

The 2023 PreACT Norming Study

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This document describes the development of the PreACT® norms for PreACT tests administered from fall 2020 to spring 2023, to be used for PreACT and PreACT Secure reporting during the 2023–2024 academic year. Norms will be updated every summer for the next reporting year.

The results of the norming study are used to report the percentile ranks associated with students' PreACT scale scores, as shown in Figure 1. The US Ranks allow students to understand how their performance compares to other students in the population. For example, a Composite rank of 68 indicates that a student's Composite score was as high or higher than 68% of the students in the population.

Figure 1. Norm Percentile Rank in the Sample Student Report

US Rank	
Composite	68%
Math	74%
Science	50%
STEM	60%
English	70%
Reading	74%

Procedures for sample selection, weighting, estimation of weighted percentile ranks, and summary statistics are detailed in this document.

Samples

The norming sample is composed of students who completed the PreACT tests during the 2020–2021, 2021–2022, or 2022–2023 school year and received Composite scale scores. Data from the three-year-combined sample were used to create the norms for each subject (i.e., English, math, reading, and science), the STEM score, and the Composite score.¹ Separate norms are estimated for fall and spring test administrations. Students tested from August to January (i.e., August 2020–January 2021, August 2021–January 2022, or August 2022–January 2023) were included in the fall norm samples, and those who tested from February to July (i.e., February 2021–July 2021, February 2022–July 2022, or February 2023–July 2023) were included in the spring norm samples.

The sample size (N count) for each year is presented in Table 1.



Table 1. Final Sample Size per Year

Year	N
2020–2021	368,577
2021–2022	419,216
2022–2023	437,711
Total	1,225,504

Table 2 presents sample sizes by grade level and season after applying the school and region cleaning rule by excluding students from the U.S. territories. Separate norms were developed for fall Grade 9, spring Grade 9, fall Grade 10, spring Grade 10, and fall Grade 11. Note that norms were not created for other samples due to small sample sizes. For students who take PreACT in grade 8 or earlier, the fall grade 9 norms are used to assign the US Ranks. For students who take PreACT in spring grade 11 or later, the fall grade 11 norms are used to assign the US Ranks. Also note that students who take PreACT 8/9 in grade 8 or earlier are assigned US ranks appropriate for their grade level and season that are developed from a different norming study.

Table 2. Number of Students by Grade Level and Season

Season	Grade Level					Total
	8	9	10	11	12	
Fall	2,729	56,497	533,989	68,746	308	662,269
Spring	2,195	57,082	495,701	4,527	118	559,623

Weighting Methodology

The samples were weighted to promote similarity across samples in student and school-level demographic variables. The samples were weighted to a common population, which we refer to as the ACT population. The ACT population includes students who took the ACT test and completed high school in spring of 2022. By weighting the PreACT samples to the demographic profile of the ACT population, differences in norms across grade levels and seasons are more likely to reflect true differences in academic development, instead of underlying differences in schools and demographics across samples. The PreACT test is used to simulate the ACT testing experience and provide students with practice and preparation for the ACT test. This intended use also supports using the ACT population as the target population for the development of the PreACT norms. The weighting variables included gender, race/ethnicity, school geographic region, and school category. School category is defined by public/nonpublic status and percentage of students eligible for free and reduced-price lunch (FRL).

For each combination of the weighting variables, the sample and population percentages were first calculated. Then, the weight for each combination was calculated as the population percentage divided by the sample percentage (i.e., $weight = \frac{ACT\ percentage}{PreACT\ percentage}$ for each



combination within each norm sample). In the cases where weights were very large (greater than 5) or very small (less than 0.2), they were truncated to be in the interval of [0.2, 5.0]. The final weights were applied to all students within each combination, and the weighting procedure was conducted separately for each of the five norm samples (fall Grade 9, spring Grade 9, fall Grade 10, spring Grade 10, and fall Grade 11). To compute weighted frequency tables, we used the `wtd.table` function in the R package `questionr` (Barnier et al., 2023).

Table 3–Table 5 show the distributions of the weighting variables for the ACT population and for the unweighted and weighted PreACT samples. Note that the sum of the percentages given in the tables may not equal 100 due to rounding.

Table 3. Summary of the ACT Population and the Grade 9 PreACT Samples

Variable	ACT Population (%)	PreACT				
		Fall		Spring		
		Unweighted (%)	Weighted (%)	Unweighted (%)	Weighted (%)	
Gender	Female	49.96	45.40	48.51	47.60	49.20
	Male	46.78	45.73	47.43	47.80	47.22
	Missing / Another Gender/ Prefer Not to Respond	3.26	8.87	4.07	4.59	3.58
Race/Ethnicity	African American	11.38	13.00	12.47	8.84	11.09
	Asian	4.04	3.53	3.09	6.21	3.79
	Caucasian	52.53	54.41	53.37	53.71	54.45
	Hispanic	15.57	6.06	13.32	6.42	12.53
	Other	5.78	9.58	6.69	17.61	8.11
	Unknown	10.70	13.43	11.07	7.21	10.03
Region	Midwest	29.11	48.59	36.75	25.30	28.69
	Northeast	4.23	2.83	2.93	2.14	2.27
	South	51.89	43.47	50.81	55.67	54.44
	West	14.77	5.07	9.51	16.85	14.60
School Category	Nonpublic	10.92	38.13	14.04	51.34	15.37
	Public, 0%–10% FRL ^a	5.97	10.03	6.16	2.54	5.31
	Public, 10%–20% FRL	11.26	9.63	9.31	8.72	9.57
	Public, 20%–40% FRL	25.50	13.10	20.60	14.74	29.82
	Public, 40%–60% FRL	19.65	6.78	20.53	14.58	18.76
	Public, 60%–80% FRL	8.28	4.84	10.11	1.02	4.04
	Public, >80% FRL	9.49	14.89	10.61	1.73	7.83
	Public, FRL unknown	8.93	2.59	8.62	5.32	9.30
	Public Total	89.08	61.87	85.96	48.66	84.63

^a FRL = free and reduced-price lunch

Table 4. Summary of the ACT Population and the Grade 10 PreACT Samples

Variable	ACT Population (%)	PreACT				
		Fall		Spring		
		Unweighted (%)	Weighted (%)	Unweighted (%)	Weighted (%)	
Gender	Female	49.96	45.40	49.80	45.19	49.67
	Male	46.78	47.64	46.75	46.24	46.64
	Missing / Another Gender/ Prefer Not to Respond	3.26	6.95	3.45	8.57	3.68
Race/Ethnicity	African American	11.38	12.83	11.41	12.44	11.34
	Asian	4.04	3.48	3.97	3.79	3.93
	Caucasian	52.53	54.20	52.90	56.45	53.72
	Hispanic	15.57	7.81	15.29	8.80	14.75
	Other	5.78	13.07	5.87	11.00	6.02
	Unknown	10.70	8.60	10.56	7.51	10.25
Region	Midwest	29.11	26.59	28.94	30.16	29.12
	Northeast	4.23	4.75	4.12	5.58	4.20
	South	51.89	57.79	52.25	50.17	53.06
	West	14.77	10.84	14.69	14.05	13.63
School Category	Nonpublic	10.92	15.81	11.08	22.46	11.29
	Public, 0%–10% FRL ^a	5.97	5.18	6.00	5.24	6.07
	Public, 10%–20% FRL	11.26	11.92	11.40	12.33	11.53
	Public, 20%–40% FRL	25.50	23.82	25.81	27.38	26.14
	Public, 40%–60% FRL	19.65	22.63	19.85	17.00	20.01
	Public, 60%–80% FRL	8.28	9.51	8.30	5.44	8.41
	Public, >80% FRL	9.49	8.64	9.56	6.63	8.62
	Public, FRL unknown	8.93	2.49	8.01	3.51	7.92
Public total	89.08	84.19	88.92	77.54	88.71	

^a FRL = free and reduced-price lunch

Table 5. Summary of the ACT Population and the Grade 11 PreACT Sample

Variable	ACT Population (%)	PreACT		
		Fall		
		Unweighted (%)	Weighted (%)	
Gender	Female	49.96	46.05	49.20
	Male	46.78	46.09	47.24
	Missing / Another Gender/ Prefer Not to Respond	3.26	7.86	3.56
Race/Ethnicity	African American	11.38	7.20	11.26
	Asian	4.04	3.30	3.56
	Caucasian	52.53	60.74	57.54
	Hispanic	15.57	7.88	11.66
	Other	5.78	9.58	6.88
	Unknown	10.70	11.29	9.10
Region	Midwest	29.11	66.61	35.13
	Northeast	4.23	5.02	3.88
	South	51.89	15.66	45.16
	West	14.77	12.67	15.83
School Category	Nonpublic	10.92	18.59	13.82
	Public, 0%–10% FRL ^a	5.97	2.09	4.94
	Public, 10%–20% FRL	11.26	14.47	10.75
	Public, 20%–40% FRL	25.50	31.87	31.46
	Public, 40%–60% FRL	19.65	22.09	20.30
	Public, 60%–80% FRL	8.28	6.75	6.55
	Public, >80% FRL	9.49	3.55	8.43
	Public, FRL unknown	8.93	0.60	3.74
Public total	89.08	81.41	86.18	

^a FRL = free and reduced-price lunch

Estimation of Weighted Percentile Ranks and Summary Statistics

The weighted PreACT norm samples were used to develop norms for each grade level and season. A five-degree polynomial smoothing method was applied to the empirical cumulative percentages to reduce sampling error. Table 6–Table 11 present the cumulative percentages of students who scored at or below each scale score point for English, math, reading, science, STEM, and Composite scales scores, respectively.

Table 6. 2023 PreACT English Norms: Percentages of Students at or Below Each Scale Score

PreACT Score	Grade Level and Season					
	9		10		11	
	Fall (%)	Spring (%)	Fall (%)	Spring (%)	Fall (%)	
1	1	1	1	1	1	
2	1	1	1	1	1	
3	1	1	1	1	1	
4	1	1	1	1	1	
5	3	2	2	2	1	
6	6	4	4	4	3	
7	10	8	8	7	5	
8	16	13	13	12	9	
9	23	20	19	17	14	
10	31	27	26	23	19	
11	38	34	33	30	25	
12	46	41	40	36	31	
13	53	48	47	42	36	
14	59	54	53	48	42	
15	65	60	59	54	47	
16	70	66	64	59	52	
17	75	71	69	64	57	
18	79	75	74	69	62	
19	83	80	78	74	67	
20	87	83	82	78	72	
21	90	87	86	82	76	
22	92	90	89	86	81	
23	94	92	91	89	84	
24	96	94	93	91	88	
25	97	96	95	93	90	
26	98	97	96	95	93	
27	98	98	97	96	94	
28	99	98	98	97	96	
29	99	99	98	98	96	
30	99	99	99	98	97	
31	99	99	99	99	98	
32	99	99	99	99	98	
33	99	99	99	99	99	
34	99	99	99	99	99	
35	100	100	100	100	100	
N	56,497	57,082	533,989	495,701	68,746	



Table 7. 2023 PreACT Math Norms: Percentages of Students at or Below Each Scale Score

PreACT Score	Grade Level and Season					
	9		10		11	
	Fall (%)	Spring (%)	Fall (%)	Spring (%)	Fall (%)	
1	1	1	1	1	1	
2	1	1	1	1	1	
3	1	1	1	1	1	
4	1	1	1	1	1	
5	1	1	1	1	1	
6	1	1	1	1	1	
7	1	1	1	1	1	
8	1	1	1	1	1	
9	1	1	1	1	1	
10	1	1	1	1	1	
11	3	3	3	2	2	
12	7	7	6	6	5	
13	16	14	14	13	11	
14	28	25	24	23	20	
15	43	39	37	34	30	
16	58	53	51	46	41	
17	70	66	63	57	51	
18	80	76	73	67	60	
19	86	83	80	74	68	
20	90	88	85	80	74	
21	92	91	89	84	78	
22	94	93	91	87	82	
23	95	94	92	89	85	
24	96	95	94	91	88	
25	97	96	95	92	90	
26	97	97	95	94	92	
27	98	97	96	95	93	
28	98	98	97	96	95	
29	99	99	98	97	96	
30	99	99	98	98	97	
31	99	99	99	98	98	
32	99	99	99	99	99	
33	99	99	99	99	99	
34	99	99	99	99	99	
35	100	100	100	100	100	
N	56,497	57,082	533,989	495,701	68,746	



Table 8. 2023 PreACT Reading Norms: Percentages of Students at or Below Each Scale Score

PreACT Score	Grade Level and Season					
	9		10		11	
	Fall (%)	Spring (%)	Fall (%)	Spring (%)	Fall (%)	
1	1	1	1	1	1	
2	1	1	1	1	1	
3	1	1	1	1	1	
4	1	1	1	1	1	
5	1	1	1	1	1	
6	2	1	1	1	1	
7	3	2	2	2	1	
8	5	3	3	3	2	
9	7	6	5	5	4	
10	11	9	8	7	6	
11	16	13	12	10	9	
12	21	18	17	14	13	
13	27	24	22	19	17	
14	34	30	28	24	22	
15	41	36	34	30	27	
16	47	43	40	36	32	
17	54	49	46	41	37	
18	59	55	52	47	43	
19	65	60	57	52	48	
20	69	65	62	58	53	
21	73	70	67	62	58	
22	77	74	71	67	62	
23	80	77	75	71	67	
24	83	80	78	75	71	
25	86	83	81	78	75	
26	88	86	84	81	78	
27	90	89	87	84	81	
28	92	91	89	87	84	
29	94	93	91	89	87	
30	95	95	93	92	90	
31	97	96	95	94	92	
32	98	97	97	96	94	
33	99	99	98	97	96	
34	99	99	99	99	98	
35	100	100	100	100	100	
N	56,497	57,082	533,989	495,701	68,746	



Table 9. 2023 PreACT Science Norms: Percentages of Students at or Below Each Scale Score

PreACT Score	Grade Level and Season					
	9		10		11	
	Fall (%)	Spring (%)	Fall (%)	Spring (%)	Fall (%)	
1	1	1	1	1	1	
2	1	1	1	1	1	
3	1	1	1	1	1	
4	1	1	1	1	1	
5	1	1	1	1	1	
6	1	1	1	1	1	
7	1	1	1	1	1	
8	3	2	2	2	1	
9	6	4	4	3	3	
10	10	7	7	6	5	
11	15	12	12	10	9	
12	22	17	17	14	13	
13	29	24	24	20	18	
14	38	32	31	27	24	
15	47	40	39	34	30	
16	55	48	47	41	37	
17	63	56	55	49	44	
18	70	64	62	56	51	
19	77	71	69	63	58	
20	82	77	75	70	65	
21	86	82	81	76	71	
22	90	87	85	81	76	
23	92	90	89	85	81	
24	94	93	92	89	86	
25	96	95	94	91	89	
26	97	96	95	93	92	
27	98	97	97	95	94	
28	98	98	97	96	95	
29	99	99	98	97	96	
30	99	99	99	98	97	
31	99	99	99	98	98	
32	99	99	99	99	99	
33	99	99	99	99	99	
34	99	99	99	99	99	
35	100	100	100	100	100	
N	56,497	57,082	533,989	495,701	68,746	



Table 10. 2023 PreACT STEM Score Norms: Percentages of Students at or Below Each Scale Score

PreACT Score	Grade Level and Season					
	9		10		11	
	Fall (%)	Spring (%)	Fall (%)	Spring (%)	Fall (%)	
1	1	1	1	1	1	1
2	1	1	1	1	1	1
3	1	1	1	1	1	1
4	1	1	1	1	1	1
5	1	1	1	1	1	1
6	1	1	1	1	1	1
7	1	1	1	1	1	1
8	1	1	1	1	1	1
9	1	1	1	1	1	1
10	2	1	1	1	1	1
11	5	3	3	3	3	2
12	10	8	8	7	6	6
13	19	16	15	13	11	11
14	31	26	25	22	19	19
15	43	37	36	32	28	28
16	55	49	47	42	37	37
17	66	60	58	52	46	46
18	74	69	67	60	54	54
19	81	76	74	68	62	62
20	86	82	80	74	68	68
21	89	86	84	79	74	74
22	92	90	88	83	78	78
23	94	92	91	87	83	83
24	95	94	93	90	86	86
25	97	96	94	92	89	89
26	97	97	96	94	92	92
27	98	98	97	95	94	94
28	99	99	98	97	96	96
29	99	99	99	98	97	97
30	99	99	99	98	98	98
31	99	99	99	99	99	99
32	99	99	99	99	99	99
33	99	99	99	99	99	99
34	99	99	99	99	99	99
35	100	100	100	100	100	100
N	56,497	57,082	533,989	495,701	68,746	



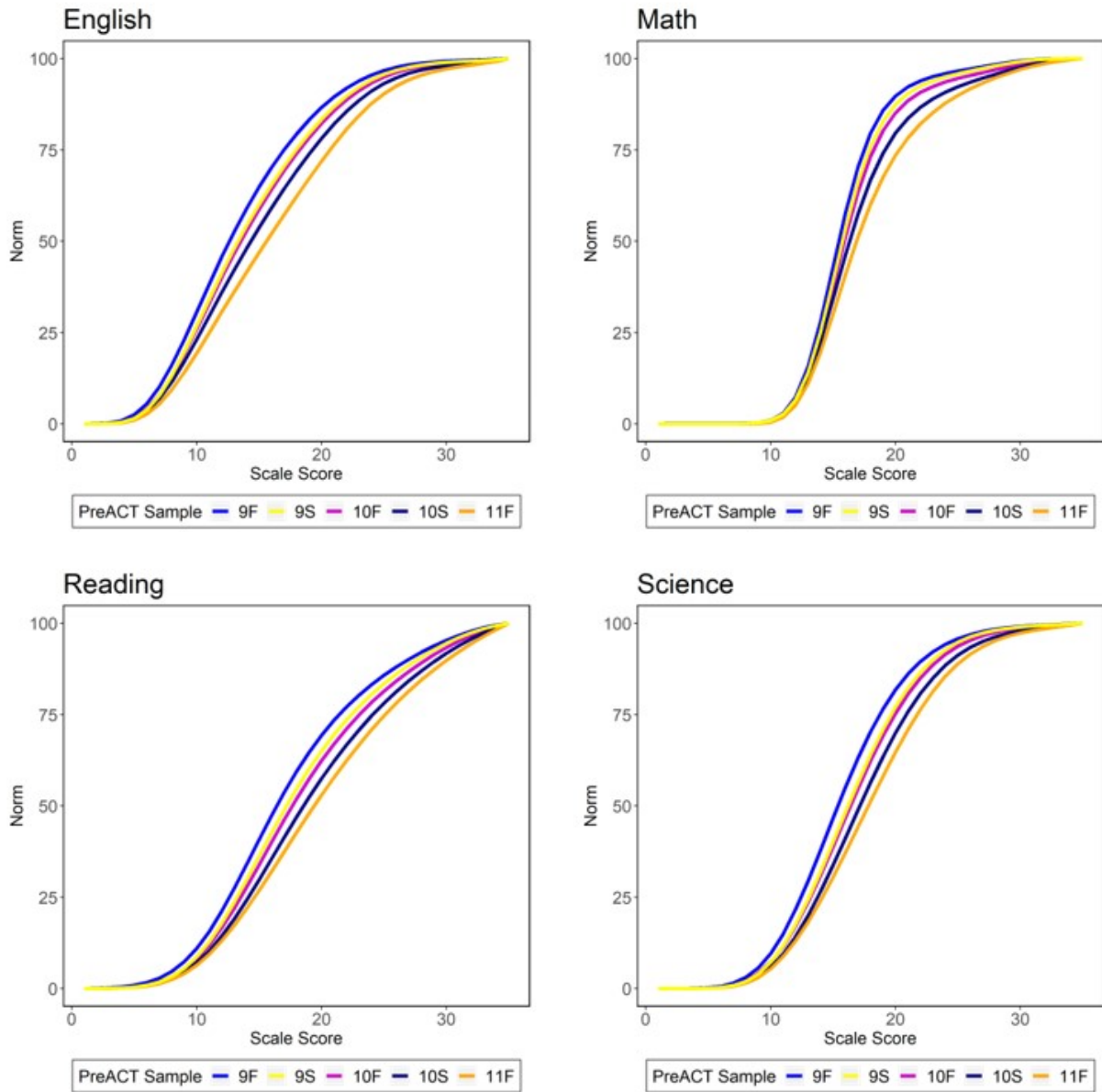
Table 11. 2023 PreACT Composite Score Norms: Percentages of Students at or Below Each Scale Score

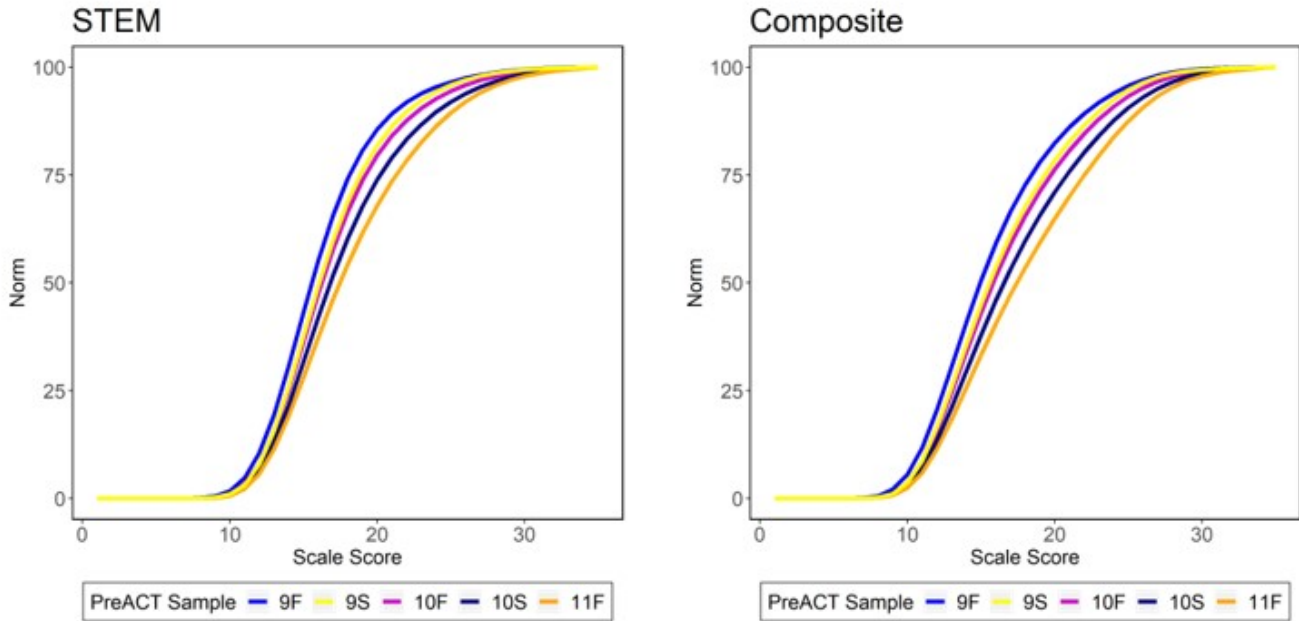
PreACT Score	Grade Level and Season					
	9		10		11	
	Fall (%)	Spring (%)	Fall (%)	Spring (%)	Fall (%)	
1	1	1	1	1	1	
2	1	1	1	1	1	
3	1	1	1	1	1	
4	1	1	1	1	1	
5	1	1	1	1	1	
6	1	1	1	1	1	
7	1	1	1	1	1	
8	1	1	1	1	1	
9	2	1	1	1	1	
10	6	4	4	3	2	
11	12	9	8	7	6	
12	20	16	16	13	11	
13	30	26	24	21	18	
14	41	35	34	29	26	
15	50	45	43	38	33	
16	59	53	51	46	40	
17	67	61	59	53	47	
18	73	68	66	60	54	
19	78	73	71	66	59	
20	82	78	76	71	65	
21	86	83	81	76	70	
22	89	87	85	80	75	
23	92	90	88	84	80	
24	94	93	91	88	84	
25	96	95	93	91	87	
26	97	96	95	93	91	
27	98	98	97	95	93	
28	99	99	98	97	95	
29	99	99	99	98	97	
30	99	99	99	99	98	
31	99	99	99	99	99	
32	99	99	99	99	99	
33	99	99	99	99	99	
34	99	99	99	99	99	
35	100	100	100	100	100	
N	56,497	57,082	533,989	495,701	68,746	



Figure 2 shows the comparison of norms across grade levels and seasons. For each scale score point, the cumulative percentage decreases with grade level and season, meaning that overall achievement level increases from fall Grade 9 to fall Grade 11.

Figure 2. 2023 PreACT Norms (Cumulative Percentage) Across Grades and Seasons





The weighted mean and standard deviation (SD) of each subject scale score for each grade level and season are shown in Table 12. The scale score statistics were calculated based on the estimated norms for each PreACT norm sample.

Table 12. 2023 PreACT Norms: Scale Score Means and Standard Deviations

Grade	Season	N	Statistic	English	Math	Reading	Science	STEM	Composite
9	Fall	56,497	Mean	14.0	16.5	17.9	16.3	16.7	16.3
			SD	5.6	3.6	6.5	4.8	3.9	4.5
	Spring	57,082	Mean	14.7	16.9	18.6	17.1	17.2	16.9
			SD	5.7	3.7	6.5	4.9	4.0	4.6
10	Fall	533,989	Mean	14.9	17.2	19.0	17.3	17.5	17.2
			SD	5.9	4.1	6.7	5.1	4.2	4.8
	Spring	495,701	Mean	15.6	17.8	19.8	18.1	18.2	17.9
			SD	6.2	4.5	6.8	5.3	4.6	5.1
11	Fall	68,746	Mean	16.7	18.5	20.5	18.7	18.8	18.7
			SD	6.5	4.8	7.0	5.5	4.8	5.4

Table 13 provides the percentages of students in each PreACT Readiness Level for each grade, season, and subject (English, math, reading, science, and STEM) based on the estimated norms shown in Table 6–Table 11. The PreACT Readiness Levels predict whether students are on target to meet the ACT College Readiness Benchmarks by the time they complete high school.

Table 13. 2023 PreACT Norms: Percentages of Students Categorized by PreACT Readiness Levels

Subject	PreACT Readiness Level	Grade 9		Grade 10		Grade 11
		Fall	Spring	Fall	Spring	Fall
English	In Need of Intervention	16	20	26	30	31
	Close to Target	22	22	21	18	16
	On Target	62	59	53	52	53
Math	In Need of Intervention	28	39	51	46	51
	Close to Target	30	27	22	21	16
	On Target	42	34	27	33	32
Reading	In Need of Intervention	27	30	34	36	37
	Close to Target	20	19	18	17	16
	On Target	53	51	48	48	47
Science	In Need of Intervention	47	40	47	49	44
	Close to Target	17	24	22	15	21
	On Target	37	36	31	37	35
STEM	In Need of Intervention	74	76	80	79	74
	Close to Target	12	10	8	8	9
	On Target	14	14	12	13	17

PreACT scores are classified into one of three readiness levels (Table 14):

1. **On Target**—Students scoring in this range are predicted to meet or exceed the ACT College Readiness Benchmark in Grade 11 or Grade 12. The PreACT Readiness Benchmark is the score associated with a 50% chance of meeting the ACT College Readiness Benchmark in Grade 11 or Grade 12 and is the minimum score of the On Target range.
2. **Close to Target**—Students scoring in this range have less than a 50% chance, but greater than a 25% chance, of meeting the ACT College Readiness Benchmark.
3. **In Need of Intervention**—Students scoring in this range have less than a 25% chance of meeting the ACT College Readiness Benchmark.

Table 14. ACT College Readiness Benchmarks and the Scale Score Ranges for PreACT Readiness Levels

Subject	ACT Benchmark	Grade Level and Season	PreACT Readiness Level		
			In Need of Intervention	Close to Target	On Target
English	18	9, Fall	1–8	9–11	12–35
		9, Spring	1–9	10–12	13–35
		10, Fall	1–10	11–13	14–35
		10, Spring	1–11	12–14	15–35
		11, Fall	1–12	13–15	16–35
Math	22	9, Fall	1–14	15–16	17–35
		9, Spring	1–15	16–17	18–35
		10, Fall	1–16	17–18	19–35
		10, Spring	1–16	17–18	19–35
		11, Fall	1–17	18–19	20–35
Reading	22	9, Fall	1–13	14–16	17–35
		9, Spring	1–14	15–17	18–35
		10, Fall	1–15	16–18	19–35
		10, Spring	1–16	17–19	20–35
		11, Fall	1–17	18–20	21–35
Science	23	9, Fall	1–15	16–17	18–35
		9, Spring	1–15	16–18	19–35
		10, Fall	1–16	17–19	20–35
		10, Spring	1–17	18–19	20–35
		11, Fall	1–17	18–20	21–35
STEM	26	9, Fall	1–18	19–20	21–35
		9, Spring	1–19	20–21	22–35
		10, Fall	1–20	21–22	23–35
		10, Spring	1–21	22–23	24–35
		11, Fall	1–21	22–23	24–35

Notes

1. Unlike the ACT test, the PreACT test does not include an English Language Arts (ELA) score because there is no separate writing test.

Reference

Barnier, J., Briatte, F., & Larmarange, J. (2023). *questionr: Functions to make surveys processing easier* (R package Version 0.7.8). <https://CRAN.R-project.org/package=questionr>



ABOUT ACT

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