Summary of Early Numeracy Indicators: Performance Levels Across Studies

The pages that follow provide a summary of the Early Numeracy Data collected across sites as part of the Research Institute on Progress Monitoring from 2004 to 2009. The data include sample sizes, means, standard deviations, and quartile values for studies conducted in Missouri and Iowa. We provide these materials so that you can be fully informed about the research conducted to date and make wise decisions about the implementation of the Early Numeracy Indicators. Be advised that our research efforts are ongoing and may result in changes to the measures and administration or scoring procedures.

The tables are intended to help guide you in determining suggested values that students might attain in the fall, winter, and spring, but users should consider the sample size and characteristics for each grade level at each time point, as well as the variation in values. We believe that it is important to provide data from all studies to date to demonstrate the variety of scores that students might attain over time. Again, these values might serve as suggested scores, but districts should develop their own tables of values for fall, winter, and spring as they administer the measures to students in their district over time.

The final page of this document includes the rates of growth that resulted in the studies where student progress was monitored on a frequent basis. The data are reported as mean weekly rates of growth, as measured by problems correct.

Summary of Early Numeracy Indicators: Performance Levels Across Studies

Kindergarten

Means, Standard Deviations, and Quartiles

	Fall					Winter					Spring				
Number Identification	M	SD	25th	50th	75th	M	SD	25th	50th	75th	M	SD	25th	50th	75th
MO, 04-05 (*n*=49 to 56)	13.0	8.3	7.0	13.5	18.8	--	--	--	--	--	27.0	9.6	19.5	27.0	32.0
MO, 05-06 (*n*=76 to77)	16.7	10.2	9.5	14.5	22.3	22.0	11.7	13.0	21.5	29.0	30.5	11.6	23.5	29.0	36.5
MO, 06-07 Dist. A (*n*=69 to 73)	13.4	10.3	6.3	10.0	19.0	21.3	12.1	12.9	17.3	29.4	27.3	13.0	18.3	27.5	37.0
IA, 06-07 (n=83 to 85)	13.4	9.8	6.5	10.5	19.0	23.7	11.0	15.5	22.5	30.3	24.7	13.1	14.5	25.0	33.5
MO, 07-08 Dist. A (*n*=63 to 67)	14.2	8.8	8.5	12.5	18.0	21.7	9.2	14.8	20.5	27.0	31.9	11.8	24.5	31.5	37.5
MO, 07-08 Dist. B (*n*=46 to 56)	8.9	8.6	2.6	7.0	10.5	17.4	11.1	9.4	15.8	24.4	23.8	14.2	11.4	23.0	38.0
IA, 07-08 (*n*=104 to 108)	11.3	7.5	6.0	10.3	16.5	20.1	9.5	13.0	18.5	27.5	22.3	11.7	12.5	20.5	29.4
MO, 08-09 Dist. A (*n*=62)	--	--	--	--	--	27.9	11.6	19.5	27.2	33.5	33.2	13.3	25.2	32.5	38.7
MO, 08-09 Dist. B (*n*=41 to 53)	9.0	7.9	3.2	7.5	11.5	17.2	11.1	7.9	14.2	24.6	23.4	11.3	14.5	24.0	31.5
IA, 08-09 (*n*=75 to 76)	13.7	8.3	7.1	13.3	17.0	22.4	11.1	14.0	21.5	30.5	25.8	12.4	15.0	25.0	34.5
Quantity Discrimination	M	SD	25th	50th	75th	M	SD	25th	50th	75th	M	SD	25th	50th	75th
MO, 04-05 (*n*=49 to 56)	13.6	8.2	6.3	13.5	20.0	--	--	--	--	--	22.3	7.1	19.0	22.0	25.5
IA, 04-05 (*n*=88)	--	--	--	--	--	20.5	9.2	14.0	21.0	27.0	--	--	--	--	--
MO, 05-06 (*n*=76 to77)	14.6	8.4	7.8	14.5	20.0	20.5	9.2	15.3	21.0	27.0	26.7	8.8	19.5	28.0	33.0
IA, 05-06 (*n*=52 to 55)	13.0	9.1	5.5	11.5	20.4	19.5	9.6	12.0	20.0	26.5	24.0	9.4	17.8	26.5	30.8
MO, 06-07 Dist. A (*n*=69 to 73)	11.6	8.3	4.8	9.5	19.5	16.7	8.4	9.3	17.0	23.0	19.4	9.0	13.0	20.0	26.5
IA, 06-07 (*n*=83 to 85)	10.5	8.3	3.0	8.5	17.5	16.5	9.0	9.5	17.5	23.5	19.0	9.4	12.0	20.0	26.5
MO, 07-08 Dist. A (*n*=63 to 67)	11.8	8.0	5.0	10.0	18.0	18.2	7.7	13.8	19.0	24.3	22.3	8.3	16.5	22.5	28.0
MO, 07-08 Dist. B (*n*=46 to 56)	4.9	5.1	1.0	3.0	8.0	11.7	8.7	4.4	10.0	17.1	15.7	9.9	7.4	14.5	25.1
IA, 07-08 (*n*=104 to 108)	7.8	6.4	3.0	6.8	11.0	16.1	8.4	8.6	16.3	22.0	18.0	8.5	12.0	18.0	24.5
MO, 08-09 Dist. A (*n*=62)	--	--	--	--	--	20.0	8.2	13.9	20.5	24.1	24.0	8.9	21.0	24.2	28.3
MO, 08-09 Dist. B (*n*=43 to 53)	5.9	6.4	1.5	4.5	7.2	10.1	8.4	2.4	8.5	17.2	16.4	8.8	9.0	15.0	24.0
IA, 08-09 (*n*=75 to 76)	10.6	8.1	4.5	7.5	16.4	18.7	8.8	12.0	18.5	24.0	20.3	8.2	15.0	20.5	25.0

Kindergarten

	Fall					Winter					Spring				
Missing Number	M	SD	25th	50th	75th	M	SD	25th	50th	75th	M	SD	25th	50th	75th
MO, 04-05 (*n*=49 to 56)	6.2	3.4	4.0	6.5	9.0	--	--	--	--	--	9.3	2.7	8.0	9.0	11.0
IA, 04-05 (*n*=88)	--	--	--	--	--	9.4	3.9	7.0	9.0	11.0	--	--	--	--	--
MO, 05-06 (*n*=76 to 77)	9.4	4.8	7.0	10.0	12.0	11.2	5.0	8.5	11.5	13.8	13.5	4.5	11.0	13.5	16.0
IA, 05-06 (*n*=52 to 55)	6.7	5.5	0.6	6.8	10.9	11.2	4.3	9.0	11.5	14.5	13.5	4.2	10.5	13.5	17.0
MO, 06-07 Dist. A (*n*=69 to 73)	7.2	4.5	3.5	6.5	10.5	9.4	4.6	6.0	8.8	13.0	11.6	4.9	7.8	11.5	16.0
IA, 06-07 (*n*=83 to 85)	6.8	4.7	2.5	6.5	10.0	9.1	5.4	5.0	9.5	12.8	11.5	5.1	8.0	11.5	15.5
MO, 07-08 Dist. A (*n*=63 to 67)	7.1	4.6	3.5	7.0	11.0	9.2	4.0	6.3	9.0	12.5	11.4	4.0	8.5	11.0	14.5
MO, 07-08 Dist. B (*n*=46 to 56)	4.9	4.8	0.5	4.5	7.5	6.4	4.9	2.8	6.0	9.6	9.4	5.0	5.4	9.8	13.0
IA, 07-08 (*n*=104 to 108)	5.6	4.1	2.0	5.5	8.5	8.8	4.4	5.1	9.0	12.5	11.0	4.2	8.0	11.0	14.5
MO, 08-09 Dist. A (*n*=62)	--	--	--	--	--	9.7	3.9	6.9	9.2	11.5	12.9	4.8	10.0	12.5	15.6
MO, 08-09 Dist. B (*n*=42 to 53)	3.2	3.6	0.0	1.0	6.5	7.0	3.6	4.5	6.5	9.0	10.1	3.8	7.5	10.5	12.5
IA, 08-09 (*n*=75 to 76)	6.4	4.2	3.0	6.0	9.0	9.4	4.2	6.0	9.5	12.5	11.1	4.3	8.0	11.0	14.0
Mixed Numeracy	M	SD	25th	50th	75th	M	SD	25th	50th	75th	M	SD	25th	50th	75th
MO, 07-08 Dist. A (*n*=63 to 67)	11.6	5.3	7.5	11.5	15.0	17.1	5.1	13.5	17.0	21.0	22.6	6.1	18.0	22.5	27.5
IA, 07-08 (*n*=104 to 108)	9.9	5.6	5.6	10.0	13.0	16.4	6.0	12.5	16.3	20.5	19.5	6.2	15.6	19.0	24.5
MO, 08-09 Dist. A (*n*=62)	--	--	--	--	--	19.0	6.3	15.4	19.5	22.6	23.3	7.4	19.0	23.0	26.9
MO, 08-09 Dist. B (*n*=43 to 53)	7.8	5.8	3.2	6.5	12.0	12.9	6.3	9.1	12.0	17.4	18.6	5.8	15.5	19.5	23.0
IA, 08-09 (*n*=75 to 76)	11.6	5.9	8.0	12.0	15.5	17.2	5.8	14.0	16.0	20.5	20.7	5.9	16.0	21.0	25.0

Summary of Early Numeracy Indicators: Performance Levels Across Studies

Grade 1

Means, Standard Deviations, and Quartiles

	Fall					Winter					Spring				
Number Identification	M	SD	25th	50th	75th	M	SD	25th	50th	75th	M	SD	25th	50th	75th
MO, 04-05 (*n*=31 to 32)	36.8	9.8	30.0	35.0	44.5	--	--	--	--	--	45.8	12.1	38.0	44.0	51.0
MO, 05-06 (*n*=29 to 30)	39.6	11.2	31.8	40.5	47.3	41.1	13.6	28.9	40.0	48.6	48.2	14.0	39.0	49.8	55.8
MO, 06-07 Dist. A (*n*=41 to 45)	42.4	13.0	32.8	41.5	51.5	47.2	11.7	38.9	44.5	56.6	50.9	9.4	45.3	51.0	55.5
MO, 06-07 Dist. B (*n*=40 to 44)	26.4	13.9	15.1	24.8	35.5	38.4	14.3	25.9	38.3	47.5	40.3	15.5	30.1	40.5	47.8
IA, 06-07 (*n*=84 to 87)	32.6	14.8	19.5	34.0	44.5	48.5	11.4	40.8	47.8	57.1	51.4	12.4	43.5	49.5	59.0
MO, 07-08 Dist. A (*n*=19)	33.2	12.2	24.0	31.5	41.5	40.3	12.9	32.0	40.5	47.5	48.3	16.9	37.5	52.0	58.5
MO, 07-08 Dist. B (*n*=38 to 48)	27.9	12.2	17.8	29.3	36.5	35.6	12.9	26.4	37.3	45.4	41.7	15.5	29.5	44.5	54.4
IA, 07-08 (*n*=91 to 93)	30.5	13.1	20.0	29.0	38.5	45.6	13.0	36.5	44.0	54.5	50.5	13.0	41.5	51.5	59.8
MO, 08-09 Dist. A (*n*=37)	--	--	--	--	--	50.0	13.9	43.5	49.0	58.0	51.0	14.4	42.7	50.5	56.2
MO, 08-09 Dist. B (*n*=38 to 44)	29.5	17.5	14.0	25.7	45.5	38.1	15.9	25.7	35.0	51.8	41.5	17.2	30.4	41.5	56.7
IA, 08-09 (*n*=99 to 102)	27.8	12.1	17.8	27.5	36.3	41.2	12.8	32.0	41.0	50.5	48.5	13.3	39.3	49.8	56.3
Quantity Discrimination	M	SD	25th	50th	75th	M	SD	25th	50th	75th	M	SD	25th	50th	75th
MO, 04-05 (*n*=31 to 32)	29.7	6.0	26.0	30.0	33.0	--	--	--	--	--	36.7	7.5	30.0	34.0	38.0
IA, 04-05 (*n*=126)	--	--	--	--	--	33.1	8.2	27.8	33.5	38.3	--	--	--	--	--
MO, 05-06 (*n*=29 to 30)	31.1	6.5	26.5	32.0	35.3	32.1	7.3	28.0	32.0	35.9	36.8	9.9	30.5	37.5	42.6
IA, 05-06 (*n*=65 to 73)	30.8	9.5	25.3	32.0	38.3	36.5	8.4	33.0	37.0	42.5	39.4	8.0	35.0	38.5	44.0
MO, 06-07 Dist. A (*n*=41 to 45)	32.1	7.6	26.8	32.5	37.5	34.5	8.1	28.4	35.3	40.5	34.8	6.5	31.0	34.5	40.0
MO, 06-07 Dist. B (*n*=40 to 44)	22.0	9.9	12.6	23.0	29.5	21.5	8.8	20.5	28.3	34.0	28.5	9.5	23.0	29.3	35.4
IA, 06-07 (*n*=83 to 87)	28.1	10.0	23.0	29.5	35.0	35.6	6.7	31.5	36.5	40.5	36.0	7.2	32.0	37.0	40.5
MO, 07-08 Dist. A (*n*=19)	26.7	9.5	22.5	26.0	33.0	30.4	8.6	24.5	32.0	36.0	34.9	13.3	23.5	36.5	47.0
MO, 07-08 Dist. B (*n*=38 to 48)	21.6	9.8	15.6	22.8	28.5	24.6	9.1	19.6	24.8	31.6	28.8	10.5	23.3	30.8	37.3
IA, 07-08 (*n*=90 to 93)	25.9	9.8	20.0	26.0	33.0	35.7	7.5	30.9	36.5	41.1	37.2	8.4	32.8	38.5	42.8
MO, 08-09 Dist. A (*n*=37)	--	--	--	--	--	35.7	7.4	31.5	35.5	40.7	35.1	7.8	29.7	34.5	39.0
MO, 08-09 Dist. B (*n*=38 to 44)	21.8	10.1	15.2	21.7	29.4	27.6	9.7	20.7	29.0	34.5	30.5	10.3	22.6	33.0	38.1
IA, 08-09 (*n*=99 to 102)	24.6	9.6	18.3	25.5	32.5	32.9	8.5	26.5	32.0	38.0	37.2	8.8	31.5	36.3	43.0

Grade 1

Missing Number	M	SD	25th	50th	75th	M	SD	25th	50th	75th	M	SD	25th	50th	75th
MO, 04-05 (*n*=31 to 32)	13.7	4.6	10.0	13.5	17.0	--	--	--	--	--	14.5	5.2	11.0	13.0	18.0
IA, 04-05 (*n*=126)	--	--	--	--	--	13.9	4.7	11.0	14.0	17.0	--	--	--	--	--
MO, 05-06 (*n*=29 to30)	15.7	4.1	12.8	15.5	18.0	15.7	4.0	13.4	14.5	18.8	17.7	4.8	14.0	18.3	21.3
IA, 05-06 (*n*=65 to 73)	16.5	4.3	13.5	16.5	20.0	18.8	4.4	16.8	19.5	21.0	19.6	4.4	17.0	20.0	21.5
MO, 06-07 Dist. A (*n*=41 to 45)	16.6	4.8	13.3	16.5	20.0	17.3	4.6	14.5	16.8	19.6	19.7	4.2	17.3	20.0	21.5
MO, 06-07 Dist. B (*n*=40 to 44)	10.3	5.6	6.6	10.5	13.9	12.5	5.2	9.1	11.8	16.5	14.9	5.5	10.6	14.0	20.0
IA, 06-07 (*n*=83 to 87)	15.5	4.9	13.0	15.5	18.5	17.8	4.5	14.9	17.5	21.0	19.7	4.9	16.0	19.5	23.0
MO, 07-08 Dist. A (*n*=19)	14.0	4.6	11.0	13.5	18.0	13.4	4.3	12.0	13.5	15.5	17.9	6.7	14.5	19.0	20.5
MO, 07-08 Dist. B (*n*=38 to 48)	10.9	4.8	8.5	12.0	14.0	12.2	5.2	9.5	13.0	15.9	14.4	5.8	11.3	14.5	18.6
IA, 07-08 (*n*=91 to 93)	13.7	4.8	11.0	14.0	17.0	16.9	4.6	14.0	17.0	20.0	19.6	4.8	16.3	20.0	22.5
MO, 08-09 Dist. A (*n*=37)	--	--	--	--	--	18.0	4.8	15.0	18.0	21.0	18.5	4.6	15.5	19.0	21.0
MO, 08-09 Dist. B (*n*=38 to 44)	11.3	5.7	7.1	12.0	14.9	13.1	5.4	9.5	12.5	16.7	16.5	6.3	12.0	15.0	20.1
IA, 08-09 (*n*=99 to 102)	13.6	4.4	11.0	13.5	16.8	16.0	4.6	13.0	16.0	19.0	19.4	5.4	16.4	19.8	22.0

Mixed Numeracy	M	SD	25th	50th	75th	M	SD	25th	50th	75th	M	SD	25th	50th	75th
MO, 07-08 Dist. A (*n*=19)	20.9	6.8	17.0	20.5	24.5	25.8	7.3	23.0	26.0	30.5	31.9	8.7	27.5	32.5	37.0
IA, 07-08 (*n*=91 to 93)	21.6	6.4	18.0	21.0	26.5	29.0	6.4	24.5	29.0	32.5	33.9	6.7	29.8	33.5	37.8
MO, 08-09 Dist. A (*n*=37)	--	--	--	--	--	30.6	6.9	25.7	31	33.2	32.3	6.8	27.7	32.5	35.7
MO, 08-09 Dist. B (*n*=38 to 44)	18.9	6.9	13.5	18.7	23.9	23.8	7.5	18.5	23.0	28.5	28.7	8.6	21.4	29.7	34.2
IA, 08-09 (*n*=99 to 102)	20.6	6.1	16.5	20.5	24.3	27.5	6.4	22.0	28.0	31.5	33.2	6.9	28.0	33.5	38.0

Summary of Early Numeracy Indicators: Performance Levels Across Studies

Progress Monitoring Weekly Growth Rates

	Number Identification	**Quantity Discrimination**	**Missing Number**	**Mixed Numeracy**
Kindergarten				
MO, 05-06 (*n*=77)	0.34	0.27	0.15	--
IA, 05-06 (n=55)		0.51	0.32	
MO, 06-07 (n=73)				
IA, 06-07 (n=85)				
MO, 07-08 (n=66)	0.34	0.26	--	0.38
IA, 07-08 (n=120)				
IA, 08-09 (n=78)				

	Number Identification	**Quantity Discrimination**	**Missing Number**	**Mixed Numeracy**
Grade 1				
MO, 05-06 (*n*=30)	0.24	0.12	0.11	--
IA, 05-06 (n=75)		0.38	0.14	
MO, 06-07(n=45)				
IA, 06-07 (n=87)		0.07-3.00†	(-1.00)-4.00†	
MO, 07-08 (n=66)	0.90	0.50	--	0.39
IA, 07-08(n=108)		.01-1.03†		0.1- 1.48†
IA, 08-09(n=107)		(-0.38)-1.32†		0.21-1.16†

Note. †= growth rates based on small groups of students receiving supplemental intervention (as opposed to typical classes)