

# Beginning Teacher Attrition and Mobility: Results From the First Through Third Waves of the 2007–08 Beginning Teacher Longitudinal Study

**First Look**





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Beginning Teacher Longitudinal Study

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**Ashley Kaiser**

Education Statistics Services Institute  
MacroSys, LLC

**Freddie Cross**

*Project Officer*  
National Center for Education Statistics

**U.S. Department of Education**

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*Secretary*

**Institute of Education Sciences**

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*Director*

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**Content Contact**

Freddie Cross  
(202) 502-7489  
[freddie.cross@ed.gov](mailto:freddie.cross@ed.gov)

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## Introduction

While the National Center for Education Statistics (NCES) has conducted surveys of attrition and mobility among school teachers for two decades, little was known specifically about the early career patterns of beginning teachers. In order to inform discussions and decisions among policymakers, researchers, and parents, the Beginning Teacher Longitudinal Study (BTLS), sponsored by NCES of the Institute of Education Sciences within the U.S. Department of Education, was initiated as a longitudinal study of public school teachers who began teaching in 2007 or 2008.<sup>1</sup> This report is a first look at data from the first three waves of data collection.

The objective of the BTLS is to obtain a better understanding of the career paths of beginning teachers. In pursuit of this objective, the BTLS examines the characteristics and attitudes (e.g. teacher satisfaction) of those who stay in the teaching profession and those who leave. Demographic information and data about the teaching profession (e.g., professional development, working conditions) and job satisfaction are collected.

Data were collected by the Census Bureau in the 2007–08, 2008–09, and 2009–10 school years and are being released as the BTLS First Through Third Wave Preliminary Data File.<sup>2</sup> The BTLS is expected to continue for a minimum of five waves. Data collection for the first wave of BTLS was part of the 2007–08 Schools and Staffing Survey (SASS), which began in August 2007 and ended in June 2008. The approximately 1,990 first-year public school teachers who completed the 2007–08 SASS comprise the cohort being followed in the BTLS.<sup>3</sup> Data collection for the second wave was conducted together with the 2008–09 Teacher Follow-up Survey (TFS), which began in February 2009 and ended in August 2009; and data collection for the third wave began in January 2010 and ended in June 2010. Sample members who did not respond during the second wave were asked selected second wave items during the third wave. These respondents are referred to as retrospective respondents. Although each collection contained a telephone follow-up, the information was collected primarily through a mailed paper questionnaire for the first wave and a web instrument for the second and third waves. A paper questionnaire that was used in follow-up efforts was also developed for the second wave.

The overall base-weighted response rate for SASS teachers with 1 to 3 years of experience<sup>4</sup> in 2007–08 was 73 percent. The individual second and third wave base-weighted response rates for the BTLS cohort were 84 percent and 86 percent, respectively. More information about the response rates for each wave and the bias analysis conducted for the first through third waves of BTLS can be found in appendix B and Tourkin et al. (forthcoming).

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<sup>1</sup> Teachers were asked for the calendar year, not the academic year, in which they first began teaching.

<sup>2</sup> For more information about the preliminary nature of this data file, please refer to the Reliability of Data section in appendix B.

<sup>3</sup> Note that 1,990 is an unweighted count of respondents. More information about the survey design can be found in Tourkin et al. (forthcoming).

<sup>4</sup> Whether or not a teacher was a first-year teacher was not known prior to the collection of the SASS teacher data, only whether each teacher was reported to have 1 to 3 years of experience, 4 to 19 years, or 20 or more years of teaching experience.



The purpose of this report is to introduce new NCES data through the presentation of tables containing descriptive information. Only selected findings are presented and not all differences in the tables are discussed in the text. In this report, stayers are teachers who were teaching in the same school in the year of data collection as in the previous year. Movers are teachers who were teaching at a different school in the year of data collection from the previous year. Returners are teachers who were teaching in the year of data collection, but were not teaching in the previous school year. Current teachers include stayers in all years, movers in 2008–09 and 2009–10, and returners in 2009–10. Leavers, also called former teachers, are teachers who were not teaching in the year of data collection. The findings were chosen to demonstrate the range of information available from the BTLS; they were not selected to emphasize any particular issue.

Table 1 examines teacher status (current/former) by year of data collection. Tables 2 and 3 examine teacher and school characteristics, by year of data collection and teacher status (current/former). Table 4 examines teacher status (stayer/mover/leaver/returner) by year of data collection, and table 5 reports on contract renewal status for leavers and movers, by year of data collection. The following variables were used in this report: age, whether a teacher was assigned a mentor, base salary, certification type, class organization, community type, whether a mover teacher's contract was not renewed, whether a leaver teacher's contract was not renewed, current/former status, whether a teacher entered teaching through an alternative certification program, full- or part-time teaching status, highest degree earned, occupational status, percent of K–12 students who were approved/eligible for free or reduced-price lunches, race/ethnicity, school level, sex, stayer/mover/leaver/returner status, and type of move between schools. More information about each variable can be found in appendix C of this report.

The tables in this report contain percentages reflecting bivariate associations between variables. All estimates have been weighted to produce national estimates. Comparisons mentioned in the selected findings have been tested for statistical significance at the .05 level using two-tailed Student's *t* statistics to ensure that the differences are larger than those that might be expected due to random sampling variation. No adjustments were made for multiple comparisons. Many of the variables are related to one another, and complex interactions and relationships have not been explored.

More information about BTLS can be found at <http://nces.ed.gov/surveys/btls/>.

## Selected Findings

- Of the teachers who began teaching in public schools in 2007 or 2008, about 10 percent were not teaching in 2008–09, and 12 percent were not teaching in 2009–10 (table 1).
- Among beginning public school teachers who were assigned a mentor in 2007–08, about 8 percent were not teaching in 2008–09 and 10 percent were not teaching in 2009–10. In contrast, among the beginning public school teachers who were not assigned a mentor in 2007–08, about 16 percent were not teaching in 2008–09 and 23 percent were not teaching in 2009–10 (table 2).
- Approximately 93 percent of beginning public school teachers who were earning less than \$40,000 in 2008–09 remained teachers in 2009–10, and about 96 percent of beginning public school teachers who were earning \$40,000 or more in 2008–09 remained teachers in 2009–10 (table 3).
- Of the beginning public school teachers, about 74 percent were teaching in the same school in 2009–10 as in the previous school year (stayers), about 10 percent were teaching in a different school in 2009–10 than the previous school year (movers), about 3 percent had returned to teaching in 2009–10 after a year of not teaching (returners), and about 12 percent were not teaching in 2009–10 (table 4).
- Approximately 21 percent of 2008–09 movers and 27 percent of 2009–10 movers moved across schools because their contract was not renewed. About 31 percent of 2008–09 leavers and 35 percent of 2009–10 leavers left the teaching profession because their contract was not renewed (table 5).

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## **Estimate Tables**

Table 1. Percentage distribution of 2007–08 beginning public school teachers, by teacher status: 2007–08 through 2009–10

Year	Teacher status	
	Current	Former
2007–08 <sup>1</sup>	100.0	†
2008–09 <sup>2</sup>	90.1	9.9
2009–10	87.5	12.5

† Not applicable.

<sup>1</sup> BTLS teachers began teaching in either 2007 or 2008.

<sup>2</sup> These estimates include those who provided 2008–09 data during the 2009–10 data collection.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

Table 2. Percentage distribution of 2007–08 beginning public school teachers, by teacher status and selected 2007–08 teacher and school characteristics: 2008–09 and 2009–10

Selected teacher or school characteristic in 2007–08	2008–09 teacher status <sup>1</sup>			2009–10 teacher status		
	Total	Current	Former	Total	Current	Former
<b>Age</b>						
Less than 30 years	100.0	91.3	8.7	100.0	90.0	10.0
30 or more years	100.0	87.1	12.9	100.0	81.0	19.0
<b>Sex</b>						
Male	100.0	87.9	12.1	100.0	86.4	13.6
Female	100.0	90.8	9.2	100.0	87.9	12.1
<b>Race/ethnicity</b>						
White, non-Hispanic	100.0	90.0	10.0	100.0	87.8	12.2
All other races/ethnicities <sup>2</sup>	100.0	90.3	9.7	100.0	86.6	13.4!
<b>Base salary</b>						
Less than \$40,000	100.0	87.5	12.5	100.0	87.0	13.0
\$40,000 or more	100.0	96.6	3.4!	100.0	89.0	11.0!
<b>Teaching status</b>						
Full time	100.0	91.3	8.7	100.0	88.1	11.9
Part time	100.0	75.5	24.5	100.0	80.6	19.4!
<b>Highest degree earned</b>						
Less than a bachelor's degree	100.0	67.6	32.4	100.0	78.6	21.4!
Bachelor's degree	100.0	91.4	8.6	100.0	88.4	11.6
Master's degree	100.0	89.1	10.9	100.0	88.2	11.8
Higher than a master's degree <sup>3</sup>	100.0	52.2!	47.8!	100.0	48.8	51.2!
<b>Assigned a mentor in 2007–08<sup>4</sup></b>						
Yes	100.0	91.6	8.4	100.0	90.2	9.8
No	100.0	83.7	16.3	100.0	77.5	22.5
<b>Entered teaching through an alternative certification program<sup>5</sup></b>						
Yes	100.0	90.1	9.9	100.0	87.8	12.2
No	100.0	90.1	9.9	100.0	87.4	12.6
<b>Certification type<sup>6</sup></b>						
Regular teaching certificate	100.0	90.9	9.1	100.0	87.7	12.3
Other certificate	100.0	88.4	11.6	100.0	87.2	12.8

See notes at end of table.

Table 2. Percentage distribution of 2007–08 beginning public school teachers, by teacher status and selected 2007–08 teacher and school characteristics: 2008–09 and 2009–10—Continued

Selected teacher or school characteristic in 2007–08	2008–09 teacher status <sup>1</sup>			2009–10 teacher status		
	Total	Current	Former	Total	Current	Former
<b>Class organization</b>						
Departmentalized instruction	100.0	90.3	9.7	100.0	87.3	12.7
Elementary subject specialist	100.0	87.4	12.6!	100.0	85.8	14.2!
Self-contained class	100.0	89.7	10.3	100.0	87.9	12.1
Team teaching	100.0	92.6	‡	100.0	92.8	‡
"Pull-out" class or "push-in" instruction	100.0	90.4	9.6!	100.0	85.3	14.7!
<b>School level</b>						
Elementary	100.0	90.4	9.6	100.0	89.5	10.5
Secondary	100.0	89.8	10.2	100.0	85.8	14.2
Combined	100.0	88.3	11.7!	100.0	78.4	21.6
<b>Community type</b>						
City/suburban	100.0	91.5	8.5	100.0	88.9	11.1
Town/rural	100.0	88.1	11.9	100.0	85.7	14.3
<b>Percent of K-12 students who were approved for free or reduced-price lunches</b>						
Less than 50 percent	100.0	90.4	9.6	100.0	89.4	10.6
50 percent or more	100.0	90.3	9.7	100.0	85.9	14.1
School did not participate in free or reduced-price lunch program	100.0	78.1	21.9!	100.0	72.6	27.4!

! Interpret data with caution. The standard error for this estimate is equal to 30 percent or more of the estimate's value.

‡ Reporting standards not met.

<sup>1</sup> These estimates include those who provided 2008–09 data during the 2009–10 data collection.

<sup>2</sup> All other races/ethnicities includes Black, not Hispanic or Latino; Hispanic or Latino, of any race; American Indian or Alaska Native, not Hispanic or Latino; Asian, not Hispanic or Latino; Native Hawaiian or Other Pacific Islander, not Hispanic or Latino; and two or more races, not Hispanic or Latino.

<sup>3</sup> Higher than a master's degree is defined as teachers who completed any of the following: an educational specialist or professional diploma, a certificate of advanced graduate studies, or a doctorate or first professional degree.

<sup>4</sup> Data for this item were collected in 2008–09 and do not include 2008–09 nonrespondents. Data are not available for 0.7 percent of 2009–10 respondents because they did not respond in 2008–09.

<sup>5</sup> An alternative program is a program that was designed to expedite the transition of nonteachers to a teaching career; for example, a state, district, or university alternative certification program.

<sup>6</sup> Regular teaching certificate includes teachers with a regular or standard state certificate or advanced professional certificate, as well as teachers holding a certificate issued after satisfying all requirements except the completion of a probationary period, regardless of other certifications held. Other certificate includes teachers who did not hold a regular certificate in the state, including those with a certificate that requires some additional coursework, student teaching, or passage of a test before regular certification can be obtained and teachers with a certificate issued to persons who must complete a certification program in order to continue teaching.

NOTE: Detail may not sum to totals because of rounding and because some data are not shown.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

Table 3. Percentage distribution of 2007–08 beginning public school teachers who were teaching in 2008–09, by teacher status and selected 2008–09 teacher and school characteristics: 2009–10

Selected teacher or school characteristic in 2008–09	Total	2009–10 teacher status	
		Current	Former
Total	100.0	94.2	5.8
Base salary			
Less than \$40,000	100.0	93.2	6.8
\$40,000 or more	100.0	95.6	4.4!
Teaching status			
Full time	100.0	94.2	5.8
Part time	100.0	90.5	†
Assigned a mentor in 2008–09			
Yes	100.0	92.9	7.1
No	100.0	94.8	5.2
Class organization			
Departmentalized instruction	100.0	92.2	7.8
Elementary subject specialist	100.0	98.0	†
Self-contained class	100.0	96.2	3.8!
Team teaching	100.0	99.2	†
"Pull-out" class or "push-in" instruction	100.0	95.8	†
Community type <sup>1</sup>			
City/suburban	100.0	94.2	5.8!
Town/rural	100.0	94.2	5.8
Percent of K-12 students who were approved for free or reduced-price lunches <sup>1</sup>			
Less than 50 percent	100.0	96.9	3.1
50 percent or more	100.0	93.0	7.0
School did not participate in free or reduced-price lunch program	100.0	75.1	†

! Interpret data with caution. The standard error for this estimate is equal to 30 percent or more of the estimate's values.

† Reporting standards not met.

<sup>1</sup> Cases with missing data are not included in the analysis.

NOTE: These estimates include those who provided 2008–09 data during the 2009–10 data collection. These estimates do not include those whose status was not known in 2008–09 or 2009–10. Detail may not sum to totals because of rounding and because some data are not shown.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLs), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.



Table 4. Percentage distribution of 2007–08 beginning public school teachers, by teacher status, type of move, and occupational status: 2007–08 through 2009–10

Selected status	2007–08	2008–09 <sup>1</sup>	2009–10
Total	100.0	100.0	100.0
Current teachers	100.0	90.1	87.5
Stayers	†	74.3	74.4
Movers	†	15.8	10.4
Moved from one public school to another public school in the same school district	†	6.4	5.2
Moved from one public school district to another public school district	†	8.7	4.5
Other move <sup>2</sup>	†	0.8!	±
Returners	†	†	2.8
Former teachers	†	9.9	12.5
Working in the field of education, but not as a regular K–12 classroom teacher <sup>3</sup>	†	2.8	5.0
Working outside the field of education, including military service	†	1.7	2.4
Other occupational status <sup>4</sup>	†	5.4	5.0

† Not applicable.

! Interpret data with caution. The standard error for this estimate is equal to 30 percent or more of the estimate's value.

± Reporting standards not met.

<sup>1</sup> These estimates include those who provided 2008–09 data during the 2009–10 data collection.

<sup>2</sup> Other move includes moving from a public school to a private school for 2008–09 and moving from a public school to a private school, moving from a private school to a public school, or moving from one private school to another private school for 2009–10.

<sup>3</sup> Working in the field of education, but not as a regular K–12 classroom teacher includes those working for a school or school district in a position in the field of K–12 education, but not as a K–12 classroom teacher and those working in a position in the field of Pre-K or postsecondary education.

<sup>4</sup> Other occupational status includes those who were students at college or university, those caring for family members, retired, disabled, unemployed and seeking work, and other.

NOTE: Detail may not sum to totals because of rounding and because some data are not shown.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

Table 5. Percentage of 2007–08 beginning public school teachers who moved across schools or left the teaching profession, by contract renewal status: 2008–09 and 2009–10

Selected reasons	2008–09 <sup>1</sup>	2009–10 <sup>2</sup>
<b>Movers</b>		
Contract not renewed	20.7	30.6
Moved for reasons other than contract not renewed	79.3	69.4
<b>Leavers</b>		
Contract not renewed	27.4	35.4
Left teaching for reasons other than contract not renewed	72.6	64.6

<sup>1</sup> These estimates do not include those who provided 2008–09 data during the 2009–10 data collection because the item was not asked.

<sup>2</sup> 2009–10 movers and leavers include only teachers who moved to a different school or who left the teaching profession after the 2008–09 school year.

NOTE: Cases with missing data are not included in this analysis. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLs), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

## **Appendix A: Standard Error Tables**

Table A-1. Standard errors for Table 1: Percentage distribution of 2007–08 beginning public school teachers, by teacher status: 2007–08 through 2009–10

Year	Teacher status	
	Current	Former
2007–08	†	†
2008–09	1.14	1.14
2009–10	1.63	1.63

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLs), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

Table A-2. Standard errors for Table 2: Percentage distribution of 2007–08 beginning public school teachers, by teacher status and selected 2007–08 teacher and school characteristics: 2008–09 and 2009–10

Selected teacher or school characteristic in 2007–08	Total	2008–09 teacher status		Total	2009–10 teacher status	
		Current	Former		Current	Former
<b>Age</b>						
Less than 30 years	†	1.25	1.25	†	1.65	1.65
30 or more years	†	3.00	3.00	†	4.21	4.21
<b>Sex</b>						
Male	†	3.03	3.03	†	3.35	3.35
Female	†	1.23	1.23	†	1.79	1.79
<b>Race/ethnicity</b>						
White, non-Hispanic	†	1.30	1.30	†	1.59	1.59
All other races/ethnicities	†	2.86	2.86	†	4.44	4.44
<b>Base salary</b>						
Less than \$40,000	†	1.51	1.51	†	1.81	1.81
\$40,000 or more	†	1.15	1.15	†	3.58	3.58
<b>Teaching status</b>						
Full time	†	1.23	1.23	†	1.70	1.70
Part time	†	6.44	6.44	†	6.47	6.47
<b>Highest degree earned</b>						
Less than a bachelor's degree	†	9.39	9.39	†	9.12	9.12
Bachelor's degree	†	1.32	1.32	†	2.04	2.04
Master's degree	†	3.03	3.03	†	2.89	2.89
Higher than a master's degree	†	17.74	17.74	†	16.87	16.87
<b>Assigned a mentor in 2007–08</b>						
Yes	†	1.15	1.15	†	1.46	1.46
No	†	3.30	3.30	†	5.18	5.18
<b>Entered teaching through an alternative certification program</b>						
Yes	†	2.78	2.78	†	2.76	2.76
No	†	1.36	1.36	†	1.94	1.94
<b>Certification type</b>						
Regular teaching certificate	†	1.50	1.50	†	2.03	2.03
Other certificate	†	2.20	2.20	†	2.50	2.50

See notes at end of table.

Table A-2. Standard errors for Table 2: Percentage distribution of 2007–08 beginning public school teachers, by teacher status and selected 2007–08 teacher and school characteristics: 2008–09 and 2009–10—Continued

Selected teacher or school characteristic in 2007–08	2008–09 teacher status			2009–10 teacher status		
	Total	Current	Former	Total	Current	Former
<b>Class organization</b>						
Departmentalized instruction	†	1.67	1.67	†	2.09	2.09
Elementary subject specialist	†	6.05	6.05	†	6.92	6.92
Self-contained class	†	2.30	2.30	†	3.25	3.25
Team teaching	†	5.24	†	†	5.25	†
"Pull-out" class or "push-in" instruction	†	3.89	3.89	†	5.59	5.59
<b>School level</b>						
Elementary	†	1.65	1.65	†	2.33	2.33
Secondary	†	2.09	2.09	†	2.22	2.22
Combined	†	3.59	3.59	†	4.69	4.69
<b>Community type</b>						
City/suburban	†	1.53	1.53	†	2.30	2.30
Town/rural	†	1.97	1.97	†	2.02	2.02
<b>Percent of K-12 students who were approved for free or reduced-price lunches</b>						
Less than 50 percent	†	1.79	1.79	†	2.17	2.17
50 percent or more	†	1.83	1.83	†	2.52	2.52
School did not participate in free or reduced-price lunch program	†	8.74	8.74	†	9.89	9.89

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLs), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

Table A-3. Standard errors for Table 3: Percentage distribution of 2007–08 beginning public school teachers who were teaching in 2008–09, by teacher status and selected 2008–09 teacher and school characteristics: 2009–10

Selected teacher or school characteristic in 2008–09	Total	2009–10 teacher status	
		Current	Former
Total	†	1.29	1.29
Base salary			
Less than \$40,000	†	1.84	1.84
\$40,000 or more	†	1.60	1.60
Teaching status			
Full time	†	1.30	1.30
Part time	†	5.46	†
Assigned a mentor in 2008–09			
Yes	†	1.88	1.88
No	†	1.80	1.80
Class organization			
Departmentalized instruction	†	2.05	2.05
Elementary subject specialist	†	2.12	†
Self-contained class	†	1.47	1.47
Team teaching	†	0.82	†
"Pull-out" class or "push-in" instruction	†	3.81	†
Community type			
City/suburban	†	1.80	1.80
Town/rural	†	1.65	1.65
Percent of K–12 students who were approved for free or reduced-price lunches			
Less than 50 percent	†	0.64	0.64
50 percent or more	†	1.94	1.94
School did not participate in free or reduced-price lunch program	†	22.08	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLs), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

Table A-4. Standard errors for Table 4: Percentage distribution of 2007–08 beginning public school teachers, by teacher status, type of move, and occupational status: 2007–08 through 2009–10

Selected status	2007–08	2008–09	2009–10
Total	†	†	†
Current teachers	†	1.14	1.63
Stayers	†	2.51	1.91
Movers	†	2.25	1.40
Moved from one public school to another public school in the same school district	†	1.46	1.02
Moved from one public school district to another public school district	†	1.76	0.92
Other move	†	0.28	†
Returners	†	†	0.70
Former teachers	†	1.14	1.63
Working in the field of education, but not as a regular K–12 classroom teacher	†	0.63	1.27
Working outside the field of education, including military service	†	0.40	0.49
Other occupational status	†	0.99	1.03

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.



Table A-5. Standard errors for Table 5: Percentage of 2007–08 beginning public school teachers who moved across schools or left the teaching profession, by contract renewal status: 2008–09 and 2009–10

Selected reasons	2008–09	2009–10
<b>Movers</b>		
Contract not renewed	4.35	5.44
Moved for reasons other than contract not renewed	4.35	5.44
<b>Leavers</b>		
Contract not renewed	6.61	9.28
Left teaching for reasons other than contract not renewed	6.61	9.28

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

## **Appendix B: Methodology and Technical Notes**

## **Overview of the Beginning Teacher Longitudinal Study**

The Beginning Teacher Longitudinal Study (BTLS) is sponsored by the National Center for Education Statistics (NCES) of the Institute of Education Sciences on behalf of the U.S. Department of Education and is conducted by the Census Bureau. BTLS is a national study of a cohort of beginning public school teachers who were initially interviewed as part of the 2007–08 Schools and Staffing Survey (SASS). SASS is the largest survey of public, private, and Bureau of Indian Education (BIE)-funded Kindergarten–12 school districts, schools, teachers, and administrators in the United States today. It provides extensive data on the characteristics and qualifications of teachers and principals, teacher hiring practices, professional development, class size, and other conditions in schools across the nation.

BTLS first began in the 2007–08 school year as part of SASS, and follow-ups were conducted in the 2008–09 school year (together with the Teacher Follow-up Survey [TFS]) and the 2009–10 school year (as a stand-alone data collection). Collection is currently being conducted for the 2010–11 school year, and collections are expected to continue for a minimum of five waves. BTLS includes all beginning public school teachers who participated in the 2007–08 SASS, including teachers who subsequently left K–12 teaching, teachers who remained in the Pre-K–12 teaching profession, and teachers who returned to the profession. Beginning teachers who were sampled for SASS but did not respond to the survey could not be included in the data collection of subsequent BTLS waves. Beginning teachers were initially identified through a question on the SASS Teacher Questionnaire. Their beginning year of teaching was confirmed in subsequent waves.

Beginning public school teachers are teachers who began teaching in 2007 or 2008 in a traditional public or public charter school that offered any of grades K–12 or comparable ungraded levels. These teachers included regular full- and part-time teachers, itinerant teachers, and long-term substitutes as well as any administrators, support staff, librarians, or other professional staff who taught at least one regularly scheduled class in the 2007–08 school year (excluding library skills classes).

To access additional general information on SASS, or to view electronic copies of the questionnaires, go to the SASS home page (<http://nces.ed.gov/surveys/sass>). For additional information on specific BTLS-related topics discussed here, consult Tourkin et al. (forthcoming). For additional information on the 2007–08 SASS methodology, see Tourkin et al. (2010).

### **Sampling Frames and Sample Selection**

Teachers sampled for the BTLS are part of the SASS teacher sample, which is based on the SASS school sample. Because SASS and BTLS are so interrelated, the description of sampling frames and sample selection begins with SASS and then moves on to BTLS.

**SASS Public Schools.** The foundation for the 2007–08 SASS public school frame was the preliminary 2005–06 Common Core of Data (CCD)<sup>1</sup> Nonfiscal School Universe Data File. The CCD includes regular and nonregular schools (special education, alternative, vocational, or technical), public charter schools, and BIE schools. Due to their small sample size, teachers from BIE schools are not eligible for the BTLs; therefore, BIE schools are not discussed in this report. The sampling frame was adjusted from the CCD in order to fit the definition of a school eligible for SASS. For the SASS sampling frame, a school was defined as an institution, or part of an institution, that provides classroom instruction to students; has one or more teachers to provide instruction; serves students in one or more of grades 1–12 or the ungraded equivalent; and is located in one or more buildings apart from a private home. It was possible for two or more schools to share the same building; in this case, they were treated as different schools if they had different administrators (i.e., principal or school head).

The SASS definition of a school was generally similar to the CCD definition, with some exceptions. Whereas SASS is confined to the 50 states plus the District of Columbia, the CCD includes the other jurisdictions and Department of Defense schools (overseas and domestic). The CCD also includes some schools that do not offer teacher-provided classroom instruction in grades 1–12 or the ungraded equivalent (whereas these schools are excluded from SASS). In some instances, schools in the CCD are essentially administrative units that may oversee entities that provide classroom instruction or they may only provide funding and oversight.

CCD schools with the same location, address, and phone number were collapsed during the SASS frame building on the assumption that the respondent would consider them to be one school. Because SASS allows schools to define themselves on the school questionnaire, Census Bureau staff observed that schools generally report as one entity in situations where the administration of two or more schools in the CCD is the same. A set of rules was applied in certain states to determine in which instances school records should be collapsed; when they were, the student and teacher counts, grade ranges, and names as reported to the CCD were all modified to reflect the change.

Finally, additional school records were added to the sampling frame. Most of these records were for career technical centers (CTCs) or alternative, special education, or juvenile justice facilities in California, Pennsylvania, New York, Arizona, Connecticut, and the District of Columbia. For a detailed list of frame modifications, see Tourkin et al. (2010). After the adding, deleting, and collapsing of school records, the SASS public school sampling frame consisted of 90,410 traditional public schools and 3,850 public charter schools.

The SASS sample is a stratified probability proportionate to size (PPS) sample. All schools underwent multiple levels of stratification. The sample was allocated so that national-, regional-, and state-level elementary and secondary school estimates and national-level combined public school estimates could be made. The sample was allocated to each state by grade range (elementary, secondary, and combined) and school type (traditional public, public charter, BIE-funded, and schools with high–American

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<sup>1</sup> For more information about the CCD, see <http://nces.ed.gov/ccd>.

Indian enrollment). For a full description of the allocation procedure, see Tourkin et al. (2010). Within each stratum, schools were systematically selected using a PPS algorithm. The measure of size used for the schools was the square root of the number of full-time-equivalent teachers reported or imputed for each school during the sampling frame creation. Any school with a measure of size greater than the sampling interval (the inverse of the rate at which the sample is selected) was included in the sample with certainty and thus automatically excluded from the probability sampling operation. This means that schools with an unusually high number of teachers relative to other schools in the same stratum were automatically included in the sample. If the pattern of probabilities (i.e., the sum of the probabilities of schools within school district and grade level) did not guarantee a sampled school for that school district, then the school with the highest probability of selection was included in the sample with certainty. This guaranteed that all school districts in these states would have at least one school in the sample. This produced a public school sample of 9,810 schools in the 2007–08 SASS (450 high–American Indian enrollment schools, 370 public charter schools, 20 CTC schools, and 8,970 other traditional public schools). For a more detailed explanation of PPS sampling, consult Cochran (1977).

**SASS Teachers.** Teachers in SASS are defined as staff who teach regularly scheduled classes to students in any of grades K–12. Teacher rosters (i.e., Teacher Listing Forms) were collected from sampled schools, primarily by mail, and compiled at the Census Bureau. This compilation was done on an ongoing basis throughout the roster collection period. Along with the names of teachers, respondents at the sampled schools were asked to provide information about each teacher’s teaching experience (1–3 years, 4–19 years, and 20 or more years), teaching status (full or part time), and subject matter taught (special education, general elementary, math, science, English/language arts, social studies, vocational/technical, or other), as well as whether the teacher was expected to be teaching at the same school in the following year.

Sampling was also done on an ongoing basis throughout the roster collection period. Schools were first allocated an overall number of teachers to be selected within each school stratum. The Census Bureau then stratified teachers into five teacher types within each sampled school: (1) new teachers expected to stay at their current school, (2) mid-career and highly experienced teachers expected to stay at their current school, (3) new teachers expected to leave their current school, (4) mid-career teachers expected to leave their current school, and (5) highly experienced teachers expected to leave their current school.

Sampling rates for teachers varied among the strata listed above. All teachers in categories 3–5 were oversampled at different rates. So that a school would not be overburdened by sampling too large a proportion of its teachers, the maximum number of teachers per school was set at 20. About 13 percent of the eligible public schools did not provide teacher lists. For these schools, no teachers were selected. Within each teacher stratum in each school, teachers were selected systematically with equal probability.

**BTLS Teachers.** All SASS traditional public or public charter school teachers who responded to the SASS Teacher Questionnaire and reported their first year of teaching as

being 2007 or 2008 were included in the BTLS sample. About 2,100 teachers were initially included. Note that 2,100 is a rounded unweighted count of respondents.

## **Data Collection Procedures**

The 2007–08 SASS data for teachers who began teaching in 2007 or 2008 is the first wave of BTLS data. The first wave collection utilized a primarily mail-based methodology with telephone and field follow-up. At the beginning of data collection, the Census Bureau telephone centers attempted to establish a survey coordinator at each school.<sup>2</sup> Nonrespondents were contacted by telephone interviewers or field representatives. The 2007–08 SASS included several questionnaire components, which collected data from schools, school districts, principals, library media centers (public and BIE-funded schools only), and teachers. The BTLS cases were identified during the teacher collection, and their SASS data constituted the BTLS first wave. The SASS teacher data collection began in August 2007 and ended in June 2008. For complete details regarding the SASS, refer to Tourkin et al. (2010).

The Census Bureau conducted the second wave of BTLS together with the TFS during the 2008–09 school year. However, BTLS teachers used the longitudinal versions (TFS-2L and TFS-3L) of the questionnaires, which contained more questions than the TFS questionnaires. The second wave included those who indicated that they began teaching in either 2007 or 2008 in a public school during the first wave. The second wave data were primarily collected using an internet instrument. During data collection, the Census Bureau discovered that 101 teachers misreported their first year of teaching in the 2007–08 SASS and had actually begun teaching prior to 2007. These cases were removed from the BTLS sample. Telephone follow-up efforts were conducted to resolve cases with this discrepancy or to collect the missing data, as well as to encourage participation or to collect data over the phone from nonrespondents. Throughout the telephone follow-up, paper questionnaires were mailed upon request. Paper questionnaires were mailed in June 2009 to all teachers who had not yet completed the survey. The TFS data collection began in February 2009 and ended in August 2009. For more details regarding the TFS, refer to Graham et al. (2011).

The Census Bureau conducted the third wave of the BTLS during the 2009–10 school year. This wave is the third data collection from respondents who reported 2007 or 2008 as their first year of teaching in the 2007–08 SASS Teacher Questionnaire. The third wave of BTLS data were collected using a single internet instrument, so that current teachers (stayers, movers, and returners) and former teachers (leavers) all responded to the same questionnaire. Their current/former and stayer/mover/leaver/returner statuses were determined by skip patterns built into the internet instrument. Telephone follow-up efforts were conducted to encourage participation or to collect BTLS data over the phone from nonrespondents. After data collection, the Census Bureau determined that five cases had been misclassified as beginning teachers and were later removed from the data file.

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<sup>2</sup> The role of the survey coordinator was to be the main contact person at the school. A survey coordinator's duties included facilitating data collection by passing out questionnaires to the appropriate staff, reminding the staff to complete them, and collecting the questionnaires to return to the Census Bureau.

Approximately 1,990 teachers were included in the BTLS sample. Note that 1,990 is a rounded unweighted count of respondents. The data collection period for the third wave began in January 2010 and ended in June 2010. All questionnaires used to collect data for the BTLS are available on the BTLS website: <http://nces.ed.gov/surveys/btls/>. For more details on data collection for the BTLS, refer to Tourkin et al. (forthcoming).

## **Data Processing and Imputation**

The BTLS first wave data was collected on the Teacher Questionnaire (Form SASS-4A) during the 2007–08 SASS. Once the BTLS first wave data collection was completed the Census Bureau captured the data from completed questionnaires.<sup>3</sup> All BTLS first wave data processing was conducted within the single SASS Teacher Questionnaire Data File.<sup>4</sup>

The Census Bureau applied a series of computer edits to identify and fix inconsistencies and impute items that were still “not answered” after taking into account item responses that were blank due to a questionnaire skip pattern. Once the data underwent all stages of computer edits, imputation,<sup>5</sup> and review, the BTLS First Wave Data File was created.

The second wave of the BTLS was conducted together with the 2008–09 TFS. Data were collected primarily using an internet instrument, but paper questionnaires were also used. Once the data collection was completed, the Census Bureau electronically captured the data from completed paper questionnaires and combined them with data from the internet instrument. Data processing was conducted separately within each questionnaire.<sup>6</sup> A series of computer edits were then run on the data to identify and correct inconsistencies, delete extraneous entries in situations where skip patterns were not followed correctly, or assign the “not answered” code to items that should have been answered but were not. A final interview status code was then assigned to each case. Once the Census Bureau analysts reviewed all data, they created the edited BTLS Second Wave Data File in

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<sup>3</sup> The 2007–08 SASS consisted of nine questionnaires: School District Questionnaire, Principal Questionnaire, Private School Principal Questionnaire, School Questionnaire, Private School Questionnaire, Public School Questionnaire (With District Items), Teacher Questionnaire, Private School Teacher Questionnaire, and School Library Media Center Questionnaire. The BTLS includes only teachers who taught in a public school (traditional or charter) in the 2007–08 school year; therefore, the only SASS questionnaire type that will be discussed is the Teacher Questionnaire.

<sup>4</sup> After all data processing of the SASS Teacher Questionnaire data was completed, the BTLS First Wave data file was created, which includes only those public school teachers who began teaching in 2007 or 2008; all other respondents were omitted from the BTLS First Wave Data File.

<sup>5</sup> SASS data files are fully imputed; therefore, the BTLS First Wave Data File began as a fully imputed data file since the data were collected on the 2007–08 SASS Teacher Questionnaire. The imputation that occurred for the BTLS first wave during SASS data processing was specific to that wave and did not occur during data processing for the BTLS second and third waves.

<sup>6</sup> There are two questionnaires that compose the BTLS second wave. Both questionnaires are for 2007–08 SASS public school teacher respondents who began teaching in 2007 or 2008. The Questionnaire for Current Teachers (form TFS-3L) collects information on sampled teachers who currently teach students in any of grades Pre-K–12 and the Questionnaire for Former Teachers (form TFS-2L) collects information about sampled teachers who left the Pre-K–12 teaching profession after the 2007–08 school year. Processing specifications used for BTLS data were slightly different from those used for TFS data.

preparation for the next stage of data processing—imputation. For further details about the TFS, refer to Graham et al. (2011).

The third wave of BTLS was collected as its own entity during the 2009–10 school year. Data were collected using an internet instrument only. The processing of data from completed internet instruments was processed separately within each survey respondent type.<sup>7</sup> A series of computer edits were then run on the data to identify and correct inconsistencies and delete extraneous entries in situations where skip patterns were not followed correctly or to assign the “not answered” code to items that should have been answered but were not. Once the Census Bureau reviewed all data, they created the edited BTLS Third Wave Data File in preparation for the next stage of data processing—imputation. Data collected from retrospective respondents were added into the second wave data file. As a result, these retrospective respondents represent 8.1 percent of the weighted total of 2008–09 current teachers (11.3 percent of the movers) and 8.6 percent of the weighted total of 2008–09 former teachers.

Data from the first, second, and third waves of BTLS are released together as one data file called the BTLS First Through Third Wave Preliminary Data File, and were released once processing for the three waves was complete. This allowed for the final stage of data processing—cross-wave imputation. Only a select set of items were identified as key, or important for reporting or analysis, and imputed. All other items are subject to missing data. The imputed data for selected items were removed from the first wave and then reimputed on the basis of the case’s responses to items from subsequent waves of the BTLS, whenever possible. If data were not available from subsequent waves, then the existing imputed value remained. For further details about the SASS, refer to Tourkin et al. (2010). Several variables in each BTLS wave were identified as “key variables,” or important reporting or analytical variables, and were imputed (or reimputed, in the case of the BTLS First Wave data) once the edited BTLS Second and Third Wave Data Files were created and fully reviewed. During the imputation stage of processing, two main approaches were used to fill “not answered” items with data. In one approach, called “cross-wave imputation,” data were imputed from the same case from either the preceding or the subsequent BTLS wave whenever possible; cross-wave imputation was used for all three waves of BTLS data. The second method of imputation is known as “weighted sequential hot deck imputation,” during which data were imputed using items from other cases that had certain predetermined characteristics in common, while also keeping the means and distributions of the full set of data, including imputed values, consistent with those of the unimputed respondent data. Weighted sequential hot deck imputation was used for only the BTLS second and third wave data.

After the imputation of the key variables was completed, data from the three waves were then combined into one three-wave BTLS file for release. The data file used to produce this report is viewed as preliminary because it will be reweighted after the data collection

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<sup>7</sup> The BTLS third wave internet instrument contained a single survey with a variety of questionnaire paths based on whether a respondent was a current or former teacher during the second and third waves of the BTLS.



of the fourth wave is complete. For more details regarding data processing for BTLS, refer to Tourkin et al. (forthcoming).

## Response Rates

**Unit response rate.** The unit response rate is the rate at which the sampled units respond by substantially completing the questionnaire. Unit response rates can be calculated as unweighted or weighted. Whether or not a teacher was a first-year teacher was not known prior to the collection of the SASS teacher data, only whether each teacher was reported to have 1 to 3 years of experience, 4 to 19 years, or 20 or more years of teaching experience. The response rates presented in this section are those of the 2007–08 SASS public school teachers reported to have 1 to 3 years of experience, not just the first-year teachers included in the BTLS. The unweighted response rates are the number of 2007–08 SASS public school teachers reported to have 1 to 3 years of experience who substantially completed the questionnaire divided by the number of eligible (in-scope) sampled units, which include respondents plus nonrespondents but excludes ineligible (out-of-scope) units. The weighted response rates are the base-weighted number of cases that substantially completed the questionnaire divided by the base-weighted number of eligible cases. The base weight for each sampled unit is the initial basic weight multiplied by the sampling adjustment factor.

**Overall response rate.** The overall response rate represents the response rate to the survey, taking into consideration each stage of data collection. For a teacher to be eligible for the SASS, it was necessary for the school to have completed the Teacher Listing Form during the 2007–08 SASS data collection, which provided a sampling frame for teachers at that school. The overall response rate for the BTLS first wave is the product of the survey response rates: (SASS Teacher Listing Form response rate) x (SASS public school teachers with 1 to 3 years of experience response rate). The overall response rate for the second and third waves are the product of three factors: (SASS Teacher Listing Form response rate) x (SASS public school teachers with 1 to 3 years of experience response rate) x (BTLS wave response rate).

Table B-1 summarizes the unweighted and base-weighted unit response and overall response rates for the BTLS.

Table B-1. Unweighted and base-weighted response rates by stage of data collection, by wave and type of weighting: 2007–08 through 2009–10

Response rate	BTLS wave	2007–08 SASS Teacher Listing Form	2007–08 SASS public school teachers with 1 to 3 years of experience	Overall response rate
First wave				
Unweighted	†	86.7	84.6	73.4
Base-weighted	†	86.2	84.3	72.7
Second wave without retrospective cases				
Unweighted	84.7	86.7	84.6	62.1
Base-weighted	84.5	86.2	84.3	61.4
Second wave with retrospective cases				
Unweighted	91.8	86.7	84.6	67.4
Base-weighted	91.9	86.2	84.3	66.8
Third wave				
Unweighted	86.2	86.7	84.6	63.3
Base-weighted	86.1	86.2	84.3	62.5

† Not applicable.

NOTE: Retrospective cases are respondents that were noninterviews during the second wave, but provided replies to second wave items during the third wave. Base-weighted response rates use the inverse of the probability of selection and the sampling adjustment factor.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

**Unit nonresponse bias analysis.** NCES Statistical Standard 4-4 requires analysis of unit nonresponse bias for any survey stage with a base-weighted response rate of less than 85 percent. Even though the BTLS achieved or almost achieved an 85 percent base-weighted response rate in all stages, all waves of BTLS data files were evaluated for potential bias. Comparisons between the eligible respondents (respondents plus non-respondents) and the respondents were made before and after the noninterview weighting adjustments were applied in order to evaluate the extent to which the adjustments reduced or eliminated nonresponse bias. The following section explains the methodology and summarizes the conclusions.

As outlined in appendix B of the *NCES Statistical Standards* (U.S. Department of Education 2003), the degree of nonresponse bias is a function of two factors: the nonresponse rate and how much the respondents and nonrespondents differ on survey variables of interest. The mathematical formulation to estimate bias for a sample mean of variable  $y$  is as follows:

$$B(\bar{y}_r) = \bar{y}_r - \bar{y}_t = \left( \frac{n_m}{n_t} \right) (\bar{y}_r - \bar{y}_m)$$

where

- $\bar{y}_t$  = the mean based on all sample cases, using the base weight
- $\bar{y}_r$  = the mean based only on respondent cases, using the base weight
- $\bar{y}_m$  = the mean based only on nonrespondent cases, using the base weight
- $n_t$  = the number of cases in the sample (i.e.,  $n_t = n_r + n_m$ ), using the base weight
- $n_m$  = the number of nonrespondent cases, using the base weight
- $n_r$  = the number of respondent cases, using the base weight

A scale-invariant estimate of the bias, referred to as a relative bias, was used to compare biases across all variables included in the analysis. The relative bias for an estimated mean using only the respondent data,  $\bar{y}_r$ , is calculated using the following formula:

$$RelB(\bar{y}_r) = \frac{B(\bar{y}_r)}{\bar{y}_r}$$

Relative bias was estimated for variables known for respondents and nonrespondents. For the first wave, first-year teachers were not identifiable from the sampling frame, although teachers in the first 3 years of their career were identified on the Teacher Listing Form. Therefore, a nonresponse bias analysis on 2007–08 SASS public school teachers with 1 to 3 years of experience was carried out as a proxy for the BTLS first wave. For this analysis, the following variables were available: teacher main subject, full-time/part-time status, charter status, school grade level, percent of K–12 students approved for free or reduced-price lunches, school enrollment, school urbanicity, school magnet status, percent Hispanic enrollment, percent Asian enrollment, percent Black enrollment, percent Native American enrollment, percent White enrollment, and school Title I eligibility status. For the second and third waves, and the longitudinal datasets, there are extensive data available for all teachers from the 2007–08 SASS sampling frame and teacher data files. The variables used are presented in exhibit B-1.

Exhibit B-1. Variables used in the unit nonresponse bias analysis of the second and third waves of the BTLS: 2008–09 and 2009–10

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<ul style="list-style-type: none"> <li>• Age;</li> <li>• Average number of students taught;</li> <li>• Base salary;</li> <li>• Census region;</li> <li>• Certification type;</li> <li>• Class organization;</li> <li>• Community type;</li> <li>• Entered through alternative certification;</li> <li>• Full- or part-time status;</li> <li>• Grade level of students taught;</li> <li>• Highest degree;</li> <li>• Highly Qualified Teacher status;</li> <li>• Main teaching assignment;</li> <li>• National Board for Professional Teaching Standards certification status;</li> <li>• Number of areas of classroom planning and teaching over which the teacher has no control or minor control;</li> <li>• Number of school-related activities outside of normal teaching duties;</li> <li>• Number of separate class periods taught;</li> <li>• Percentage of teacher's students who are limited-English proficient (LEP);</li> <li>• Percentage of teacher's students with an Individualized Education Program (IEP);</li> <li>• Percentage of students in the school approved/eligible for the National School Lunch Program;</li> <li>• Race/ethnicity;</li> </ul>	<ul style="list-style-type: none"> <li>• School level;</li> <li>• School type;</li> <li>• Serious or moderate problems at school;</li> <li>• Sex;</li> <li>• Stayer/mover/leaver/returner status;</li> <li>• Teacher career reflection;</li> <li>• Teacher dissatisfaction;</li> <li>• Teacher has been physically attacked by a student;</li> <li>• Teacher participated in induction program in first year of teaching;</li> <li>• Teacher participated in professional development activities;</li> <li>• Teacher plans to remain in teaching;</li> <li>• Teacher's main activity in the last school year;</li> <li>• Teacher's evaluation of the usefulness of professional development activities;</li> <li>• Teacher's Praxis or other exam results;</li> <li>• Teacher's subject matter taught;</li> <li>• Total hours per week spent on all school-related activities;</li> <li>• Total hours per week spent on classroom instruction;</li> <li>• Total K–12 and ungraded enrollment in school;</li> <li>• Total number of students taught;</li> <li>• Total out-of-pocket expenses; and</li> <li>• Union member status.</li> </ul>
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The following steps were followed to compute the relative bias. First, the nonresponse bias was estimated and tested to determine if the bias is significant at the .05 level. Second, noninterview adjustments were computed, and the variables listed above were included in the nonresponse models. The noninterview adjustments, which are included in the weights, were designed to significantly reduce or eliminate unit nonresponse bias for variables included in the models. Third, after the weights were computed, any remaining bias was estimated for the variables listed above and statistical tests were performed to check the remaining significant nonresponse bias. For this comparison, nonresponse bias was calculated as the difference between the base-weighted sample mean and the nonresponse-adjusted respondent mean, which evaluates the effectiveness of each noninterview adjustment in mitigating nonresponse bias. Table B-2 contains summary statistics of the findings.

Table B-2. Summary of SASS new teacher and BTLS nonresponse bias, by wave and nonresponse bias statistic: 2007–10

Nonresponse bias statistic	2007–08 SASS public school teachers with 1 to 3 years of experience	Second wave without retrospective cases <sup>1</sup>	Second wave with retrospective cases <sup>1</sup>	Third wave	Longitudinal without retrospective cases <sup>2</sup>	Longitudinal with retrospective cases <sup>2</sup>
Before nonresponse adjustment						
Mean estimated percent relative bias	-0.08	-1.99	-1.37	-1.91	-1.96	-2.61
Median estimated percent relative bias	0.21	-0.08	0.09	0.27	0.05	-0.52
Percent of variable categories significantly biased	0.00	6.76	9.01	9.91	7.66	9.91
After nonresponse adjustment						
Mean estimated percent relative bias	#	-1.26	-1.08	-1.48	-1.33	-1.74
Median estimated percent relative bias	0.13	0.17	0.12	0.27	0.27	-0.10
Percent of variable categories significantly biased	4.55	2.70	6.31	5.86	5.41	6.31

# Rounds to zero.

<sup>1</sup> Retrospective cases are respondents that were noninterviews during the second wave, but provided replies to second wave items during the third wave.

<sup>2</sup> Longitudinal cases are those that responded to all three waves. Longitudinal retrospective cases responded to the first and third waves at the time of data collection, but provided replies to second wave items during the third wave.

SOURCE: U.S. Department of Education, National Center for Education Statistics, School Schools and Staffing Survey (SASS), "Public School Sample File" and "Public School Teacher Documentation File," 2007–08 and Beginning Teacher Longitudinal Survey (BTLS), "First, Second and Third Waves Documentation Data File," 2007–10.

As shown in table B-2, for 2007–08 SASS public school teachers with 1 to 3 years of experience, both mean and median estimated percent relative bias decreased after the weighting adjustment, but variable categories significantly biased increased to about 5 percent. For the second wave respondents, about 7 percent of the variable categories were significantly biased before nonresponse weighting adjustments, and about 3 percent were significantly biased after adjustments. For the second wave including retrospective respondents, the percent of the variable categories that were significantly biased after noninterview weighting adjustments decreased (about 9 percent versus 6 percent); also the mean relative bias was reduced. For the third wave respondents, the percentage of the variable categories that were significantly biased before and after the weighting adjustments decreased from about 10 percent to 6 percent. Likewise, the longitudinal weights showed the weighting adjustments reduced significantly biased variable categories from about 8 percent to 5 percent. The longitudinal weighting including retrospective cases reduced significantly biased variable categories from about 10 percent to 6 percent. In general, the weighting adjustments eliminated some, but not all, significant bias. For detailed information and results for the unit bias analysis of the

BTLS, see Tourkin et al. (forthcoming). For further details about the bias analysis conducted on the Teacher Listing Form, refer to Tourkin et al. (2010).

**Item response rates.** Item response rates indicate the percentage of respondents who answered a given survey question or item. Weighted item response rates are produced by dividing the number of sampled cases responding to an item by the number of sampled cases eligible to answer the item and adjusting by either the base or final weight. The base weight for each sampled unit is the initial basic weight multiplied by the sampling adjustment factor. The final weight for each sampled unit is the base weight adjusted for unit nonresponse and then ratio adjusted to the frame total.

Table B-3 provides a brief summary of the base- and final-weighted item response rates for BTLS public school teachers in the first, second, and third waves. The nonresponse bias analysis conducted at the item level revealed no substantial evidence of item bias in the data files. For further information on the nonresponse bias analysis and item response rates for BTLS, see Tourkin et al. (forthcoming).

Table B-3. Range of item response rates and percentage of items with selected rate ranges, by wave and type of weighting: 2007–08 through 2009–10

Wave and type of weighting	Range of item response rate	Percentage of items with a response rate of 85.0 percent or more	Percentage of items with a response rate of 70.0 percent–84.9 percent	Percentage of items with a response rate of less than 70.0 percent
First wave				
Base-weighted	0.0–100.0	82.5	10.1	7.4
Final-weighted	0.0–100.0	83.3	8.9	7.8
Second wave without retrospective case				
Base-weighted	4.3–100.0	87.2	8.5	4.3
Final-weighted	3.8–100.0	86.8	8.9	4.3
Second wave with retrospective cases				
Base-weighted	4.3–100.0	87.8	7.8	4.4
Final-weighted	3.9–100.0	87.8	7.8	4.4
Third wave				
Base-weighted	0.0–100.0	84.3	12.2	3.5
Final-weighted	0.0–100.0	84.7	11.8	3.5

NOTE: Retrospective cases are respondents that were noninterviews during the second wave, but provided replies to second wave items during the third wave. Base-weighted response rates use the inverse of the probability of selection and the sampling adjustment factor. Final-weighted response rates use an initial basic weight, a SASS teacher weighting adjustment factor, a noninterview adjustment factor, and a ratio adjustment factor. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

## Weighting

The general purpose of weighting is to scale up the sample estimates to represent the target survey population. For the BTLS first wave, weights are obtained directly from the 2007–08 SASS, since all interviewed beginning teachers in SASS were eligible for BTLS. The final weight for the first wave is TFNLWGT, which is called W1TFNLWGT on BTLS. For BTLS second and third waves, an initial basic weight (the inverse of the sampled teacher’s probability of selection) is used as the starting point. Then, a weighting adjustment is applied that reflects the impact of the SASS teacher weighting procedure. Next, a nonresponse adjustment factor is calculated and applied using data that are known about the respondents and nonrespondents from the sampling frame. Finally, a ratio adjustment factor is calculated and applied, which adjusts the sample totals to frame totals in order to reduce sampling variability. The product of the factors listed above are the final cross-sectional weights for the second and third waves of BTLS, which appear in the data file as W2AFWT (applies to second wave respondents) and W2RAFWT (applies to respondents and retrospective respondents) for the second wave, and W3AFWT for the third wave. For longitudinal analysis over the 3-year collection period, W3LWGT is provided. Longitudinal weights should be used when change over time within a single population is being examined by using more than one wave of data. For further information on weighting, see Tourkin et al. (forthcoming).

The weights used in the tables in this report may vary by table and within table. For table 1, weights vary by row. Row 1 is calculated using W1TFNLWGT, row 2 is calculated using W2RAFWT, and row 3 is calculated using W3AFWT. For table 2, weights vary by data column. Estimates in data columns 1 through 3 are calculated using W2RAFWT, while estimates in data columns 4 through 6 are calculated using W3AFWT. W3AFWT is used to calculate all data columns in table 3. The weights in table 4 vary by data column. Data column 1 is calculated using W1TFNLWGT, data column 2 is calculated using W2RAFWT, and data column 3 is calculated using W3AFWT. The weights in table 5 also vary by data column. Data column 1 is calculated using W2AFWT and data column 2 is calculated using W3AFWT. The corresponding replicate weights for each final weight were used to calculate the corresponding standard errors for each table. Statistical Analysis Software (SAS) (9.2) was used to compute the statistics for this report.

## Variance Estimation

In surveys with complex sample designs, such as SASS or BTLS, direct estimates of sampling errors that assume a simple random sample will typically underestimate the variability in the estimates. The SASS sample design and estimation include procedures that deviate from the assumption of simple random sampling, such as stratifying the school sample, oversampling new teachers, and sampling with differential probabilities. Therefore, to accurately estimate variance, users must employ special calculations.

One method of calculating sampling errors to reflect these aspects of the complex sample design of SASS is replication. Replication methods involve constructing a number of

subsamples (i.e., replicates) from the full sample and computing the statistic of interest for each replicate. The mean square error of the replicate estimates around the full sample estimate provides an estimate of the variance of the statistic. The BTLS data file includes one set of 88 replicate weights for each cross-sectional and longitudinal weight designed to produce variance estimates. The replicate weights for cross-sectional analysis are W1TREPWT1–W1TREPWT88 for the first wave, W2ARWT1–W2ARWT88 and W2RARWT1–W2RARWT88 (includes retrospective respondents) for the second wave, and W3ARWT1–W3ARWT88 for the third wave. For longitudinal analysis over the 3-year collection period, the replicate weights are W3LRWGT1–W3LRWGT88.

## **Reliability of Data**

The BTLS First Through Third Wave Preliminary Data File is a preliminary data file. It is considered preliminary for two reasons. First, due to the longitudinal nature of BTLS, data collected in subsequent waves have been and will be used to adjust previously missing, imputed or inaccurate values. Thus, data collected in the fourth and fifth waves may lead to changes in first, second, or third wave data. Second, first wave weights were developed prior to learning that seven additional members of the sample did not meet the definition of a beginning teacher—five did not start teaching in 2007 or 2008, and two were not teachers of regularly scheduled classes. As a result of obtaining this new information during third wave processing, these cases (representing 0.27 percent of the first wave weighted population) were removed. The subsequent waves have not yet been reweighted and will be reweighted before the next preliminary data release in 2012. The 2012 release will also include data from the fourth wave. The final dataset will be released in 2013. It will replace the preliminary datasets and will be accompanied by expanded documentation. For more information about the data collection and processing, please see Tourkin et al. (forthcoming).

BTLS estimates are based on samples. The sample estimates may differ somewhat from the values that would be obtained from administering a complete census using the same questionnaires, instructions, and enumerators. The difference occurs because a sample survey estimate is subject to two types of error: nonsampling and sampling. Estimates of the magnitude of the BTLS sampling error, but not the nonsampling error, can be derived or calculated. Nonsampling errors are attributed to many sources, including definitional difficulties, the inability or unwillingness of respondents to provide correct information, differences in the interpretation of questions, inability to recall information, errors made in collection (e.g., in recording or coding the data), errors made in processing the data, and errors made in estimating values for missing data. Quality control and edit procedures were used to reduce errors made by respondents, coders, and interviewers.



## **Appendix C: Description of Variables**

## Description of Variables

Variables used in this report are listed in table C-1. They include those found in the 2007–08 Schools and Staffing Survey (SASS) Teacher Questionnaire, the 2008–09 Teacher Follow-up Survey (TFS) Current and Former Questionnaires for First-Year Teachers, the 2009–10 Beginning Teacher Longitudinal Study (BTLS) Questionnaire, as well as “created variables” computed using survey variables, sampling frame variables, other created variables, or a combination of these. Some created variables are frequently used in National Center for Education Statistics (NCES) publications and have been added to the data files to facilitate data analysis. Unless otherwise noted, all variables in this appendix can be found on the BTLS First Through Third Wave Preliminary Data File. The definitions for all BTLS variables used in this report follow table C-1.

Table C-1. Variables used in the *Beginning Teacher Attrition and Mobility: Results From the First Through Third Waves of the 2007–08 Beginning Teacher Longitudinal Study First Look* report

Age	W1AGE_T
Assigned a mentor	W2MNTYN, W2M08YN
Base salary	W1T0343, W2TCHSA
Certification type	Cert <sup>1</sup>
Class organization	W1T0068, W2TECLD
Community type	W1URBANS12, W2URBANS12
Contract not renewed, leaver	W2LCNYS
Contract not renewed, mover	W2MCNYS
Current/former status	W2FCSTS, W3FCSTS
Entered teaching through an alternative certification program	W1T0153
Full- or part-time teaching status	W1FTPT, W2TCHFP
Highest degree earned	W1HIDEGR
Occupational status	W2OCCST, W3OCCST
Percent of K–12 students who were approved/eligible for free or reduced-price lunches	W1NSLAPP_S, W2TEFRPL
Race/ethnicity	W1RACETH_T
School level	W1SCHLEVEL
Sex	W1T0352
Stayer/mover/leaver/returner status	W2STTUS, W3STTUS
Type of move between schools	W2MVTYP, W3MVTYP

<sup>1</sup> This variable was created by the author of this report and does not appear on the data file.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Third Wave Preliminary Data File," 2007–08, 2008–09, 2009–10.

**Age (W1AGE\_T):** A created variable based on respondent's reported year of birth, W1AGE\_T is a continuous variable created by subtracting the teacher's reported year of birth (W1T0160) from the year of data collection (2007). If respondents did not report their year of birth in the first wave, it is also asked in subsequent waves. Since year of birth is a fully imputed variable, the imputed value may be replaced with a value reported in another wave. The distribution for this variable was examined in order to determine the categories reported in the tables.

**Assigned a mentor (W2MNTYN, W2M08YN):** The data for these variables were collected on the second wave questionnaires.

**Base salary (W1T0343, T2TCHSA):** The data for these variables were collected on the first and second wave questionnaires. The distribution for this variable was examined in order to determine the categories reported in the tables.

**Certification type:** This author-created variable is based on a teacher's reported certification type (W1T0160, W1T0185, W1T0186) during the 2007–08 school year. The categories for this variable were collapsed due to small size.

**Class organization (W1T0068, W2TECLD):** The data for these variables were collected on the first and second wave questionnaires.

**Community type (W1URBANS12, W2URBANS12):** Taken from the SASS public school data file, W1URBANS12 is a created variable collapsed from the 12-category urban-centric school locale code (SCLOP\_07) that was assigned using the 2000 Decennial Census data and recoded into four categories: city, suburban, town, and rural. W2URBANS12 is drawn firstly from data on the 2008–09 Common Core of Data (CCD). If data were missing or a school could not be matched on the 2008–09 CCD, the 2007–08 CCD was used. The categories for this variable were collapsed due to small size.

**Contract not renewed, leaver (W2LCNYN):** The data for this variable were collected on the second wave Former Teacher Questionnaire.

**Contract not renewed, mover (W2MCNYN):** The data for this variable were collected on the second wave Current Teacher Questionnaire.

**Current/former status (W2FCSTS, W3FCSTS):** These created variables are a measure of teacher status and indicate whether teachers are currently teaching during the year of data collection and are based on W2STTUS and W3STTUS (see stayer/mover/leaver/returner definition below).

**Full- or part-time teaching status (W1FTPT, W2TCHFP):** These two-category variables indicate whether the teacher is a full- or part-time teacher. W1FTPT is based on W1T0025 and W1T0028, and W2TCHFP is a survey variable.

**Entered teaching through an alternative certification program (WT1053):** The data for this variable were collected on the first wave questionnaire.

**Highest degree earned (W1HIDEGR):** A created variable that indicates the highest degree a teacher had earned at the time of data collection during the 2007–08 school year. It is computed using the following variables (W1T0110, W1T0120, W1T0132, W1T0135, W1T0138, W1T0141). The categories for this variable were collapsed due to small size.

**Occupational status (W2OCCST, W3OCCST):** The data for these variables were collected on the second wave Former Teacher and the third wave questionnaires. The categories for this variable were collapsed due to small size.

**Percentage of K–12 students who were approved/eligible for the free or reduced-price lunches (W1NSLAPP\_S, W2TEFRPL):** A created variable, W1NSLAPP\_S is a continuous variable created by dividing the number of students approved for free or reduced-price lunches (S0217) by the total number of K–12 grade students enrolled (S0047) in schools that participated in the National School Lunch Program (NSLP) (S0215 = 1). W2TEFRPL measures the percentage of students eligible for free or reduced-price lunches and is drawn firstly from data on the 2008–09 Common Core of Data (CCD). If data were missing or a school could not be matched on the 2008–09 CCD, the 2007–08 CCD was used. Schools that did not participate in the NSLP have valid skip values. S0217, S0047, and S0215 can be found on the SASS Public School Data File.

For those teaching in public schools in this report, W1NSLAPP\_S and W2TEFRPL are recoded as categorical variables describing the proportion of students approved or eligible for free or reduced-price lunches. For those teaching in private schools beginning in the BTLS second wave, NSLAPP\_S is recoded as a dichotomous variable of schools that participated and did not participate. The distribution for this variable was examined in order to determine the categories reported in the tables.

**Race/ethnicity (W1RACETH\_T):** A created variable based on respondents' reported race and ethnicity (W1T0353–W1T0358). The first wave allowed respondents to mark more than one racial category. This variable was recoded into two categories for this report: White, non-Hispanic; all other races/ethnicities. The categories for this variable were collapsed due to small size.

**School level (W1SCHLEVEL):** A created variable based on grades reported by the school (S0025–S0038): Elementary, secondary, and combined. Elementary schools are those with any of grades K–6 and none of grades 9–12. Secondary schools have any of grades 7–12 and none of grades K–6. Combined schools are those schools with grade levels in both elementary and secondary grade levels, or with all students in ungraded classrooms.

**Sex (W1T0352):** The data for this variable were collection on the first wave questionnaire.

**Stayer/mover/leaver/returner status (W2STTUS, W3STTUS):** These created variables are a measure of teacher status and indicate whether teachers stayed in the same school as in the previous year of data collection, moved to a new school in the year of data collection, left the teaching profession, or returned to the teaching profession after a leave of absence. In order to be a returner teacher, a respondent has to be a former teacher during the second wave and a current teacher during the third wave; therefore, returner teachers only appear in the third wave. The following variables were used to create these variables: W2MOVYN, W3MOVYN (or W3NRSAS for wave 2 nonrespondents) W2REGCL, W3REGCL, W2POSSC, W3POSSC, and W3RESAS.

**Type of move between schools (W2MVTYP, W3MVTYP):** The data for these variables were collected on the second wave Current Teacher and third wave questionnaires. The categories for this variable were collapsed due to small size.