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edTPA: Understanding Academic Language

Participant Resource Booklet

OVERVIEW

- Review - definition of academic language.

- Examine the specific edTPA requirements for academic language in mathematics.

- Explore examples – Rubric 4
  - Determine Language Demands
  - General Supports versus Targeted Supports

- Explore examples – Rubric 14

SCALE
Stanford Center for Assessment, Learning, & Equity

Section 1: Review of Academic Language

Disciplinary Language Questions

What does writing look like in mathematics? What are the writing skills students need to be successful?

What does reading look like in mathematics? What are the reading skills students need to be successful?

What does speaking/listening/performing look like in mathematics? What are the speaking/listening/performing skills students need to be successful?

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Examples

Discipline	Writing	Reading	Speaking/ Listening/ Performing
English/Language Arts	essays, poems, memoirs, letters, etc.	novels, poetry, textbooks, plays, film, ads, etc.	speeches, read alouds, scenes, discussions, presentations, etc.
Visual Arts	critique, artist statements, how tos, process pieces, etc.	images, textbooks, art pieces, pottery, commentary, etc.	painting, sketching, drawing, making pottery, discussion, showcase, etc.
Physical Education	game plans, game analysis, plays, routines, etc.	textbooks, game plans, plays, game or practice video review, demonstrations, etc.	game play, practice, demonstrations, drills, etc.
Mathematics			

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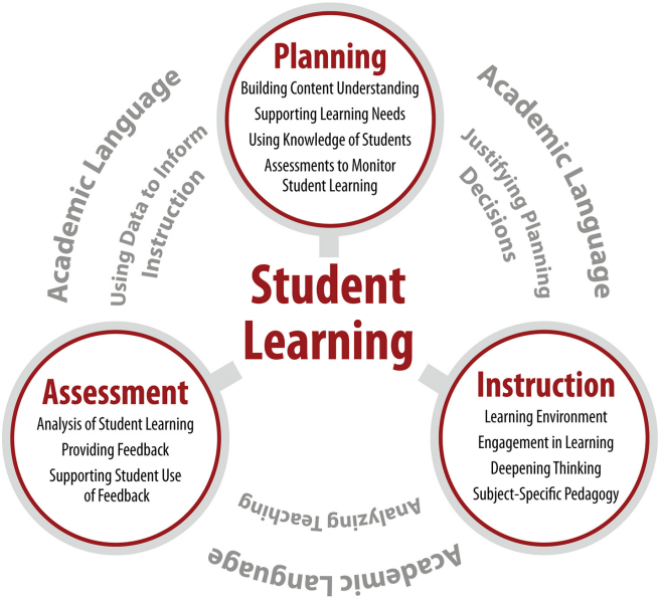
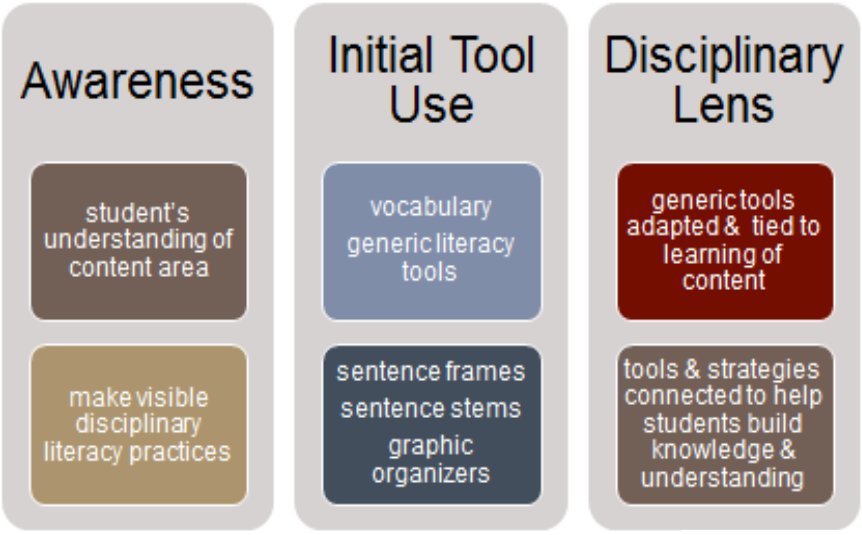
Section 2: Academic Language in the edTPA

edTPA Graphic



Candidate Journey to Academic Language



Hundley, 2013

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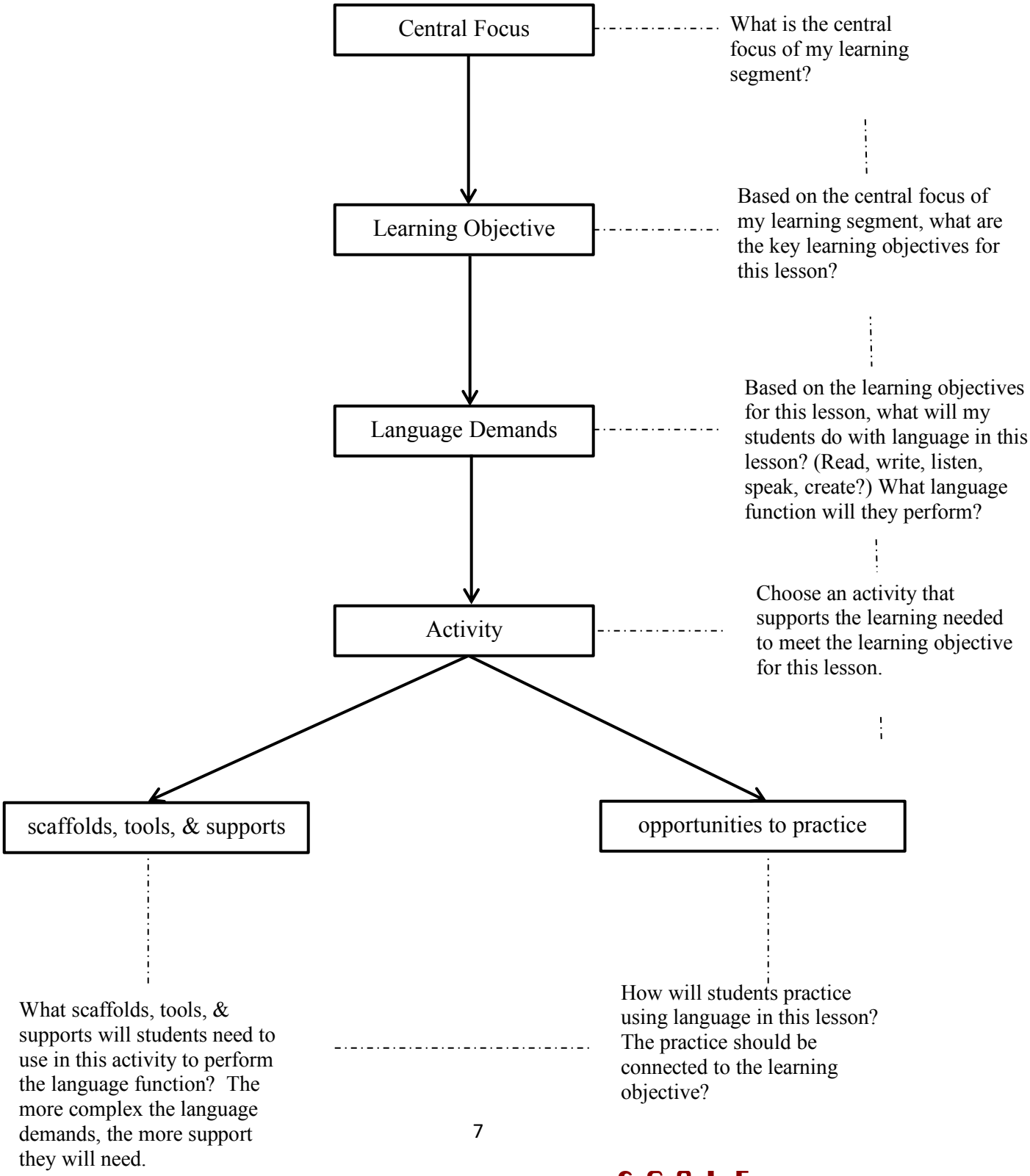
Academic Language in edTPA Lessons



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Teacher Candidates are asked to:

- Select one key language function essential for students to learn within the central focus.
- Identify a key learning task from plans that provide students opportunities to practice using the language function.
- Language Demands (consider language function & task) describe the language demands (written or oral) students need to understand and/or use.
  - Vocabulary and/or symbols
  - Precision
  - Syntax
  - Discourse
- Language Supports: Describe instructional supports that will help students understand and use language function & additional language demands.

Language Supports

- Strategies that are used to build students' academic language within a learning task.
- Strategies involve both modeling the appropriate language for the students to use in a learning task a well as opportunities for guided practice.

List some language supports that are useful in mathematics.

_____

_____

_____

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Section 3: Candidate Samples Demonstrating Language Supports

Rubric 4

Looking at Rubric 4

Rubric 4: Identifying and Supporting Language Demands

How does the candidate identify and support language demands associated with a key mathematics learning task?

Level 1	Level 2	Level 3	Level 4	Level 5
Language demands[4] identified by the candidate are **not consistent with the selected language functions OR task**. **OR** **Language supports are missing or are not aligned with the language demand(s)** for the learning task.	**Language supports primarily address one language demand** (vocabulary and/or symbols, function, mathematical precision, discourse, syntax).	**General language supports address use of two or more language demands** (vocabulary and/or symbols, function, mathematical precision, discourse, syntax).	**Targeted language supports** address use of • **vocabulary and/or symbols,** • **language function, AND** • **one or more additional language demands** (mathematical precision, discourse, syntax).	**Level 4 plus:** **Language** supports are **designed to meet the needs of students with different levels of language learning**.

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- The focus of this rubric is on identifying and supporting the language demands of a particular lesson so that students will be able to participate and learn.

Let's look at Rubric level 3.

- At this level, candidates provides general language supports that address two or more of the language demands. (vocabulary and/or symbols, function, precision, syntax, discourse).

Now, let's look at Rubric level 4.

- Here the candidate provides **targeted language supports** address use of vocabulary, the **language function**, **AND** one or more additional language demands (precision, syntax, discourse).

What are the characteristics of general supports?

_____

_____

_____

_____

_____

What are the characteristics of targeted supports?

_____

_____

_____

_____

_____

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Directions:

1. **Read the sample response to planning prompt 4 for Middle Childhood Mathematics.**

2. **Underline/Highlight the identified language function and any additional identified language demand (vocabulary, precision, discourse, syntax).**

3. **Circle the language supports in the commentary.**

4. **Complete the chart matching the language demands to the planned language supports.**

5. **Examine evidence you found and map it to Rubric4 language – what level/s do you think it represents?**

4. Supporting Mathematics Development Through Language

As you respond to prompts 4a–d, consider the range of students' language assets and needs—what do students already know, what are they struggling with, and/or what is new to them?

a. **Language Function.** Using information about your students' language assets and needs, identify **one** language function essential for young adolescents to develop conceptual understanding, procedural fluency, and mathematical reasoning or problem-solving skills within your central focus. Listed below are some sample language functions. You may choose one of these or another more appropriate for your learning segment.

Compare/contrast	Describe	Explain	Justify	Prove

Please see additional examples and non-examples of language functions in the glossary.

[Students will be able to explain the strategy they used to factor trinomials.]

b. Identify a key learning task from your plans that provides young adolescents with opportunities to practice using the language function. Identify the lesson in which the learning task occurs. (Give lesson day/number.)

[Within the direct instruction in Lesson 1, students are able to explain their process of factoring trinomials as they work collaboratively with the peers at their tables. The students will be asked to not only factor the trinomials they are given, but also explain how they factored them to their group

members. Also, in Lesson 3, students are provided the opportunity to ask questions and discuss their errors made on their pre-assessments. While doing this, students will have to explain how to factor a trinomial correctly.]

c. **Additional Language Demands.** Given the language function and learning task identified above, describe the following associated language demands (written or oral) young adolescents need to understand and/or use:

- Vocabulary and/or symbols
- Mathematical precision (e.g., using clear definitions, labeling axes, specifying units of measure, stating meaning of symbols), appropriate to your students' mathematical and language development[1]
- **Plus** at least one of the following:
  - Syntax
  - Discourse

[The vocabulary addressed in the learning tasks identified above include: factor, trinomials, binomials, product, sum, coefficient, and term. While describing the process that they took to factor trinomials, students should be using the appropriate vocabulary. Also, in direct instruction, I will be modeling using these vocabulary terms and asking students the definitions of these words throughout the lesson. For discourse, I will have students come to the board and explain their process of factoring trinomials in front of the class. In their explanations, I will ask for the use of appropriate language and participation, as well as use of vocabulary terms when appropriate.]

d. **Language Supports.** Refer to your lesson plans and instructional materials as needed in your response to the prompt below.

- Identify and describe the planned instructional supports (during and/or prior to the learning task) to help students understand, develop, and use the identified language demands (function, vocabulary and/or symbols, mathematical precision, syntax, or discourse).

[To help students understand, develop and use the appropriate vocabulary and discourse, I will first model how I expect the students to speak. I will use the appropriate vocabulary terms when addressing certain parts of a trinomial. Also, on the worked example in the guided notes packet, I provided students with an explanation for how to factor that implements the appropriate vocabulary and discourse. To meet the needs of all of my students, I will repeat the vocabulary terms often, since I have a student with a seizure disorder who has trouble with memorizing vocabulary and formulas. Providing her with cues will help her understand, develop, and eventually use the specified language demands. Speaking the vocabulary aloud will also support my student who is a struggling reader because new and complicated vocabulary in writing can be very intimidating for her. By saying the words aloud repeatedly throughout the learning segment, she will understand the appropriate use of the vocabulary, and the discourse of how to discuss the material she is learning.]

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Academic Language Chart

Language Demand	Identified Language Demands (Task)	General Language Supports	Targeted Language Supports
Function:	•	•	•
Vocabulary:	•	•	•
Precision:	•	•	•
Syntax:	•	•	•
Discourse:	•	•	•

EXAMPLE 1 – Middle Childhood Mathematics

Language Demand	Identified Language Demands (Task)	General Language Supports	Targeted Language Supports
Function:	• explain	• Models explanation for how to factor	•
Vocabulary:	Factor, trinomials, binomials, product, sum coefficient and term	• Models appropriate use of vocabulary terms when factoring trinomials • Asks students to provide definitions of vocabulary terms	•
Precision:	•	•	•
Syntax:	•	•	•
Discourse:	• Oral Explanation – how to factor trinomials	• Worked (written) example in guided notes packet	•

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Directions:

1. **Read the sample response to planning prompt 4 for Secondary Mathematics.**

2. **Underline/Highlight the identified language function and any additional identified language demand (vocabulary, precision, discourse, syntax).**

3. **Circle the language supports in the commentary.**

4. **Complete the chart matching the language demands to the planned language supports.**

5. **Examine evidence you found and map it to Rubric4 language – what level/s do you think it represents?**

4. Supporting Mathematics Development Through Language

As you respond to prompts 4a–d, consider the range of students' language assets and needs—what do students already know, what are they struggling with, and/or what is new to them?

a. **Language Function.** Using information about your students' language assets and needs, identify **one** language function essential for students to develop conceptual understanding, procedural fluency, and mathematical reasoning or problem-solving skills within your central focus. Listed below are some sample language functions. You may choose one of these or another language function more appropriate for your learning segment.

Compare/Contrast	Justify	Describe	Explain	Prove

Please see additional examples and non-examples of language functions in the glossary.

[The language function that essential for students learning within my central focus is apply. Students will be learning about the Pythagorean theorem and special right triangles to later apply these concepts when solving for missing side lengths and to apply them in real-world application problems. They will also apply their knowledge to develop connections between how shapes are related, i.e. the 45-45-90 triangle with the square and the 30-60-90 triangle with the rectangle.]

b. Identify a key learning task from your plans that provides students with opportunities to practice using the language function identified above. Identify the lesson in which the learning task occurs. (Give lesson day/number.)

[The key learning task that gives students the opportunity to practice using the language function is planned to happen in lesson 4, where students will apply their knowledge of the Pythagorean theorem and / or their knowledge of the special right triangles to be able to conceptually connect the 45-45-90 right triangle with the square as well as find the missing lengths of the shape given, when students will be able to only measure one side.]

c. **Additional Language Demands.** Given the language function and learning task identified above, describe the following associated language demands (written or oral) students need to understand and/or use:

- Vocabulary and/or symbols
- Mathematical precision[2] (e.g., using clear definitions, labeling axes, specifying units of measure, stating meaning of symbols), appropriate to your students' mathematical and language development
- **Plus** at least one of the following:
  - Discourse
  - Syntax

[**Vocabulary**:
Students should be already familiar with the basic representation and meaning of a triangle. However, they might not remember or might not have learned what each side of a triangle is called (i.e leg and hypotenuse). The students will then use the ratios for special right triangles and / or the Pythagorean theorem to find the missing side length of triangles. Students should be able to orally explain the difference between a 30-60-90 triangle and a 45-45-90 triangle.

Mathematical Precision: Students will need to use the definition of 45-45-90 and 30-60-90 to find a connection between the angles and the length of the sides of special right triangles. Students will also be applying the correct ratios depending on the type of special right triangle. Furthermore, while measuring, students should be able to correctly use a ruler to measure one side of the triangle in inches. Students will also be able to check their answer for the measurements of the triangle by applying the Pythagorean theorem to make sure that the sum of the legs squared equals the hypotenuse squared.

Discourse: Students will apply the Pythagorean Theorem to a right triangle to solve for a missing side and will write this process on their poster board by using their knowledge of right triangles. Students will be working together in pairs; therefore, they will also be communicating orally their process of finding the missing side lengths when applying the theorem.]

d. **Language Supports.** Refer to your lesson plans and instructional materials as needed in your response to the prompt.

[2] For an elaboration of "precision," refer to the "Standards for Mathematical Practice" from The Common Core State Standards for Mathematics (June 2010), which can be found at http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf.

- Identify and describe the planned instructional supports (during and/or prior to the learning task) to help students understand, develop, and use the identified language demands (function, vocabulary and/or symbols, mathematical precision, discourse, or syntax).

[**Function**: For lessons 1 – 3, the support for the function will include a step by step breakdown of me modeling how to reason through completing problems when we have to apply the Pythagorean theorem as well as the ratios for the special right triangles. For lesson 4, I will explain and model what is expected of students when they are asked to apply their knowledge of right triangles and special right triangles to real world problems. I will also provide sentence frames and/or guiding questions for students to reason through when students are stuck. For example, "I can apply the Pythagorean Theorem, if and only if, the figure is a triangle that has an angle that measures _____. This will help students know when to apply (function) the theorem. For lesson 5, the posters that students created will be on the wall and will be referred to as anchor charts, which students will be able to use for their quiz to look at their mathematical reasoning and their conceptual understanding in relation to finding the missing triangle lengths.

Vocabulary: For lesson 1, the guided notes include a vocabulary fill-in-the-blank section for students and this will be filled out during the lesson. In lessons 2 and 3, teacher will label the diagrams in the notes with the vocabulary words and will explain them orally. For lesson 4, students will be allowed to use their notes and practice packets to remember the vocabulary words, but they will also draw out a picture and label it with the new vocabulary words, 30-60-90 triangle and 45-45-90 triangle. In lesson 5, students will be able to refer back to their posters and see what vocabulary words they used when they were asked to complete the function.

Mathematical Precision: In all lessons, students will be reminded to use the correct units when solving a real-world application problem. Students will also be reminded about labeling their triangle with the correct ratios, by looking at the relationship between the triangle sides with the angles. For lesson 4, when I will be explaining the directions, I will model how to measure a side of the square and/or triangle using a ruler, so that students will remember, and they can ask questions. For lesson 5, students can refer back to their posters and see that they used inches as their unit and therefore will remember to write the correct units down for the quiz.

Discourse: For lesson 1, students will be able to check their answers to the task cards (which do not include work), but in order to receive full credit, the student must show work and how they applied the Pythagorean Theorem. In lesson 2 and 3 I will be modeling how to complete the activity by asking students pretend to be my partners, and actually solve one problem modeling the think-aloud.
For lesson 4, I will be providing an example on the board which will have what students need to have on their own posters. In the example there will be sentence frames that students may be able to use to start their writing. For example, "For a given triangle, if one angle is 90 and the other two sides are the same, then I know I have a _____ right triangle. If I have a _____ right triangle, then I can apply this ratio _____ from the Pythagorean Theorem to solve for the missing side." Students will also be talking about how they can complete the activity which includes real world problems (throwing ideas at each other), and then actually planning what they can be doing. And how they will apply their knowledge to develop connections between how shapes are related, i.e. the 45-45-90 triangle with the square and the 30-60-90 triangle with the rectangle

For lesson 5, students will be able to use the posters that are hung on the walls to help them remember how to apply the ratios and/or theorem and how to express their final answers correctly.]

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Academic Language Chart

Language Demand	Identified Language Demands (Task)	General Language Supports	Targeted Language Supports
Function:	•	•	•
Vocabulary:	•	•	•
Precision:	•	•	•
Syntax:	•	•	•
Discourse:	•	•	•

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EXAMPLE 2 – Secondary Mathematics

Language Demand	Identified Language Demands (Task)	General Language Supports	Targeted Language Supports
Function:	• apply	• Models for class – applying Pythagorean theorem and ratios for special right triangles	• Sentence frames and/or guiding questions provided for students to reason through 'application' when struggling. For example, "I can apply the Pythagorean Theorem, if and only if, the figure is a triangle that has an angle that measures _____."
Vocabulary:	• Leg, hypotenuse, ratio, Pythagorean Thereon, special right triangle (45-45-90 & 30-60-90)	• Candidate/teacher labels diagram in notes with vocabulary terms; draws picture of new vocabulary "altitude"	• Guided notes – vocabulary fill-in blanks • Students draw new vocabulary terms and label them (i.e., 45-45-90 triangle and 30-60-90 triangle)
Precision:	• Correct ratios depending on type of special right triangles • Using a ruler to measure	• Students reminded to use correct units • Students reminded to label triangle with correct ratios	•
Syntax:	•	•	•
Discourse:	• Poster Board – Explanation for how to solve for a missing side of triangle • Oral Explanation - Working with peer to explain orally how to solve for a missing side of triangle	• Sample problem for inclusion on poster board • Students brainstorm how to complete problem • Candidate/teacher acknowledge correct language used in the poster or oral conversation	• Sample problem includes "sentence starters" for writing about their solutions. For example, "For a given triangle, if one angle is 90 and the other two sides are the same, then I know I have a _____ right triangle. If I have a _____ right triangle, then I can apply this ratio _____ from the Pythagorean Theorem to solve for the missing side."

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Rubric 14

Rubric 14: Analyzing Students' Language Use and Mathematics Learning

How does the candidate analyze students' use of language to develop content understanding?

Level 1	Level 2	Level 3	Level 4	Level 5
Candidate identifies student language use that is superficially related or unrelated to the language demands (function,[7] vocabulary and/or symbols, and additional demands). **OR** **Candidate's description or explanation of language use is not consistent with the evidence submitted.**	**Candidate describes how students use only one language demand (vocabulary and/or symbols, function, mathematical precision, discourse, syntax).**	Candidate **explains** and provides **evidence of students' use of** • **the language function** **AND** • **one or more additional language demands** (vocabulary and/or symbols, mathematical precision, discourse, syntax).[8]	Candidate explains and provides evidence of students' use of • the language function, • **vocabulary and/or symbols, AND** • additional language demand(s) (mathematical precision, discourse, syntax) **in ways that develop content understandings.**	**Level 4 plus:** **Candidate explains and provides evidence of language use and content learning for students with varied needs.**

[7] The selected language function is the verb identified in the Planning Commentary Prompt 4a (conjecture, explain, etc.).

[8] These are the additional language demands identified in the Planning Commentary Prompt 4c (vocabulary and/or symbols, mathematical precision, plus syntax or discourse).

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Directions:

1. Read the sample response to the analyzing students' use of academic language, prompt 3 – task 3 (rubric 14), for Secondary Mathematics

2. Underline/highlight the evidence the candidate provides for students' use of the language demand

3. Examine the evidence you found and map it to Rubric 14. What level of evidence do you think it represents?

Evidence of Language Understanding and Use

When responding to the prompt below, use concrete examples from the clip(s) and/or student work samples as evidence. Evidence from the clip(s) may focus on one or more students.

You may provide evidence of students' language use **from ONE, TWO, OR ALL THREE of the following sources:**

1. Use the video clip(s) from Instruction Task 2 and provide time-stamp references for evidence of language use.
2. Submit an additional video file named "Language Use" of no more than 5 minutes in length and cite language use (this can be footage of one or more students' language use). Submit the clip in Assessment Task 3, Part B.
3. Use the student work samples analyzed in Assessment Task 3 and cite language use.

a. Explain and provide concrete examples for the extent to which your students were able to use or struggled to use the

- selected language function,
- vocabulary and/or symbols, **AND**
- mathematical precision, syntax, or discourse to develop content understandings.

[All 3 focus students attempted to explain why the student's work sample in Item Number 7 was incorrect. The expected response from students was to disagree, explain that the student incorrectly distributed the 2 to the terms inside the parentheses, and correct the error in writing on the assessment. Students were asked to explain how to apply the distribute property correctly in a step-by-step process. Other possible expectations from Item Number 7 was to see students label or use symbols illustrating how to use the distributive property. Students were reintroduced to the distributive property in Lesson 1 by connecting an arrow from the outside term to all terms inside the parentheses. Therefore, it would be expected for the students to draw arrows from the outside term to the inside terms in Item Number 7 to show their understanding of the distributive property. In addition, students were also introduced to identify the second term inside the parentheses including the sign in front of the term to remind themselves as the second term being a positive or negative value. For example, if distributing a value to the second term inside the parentheses with a subtraction operation in front of it means the same as distributing the outside value to a negative second term inside the parentheses. All 3 focus students did not use mathematical vocabulary introduced in Lesson 1, such as terms, like terms, coefficients, combining like terms, or distributing a term, to support their explanation. Student 1 was able to detail that they disagree with the student work's sample, describe that the student did not multiple the outside term to the second term and corrected the mistake. Student 1 was able to state their disagreement but struggled with explaining in mathematical words how to distribute the outside term to all the terms inside the parentheses. Instead of stating "2 x 6 = 6 not 3," Student 1 could have explained in words that "distributing the outside term to the second term would result in 6 and not 3." However, at an 8th grade level Student 1 did an excellent job in disagreeing with the work sample and correcting the mistake. In addition, Student 1 was able to symbolize how to distribute the outside term to the inside terms of the parentheses by writing (drawing) arrows connecting the outside term to the first and second term inside the parentheses. Furthermore, Student 1 identified the mistake by drawing a circle around the second term to symbolize it as a mistake. Student 2 was able to state that they disagree with the work sample and explain that the work sample "is not even set up right. This is how it should be set up." Student 2's ability to reflect on the distributive property, analyze the work sample and determine that the work sample is incorrect met some of the expectations for Item Number 7. However, Student 2 could have explained how to distribute the 2 to the terms inside the parentheses more effectively by

stating "it is not set up right. You need to distribute the 2 to the terms inside the parentheses." Based on Student 2's explanation and correction of the work sample error, we can determined that Student 2 is still developing an understanding of the distribute property and has not mastered the topic yet. Student 2 is still in the process of developing an understanding of the distribute property and once they mastered the content will be able to mathematically explain how to appropriately use the distribute property. Student 3 identified the math operation inside the parentheses by drawing a circle around the operation as a reminder for themselves of what to expect after distributing the outside term. Student 3 continued to use symbols to support their thinking of identifying an error by writing arrows from the outside term to the terms inside the parentheses to symbolize the use of the distributive property. However, Student 3 was unable to use vocabulary to support their disagreement of the work sample. Although Student 3 was able to symbolize how to apply the distributive property, Student 3 struggled with writing an explanation of how to properly use the distributive property in the given example. Student 3 was able to correct the mistake using mathematical computation, but not using vocabulary words or written sentences. All 3 focus students struggled using vocabulary words from the learning segment to support their reasoning.]

Solving Linear Equations Quiz 16.5/19 86.8%

Combining Like Terms and Distributive Property

Name Student 1

Date October 8th Block 1 A/B

Justify your reasoning by showing **all** work.

Simplify.

Great method to identify like terms

#1 $-2x - 1 + 3x + 2$

$-5x + 3$

How did you combine your like terms to get -5x?

+1 pt

#2 $5(x + 4)$

$5x + 20$

Awesome skill of distributing the 5 to the terms inside the parentheses.

+2 pts

#3 $-3(x - 3)$

$-3x - 9$

How did you distribute the -3 to the second term inside the parentheses?

does the sign affect it?

+1 ½ pts

Solve for x.

#4 $2(x - 1) = 4$

$2x - 2 = 4$

$+2 \quad +2$

$\frac{2x}{2} = \frac{6}{2}$

$x = 3$

Perfect work for distributing the 2 combining like terms, and isolating the variable!!

+3pts

#5 $-3x + 4 + 1x + 1 = 7$

$4x + 5 = 7$

$-5 \quad -5$

$\frac{4x}{4} = \frac{2}{4}$

$x = -2$

How did you combine the like terms to get 4x?

+2 pts

Solve for x.

#6 $4(x + 2) + 2 = 14$

$4x + 10 = 14$

$-10 \quad -10$

$\frac{4x}{4} = \frac{4}{4}$

$x = 1$

Excellent detail using the distributive property and combining like terms.

+4pts

Justify your reasoning.

#7 Melissa used the Distributive Property on the following expression:

$$2(x - 3) = 2x - 3 = 6$$

Do you agree with Melissa's work? If so, why? If not, justify your reasoning **and** correct Melissa's mistake.

NO, I do not agree because 2 x 3 = 6 not 3. It should be

$\boxed{2x - 6}$

Great explanation of how Melissa should have distributed the 2 to the terms inside parentheses

+3pts

Solving Linear Equations Quiz $\frac{14\frac{1}{2}}{19}$ 76.3%

Combining Like Terms and Distributive Property

Name Student Z

Date 10-8-15 Block 1

Justify your reasoning by showing **all** work.

Simplify.

Great identification of like terms!

#1 $-2x - 1 + 3x + 2$

$-5x + -3$

How did you combine your like terms to get -5x?

+1 pt

#2 $5(x + 4)$

$5x + 20$

+2 pts

Excellent work of distributing the 5 to all terms inside parentheses.

#3 $-3(x - 3)$

$-3x - 9$

Distributing the -3 to the second term inside parentheses means to multiply what?

+1 $\frac{1}{2}$ pts

Solve for x.

#4 $2(x - 1) = 4$

$2x - 2 = 4$

$+2 \quad +2$

$\frac{2x}{2} = \frac{6}{2}$

$\boxed{x = 4}$

inverse operation of multiplying is?

Did you subtract or divide by 2?

How did you isolate the variable?

+2 pts

#5 $-3x + 4 + x + 1 = 7$

$-4x + 5 = 7$

$-5 \quad -5$

$\frac{-4x}{-4} = \frac{2}{-4}$

$\boxed{x = 2}$

How did you combine like terms to get -4x?

+2 pts

Solve for x.

#6 $4(x + 2) + 2 = 14$

$4x + 8 + 2 = 14$

$4x + 10 = 14$

$-10 \quad -10$

$\frac{4x}{4} = \frac{4}{4}$

$\boxed{x = \frac{4}{4} \text{ or } 0}$

Awesome work of identifying and combining like terms

Amazing detail in showing all work!

+4 pts

Justify your reasoning.

#7 Melissa used the Distributive Property on the following expression:

$$2(x - 3) = 2x - 3$$

Do you agree with Melissa's work? If so, why? If not, justify your reasoning and correct Melissa's mistake.

NO, because it is not even set up right. this is how it should be set up

How does the expression look like after distributing the 2 to all terms inside the parentheses?

$2x(x-3)-3$

+2 pts

$\frac{14}{19}$ 73.7%

Solving Linear Equations Quiz

Name Student 3

Combining Like Terms and Distributive Property

Date 10-8-15 Block 1

Justify your reasoning by showing **all** work.

Simplify.

Can you identify any like terms?

#1 $-2x - 1 + 3x + 2$

$5x - 1$

How did you combine your like terms to get 5x?

+0 pts

#2 $5(x + 4)$

$5x + 20$

Great job distributing the 5 to the terms inside the parentheses. +2 pts

#3 $-3(x - 3)$

After distributing the -3, the product of two negatives is?

$-3 - 9$

Did you distribute the -3 to a variable?

+1 pt

Solve for x.

#4 $2(x - 1) = 4$

$2x + 2 = 4$
$-2 \quad -2$
$2x = 2$
$\frac{2x}{2} = \frac{2}{2}$

$x = 1$

Awesome job of applying the distributive property and isolating the x.

+3 pts

#5 $-3x + 4 + x + 1 = 7$

What is the coefficient of x?

$-4x + 5 = 7$
$-5 \quad -5$
$\frac{-4x}{-4} = \frac{2}{-4}$

$x = -2$

How did you combine the like terms to get -4x?

+2 pts

Solve for x.

#6 $4(x + 2) + 2 = 14$

$4x + 10 = 14$
$-10 \quad -10$
$\frac{4x}{4} = \frac{4}{4}$

$x = 1$

Awesome job of using the distributive property, combining like terms, and isolating the variable.

+4 pts

Justify your reasoning.

#7 Melissa used the Distributive Property on the following expression:

$$2(x - 3) = 2x - 3$$

Do you agree with Melissa's work? If so, why? If not, justify your reasoning and correct Melissa's mistake.

+2 pts

No it would be

$2x - 6$

Why was melissa's work mathematically incorrect?

How did she distribute the 2 to the terms inside the parentheses?

edTPA

Culminating Task

▶What is it that you know now that you didn't know previously about academic language, in particular language supports?

_____

_____

_____

_____

_____

edTPA

Resources:

Varlas, L. (2018). Ells count on language support in math. *Education Update, (60)*4. ASCD.

Academic Language Handout – Secondary Mathematics (SCALE)

Understanding Rubric Level Progressions - Secondary Mathematics (SCALE)

Understanding Academic Language in edTPA: Supporting Learning and Language Development

Academic Language (AL) is the oral and written language used for academic purposes. AL is the "language of the discipline" used to engage students in learning and includes the means by which students develop and express content understandings.

When completing their edTPA, candidates must consider the AL (i.e., **language demands**) present throughout the learning segment in order to support student learning and language development. The language demands in *Secondary Mathematics* include: **function, vocabulary, discourse, syntax and mathematical precision.**

As stated in the edTPA handbook:

- Candidates identify a key *language function* and one essential learning task within their learning segment lesson plans that allows students to practice the function (Task 1- Prompts 4a/b).
- Candidates are then asked to identify *vocabulary and one additional language demand* related to the language function and learning task (Task 1 – Prompt 4c).
- Finally, candidates must identify and describe the *instructional and/or language supports* they have planned to address the language demands (Task 1 - 4d). *Language supports* are scaffolds, representations, and instructional strategies teachers intentionally provide to help learners understand and use the language they need to learn within disciplines.

It is important to realize that not all learning tasks focus on **both** discourse and syntax. As candidates decide which additional language demands (i.e., syntax and/or discourse) are relevant to their identified function, they should examine the language understandings and use that are **most relevant** to the learning task they have chosen. Then, teacher candidates should plan to provide appropriate and targeted language supports for students to learn and practice the language demands within the chosen learning task.

This AL handout provides definitions and a few examples of language demands and supports to help teacher candidates and Educator Preparation Programs understand edTPA Rubrics 4 and 14. See the edTPA Handbook glossary and the Understanding Rubric Level Progressions for Secondary Mathematics for additional examples of language demands.

Another valuable resource is the website of Understanding Language, the center that recently merged with SCALE: http://ell.stanford.edu/. It has a number of papers on academic language for all students, archived webinars (listed under Events), and periodic MOOC offerings. The most relevant resources for teacher candidates are the teaching resources in English/language arts (with an example based on history/social science texts) and mathematics, with materials forthcoming in science. These teaching resources are explained and annotated to illustrate how to combine academic language development and content pedagogy for all students, including English learners.

LANGUAGE DEMANDS

I. Functions	
Definition	**Examples** (bolded and underlined within learning objectives)

▪ Purposes for which language is used.
▪ Content and language focus of learning tasks often represented by the **active verbs within the learning outcomes**.
	▪ Learning Objective:
	  ▪ Students will be able to **compare** the lengths of various objects in the classroom.
	  ▪ Students will be able to **explain** what strategy (ies) they used to solve a problem.
	  ▪ Students will be able to **describe** the specific attributes of a parallelogram.

II. Vocabulary – Includes words, phrases and symbols used within disciplines.	
Definition	**Examples**
▪ Words and phrases with subject-specific meanings that differ from meanings used in everyday life	▪ table, ruler, square, face, chord, digit, times, set
▪ General academic vocabulary used across disciplines	▪ compare, analyze, evaluate, describe, sequence, classify
▪ Subject-specific words and/or symbols defined for use in the discipline	▪ exponent, numerator, denominator, equilateral, multiple, ÷, ≥, × (symbols)

III. Discourse	
Definition	**Examples**
▪ How members of the discipline talk, write, and participate in knowledge construction, using the structures of written and oral language ▪ Discipline-specific discourse has distinctive features or ways of structuring oral or written language (text structures) or representing knowledge visually.	▪ Constructing an Argument (two-column proof) ▪ Interpreting Graphic Representations (e. g. graphs, diagrams) ▪ Making and supporting a conjecture

IV. Syntax	
Definition	**Examples**
▪ The rules for organizing words or symbols together into phrases, clauses, sentences or visual representations. ▪ One of the main functions of syntax is to organize language in order to convey meaning.	▪ **Mathematical sentences (using words or symbols) including** • $6 \geq 4$ • There are 5 times as many apples as oranges. ▪ **Long or elaborate noun phrases** • Write an inequality that, when solved, will give the amount of sales Mandy needs to cover her planned expenses. ▪ **Conditional sentences** • If 50% of a number is 25, what is 75% of the number?

V. Mathematical Precision	
Definition	**Examples**
▪ Being precise and accurate with definitions and symbols in labeling, measurement, and numerical answers.	▪ Correctly labeling the axes of a graph ▪ Specifying units of measure during calculations ▪ Calculating accurately and expressing numeric answers with appropriate precision for context of problem

EXAMPLE OF PLANNED LANGUAGE SUPPORTS

To help programs and candidates begin to develop their understanding of language supports, **start by examining a key standard or learning objective.**

The chart below identifies sample language demands with related examples of supports based on one selected learning objective in mathematics.

Example learning objective: Students will ***interpret*** a ***word problem*** to find the ***part*** or ***whole*** prior to setting up and solving the problem.

Identified Language Demands	Planned Language Supports
Interpret (Function)	Model interpreting a word problem
Part, whole (Vocabulary)	Review vocabulary and word chart and discuss meanings in the context of the word problems modeled
Word problem (Syntax)	Break down sentences within word problems with the whole class to identify essential information and paths to solution.

