California Department of Education
Assessment Development & Administration Division

California Assessment of
Student Performance and Progress

California Assessment of Student Performance and Progress

California Science Test
2018–2019 Technical Report

Chapter 4 Appendix

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Appendix 4.A: Performance Expectation Distribution for Segment A

Blueprints

For scoring and reporting purposes, items written to assess performance expectations (PEs) associated with Engineering, Technology, and Application of Science (ETS) will be assigned to one of the three science content domains, depending upon the context of their stimulus.

Refer to the *Alternative Text for Figure 4.A.1* for a description of this spreadsheet image.

Science Content Domain and DCI Strands (row group: Science and Engineering Practices)

	Physical Sciences (17 PEs)								Life Sciences (12 PEs)										Earth and Space Sciences (13 PEs)								ETS (3 PEs)	Items per SEP
	PS1	PS1	PS2	PS2	PS2	PS3	PS4	PS4	LS1	LS1	LS1	LS2	LS2	LS3	LS3	LS4	LS4	LS4	ESS1	ESS1	ESS2	ESS2	ESS2	ESS2	ESS3	ESS3	ETS	
CCC	2	3	1	2	n/a	5	1	2	1	4	5	2	4	1	2	2	3	4	1	3	1	2	3	4	2	4	n/a	
SEP 1				X			X																				X	1–4
SEP 1E				X																								
SEP 2				X		X	X		X	X			X										X					1–7
SEP 3	X	X	X	X		X																X					X	1–7
SEP 4												X				X			X	X								2–4
SEP 5		X																				X						1–2
SEP 6						X								X		X			X								X	2–8
SEP 6E						X	X																		X			
SEP 7				X					X	X	X			X				X	X						X			1–8
SEP 8																					X				X	X		1–3
Items per DCI Strand	1–3		1–4			1–4	1–2		1–2			1–2		1–2		1–4			1–2		1–5				1–3		2–4	Total of 32–34 Items
Items per Domain	8–10								8–10										8–10								2–4	

Figure 4.A.1 PE distribution for Segment A of the CAST grade five assessment

Notes on Figure 4.A.1:

- X indicates that there is at least one PE at the given intersection of the three dimensions that can be sampled on a test form for Segment A.

- N/A indicates there is no crosscutting concept (CCC) for at least some of the PEs in the column.

- Science and engineering practices (SEPs) 1 and 6 have separate components for science and engineering (SEP 1E and SEP 6E). All other SEPs incorporate the same components for both science and engineering.

  – The California Next Generation Science Standards (CA NGSS) call out the distinctive purposes of practices primarily in two specific SEPs: SEP 1 and SEP 6. For SEP 1 in science (SEP 1), the practice focuses on identifying questions about phenomena. For SEP 1 in engineering (SEP 1E), the practice focuses on defining a problem to be solved. For SEP 6 in science (SEP 6), the goal of the practice is to construct logically coherent explanations of phenomena to incorporate students' current understanding of science. For SEP 6 in engineering (SEP 6E), the goal is to propose design solutions to balance competing criteria of desired functions.

Refer to the *Alternative Text for Figure 4.A.2* for a description of this spreadsheet image.

Science Domain and DCI Strands — Physical Sciences (19 PEs): PS1, PS2, PS3, PS4; Life Sciences (21 PEs): LS1, LS2, LS3, LS4; Earth and Space Sciences (15 PEs): ESS1, ESS2, ESS3; ETS (4 PEs).

CCC \ SEP	PS1·1	PS1·2	PS1·3	PS1·5	PS1·6	PS2·2	PS2·4	PS2·7	PS3·3	PS3·4	PS3·5	PS4·1	PS4·6	LS1·2	LS1·3	LS1·4	LS1·5	LS1·6	LS2·1	LS2·2	LS2·5	LS2·7	LS3·2	LS3·6	LS4·1	LS4·2	ESS1·1	ESS1·3	ESS1·4	ESS2·1	ESS2·2	ESS2·3	ESS2·4	ESS2·5	ESS2·7	ESS3·1	ESS3·2	ESS3·7	ETS n/a	Items per SEP
SEP 1						X																																X	X	1–3
SEP 1E																																								
SEP 2		X	X	X						X			X			X	X					X	X	X			X		X			X	X	X					X	1–16
SEP 3						X			X	X					X																									1–5
SEP 4	X									X											X						X		X								X		X	1–9
SEP 5												X														X														1–2
SEP 6														X		X			X				X	X			X					X					X			1–12
SEP 6E							X		X				X																								X			
SEP 7							X						X	X	X							X															X		X	1–8
SEP 8								X					X	X												X														1–4
Items per DCI Strand	1–5					1–4			1–4			1–2		1–6					1–4				1–2		1–5		1–3			1–5						1–4			2–4	Total of 32–34 Items
Items per Domain	8–10													8–10													8–10												2–4	

* For scoring and reporting purposes, items written to assess PEs associated with Engineering, Technology, and Application of Science will be assigned to one of the three science domains, depending upon the context of their stimulus.

Figure 4.A.2 PE distribution for Segment A of the CAST grade eight assessment

Notes on Figure 4.A.2:

- X indicates that there is at least one PE at the given intersection of the three dimensions that can be sampled on a test form for Segment A.

- N/A indicates there is no CCC for at least some of the PEs in the column.

- SEPs 1 and 6 have separate components for science and engineering (SEP 1E and SEP 6E). All other SEPs incorporate the same components for both science and engineering.

  - The CA NGSS call out the distinctive purposes of practices primarily in two specific SEPs: SEP 1 and SEP 6. For SEP 1 in science (SEP 1), the practice focuses on identifying questions about phenomena. For SEP 1 in engineering (SEP 1E), the practice focuses on defining a problem to be solved. For SEP 6 in science (SEP 6), the goal of the practice is to construct logically coherent explanations of phenomena to incorporate students' current understanding of science. For SEP 6 in engineering (SEP 6E), the goal is to propose design solutions to balance competing criteria of desired functions.

Refer to the *Alternative Text for Figure 4.A.3* for a description of this spreadsheet image.

Science and Engineering Practices

	PS1-1	PS1-5	PS1-7	PS2-1	PS2-2	PS2-4	PS2-6	PS3-2	PS3-4	PS3-5	PS4-2	PS4-4	PS4-7	LS1-4	LS1-5	LS1-6	LS1-7	LS2-2	LS2-3	LS2-4	LS2-5	LS2-7	LS3-2	LS3-3	LS4-1	LS4-2	ESS1-1	ESS1-3	ESS1-5	ESS1-7	ESS2-2	ESS2-5	ESS2-7	ESS3-2	ESS3-4	ESS3-7	ETS n/a	Items per SEP
SEP 1													X										X															2–3
SEP 1E																																					X	2–3
SEP 2	X	X				X			X					X	X					X							X				X	X	X					2–6
SEP 3	X				X				X											X												X						2–5
SEP 4					X																				X	X						X			X			2–5
SEP 5		X		X		X			X		X								X		X					X	X							X	X		X	2–6
SEP 6	X									X				X	X					X						X		X	X				X				X	2–6
SEP 6E			X	X																				X												X		2–6
SEP 7												X				X					X	X				X	X					X				X		2–6
SEP 8							X				X															X		X										2–6
Items per DCI Strand	2–7			1–5				1–4			1–4			1–6				1–7					1–2		1–5		1–5				1–6			1–5			2–4	Total of 32–34 Items
Items per Domain	8–10													8–10													8–10										2–4	

(Column group headers: Physical Sciences (24 PEs) = PS1–PS4; Life Sciences (24 PEs) = LS1–LS4; Earth and Space Sciences (19 PEs) = ESS1–ESS3; ETS (4 PEs). CCC values per strand: PS1 = 1,5,7; PS2 = 1,2,4,6; PS3 = 2,4,5; PS4 = 2,4,7; LS1 = 4,5,6,7; LS2 = 2,3,4,5,7; LS3 = 2,3; LS4 = 1,2; ESS1 = 1,3,5,7; ESS2 = 2,5,7; ESS3 = 2,4,7; ETS = n/a.)

* For scoring and reporting purposes, items written to assess PEs associated with Engineering, Technology, and Application of Science will be assigned to one of the three science domains, depending upon the context of their stimulus.

Figure 4.A.3 PE distribution for Segment A of the CAST high school assessment

Notes on Figure 4.A.3:

- X indicates that there is at least one PE at the given intersection of the three dimensions that can be sampled on a test form for Segment A.

- N/A indicates there is no CCC for at least some of the PEs in the column.

- SEPs 1 and 6 have separate components for science and engineering (SEP 1E and SEP 6E). All other SEPs incorporate the same components for both science and engineering.

  - The CA NGSS call out the distinctive purposes of practices primarily in two specific SEPs: SEP 1 and SEP 6. For SEP 1 in science (SEP 1), the practice focuses on identifying questions about phenomena. For SEP 1 in engineering (SEP 1E), the practice focuses on defining a problem to be solved. For SEP 6 in science (SEP 6), the goal of the practice is to construct logically coherent explanations of phenomena to incorporate students' current understanding of science. For SEP 6 in engineering (SEP 6E), the goal is to propose design solutions to balance competing criteria of desired functions.

Accessibility Information

Alternative Text for Figure 4.A.1

In the table, an X indicates that there is at least one PE at the given intersection of the three dimensions that can be sampled on a test form for Segment A. The table has an X only in the locations described in the bulleted text that follows for each science domain and the ETS subdomain.

In the Physical Sciences (PS) domain for grade five, there are 17 PEs, organized into four disciplinary core idea (DCI) strands, that are distributed among six of the eight SEPs and four of the seven CCCs.

- For the science component of SEP 1, there are at least two PEs.

  - There is at least one PE in DCI strand PS2, with CCC 2.
  - There is at least one PE in DCI strand PS3, with CCC 5.

- For the engineering component of SEP 1 (SEP 1E), there is at least one PE in DCI strand PS2, with no CCC.
- For SEP 2, there are at least four PEs.

  - There is at least one PE in DCI strand PS1, with CCC 3.
  - There is at least one PE in DCI strand PS3, with CCC 5.
  - There are at least two PEs in DCI strand PS4, with CCC 1 and CCC 2.

- For SEP 3, there are at least five PEs.

  - There are at least two PEs in DCI strand PS1, with CCC 2 and CCC 3.
  - There are at least two PEs in DCI strand PS2, with CCC 1 and CCC 2.
  - There is at least one PE in DCI strand PS4, with CCC 5.

- For SEP 5, there is at least one PE in DCI strand PS1, with CCC 3.
- For the science component of SEP 6, there is at least one PE in DCI strand PS3, with CCC 5.
- For the engineering component of SEP 6 (SEP 6E), there are at least two PEs.

  - There is at least one PE in DCI strand PS3, with CCC 5.
  - There is at least one PE in DCI strand PS4, with CCC 1.

- For SEP 7, there is at least one PE in DCI strand PS2, with CCC 2.

The range of items per DCI strand is described as follows:

- Between one and three items aligned to PEs from DCI strand PS1 will be assessed on Segment A of the CAST.
- Between one and four items aligned to PEs from DCI strand PS2 will be assessed on Segment A of the CAST.

- Between one and four items aligned to PEs from DCI strand PS3 will be assessed on Segment A of the CAST.
- Between one and two items aligned to PEs from DCI strand PS4 will be assessed on Segment A of the CAST.

For the entire PS domain, between eight and nine items will be assessed on Segment A of the CAST.

In the Life Sciences (LS) domain for grade five, there are 12 PEs, organized into four DCI strands, that are distributed among four of the eight SEPs and five of the seven CCCs.

- For SEP 2, there are at least three PEs.

  - There are at least two PEs in DCI strand LS1, with CCC 1 and CCC 4.
  - There is at least one PE in DCI strand LS2, with CCC 4.

- For SEP 4, there are at least two PEs.

  - There is at least one PE in DCI strand LS3, with CCC 1.
  - There is at least one PE in DCI strand LS4, with CCC 3.

- For the science component of SEP 6 (SEP 6), there are at least two PEs.

  - There is at least one PE in DCI strand LS3, with CCC 2.
  - There is at least one PE in DCI strand LS4, with CCC 2.

- For SEP 7, there are at least five PEs.

  - There are at least two PEs in DCI strand LS1, with CCC 4 and CCC 5.
  - There is at least one PE in DCI strand LS2, with CCC 2.
  - There are at least two PEs in DCI strand LS4, with CCC 2 and CCC 4.

The range of items per DCI strand is described as follows:
- Between one and two items aligned to PEs from DCI strand LS1 will be assessed on Segment A of the CAST.
- Between one and two items aligned to PEs from DCI strand LS2 will be assessed on Segment A of the CAST.
- Between one and two items aligned to PEs from DCI strand LS3 will be assessed on Segment A of the CAST.
- Between one and four items aligned to PEs from DCI strand LS4 will be assessed on Segment A of the CAST.

For the entire LS domain, between eight and nine items will be assessed on Segment A of the CAST.

In the Earth and Space Sciences (ESS) domain for grade five, there are 13 PEs, organized into three DCI strands, that are distributed among seven of the eight SEPs and four of the seven CCCs.
- For SEP 2, there is at least one PE in DCI strand ESS2, with CCC 4.
- For SEP 3, there is at least one PE in DCI strand ESS2, with CCC 2.
- For SEP 4, there are at least two PEs.

- There is at least one PE in DCI strand ESS1, with CCC 1.
- There is at least one PE in DCI strand ESS2, with CCC 1.

- For SEP 5, there is at least one PE in DCI strand ESS2, with CCC 3.
- For the science component of SEP 6, there is at least one PE in DCI strand ESS1, with CCC 1.
- For the engineering component of SEP 6 (SEP 6E), there is at least one PE in DCI strand ESS3, with CCC 2.
- For SEP 7, there are at least two PEs.

  - There is at least one PE in DCI strand ESS1, with CCC 3.
  - There is at least one PE in DCI strand ESS3, with CCC 2.

- For SEP 8, there are at least three PEs.

  - There is at least one PE in DCI strand ESS2, with CCC 1.
  - There are at least two PEs in DCI strand ESS3, with CCC 2 and CCC 4.

The range of items per DCI strand is described as follows:
- Between one and two items aligned to PEs from DCI strand ESS1 will be assessed on Segment A of the CAST.
- Between one and five items aligned to PEs from DCI strand ESS2 will be assessed on Segment A of the CAST.
- Between one and three items aligned to PEs from DCI strand ESS3 will be assessed on Segment A of the CAST.

For the entire ESS domain, between eight and nine items will be assessed on Segment A of the CAST.

In the ETS subdomain for grade five, there are three PEs, organized into one DCI strand, that are distributed among three of the eight SEPs and no CCCs.
- For the science component of SEP 1, there is at least one PE.
- For SEP 3, there is at least one PE.
- For the engineering component of SEP 6 (SEP 6E), there is at least one PE.

The range of items per DCI strand is described as follows:
- Between two and four items aligned to PEs from DCI strand ETS1 will be assessed on Segment A of the CAST.

For the entire ETS subdomain, between two and four items will be assessed on Segment A of the CAST.

The range of items per SEP across all domains in grade five is described as follows:
- Between one and four items representing both the science and engineering components of SEP 1 will be assessed on Segment A of the CAST.

- Between one and seven items representing SEP 2 will be assessed on Segment A of the CAST.

- Between one and seven items representing SEP 3 will be assessed on Segment A of the CAST.

- Between two and four items representing SEP 4 will be assessed on Segment A of the CAST.

- Between one and two items representing SEP 5 will be assessed on Segment A of the CAST.

- Between two and eight items representing both the science and engineering components of SEP 6 will be assessed on Segment A of the CAST.

- Between one and eight items representing SEP 7 will be assessed on Segment A of the CAST.

- Between one and three items representing SEP 8 will be assessed on Segment A of the CAST.

In grade five, a total of 32 items representing a selection of PEs across all three science domains and the ETS subdomain will be assessed on Segment A of the CAST.

Alternative Text for Figure 4.A.2

In the table, an X indicates that there is at least one PE at the given intersection of the three dimensions that can be sampled on a test form for Segment A. The table has an X only in the locations described in the bulleted text that follows for each science domain and the ETS subdomain.

In the PS domain for grade eight, there are 19 PEs, organized into four DCI strands, that are distributed among eight SEPs and seven CCCs.

- For the science component of SEP 1, there is at least one PE in DCI strand PS2, with CCC 2.
- For SEP 2, there are at least five PEs.

  – There are at least three PEs in DCI strand PS1, with CCC 2, CCC 3, and CCC 5.
  – There is at least one PE in DCI strand PS3, with CCC 4.
  – There is at least one PE in DCI strand PS4, with CCC 6.

- For SEP 3, there are at least three PEs.

  – There are at least two PEs in DCI strand PS2, with CCC 2 and CCC 7.
  – There is at least one PE in DCI strand PS3, with CCC 3.

- For SEP 4, there are at least two PEs.

  – There is at least one PE in DCI strand PS1, with CCC 1.
  – There is at least one PE in DCI strand PS3, with CCC 3.

- For SEP 5, there is at least one PE in DCI strand PS4, with CCC 1.
- For the engineering component of SEP 6 (SEP 6E), there are at least three PEs.

  – There is at least one PE in DCI strand PS1, with CCC 5.
  – There is at least one PE in DCI strand PS2, with CCC 4.
  – There is at least one PE in DCI strand PS3, with CCC 5.

- For SEP 7, there are at least two PEs.

  – There is at least one PE in DCI strand PS2, with CCC 4.
  – There is at least one PE in DCI strand PS3, with CCC 5.

- For SEP 8, there are at least two PEs.

  – There is at least one PE in DCI strand PS1, with CCC 6.
  – There is at least one PE in DCI strand PS4, with CCC 6.

The range of items per DCI strand is described as follows:

- Between one and five items aligned to PEs from DCI strand PS1 will be assessed on Segment A of the CAST.
- Between one and four items aligned to PEs from DCI strand PS2 will be assessed on Segment A of the CAST.
- Between one and four items aligned to PEs from DCI strand PS3 will be assessed on Segment A of the CAST.
- Between one and two items aligned to PEs from DCI strand PS4 will be assessed on Segment A of the CAST.

For the entire PS domain, between 8 and 10 items will be assessed on Segment A of the CAST.

In the LS domain for grade eight, there are 21 PEs, organized into four DCI strands, that are distributed among seven of the eight SEPs and seven CCCs.

- For SEP 2, there are at least five PEs.

    – There are at least two PEs in DCI strand LS1, with CCC 5 and CCC 6.
    – There is at least one PE in DCI strand LS2, with CCC 5.
    – There are at least two PEs in DCI strand LS3, with CCC 2 and CCC 6.

- For SEP 3, there is at least one PE in DCI strand LS1, with CCC 3.
- For SEP 4, there are at least two PEs.

    – There is at least one PE in DCI strand LS2, with CCC 2.
    – There is at least one PE in DCI strand LS4, with CCC 1.

- For SEP 5, there is at least one PE in DCI strand LS4, with CCC 2.
- For the science component of SEP 6 (SEP 6), there are at least five PEs.

    – There are at least two PEs in DCI strand LS1, with CCC 2 and CCC 5.
    – There is at least one PE in DCI strand LS2, with CCC 1.
    – There are at least two PEs in DCI strand LS4, with CCC 1 and CCC 2.

- For SEP 7, there are at least three PEs.

    – There are at least two PEs in DCI strand LS1, with CCC 2 and CCC 4.
    – There is at least one PE in DCI strand LS2, with CCC 7.

- For SEP 8, there are at least two PEs.

    – There is at least one PE in DCI strand LS1, with CCC 2.
    – There is at least one PE in DCI strand LS4, with CCC 2.

The range of items per DCI strand is described as follows:

- Between one and six items aligned to PEs from DCI strand LS1 will be assessed on Segment A of the CAST.
- Between one and four items aligned to PEs from DCI strand LS2 will be assessed on Segment A of the CAST.
- Between one and two items aligned to PEs from DCI strand LS3 will be assessed on Segment A of the CAST.
- Between one and five items aligned to PEs from DCI strand LS4 will be assessed on Segment A of the CAST.

For the entire LS domain, between 8 and 10 items will be assessed on Segment A of the CAST.

In the ESS domain for grade eight, there are 15 PEs, organized into three DCI strands, that are distributed among six of the eight SEPs and six of the seven CCCs.

- For the science component of SEP 1, there is at least one PE in DCI strand ESS3, with CCC 7.
- For SEP 2, there are at least five PEs.

  – There are at least two PEs in DCI strand ESS1, with CCC 1 and CCC 4.
  – There are at least three PEs in DCI strand ESS2, with CCC 4, CCC 5, and CCC 7.

- For SEP 3, there is at least one PE in DCI strand ESS2, with CCC 2.
- For SEP 4, there are at least three PEs.

  – There is at least one PE in DCI strand ESS1, with CCC 3.
  – There is at least one PE in DCI strand ESS2, with CCC 1.
  – There is at least one PE in DCI strand ESS3, with CCC 1.

- For the science component of SEP 6, there are at least three PEs.

  – There is at least one PE in DCI strand ESS1, with CCC 3.
  – There is at least one PE in DCI strand ESS2, with CCC 3.
  – There is at least one PE in DCI strand ESS3, with CCC 2.

- For the engineering component of SEP 6 (SEP 6E), there is at least one PE in DCI strand ESS3, with CCC 2.
- For SEP 7, there is at least one PE in DCI strand ESS3, with CCC 2.

The range of items per DCI strand is described as follows:

- Between one and three items aligned to PEs from DCI strand ESS1 will be assessed on Segment A of the CAST.
- Between one and five items aligned to PEs from DCI strand ESS2 will be assessed on Segment A of the CAST.
- Between one and four items aligned to PEs from DCI strand ESS3 will be assessed on Segment A of the CAST.

For the entire ESS domain, between 8 and 10 items will be assessed on Segment A of the CAST.

In the ETS subdomain for grade eight, there are four PEs, organized into one DCI strand, that are distributed among four of the eight SEPs and no CCCs.

- For the science component of SEP 1, there is at least one PE aligned to DCI strand ETS1.
- For SEP 2, there is at least one PE aligned to DCI strand ETS1.
- For SEP 4, there is at least one PE aligned to DCI strand ETS1.
- For SEP 7, there is at least one PE aligned to DCI strand ETS1.

The range of items per DCI strand is described as follows:

- Between two and four items aligned to PEs from DCI strand ETS1 will be assessed on Segment A of the CAST.

For the entire ETS subdomain, between two and four items will be assessed on Segment A of the CAST.

The range of items per SEP across all domains is described as follows:

- Between one and three items representing both the science and engineering components of SEP 1 will be assessed on Segment A of the CAST.

- Between 1 and 16 items representing SEP 2 will be assessed on Segment A of the CAST.

- Between one and five items representing SEP 3 will be assessed on Segment A of the CAST.

- Between one and nine items representing SEP 4 will be assessed on Segment A of the CAST.

- Between one and two items representing SEP 5 will be assessed on Segment A of the CAST.

- Between 1 and 12 items representing both the science and engineering components of SEP 6 will be assessed on Segment A of the CAST.

- Between one and eight items representing SEP 7 will be assessed on Segment A of the CAST.

- Between one and four items representing SEP 8 will be assessed on Segment A of the CAST.

For grade eight, a total of 28 items representing a selection of PEs across all three science domains and the ETS subdomain will be assessed on Segment A of the CAST.

Alternative Text for Figure 4.A.3

In the table, an X indicates that there is at least one PE at the given intersection of the three dimensions that can be sampled on a test form for Segment A. The table has an X only in the locations described in the bulleted text that follows for each science domain and the ETS subdomain.

In the PS domain for high school, there are 24 PEs, organized into four DCI strands, that are distributed among the eight SEPs and six of the seven CCCs.

- For the science component of SEP 1, there is at least one PE in DCI strand PS4, with CCC 7.
- For SEP 2, there are at least four PEs.

    – There are at least two PEs in DCI strand PS1, with CCC 1 and CCC 5.
    – There are at least two PEs in DCI strand PS3, with CCC 2 and CCC 5.

- For SEP 3, there are at least three PEs.

    – There is at least one PE in DCI strand PS1, with CCC 1.
    – There is at least one PE in DCI strand PS2, with CCC 2.
    – There is at least one PE in DCI strand PS3, with CCC 4.

- For SEP 4, there is at least one PE in DCI strand PS2, with CCC 2.
- For SEP 5, there are at least five PEs.

    – There is at least one PE in DCI strand PS1, with CCC 5.
    – There are at least two PEs in DCI strand PS2, with CCC 1 and CCC 4.
    – There is at least one PE in DCI strand PS3, with CCC 4.
    – There is at least one PE in DCI strand PS4, with CCC 2.

- For the science component of SEP 6, there is at least one PE in DCI strand PS1, with CCC 1.
- For the engineering component of SEP 6 (SEP 6E), there are at least three PEs.

    – There is at least one PE in DCI strand PS1, with CCC 7.
    – There is at least one PE in DCI strand PS2, with CCC 2.
    – There is at least one PE in DCI strand PS3, with CCC 5.

- For SEP 7, there is at least one PE in DCI strand PS4, with CCC 4.
- For SEP 8, there are at least two PEs.

    – There is at least one PE in DCI strand PS2, with CCC 6.
    – There is at least one PE in DCI strand PS4, with CCC 2.

The range of items per DCI strand is described as follows:

- Between two and seven items aligned to PEs from DCI strand PS1 will be assessed on Segment A of the CAST.
- Between one and five items aligned to PEs from DCI strand PS2 will be assessed on Segment A of the CAST.
- Between one and four items aligned to PEs from DCI strand PS3 will be assessed on Segment A of the CAST.
- Between one and four items aligned to PEs from DCI strand PS4 will be assessed on Segment A of the CAST.

For the entire PS domain, between 9 and 12 items will be assessed on Segment A of the CAST.

In the LS domain for high school, there are 24 PEs, organized into four DCI strands, that are distributed among eight SEPs and seven CCCs.

- For the science component of SEP 1, there is at least one PE in DCI strand LS3, with CCC 2.
- For SEP 2, there are at least three PEs.

  - There are at least two PEs in DCI strand LS1, with CCC 4 and CCC 5.
  - There is at least one PE in DCI strand LS2, with CCC 4.

- For SEP 3, there is at least one PE in DCI strand LS1, with CCC 7.
- For SEP 4, there are at least two PEs.

  - There is at least one PE in DCI strand LS3, with CCC 3.
  - There is at least one PE in DCI strand LS4, with CCC 1.

- For SEP 5, there are at least three PEs.

  - There are at least two PEs in DCI strand LS2, with CCC 3 and CCC 5.
  - There is at least one PE in DCI strand LS4, with CCC 2.

- For the science component of SEP 6, there are at least four PEs.

  - There are at least two PEs in DCI strand LS1, with CCC 5 and CCC 6.
  - There is at least one PE in DCI strand LS2, with CCC 5.
  - There is at least one PE in DCI strand LS4, with CCC 2.

- For the engineering component of SEP 6 (SEP 6E), there is at least one PE in DCI strand LS2, with CCC 7.
- For SEP 7, there are at least four PEs.

  - There are at least two PEs in DCI strand LS2, with CCC 2 and CCC 7.
  - There is at least one PE in DCI strand LS3, with CCC 2.
  - There is at least one PE in DCI strand LS4, with CCC 2.

- For SEP 8, there is at least one PE in DCI strand LS4, with CCC 1.

The range of items per DCI strand is described as follows:

- Between one and six items aligned to PEs from DCI strand LS1 will be assessed on Segment A of the CAST.
- Between one and seven items aligned to PEs from DCI strand LS2 will be assessed on Segment A of the CAST.
- Between one and two items aligned to PEs from DCI strand LS3 will be assessed on Segment A of the CAST.
- Between one and five items aligned to PEs from DCI strand LS4 will be assessed on Segment A of the CAST.

For the entire LS domain, between 9 and 12 items will be assessed on Segment A of the CAST.

In the ESS domain for high school, there are 19 PEs, organized into three DCI strands, that are distributed among seven of the eight SEPs and seven CCCs.

- For SEP 2, there are at least four PEs.
  - There is at least one PE in DCI strand ESS1, with CCC 3.
  - There are at least three PEs in DCI strand ESS2, with CCC 2, CCC 5, and CCC 7.

- For SEP 3, there is at least one PE in DCI strand ESS2, with CCC 6.
- For SEP 4, there are at least two PEs.
  - There is at least one PE in DCI strand ESS2, with CCC 7.
  - There is at least one PE in DCI strand ESS3, with CCC 7.

- For SEP 5, there are at least three PEs.
  - There is at least one PE in DCI strand ESS1, with CCC 3.
  - There are at least two PEs in DCI strand ESS3, with CCC 4 and CCC 7.

- For the science component of SEP 6, there are at least three PEs.
  - There are at least two PEs in DCI strand ESS1, with CCC 5 and CCC 7.
  - There is at least one PE in DCI strand ESS3, with CCC 2.

- For the engineering component of SEP 6 (SEP 6E), there is at least one PE in DCI strand ESS3, with CCC 7.
- For SEP 7, there are at least three PEs.
  - There is at least one PE in DCI strand ESS1, with CCC 1.
  - There is at least one PE in DCI strand ESS2, with CCC 7.
  - There is at least one PE in DCI strand ESS3, with no CCC.

- For SEP 8, there is at least one PE in DCI strand ESS1, with CCC 5.

The range of items per DCI strand is described as follows:

- Between one and five items aligned to PEs from DCI strand ESS1 will be assessed on Segment A of the CAST.
- Between one and six items aligned to PEs from DCI strand ESS2 will be assessed on Segment A of the CAST.
- Between one and five items aligned to PEs from DCI strand ESS3 will be assessed on Segment A of the CAST.

For the entire ESS domain, between 9 and 12 items will be assessed on Segment A of the CAST.

In the ETS subdomain for high school, there are four PEs, organized into one DCI strand, that are distributed among three of the eight SEPs and one of the seven CCCs.

- For the engineering component of SEP 1 (SEP 1E), there is at least one PE in the DCI strand ETS1, with no CCC.
- For SEP 5, there is at least one PE in the DCI strand ETS1, with CCC 4.
- For the science component of SEP 6, there is at least one PE in the DCI strand ETS1, with no CCC.

The range of items per DCI strand is described as follows:

- Between two and four items aligned to PEs from DCI strand ETS1 will be assessed on Segment A of the CAST.

For the entire ETS subdomain, between two and four items will be assessed on Segment A of the CAST.

The range of items per SEP across all domains is described as follows:

- Between two and three items representing both the science and engineering components of SEP 1 will be assessed on Segment A of the CAST.
- Between two and six items representing SEP 2 will be assessed on Segment A of the CAST.
- Between two and five items representing SEP 3 will be assessed on Segment A of the CAST.
- Between two and five items representing SEP 4 will be assessed on Segment A of the CAST.
- Between two and six items representing SEP 5 will be assessed on Segment A of the CAST.
- Between two and six items representing both the science and engineering components of SEP 6 will be assessed on Segment A of the CAST.
- Between two and six items representing SEP 7 will be assessed on Segment A of the CAST.
- Between two and six items representing SEP 8 will be assessed on Segment A of the CAST.

For high school, a total of 32 items representing a selection of PEs across all three science domains and the ETS subdomain will be assessed on Segment A of the CAST.