

# De Anza College Office of Institutional Research and Planning

**To:** Math Department

**From:** Mallory Newell, De Anza Researcher

**Date:** 2/27/2018

**Subject:** Multiple Measures Analysis – Fall 2017

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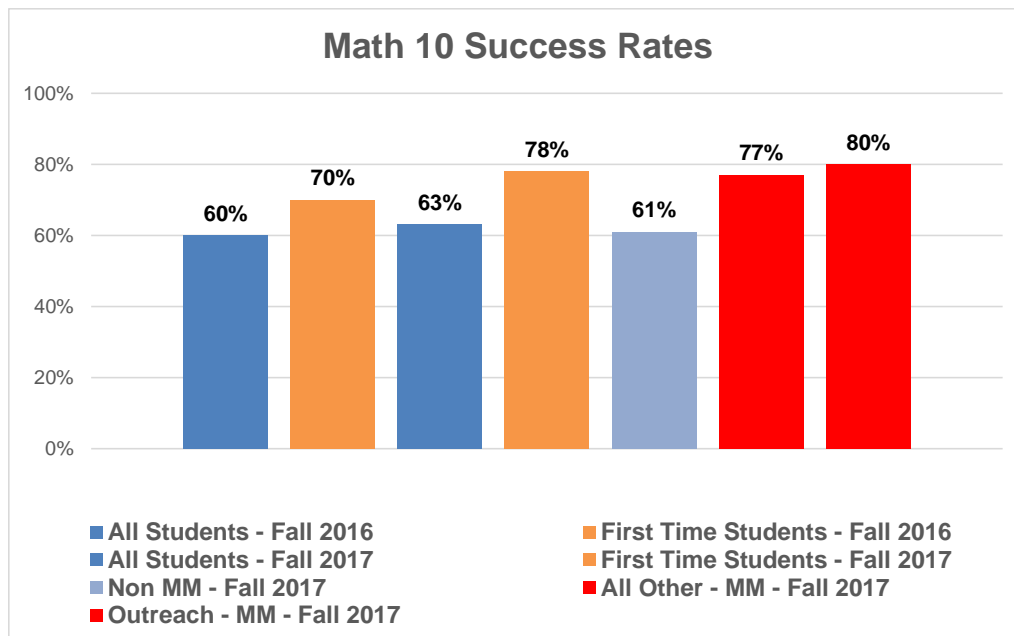
In fall 2017 the De Anza math department piloted the use of high school transcript data as a multiple measure (MM) for placement. The high school transcript model was applied to students assessed at their high school between March-May 2017 and to students who took a placement test and had a high school transcript available in CalPass Plus or submitted a high school transcript to De Anza between February 23 and October 6, 2017. 766 students were assessed using multiple measures at their high school, this is the 'Outreach' group, and 982 students tested at De Anza and had a transcript available for assessment, this is the 'All Other MM' group.

## Highlights

- Of the students assessed by Outreach, 37% resulted in their test score being equal to their placement with high school transcripts. 40% the transcript placed them higher and 23% the transcript placed them lower.
- 49% of Outreach students and 38% of All Other MM test takers enrolled in a math class in fall 2017. This is compared to historical placement and enrollment rates in prior fall terms which ranged from 45% to 49%.
- In both MM student groups math course enrollment was lowest when the MM score was lower than the test score (25% of Outreach students and 26% of other students).
- The majority of students placed into math 212 (40% for both groups). Consistently, enrollment into MATH212 was the highest for all first-time students over the past 5 year (40% to 36%).
- Success rates for all MM students (79% to 70%) were higher than non-MM students (61% to 56%) in all math courses with the exception of MATH210 success rates (51% of MM students vs. 55% of non-MM students).
- All students enrolled in MATH10 in fall 2016 exhibited a success rate of 60%, compared to 63% the following term (including multiple measure students). This is compared to a success rate of 61% for students in fall 2017 who were not placed by multiple measures.
- The average persistence rate from fall 2017 to winter 2018 with multiple measures in place from MATH114 to MATH10 (or equivalent) was 43% compared to 35% the fall prior without multiple measures in place.
  - MATH212 to MATH114 was 51% compare to 44%
  - MATH210 to MATH114 was 38% compared to 43%
- Multiple measures assessment for students in the Outreach group had the most impact on Latino/a students.

- Fewer Latino/a students were placed into the lowest level, MATH210 via multiple measures than the test, 58% compared to 61%.
- This was also the case for MATH212, 43% compared to 46%
- More Latino/a students were placed into MATH114 by multiple measures than the test, 35% compared to 20%
- This was also the case for MATH10, 17% compared to 12%
- Targeted student populations placed through Outreach had lower success rates in all courses when compared to non targeted student groups, both placed with multiple measures.
  - Success rates for targeted students were highest in MATH10 and lowest in MATH210.

**1. How did students do when placed into MATH10 using multiple measures?**



- All students enrolled in MATH10 in fall 2016 exhibited a success rate of 60%, compared to 63% the following term when multiple measures assessment was used.
  - This is compared to a success rate of 61% for students in fall 2017 who were not placed by multiple measures.
- When looking at only first-time students in the past two fall terms, their rates were 70% and 78%.
- The students placed by multiple measures in fall 2017 exhibited success rates well above all other students and similar to or higher than first time students.

## 2. Where did students place based on the test or their transcript?

Outreach MM Students		
MM Score vs. Test Score	Count	%
MM Score = Test Score	286	37%
MM Score > Test Score	306	40%
MM Score < Test Score	174	23%
Total	766	100%

All Other MM Students		
MM Score vs. Test Score	Count	%
MM Score = Test Score	242	25%
MM Score > Test Score	481	49%
MM Score < Test Score	259	26%
Total	982	100%

- Of the students assessed by Outreach, 37% resulted in their test score being equal to their placement with high school transcripts. 40% the transcript placed them higher and 23% the transcript placed them lower. For students who tested at De Anza, 25% the test and transcript aligned, 49% placed higher with their transcript, and 26% placed lower.

## 3. How were students placed based on their ethnicity?

	Placement Via Multiple Measures	Placement Via Test
<b>MATH10</b>		
African American	1%	3%
Filipino/a	14%	14%
Latino/a	17%	12%
<b>MATH114</b>		
African American	5%	2%
Filipino/a	7%	11%
Latino/a	35%	20%
<b>MATH212</b>		
African American	2%	2%
Filipino/a	7%	11%
Latino/a	43%	46%
<b>MATH210</b>		
African American	1%	1%
Filipino/a	8%	6%
Latino/a	58%	61%

Note: Only includes students placed in the Outreach group. N = 766.

- Multiple measures assessment for students in the Outreach group had the most impact on Latino/a students.
  - Fewer Latino/a students were placed into the lowest level, MATH210 via multiple measures than the test, 58% compared to 61%. This was also the case for MATH212, 43% compared to 46%
  - More Latino/a students were placed into MATH114 by multiple measures than the test, 35% compared to 20%. This was also the case for MATH10, 17% compared to 12%

#### 4. What were the enrollment rates of students based on their placement method?

Enrollment of MM Students			
Group	Enrolled in		% Enrolled
	Took a Math Test	Math Course	
Outreach	766	377	49%
All Other MM	982	372	38%
<b>Total</b>	<b>1,748</b>	<b>749</b>	<b>43%</b>

Placement tests taken between February 23, 2017 and October 6, 2017.

Enrollment of all other students prior to MMAP			
Term Enrolled	Enrolled in		% Enrolled
	Took a Math Test	a Math Course	
Fall 2016	5,642	2,660	47%
Fall 2015	6,262	2,808	45%
Fall 2014	6,487	3,126	48%
Fall 2013	5,729	2,820	49%

Test taken between February 1 through October 10 of each year.

- Of the 1,748 unique students who were assessed with multiple measures, 43% enrolled in a math class in fall 2017.
  - 49% of outreach students and 38% of all other test takers.
- This is compared to historical placement and enrollment rates in prior fall terms which ranged from 45% to 49%.

#### 5. Of students that enrolled, how were they placed?

Outreach Students		
MM Enrollment vs. Test Enrollment	Count	%
MM Score = Test Score	149	40%
MM Score > Test Score	133	35%
MM Score < Test Score	95	25%
<b>Total</b>	<b>377</b>	<b>100%</b>

All Other MM Students		
MM Enrollment vs. Test Enrollment	Count	%
MM Score = Test Score	107	29%
MM Score > Test Score	169	45%
MM Score < Test Score	96	26%
<b>Total</b>	<b>372</b>	<b>100%</b>

- For both groups, enrollment in a math course was the lowest when the MM score was lower than the test score.

**6. At what rate do students place into each math level?**

Fall 2017 Students			
Group	Course	Students	Percent
MM - Outreach	MATH10	82	20%
	MATH114	108	26%
	MATH212	165	40%
	MATH210	61	15%
Total		416	100%
MM - Other	MATH10	66	23%
	MATH114	66	23%
	MATH212	114	40%
	MATH210	39	14%
Total		285	100%
Non MM	MATH10	185	21%
	MATH114	173	19%
	MATH212	319	36%
	MATH210	215	24%
Total		892	100%

Note: MM Other and Non MM include only first time students.  
Many students enroll in more than one math course at a time.

- Enrollment into MATH212 was the highest for all three groups followed by MATH10.

**7. How does this rate compare to overall enrollment rates by level?**

	Enrollment into Each Level - First-Time Students									
	Fall 2013		Fall 2014		Fall 2015		Fall 2016		Fall 2017	
	Students	Percent	Students	Percent	Students	Percent	Students	Percent	Students	Percent
MATH10	239	17%	271	17%	281	18%	290	19%	317	20%
MATH114	610	43%	655	40%	587	38%	605	39%	595	38%
MATH212	351	25%	429	26%	356	23%	349	23%	335	21%
MATH210	230	16%	268	17%	317	21%	299	19%	315	20%
Total	1,430	100%	1,623	100%	1,541	100%	1,543	100%	1,562	100%

- Enrollment into MATH10 increased slightly from 19% the prior fall to 20% in fall 2017 while enrollment into MATH114 decreased 1% from 39% to 38%, and MATH212 decreased from 23% to 21% and MATH210 increased 1% from 19% to 20%. But overall, course patterns were not changed drastically.

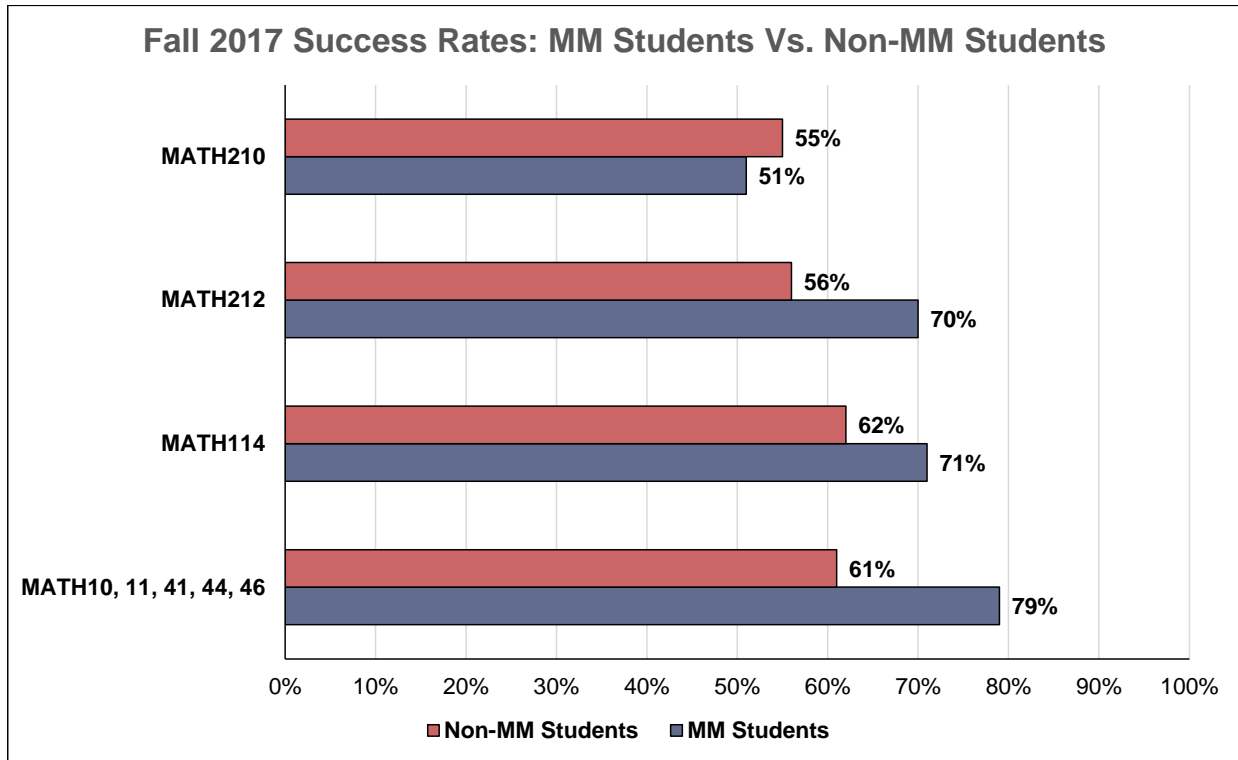
8. Where did students place via the test compared to multiple measures and how did they do?

Test Score	MM Score	Count	Success		Test vs. MM	
MATH10, 11, 41, 44, 46	MATH10	32	28	88%	Equal	67%
	MATH114	8	7	88%	Test Higher	33%
	MATH212	4	3	75%	Test Lower	0%
	MATH210	4	2	50%	Total	100%
Total		48				
MATH114	MATH10	31	25	81%	Equal	28%
	MATH114	21	19	90%	Test Higher	32%
	MATH212	19	16	84%	Test Lower	41%
	MATH210	5	3	60%	Total	100%
Total		76				
MATH212, 217	MATH10	52	46	88%	Equal	13%
	MATH114	60	42	70%	Test Higher	30%
	MATH212	26	20	77%	Test Lower	57%
	MATH210	58	31	53%	Total	100%
Total		196				
MATH210	MATH10	11	7	64%	Equal	48%
	MATH114	29	15	52%	Test Higher	0%
	MATH212	9	2	22%	Test Lower	52%
	MATH210	46	24	52%	Total	100%
Total		95				
No Test Score	MATH10	1	1	100%		
Total		1				
Total		416	291			

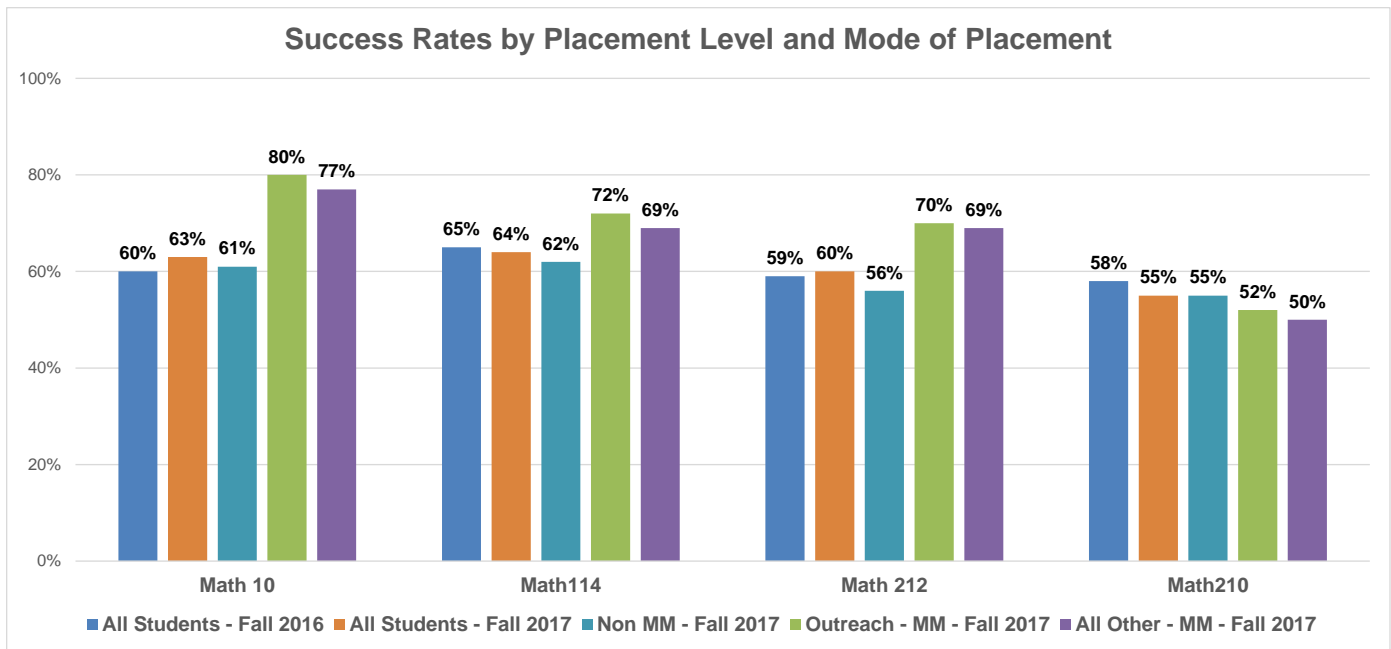
Note: Includes students placed via Outreach only.

- 48 students were placed into MATH10 via the test. 67% were given the same placement via multiple measures (32) while 33% the test placed them higher than their transcript did (16). Of the 48 students, 28 successfully completed MATH10 for a success rate of 88%.
- 76 students were placed into MATH114 via the test. 28% were given the same placement via multiple measures (21). 31 students were placed lower with the test than multiple measures (41%). Success rates of these students who were placed into MATH114 by the test but enrolled in MATH10 based on the multiple measure had a success rate of 81%.

9. What are the success rates of students placed by multiple measures compared to all math students?



- Overall, success rates in fall 2017 for students placed via multiple measures (796) was higher than students who were placed without multiple measures (3,883), with the exception of MATH210.



- Success rates in fall 2017 with multiple measures assessment compared to fall 2016 without multiple measures assessment were very similar or slightly higher, which is the intent of the multiple measures models, to maintain about current success rates in each level while increasing the rate at which student have access to higher level courses.
- Success rates for students who were placed without multiple measures in all courses, excluding MATH210, were significantly lower than students placed with multiple measures, between 14 and 10 percentage points.

Fall 2017 - All Other Non-MM Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
MATH10, 11, 41, 44, 46	990	61%	306	19%	325	20%	1,621	100%
MATH114	557	62%	217	24%	124	14%	898	100%
MATH212	511	56%	276	30%	122	13%	909	100%
MATH210	252	55%	153	34%	50	11%	455	100%
<b>Total</b>	<b>2,310</b>	<b>59%</b>	<b>952</b>	<b>25%</b>	<b>621</b>	<b>16%</b>	<b>3,883</b>	<b>100%</b>

Note: MATH212 includes MATH217.

- When excluding students placed via multiple measures from all other students who took a math course in fall 2017, the success rates drop to 59% compared to 61%. Success rates in MATH10 drop from 63% for all multiple measures students to 61%, MATH114 drops from 64% to 62%, MATH212 drops from 60% to 56% and MATH210 stays flat at 55%.



Fall 2017 - All MM Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
MATH10, 11, 41, 44, 46	154	79%	18	9%	24	12%	196	100%
MATH114	136	71%	39	20%	17	9%	192	100%
MATH212	212	70%	69	23%	24	8%	305	100%
MATH210	53	51%	42	41%	8	8%	103	100%
Total	555	70%	168	21%	73	9%	796	100%

Note: MATH212 includes MATH217.

- Success rates for all students placed with multiple measures was 70%. Success rates in MATH10 were 79%, MATH114 were 71%, MATH212 were 70% and MATH212 were 51%.

Fall 2017 - Outreach Multiple Measures Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
MATH10, 11, 41, 44, 46	66	80%	8	10%	8	10%	82	100%
MATH114	78	72%	23	21%	7	6%	108	100%
MATH212	115	70%	41	25%	9	5%	165	100%
MATH210	32	52%	23	38%	6	10%	61	100%
Total	291	70%	95	23%	30	7%	416	100%

Note: MATH212 includes MATH217.

- Success rates for students placed using multiple measures via Outreach had an overall success rate of 70% in all four courses. Success rates in MATH10 were 80%, MATH114 were 72%, MATH212 were 70% and MATH2120 were 52%.

Fall 2017 - All Other Multiple Measures Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
MATH10, 11, 41, 44, 46	88	77%	10	9%	16	14%	114	100%
MATH114	58	69%	16	19%	10	12%	84	100%
MATH212	97	69%	28	20%	15	11%	140	100%
MATH210	21	50%	19	45%	2	5%	42	100%
Total	264	69%	73	19%	43	11%	380	100%

Note: MATH212 includes MATH217.

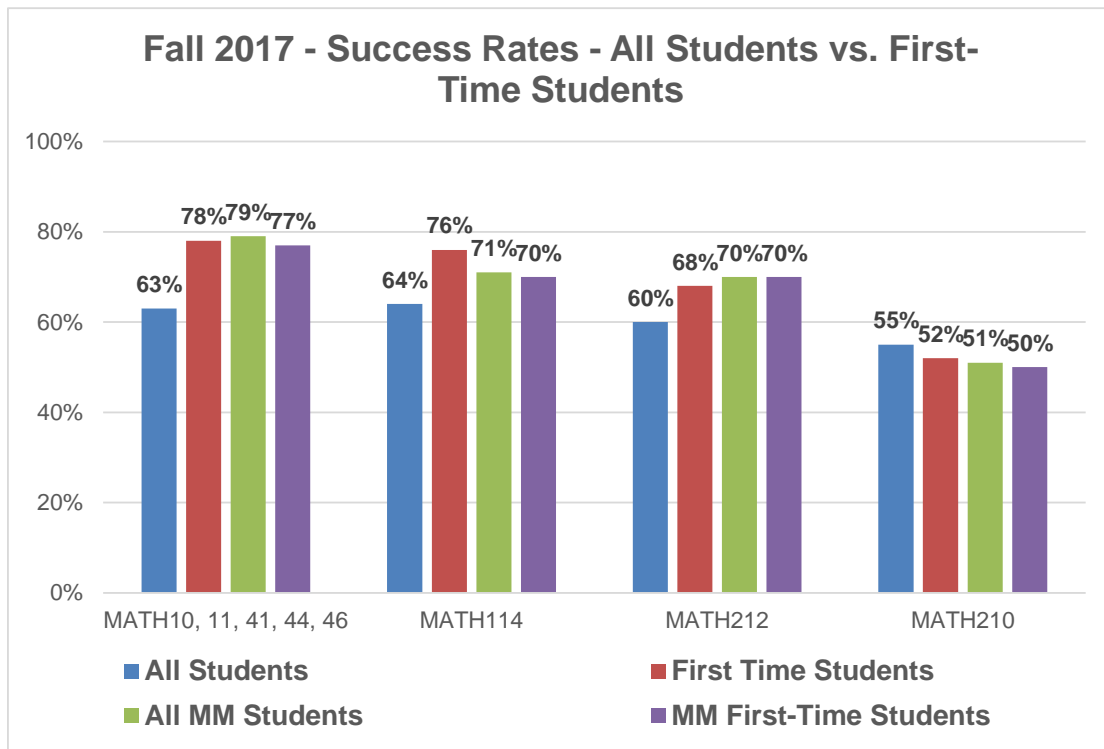
Fall 2017 - All Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
MATH10, 11, 41, 44, 46	1,144	63%	324	18%	349	19%	1,817	100%
MATH114	693	64%	256	23%	141	13%	1,090	100%
MATH212	723	60%	345	28%	146	12%	1,214	100%
MATH210	305	55%	195	35%	58	10%	558	100%
Total	2,865	61%	1,120	24%	694	15%	4,679	100%

Note: MATH212 includes MATH217.

- In fall 2017, success rates for MATH10 for all students was 63% compared to 64% for MATH114, 60% for MATH212 and 55% for MATH210. Overall success rates for these four courses was 61%.

**10. What are the success rates of students placed by multiple measures compared to all first-time math students?**



- Students placed via multiple measures exhibited higher success rates when compared to all non-MM and all non-MM first-time students, with the exception of MATH210.

Fall 2017 - First Time Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Non MM	609	68%	210	24%	73	8%	892	100%
MM - Non Outreach	194	68%	58	20%	33	12%	285	100%
MM - Outreach	264	69%	91	24%	30	8%	385	100%
Total	1,067	68%	359	23%	136	9%	1,562	100%

Includes first-time students and first-time transfer students. MATH212 includes MATH217.

- First-time student success rates were included since the students in the Outreach group were first time students.

MATH10 - Fall Success Rates - All Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Fall 2013	1,129	64%	321	18%	324	18%	1,774	100%
Fall 2014	1,186	63%	378	20%	333	18%	1,897	100%
Fall 2015	1,208	66%	358	20%	257	14%	1,823	100%
Fall 2016	1,073	60%	374	21%	341	19%	1,788	100%
Fall 2017	1,144	63%	324	18%	349	19%	1,817	100%

MATH10 - Fall Success Rates - First Time Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Fall 2013	188	79%	35	15%	16	7%	239	100%
Fall 2014	205	76%	44	16%	22	8%	271	100%
Fall 2015	229	81%	35	12%	17	6%	281	100%
Fall 2016	203	70%	52	18%	35	12%	290	100%
Fall 2017	246	78%	32	10%	39	12%	317	100%

MATH114 - Fall Success Rates - All Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Fall 2013	780	60%	349	27%	165	13%	1,294	100%
Fall 2014	787	59%	366	27%	178	13%	1,331	100%
Fall 2015	701	58%	321	27%	179	15%	1,201	100%
Fall 2016	792	65%	260	21%	172	14%	1,224	100%
Fall 2017	693	64%	256	23%	141	13%	1,090	100%

MATH114 - Fall Success Rates - First Time Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Fall 2013	258	74%	74	21%	19	5%	351	100%
Fall 2014	313	73%	88	21%	28	7%	429	100%
Fall 2015	262	74%	71	20%	23	6%	356	100%
Fall 2016	277	79%	48	14%	24	7%	349	100%
Fall 2017	253	76%	54	16%	28	8%	335	100%

MATH212 - Fall Success Rates - All Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Fall 2013	969	63%	406	26%	167	11%	1,542	100%
Fall 2014	875	61%	413	29%	145	10%	1,433	100%
Fall 2015	822	65%	290	23%	153	12%	1,265	100%
Fall 2016	764	59%	342	26%	198	15%	1,304	100%
Fall 2017	723	60%	345	28%	146	12%	1,214	100%

MATH212 - Fall Success Rates - First Time Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Fall 2013	407	67%	162	27%	41	7%	610	100%
Fall 2014	412	63%	201	31%	42	6%	655	100%
Fall 2015	424	72%	126	21%	37	6%	587	100%
Fall 2016	386	64%	159	26%	60	10%	605	100%
Fall 2017	404	68%	150	25%	41	7%	595	100%

MATH210 - Fall Success Rates - All Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Fall 2013	358	62%	150	26%	71	12%	579	100%
Fall 2014	352	54%	218	34%	78	12%	648	100%
Fall 2015	372	62%	181	30%	49	8%	602	100%
Fall 2016	353	58%	184	30%	70	12%	607	100%
Fall 2017	305	55%	195	35%	58	10%	558	100%

MATH210 - Fall Success Rates - First Time Students

	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
Fall 2013	141	62%	65	28%	23	10%	229	100%
Fall 2014	138	51%	104	39%	26	10%	268	100%
Fall 2015	200	63%	96	30%	21	7%	317	100%
Fall 2016	162	54%	100	33%	37	12%	299	100%
Fall 2017	164	52%	123	39%	28	9%	315	100%

**11. What are success rates of Outreach students by Targeted and Non Targeted groups?**

	MATH10		MATH114		MATH212		MATH210	
	Success		Success		Success		Success	
	Grades	%	Grades	%	Grades	%	Grades	%
Not Targeted	42	82%	43	81%	38	85%	8	67%
Targeted	17	76%	27	63%	71	63%	22	48%
Total	59	80%	70	72%	109	70%	30	52%

Note: Includes only Outreach students, targeted are African American, Filipino, Latino/a, and Pacific Islander

- Targeted student population placed through Outreach had lower success rates in all courses when compared to non targeted student groups, both placed with multiple measures.
  - Success rates for targeted students were highest in MATH10 and lowest in MATH210.

## 12. What are the persistence rates of students placed by multiple measures?

	Fall 2017										Fall 2016		
	Outreach			Other - MM			Non MM			Average	F16		
	F17	W18	Persistence	F17	W18	Persistence	F17	W18	Persistence		F16	W17	Persistence
MATH114 - MATH10	92	46	50%	84	38	45%	898	308	34%	43%	1,224	432	35%
MATH212 - MATH114	157	96	61%	140	72	51%	909	373	41%	51%	1,304	572	44%
MATH210 - MATH114	58	21	36%	42	17	40%	455	173	38%	38%	607	260	43%

Note: MATH10 includes 11, 41, 44, 46

- The average persistence rate from fall 2017 to winter 2018 with multiple measures in place from MATH114 to MATH10 (or equivalent) was 43% compared to 35% the fall prior without multiple measures in place.
  - MATH212 to MATH114 was 51% compare to 44%
  - MATH210 to MATH114 was 38% compared to 43%

## Appendix A

The following tables are included as historical reference.

	Fall 5-year Average - First Time Students							
	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
MATH10, 11, 41, 44, 46	1,071	77%	198	14%	129	9%	1,398	100%
MATH114	1,363	75%	335	18%	122	7%	1,820	100%
MATH212	2,033	67%	798	26%	221	7%	3,052	100%
MATH210	805	56%	488	34%	135	9%	1,428	100%
Total	5,272	68%	1,819	24%	607	8%	7,698	100%

\*Fall 2013, 2014, 2015, 2016, 2017 - averages

	Fall 5-year Average - All Students							
	Success		Non Success		Withdraw		Total	
	Grades	%	Grades	%	Grades	%	Grades	%
MATH10, 11, 41, 44, 46	5,740	63%	1,755	19%	1,604	18%	9,099	100%
MATH114	3,753	61%	1,552	25%	835	14%	6,140	100%
MATH212	4,153	61%	1,796	27%	809	12%	6,758	100%
MATH210	1,740	58%	928	31%	326	11%	2,994	100%
Total	15,386	62%	6,031	24%	3,574	14%	24,991	100%

\*Fall 2013, 2014, 2015, 2016, 2017 - averages