Spec Title	Language Domain	Grade Level	Standard	Item Format	Key Use of Academic Language	Topic	Proficiency Range
R91C_MA	Reading	9–12	LoMA	Multiple Choice	Explain	Multidimensional shapes	3–5

Purpose

To allow ELLs in grades 9–12 to demonstrate comprehension of the written language used to describe and compare multi-dimensional shapes. The key use of academic language is EXPLAIN: The purpose of the item passages is to clarify the why or the how of ideas, actions, or phenomena.

Model Performance Indicators (MPIs)

P3	P4	P5
Compare/contrast multidimensional shapes or geometric arguments within visually supported text (e.g., based on angles, parallel/ perpendicular sides or diagonals, "At least one pair of..")	Summarize key components of geometric arguments, constructions or multidimensional shapes from visually supported text (e.g., ray, alternate interior angles, corresponding sides)	Analyze geometric arguments, theorems, or multidimensional shapes from visually supported text

Cognitive Function: Students at all levels of English language proficiency ANALYZE information about multidimensional shapes related to real-world situations.

Connection to Content Standards (referenced in the topic selection or context for language use)

Common Core Standards for Math

CCSS.MATH.CONTENT.7.G.A.3: Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

CCSS.MATH.CONTENT.7.G.B.6: Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

CCSS.MATH.CONTENT.8.G.C.9: Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

CSS.MATH.CONTENT.HSG.GMD.A.1: Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.

CCSS.MATH.CONTENT.HSG.GMD.A.2: (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.

CCSS.MATH.CONTENT.HSG.GMD.A.3: Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

CCSS.MATH.CONTENT.HSG.GMD.B.4: Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

CCSS.MATH.CONTENT.HSG.MG.A.1: Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree or a human torso as a cylinder).

CCSS.MATH.CONTENT.HSG.GMD.B.4: Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Guidelines for Choosing a Theme

- Think of a theme involving several two- or three-dimensional geometric shapes that would be interesting to a student in grades 9–12. For example, what kinds of familiar contexts naturally contain cubic, spherical, pyramidal, or cylindrical objects that can easily be represented graphically? Or, what kinds of square, circular, triangular, or trapezoidal shapes appear in everyday situations familiar to students in grades 9–12?
- Possible categories from which to select a theme include: architecture, food, sports, transportation, technology, etc.
- Think about how geometric shapes and arguments are introduced, explained, and manipulated in math classrooms. The theme must lend itself to showing how a single geometric argument (e.g. alternate interior angles or pairs of angles) relates in different ways to the shapes chosen.
- Make sure the theme is grade level appropriate, concrete, and real-life.
- Avoid discussing multidimensional shapes in the context of gardens, cakes, craft fairs or field days as these themes have already been developed for other LoMA specs.

Context for Language Use

- Select a text type or an authentic and relevant context in which students in this grade level cluster might engage with print text in the given Standard.

Theme Level Information

Theme ID: R91C_MA_Title_502

Theme Title: Write a short, engaging title. It will be repeated at the top of each screen. It should reflect the theme of the reading passages presented in the thematic folder.

Orientation: Write a few short sentences to orient students to the text type and theme they will encounter when they read the item passages.

The purpose of the orientation screen is to announce and introduce the source of the text that test takers will be reading. It may also introduce the context for the reading activity/experience. The content of the orientation screen may vary according to the standard, grade cluster, and proficiency levels addressed in the items. The amount of text shown on the orientation screen should be minimal, to reduce the processing load.

Theme Graphic Description: Write a detailed description of a graphic and/or draw a sketch that represents the theme or shows the source of the reading text that the test taker will encounter in the items.

Item Level Characteristics			
Item Seq No.	Item 1	Item 2	Item 3
Prof Level	3	4	5
MPI (what the *passage* must do)	Compare/contrast multidimensional shapes or geometric arguments within visually supported text (e.g., based on angles, parallel/ perpendicular sides or diagonals, "At least one pair of..")	Summarize key components of geometric arguments, constructions or shapes from visually supported text (e.g., ray, alternate interior angles, corresponding sides)	Analyze geometric arguments, theorems, or multidimensional shapes from visually supported text
Item Passage The linguistic features of the key use of academic language (EXPLAIN) will be realized through the item passages in the thematic folder.	Maximum of 4 sentences Write a passage that compares or contrasts one aspect of two shapes from the theme graphic. Use the language of comparison, for example words like "similar," "on the other hand," or "identical".	Maximum of 6 sentences Write a passage that describes components of two to four shapes. These shapes may come from the theme graphics, or you may introduce new shapes related to the same topic.	Maximum of 8 sentences Write a passage that presents a geometric argument. The passage should describe the steps taken to prove a geometric rule or feature. Remember that the student needs to show comprehension of the language, not the content of the passage. Use language associated with analysis such as "therefore," "in order to," or "because."
Item Graphic	Write a short description of the visual support for EACH item.		
Performance Definitions: Application to Reading Students at each proficiency level will demonstrate comprehension of the intended meaning of:	• Discourse with a series of extended sentences • Related ideas • Compound and some complex grammatical constructions (e.g., noun phrase, verb phrase, prepositional phrase) • Sentence patterns across content areas • Specific content words and expressions • Words or expressions related to content area with common collocations and idioms across content areas	• Connected discourse with a variety of sentences • Expanded related ideas • A variety of complex grammatical constructions • Sentence patterns characteristic of particular content areas • Specific and some technical content-area language • Words and expressions with multiple meanings or collocations and idioms for each content area	• Rich descriptive discourse with complex sentences • Cohesive and organized related ideas • Compound, complex grammatical constructions (e.g., multiple phrases and clauses) • A broad range of sentence patterns characteristic of particular content areas • Technical and abstract content-area language • Words and expressions with shades of meaning for each content area
Task Statement/ Question (what the *student* must do)	Ask the students to choose the correct description of how the shapes are alike or different based on information presented in the reading passage.	Ask the students to select the option that summarizes a component presented in the passage.	Ask the students to select the option that shows understanding of the analysis presented in the passage.
Response Option Characteristics			
Number	P3 = 4 response options	P4 = 4 response options	P5 = 4 response options
Properties	Text	Text	Text
Layout	Vertical	Vertical	Vertical

Orientation Screen Layout

Theme Title

Orientation presented here.

Theme Graphic shown here

Item Screen Layout

Theme Title	1. QUESTION shown here
Item passage presented here. This space is available to provide graphic support. The Theme Graphic may be repeated here or an Item Graphic may be shown here. If no additional graphic support is necessary, this space may be left blank.	○ KEY Graphic or text shown here
	○ DISTRACTOR 1 Graphic or text shown here
	○ DISTRACTOR 2 Graphic or text shown here
	○ DISTRACTOR 3 (if applicable) Graphic or text shown here

For Internal (CAL) Use Only:

Spec Identification						
Spec Title	Language Domain	Grade Level	Standard	Key Use of Academic Language	Item Format	Proficiency Range
R91C_MA	Reading	9–12	LoMA	Explain	Multiple Choice	3–5

Response Options Description			
Number of Options	P3 = 4	P4 = 4	P5 = 4
Properties	Text only	Text only	Text only
Layout	Vertical	Vertical	Vertical

Model Performance Indicators			
	P3	**P4**	**P5**
Original MPIs: *Multidimensional shapes*	Compare/contrast multidimensional shapes or arguments within visually supported text (e.g., based on angles, parallel/ perpendicular sides or diagonals, “At least one pair of..”)	Match specific and some technical language associated with components of geometric arguments, constructions or shapes to visually supported text (e.g., ray, alternate interior angles, corresponding sides)	Analyze and defend geometric arguments, theorems or shapes
Transformed MPIs: *Minor text revisions to MPIs*	Compare/contrast multidimensional shapes or geometric arguments within visually supported text (e.g., based on angles, parallel/ perpendicular sides or diagonals, “At least one pair of..”)	Summarize key components of geometric arguments, constructions or shapes from visually supported text (e.g., ray, alternate interior angles, corresponding sides)	Analyze geometric arguments, theorems, or multidimensional shapes from visually supported text

Notes
For 502: P4 MPI revised to avoid two MPIs in a spec targeting ‘match’; P5 MPI revised to provide details on textual support (to match all other MPIs)

