A Closer Look at Summer Change: Lessons from Longitudinal Data

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CATHOLIC SCHOOLS

PURPOSE

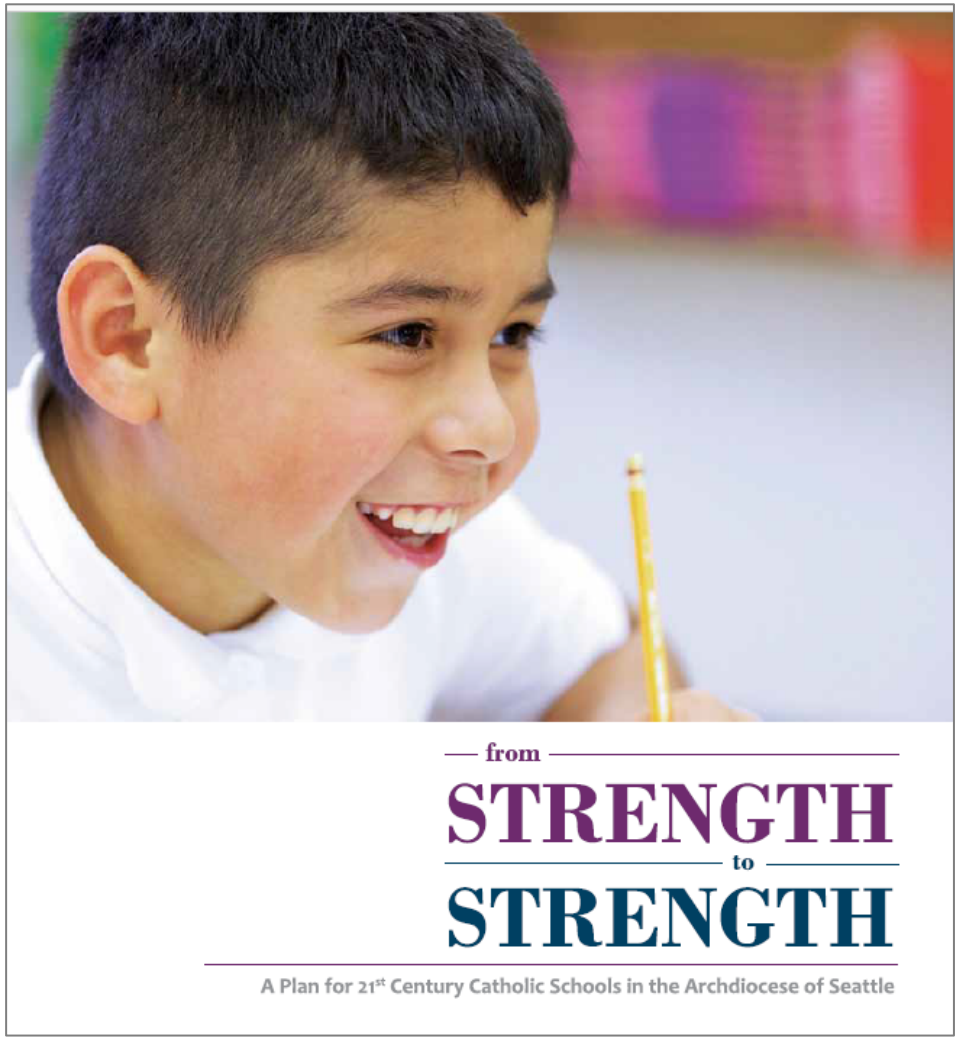
1. Build knowledge of summer change in student achievement based on recent applied research
2. Learn why and how to do longitudinal analysis
3. Harvest ideas for how to analyze your own MAP growth data

About us

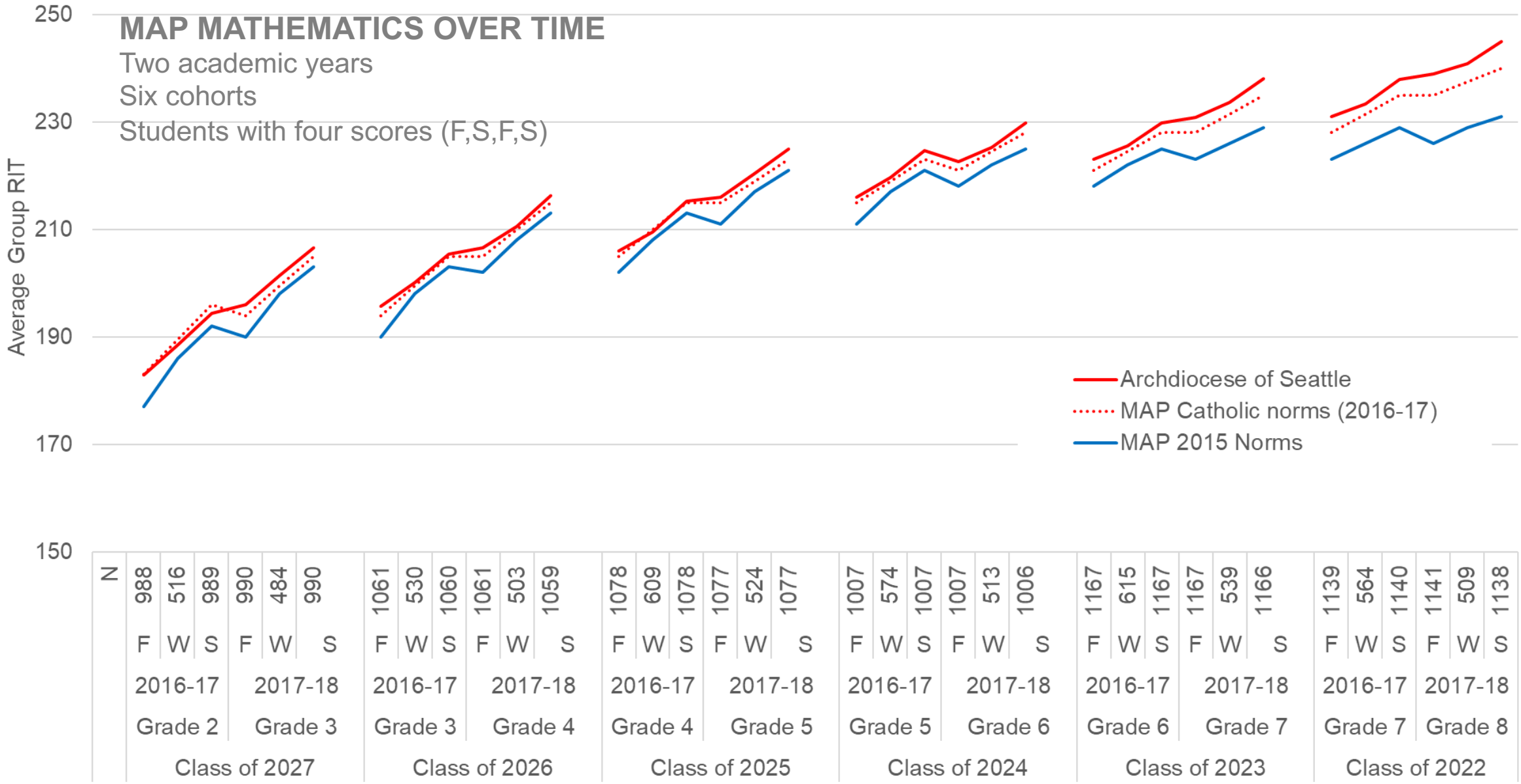
	Archdiocese of Seattle	Washington State
Elementary schools (K-8)	63	
High schools	11	
Total Catholic schools	**74**	
October 2017 enrollment	**21,635**	
Percent of students of color	39	45
Percent of students with financial need	0 - 33	43

Our MAP origin story

2014	Strategic Plan “Strength for Strength” calls for common Archdiocesan assessment of student achievement
2016-17	First year of implementation. 50 elementary schools participated.
2017-18	Second year of implementation. Expectation: Grades 2-8, Fall and Spring, Winter optional. 62 elementary schools participated.
Summer 2018	**MAP after Two Years: What Have We Learned?**
2018-19	Expectation: all elementary schools to participate. Some high school interest in getting good placement data.



How we've been looking at our nascent MAP data



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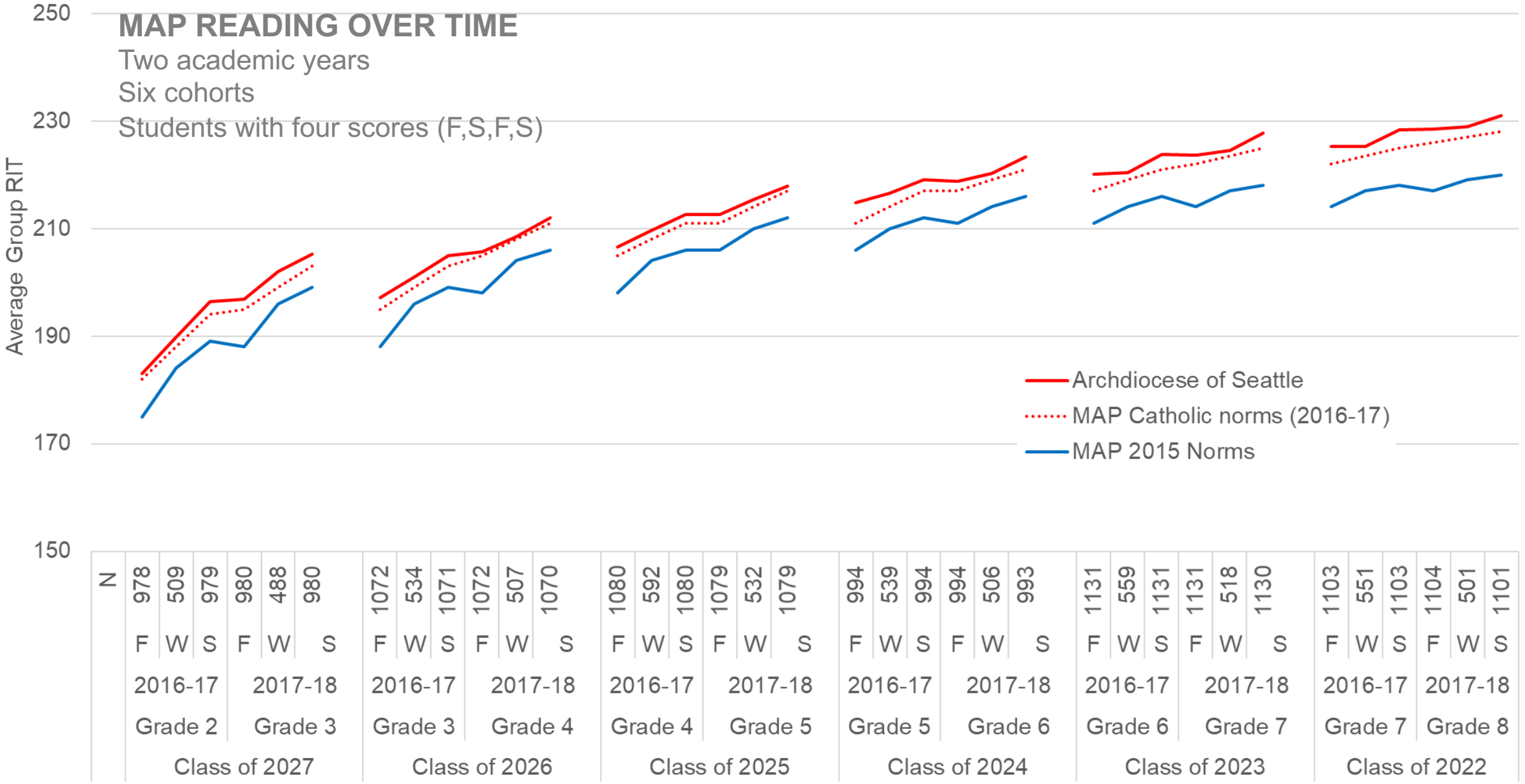

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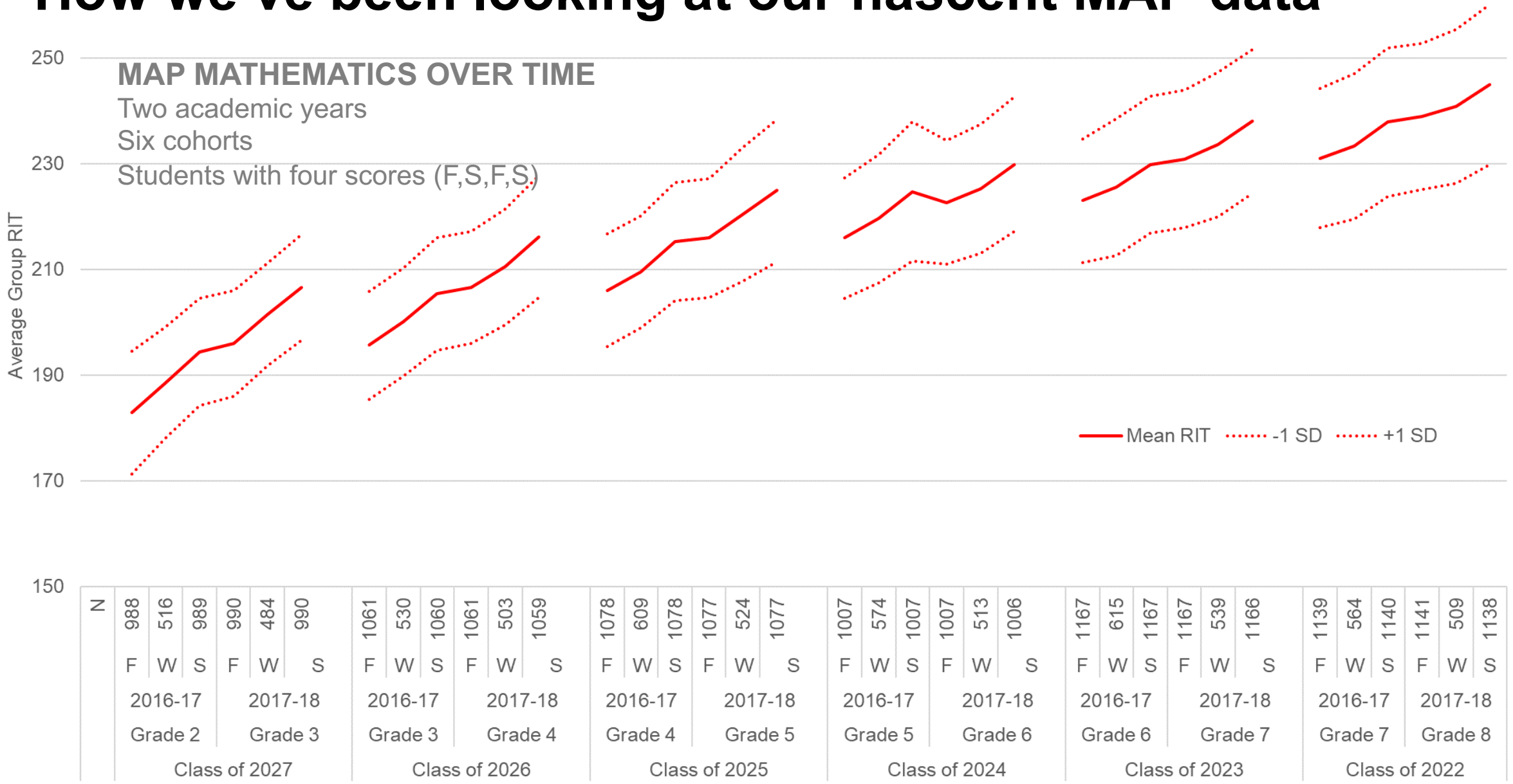
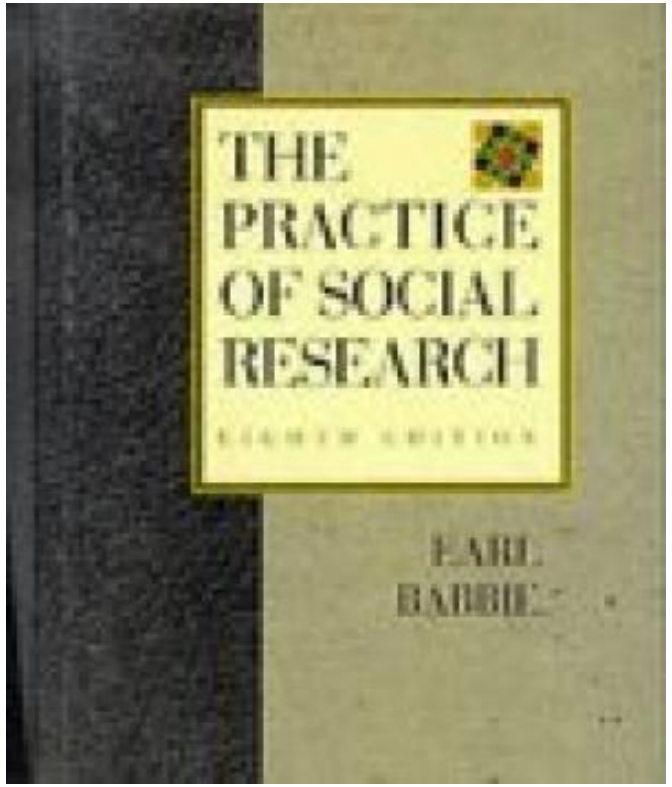


Longitudinal analysis: three kinds

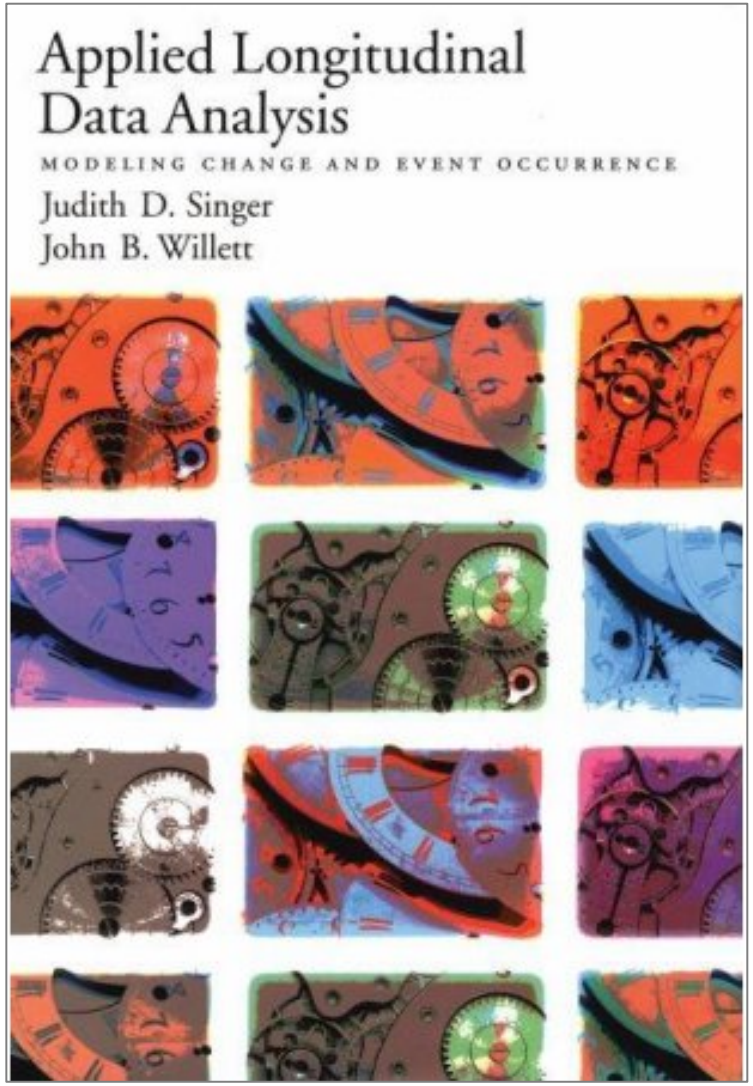
Trend analysis	Change in **summary values**--such as percent meeting standard, or average RIT--over time
Cohort analysis	Change in the **same age group** over time
Panel analysis	Change in the **same individuals** over time



Requirements for longitudinal analysis

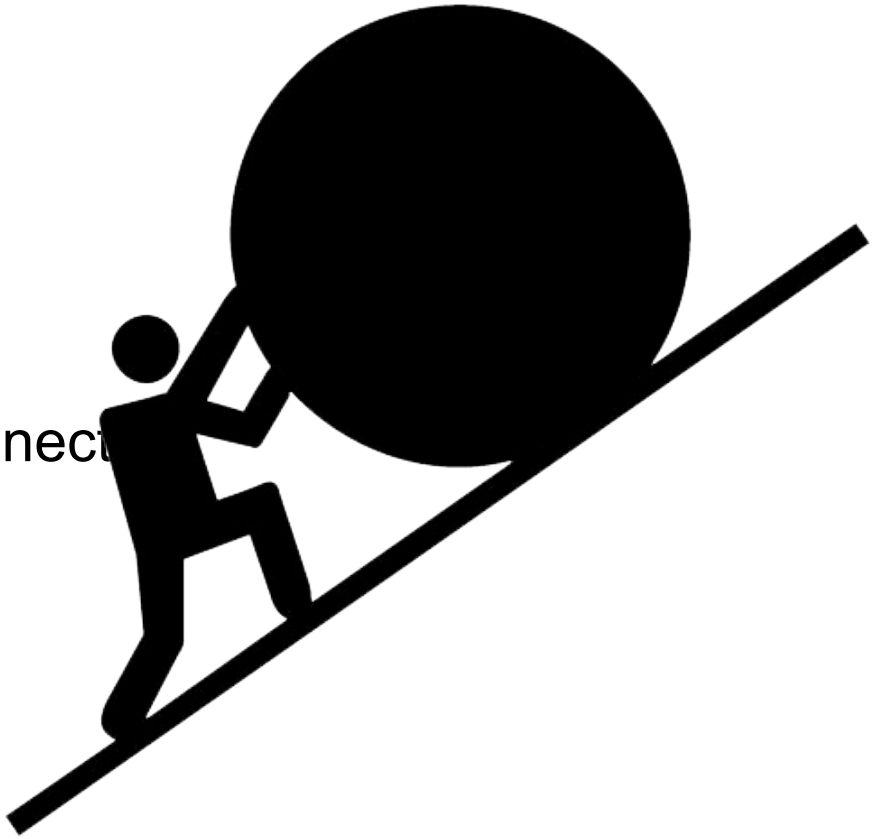
Study of change in individuals
(or, panel analysis of student learning)

1. Three or more waves of data
2. An outcome whose values change systematically over time
3. A sensible metric for clocking time



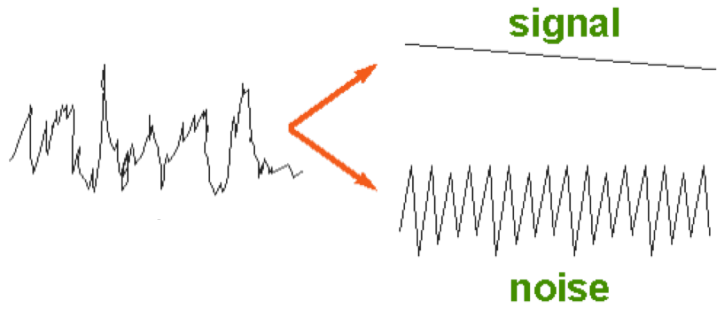
Challenges doing longitudinal analysis in schools and districts

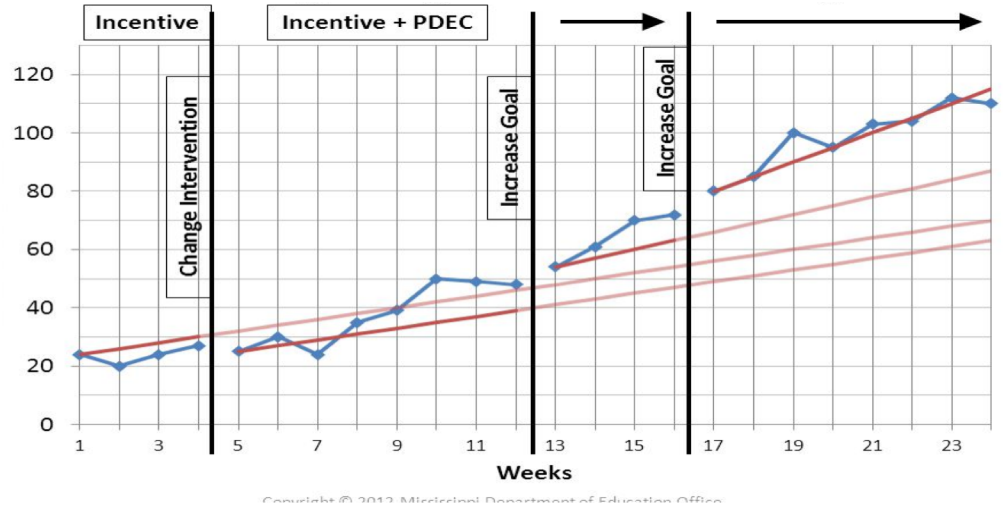
- We keep changing tests
- When we do test, we usually have only a pre and post
- Tests don't always have vertical scales
- Data are usually cross-sectional (snapshots of kids at different ages)
- Time-consuming to assemble the data longitudinally
- Cannot always depend on a consistent ID number to connect test events to the same student
- Attrition
- History is lost



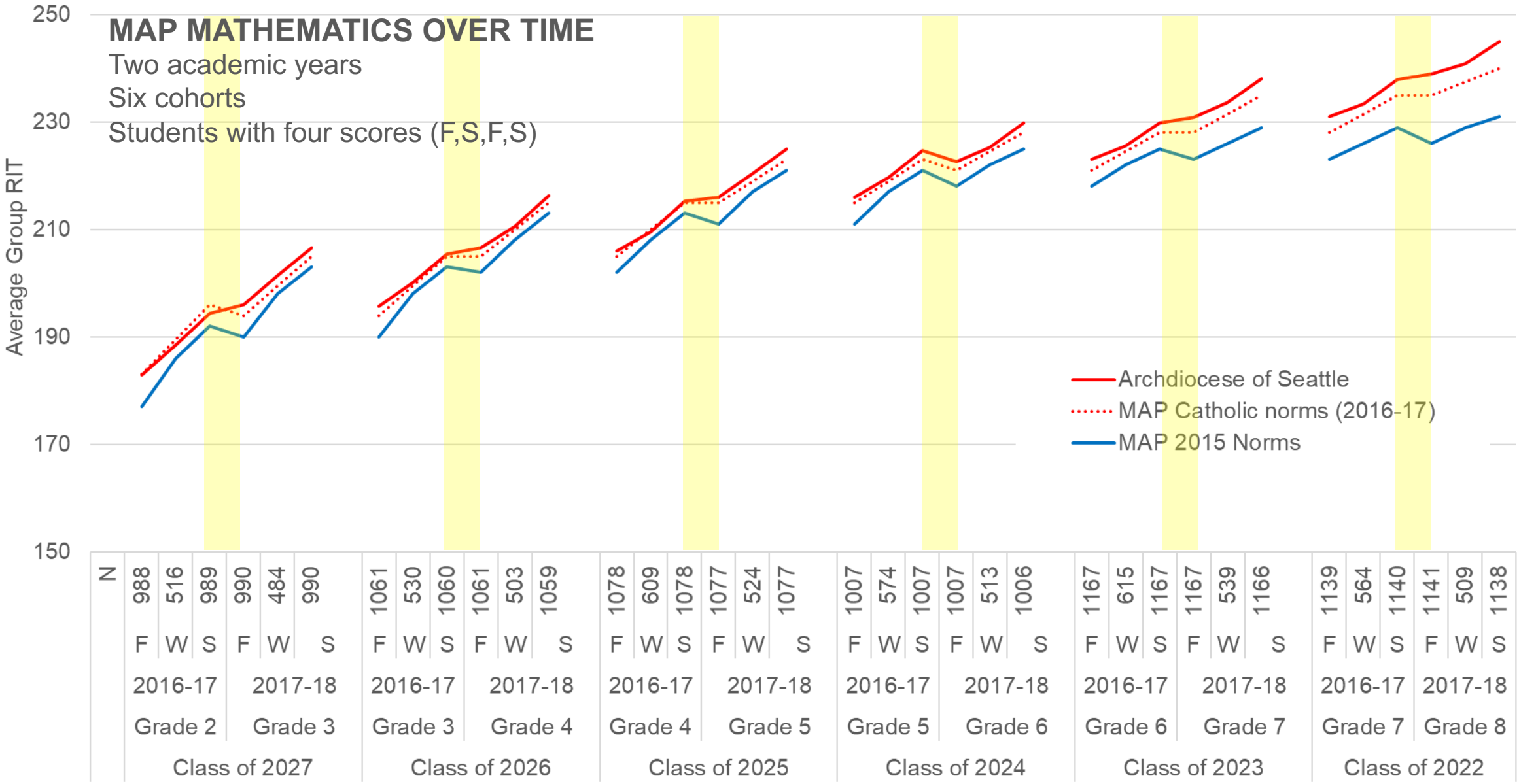
Why do longitudinal analysis?

- Everybody wants “apples to apples”
- Better measurement: More data points enable us to more clearly distinguish signal from noise
- Data over time gets us closer to cause and effect
- Over time brings in context
- To look at the same students lets us see the effect of the instruction
- To include summer in the trend lets us distinguish the effects of school and non-school



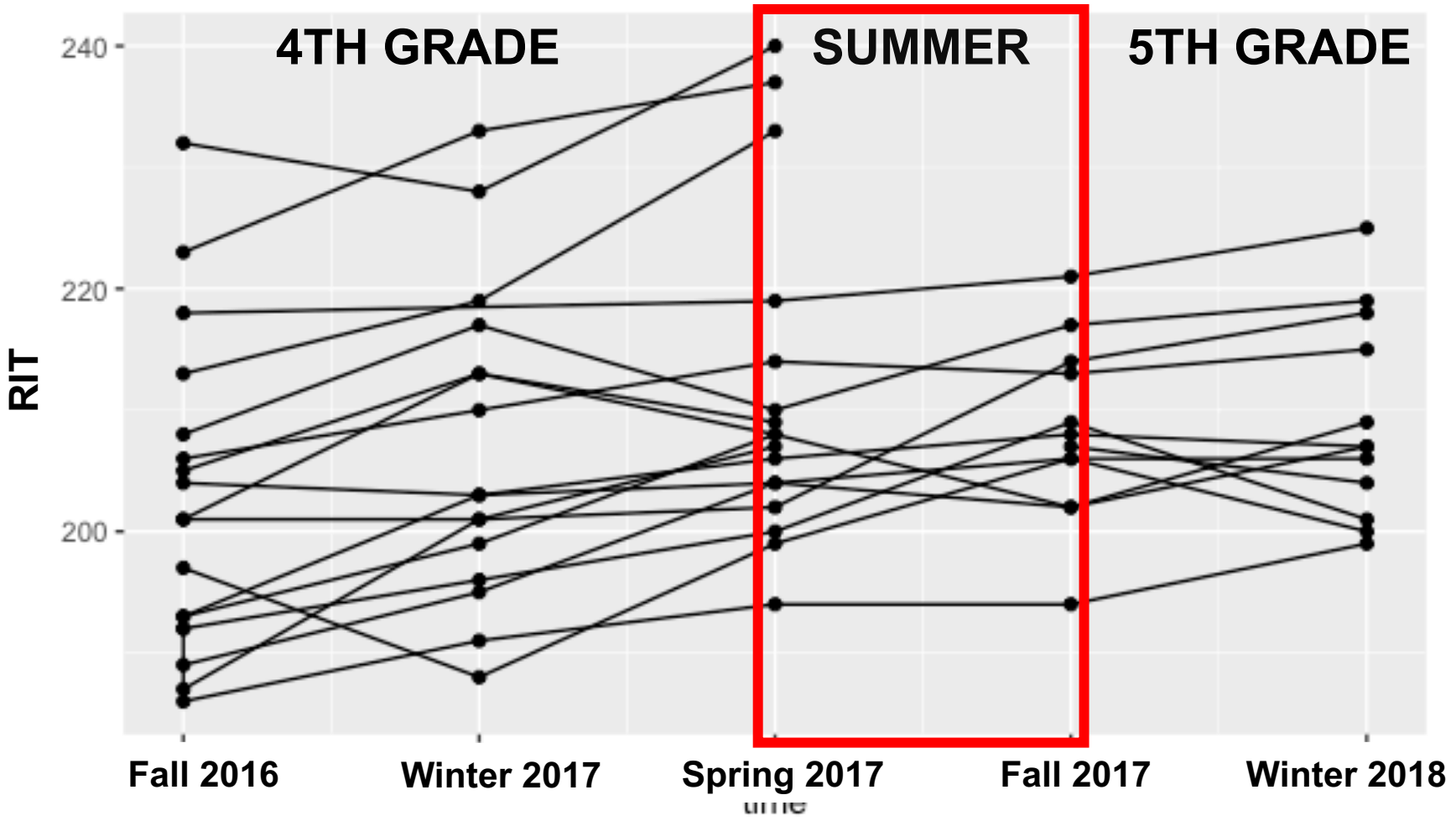


Focus of today: summer change



Summer *loss*, or summer *change*?

- We're most familiar with the term summer "loss" from spring to fall
- But some students stay the same and some increase
- So it's more accurate to say summer "change"



Research questions

How much summer change did we see?

- How many students saw a lower fall RIT score? About the same? Higher?
- How much change was statistically significant?

Which students saw more change than others?

- Test duration
- Family income
- Prior achievement
- Grade level
- Mobility (transfer between schools)
- Gender, race

Study methods

Decisions	Rationale
All students with **four test scores** from **required testing windows** in each content area: Fall-Spring-Fall-Spring	To maximize sample size. To ensure continuous enrollment (panel) and balanced data on time
Included winter scores if available	More data
Students grouped by graduating cohort (12th grade)	One code to identify groups of students who have two grade levels

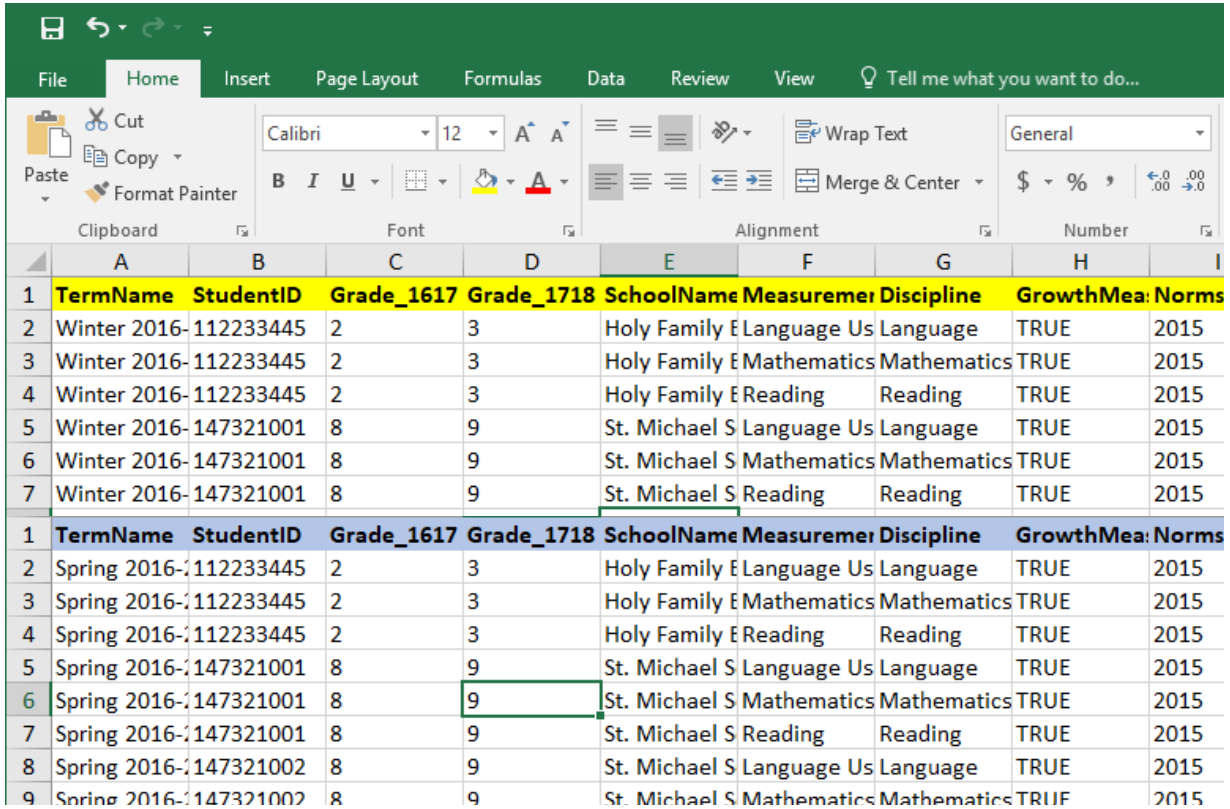
The cost of “apples to apples”

How many students have all four expected scores?
Who’s lost by isolating a longitudinal panel of students?

			Count of RIT scores					Percent of all scores in testing window				
Domain	School year	Window	1	2	3	4	Total	1	2	3	4	Total
Mathematics	2016-17	Fall	113	518	221	6,440	7,292	1.5	7.1	3.0	88.3	100.0
		Winter	47	310	208	3,408	3,973	1.2	7.8	5.2	85.8	100.0
		Spring	17	523	330	6,441	7,311	0.2	7.2	4.5	88.1	100.0
	2017-18	Fall	229	1,962	348	6,443	8,982	2.5	21.8	3.9	71.7	100.0
		Winter	55	669	195	3,072	3,991	1.4	16.8	4.9	77.0	100.0
		Spring	275	1,959	223	6,436	8,893	3.1	22.0	2.5	72.4	100.0
Reading	2016-17	Fall	115	518	300	6,358	7,291	1.6	7.1	4.1	87.2	100.0
		Winter	50	295	229	3,284	3,858	1.3	7.6	5.9	85.1	100.0
		Spring	16	527	359	6,358	7,260	0.2	7.3	4.9	87.6	100.0
	2017-18	Fall	234	1,953	413	6,360	8,960	2.6	21.8	4.6	71.0	100.0
		Winter	51	676	216	3,052	3,995	1.3	16.9	5.4	76.4	100.0
		Spring	284	1,954	260	6,353	8,851	3.2	22.1	2.9	71.8	100.0

Technical aside: How to build your data file

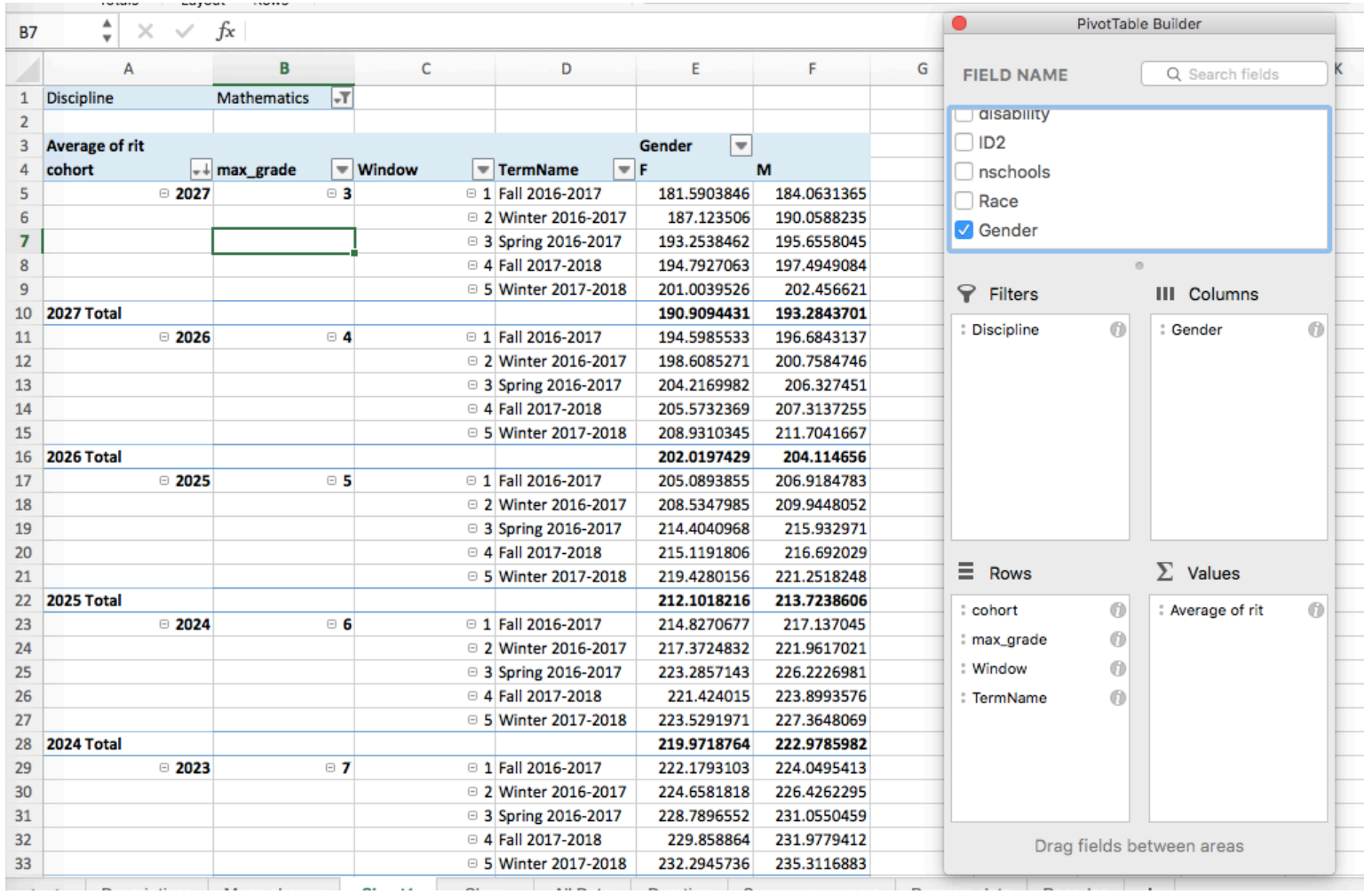
1. Export your district raw data files from MAP MARC – Data Scheduler
    1. one for each testing window
2. Make sure they all share the same column labels
3. Stack them vertically all into one “Combined” file
4. Assign a numeric code to your test windows (i.e., Fall =1, Winter=2, Spring=3)
5. Assign a numeric code to your student cohorts based on their grade level (etc. Class of 2022)



	A	B	C	D	E	F	G	H	I
1	TermName	StudentID	Grade_1617	Grade_1718	SchoolName	Measureme	Discipline	GrowthMea	Norms
2	Winter 2016-	112233445	2	3	Holy Family E	Language Us	Language	TRUE	2015
3	Winter 2016-	112233445	2	3	Holy Family E	Mathematics	Mathematics	TRUE	2015
4	Winter 2016-	112233445	2	3	Holy Family E	Reading	Reading	TRUE	2015
5	Winter 2016-	147321001	8	9	St. Michael S	Language Us	Language	TRUE	2015
6	Winter 2016-	147321001	8	9	St. Michael S	Mathematics	Mathematics	TRUE	2015
7	Winter 2016-	147321001	8	9	St. Michael S	Reading	Reading	TRUE	2015
1	TermName	StudentID	Grade_1617	Grade_1718	SchoolName	Measureme	Discipline	GrowthMea	Norms
2	Spring 2016-	112233445	2	3	Holy Family E	Language Us	Language	TRUE	2015
3	Spring 2016-	112233445	2	3	Holy Family E	Mathematics	Mathematics	TRUE	2015
4	Spring 2016-	112233445	2	3	Holy Family E	Reading	Reading	TRUE	2015
5	Spring 2016-	147321001	8	9	St. Michael S	Language Us	Language	TRUE	2015
6	Spring 2016-	147321001	8	9	St. Michael S	Mathematics	Mathematics	TRUE	2015
7	Spring 2016-	147321001	8	9	St. Michael S	Reading	Reading	TRUE	2015
8	Spring 2016-	147321002	8	9	St. Michael S	Language Us	Language	TRUE	2015
9	Spring 2016-	147321002	8	9	St. Michael S	Mathematics	Mathematics	TRUE	2015

Technical aside: How to make these charts

- Make sure your data is in “long” format (a row “within” student for each score)
- Set up this PivotTable:
  - Cohorts and test windows in the Rows area
  - Average RIT in the Values area
  - Predictor groups in the Columns area
- Insert line graph
- The row layers will be the horizontal “time” axis

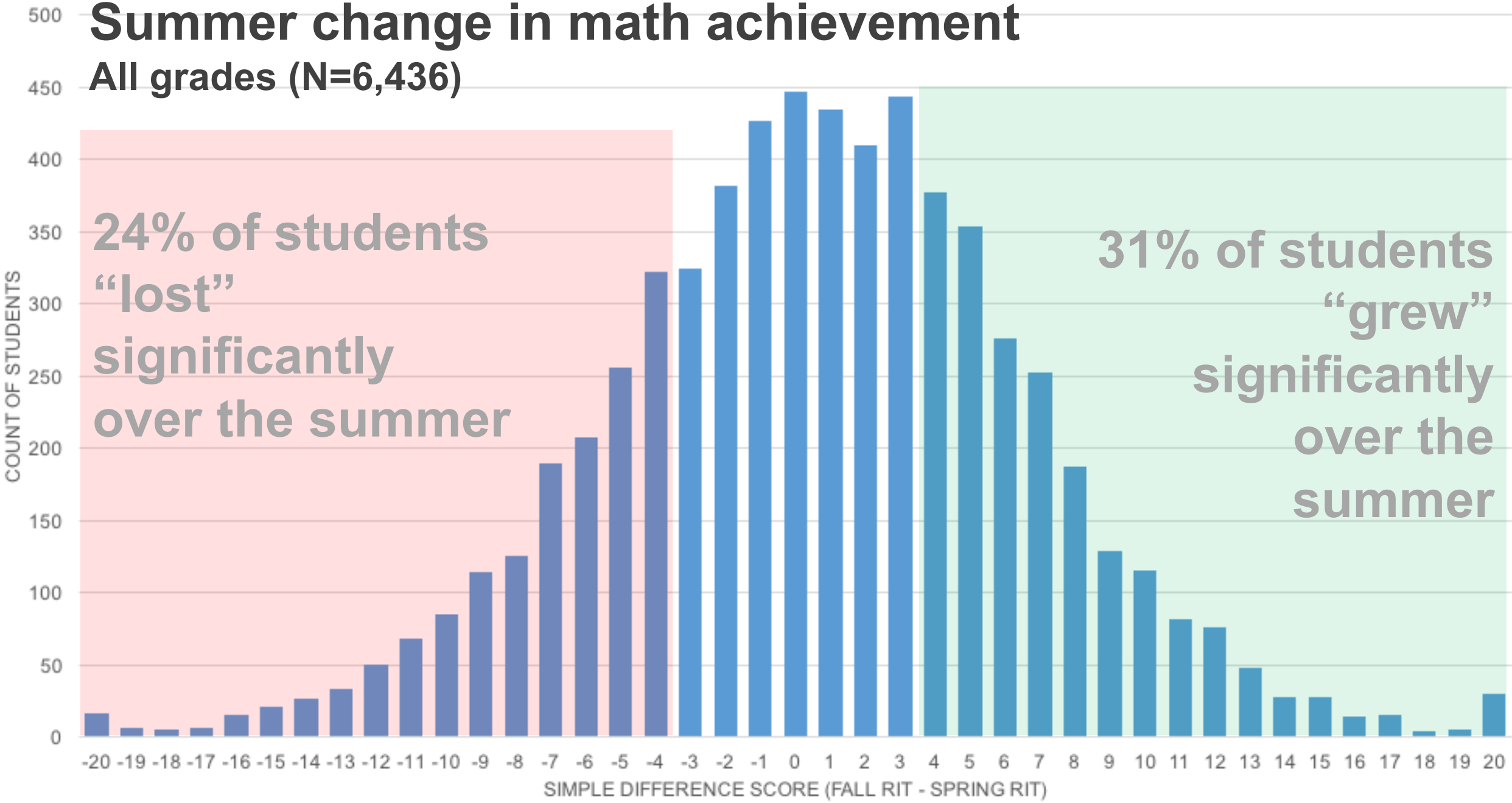


Discipline	Mathematics

Average of rit				Gender	
cohort	max_grade	Window	TermName	F	M
2027	3	1	Fall 2016-2017	181.5903846	184.0631365
		2	Winter 2016-2017	187.123506	190.0588235
		3	Spring 2016-2017	193.2538462	195.6558045
		4	Fall 2017-2018	194.7927063	197.4949084
		5	Winter 2017-2018	201.0039526	202.456621
2027 Total				190.9094431	193.2843701
2026	4	1	Fall 2016-2017	194.5985533	196.6843137
		2	Winter 2016-2017	198.6085271	200.7584746
		3	Spring 2016-2017	204.2169982	206.327451
		4	Fall 2017-2018	205.5732369	207.3137255
		5	Winter 2017-2018	208.9310345	211.7041667
2026 Total				202.0197429	204.114656
2025	5	1	Fall 2016-2017	205.0893855	206.9184783
		2	Winter 2016-2017	208.5347985	209.9448052
		3	Spring 2016-2017	214.4040968	215.932971
		4	Fall 2017-2018	215.1191806	216.692029
		5	Winter 2017-2018	219.4280156	221.2518248
2025 Total				212.1018216	213.7238606
2024	6	1	Fall 2016-2017	214.8270677	217.137045
		2	Winter 2016-2017	217.3724832	221.9617021
		3	Spring 2016-2017	223.2857143	226.2226981
		4	Fall 2017-2018	221.424015	223.8993576
		5	Winter 2017-2018	223.5291971	227.3648069
2024 Total				219.9718764	222.9785982
2023	7	1	Fall 2016-2017	222.1793103	224.0495413
		2	Winter 2016-2017	224.6581818	226.4262295
		3	Spring 2016-2017	228.7896552	231.0550459
		4	Fall 2017-2018	229.858864	231.9779412
		5	Winter 2017-2018	232.2945736	235.3116883

Summer change in math achievement

All grades (N=6,436)



Summer change in math achievement

By cohort

Graduation cohort (12th grade)	Grade in 2017-18	N	School Year Growth		Summer Change	
			Mean	SD	Mean	SD
2027	3	987	11.5	7.4	1.7	6.1
2026	4	1,061	9.6	6.6	1.2	6.2
2025	5	1,078	9.2	6.8	0.7	5.7
2024	6	1,006	8.7	7.0	-2.0	6.8
2023	7	1,166	6.9	6.9	1.1	6.4
2022	8	1,138	6.8	6.7	1.0	6.2
Total		6,436	8.7	7.1	0.6	6.3

What we've learned about summer change

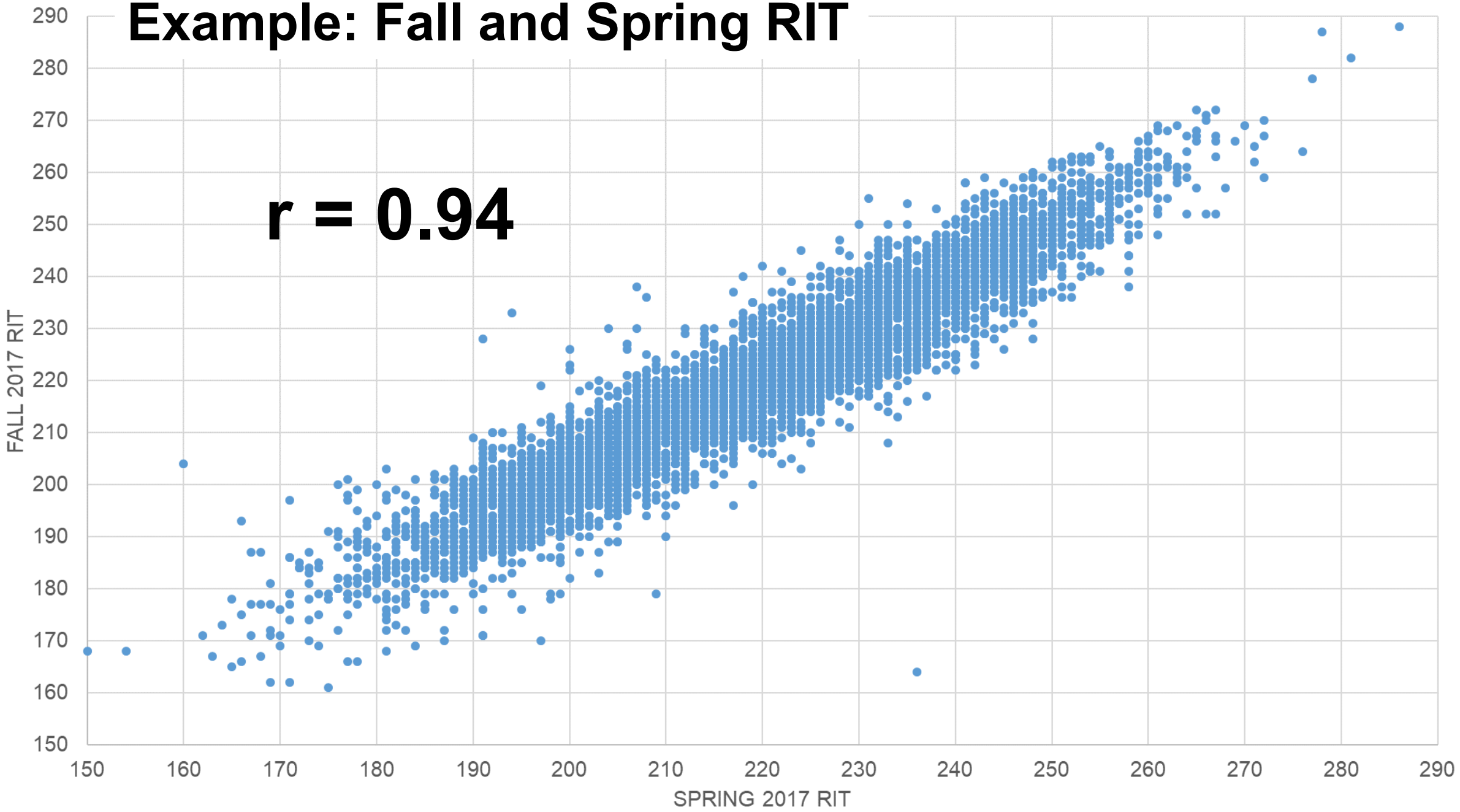
Research question	Results
How much summer change did we see?	Most of our students changed very little. Average change was ~ +1 RIT About 1/4 of our students saw significant losses About 1/3 of our students saw significant gains
Which students saw more change than others?	

How do we explain the summer change we do see?

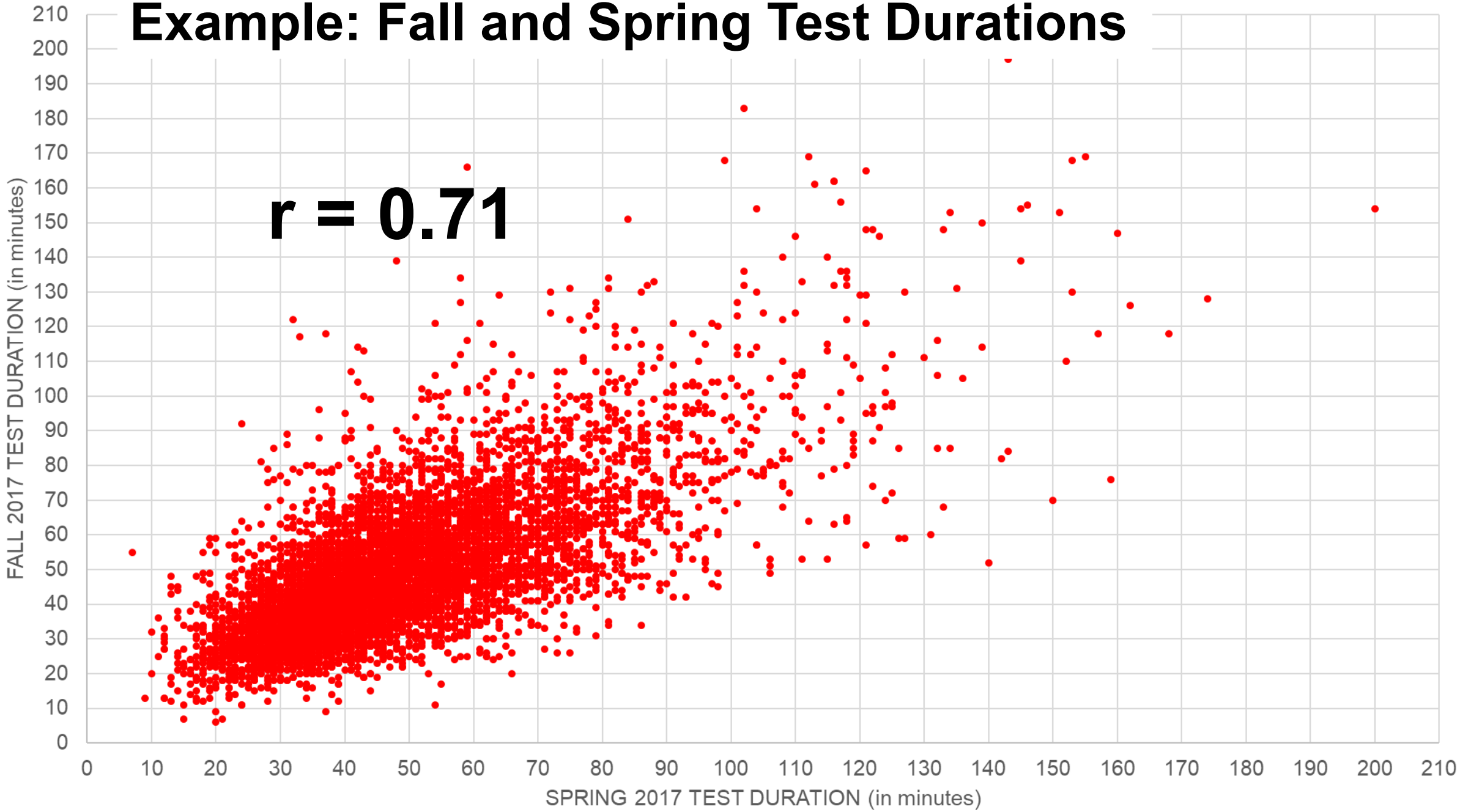
Predictor	Hypothesis
Test duration	Big loss or change is really due to an extreme test duration from either window
Family income	Students from low income families will suffer greater losses
Prior achievement	Higher achievers will regress less
School mobility	Transferring between schools is disruptive. Kids who transfer to a new school in the fall will regress more than those who attend the same school in the fall

Matrix of correlations: summer change and hypothesized predictors

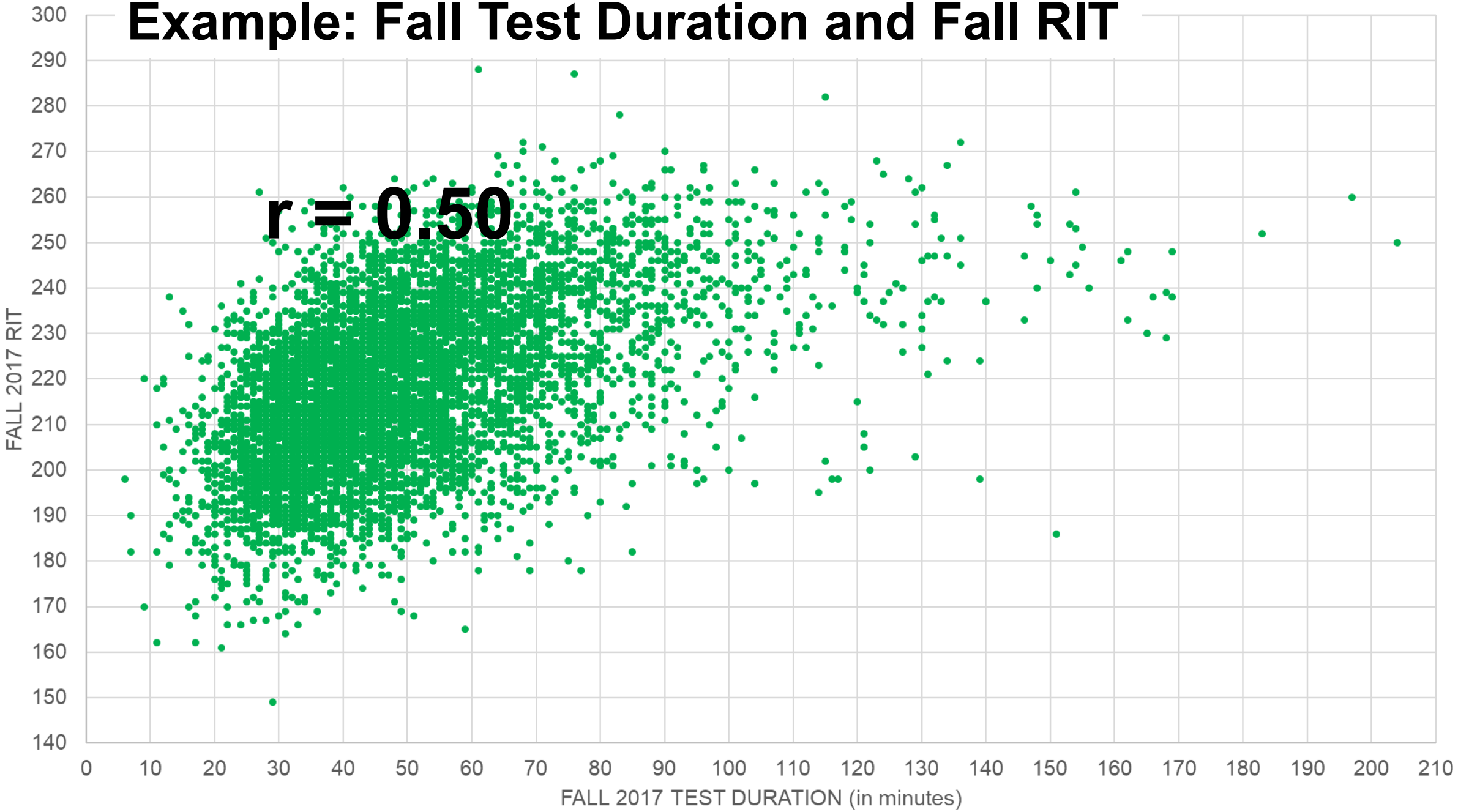
Example: Fall and Spring RIT



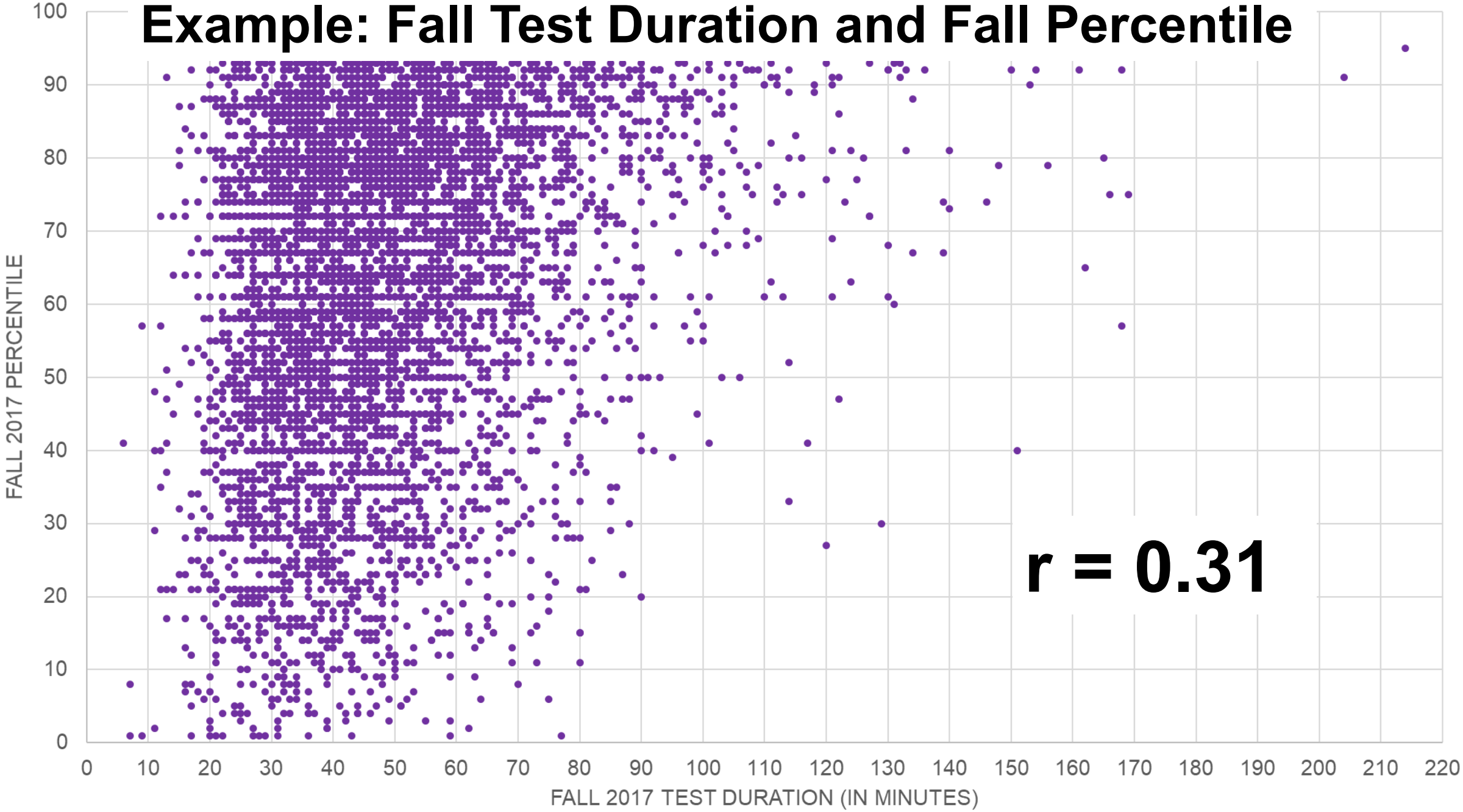
Example: Fall and Spring Test Durations

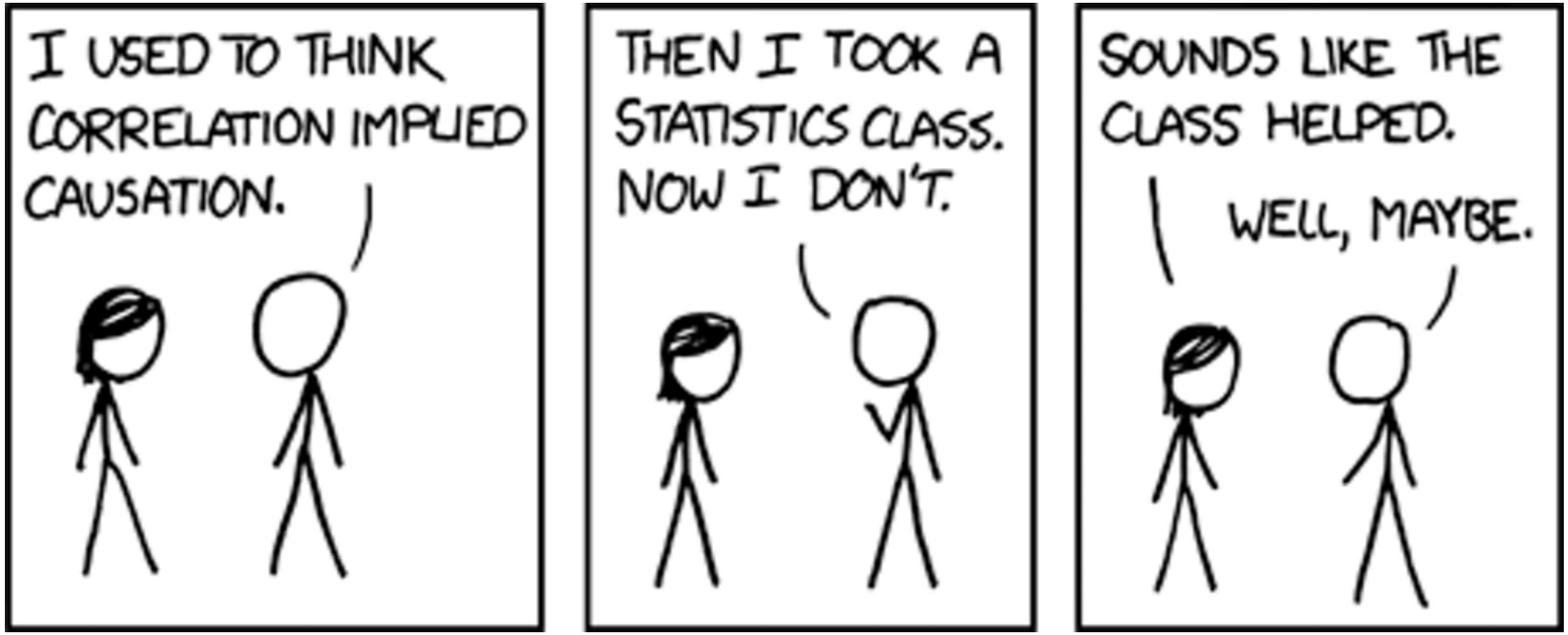


Example: Fall Test Duration and Fall RIT



Example: Fall Test Duration and Fall Percentile




I USED TO THINK CORRELATION IMPLIED CAUSATION.
THEN I TOOK A STATISTICS CLASS. NOW I DON'T.
SOUNDS LIKE THE CLASS HELPED.
WELL, MAYBE.

Summer change varies only slightly by grade level and content area

What we've learned

Research question	Results
How much summer change did we see?	Most of our students changed very little. Average change was ~ +1 RIT Most cohorts saw about the same change Variance appears to decrease slightly over time in reading About 1/3 of our students saw substantial losses About 1/3 of our students saw substantial gains Students seemed to gain a bit more in mathematics
Which students saw more change than others?	

What we've learned

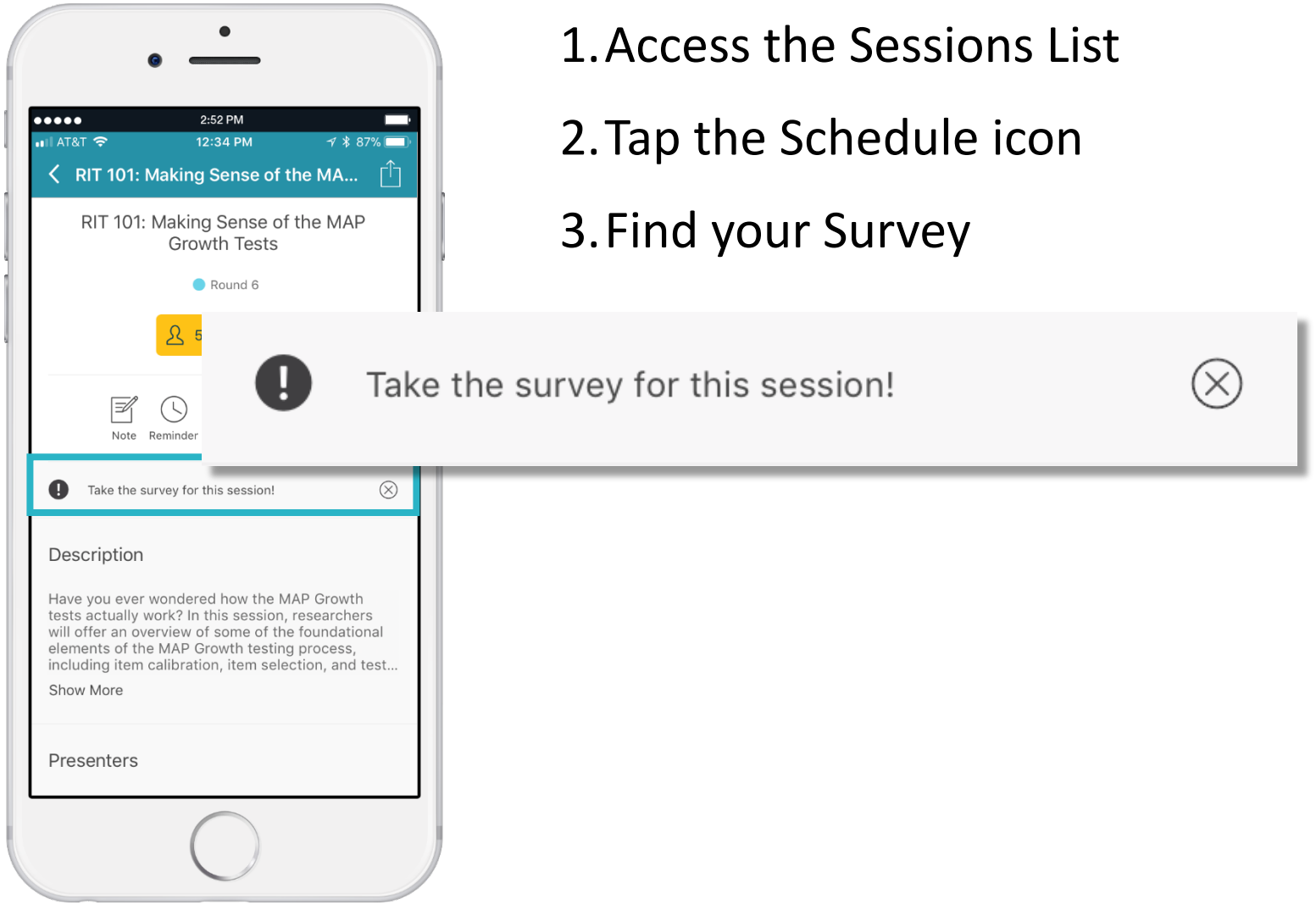
Research question	Results
How much summer change did we see?	Most of our students changed very little. Average change was ~ +1 RIT Most cohorts saw about the same change About 1/5 of our students saw substantial losses About 1/3 of our students saw substantial gains
Which students saw more change than others?	Extreme test durations don't account for substantial summer change

How to help students retain or increase achievement over the summer

- Summer homework
- Summer school
- Cross grade level communication between teachers


THANK
YOU

Take the survey



1. Access the Sessions List
2. Tap the Schedule icon
3. Find your Survey