DMT INSTITUTE

Developing Mathematical Thinking Institute (DMTI)

Professional Development

Curricular Resources

Assessment

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About the DMTI Modules

The DMTI modules are designed to guide classroom instruction and formative assessment for teachers implementing the DMTI curricular materials.

The lessons are not necessarily intended for a single day of instruction. Teachers are encouraged to use their professional judgement regarding pacing. A suggested number of weeks is provided.

PMA – Grade 1

Spatial Reasoning

Spatial Reasoning: Quick Draw

What's involved:

Composing and decomposing space

Orientation of objects

Examining and describing 2 and 3 dimensional space

Maneuvering space

- Directional words (right, left, forward, back)
- Transformational words (slide/translate, flip/reflect, turn/rotate)

Why it matters:

Builds initial ideas of measurement, proportional reasoning, graphing, statistics and data

Connects concepts of spatial awareness to concepts of number

Focuses on the structure of mathematics: decomposing and composing

Highly predictive of success in math

Spatial Reasoning: Quick Draw

Materials

Paper or drawing space

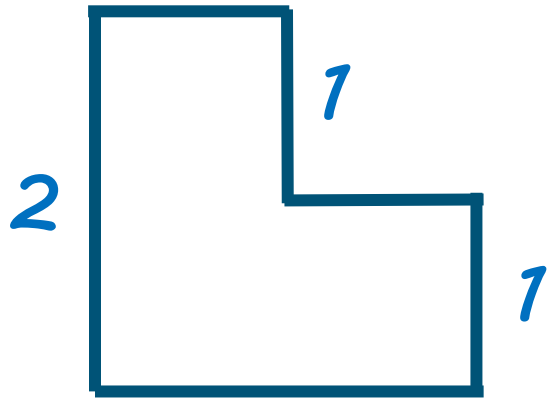
Spatial Reasoning: Quick Draw

Terms

Transitivity – knowing the relationship of one measure to help determine another measure.

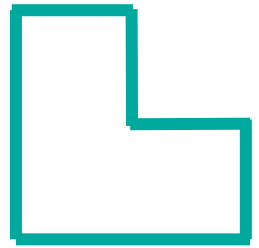
- I know if the left side is 2 units long then each of the lengths on the right is 1 and 1.

Rotate – to turn an object



Spatial Reasoning: Quick Draw

Rotations

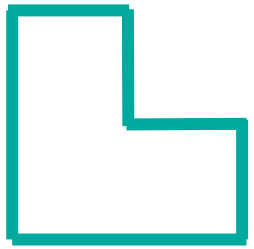


Here are some rotations that might be used.

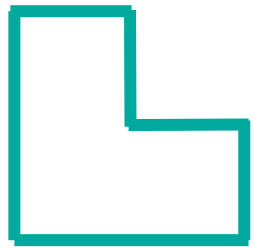
- I rotated the figure to the right a full turn.
- I rotated the figure to the right a quarter turn.
- I rotated the figure to the right a half turn.
- I rotated the figure to the left a quarter turn.
- I rotated the figure to the left a half turn.

Right – full turn

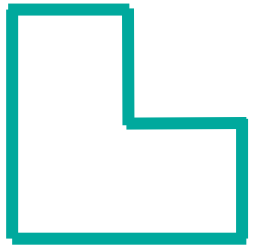
Right – quarter turn



Right – half turn



Left – quarter turn



Left – half turn

Spatial Reasoning: Quick Draw

Activity

1. Have the child draw the shape on a piece of paper based on the orientation described.
2. The goal is for the child to be as precise or exact as possible.
3. Teach the child to use transitivity to be more precise.
4. Use the sentence frame below:
   - *I know this length is (the same, longer, shorter, two times longer, half as long, . . .) as this other length.*

Spatial Reasoning: Quick Draw

Activity

1. Draw this shape rotated quarter turn to the right.
2. Use your fingers to determine whether your drawing is precise. Erase and change the lengths to make it the same if needed.
3. Compare the lengths of the different sides and explain the similarities or differences.
4. Once complete restate how the shape was changed.

Spatial Reasoning: Quick Draw

Let's Check

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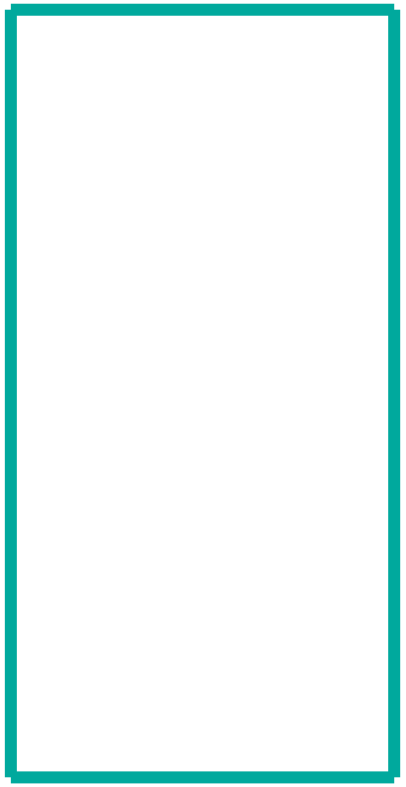

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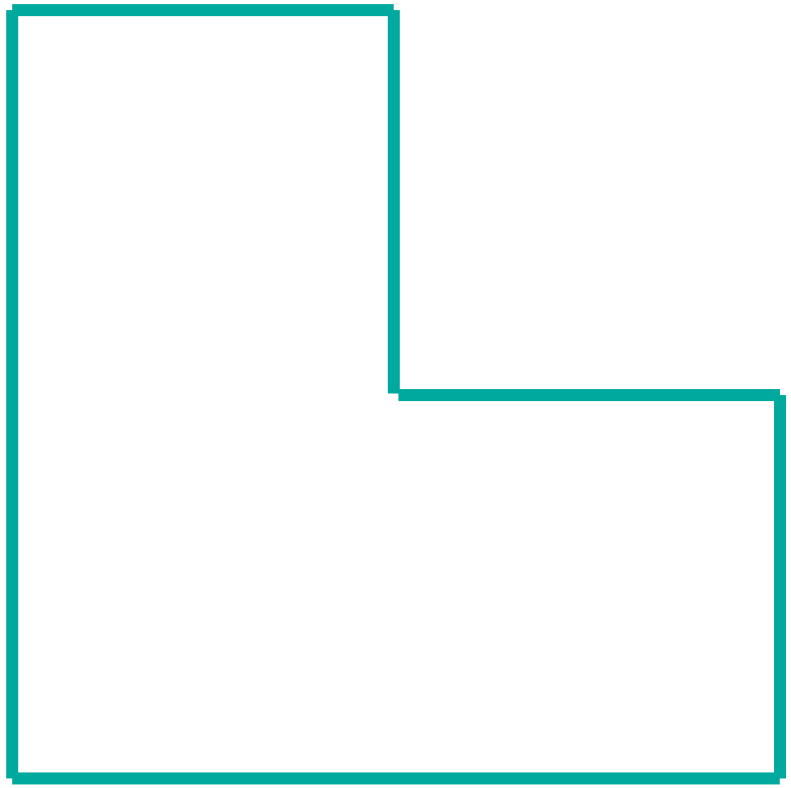

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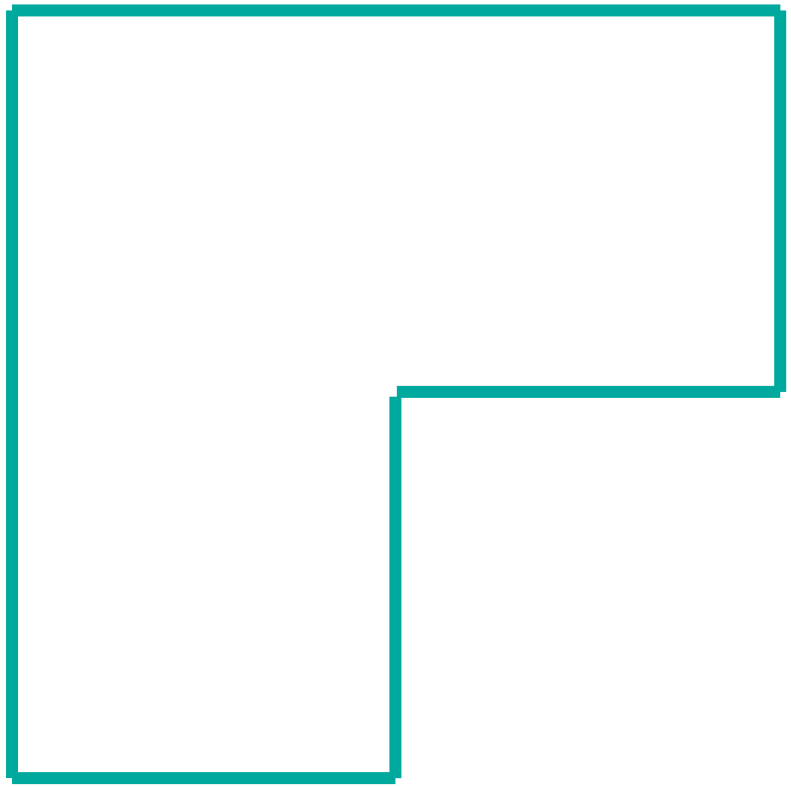

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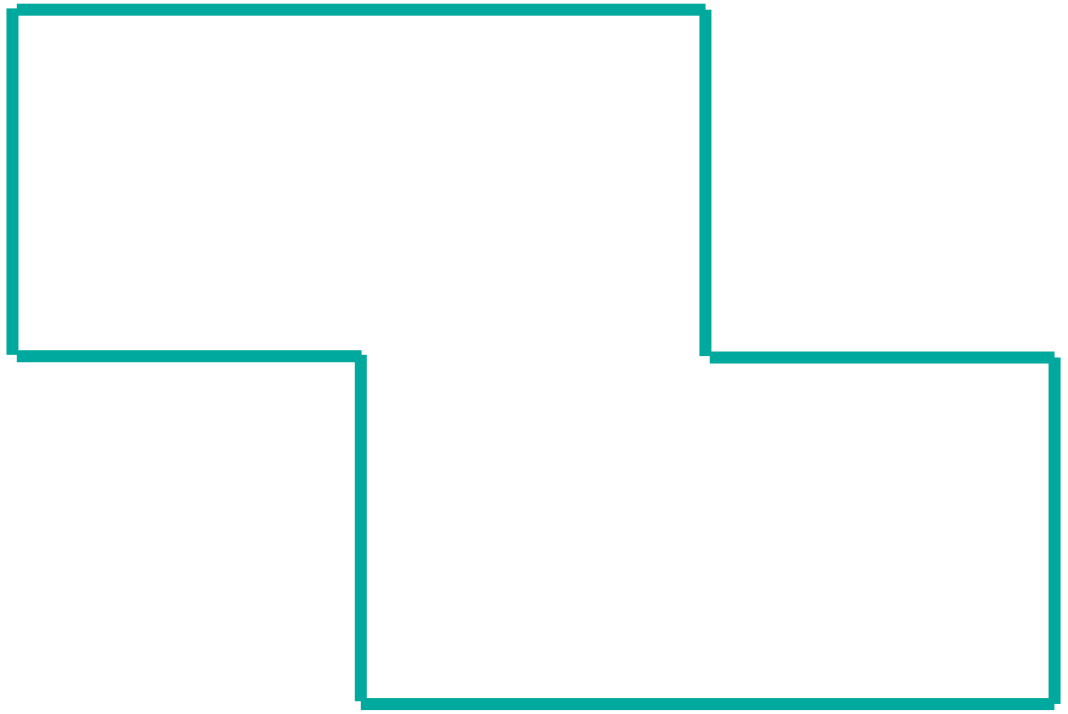

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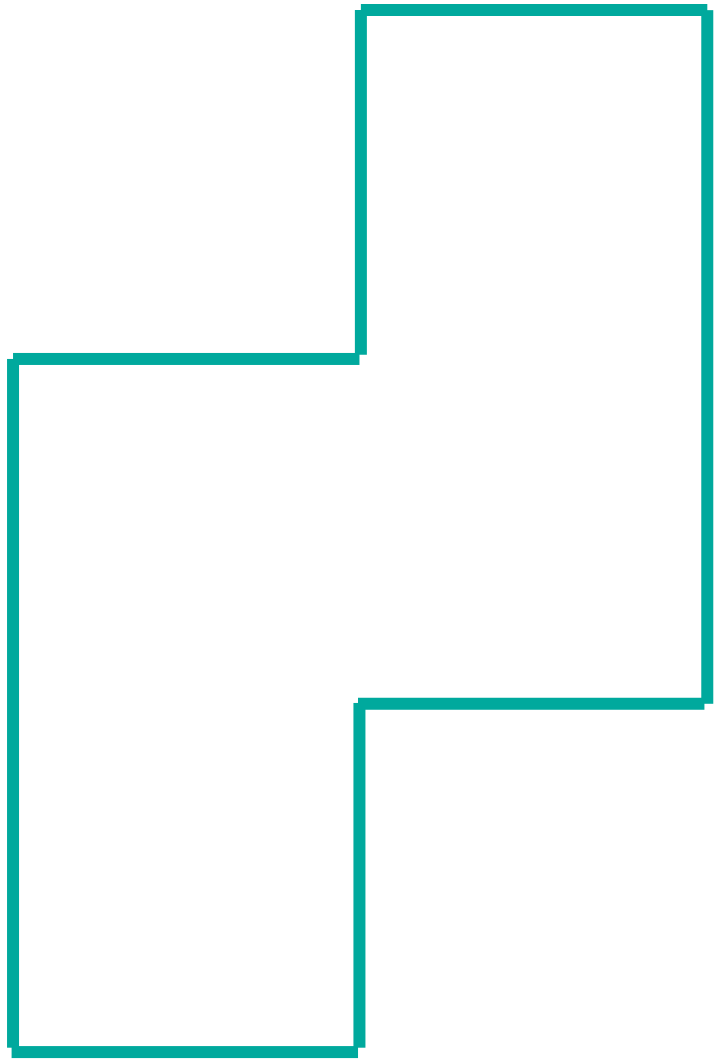

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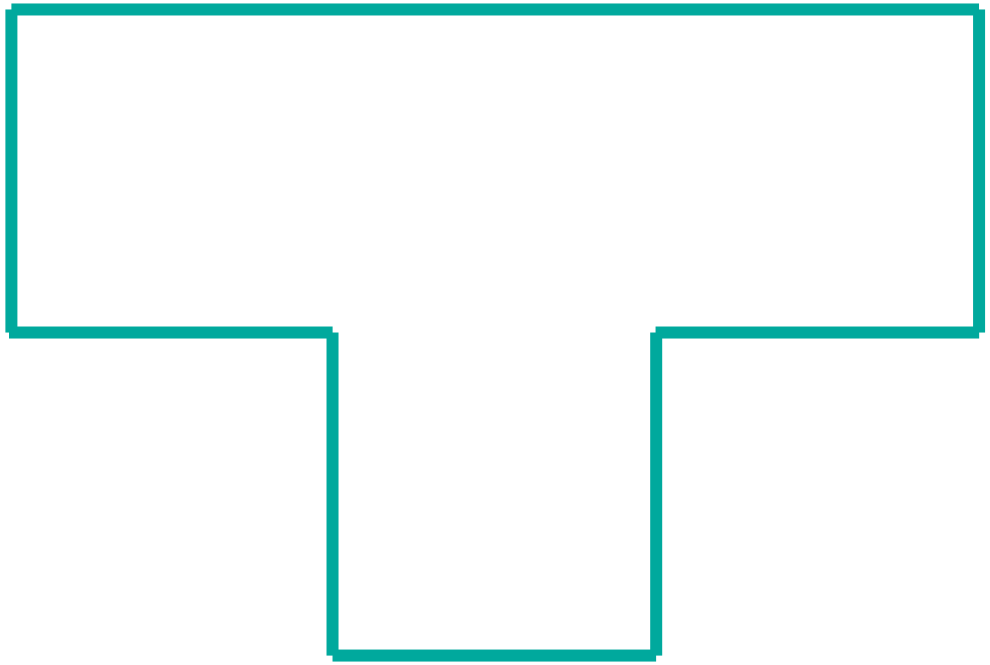

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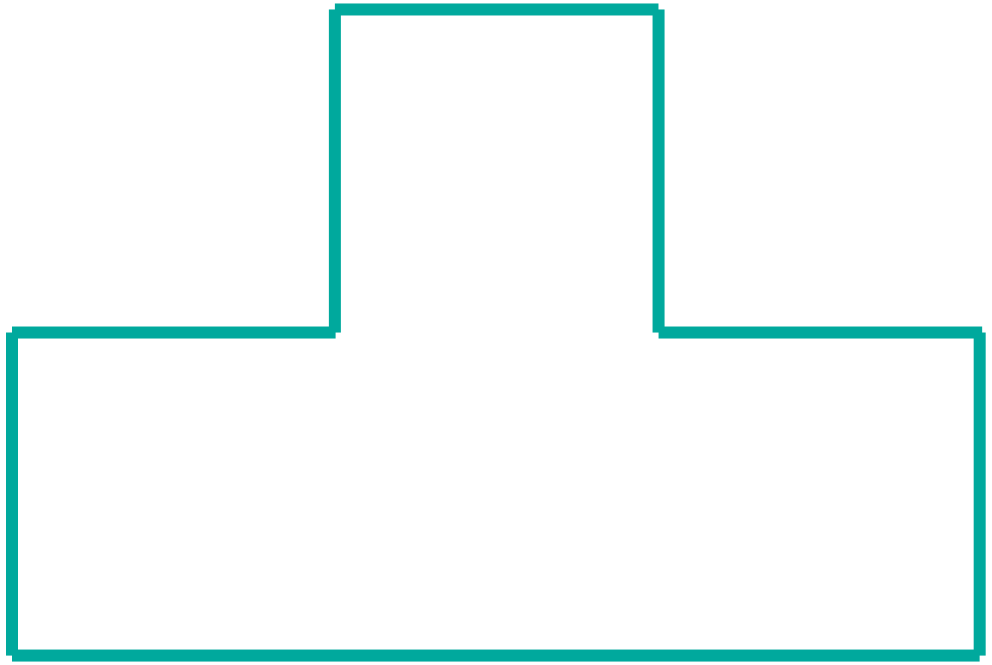

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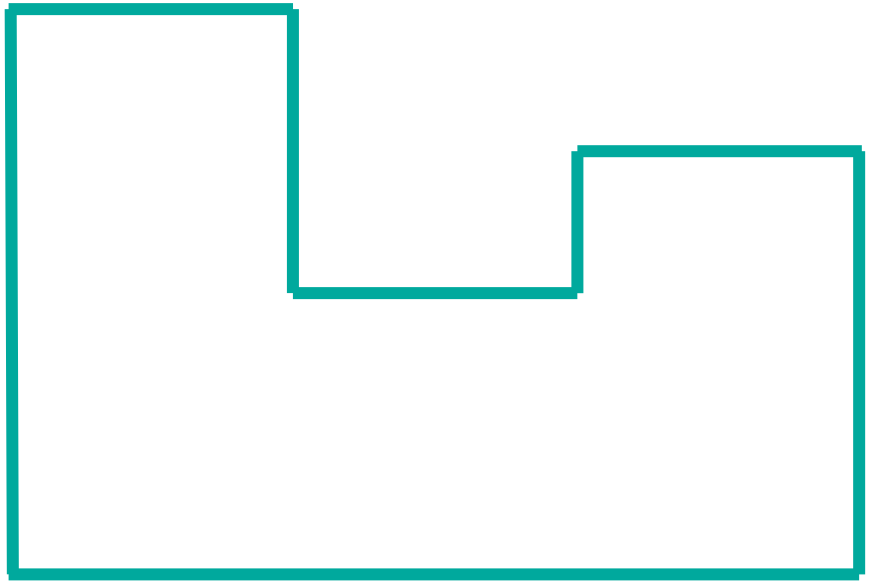

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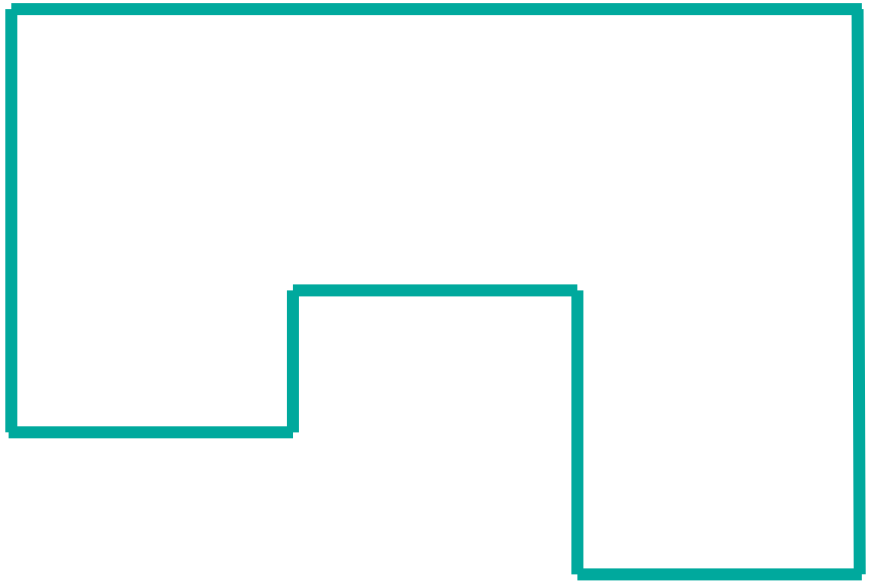

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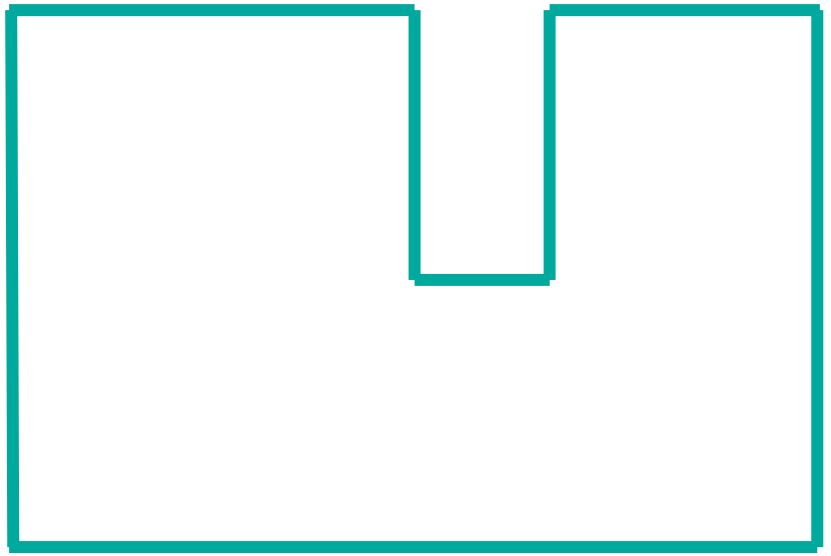

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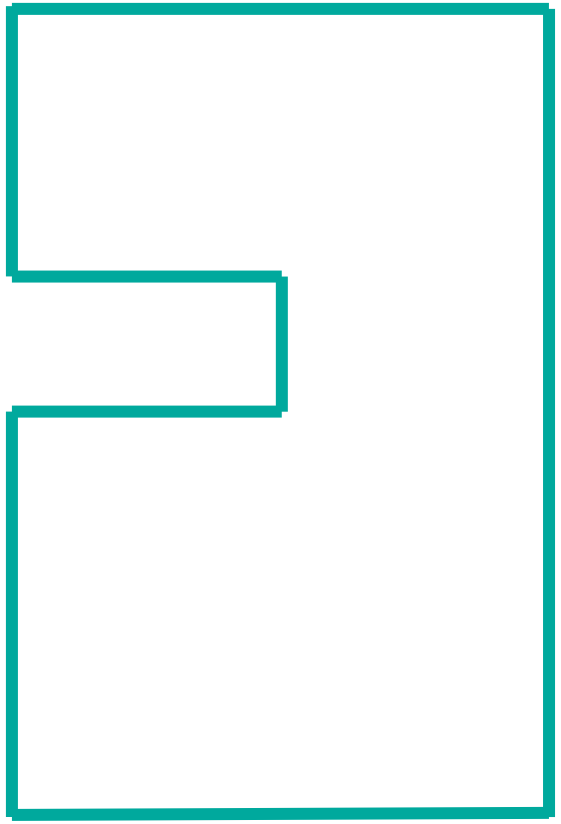

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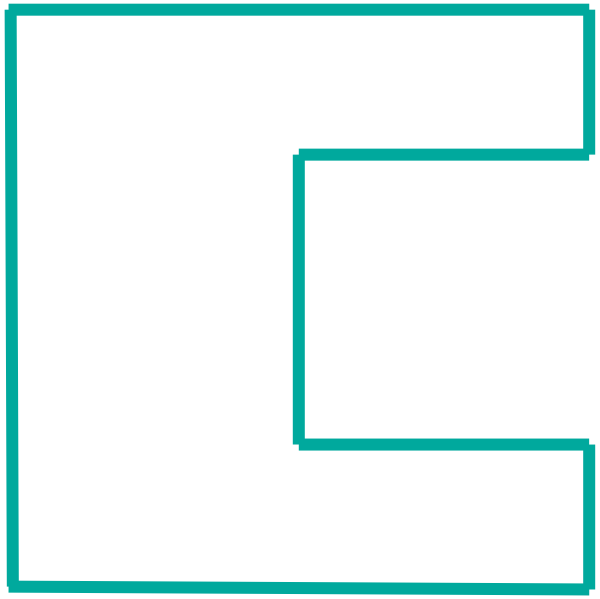

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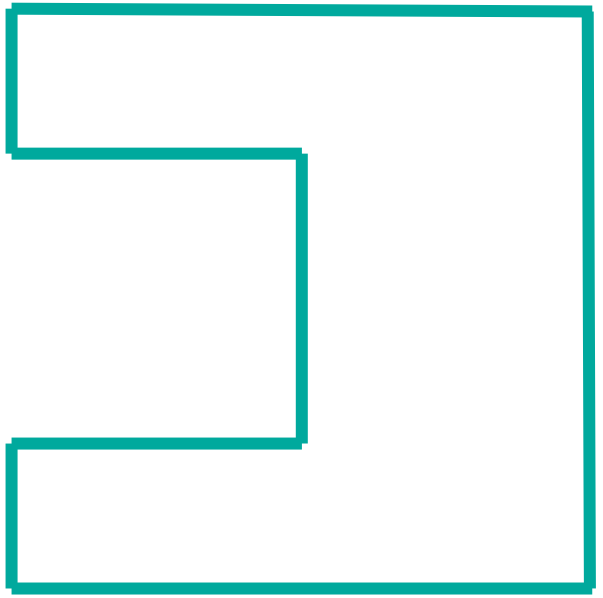

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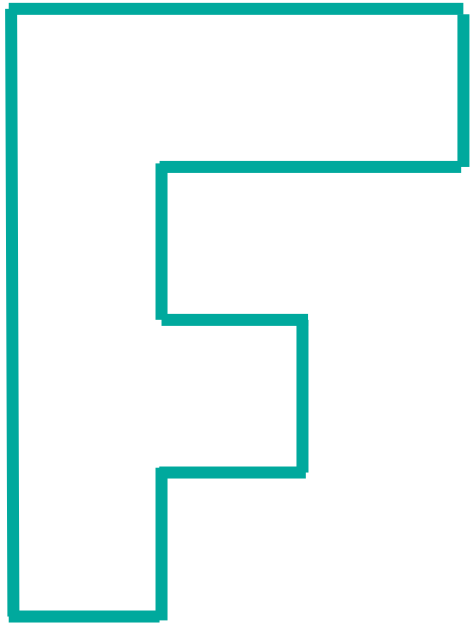

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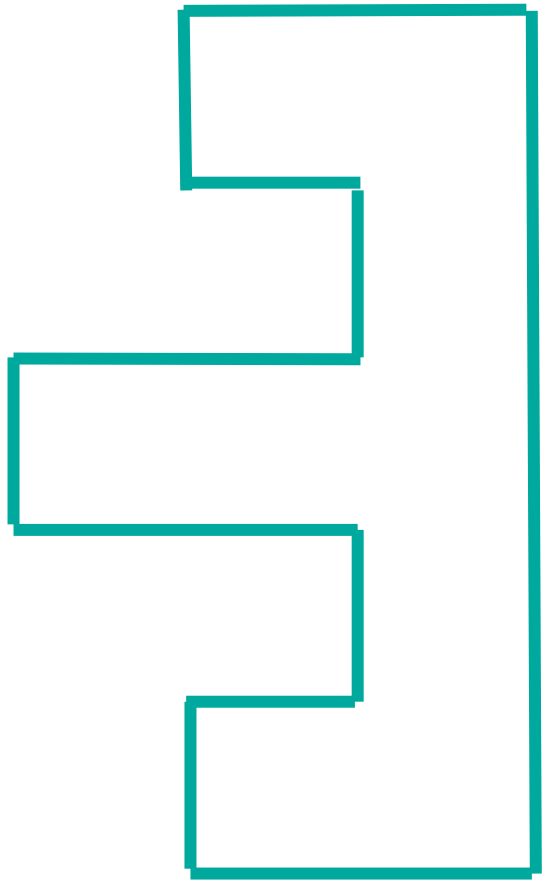

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"The Developing Mathematical Thinking Institute (DMTI) is dedicated to enhancing students' learning of mathematics by supporting educators in the implementation of research-based instructional strategies through high-quality professional development, curricular resources and assessments."

For more information contact
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