

Equating Study
Final Concordance Tables Between
Stanford 10 and Iowa Test of Basic Skills
For
Grades 1 – 9

Prepared by Pearson
for the Arkansas Department of Education

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COMMENT FROM THE ADE, CURRICULUM, ASSESSMENT, AND RESEARCH SECTION

Concordance Tables between Stanford 10 and Iowa Test of Basic Skills

These concordance tables serve two purposes. One, they allow district personnel to compare spring 2008 student scores on the SAT10 with the spring 2007 scores on the ITBS/ITED to see if student performance changed from one year to the next. Secondly, they provide the information needed to establish an AIP or IRI as required by ACTAAP Rules and Regulations. Using these concordance tables for grades 1 and 2, the “cut scores” for *Basic*, *Proficient*, and *Advanced* as stated in the ACTAAP rules can be compared to the spring 2008 SAT10 scores. Additionally, the concordance tables indicate each cut score by a bolded scale score point.

As noted in the Executive Summary, this table is appropriate for a one-time comparison of scores from the 2008 to 2007 NRT tests and is based only on Arkansas students.

EXECUTIVE SUMMARY

Purpose. In the spring of 2008, Arkansas school systems administered the Stanford Achievement Test, 10th Edition (SAT10) for the first time. Previously, the Iowa Test of Basic Skills (ITBS) and Iowa Test of Educational Development (ITED) had been administered to grades K-8 and 9, respectively. In order to be able to make comparisons of scores between ITBS/ITED and SAT10, the Arkansas Department of Education required that Pearson conduct an equating study between the two tests.

Procedure. Pearson conducted a study that used a randomly equivalent groups design that assumes the group of students tested with the ITBS/ITED in 2007 was equivalent to the group of students tested with the SAT10 in 2008.

For grades 3-8 Math and Reading, a sample of approximately 25,000 from the general population of students that matched the distribution of proficiency levels from 2007 was used for the analysis. For grades 1, 2, and 9 Science and for grades 3-8 Language, the full combined population of students was used for the analysis. For all grades and content areas, students came from all school systems in Arkansas.

The scores of those students tested in grades 1 through 9 in 2008 who had valid scores in the subjects of Reading Comprehension, Mathematics Problem Solving, and Language were equated to the scores of those students in 2007 who had valid scores in Reading Comprehension, Mathematics Problems and Data Interpretation, and Language. The same criteria were used for Science grades 5 and 7.

The linking of the subjects at grades 1 through 9 was based on samples of approximately 25,000 to 35,000 students per grade and subject. Thus, the score comparisons for the equating study were based on a substantial number of Arkansas students.

The first step in the production of the equating tables was the creation of pairs of relative cumulative frequency distributions for each grade and subject by test. For example, separate frequency distributions of the ITBS Reading Comprehension scores from 2007 and the SAT10 Reading Comprehension scores from 2008 were developed for grade 1. In the second step, the score points in the distributions were matched, and statistically equivalent pairs of scores were identified. For example, if 65% of students obtained a scale score of 456 on the SAT10, and 65% of the students obtained a scale score of 138 on the ITBS, then a scale score of 456 on the SAT10 is said to be equivalent to a scale score of 138 on the ITBS. After the second step, an analytical procedure was used to smooth the final set of distributions.

The Equating Tables. For each of the grades and subtests, two matched columns of Scale Scores (SS) are given. Table 1 displays equated scale scores for the SAT10 and the ITBS for grade 1 Mathematics Problem Solving. The two columns show all possible SS between 359 and 669 for SAT10 and the corresponding ITBS/ITED SS, as estimated by the equating study. For example, at grade 1 a SAT10 Mathematics Problem Solving SS of 583 is statistically equivalent to an ITBS SS of 161. Without the equating study one might erroneously conclude that there has been a loss of 422 SS in achievement from 2007 to 2008, while achievement has actually remained relatively stable. Table 1 through Table 27 display equated Scale Scores (SS) for grades 1 through 9 for Reading, Mathematics, Language, and Science and were derived using the same procedure as Table 1. It must be emphasized that the design used in this analysis is sufficiently precise to permit the *one-time* comparison of scores when Arkansas transitioned from administering the ITBS/ITED tests to the SAT10 tests. These concordance tables are based *only* on Arkansas students and these tables are not meant to map ITBS/ITED norms to SAT10 norms. *These equated scores are estimations and, thus, small differences of a few scale score points should not be overly emphasized.* For grades 1 and 2, the lowest inclusive score for the Basic, Proficient, and Advanced performance levels are indicated in bold.

NOTE: When states update their testing programs by administering a new norm-referenced test (NRT), there are often observed differences in the norm-referenced scores between the new and previous tests. Frequently, administering a new test results in lower scores because, along with other possible reasons, students and teachers are not familiar with the structure of the new test. However, scores tend to rise as familiarity increases. Therefore, there is often a concern about an artificial drop in scores when a new test is adopted, and the Arkansas Department of Education shared these concerns.

Table 1

Grade 1 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
359	100
413	103
422	106
431	110
438	110
444	114
450	118
456	118
461	121
466	121
470	124
475	124
479	127
483	127
488	130
492	130
496	133
500	133
504	133
508	136

SAT10 SS	ITBS SS
512	136
516	138
520	138
524	141
528	141
532	144
537	144
541	147
546	147
551	149
556	152
562	155
568	155
575	158
583	161
593	164
604	167
620	171
646	181
669	187

Table 2

Grade 2 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
392	105
417	105
433	105
444	111
454	115
462	119
469	123
475	127
481	127
486	131
491	131
496	135
500	135
505	138
509	138
513	141
517	141
521	141
525	144
529	144
533	147
537	147

SAT10 SS	ITBS SS
541	151
545	151
549	151
553	154
557	154
561	157
565	157
569	160
574	163
578	163
583	166
588	169
594	172
600	175
606	178
613	182
622	186
631	191
643	196
659	201
685	208
709	219

Table 3

Grade 3 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
446	125
472	125
489	131
501	131
511	137
519	137
527	143
534	147
540	147
547	152
552	152
558	156
564	156
569	161
574	165
580	165
585	169
591	172
597	176
603	176
609	179
616	183
623	187
631	192
641	197
651	197
665	204
684	214
713	226
740	241

Table 4

Grade 4 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
471	132
497	132
513	139
525	145
535	145
544	151
551	151
558	156
565	156
571	161
577	161
582	167
588	172
593	172
599	177
604	182
610	187
615	191
621	195
627	199
634	203
640	207
648	212
656	218
665	226
675	234
688	243
705	253
732	262
757	270

Table 5

Grade 5 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
502	136
528	136
544	144
557	144
567	150
575	155
583	161
590	161
596	167
602	173
608	179
614	185
619	190
625	194
630	198
635	198
641	203
646	207
652	212
658	217
664	228
671	234
678	241
685	249
694	258
704	266
716	274
733	282
759	282
783	290

Table 6

Grade 6 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
525	131
551	141
567	148
579	148
588	154
596	159
604	164
610	170
616	175
622	175
628	181
633	187
638	192
643	196
648	201
653	205
658	210
664	214
669	218
674	227
680	232
686	238
693	245
700	253
708	261
718	270
729	278
745	286
771	295
794	310

Table 7

Grade 7 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
539	142
564	149
580	155
592	161
602	167
610	172
618	178
624	184
631	190
637	196
642	201
648	205
653	210
658	220
664	225
669	230
674	235
680	241
685	248
691	255
697	263
703	271
710	278
717	278
726	286
735	294
747	302
763	311
789	320
813	326

Table 8

Grade 8 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
561	151
587	157
603	163
615	169
624	176
633	183
640	190
647	196
653	202
659	208
664	208
669	214
675	221
680	227
685	234
690	241
695	249
700	256
705	263
711	270
717	277
723	284
729	290
737	296
745	301
754	306
766	312
782	318
808	325
831	339

Table 9

Grade 9 Math: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
556	159
582	159
598	168
609	168
618	168
626	176
633	183
639	183
645	189
650	195
654	195
659	201
663	208
667	214
671	214
675	220
679	226
682	231
686	235
689	240
692	245
696	250
699	255
702	259
706	263

SAT10 SS	ITBS SS
709	266
712	270
715	274
719	278
722	285
725	285
729	288
732	292
736	295
739	299
743	303
747	307
751	311
756	311
760	316
765	320
771	324
777	324
783	328
791	333
800	339
811	339
827	346
852	354
875	354

Table 10

Grade 1 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS	SAT10 SS	ITBS SS
352	112	501	138
378	116	505	140
393	116	510	140
405	116	514	142
415	119	519	143
423	122	524	143
430	122	529	145
437	124	534	146
443	126	539	147
449	126	544	148
454	128	550	151
459	130	556	152
464	130	563	154
469	133	570	155
474	133	579	159
478	135	588	161
483	135	600	163
487	137	616	167
492	137	642	179
496	138	666	188

Table 11

Grade 2 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
427	123
452	127
468	127
479	130
489	133
497	133
504	135
510	137
516	140
521	143
526	146
531	149
535	149
540	151
544	152
548	154
552	155
556	156
560	158
564	159

SAT10 SS	ITBS SS
569	160
573	161
577	162
581	163
585	165
589	167
594	167
598	169
603	171
608	174
613	177
619	181
625	185
632	190
640	196
650	203
661	212
677	219
703	222
726	224

Table 12

Grade 3 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
475	124
502	132
519	136
531	140
541	143
550	146
558	149
565	152
571	154
577	157
583	160
589	163
595	165
600	169
605	172
611	174
616	178
621	180
627	182
633	186
639	189
645	196
652	200
660	204
668	213
678	219
690	226
706	242
732	251
755	260

Table 13

Grade 4 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
490	135
516	135
532	139
544	143
554	146
562	149
570	152
577	155
583	159
589	163
595	166
600	169
605	172
611	175
616	178
621	181
626	187
631	190
637	194
643	197
648	201
655	206
661	210
669	217
677	226
687	237
699	242
715	254
741	260
765	272

Table 14

Grade 5 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
497	136
523	140
539	143
552	146
561	150
570	153
578	156
585	159
591	163
597	167
603	171
609	171
614	178
619	181
625	184
630	189
635	192
641	198
646	203
652	208
658	213
665	219
671	226
679	234
687	243
697	253
709	261
725	278
751	287
775	299

Table 15

Grade 6 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
535	140
553	144
566	148
576	152
586	155
594	158
601	161
608	164
614	167
620	170
626	177
632	180
637	187
643	193
648	199
654	208
659	214
665	223
670	230
676	240
683	248
690	257
697	262
706	275
715	283
727	291
744	302
770	316
793	316

Table 16

Grade 7 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
522	139
548	143
564	147
576	150
585	154
594	157
601	160
608	163
614	167
620	171
626	171
631	176
636	180
642	185
647	189
652	198
657	201
663	208
668	218
674	223
680	232
686	241
693	250
701	260
709	271
719	281
731	295
748	311
774	320
797	333

Table 17

Grade 8 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
522	134
548	150
565	154
577	158
587	161
596	164
603	167
610	167
617	171
623	175
629	178
635	178
640	182
646	187
651	197
657	201
662	210
668	217
673	226
679	238
685	246
692	257
699	266
706	277
715	289
725	300
737	312
753	324
779	333
802	349

Table 18

Grade 9 Reading: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS	SAT10 SS	ITBS SS
500	138	652	218
526	153	655	218
541	153	658	223
552	153	661	227
561	157	665	231
568	157	668	231
575	157	671	234
581	162	674	238
586	166	677	242
591	166	681	246
595	170	684	250
600	170	688	253
604	175	692	261
607	175	696	265
611	181	700	269
615	181	704	273
618	181	709	276
621	187	714	280
625	187	719	288
628	193	725	293
631	193	732	298
634	193	739	304
637	199	748	317
640	199	759	324
643	206	775	339
646	206	800	346
649	212	823	353

Table 19

Grade 3 Language: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
467	135
493	139
509	143
521	146
531	149
539	152
546	155
553	159
559	162
565	166
571	169
576	173
582	176
587	179
592	182
597	185
603	188
608	192
614	195
619	199
625	203
632	208
638	213
646	219
654	225
664	231
676	238
693	244
719	251
743	256

Table 20

Grade 4 Language: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
472	142
498	145
514	148
526	151
535	154
544	158
551	162
558	166
564	170
570	174
575	178
581	182
586	186
591	189
596	193
601	196
607	200
612	204
617	209
623	214
629	219
635	225
642	231
649	238
657	245
667	253
679	260
695	268
721	276
744	284

Table 21

Grade 5 Language: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
481	144
508	147
524	152
537	156
547	160
556	164
564	168
571	171
578	176
584	180
590	186
596	191
601	196
607	201
612	206
618	210
623	216
629	221
634	226
640	232
647	239
653	246
660	255
668	263
676	272
686	281
698	290
715	297
741	304
765	308

Table 22

Grade 6 Language: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
494	146
520	152
536	154
548	158
558	162
566	166
573	169
580	174
586	178
592	183
598	188
603	193
609	198
614	203
619	208
624	214
629	219
635	225
640	231
646	238
652	246
659	254
666	262
673	272
682	281
692	290
704	300
721	309
747	316
771	324

Table 23

Grade 7 Language: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
508	152
534	156
550	160
562	164
572	169
580	173
587	178
594	182
600	187
606	193
612	198
617	204
623	209
628	214
633	220
638	225
643	231
649	237
654	244
660	251
666	260
672	268
679	278
686	288
694	298
704	308
716	317
732	326
758	333
782	341

Table 24

Grade 8 Language: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
512	154
538	160
554	165
566	168
576	172
584	175
591	179
598	184
604	189
610	194
616	199
621	205
626	210
632	215
637	221
642	226
647	232
652	238
658	244
663	250
669	258
675	266
682	274
689	284
698	294
707	305
719	316
735	326
761	336
784	346

Table 25

Grade 9 Language: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS	SAT10 SS	ITBS SS
508	145	652	227
533	154	655	230
548	157	658	234
559	161	662	237
568	165	665	241
576	172	668	245
582	175	672	249
588	178	676	253
593	181	679	257
598	184	683	261
603	187	687	265
607	190	691	269
611	193	696	273
615	193	700	281
619	196	706	285
622	200	711	293
626	203	717	297
629	207	724	305
632	207	732	309
636	212	741	318
639	216	753	327
642	220	769	335
646	220	795	343
649	223	819	354

Table 26

Grade 5 Science: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
501	145
527	149
543	149
555	154
565	158
573	162
581	167
588	171
594	176
600	181
606	185
611	190
616	194
621	198
627	201
632	204
637	211
642	214
648	218
653	227
659	232
665	242
672	248
680	255
688	269
698	275
710	281
726	286
752	290
775	301

Table 27

Grade 7 Science: Stanford 10 (SAT10) to ITBS Scale Score Concordance Table

SAT10 SS	ITBS SS
516	134
543	154
559	158
572	163
582	167
591	170
599	174
606	179
612	184
619	189
625	194
631	200
637	205
642	210
648	218
653	226
659	233
664	240
670	249
676	258
682	269
689	282
696	289
703	295
712	310
722	317
734	325
750	331
776	337
800	344