

DMT INSTITUTE

Developing Mathematical Thinking Institute (DMTI)



Professional
Development



Curricular
Resources



Assessment

Jonathan Brendefur, PhD
jonathan@dmtinstitute.com

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

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: Perspectives

Materials

- **Cubes (DMTI Math Pack)**
- **Paper**

Terms

- **Composing** – to put together
- **Decomposing** – to take apart

Spatial Reasoning: Perspectives

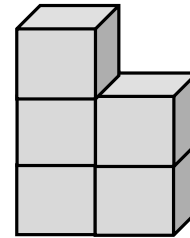
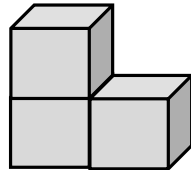
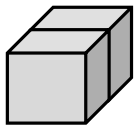
Activity I

1. Create the following constructions using your cubes.
2. Ask the child the following questions:
 - How many cubes were used to create this construction?
 - How many cubes high is the construction?

Spatial Reasoning: Perspectives

Activity I

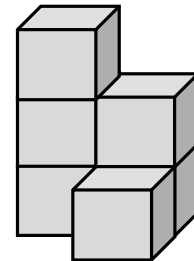
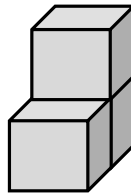
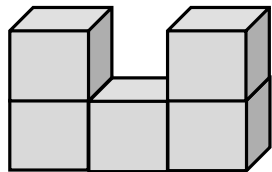
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Spatial Reasoning: Perspectives

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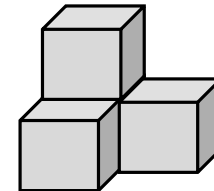
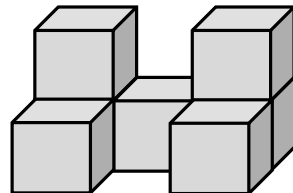
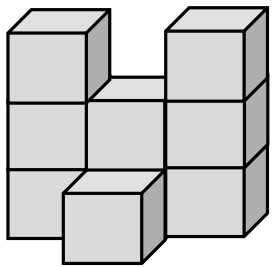
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Spatial Reasoning: Perspectives

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Spatial Reasoning: Perspectives


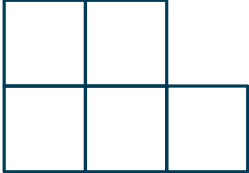

Activity II

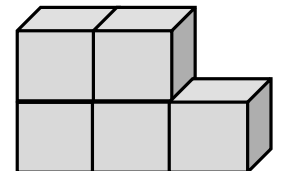
1. Use the top view, front view and side view to create this construction with cubes.
2. Ask the child the following questions:
 - How many cubes were used to create this construction?
 - How many cubes high is the construction?

Spatial Reasoning: Perspectives

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1. Use the top view, front view and side view to create this construction with cubes.
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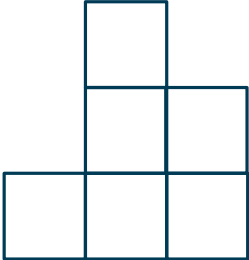

Top View	Front View	Side View
		

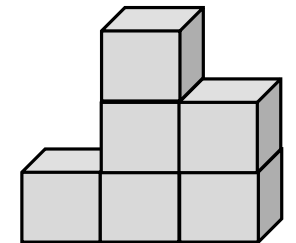


Spatial Reasoning: Perspectives

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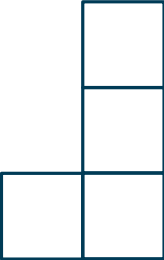
Top View	Front View	Side View
		

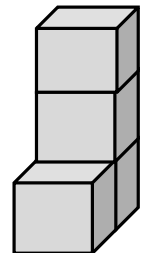


Spatial Reasoning: Perspectives

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Spatial Reasoning: Perspectives


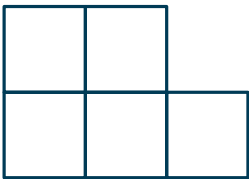

Activity III

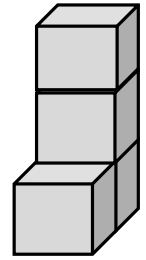
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Spatial Reasoning: Perspectives

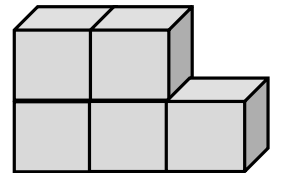
Activity III

1. Which 3D model matches the top, front and side view drawings?
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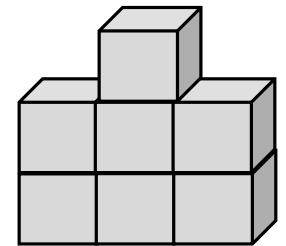
Top View	Front View	Side View
		



A



B


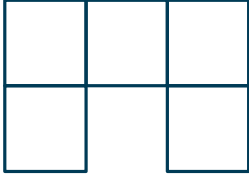



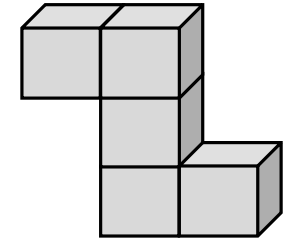
C

Spatial Reasoning: Perspectives

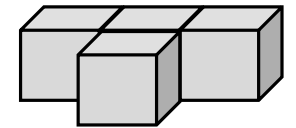
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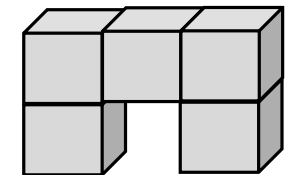
Top View	Front View	Side View
		



A



B

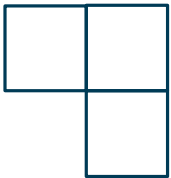
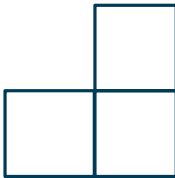
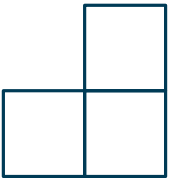


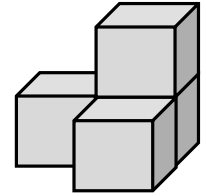
C

Spatial Reasoning: Perspectives

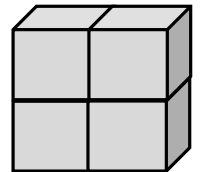
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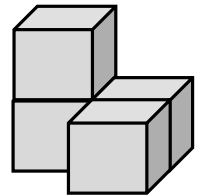
Top View	Front View	Side View
		



A



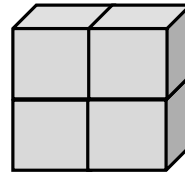
B



C

Spatial Reasoning: Perspectives

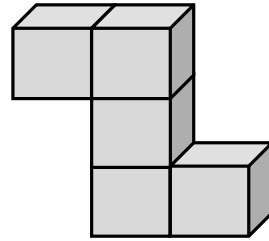
Activity IV - A: Look at the 3D object and draw the 2D viewpoints.



Top View	Front View	Side View

Spatial Reasoning: Perspectives

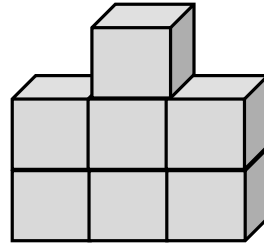
Activity IV - B: Look at the 3D object and draw the 2D viewpoints.



Top View	Front View	Side View

Spatial Reasoning: Perspectives

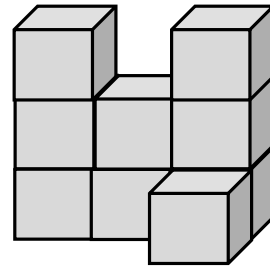
Activity IV - C: Look at the 3D object and draw the 2D viewpoints.



Top View	Front View	Side View





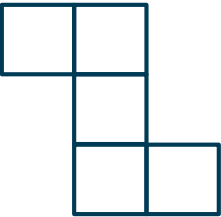


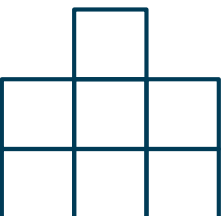

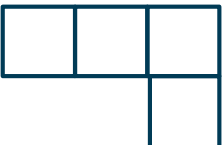
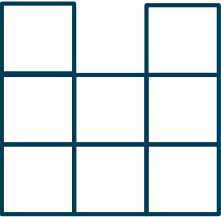
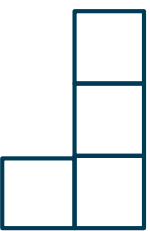
Spatial Reasoning: Perspectives

Activity IV - D: Look at the 3D object and draw the 2D viewpoints.



Top View	Front View	Side View

Correct responses for Activity IV

Top View	Front View	Side View
<p>A</p> 	<p>A</p> 	<p>A</p> 
<p>B</p> 	<p>B</p> 	<p>B</p> 
<p>C</p> 	<p>C</p> 	<p>D</p> 
<p>A</p> 	<p>B</p> 	<p>C</p> 

Spatial Reasoning: Perspectives

Activity V

1. Construct your own figure.
2. Draw top view, front view, and side view that matches the 3D construction you created.
3. Ask the following questions:
 - How many cubes were used to create this construction?
 - How many cubes high is the construction?



“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
Dr. Brendefur at jonathan@dmtinstitute.com

