











Bob Brilliant Test Responses??



















-	State by State C	omparison of Scores	
Highest States	>Proficient	Lowest States	>Proficie
Minnesota	53%	Alabama	28%
Massachusetts	50%	New Mexico	29%
New Jersey	48%	Louisiana	29%
Virginia	48%	West Virginia	30%
Wyoming	48%	Alaska	33%
Florida	48%	Arkansas	33%
Pennsylvania	47%	California	34%
Indiana	47%	Washington DC	34%
Utah	46%	Nevada	34%







	State by Stat	te Comparison of Scor	es
Highest States	>Proficient	Lowest States	>Proficien
Massachusetts	47%	New Mexico	21%
Minnesota	44%	Alabama	21%
New Jersey	44%	Washington DC	23%
Wisconsin	41%	Louisiana	23%
Washington	40%	West Virginia	24%
South Dakota	39%	Mississippi	24%
Connecticut	39%	Oklahoma	26%
Pennsylvania	39%	Nevada	26%
New Hampshire	38%	Arkansas	27%
Vermont	38%	Hawaii	28%



PISA DATA (2018): 15 yr. olds Program for International Student Assessment) A test of **mathematical literacy** for <u>15</u> year old students which focuses upon the direct application of mathematical principles. The test is administered every three years. Approximately 600,000 students completed the assessment in 2018, representing $~\underline{\textbf{78}}$ participating countries and approximately 32 million 15 year-olds . . The test was <u>not</u> designed to measure curricular outcomes, but rather to assess mathematics' literacy within a real world context. Student Selection: PISA internet PISA international contractors sampled schools in each country according to strict technical standards. For further information, go to http://www.oecd.org/pisa/ Exclusionary criteria included intellectual and physical disabilities, remoteness of school, or insufficient language experiences. Most countries randomly assessed between 4000-8000 students Reading was a featured subject in 2018.

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	PISA DATA (2018): Data Released: December 5	15 yr. olds
	Country	Average Score
	International Average	489
	1. B-S-J-Z China (Beijing, Shanghai, Jiangsu, and Zheijan	g) 591
	2. Singapore	569
	3. Macao-China	558
	4. Hong Kong (China)	551
	5. Chinese Taipai	531
	6. Japan	527
	7. Korea	526
i i i	8. Estonia	523
	9. Netherlands	519
	10. Poland	516
	11. Switzerland	515
	12. Canada	512
	13. Denmark	509
	14. Slovenia	509
	15. Belgium	508
	16. Finland	507
	17. Sweden	502
	18. United Kingdom	502
	19. Norway	501

E.	PISA DAT Data Re	A (2018): 15 yr. olds leased: December s rd , 2019
	Country	Average Score
	International Average	489
	21. Ireland	500
	22. Czech Republic	499
	23. Austria	499
	24. Latvia	496
	25. France	495
	26. Iceland	495
	27. New Zealand	494
	28. Portugai	492
	29. Australia	491
	30. Russia	488
	31. Italy	487
	32. Slovak Republic	486
	33. Luxembourg	483
	34. Spain	481
	35. Lithuania	481
	36. Hungary	481 18

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PISA DATA (2 Data Released:	018): 15 yr. olds December 5 rd , 2019
Country	Average Score
International Average	489
37. UNITED STATES	$478 (477 \text{ in } 2015/40^{\text{th}})$
38. Belarus	472
39. Malta	472
40. Croatia	464
41. Israel	463
42. 1 urkey	454
43. Ukraine	453
44. Greece	431
45. Cyprus	451
46. Serbia	448
47. Malaysia	440
48. Albania	437
49. Bulgaria	436
50. United Arab Emirates	435
78. Dominican Republic	325



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PISA 20	03-2012 - Res	ults in pap	per-based m	nathematic	s – Canada	and provinc	es 20	112
	Average	SE	Average	S.E.with linking error*	Average	S.E.with linking error*	Average	S.E. with linking error*
Canada	532	1.8	527	2.4	527	2.6	518	2.7
Newfoundiand and Labrador	517	25	507	2.8	503	3.4	490	4.2
Prince Edward Island	500	2	501	2.7	487	3.0	479	3.2
Nova Scotia	515	22	506	2.7	512	3.0	497	4.5
New Brunswick	512	1.8	506	2.5	504	3.0	502	3.2
Quebec	537	4.7	540	4.4	543	3.9	536	3.9
Ontario	530	3.6	526	3.9	526	3.8	514	4.5
Manitoba	528	3.1	521	3.6	501	4.1	492	3.5
Saskatchewan	516	3.9	507	3.6	506	3.8	506	3.6
Alberta	549	43	530	4.0	529	4.8	517	5.0
British Columbia	538	2.4	523	4.6	523	5.0	522	4.8













































A mental representational system of visual-spatial approximations that may underscore <u>"number sense"</u>.
A mental representational system of visual-spatial approximations that may underscore <u>"number sense"</u>.
Emerges independent of instruction (innate) and in non-humans as well. A <u>preverbal skill</u>.
Distinguishes math LD from students from typical peers.
Intuitively judging which line at the grocery store is shortest, or whether there is enough milk left in the carton to make breakfast are everyday examples.
Activation in inferior parietal sulcus.





S.	ð	Meas Th	uring Connect e Distance Eff	iv ec	ity: t	
	Distan numera fastest than cl	<u>ce Effect:</u> when s als and asked whic when the numeral ose together (Butte	students are present h one is larger, they s are quantitatively worth & Varma, 2014).	ed te far	with two nd to respond • apart, rather	
	Faster R	lesponse	Slowe	er I	Response	
	12	94		6	8	
	3	44	1	2	11	
	47	1	9	81	29	
	87	15	3	06	58 17	
		39	s	1.5	78	
			e			42



ð	Mez T	isuring Com he Distance	iectivi Effect	ty: t	
Distand times ter Child typic: contr • A chi and n	<u>ce Effect</u> : Wheneve nd to be slower and le Iren with <u>development</u> al peers when making rolling for IQ and gene ild's reaction time, ten- nath fact retrieval skil	r both numbers are i ss accurate as well (' <u>al dyscalculia</u> tend t comparisons betwee eral reading ability (ds to be an excellent ls (Holloway & Ansari	relatively l Weber's L to respond en two nur Skagerlund t predictor , 2009).	arge, response aw). more slowly the nbers, even whe & Traff, 2014). of math fluency	in n 7
Faster F 12 3 47 87 17 8	Response 94 44 1 71 39		Slower F 1,211 38,004 987 10,242 261,789 8,111	tesponse 1,221 38,409 978 10,202 261,689 8,101	







4. Quantitative Knowledge: The Key for Higher Level Math Skills The development of quantitative knowledge is critical to comprehend more complex mathematics, as well as to establish cognitive flexibility when problem solving. Often dependent upon a variety of neuropsychological constructs including both visual spatial and symbolic reasoning and executive functioning skills.

- For example, the ability to develop a base-10 understanding of numerals and trans-code challenging equations into more palatable forms of operations requires good executive functioning skills. Take the equation 9 X 16 = ____.
- <u>The "24" Game</u>: http://www.4nums.com/

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- <u>Dreambox Learning</u> grades K-6 online learning program that focuses on numbers, place value, and developing number sense.
- <u>EnVision Math -</u> Aligned with common core for students K-6. Includes daily assessments (Pearson).
- <u>I Can Learn Algebra -</u> designed for more inner city and students in grades 6-12. Computer based and consists of 130 lessons and 45 hours of instructional video.



















- Construct incorrect answers to equations and have students discriminate correct vs. incorrect responses.
- Reinforce the language of math by re-teaching quantitative words such as more, less, equal, sum, altogether, difference, etc...





No.	Co	mprehensive Assessment for Math
- III	MATH:	Wechsler Individual Achievement Test- 3rd Edition
		Woodcock Johnson IV Achievement Test
Ш		Kaufman Test of Educational Achievement (KTEA-III)
		Test of Early Mathematics Ability – 3 rd Edition (TEMA-3)
		Comprehensive Mathematical Abilities Test (CMAT)
		Test of Mathematical Abilities -3 rd Edition (TOMA-3)
		WRAT-3
		Academic Achievement Battery (AAB)
		KEYMATH-3
		PAL II Mathematics
	Executive Functions:	Wisconsin Card Sort Test
		NEPSY II (Animal Sorting, Design Fluency)
		BRIEF II
		CEFI
		Woodcock Johnson IV (Number Series)
		DKEFS (Delis-Kaplan Executive Function Scale)
		D-REF (Delis Rating of Executive Functioning)
		Test of Executive Control
Ш	Visual-Spatial:	SB5 (Visual-Spatial Processing, Quantitative Reasoning)
Ш		DAS (Matrices, Recall of Designs, Pattern Construction
		WJIV (Visualization)
		Rev-Octorright Complex Figure Test
I		TONI-3/RIAS/NIX Index)/KABC II (Gestalt Closure)





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	feifer assessment ofn Steven G. Feifer,		
	Structure of t	he FAM	
Index	Subtest	Grade range	Approximate administration time
	Forward Number Count (FNC)	PK to college	5 minutes
Procedural Index (PI)	Backward Number Count (BNC)	K to college	5 minutes
	Numeric Capacity (NCA)	PK to college	3 minutes
	Sequences (SEQ)	PK to college	5 minutes
	Object Counting (OC)	PK to Grade 2	5 minutes
	Rapid Number Naming (RNN)	PK to college	1 minute
	Addition Fluency (AF)	K to college	1 minute
Verbel Index (VI)	Subtraction Fluency (SF)	K to college	1 minute
verbai index (vi)	Multiplication Fluency (MF)	Grade 3 to college	1 minute
	Division Fluency (DF)	Grade 3 to college	1 minute
	Linguistic Math Concepts (LMC)	PK to college	6 minutes
	Spatial Memory (SM)	PK to college	5 minutes
	Equation Building (EB)	Grade 3 to college	4 to 6 minutes
	Perceptual Estimation (PE)	PK to college	5 minutes
Commenties Index (CD)	Number Comparison (NCO)	PK to college	2 minutes
Semantic Index (SI)	Addition Knowledge (AK)	K to college	2 minutes
	Subtraction Knowledge (SK)	K to college	2 minutes
	Multiplication Knowledge (MK)	Grade 3 to college	2 minutes
	Division Knowledge (DK)	Grade 8 to college	2 minutes









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	W.		feifer as	sessme Steven G	ntofmath . Feifer, DEd	ematic	s™		
		Nun	ıber C	ompa	arison	(All G	rades)		÷ - × +
	"For ea	ach pai	r, I want	you to nur	draw a nber."	line thr	ough the	large	r
	106	7	99	199	17	103	120	57	
	101	111	118	125	106	105	505	601	
	898	989	2,100	2,015	6,666	6,677	9,890	9,089	
	24	$\frac{1}{4}$	$\frac{1}{6}$	17	34	<u>2</u> 3	3 8	$\frac{4}{5}$	







	Case Study: Kenny						
	Sc	ore Summ	ary				
Page range	Subtest	Row	Standard score	Index standard score	Confidence interval	Percentile	
5-6	Forward Number Count (FNC)	11	77			6	
7-8	Backward Number Count (BNC) K+	9	+ 77			6	
9	Numeric Copacity (NCA)	8	+ 102			55	
27/28	Sequences (SEG)	15	+ 82			12	
31-32	Object Counting (OC) PK-24	-	•			-	
	Procedu	ral Index (PI)	- 338	80	72-88	9	
10	Rapid Number Naming (RNN)	57	107			68	
12-13	Addition Fluency (AF) K+	11	+ 89			23	
14-15	Subtraction Fluency (SF) K+	7	+ 87			19	
16-17	Multiplication Fluency (MF) 34+	6	+ 87			19	
18-19	Division Fluency (DF) 3*+	2	+ 85			16	
23-26	Einguistic Math Concepts (LMC)	26	+ 100			50	
S ec	Ver	bal Index (VI)	- 555	90	82-98	25	
11	Spatial Memory (SM)	14	98			45	
20-22	Equation Building (EB) 34+	2	+ 80			9	
29-30	Perceptual Estimation (PE)	10	+ 84			14	
33	Number Comparison (NCO)	17	+ 76			5	
34	Addition Knowledge (AK) K+	4	+ 71			3	
35	Subtraction Knowledge (SK) K+	1	 74 			4	
36	Multiplication Knowledge (MK) 34+	1	+ 75			5	
37	Division Knowledge (DK) 34+	1	• 77			6	
+ - × +	Sema	ntic Index (SI)	- 635	71	66-76	3	
	PI + VI + SI = FAM T	otal Index (TI)	1,528	77	69-85	6	









