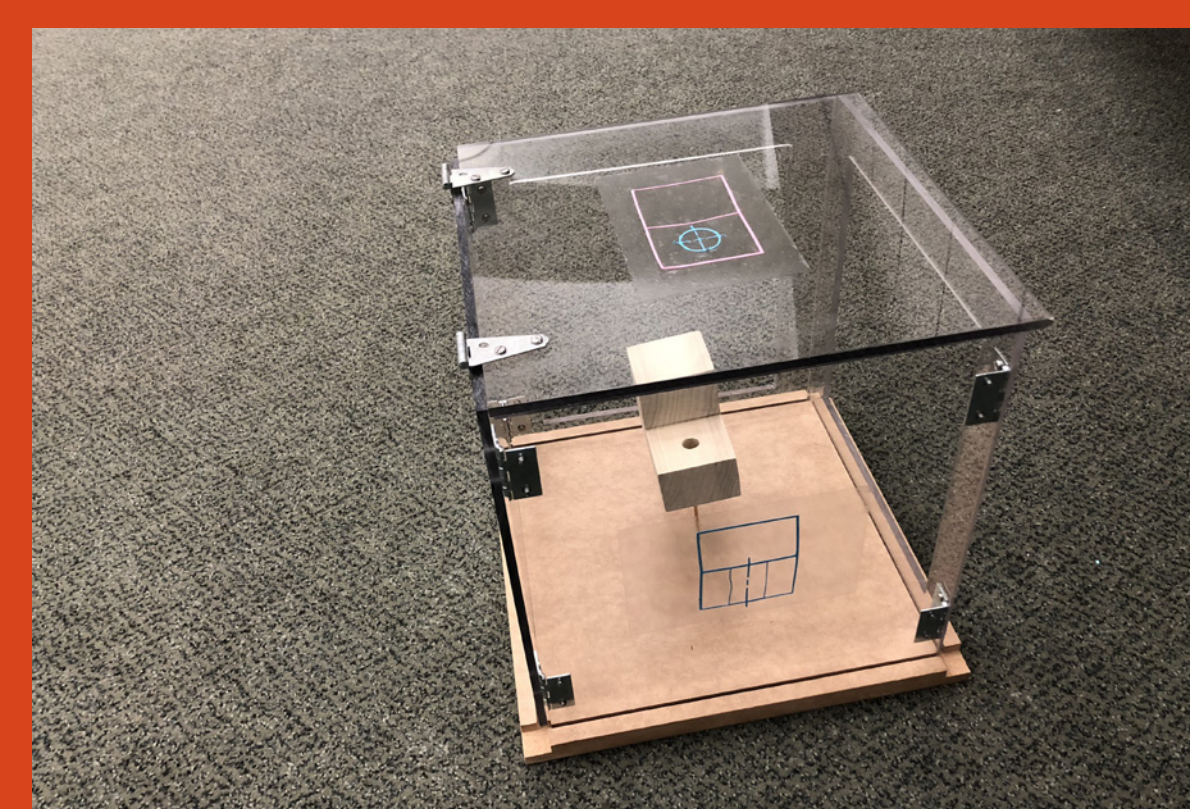
#### Braille and Large Print



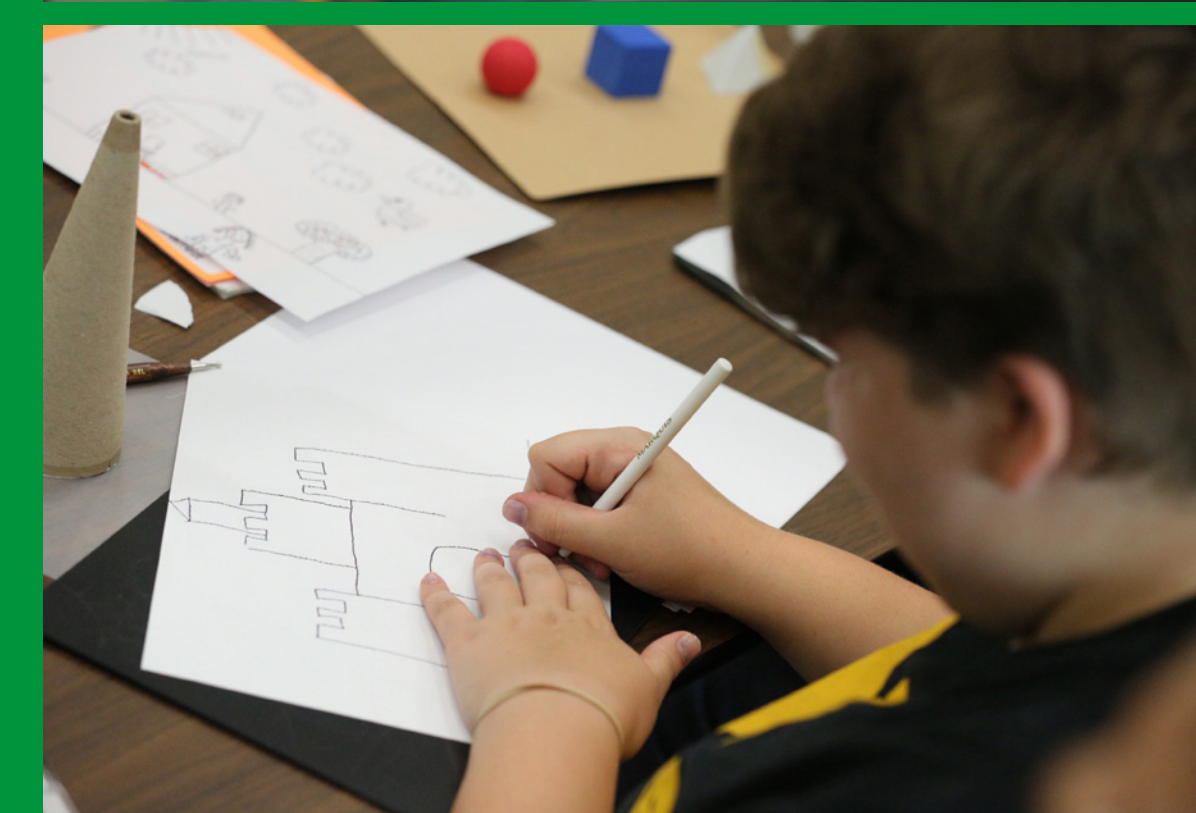
#### Tactile Graphics



#### Manipulatives



#### Tactile Drawing



#### Hands-on Activities

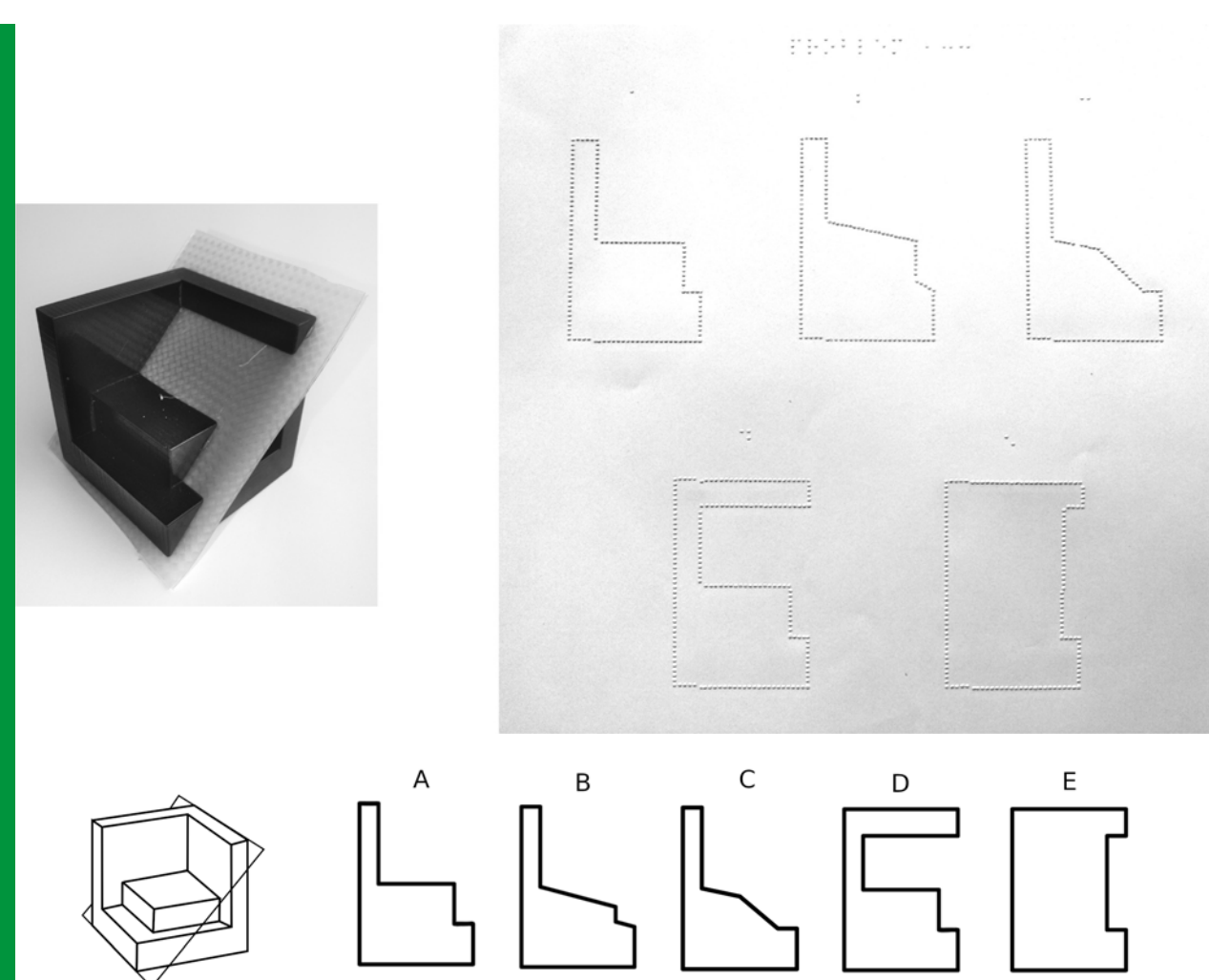


#### Accessible Instruments



#### From Obstacle to Opportunity: T-MCT

We have adapted an existing instrument, the Mental Cutting Test (MCT),<sup>[2]</sup> into a new, nonvisually accessible instrument called the Tactile-MCT, or T-MCT, by modeling and printing 3D models of the questions, and generating tactile-graphic copies of the answer choices.



#### Key Personnel

Anil Lewis, MPA, Principal Investigator | Wade Goodridge, PhD, Co-Principal Investigator  
Natalie Shaheen, MEd, Project Director | Maryanne Wojton, PhD, External Evaluator  
Ann Cunningham, CBI, Educator | Peter Anderson, MEd, Educator

#### References

- [1] Wai, J., Lubinski, D., & Benbow, C. P. (2009). Spatial ability for STEM domains: Aligning over 50 years of cumulative psychological knowledge solidifies its importance. *Journal of Educational Psychology*, 101(4), 817.
- [2] CEEB Special Aptitude Test in Spatial Relations (MCT), (1939), Developed by the College Entrance Examination Board, USA.

*This material is based upon work supported by the National Science Foundation under Grant No. 1712887. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.*

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