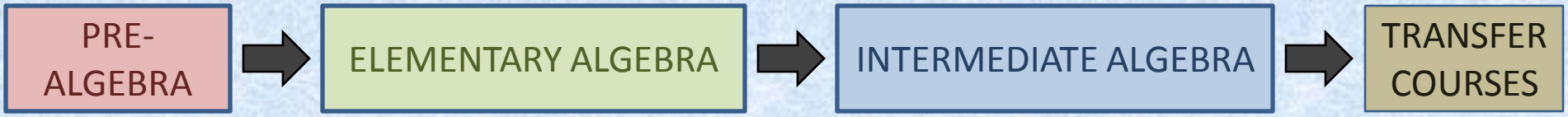
An Analysis of Placement Patterns & Sequence Completion at Cañada College

DRAFT REPORT

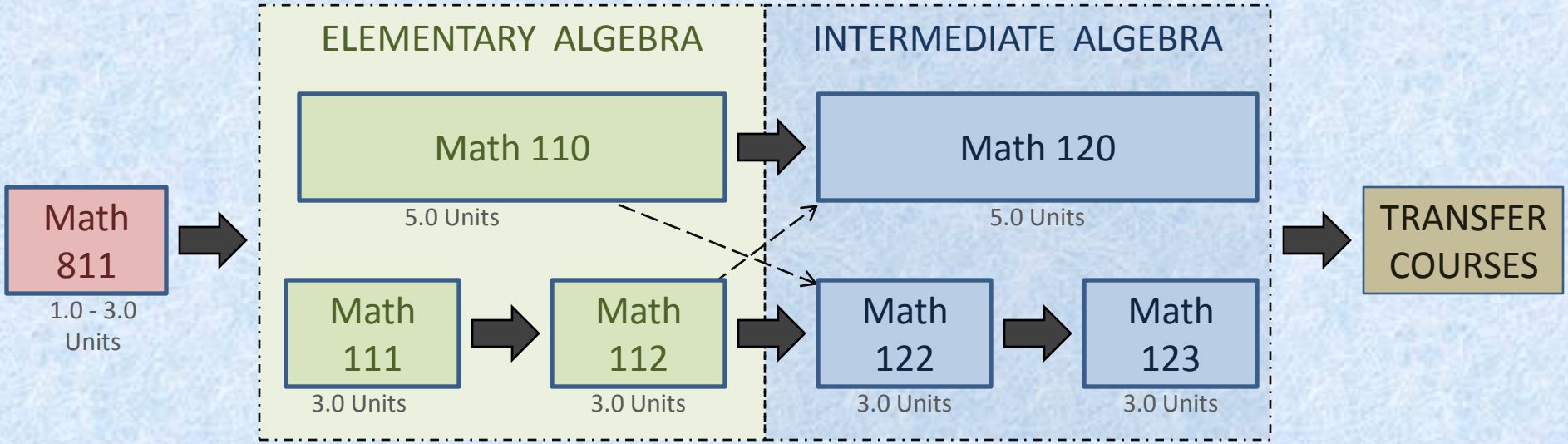
Office of Planning, Research and Student Success

The Cañada Math Sequence

Curriculum Sequence

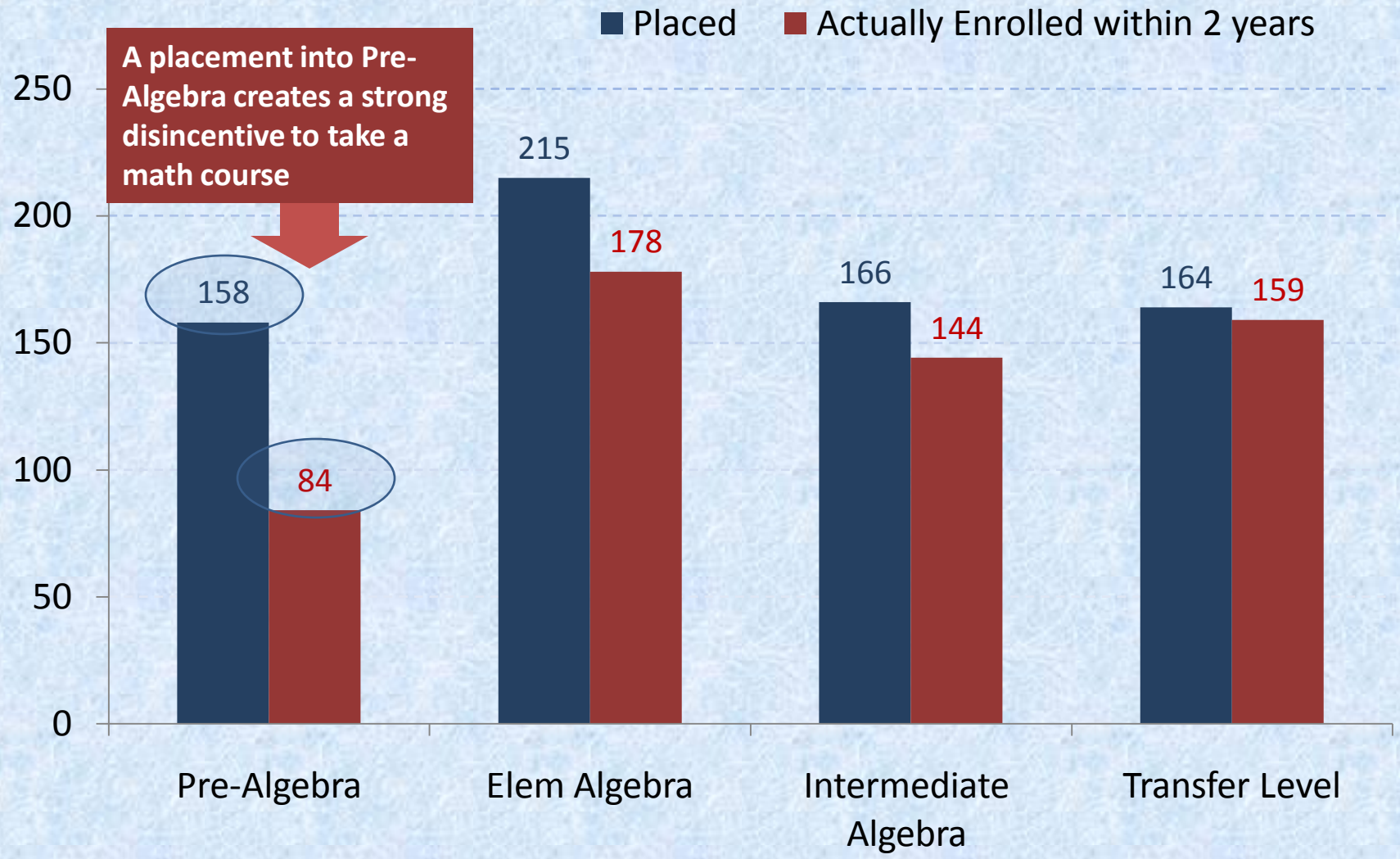


Course Level Sequence



Note: Only a very small % of students move along the pathway indicated by the dashed line.

The gap between student placement and their actual course taking behavior is greatest in Pre-Algebra



Data Source: San Mateo District Data Warehouse (Sept 2008). Note that findings are preliminary.

Students that place into a course tend to outperform their non-placed peers

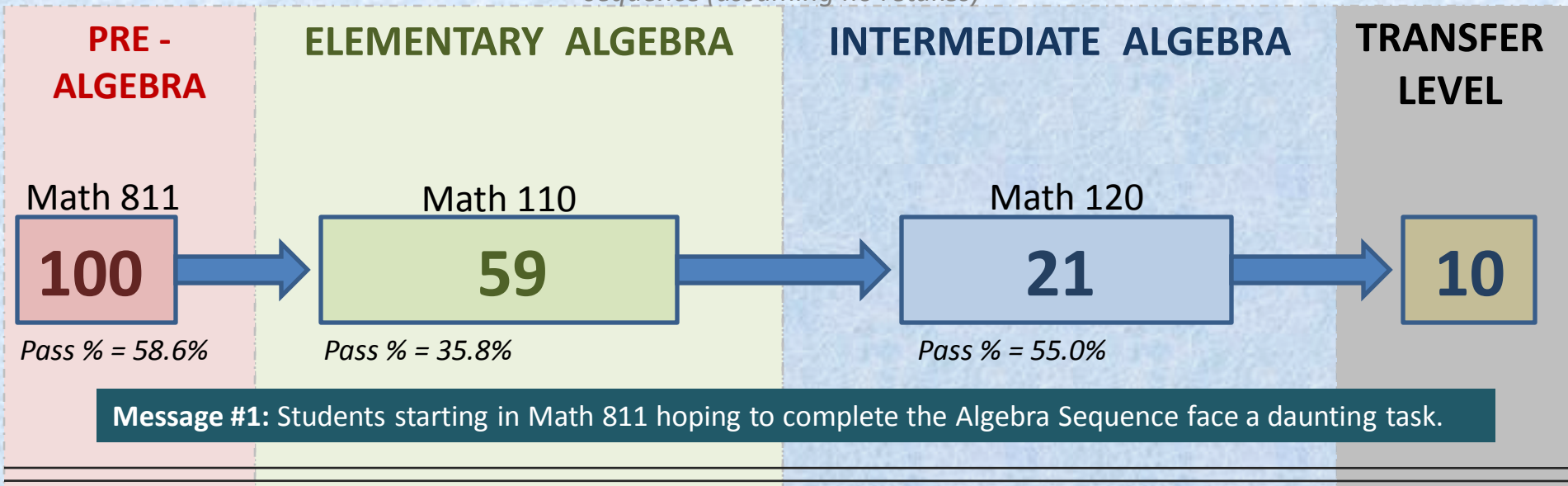
Curriculum	Course	Course Success Rate Placed	Course Success Rate Pre-Req	Performance Gap
Pre-Algebra	Math 811	58.6%	N/A	N/A
Elementary Algebra	Math 110	49.7%	35.8%	13.9%
	Math 111	50.4%	42.1%	8.3%
	Math 112	51.4%	37.9%	13.5%
Intermediate Algebra	Math 120	56.1%	55.0%	1.1%
	Math 122	60.9%	49.7%	11.2%
	Math 123	58.9%	53.9%	5.0%
Transfer Level		69.1%	58.4%	10.7%

Note: Coverage period is Fall 2000 – Spring 2007; Pre-Req success rate does not include students retaking the course.

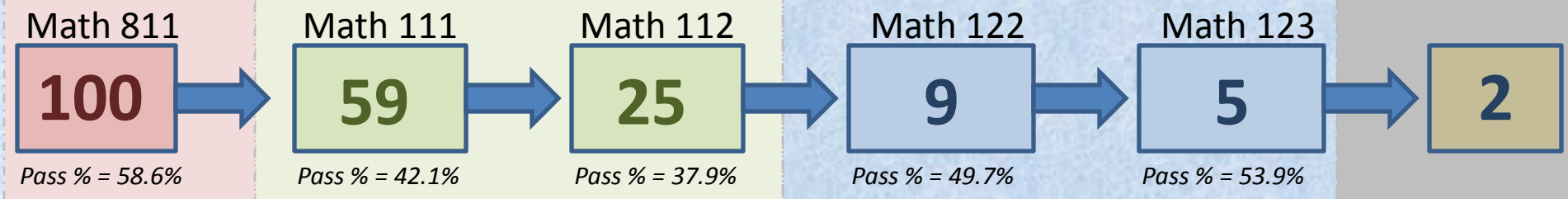
Students entering Elementary & Intermediate Algebra through prerequisite completion display systematically lower performance than students placed into the course.

We ask the question: based on average course success rates what is the expected outcome for a Pre-Algebra student attempting to complete the Algebra Sequence?

Simulated flow volume for a cohort of 100 Math 811 students given the average course pass rates for each course in the sequence (assuming no retakes)



Message #1: Students starting in Math 811 hoping to complete the Algebra Sequence face a daunting task.



Message #2: A Truth about the nature of sequences: The longer the sequence the lower the flow-through rate.

So before we examine actual algebra sequence completion what do we know

Recall: placement rates into each of the Algebra Courses have remained relatively stable over time.

1. **Placement into Pre-Algebra significantly lowers a student's likelihood of taking a Math course.**
2. **The cumulative effect of low course pass rates within the Algebra sequence, by itself, leads to low sequence completion rates.**

Any effective strategy to improve sequence completion must address these two areas !

Placement Test Retake Activity

Placement Test Discipline	Retake the Placement Test	Score Higher on the Retake	Place into a Higher Course
Math Placement	**14.1%**	**88.3%**	**69.4%**
English Placement	**8.6%**	**56.0%**	**25.2%**

Most students, nearly 85%, retake the test within a week of their first test.

These findings suggest that:

1. students are probably not properly prepared for their initial placement experience & not sufficiently aware that the placement test is a ***high stakes exam***
2. Better preparation may help students improve their test performance

Data Source: San Mateo District Data Warehouse (Sept 2008). Note that findings are preliminary.

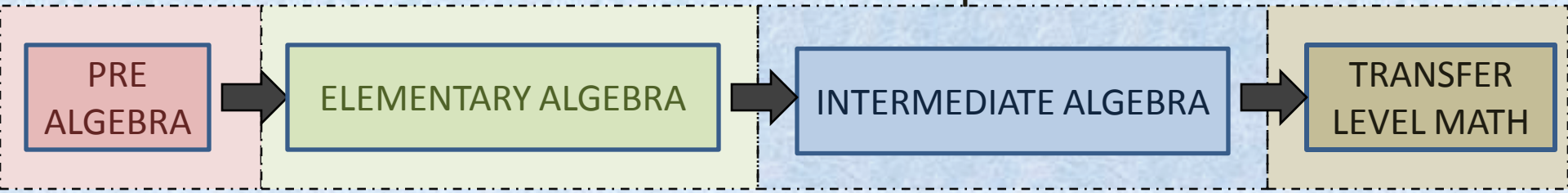
Analysis of Course Sequence Completion

Cohort Analysis Methodology

- Select students that placed into Pre-Algebra and track them through the sequence.
- Limit cohort to First time course takers (remove from the cohort all students retaking Math 811).
- Allow students to move through Algebra Sequence at their own pace (but not to exceed five years).
- Allow them unlimited retakes
- Period of coverage = Fall 2000 – Spring 2008

Sequence Completion Rates by Initial Course Placement

Cañada Curriculum Sequence



Percent of Students Completing the Algebra Sequence within 2 to 5 Years

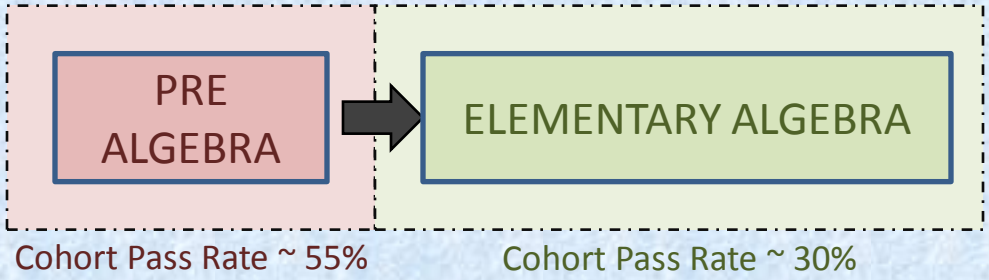
Initial Placement	2 years	3 years	4 years	5 years
PRE ALGEBRA	2.3%	3.6%	5.4%	6.1%
ELEMENTARY ALGEBRA	15.5%	19.1%	20.6%	22.4%
INTERMEDIATE ALGEBRA	43.4%	47.6%	49.2%	49.2%

Students are 3 to 4 times more likely to complete the sequence when starting in Elementary Algebra

Data Source: San Mateo District Data Warehouse (Sept 2008). Note that findings are preliminary.

First Sequence Completion Rates for Pre-Algebra Students

First Chain in Algebra Sequence



Percent of Students Successfully moving from Pre-Algebra Elementary Algebra within 5 Years

Of those Passing Pre-Algebra:	**2 years**	**3 years**	**4 years**	**5 years**
Percent that enroll in Elementary Algebra	28.4%	48.2%	56.1%	59.1%
Percent that pass Elementary Algebra	20.5%	25.3%	26.9%	30.5%

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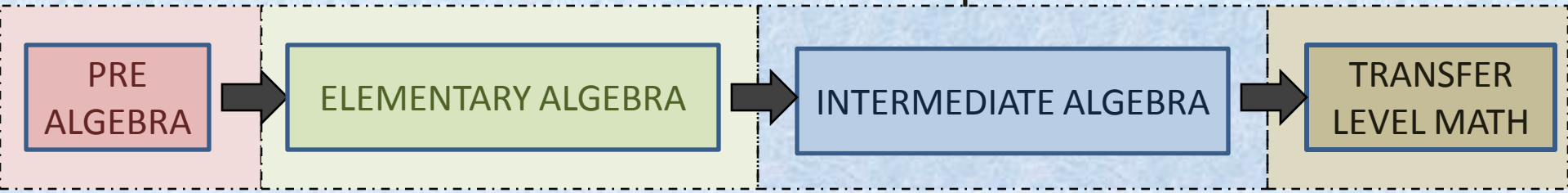
Sequence Completion Rates by Initial Course Placement

Cañada Curriculum Sequence



Percent of Students Successfully Completing the Algebra Sequence within 2 to 5 Years

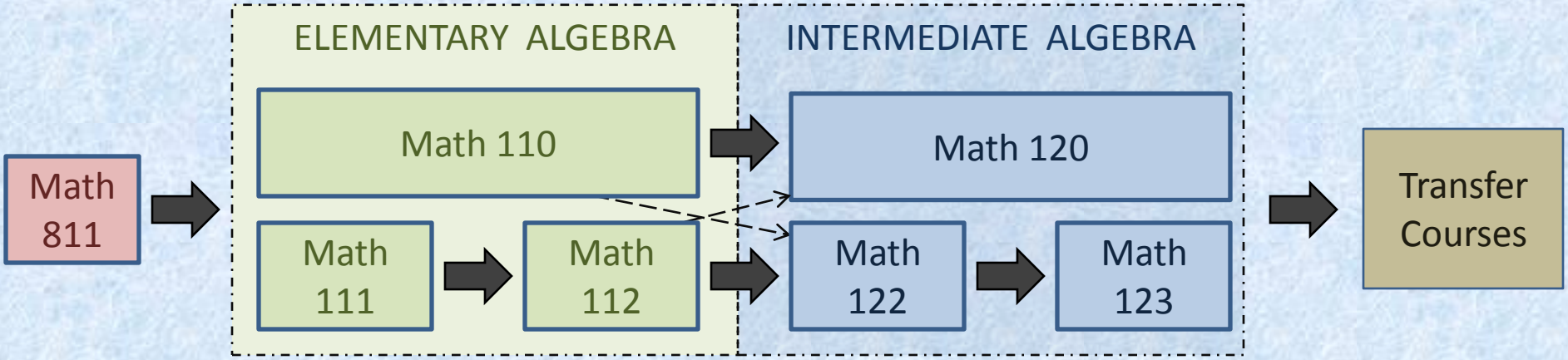
Initial Placement	2 years	3 years	4 years	5 years
Received an "A" in Pre-Algebra*	8.8%	13.8%	15.3%	17.8%
Did not Receive an "A" in Pre-Algebra	0.8%	1.7%	2.5%	2.5%

Mastery is key! Preliminary findings suggest that students receiving an A grade in Pre-Algebra are 8 or 9 times more likely to complete the algebra sequence.

Important Finding: For students receiving an A in Pre-Algebra there is no disproportional impact by ethnicity in algebra sequence completion.

** Math 811 is a self-paced course. Cohort is restricted students receiving an A grade and completing the course in one semester (3.0 units).*

Sequence Completion Rates by Initial Course Placement

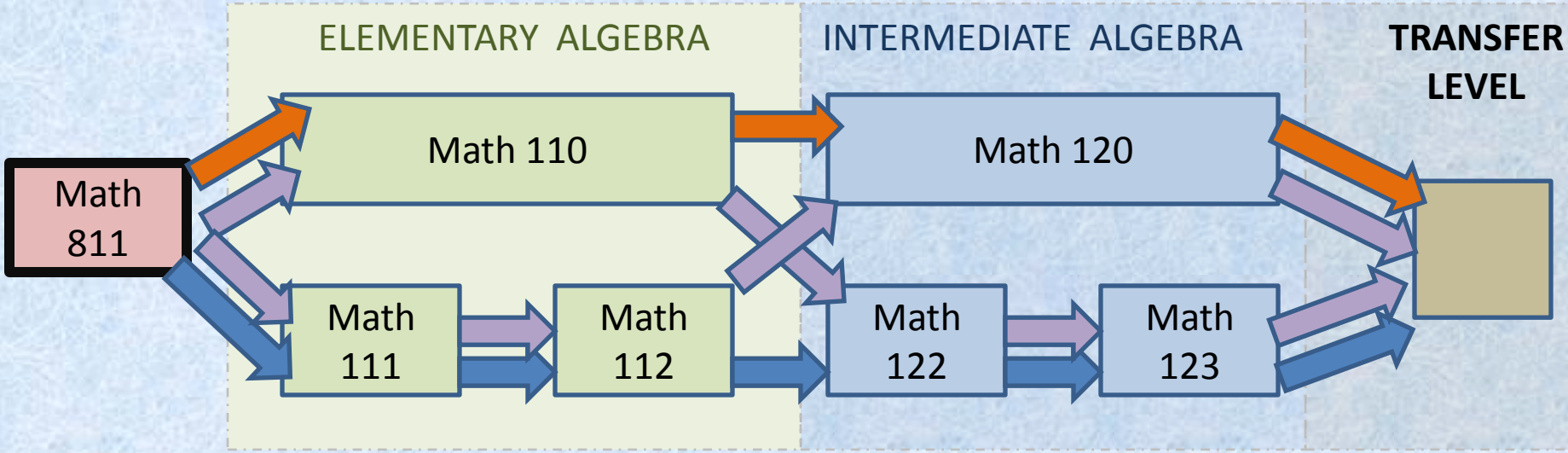


Initial Placement	2 years	3 years	4 years	5 years
811	2.3%	3.6%	5.4%	6.1%
110	19.1%	21.9%	23.2%	23.7%
111	11.8%	16.2%	17.9%	19.1%
120	57.0%	58.8%	59.6%	59.6%
122	29.7%	36.4%	38.7%	38.7%

3 to 4 times more likely to complete sequence starting in Elementary Algebra

2 times as likely to complete sequence starting in Intermediate Algebra

Pathway analysis: successful sequence completion rates by sequence route



Percent of Cohort Starting in Math 811 that completed sequence:	Pathway	2 years	3 years	4 years	5 years
	→	2.2%	4.0%	5.2%	6.2%
	→	0.4%	1.1%	1.3%	1.6%
	→	0.3%	0.7%	1.1%	1.4%

Students receiving an A in Math 811 are roughly 10 times more likely to take the orange pathway

Profile of those completing the Algebra Sequence:

- Display mastery of course content (A Grade)
- Complete the sequence within 2 academic years
- Take the shortest sequence pathway (811, 110, 120)

Profile of the Non-completer (those that make the attempt):

- Starts at the bottom of the sequence
- Long time lapses between courses
- Does not Pass the course on their first attempt
- Engage in multiple course retakes *

** Only 13.1% of students that withdraw from Pre-Algebra ever pass the course. The chances of passing are highest when the retake is in the subsequent semester.*

Take Away

As you reflect on possible methods/approaches to refine and improve the placement process keep in mind:

1. **Our findings that suggest:**
    - students are probably not properly prepared for their initial placement experience & not adequately aware that the placement test is a high stakes exam
    - Better preparation may help students improve their test performance.
2. **Even modest improvements in course success rates can have big impacts !**