CPI
Cumulative Promotion Index
Estimation of Perspective Graduation Rates

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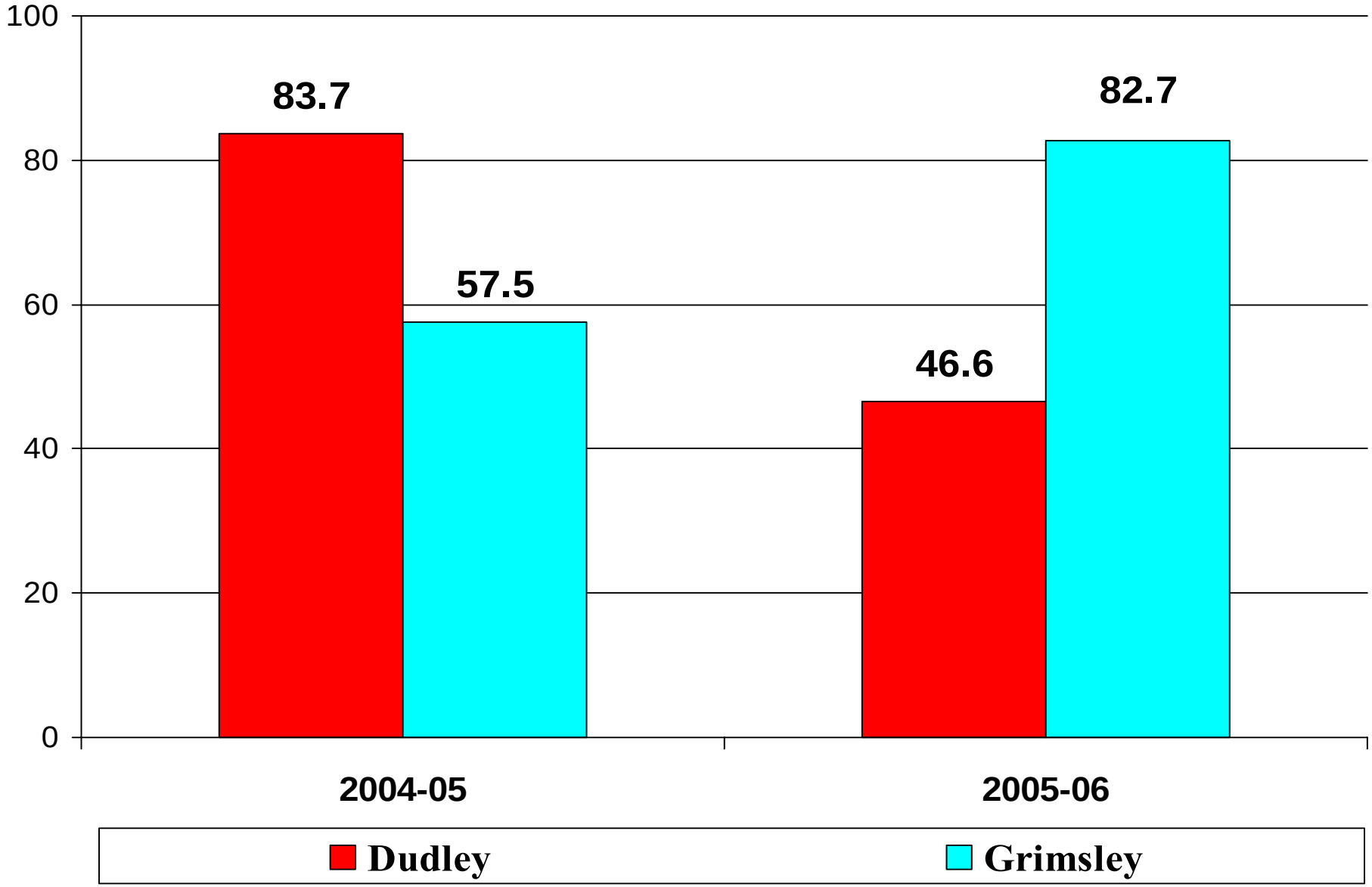
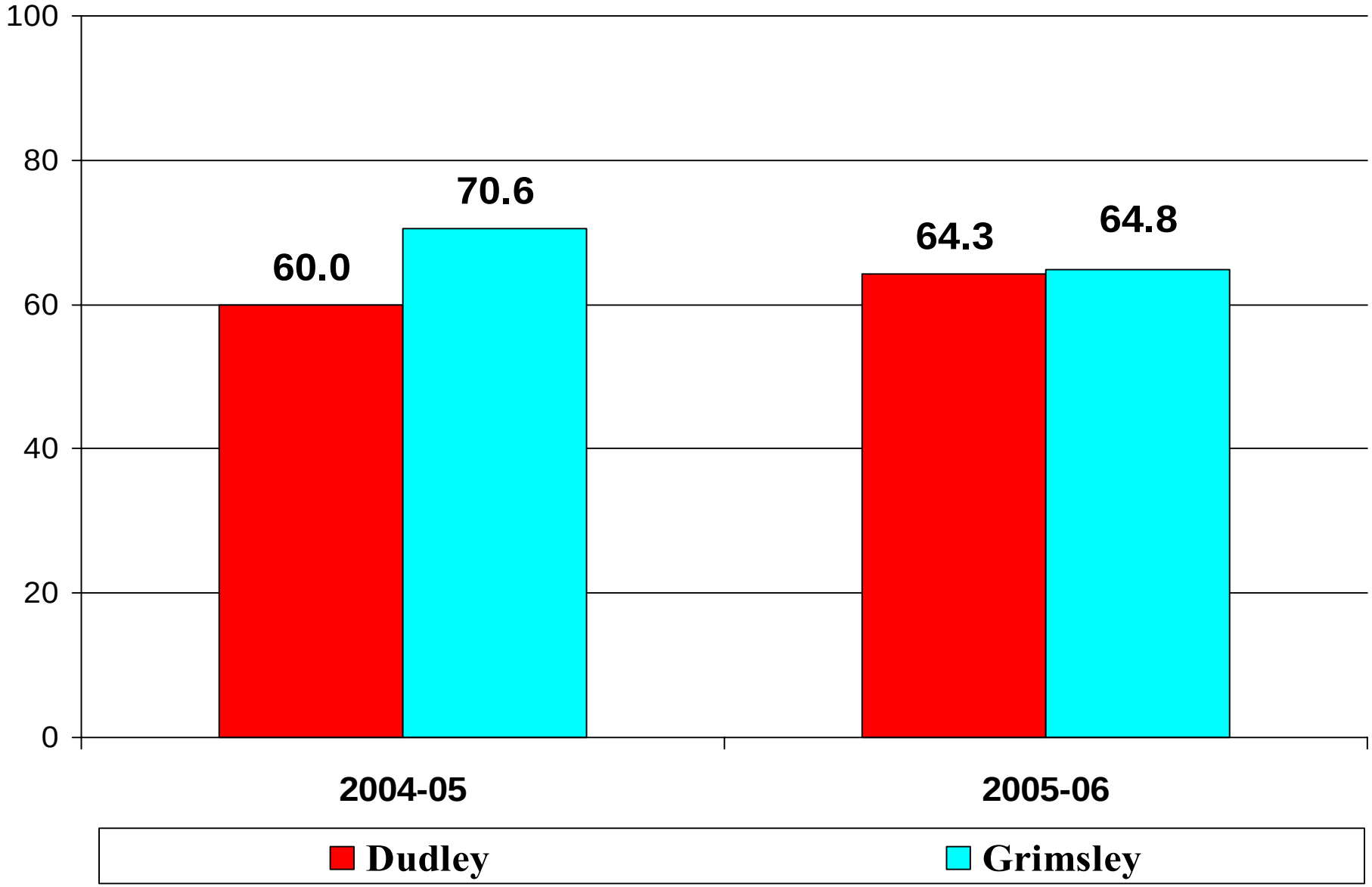
CPIs of Dudley and Grimsley: 2004-05 and 2005-06



True CPIs of Dudley and Grimsley: 2004-05 and 2005-06



Cumulative Promotion Index (CPI)

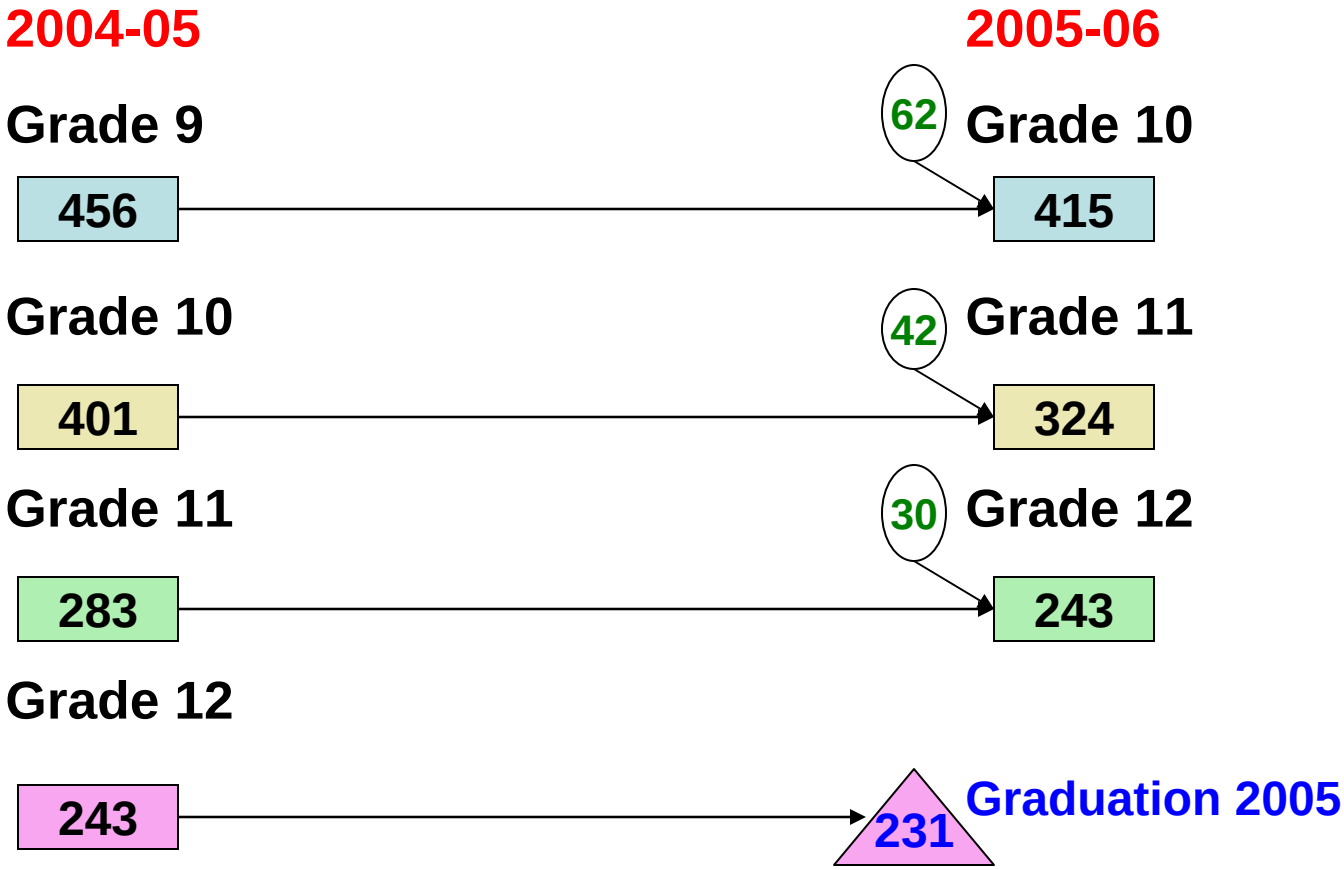
- **CPI is used by Harvard Civil Rights Project to estimate the chance (probability) of graduation with a regular diploma for an average high school student at a school or an LEA.**
- **It combines overall promotional/successful rates of students from grade 9 to 10, grade 10 to 11, grade 11 to 12, and from grade 12 to graduation with a regular diploma at a school or an LEA.**

$$CPI06 = \frac{NE_{G10_2006\text{-}07}}{NE_{G9_2005\text{-}06}} * \frac{NE_{G11_2006\text{-}07}}{NE_{G10_2005\text{-}06}} * \frac{NE_{G12_2006\text{-}07}}{NE_{G11_2005\text{-}06}} * \frac{NG_{2005\text{-}06}}{NE_{G12_2005\text{-}06}}$$

Cumulative Promotion Index (CPI) Method

Four cohorts - One year distance/Two data points

Forward Estimation



2005 CPI:

87.3

$$\frac{(415+62)}{456} \star \frac{(324+42)}{401} \star \frac{(243+30)}{283} \star \frac{231}{243} = \frac{456}{456} \star \frac{366}{401} \star \frac{273}{283} \star \frac{231}{243}$$

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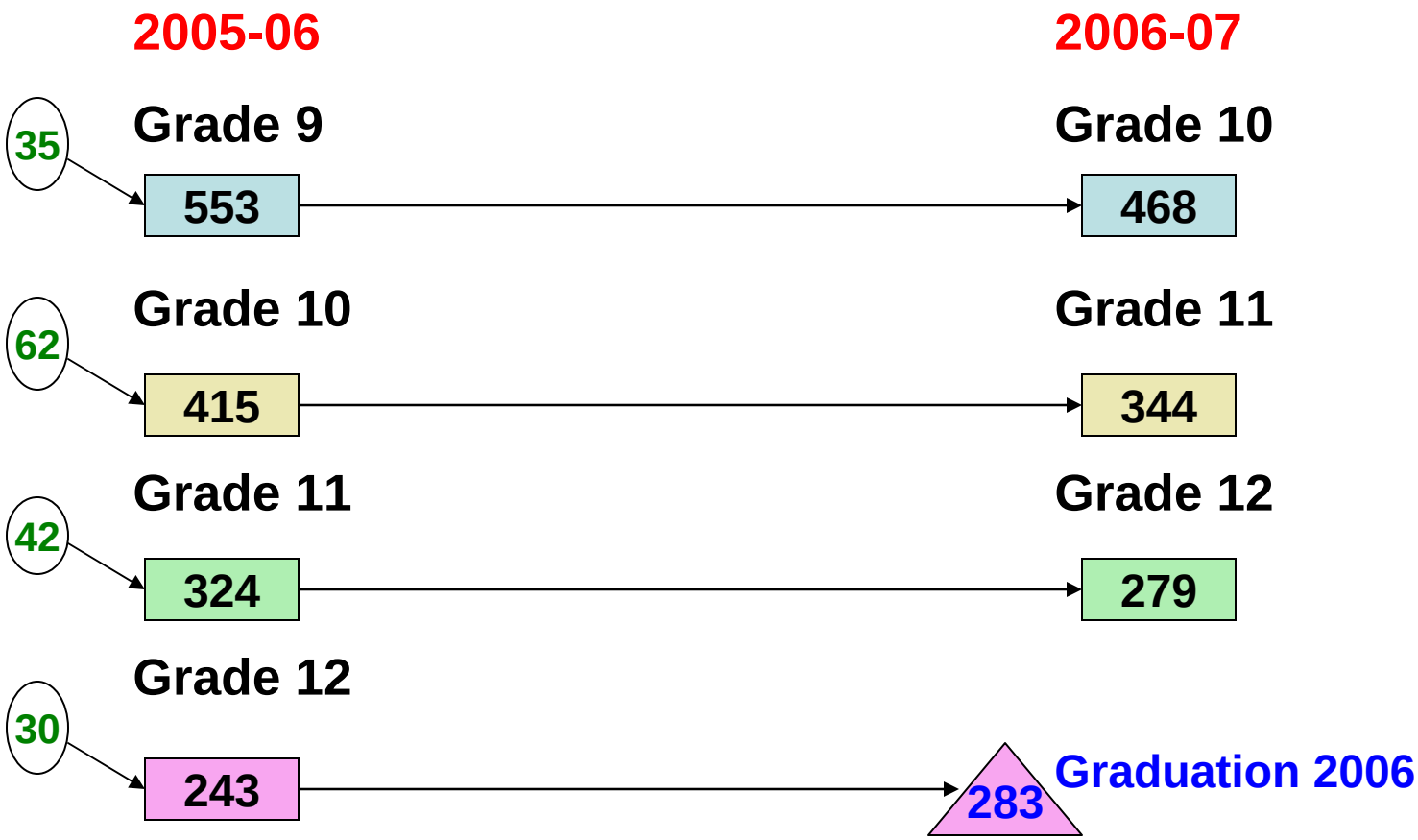
Forward Estimation



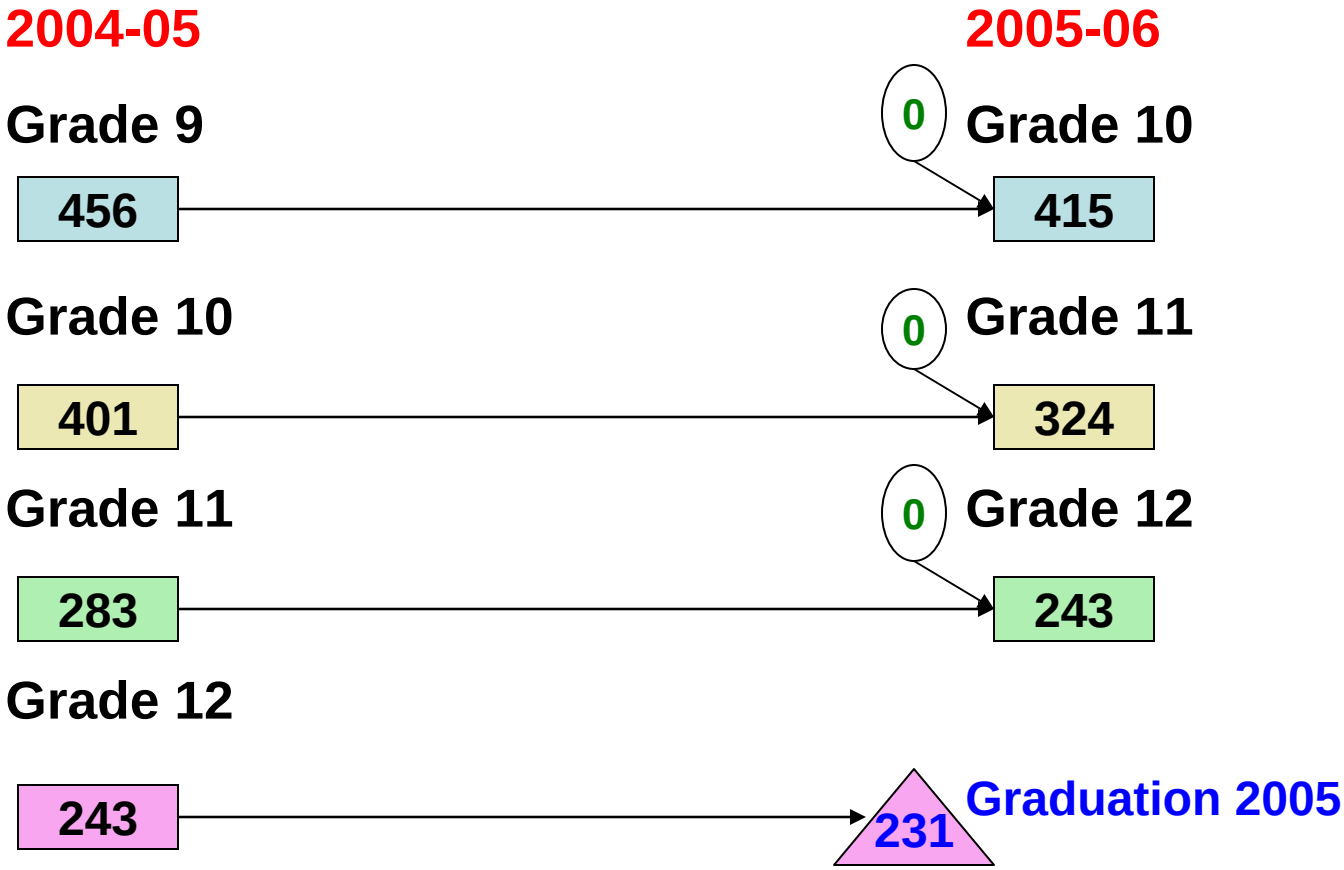
2006 CPI: 46.6

$$\frac{(468+0)}{(553+35)} \star \frac{(344+0)}{(415+62)} \star \frac{(279+0)}{(324+42)} \star \frac{283}{(243+30)} = \frac{468}{588} \star \frac{344}{477} \star \frac{279}{366} \star \frac{273}{273}$$

True Cumulative Promotion Index (CPI) Method

Four cohorts - One year distance/Two data points

Forward Estimation



2005 CPI:

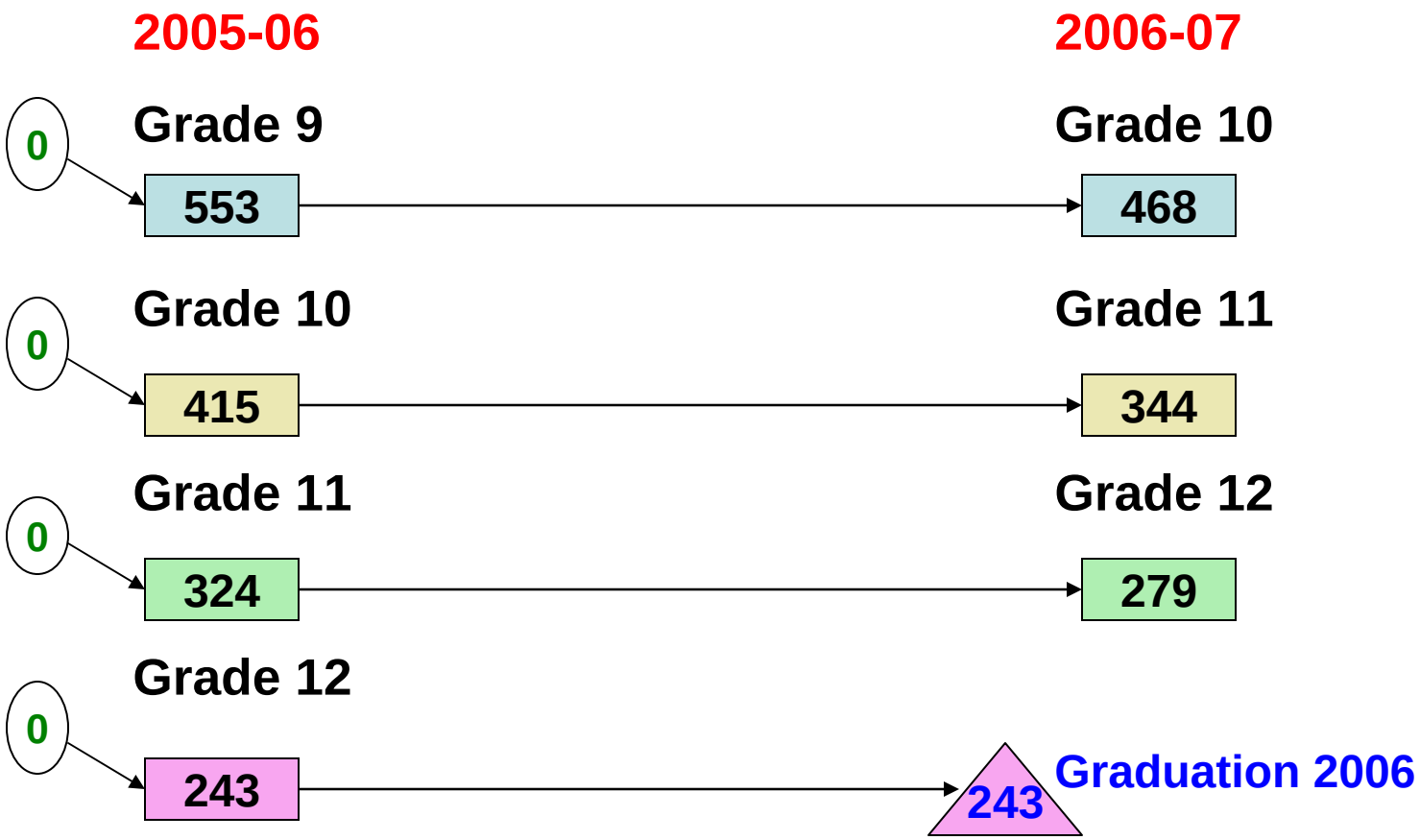
60.0

$$\frac{(415+0)}{456} \star \frac{(324+0)}{401} \star \frac{(243+0)}{283} \star \frac{231}{243} = \frac{415}{456} \star \frac{324}{401} \star \frac{243}{283} \star \frac{231}{243}$$

True Cumulative Promotion Index (CPI) Method

Four cohorts - One year distance/Two data points

Forward Estimation



2006 CPI: 64.3

$$\frac{468}{(553+0)} \star \frac{344}{(415+0)} \star \frac{279}{(324+0)} \star \frac{243}{(243+0)} = \frac{468}{553} \star \frac{344}{415} \star \frac{279}{324} \star \frac{243}{243}$$

Dudley Graduation Rate: 2004-05 and 2005-06

			With RD				Without RD		
			Rate	Enrollment	RD_2005-06*	Next year Enrollment	Enrollment	Next year Enrollment	Rate
	2005	GR05	83.70	.	.	.	.	.	60.03
DUDLEY HIGH	2005	9	1.0000	456	G10: 62	(415+62=477)456	456	415	0.9101
DUDLEY HIGH	2005	10	0.9127	401	G11: 42	324+42=366	401	324	0.8080
DUDLEY HIGH	2005	11	0.9647	283	G12: 30	243+30=273	283	243	0.8587
DUDLEY HIGH	2005	12	0.9506	243	.	GD:231	243	GD:231	0.9506
	2006	GR06	46.58	.	.	.	.	.	64.31
DUDLEY HIGH	2006	9	0.7959	553+35=588	G9: 35	468	553	468	0.8463
DUDLEY HIGH	2006	10	0.7212	415+62=477	G10: 62	344	415	344	0.8289
DUDLEY HIGH	2006	11	0.8115	324+42=366	G11: 42	297	324	297	0.9167
DUDLEY HIGH	2006	12	1.0000	243+30=273	G12: 30	GD: (283) 273	243	GD: (283) 243	1.0000

* A total 169 students added to Dudley in 2005-06: 128 from Grimsley and 41 from Southeast.

ESTGR05 = ((415+41)/456))*((324+42)/401))*((243+30)/283))* (231/243) = 83.70%

Without RD: ESTGR05 = (415/456)* (324/401)* (243/283)* (231/243) = 60.03%

ESTGR06 = (468/(553+35))*(344/(415+62))* (297/(324+42))* (273/(243+30)) = 46.58%

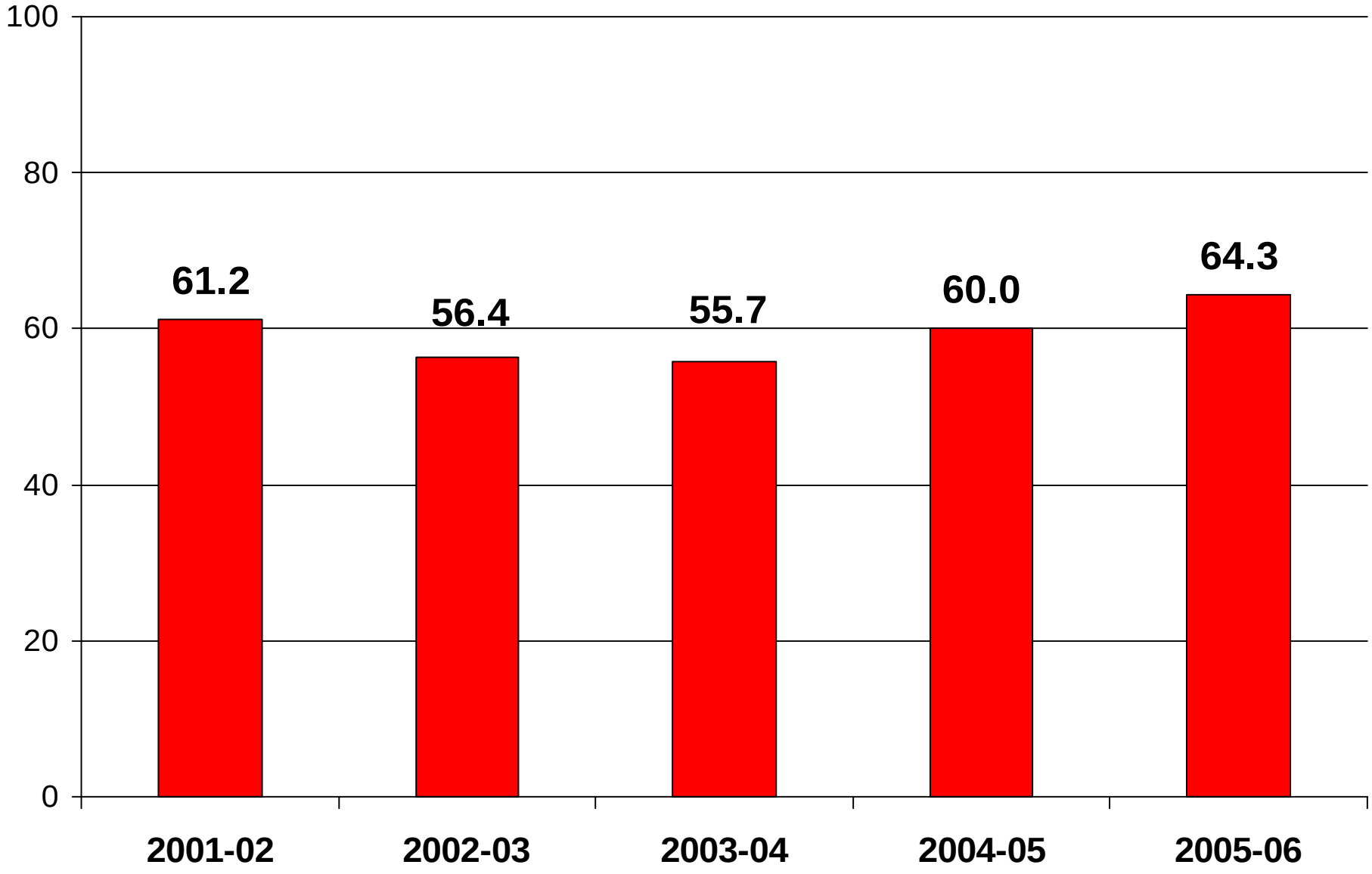
Without RD: ESTGR06 = (468/553)* (344/415)* (297/324)* (243/243) = 64.31%

Grimsley Graduation Rate: 2004-05 and 2005-06

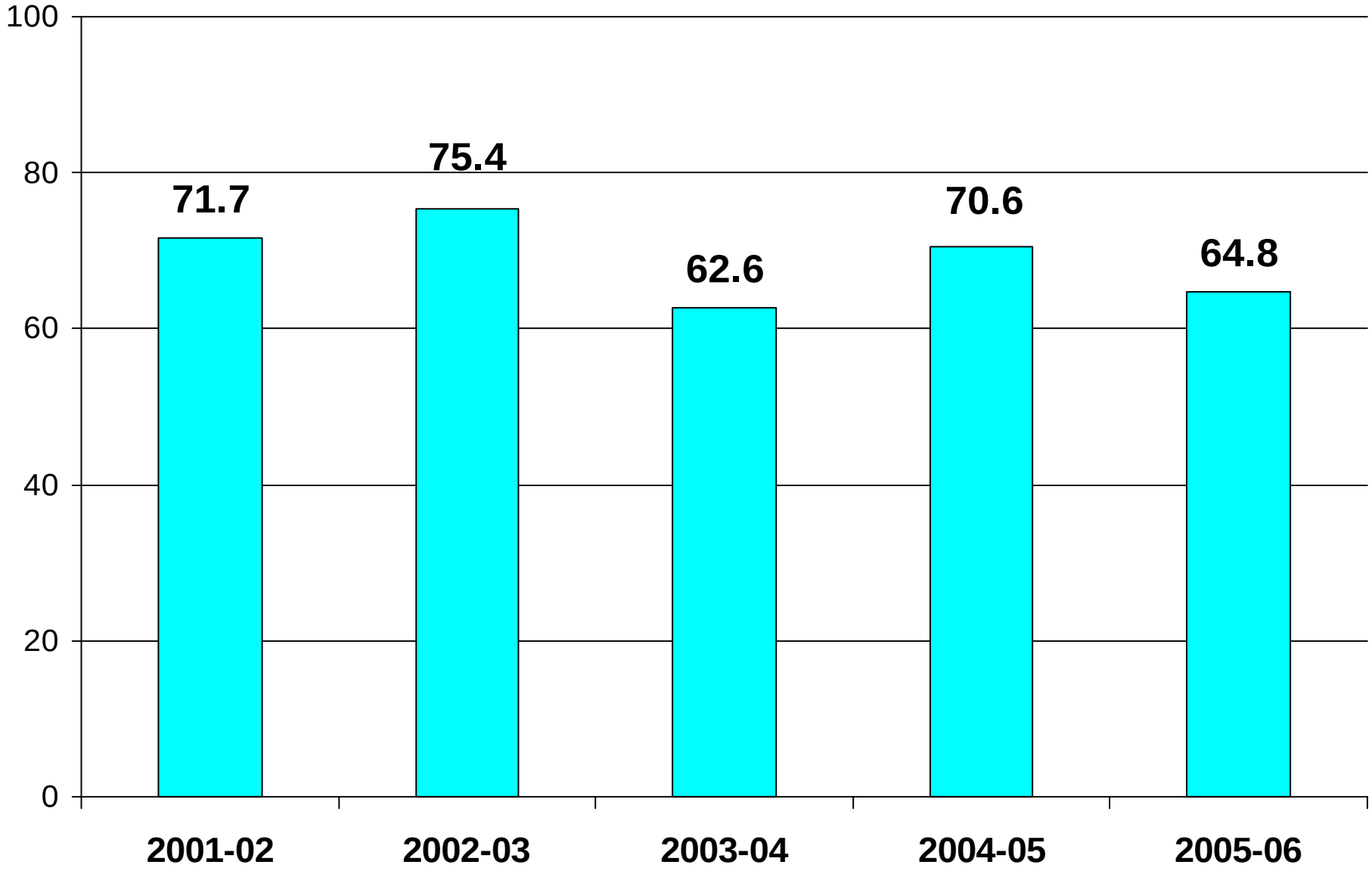
			With RD				Without RD		
			Rate	Enrollment	RD_2005-06*	Next year Enrollment	Enrollment	Next year Enrollment	Rate
	2005	GR05	57.54	.	.	.	.	.	70.61
Grimsley High	2005	9	0.7907	540	G10: 49	427	540	476	0.8815
Grimsley High	2005	10	0.8021	475	G11: 31	381	475	412	0.8674
Grimsley High	2005	11	0.9825	399	G12: 20	392	399	(412) 399	1.0000
Grimsley High	2005	12	0.9235	379	.	GD: 350	379	GD: 350	0.9235
	2006	GR06	82.67	.	.		.	.	64.83
Grimsley High	2006	9	0.9321	486	G9: 28	450	514	450	0.8755
Grimsley High	2006	10	0.9259	427	G10: 49	421	476	421	0.8845
Grimsley High	2006	11	0.9859	381	G11: 31	381	412	381	0.9248
Grimsley High	2006	12	1.0000	392	G12: 20	GD: 355	412	GD: 373 adj.	0.9053

* A total of 128 students moved to Dudley in 2005-06.

CPIs of Dudley: 2001-02 and 2005-06



CPIs of Grimsley: 2001-02 and 2005-06



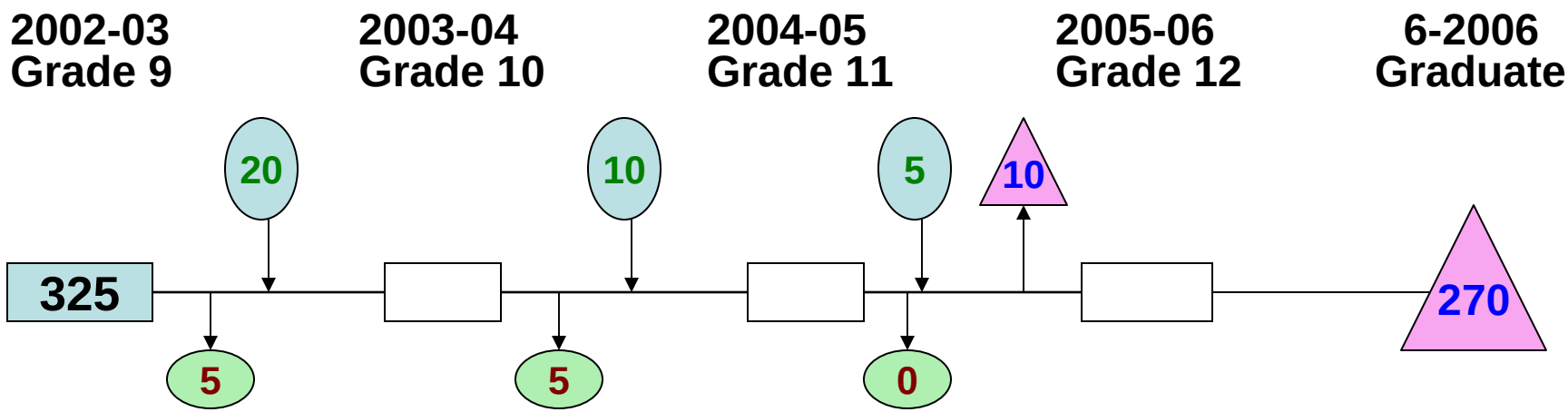
Summary

- **CPI only needs two data points with one year distance. When the data of tracking all four years' detailed enrollment situation for every high school student is not available, CPI becomes a popular method for comparing perspective graduation rates for schools or LEAs, which is far more accurate than NC simple graduation rate used in AYP before 2005-06.**
- **When a school or an LEA has a consistent enrollment number over years CPI is a good estimation of graduation rate. When there is a sizable students' enrollment number change for a single year, CPI will not be accurate estimations for previous year and current year. In this case a true CPI, which adjusted the single year's change, should be used.**

9th Grader Cohort Method:

One cohort - Four years/Many data points

Backward Calculation

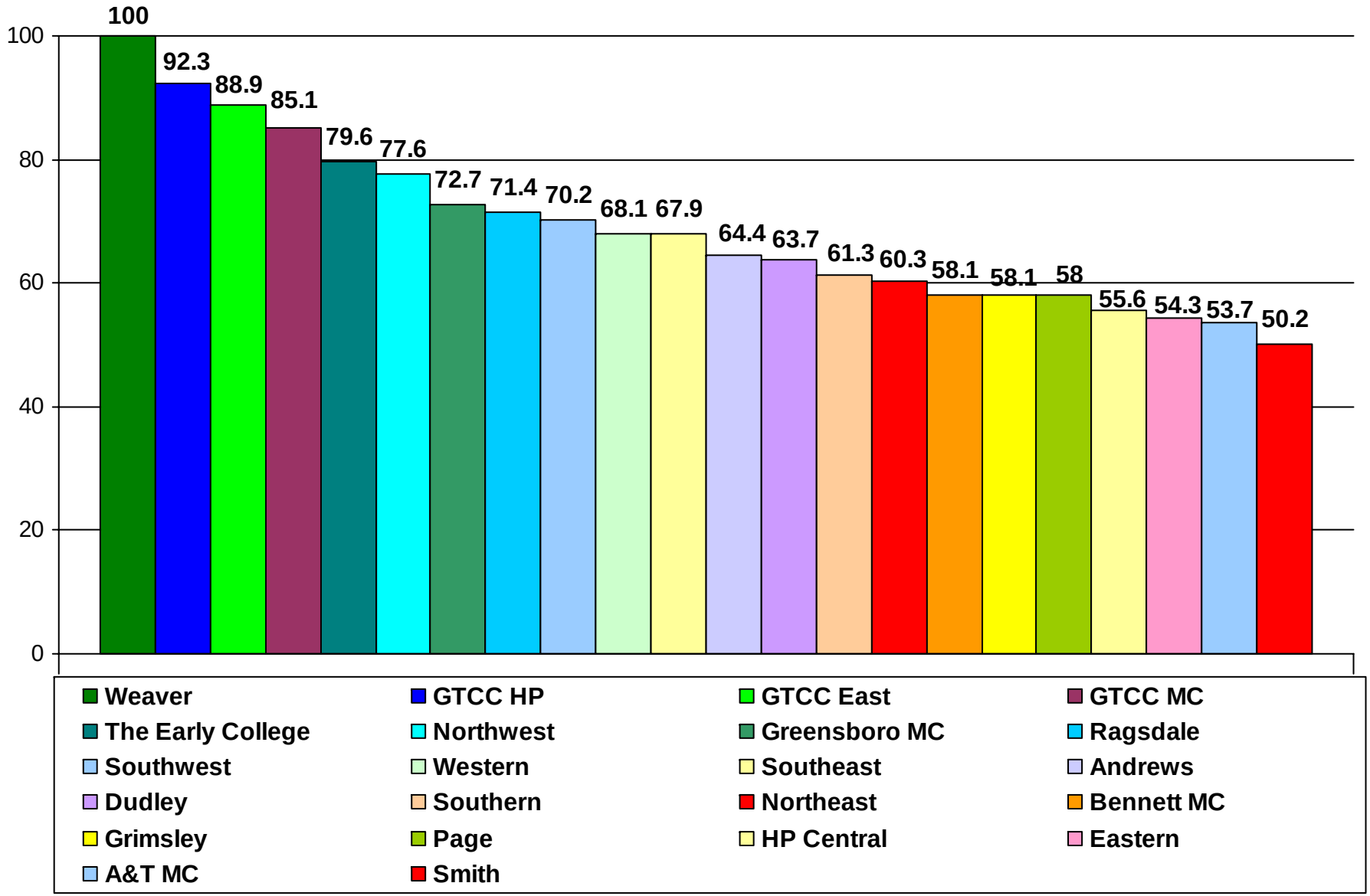


Graduation Rate 2006: 80.0%

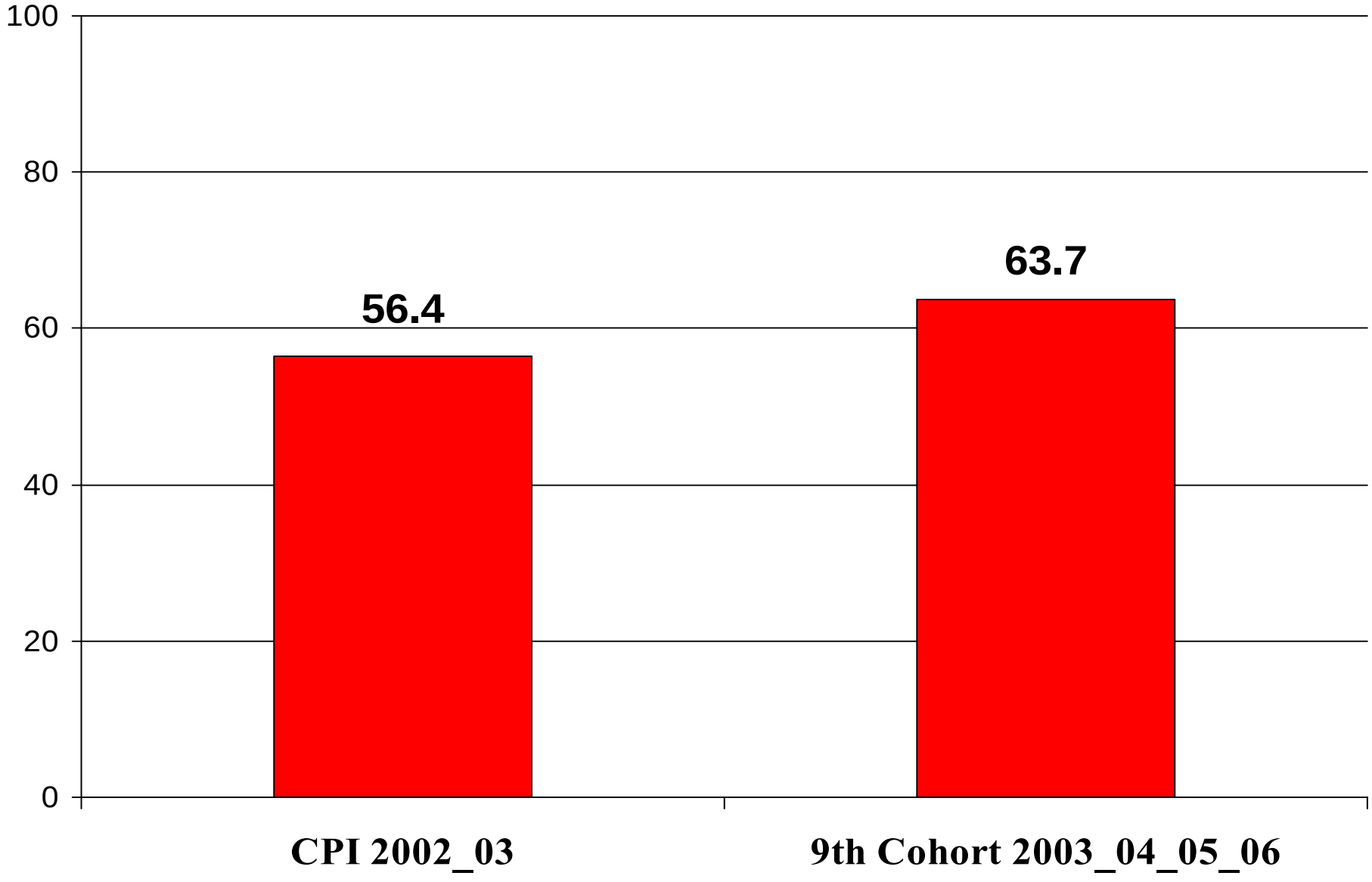
$$\frac{270 + 10}{325+(20+10+5)-(5+5+0)} = \frac{280}{350}$$

* **By December 15, 2006, there are 7,500 seniors' records could not be verified by DPI, and another 10,000 seniors in the file but DPI data showed that they did not attend schools in 2005-06 – 17,500 is about 25% of the total number of seniors in the State!**

Graduation Rate of 2006: 9th Cohort Method



Dudley Graduation Rate: 2005-06



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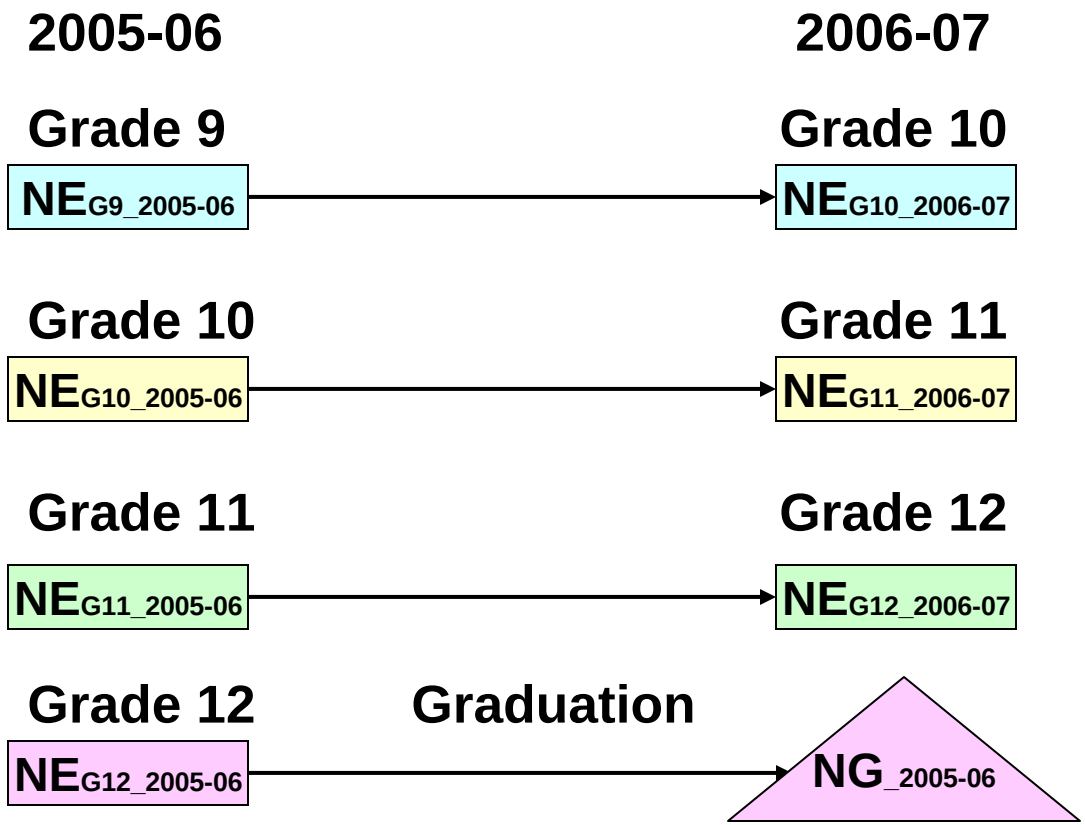

$$CPI06 = \frac{NE_{G10_2006\text{-}07}}{NE_{G9_2005\text{-}06}} * \frac{NE_{G11_2006\text{-}07}}{NE_{G10_2005\text{-}06}} * \frac{NE_{G12_2006\text{-}07}}{NE_{G11_2005\text{-}06}} * \frac{NG_{2005\text{-}06}}{NE_{G12_2005\text{-}06}}$$

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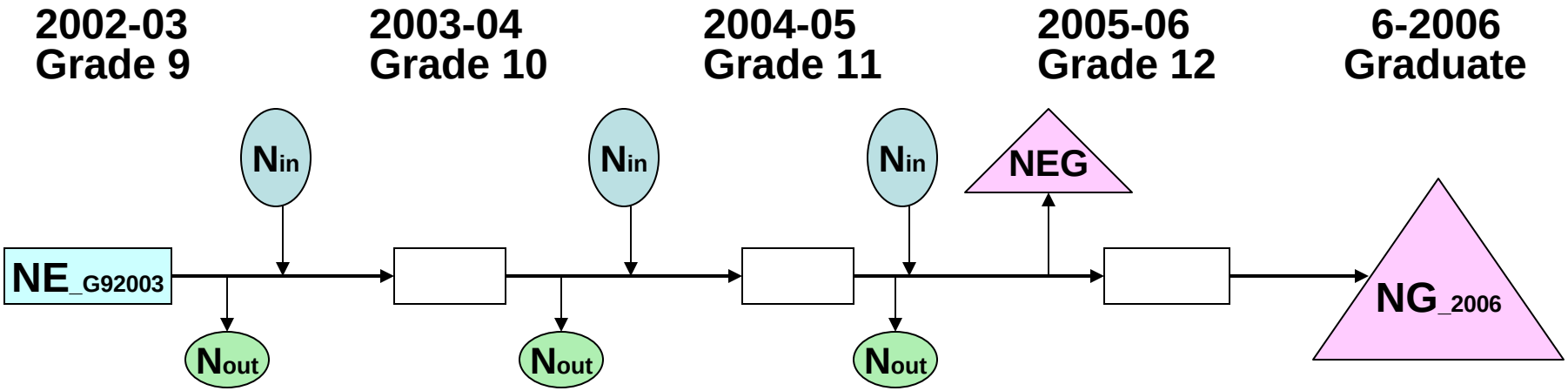

$$\frac{N_EarlyGd_{G9_2003cohort} + N_Gd_{G9_2003cohort}}{N_{}_{20thdayenrollment_G9_2003cohort} + N_{}_{moving_in_G9_2003cohort} - N_{}_{death/moving_out_G9_2003cohort}}$$