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Strategies for Longitudinal Analysis of the Career Paths of Beginning Teachers: Results From the First Through Fourth Waves of the 2007–08 Beginning Teacher Longitudinal Study

Research and Development Report

NCES 2013-336

U.S. DEPARTMENT OF EDUCATION

Strategies for Longitudinal Analysis of the Career Paths of Beginning Teachers: Results From the First Through Fourth Waves of the 2007–08 Beginning Teacher Longitudinal Study

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BEGINNING TEACHER LONGITUDINAL STUDY

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Foreword

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Introduction

The American supply of and demand for teachers is a topic of attention and concern as teachers of the baby boom generation retire. While public school enrollment has remained fairly constant over the last 10 years, it is projected to increase by almost 1.5 million students by 2016–17 (Hussar and Bailey 2012). Finding ways to ensure that there are enough teachers to educate America's children is a major policy issue at the local, state, and federal levels.

Considerable research exists on teacher attrition, retention, and mobility. Attrition and mobility are often linked to the existence of supports for new teachers (e.g., induction programs), personal life factors (e.g., caring for family), working conditions (e.g., principal support, discipline issues), salary and benefits, career objectives, assignment and credentialing factors, accountability practices, and numerous other factors (Johnson, Berg, and Donaldson 2005; Gonzalez, Brown, and Slate 2008; Borman and Dowling 2008; Greiner and Smith 2006). The findings from these studies, however, are sometimes inconsistent (see Ingersoll and Strong 2011; Borman and Dowling 2008). Moreover, the data most often used are cross-sectional in nature or cover only 2 years of teachers' careers. Findings from these studies, therefore, cannot provide information on the career paths of teachers and their future paths (Borman and Dowling 2008.)

To learn more about the early career patterns of beginning teachers, the National Center for Education Statistics (NCES) of the Institute of Education Sciences within the U.S. Department of Education undertook the Beginning Teacher Longitudinal Study (BTLS). BTLS is a nationally representative longitudinal study of public school teachers who began teaching in 2007 or 2008.[1] It provides data on teacher characteristics (e.g., age and gender) and attitudes (e.g., teacher satisfaction) of teachers who stay in the prekindergarten through 12th-grade teaching profession and those who leave teaching. The survey also collects data on teachers' mobility across schools and/or districts. In addition, data on school characteristics (e.g., community type) are collected. The BTLS, therefore, provides researchers with the opportunity to examine the career paths of beginning teachers as well as factors that may influence those paths.

The Census Bureau collected and processed the BTLS data for each school year, from 2007–08 through 2010–11.[2] In this report, the base year (i.e., the year in which the BTLS sample was selected) is referred to as the first wave or wave 1. 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 compose the cohort being followed in the BTLS.[3] 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. Data were collected for the third and fourth waves of BTLS during January 2010 through June 2010 and January 2011 through June 2011, respectively. 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

[1] Teachers were asked about the calendar year, not the academic year, in which they first began teaching. Teachers who began teaching in calendar year 2007 may have first taught in academic year 2006–07 or 2007–08. All BTLS teachers were teaching regularly scheduled classes in the 2007–08 base academic year.
[2] The fifth and final wave of BTLS is longitudinal data collected during the 2011–12 school year. NCES will release the final BTLS data for the first through fifth waves to licensed users in 2013. This data file may be used to replicate the analysis in this report because the wave 1–4 data and weights used for this report will be included in the file.
[3] Note that 1,990 is an unweighted rounded count of BTLS sample members. More information about the sample design may be found in appendix C.

instrument for the second through fourth waves. A paper questionnaire that was used in follow-up efforts was also developed for the second wave.

Sample members who did not respond during the second wave were asked selected second-wave items during the third wave. Similarly, those who did not respond during the third wave were asked selected third-wave items during the fourth wave. These respondents are referred to as retrospective respondents.

Because BTLS is a longitudinal survey, there are several stages of response involved in calculating an overall response rate for each wave. The overall base-weighted response rate for SASS teachers with 1 to 3 years of experience[4] in 2007–08 was 73 percent. The individual base-weighted response rates for the BTLS cohort in the second, third, and fourth waves were 84 percent, 86 percent, and 84 percent, respectively. More information about the response rates for each wave and the bias analysis conducted for the first through fourth waves of BTLS can be found in appendix C. More information about BTLS can be found at http://nces.ed.gov/surveys/btls/.

The ultimate purpose of this report is to develop a strategy for the longitudinal analysis of the BTLS data that can be used to better understand teacher attrition, retention, and mobility. NCES may use this strategy to analyze and present data on all 5 years of the BTLS in their future reports. Users of the BTLS restricted-use data files may choose to use other strategies for data analysis.

This report includes an analysis chapter that discusses the research purposes and results, and a chapter of conclusions and recommendations, followed by the tables of estimates. Appendix A contains tables of standard errors, appendix B provides a description of the variables used in the report, and appendix C presents methodology and technical notes.

[4] Response rates were calculated for the 2007–08 SASS public school teachers reported to have 1 to 3 years of experience, not just the beginning teachers included in BTLS. The first year of teaching was not available for nonrespondents, so it was not possible to compute a unit response rate for beginning teachers.

Analysis

There are three research objectives addressed in this report. The first objective is to define the concept of a career path for beginning teachers that can be implemented with all waves of the BTLS. The second objective is to operationalize the assignment of a career path using this definition, i.e., examine methods for assigning career paths. To do so, this report investigates the methodological and analytic issues involved in analyzing the BTLS data longitudinally (i.e., across waves for individual teachers). The third objective is to investigate the best approach for analyzing the relationships between beginning teachers' career paths and selected teacher and school characteristics. The first 4 waves of BTLS data will be used to examine these issues.

In the first section below, Defining Career Paths, the concepts and steps involved in defining career paths are discussed without taking missing data into consideration. In the second section, Methods of Assigning Career Paths, approaches for coding career paths for all BTLS teachers, including methods for handling missing data, are explored. The third section, Reporting Career Paths by Teacher and School Characteristics, contains a discussion of how the relationships between career paths and teacher or school characteristics may be analyzed, including the effect of missing data on this analysis.

Defining Career Paths

BTLS data may be analyzed in a variety of ways to report on the issues of teaching attrition, retention, and mobility. The First Look report, *Beginning Teacher Attrition and Mobility* (Kaiser 2011) used BTLS data from waves 1 through 3 to report cross-sectional analysis results, such as the percentage of beginning teachers who stayed in or left teaching each year. BTLS data may also be analyzed longitudinally, for individual teachers across waves, to examine the variety of paths related to retention and mobility that teachers took during their early years of teaching. Another important feature of BTLS is that in addition to collecting information on past actions, such as whether beginning teachers left teaching or changed schools, the survey collects information that may be used to predict future actions, such as teachers' reasons for leaving and attitudes about teaching. For example, beginning teachers may leave for short-term reasons, such as maternity leave, or they may leave due to dissatisfaction with teaching as a career. This report uses this information as well as the longitudinal nature of BTLS to develop career paths.

Creating the criteria to be used to define the career paths involved several steps. The first level of analysis was to determine how many teachers stayed in teaching and how many left during their first 4 years. An estimated 80 percent of all beginning teachers taught in all 4 waves.[5] Further analyses revealed that mobility was common among this group, that is, teachers who changed schools within a district, moved to another school district, or moved to a private school or outside the United States during their early years. As school and district personnel must contend with teacher mobility, paths were created within the group of teachers who taught all 4 years based on teacher mobility.

Given that an estimated 20 percent of the eligible respondents did not teach all years, the second level of analysis examined common career paths among this group. Identifying teachers who

[5] Based on the 1,610 longitudinal respondents, including retrospective respondents (i.e., those who provided data for all 4 years either during data collection or retrospectively), the weighted percentage of BTLS teachers who reported teaching in all years was 79.6 and the weighted percentage who did not teach all years was 20.4 (data not shown in tables).

returned to teaching, those who could be expected to return or may return to teaching, and those not expected to return is also a consideration for policymakers, especially as more teachers are retiring every year. For this reason, criteria for teachers who did not teach in all waves were created based on whether the teacher returned to teaching and on available items in the surveys that might predict whether teachers could be expected to return to teaching or not. For example, teachers who applied for a position of pre-K–12 teacher during the most recent school year have indicated a desire to continue teaching. Alternatively, teachers who reported that they left teaching because they were dissatisfied with teaching as a career may not return to teaching. Teachers are classified, therefore, based on both their actual behavior and on their responses to survey items that may indicate future behavior.

In selecting criteria to assign teachers who did not teach in all waves into career paths for analysis, consideration was given to the best use of responses to the survey question: "Would you ever consider returning to the position of a pre-K–12 teacher?" This information was collected in waves 3 and 4. The language of this question (i.e., ever consider) might lead some respondents to answer "yes" when they would consider returning only under unusual circumstances. Because the goal was to identify those who could reasonably be expected to return, respondents who answered "yes" were not automatically classified as expected to return or may return. However, respondents who answered "no" to this question were classified as not expected to return to teaching.

This process resulted in six main career paths plus two "undetermined" categories. The criteria used to define the career paths are listed in exhibit 1. The number of teachers in each career path will be presented in later sections of this report. Three career paths were defined among the teachers who taught in all years; they are distinguished by the teachers' mobility over the years, as follows:[6]

- Career Path 1: teachers who taught in the same school all years;
- Career Path 2: teachers who taught in the same district but not in the same public school all years; and
- Career Path 3: teachers who did not teach in the same district all years.[7]

Four career paths were defined among those teachers who did not teach all years, as follows:

- Career Path 4: teachers who returned to teaching;
- Career Path 5: teachers who were expected to return or may return to teaching;
- Career Path 6: teachers who were not expected to return to teaching; and
- Career Path 7: teachers for whom it cannot be determined if they will return.

Career Path 8, status undetermined, is teachers whose teaching status during the first 4 years cannot be determined.

[6] Note that all BTLS teachers were teaching in public schools during wave 1.
[7] This group includes teachers who moved to other public school districts (including in different states), as well as those who taught in private schools or outside the United States. Data items on the specific type of move will be available to licensed users of the BTLS restricted-use data files.

Exhibit 1. Criteria used to define career paths

Teachers who taught all years:

1. **In same school:** Teachers who taught all years in the same school were classified into Career Path 1.
2. **In same district but not same public school:** Teachers who taught all years in the same district but not the same public school were classified into Career Path 2.
3. **Not in same district:** Teachers who taught all years but not in the same district (including teaching in private schools or outside the United States) were classified into Career Path 3.

Teachers who did not teach all years:

4. **Returned:** Teachers who did not teach all years but went back to teaching. Teachers who did not teach during all years and met the criterion below were classified into Career Path 4.
   - Taught in most recent year (but did not teach all years)—these are teachers who stopped teaching for one or more years but went back to teaching later.
5. **Expected to return or may return:** Teachers who did not teach all years but are expected to return or may return to teaching. Teachers who did not teach during all years and met one or more of the criteria below were classified into Career Path 5.
   - On maternity/paternity leave, disability leave, or sabbatical from teaching—these teachers may have a short-term reason for not teaching and may return to teaching.
   - Applied for position of a pre-K–12 teacher during most recent school year—this indicates a desire to continue teaching.
   - Teachers whose most important reason for leaving the position of a pre-K–12 teacher is listed below **and do not** have any of the criteria indicating they are **not** expected to return to teaching (as described for Career Path 6). These reasons for leaving are not related to dissatisfaction with teaching as a profession and may indicate that the teacher is likely to return. Because these reasons alone may not be sufficient to indicate expectation to return to teaching, they are used with the lack of criteria for Career Path 6.
     - Left teaching position involuntarily/contract not renewed.[1]
     - Change in residence or wanted job more convenient to home.
     - Pregnant or needed more time to raise children.
     - Being involuntarily transferred and did not want the offered assignment.
     - Concerned about job security at last year's school.
     - Decided to take courses to improve career opportunities **within** the field of education.
6. **Not expected to return:** Teachers who did not teach all years and are not expected to return to teaching. Teachers who did not teach during all years, met one or more of the criteria below, and were not assigned to Career Path 4 or 5 were classified into Career Path 6.
   - Did not apply for position of a pre-K–12 teacher and meet one of the following criteria:[2]
     - Gave one of the following reasons for not applying:

       "I was not interested in continuing a career in pre-K–12 teaching."

See notes at end of exhibit.

Exhibit 1. Criteria used to define career paths—Continued

"I wanted a position outside the classroom in an elementary or secondary school."

"I wanted to pursue an occupation outside elementary and secondary schools."

– Or said would not ever consider returning to position of a pre-K–12 teacher.

- Current main occupational status is retired.
- Current main occupation is one of the positions listed below in the field of K–12 education—teachers who become assistant principals, principals, or school district administrators may be considered to have obtained a higher position in education. Teachers who become librarians or school counselors/psychologists have made a decision to go into a different field of education that often requires additional education in that specialty. These positions include the following:
  - Principal/school head/dean,
  - Assistant principal,
  - School district administrator,
  - Librarian, and
  - Counselor or school psychologist.
- The most important reason for leaving the position of a pre-K–12 teacher is one of those listed below.[3] With the exception of retirement, these reasons indicate the teacher wants a position outside of teaching or is dissatisfied with teaching.
  - The teacher decided it was time to retire.
  - The teacher decided to take courses to improve career opportunities outside the field of education.
  - The teacher was dissatisfied with teaching as a career/dissatisfied with teaching.
  - The teacher decided to pursue position other than pre-K–12 teacher/wanted to pursue another career.

7. **Cannot determine if returning:** Teachers who did not teach all years for whom it cannot be determined if they will return. Teachers who did not teach all years and did not meet the criteria for Career Path 4 (returned), Career Path 5 (expected to return or may return), or Career Path 6 (not expected to return) were classified into Career Path 7.

Status undetermined:

8. **Status undetermined:** Teachers for whom it cannot be determined whether they taught all years were classified into Career Path 8.

[1] For waves 2 and 3, former teachers were asked "Did you leave teaching because your contract was not renewed?" In wave 4, teachers were asked "Did you leave your pre-K–12 teaching position involuntarily (e.g., contract not renewed, laid off, school closed or merged)?"

[2] In wave 2, respondents who did not apply for a teaching position were asked to indicate which factors influenced their decision not to apply. In waves 3 and 4, respondents who did not apply were asked whether they would ever consider returning to the position of a pre-K–12 teacher.

[3] Retrospective respondents were asked a shorter list of questions to determine reasons for leaving pre-K–12 teaching, so only the last two reasons apply to these respondents.

NOTE: All BTLS teachers were teaching in public schools during wave 1.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

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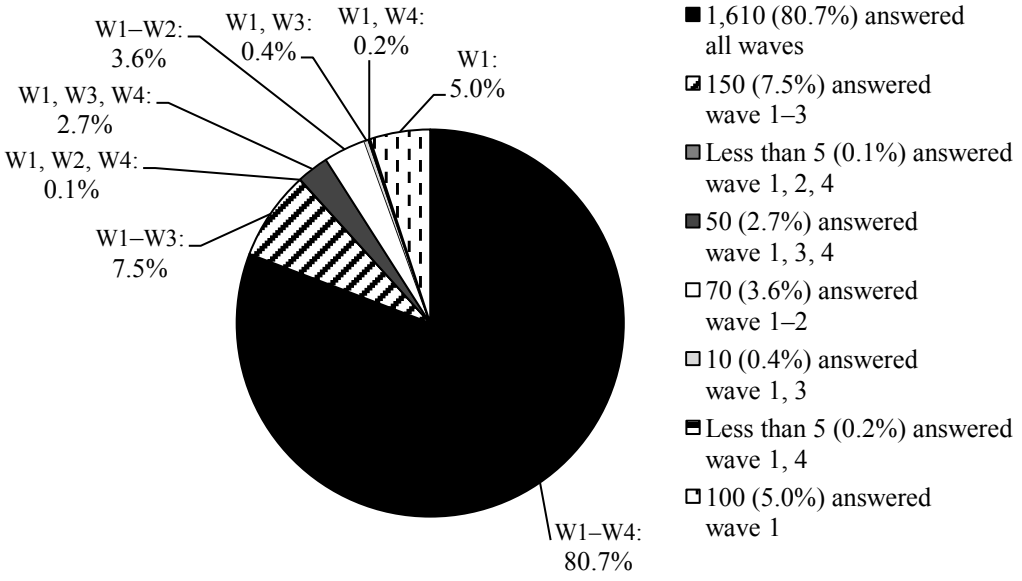
Methods for Assigning Career Paths

The method for assigning career paths depended on the amount of information available for a teacher, i.e., the response pattern across waves. To develop the best method, the number of teachers with each response pattern was reviewed. Including retrospective respondents, approximately 81 percent (1,610 teachers) of the sampled 1,990 beginning teachers responded to all 4 waves (figure 1).[8]

Figure 1. Number and percentage distribution of BTLS respondents, by response pattern: 2007–08 through 2010–11



NOTE: Unweighted, rounded sample sizes based on detailed interview status (variable ISRD) for each wave. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

For this analysis, teachers who gave retrospective responses that were complete enough to be considered survey-level respondents for a given wave were considered to have answered that wave. For example, the group of 150 teachers who answered waves 1–3 includes those who answered wave 2 items retrospectively during data collection for wave 3 and met the criteria to be counted as wave 2 respondents. The criteria required to be considered a unit or survey-level respondent during data collection or retrospectively are listed in exhibit 2. Some response patterns have gaps that are due to missing or incomplete retrospective responses, as described below.

- The teachers (less than 5) who answered waves 1, 2, and 4 were nonrespondents during wave 3 data collection. Although wave 4 data were collected by telephone, the teachers did not provide enough retrospective wave 3 data to meet the criteria to be wave 3 respondents.

[8] Unweighted, rounded sample sizes.

Exhibit 2. Criteria used to define unit-level respondents

During data processing for each wave, a final determination was made for each sample member as to whether sufficient data had been collected for the case to be classified as a respondent for that wave. A case was classified as a respondent if the criteria below were met. The same criteria were used to classify a teacher as a retrospective respondent if the necessary data were collected retrospectively.

- Former teacher:
  - was not classified as deceased or permanently incapacitated;
  - reported that he or she did not currently teach any regularly scheduled classes in any of grades pre-K–12 or reported that his or her job classification was as a short-term substitute, student teacher, or teacher aide; and
  - reported main occupational status and was not on leave.
- Current teacher:
  - was not classified as deceased or permanently incapacitated;
  - reported that he or she taught any regularly scheduled classes in any of grades pre-K–12;
  - reported that his or her job classification was not as a short-term substitute, student teacher, or teacher aide; and
  - indicated whether or not he or she was teaching in the same school as in the previous year.

- The 50 teachers who answered waves 1, 3, and 4 were nonrespondents during wave 2 data collection. This group includes those who provided wave 3 data by telephone but did not provide enough retrospective wave 2 data to meet the criteria to be a wave 2 respondent. It also includes those who did not answer wave 2 or 3 during the wave data collections, but answered wave 3 retrospectively during the wave 4 data collection.
- The 10 teachers who answered waves 1 and 3 were nonrespondents during wave 2 data collection. Although wave 3 data were collected by telephone, the teachers did not provide enough retrospective wave 2 data to meet the criteria to be a wave 2 respondent.
- The teachers (less than 5) who answered waves 1 and 4 were nonrespondents during wave 2 and 3 data collection. Although wave 4 data were collected by telephone, the teachers did not provide enough retrospective wave 3 data to meet the criteria to be a wave 3 respondent.

Because some teachers did not respond to all 4 waves, there is a fundamental question to be answered related to assigning career paths: Which group of teachers should be used to produce the estimates of teacher career paths? There are several reasons to use one group of teachers, i.e., those who responded to all waves (1,610) or all sample members (1,990). Weights are available in the BTLS to conduct analyses for either group. To address this question, career paths were assigned to both groups and the results examined. The methods used to code career paths for each group are discussed in the sections below. Next, an alternative method for coding career paths is

explained, along with the reasons this alternative method was not used. Following this discussion, the results of the coding and a comparison of the two groups are presented.

Assignment for Teachers Who Answered All Waves. For the teachers who answered all waves, including the retrospective respondents, all the information needed to identify teachers who taught all waves and assign them into one of Career Paths 1–3 was available. The survey items needed to code these paths were either answered or responses were imputed because they were designated as key items.[9] No special predictions were needed for assigning these paths because the paths reflect actual behavior and teachers were asked all of the questions needed to meet the criteria. Career Paths 4–7 were assigned to those who did not teach all waves and were divided into those who returned to teaching, were expected to return or may return to teaching, were not expected to return, and whose return status was not determined. Because these paths use predicted as well as actual behavior, criteria for assigning these 4 paths were developed to make this prediction (see exhibit 1). Some teachers who did not teach in all waves did not meet the criteria for Career Paths 4, 5, or 6. In addition, there was item nonresponse for some of these criteria because they were not key items and therefore not imputed. Therefore, Career Path 7, did not teach all years and cannot determine if expected to return, was established. No teachers were assigned to Career Path 8 because this group had all the information needed to code teachers into Career Paths 1–7.

Assignment for Teachers Who Did Not Answer All Waves. The coding method for this group depends on whether the teacher answered only wave 1 or more than wave 1, as described below.

- **Answered only wave 1.** There is little information available to code career paths for this group.[10] All sample members were teaching during wave 1, and there is no information about changing schools, applying to teach, reasons for leaving teaching, occupations outside of teaching, or the other criteria used to code career paths. The wave 1 question "If you could go back to your college days and start over again, would you become a teacher or not?" was reviewed to see whether this item would provide good criteria for coding career paths. Specifically, the distribution of the teachers with known career paths, i.e., those who responded to all waves by their response to this wave 1 item, was examined. This questionnaire item does not appear to be a good predictor of career paths. For example, only about 35 percent of teachers who said they certainly would not become a teacher again actually left teaching (not shown in tables). For these reasons, the career paths for teachers who answered only wave 1 are coded as status undetermined, i.e., Career Path 8.
- **Answered more than wave 1 but not all waves.** For these teachers, some of the data needed to code career paths were missing. Therefore, these paths were created based on the reported information. The first step was to code teachers into one of the two main groups of "taught all years for which they responded" or "did not teach all years for which they responded." This was done based on their teaching statuses during the waves for which they responded. For example, teachers who responded to waves 1–3 only and reported teaching during each wave 1–3 were coded as "taught

[9] Only survey items designated as "key" were imputed for BTLS. For more information on imputation, see the section on data processing and imputation in appendix C.

[10] For teachers who did not respond during data collection or retrospectively to waves 2–4, only wave 1 survey data are available in the database.

all years for which they responded," whereas those who did not teach in one or more waves were coded "did not teach all years for which they responded."

Within the main classification, teachers were coded into career paths based on their available responses to the items listed in exhibit 1. Teachers in the "taught all years for which they responded" group were coded into one of the Career Paths 1–3 based on whether they changed schools (within or outside the same district) during the years for which they responded. Teachers in the "did not teach all years for which they responded" group were coded into one of the Career Paths 4–6 based on their responses to the criteria listed in exhibit 1 in the waves for which they responded. For example, teachers who responded to waves 1–2 only and reported in wave 2 that they were not teaching but had applied to teach were coded as not teaching all years but expected to return or may return (Career Path 5). Another example is teachers who responded to waves 1, 3, and 4 only and reported in wave 4 that they were not teaching and their most important reason for leaving teaching was that they decided to pursue a position other than pre-K–12 teacher were coded as not teaching all years and not expected to return (Career Path 6). Teachers who did not provide enough information to be coded into a career path were coded as status undetermined, i.e., Career Path 8. Table 1 shows the unweighted number of respondents that were coded into each career path for each response pattern.

Alternative Assignment Method Considered But Not Used for Teachers Who Did Not Answer All Waves. An alternative method of coding career paths was considered for teachers who answered more than wave 1 but not all waves (i.e., partial respondents). For the partial respondents who reported teaching during all the years for which they responded, consideration was given to coding some into the "did not teach all years" group. Information from those who responded to all 4 waves could have been used to indicate the percentage of those with each partial response pattern who might leave teaching (e.g., the percentage of those who taught in waves 1–3 who left in wave 4). However, this method would only provide an estimate of the overall percentage that might leave teaching and would not identify which individual partial respondents should be assigned into the "did not teach all years" group. For example, suppose that among teachers who responded to all 4 waves and taught in each wave 1–3, there were 10 percent who did not teach in wave 4. The same rate of leaving teaching could be assumed for the group of teachers who only responded to waves 1–3 and taught in each of those waves, but which individual partial respondents were in that 10 percent could not be determined. In addition, it would not be possible to code these teachers into a subgroup for "expected to return or may return" or "not expected to return" because none of the necessary information had been collected. That is, this group was not asked questions for former teachers (e.g., reason for leaving, whether applied for a teaching position, main occupation) because they taught all years for which they responded. Therefore, this approach would not help in the assignment of individual career paths, and for these reasons was not used.

Comparison of Career Paths for the Two Groups. Table 2 shows the unweighted numbers, weighted numbers, and weighted percentage distribution of career paths for all BTLS sample members and for the teachers who responded to all waves, including retrospective respondents. Data from this table are used below to describe the strengths and weaknesses of using each set of teachers.

For the estimated number of teachers and the percentage distribution by career paths, there are no statistically significant differences[11] between the estimates based on all BTLS sample members and the estimates based on respondents to all waves. However, the percentage with "status undetermined" is 7.1 for all sample members and does not exist for respondents to all waves. Of the 150 eligible (unweighted) teachers with "status undetermined," 100 were teachers who only responded in wave 1. For the last two columns of table 2 (weighted percentage distribution of teachers with coded career paths), percentage distributions were calculated only among those with assigned Career Paths 1–6, excluding those whose path was not determined. Again, there are no statistically significant differences between the estimates based on all BTLS sample members and the estimates based on respondents to all waves in these last two columns.

One of the differences between the two groups is that the group of all sample members includes both the respondents to all waves and about 380 (unweighted) partial respondents (those who answered some but not all waves). These partial respondents may have different career paths than the respondents who answered all waves, and these differences may not be accounted for in the weighting adjustments. Another difference is the amount of information available for assigning career path codes. The partial respondents are missing key information needed to assign career path codes.

It cannot be determined whether the estimates based on all sample members or those based on respondents to all waves are better (i.e., closer to the truth). Each set has strengths and weaknesses. Using all sample members means that any true differences between partial respondents and full respondents are represented. However, it also means that career paths must be assigned using partial information and the results may not be as accurate as when using full information. In addition, this group of all sample members has more teachers in the "undetermined" category. In comparison, the weakness of using the group that responded to all waves is that any true differences between partial respondents and full respondents are not represented. The strengths are that career paths are assigned using full information and there are no teachers in the "status undetermined" category.

Of the 380 (unweighted) sample members added to the analysis by including partial respondents, 150 (39 percent) were added to the "status undetermined" category and therefore do not contribute to the analysis (data not shown in tables). Having a large number of sample members in the "status undetermined" category means that one must interpret or estimate how the percentage distributions might change if the career paths were known for this group. Of the remaining partial respondents, some may be coded in the wrong career path because the codes are based on partial information, as described in the section above. So while there is a larger sample using all sample members, the quality of the career path coding of that additional data may be reduced compared to using respondents to all waves.

Using respondents to all waves may underrepresent beginning teachers who did not teach continuously and those who left teaching, due to the fact that it may have been harder to find these teachers during data collection and their interest in participating in a survey about teaching may have been low relative to active teachers.

[11] All data comparisons in this report have been tested for statistical significance at the .05 level using Student's *t*-statistics to check if the differences are larger than those that might be expected due to sampling variation.

The coding of career paths relies on both reported data and assumptions about future behavior. Using the respondents to all waves reduces the number of assumptions that need to be made and increases the reliance on reported data. With this group, data are reported for all survey items needed to classify respondents into Career Paths 1, 2 and 3, i.e., teaching and moving statuses. In contrast, if those who did not respond to all waves are included, one must make assumptions such as teachers who taught in the same school in waves 1–3 also taught in that school in wave 4, if there was no response to wave 4.

True differences between those who responded to all waves and those who responded to only some waves cannot be determined. However, to assess how well the methods to assign career paths worked when only partial information was available, the group with known career paths (teachers who responded to all waves) was used, and career paths were coded as if they had only responded to some of the waves. Then the career paths coded using partial information were compared to those coded using full information. This comparison shows how closely the paths coded using partial information match the paths coded using full information. Because only those who responded to all waves are used for this test, the issue of true differences between those who responded to some waves and those who responded to all waves is not relevant. Therefore, this test allows one to look only at the success of assigning career paths using partial information. This comparison was conducted for the three main response patterns. The comparisons were not done for patterns with 10 or less teachers and for teachers with only wave 1 information. As previously discussed, wave 1 alone does not provide enough information to assign career paths.

Table 3 shows a comparison of career paths based on using information from waves 1–3 and based on information from all waves 1–4. For example, among the teachers coded as Career Path 1 (taught all years in same school) based on wave 1–3 data, about 87 percent remain in this path when data from all waves 1–4 are used. The remaining 13 percent (estimated) move into other paths when the wave 4 information is known. For example, about 4 percent move into Career Path 2 (taught all years in same district but not same public school) using the additional information from wave 4.[12] For Career Paths 1–6, the percentage of teachers that are coded into the same career path using responses from all waves and responses from waves 1–3 ranges from 75 percent for Career Path 5 to 93 percent for Career Path 2.

Table 4 shows a comparison of career paths based on using information from waves 1–2 and based on information from all waves. For Career Paths 1–6, the percentage of teachers that are coded into the same career path using responses from all waves and responses from waves 1–2 ranges from 57 percent for Career Path 5 to 81 percent for Career Path 6.

Table 5 compares the career paths based on information from waves 1, 3, and 4 to paths based on information from all waves. For Career Paths 1–6, the percentage of teachers that are coded into the same career path using responses from all waves and responses from waves 1, 3, and 4 ranges from 95 percent for Career Path 1 to 100 percent for Career Paths 2, 4, 5, and 6.

[12] Note that teachers may move into Career Path 7 (did not teach all years and cannot determine if returning) because they change from "taught all years" to "did not teach all years" but did not provide enough information to classify them into "returned," "expected to return or may return," or "not expected to return."

Reporting Career Paths by Teacher and School Characteristics

While it is interesting to examine the career paths that beginning teachers follow during their early years of teaching, it is also important to look at these paths using various characteristics that may influence which paths are taken. As discussed in the introduction, research has shown that attrition, retention, and mobility may be linked to factors such as salary and benefits, supports for new teachers, and personal life factors, as well as demographics.

To examine the relationships between teacher career paths and teacher and school characteristics, a decision was needed on the set of teachers to be used to analyze the relationships. Using the set of teachers who responded to all waves, there will be less missing data for the teacher and school characteristics needed for the analyses compared to including all eligible respondents. Also, the weights for all eligible respondents include everyone in the analysis weighted to the population, whereas the portion of the population in the "status undetermined" group are not reflected in the weighted percentage distribution when the undetermined are excluded. To examine the differences in the relationships between career paths and teacher and school characteristics, analyses were produced using both sets of teachers to see if the estimates were similar or dissimilar for the two sets.

A similar decision was needed on whether retrospective respondents should be included in the analyses.[13] Retrospective respondents were only asked a limited set of questions. These questions did not include some items used to create the teacher and school characteristic variables for the analyses. As including the retrospective respondents in the analyses may result in different estimates of the relationships between career paths and teacher and school characteristics, the set of teachers *including* and *excluding* retrospective respondents was examined. Separate weights are available on the data file for each set of teachers, including and excluding retrospective respondents.

Characteristics During First Year of Teaching. Research on teacher retention and attrition has shown that teachers' experiences during their first year of teaching are often related to retention and attrition. For example, teacher induction programs in the first year of teaching have been shown to be related to teacher retention. The decision was made, therefore, to examine the relationships between teacher career paths and teacher and school characteristics in the first year of teaching.

Tables 6 and 7 show the percentage distributions of career paths by first-year teacher and school characteristics using all BTLS sample members and teachers responding to all waves (including retrospective respondents), respectively. We tested each estimate in table 6 against the comparable estimate in table 7 to determine if the differences were statistically significant. Only two statistically significant differences were found between the estimates produced using all BTLS sample members (table 6) and those produced using teachers responding to all waves, including retrospective respondents (table 7). These differences were found on the "nonresponse" row for "had a mentor in the first year of teaching who helped the teacher to improve teaching" in the column for "number of teachers" and the column for percentage "taught all years in same school." This is likely due to the larger amount of nonresponse among all BTLS sample members

[13] Sample members who did not respond during the second wave were asked selected second-wave items during the third wave. Similarly, those who did not respond during the third wave were asked selected third-wave items during the fourth wave. These respondents are referred to as retrospective respondents.

compared to respondents to all waves. The very small number of differences found between the estimates in these tables suggests that the set of teachers used to analyze the BTLS data has little influence on the estimates obtained when the relationships between career paths and teacher and school characteristics are examined.

Characteristics During Most Recent Year of Teaching. As career paths are based on teacher attrition, retention, and mobility across waves, a decision was also needed on how to link teacher and school characteristics to the career paths of teachers. That is, would characteristics in the most recent year of teaching or those that ever occurred across the waves be used to examine these relationships? For teachers who taught in all waves, the characteristics from the most recent wave were used because they represent teacher characteristics at the most recent point at which teachers might consider leaving the profession. These characteristics would likely have the most immediate and greatest impact on the decision to leave.

Tables 8 and 9 examine the distributions of career paths of the beginning teachers by teacher and school characteristics in the teachers' most recent year of teaching.[14] In table 8, this analysis was conducted with the set of teachers who responded to all waves of the survey *including* retrospective respondents. Table 9 is based on the set of teachers who responded to all waves *excluding* retrospective respondents.

Comparing the tables, the most striking finding is that the distributions of career paths by teacher and school characteristics are similar for both sets of teachers. We tested each estimate in table 8 against the comparable estimate in table 9 to determine if the differences were statistically significant. No statistically significant differences were found between the estimates produced using teachers responding to all waves *including* retrospective respondents (table 8) and those using teachers responding to all waves *excluding* retrospective respondents (table 9). This finding suggests that the inclusion of retrospective respondents in this type of analysis has little impact on the estimates for relationships between career paths and teacher and school characteristics. More information about these variables can be found in appendix B of this report.

[14] Teacher and school characteristics used for these analyses were those for each teacher's most recent year of teaching. See appendix B for a list of the characteristic variables used in the tables.

Conclusions and Recommendations

The ultimate purpose of this report is to develop a strategy for the longitudinal analysis of BTLS data that can be used to better understand teacher attrition, retention, and mobility. This strategy may be used for future NCES analysis of all 5 years of BTLS data once data from the fifth wave become available.

This report has three objectives.

1. Define the concept of a career path for beginning teachers that can be implemented with all waves of the BTLS.
2. Operationalize the assignment of a career path using this definition, i.e., examine methods for assigning career paths.
3. Investigate the best approach for analyzing the relationships between beginning teachers' career paths and selected teacher and school characteristics.

Each of these objectives and its outcome is discussed below, followed by recommendations for wave 1–5 longitudinal career path analysis and discussion of additional analysis that could be conducted using wave 1–5 data.

Defining Career Paths

As BTLS provides longitudinal data for beginning teachers, it can be used to create career paths related to retention and mobility that teachers took during their early years of teaching. In addition, the data provide information on past actions and information that can be used to predict future actions. Analyses of the teachers' past actions showed that approximately 80 percent of all beginning teachers taught all 4 years, but there was mobility within this group. Three career paths were created for this group based on the type(s) of moves they made. Among the remaining 20 percent of beginning teachers, paths were created based on whether a teacher returned, is likely to return to teaching, or is not likely to return, using several survey items. In addition, two other career paths were created. The first of these was for teachers for whom it could not be determined if they would return, and the second was for teachers for whom it could not be determined if they taught all years, i.e., status undetermined.

An important consideration in the development of the career paths was to provide information to policymakers on teacher attrition, retention, and mobility that reflects not only teachers' current paths but also their expected paths. The criteria for assigning career paths include a wide range of BTLS data items. This variety of items provides checks and balances to help ensure that the most appropriate paths were identified for the teachers.

The authors believe that the career paths developed for this report, as described in exhibit 1 and exhibit B-1, are appropriate for use in future analyses of BTLS wave 1–5 data, when even more data will be available.

Operationalizing the Definition of Career Paths

The method for assigning career paths depended on the amount of information available for teachers, that is, the response patterns across the waves. Approximately 81 percent (unweighted) of all sample members responded to all 4 waves. Because all teachers did not respond to all waves, two possible sets of teachers could be used to produce estimates of teacher career paths.

These sets are all sample members and those who responded to all waves of the BTLS. Some of the differences in these groups are discussed below.

- There is a larger sample size for analysis using all sample members. However, of the 380 (unweighted) sample members added by including partial respondents, 150 (39 percent) were added to the "status undetermined" category and therefore do not contribute to the analysis (data not shown in tables). Of the remaining partial respondents, some may be coded in the wrong career path because the codes are based on partial information. This is reflected in the test conducted to assess how well the methods to assign career paths worked when only partial information was available. So while there is a larger sample using all sample members, the quality of the career path coding of that additional data may be less than that when using respondents to all waves.
- Using all sample members means that any true differences in career paths between partial respondents and full respondents are represented. But based on the percentage distributions shown in table 2 (including and excluding the "undetermined" career paths), there are no statistically significant differences between the percentages based on all BTLS sample members and the percentages based on respondents to all waves.
- The coding of career paths relies on both reported data and assumptions about future behavior. Using the respondents to all waves reduces the number of assumptions that need to be made and increases the reliance on reported data. In contrast, if partial respondents are included, such assumptions as teachers who taught in the same school in waves 1–3 also taught in that school in wave 4 must be made if there was no response to wave 4.

Based on the analyses conducted using both sets of teachers, using the respondents to all waves of the survey was found to be the best approach to operationalizing teacher career paths. For the estimated number of teachers and the percentage distribution by career paths, no statistically significant differences between the estimates based on all BTLS sample members and the estimates based on respondents to all waves, including retrospective respondents, were found. Using respondents to all waves has several advantages. These advantages include having fewer teachers whose paths could not be determined; relying more on reported data and less on assumptions, which may improve the quality of career path coding; and having no missing data for analysis due to survey unit-level nonresponse. For these reasons, the authors recommend using the respondents to all waves, including retrospective respondents, for future longitudinal career path analysis.

Analyzing Relationships Between Career Paths and Teacher and School Characteristics

Given the results of the analyses conducted on the set of teachers to be used to produce estimates of teacher career paths, using respondents to all waves is appropriate in analyzing the relationships between career paths and teacher and school characteristics because the results for this group did not differ significantly from results for all sample members. The inclusion of retrospective respondents in the analysis of the relationships between teacher and school characteristics in the last year of teaching and career paths did not significantly impact the estimates for those relationships. No statistically significant differences were found between the estimates produced using teachers responding to all waves *including* retrospective respondents and those using teachers responding to all waves *excluding* retrospective respondents. For these reasons, the authors recommend inclusion of retrospective respondents in future longitudinal career path analysis.

Summary of Recommendations for Wave 1–5 Longitudinal Career Path Analysis

Below is a summary of recommendations for wave 1–5 longitudinal career path analysis based on the findings in this report.

- Define career paths the same as defined for this report. Code the paths based on the criteria shown in exhibit 1, incorporating data collected in wave 5. The term "all years" used in exhibit 1 (for example, teachers who taught all years in same school) would be defined as waves 1–5. The term "most recent year" would be defined as wave 5. For example, the criteria for Career Path 4 "taught in most recent year" would be defined as "taught in wave 5." Drop Career Path 8 (status undetermined) because it will not be needed when using respondents to all waves (see below).
- Conduct analysis using respondents to all waves 1–5, including retrospective respondents. Use the appropriate final and replicate weights for this group, which are the wave 1–5 retrospective longitudinal weights.

Additional Analysis

NCES will release the wave 1–5 data as restricted-use data files available to restricted-use SASS license holders. These data files will contain the data collected during each survey wave and several sets of full-sample and replicate weights to support various types of analysis, including those listed below.

- **Cross-sectional analysis.** Tabulations may be produced for each wave of data separately, using the cross-sectional weights provided on the data file for this purpose. Results from each wave may be used to examine behavior at different stages of teachers' careers, for example, the percentage of beginning teachers who changed schools during their second year of teaching and the percentage who changed schools during their third year of teaching. This is the type of analysis conducted using preliminary wave 1–3 data presented in the First Look report, *Beginning Teacher Attrition and Mobility* (Kaiser 2011). That report examined the retention rates of teachers each year by characteristics, and the mobility (e.g., moving to a different school) for those who stayed in teaching. Additional analysis may be done for different types of behavior and characteristics. Researchers may

include data from any wave 1–5 and may use multiple predictors or characteristics in their analysis.

- **Longitudinal analysis.** This type of analysis examines individual behavior across time. The career path created for this report is an example of longitudinal analysis because it is based on individual-level data at various points in time. For example, Career Path 1 is coded if a teacher taught in the same school during every wave of the survey. This type of analysis may be used for examining longitudinal career paths by characteristics. Licensed researchers may use the longitudinal weights provided on the data file to conduct other longitudinal analysis.
- **Regression analysis.** This type of analysis examines the relationships between variables and may be used with cross-sectional or longitudinal data. It may be used to identify the association between variables and to control for the interdependence of related variables. For example, when examining career paths by teacher and school characteristics (such as those in tables 7 and 8 of this report), some of the characteristics may be related to each other. Regression analysis allows the researcher to control for the interrelationships among characteristics. Regression analysis may also be used to predict behavior, such as whether a teacher will continue or leave teaching. NCES has plans to conduct this type of analysis and release a report of the findings in the future. Licensed researchers may use the wave 1–5 restricted-use data file to conduct regression analysis and modeling.

Regardless of the type of analysis being conducted, licensed users of the BTLS data need to determine whether or not to use data collected retrospectively. If the analysis uses variables collected retrospectively (i.e., key items), researchers should consider including retrospective respondents in the analysis. Researchers have a larger set of sample members using retrospective respondents, but there may be considerable item nonresponse for nonkey items. The documentation provided with the wave 1–5 restricted-use data file contains more information on using the survey data and weights for analysis.

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Estimate Tables

Table 1. Unweighted number of BTLS respondents, by response pattern and career path: 2007–08 through 2010–11

Career path	All teachers	Response pattern—answered waves: All waves	Waves 1–3	Waves 1, 2, 4	Waves 1, 3, 4	Waves 1–2	Waves 1, 3	Waves 1, 4	Only wave 1
All teachers	1,990	1,610	150	#	50	70	10	#	100
1 Taught all years in same school	1,000	860	90	#	#	40	#	#	#
2 Taught all years in same district but not same public school	170	150	10	#	#	10	#	#	#
3 Taught all years but not in same district	280	250	20	#	10	10	#	#	#
4 Did not teach all years but returned	70	70	10	#	#	#	#	#	#
5 Did not teach all years but expected to return or may return	180	160	10	#	#	10	#	#	#
6 Did not teach all years and not expected to return	100	90	10	#	#	#	#	#	#
7 Did not teach all years and cannot determine if returning	40	40	#	#	#	#	#	#	#
8 Status undetermined	150	†	#	#	30	10	10	#	100

† Not applicable. Career Path 8 (status undetermined) does not apply to respondents to all waves because these respondents have sufficient data to determine the status.
# Rounds to zero.
NOTE: Unweighted, rounded sample sizes, including retrospective respondents. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table 2. Unweighted number, weighted number, and weighted percentage distribution of all BTLS sample members and respondents to all waves, including retrospective respondents, by assigned career path: 2007–08 through 2010–11

Career path	Unweighted number		Weighted number		Weighted percentage distribution		Weighted percentage distribution of teachers with coded Career Paths 1–6[1]	
	All BTLS sample members	Respondents to all waves	All BTLS sample members	Respondents to all waves	All BTLS sample members	Respondents to all waves	All BTLS sample members	Respondents to all waves
All teachers	1,990	1,610	156,100	156,100	100.0	100.0	100.0	100.0
1 Taught all years in same school	1,000	860	83,300	86,100	53.3	55.1	58.7	56.5
2 Taught all years in same district but not same public school	170	150	16,100	17,700	10.3	11.3	11.3	11.6
3 Taught all years but not in same district	280	250	18,900	20,600	12.1	13.2	13.3	13.5
4 Did not teach all years but returned	70	70	5,400	6,900	3.4	4.4	3.8	4.6
5 Did not teach all years but expected to return or may return	180	160	12,000	13,400	7.7	8.6	8.5	8.8
6 Did not teach all years and not expected to return	100	90	6,200	7,500	4.0	4.8	4.4	5.0
7 Did not teach all years and cannot determine if returning	40	40	3,100!	3,900!	2.0!	2.5!	†	†
8 Status undetermined	150	†	11,100	†	7.1	†	†	†

† Not applicable. Career Path 7 (did not teach all years and cannot determine if returning) and Career Path 8 (status undetermined) do not apply to the columns for teachers with coded career paths 1–6. Career Path 8 (status undetermined) does not apply to respondents to all waves because these respondents have sufficient data to determine the status.
! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).
[1] Excludes teachers in Career Paths 7 and 8.
NOTE: Weighted data in the "all BTLS sample members" columns were weighted using the W1 Teacher final sampling weight (W1TFNLWGT). Weighted data in the "respondents to all waves" columns include retrospective respondents and were weighted using theW1–W4 Retrospective longitudinal final weight (W4RLWGT, adjusted). 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table 3. Weighted percentage distribution of respondents to waves 1–4, including retrospective respondents, by career path based on responses to waves 1–3 and career path based on responses to waves 1–4: 2007–08 through 2010–11

	Career path based on responses to waves 1–3							
Career path based on responses to waves 1–4	1 Taught all years in same school	2 Taught all years in same district but not same public school	3 Taught all years but not in same district	4 Did not teach all years but returned	5 Did not teach all years but expected to return or may return	6 Did not teach all years and not expected to return	7 Did not teach all years and cannot determine if returning	8 Status undetermined
All teachers	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 Taught all years in same school	86.7	#	#	#	#	#	#	#
2 Taught all years in same district but not same public school	4.0	93.1	#	#	#	#	#	#
3 Taught all years but not in same district	3.5	‡	89.1	#	#	#	#	#
4 Did not teach all years but returned	#	#	#	83.8	19.3	‡	‡	#
5 Did not teach all years but expected to return or may return	2.7	‡	6.0!	‡	74.6	‡	‡	#
6 Did not teach all years and not expected to return	1.4!	‡	‡	‡	‡	80.9	‡	100.0
7 Did not teach all years and cannot determine if returning	‡	‡	‡	#	‡	‡	45.1!	#
8 Status undetermined	†	†	†	†	†	†	†	†

† Not applicable. Career Path 8 (status undetermined) does not apply to respondents to waves 1–4 because these respondents have sufficient data to determine the status.

Rounds to zero.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).

‡ Reporting standards not met. The coefficient of variation (CV) for this estimate is 50 percent or greater (i.e., the standard error is 50 percent or more of the estimate).

NOTE: Based on the 1,610 respondents to all waves, including 160 retrospective respondents. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table 4. Weighted percentage distribution of respondents to waves 1–4, including retrospective respondents, by career path based on responses to waves 1–2 and career path based on responses to waves 1–4: 2007–08 through 2010–11

	Career path based on responses to waves 1–2							
Career path based on responses to waves 1–4	1 Taught all years in same school	2 Taught all years in same district but not same public school	3 Taught all years but not in same district	4 Did not teach all years but returned	5 Did not teach all years but expected to return or may return	6 Did not teach all years and not expected to return	7 Did not teach all years and cannot determine if returning	8 Status undetermined
All teachers	100.0	100.0	100.0	100.0	100.0	100.0	100.0	†
1 Taught all years in same school	74.2	#	#	–	#	#	#	†
2 Taught all years in same district but not same public school	9.1	75.1	#	–	#	#	#	†
3 Taught all years but not in same district	7.2	‡	73.7	–	#	#	#	†
4 Did not teach all years but returned	0.8!	‡	‡	–	36.2	‡	61.2	†
5 Did not teach all years but expected to return or may return	4.5	8.4!	16.5!	–	56.7	‡	‡	†
6 Did not teach all years and not expected to return	2.3!	‡	‡	–	‡	81.1	‡	†
7 Did not teach all years and cannot determine if returning	‡	‡	‡	–	#	‡	‡	†
8 Status undetermined	†	†	†	†	†	†	†	†

– Not available. Information to code Career Path 4 (did not teach all years but returned) is not available for respondents to waves 1–2 because these respondents could not have left and returned to teaching within two waves.

† Not applicable. Career Path 8 (status undetermined) does not apply to respondents to waves 1–4 and respondents to waves 1–2 because these respondents have sufficient data to determine the status.

Rounds to zero.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).

‡ Reporting standards not met. The coefficient of variation (CV) for this estimate is 50 percent or greater (i.e., the standard error is 50 percent or more of the estimate).

NOTE: Based on the 1,610 respondents to all waves, including 160 retrospective respondents. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table 5. Weighted percentage distribution of respondents to waves 1–4, including retrospective respondents, by career path based on responses to waves 1, 3, and 4 and career path based on responses to waves 1–4: 2007–08 through 2010–11

	Career path based on responses to waves 1, 3, and 4							
Career path based on responses to waves 1–4	1 Taught all years in same school	2 Taught all years in same district but not same public school	3 Taught all years but not in same district	4 Did not teach all years but returned	5 Did not teach all years but expected to return or may return	6 Did not teach all years and not expected to return	7 Did not teach all years and cannot determine if returning	8 Status undetermined
All teachers	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 Taught all years in same school	94.9	#	#	#	#	#	#	#
2 Taught all years in same district but not same public school	5.1!	100.0	#	#	#	#	#	#
3 Taught all years but not in same district	#	#	99.1	#	#	#	#	#
4 Did not teach all years but returned	#	#	‡	100.0	#	#	32.1	#
5 Did not teach all years but expected to return or may return	#	#	#	#	100.0	#	22.6	#
6 Did not teach all years and not expected to return	#	#	#	#	#	100.0	9.0!	100.0
7 Did not teach all years and cannot determine if returning	#	#	#	#	#	#	36.3	#
8 Status undetermined	†	†	†	†	†	†	†	†

† Not applicable. Career Path 8 (status undetermined) does not apply to respondents to waves 1–4 because these respondents have sufficient data to determine the status.

Rounds to zero.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).

‡ Reporting standards not met. The coefficient of variation (CV) for this estimate is 50 percent or greater (i.e., the standard error is 50 percent or more of the estimate).

NOTE: Based on the 1,610 respondents to all waves, including 160 retrospective respondents. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table 6. Weighted number and percentage distribution of all BTLS sample members, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
All 2007–08 beginning teachers	156,100	100.0	53.3	10.3	12.1	3.4	7.7	4.0	2.0!	7.1
Age										
Less than 30 years	112,800	100.0	53.6	11.1	12.6	3.8	5.9	3.5	1.8!	7.8
30 or more years	43,300	100.0	52.7	8.2	11.0	2.4!	12.5	5.3!	2.5!	5.4
Sex										
Male	39,800	100.0	55.6	9.9	9.3	1.5!	7.7	6.1	1.6!	8.3
Female	116,300	100.0	52.6	10.4	13.1	4.1	7.7	3.2	2.1!	6.7
Race/ethnicity										
White, non-Hispanic	122,100	100.0	55.4	8.9	12.6	3.7	6.8	4.1	1.7!	6.8
All other races/ethnicities	34,100	100.0	45.9	15.4!	10.5	‡	10.9!	3.4!	‡	8.3
Highest degree										
Less than a bachelor's degree	1,900	100.0	59.5	#	‡	‡	‡	11.6!	‡	‡
Bachelor's degree	125,100	100.0	53.5	10.4	12.2	2.6	7.8	4.1	1.7!	7.7
Master's degree	26,900	100.0	54.3	10.5	13.4	6.2!	5.3	‡	3.5!	4.2!
Higher than a master's degree	2,300 !	100.0	28.9!	‡	‡	‡	‡	‡	#	‡
Entered teaching through an alternative certification program										
Yes	42,400	100.0	46.6	15.3	14.3	2.6!	5.4	6.7	‡	6.0
No	113,700	100.0	55.8	8.4	11.3	3.8	8.6	2.9	1.6!	7.6
Length of practice teaching										
None	30,300	100.0	48.3	10.0!	13.4!	‡	7.4!	7.1	‡	8.2
11 weeks or less	24,600	100.0	55.2	8.6!	9.4!	3.3!	9.3!	5.7!	‡	6.7!
12 or more weeks	90,400	100.0	54.6	10.9	11.4	4.4	8.0	2.8	1.3!	6.5
Nonresponse	10,800	100.0	52.2	9.6!	20.7!	‡	‡	‡	‡	10.0!

See notes at end of table.

Table 6. Weighted number and percentage distribution of all BTLS sample members, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Certification type										
Regular teaching certificate	104,400	100.0	55.5	9.2	12.2	3.9	7.6	3.0	1.5!	7.0
Other certificate	41,700	100.0	47.4	14.9	12.9	2.4!	6.7!	5.2	‡	7.4
No certificate	10,000	100.0	55.1	‡	8.4	2.5!	12.5!	9.0!	‡	6.9!
Participated in a teacher induction program										
Yes	117,900	100.0	56.2	10.3	11.7	3.3	7.3	3.3	1.9!	5.9
No	31,200	100.0	42.2	10.6!	14.8	4.2!	8.7	6.7!	2.5!	10.2
Nonresponse	7,000	100.0	53.8	‡	‡	‡	‡	‡	‡	14.1!
Number of teaching methods courses										
None	25,600	100.0	48.9	11.5!	8.6	3.0!	6.5!	7.9	‡	9.1
1 to 2 courses	23,800	100.0	49.6	12.7!	11.3!	4.9!	‡	‡	‡	6.1!
3 to 4 courses	33,900	100.0	57.8	7.4	10.8	3.2!	6.8	4.7!	‡	9.1!
5 to 9 courses	41,100	100.0	53.6	7.4	16.9	3.2!	7.6	3.0!	3.4!	4.9
10 or more courses	29,400	100.0	55.2	14.1	10.8	‡	8.9!	‡	‡	7.2!
Nonresponse	2,300 !	100.0	45.9!	‡	‡	‡	#	‡	#	‡
Had ongoing guidance from a mentor										
Yes	127,600	100.0	53.1	11.2	12.1	3.8	7.9	3.4	2.2!	6.3
No	25,200	100.0	56.2	‡	12.0	‡	5.8	7.3!	‡	10.5!
Nonresponse	3,300	100.0	39.0	‡	12.7!	‡	‡	‡	‡	14.8!
Assigned a mentor										
Yes	116,200	100.0	59.1	11.4	13.0	3.6	7.1	3.0	2.0!	0.7!
No	27,500	100.0	51.5	9.5!	10.2	3.0!	13.2!	9.6!	2.9!	#
Nonresponse	12,500	100.0	‡	‡	‡	‡	‡	‡	#	82.5

See notes at end of table.

Table 6. Weighted number and percentage distribution of all BTLS sample members, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Had a mentor in the first year of teaching who helped the teacher to improve teaching										
Did not have a mentor	27,500	100.0	51.5	9.5!	10.2	3.0!	13.2!	9.6!	2.9!	#
Not at all	12,000	100.0	51.7	‡	14.3!	‡	6.1!	‡	‡	#
To a small extent	25,700	100.0	59.8	8.8!	13.0	3.0!	8.8!	2.7!	‡	‡
To a moderate extent	35,800	100.0	52.6	17.8	17.8!	2.9!	5.0	1.7!	‡	‡
To a great extent	27,400	100.0	71.6	6.1!	6.2!	3.0!	6.5	3.3!	‡	‡
Nonresponse	27,800	100.0	32.9	4.6!	10.7	‡	6.8!	‡	‡	38.0
Had special supports in first year										
Yes	148,100	100.0	54.4	10.3	12.0	3.5	7.7	3.6	1.9!	6.6
No	4,700	100.0	30.4!	‡	16.7!	‡	‡	17.4!	‡	17.6!
Nonresponse	3,300	100.0	39.0	‡	12.7!	‡	‡	‡	‡	14.8!
If had to do it over again, would still become a teacher										
Certainly/probably become a teacher	127,300	100.0	54.1	10.6	13.3	3.5	7.8	2.3	1.4!	7.1
Chances are about even for or against	17,300	100.0	51.6	7.6!	‡	3.8!	7.6!	8.6!	‡	6.7!
Probably/certainly not become a teacher	10,300	100.0	46.3	‡	‡	‡	6.1!	17.4!	‡	6.6!
Nonresponse	1,300!	100.0	55.1!	‡	‡	#	‡	#	#	‡
Length of time teacher anticipated remaining in teaching										
As long as I am able	100,000	100.0	56.1	10.8	12.4	2.1!	7.8	1.7!	‡	7.2
Undecided	24,300	100.0	47.7	8.7!	8.4	6.2!	8.9	9.6	2.9!	7.6
Other	30,700	100.0	48.7	10.0	14.5	5.8!	6.2	6.9!	‡	6.0!
Nonresponse	1,100!	100.0	60.5!	‡	‡	#	‡	#	#	‡

Rounds to zero.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).

‡ Reporting standards not met. The coefficient of variation (CV) for this estimate is 50 percent or greater (i.e., the standard error is 50 percent or more of the estimate).

NOTE: Based on all 1,990 BTLS sample members. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table 7. Weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
All 2007–08 beginning teachers	156,100	100.0	55.1	11.3	13.2	4.4	8.6	4.8	2.5!	†
Age										
Less than 30 years	112,000	100.0	55.3	12.4	14.2	5.0	6.7	4.1	‡	†
30 or more years	44,100	100.0	54.6	8.5	10.7!	3.2!	13.2	6.7!	3.2!	†
Sex										
Male	39,800	100.0	60.4	10.9	9.3	2.1!	7.1	8.2	2.2!	†
Female	116,300	100.0	53.3	11.5	14.5	5.3	9.1	3.7	2.6!	†
Race/ethnicity										
White, non-Hispanic	124,200	100.0	56.4	10.2	14.1	5.0	7.0	5.0	2.2!	†
All other races/ethnicities	31,900	100.0	50.2	15.9!	9.5!	‡	14.5!	4.0!	‡	†
Highest degree										
Less than a bachelor's degree	2,000	100.0	63.0	#	‡	‡	‡	‡	‡	†
Bachelor's degree	122,900	100.0	55.4	11.7	13.4	3.6	8.7	5.0	2.2!	†
Master's degree	28,400	100.0	56.2	9.9!	14.4	6.7!	5.2	‡	‡	†
Higher than a master's degree	2,900!	100.0	26.4!	‡	‡	‡	‡	‡	#	†
Entered teaching through an alternative certification program										
Yes	41,700	100.0	48.7	16.3	13.4!	3.4!	6.1	8.3	‡	†
No	114,400	100.0	57.5	9.5	13.1	4.8	9.5	3.6	2.0!	†
Length of practice teaching										
None	29,900	100.0	49.9	10.9!	14.4!	‡	‡	9.0	‡	†
11 weeks or less	24,600	100.0	56.3	10.3!	11.3	4.6!	7.3!	8.3!	‡	†
12 or more weeks	90,700	100.0	56.3	11.8	12.1	5.6	9.6	3.0!	1.8!	†
Nonresponse	11,000	100.0	57.1	10.7!	23.5!	‡	‡	‡	‡	†

See notes at end of table.

Table 7. Weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Certification type										
Regular teaching certificate	104,300	100.0	56.8	9.6	14.1	4.9	8.8	3.7!	2.0!	†
Other certificate	41,400	100.0	49.9	17.8	11.9	3.8!	6.2!	6.8	‡	†
No certificate	10,400	100.0	59.4	‡	8.7!	‡	15.4!	8.0!	‡	†
Participated in a teacher induction program										
Yes	119,600	100.0	57.8	11.2	12.9	4.5	7.7	3.7	2.2!	†
No	30,500	100.0	44.9	11.3!	15.0	4.3!	11.1	9.6	3.8!	†
Nonresponse	6,000	100.0	53.3	‡	‡	‡	‡	‡	‡	†
Number of teaching methods courses										
None	24,100	100.0	50.8	10.8!	9.3	4.5!	8.5!	10.2	‡	†
1 to 2 courses	24,900	100.0	52.7	15.2!	8.1!	7.2!	10.9!	‡	‡	†
3 to 4 courses	32,000	100.0	62.1	7.6!	12.8	3.3!	7.1	6.8!	‡	†
5 to 9 courses	44,000	100.0	54.7	7.3!	18.8	4.4!	7.5	‡	4.1!	†
10 or more courses	29,500	100.0	54.4	17.7!	12.6	‡	10.4!	‡	‡	†
Nonresponse	1,500!	100.0	44.1!	‡	‡	‡	#	‡	#	†
Had ongoing guidance from a mentor										
Yes	128,000	100.0	54.5	12.4	13.0	4.9	8.6	3.9	2.7!	†
No	25,000	100.0	60.6	‡	13.8	‡	7.5!	10.0!	1.0!	†
Nonresponse	3,100	100.0	37.1!	‡	‡	‡	‡	‡	‡	†
Assigned a mentor										
Yes	125,500	100.0	56.9	11.8	13.9	4.6	7.3	3.2	2.2!	†
No	30,600	100.0	47.7	9.4!	10.2	3.7!	13.9!	11.3!	3.8!	†
Nonresponse	#	†	†	†	†	†	†	†	†	†

See notes at end of table.

Table 7. Weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Had a mentor in the first year of teaching who helped the teacher to improve teaching										
Did not have a mentor	30,600	100.0	47.7	9.4!	10.2	3.7!	13.9!	11.3!	3.8!	†
Not at all	13,300	100.0	50.9	‡	15.6!	‡	5.8!	‡	‡	†
To a small extent	29,300	100.0	60.5	9.0!	13.1	2.6!	9.2!	2.5!	‡	†
To a moderate extent	39,300	100.0	47.2	19.7	19.5!	4.1!	5.7	2.1!	‡	†
To a great extent	30,000	100.0	70.8	5.4!	6.0!	3.6!	7.2	3.8!	‡	†
Nonresponse	13,700	100.0	52.7	9.8!	15.4!	9.1!	9.4!	‡	1.6!	†
Had special supports in first year										
Yes	148,400	100.0	56.1	11.3	12.9	4.5	8.6	4.3	2.4!	†
No	4,600	100.0	35.9!	‡	20.3!	‡	‡	24.4!	‡	†
Nonresponse	3,100	100.0	37.1!	‡	‡	‡	‡	‡	‡	†
If had to do it over again, would still become a teacher										
Certainly/probably become a teacher	127,300	100.0	56.2	12.1	14.5	4.5	8.7	2.3!	1.8!	†
Chances are about even for or against	17,600	100.0	49.7	9.4!	‡	5.9!	6.8!	11.9!	‡	†
Probably/certainly not become a teacher	10,100	100.0	50.2	5.9!	‡	‡	7.6!	24.8!	‡	†
Nonresponse	1,100!	100.0	65.7!	‡	#	#	‡	#	#	†
Length of time teacher anticipated remaining in teaching										
As long as I am able	99,500	100.0	60.2	12.2	13.1	2.5!	7.9	1.7!	‡	†
Undecided	24,200	100.0	43.8	7.2!	10.4	9.5!	11.9	13.6	3.6!	†
Other	31,500	100.0	47.2	11.7	15.9	6.8!	7.9	8.1!	‡	†
Nonresponse	900!	100.0	74.4!	‡	#	#	‡	#	#	†

† Not applicable. Career Path 8 (status undetermined) does not apply to respondents to all waves because these respondents have sufficient data to determine the status.
# Rounds to zero.
! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).
‡ Reporting standards not met. The coefficient of variation (CV) for this estimate is 50 percent or greater (i.e., the standard error is 50 percent or more of the estimate).
NOTE: Based on the 1,610 respondents to all waves, including 160 retrospective respondents. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table 8. Weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
All 2007–08 beginning teachers	156,100	100.0	55.1	11.3	13.2	4.4	8.6	4.8	2.5!	†
Base salary										
Less than $40,000	82,700	100.0	47.3	11.5	12.1	6.5	12.7	6.9	3.0	†
$40,000 or more	73,400	100.0	64.0	11.1	14.5	2.1!	3.9	2.4!	‡	†
Class organization										
Departmentalized instruction	86,900	100.0	54.9	9.9	14.0	3.6	8.2	6.7	2.8!	†
Elementary subject specialist	7,200	100.0	48.3	15.7!	‡	‡	‡	‡	‡	†
Self-contained class	46,700	100.0	57.3	13.5	12.3!	2.9!	10.0	2.4!	‡	†
Team teaching	5,700	100.0	72.6	‡	‡	‡	‡	‡	‡	†
”Pull-out” class or “push-in” instruction	9,600	100.0	41.4	11.7!	19.0	11.2!	10.2!	‡	‡	†
Teaching level[1]										
Primary	56,400	100.0	56.5	14.1	8.6!	4.7	12.4	2.3!	‡	†
Middle	37,700	100.0	56.8	10.9	17.6	3.0!	‡	4.5!	‡	†
High	44,900	100.0	56.5	11.6	14.4	2.6!	6.7	6.3	1.8!	†
Combined	14,300	100.0	47.0	‡	16.2!	10.8!	7.6!	‡	‡	†
Nonresponse	2,900!	100.0	‡	‡	11.6!	‡	‡	‡	#	†
Community type										
City/suburban	88,000	100.0	55.0	13.4	11.4	3.9	9.8	4.2	‡	†
Town/rural	65,400	100.0	57.6	8.0	14.4	4.0	7.3	5.9	2.8!	†
Nonresponse	2,800!	100.0	#	‡	43.1!	‡	#	#	#	†

See notes at end of table.

Table 8. Weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Percent of K–12 students who were approved for free or reduced-price lunches										
Less than 50 percent	80,900	100.0	58.5	10.7	13.4	3.8	7.2	3.8	‡	†
50 percent or more	66,800	100.0	56.2	12.4	11.0	4.3	8.4	5.8	1.9!	†
School did not participate in free or reduced-price lunch program	2,100!	100.0	#	‡	45.6!	‡	19.8!	‡	‡	†
Nonresponse	6,400	100.0	19.1!	‡	23.4!	‡	‡	‡	‡	†
Teaching status										
Full time	148,600	100.0	56.9	11.4	13.1	3.6	8.4	4.5	2.1!	†
Part time	7,600	100.0	20.8	9.0!	15.5!	20.1	12.6!	10.7!	‡	†
Assigned a mentor										
Yes	22,800	100.0	14.5	6.4!	24.6	6.6!	26.5	13.0	‡	†
No	133,300	100.0	62.1	12.2	11.2	4.1	5.5	3.4	1.5!	†
Highly qualified teacher status										
Fully qualified	136,000	100.0	57.3	12.4	13.2	4.1	6.8	3.9	2.4!	†
Qualified in at least one subject	4,200	100.0	28.4!	‡	27.2!	‡	24.2!	‡	‡	†
Not highly qualified	11,900	100.0	46.7	‡	9.8!	6.9!	17.2	11.4!	5.6!	†
Nonresponse	4,100	100.0	35.6!	‡	10.0!	‡	25.1!	14.9!	#	†

See notes at end of table.

Table 8. Weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Satisfied with school										
Strongly agree	79,400	100.0	58.5	12.4	13.6	4.9	7.0	2.2!	‡	†
Somewhat agree	53,000	100.0	50.8	11.4	14.6	4.1	8.8!	6.0	4.3!	†
Somewhat disagree	15,600	100.0	58.3	8.2!	8.2!	‡	12.2!	9.1!	‡	†
Strongly disagree	4,900	100.0	55.9	‡	9.0!	‡	5.6!	‡	‡	†
Nonresponse	3,200	100.0	‡	‡	12.1!	‡	30.7!	‡	#	†
Had an additional job outside the school system										
Yes	26,400	100.0	55.5	5.4!	13.0!	7.8!	4.9!	9.7	‡	†
No	126,500	100.0	55.8	12.7	13.3	3.5	8.8	3.6	2.3!	†
Nonresponse	3,300	100.0	‡	‡	11.8!	‡	30.0!	‡	#	†

† Not applicable. Career Path 8 (status undetermined) does not apply to respondents to all waves because these respondents have sufficient data to determine the status.

Rounds to zero.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).

‡ Reporting standards not met. The coefficient of variation (CV) for this estimate is 50 percent or greater (i.e., the standard error is 50 percent or more of the estimate).

[1] Teaching level is the grade level taught by the teacher, which may be different than the grade level of the school.

NOTE: Based on the 1,610 respondents to all waves, including 160 retrospective respondents. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table 9. Weighted number and percentage distribution of respondents to all waves, not including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
All 2007–08 beginning teachers	156,100	100.0	54.9	11.9	13.4	4.4	8.4	4.3	2.7!	†
Base salary										
Less than $40,000	80,400	100.0	46.2	12.1	12.5	6.5	13.1	6.4	3.2!	†
$40,000 or more	75,800	100.0	64.0	11.7	14.3	2.1!	3.5	2.2!	‡	†
Class organization										
Departmentalized instruction	84,800	100.0	54.5	10.8	14.9	3.3	7.5	6.0	3.1!	†
Elementary subject specialist	7,400	100.0	47.4	17.7!	‡	‡	‡	‡	‡	†
Self-contained class	49,200	100.0	57.2	13.4	11.9!	3.1!	10.3	2.4!	‡	†
Team teaching	5,900	100.0	72.2	‡	‡	‡	‡	‡	‡	†
”Pull-out” class or “push-in” instruction	8,900	100.0	40.0	‡	18.3	12.6!	11.5!	‡	‡	†
Teaching level[1]										
Primary	58,000	100.0	55.2	14.1	8.3!	5.3	13.6	2.0!	‡	†
Middle	38,700	100.0	55.8	11.8	18.9	2.2!	‡	‡	‡	†
High	44,200	100.0	54.6	12.1	14.8	2.7!	6.9	7.2	1.6!	†
Combined	14,000	100.0	51.5	‡	14.6!	10.4!	7.5!	‡	‡	†
Nonresponse	‡	100.0	58.5!	‡	‡	‡	#	#	#	†
Community type										
City/suburban	89,000	100.0	55.1	14.1	11.8	3.7	9.0	3.8	‡	†
Town/rural	64,500	100.0	56.7	8.3	14.4	4.3	7.9	5.2	3.2!	†
Nonresponse	2,600!	100.0	#	‡	43.6!	‡	#	#	#	†

See notes at end of table.

Table 9. Weighted number and percentage distribution of respondents to all waves, not including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Percent of K–12 students who were approved for free or reduced-price lunches										
Less than 50 percent	78,800	100.0	57.3	11.3	13.4	3.8	7.8	3.6!	‡	†
50 percent or more	69,000	100.0	56.8	12.8	11.7	4.4	7.3	5.0	2.0!	†
School did not participate in free or reduced-price lunch program	2,200!	100.0	#	‡	50.9	‡	‡	‡	‡	†
Nonresponse	6,200	100.0	21.3!	‡	‡	‡	‡	‡	‡	†
Teaching status										
Full time	149,200	100.0	56.3	12.0	13.3	3.7	8.2	4.3	2.3!	†
Part time	6,900	100.0	22.6	10.1!	‡	19.8	13.7!	4.7!	‡	†
Assigned a mentor										
Yes	22,300	100.0	15.3	7.1!	24.9	4.7!	24.2	14.1	‡	†
No	133,900	100.0	61.4	12.7	11.5	4.3	5.8	2.7	1.6!	†
Highly qualified teacher status										
Fully qualified	139,300	100.0	56.6	12.6	13.3	4.1	7.3	3.5	2.6!	†
Qualified in at least one subject	4,100	100.0	28.7!	‡	27.3!	#	22.8!	‡	‡	†
Not highly qualified	10,300	100.0	39.7	‡	9.6!	7.8!	18.2	14.9!	6.3!	†
Nonresponse	2,500!	100.0	61.8	‡	12.9!	‡	‡	‡	#	†

See notes at end of table.

Table 9. Weighted number and percentage distribution of respondents to all waves, not including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Satisfied with school										
Strongly agree	79,700	100.0	57.1	12.1	13.5	5.5	7.8	2.3!	‡	†
Somewhat agree	54,000	100.0	51.1	12.8	14.7!	3.3!	8.4!	5.4!	‡	†
Somewhat disagree	15,600	100.0	57.6	8.8!	9.1!	‡	12.7!	7.7!	‡	†
Strongly disagree	5,300	100.0	51.7	‡	10.2!	‡	5.8!	‡	‡	†
Nonresponse	‡	100.0	52.6!	‡	‡	‡	‡	#	#	†
Had an additional job outside the school system										
Yes	24,900	100.0	55.0	6.1!	‡	8.2!	4.9!	7.3!	‡	†
No	129,700	100.0	54.8	13.1	13.2	3.5	9.1	3.8	2.5!	†
Nonresponse	‡	100.0	53.7!	‡	‡	‡	‡	#	#	†

† Not applicable. Career Path 8 (status undetermined) does not apply to respondents to all waves because these respondents have sufficient data to determine the status.

Rounds to zero.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).

‡ Reporting standards not met. The coefficient of variation (CV) for this estimate is 50 percent or greater (i.e., the standard error is 50 percent or more of the estimate).

[1] Teaching level is the grade level taught by the teacher, which may be different than the grade level of the school.

NOTE: Based on the 1,450 respondents to all waves, not including retrospective respondents. 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Appendix A: Standard Error Tables

Table A-1. Standard errors for unweighted number of BTLS respondents, by response pattern and career path: 2007–08 through 2010–11

		Response pattern—answered waves:							
Career path	All teachers	All waves	Waves 1–3	Waves 1, 2, 4	Waves 1, 3, 4	Waves 1–2	Waves 1, 3	Waves 1, 4	Only wave 1
All teachers	†	†	†	†	†	†	†	†	†
1 Taught all years in same school	†	†	†	†	†	†	†	†	†
2 Taught all years in same district but not same public school	†	†	†	†	†	†	†	†	†
3 Taught all years but not in same district	†	†	†	†	†	†	†	†	†
4 Did not teach all years but returned	†	†	†	†	†	†	†	†	†
5 Did not teach all years but expected to return or may return	†	†	†	†	†	†	†	†	†
6 Did not teach all years and not expected to return	†	†	†	†	†	†	†	†	†
7 Did not teach all years and cannot determine if returning	†	†	†	†	†	†	†	†	†
8 Status undetermined	†	†	†	†	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table A-2. Standard errors for the unweighted number, weighted number, and weighted percentage distribution of all BTLS sample members and respondents to all waves, including retrospective respondents, by assigned career path: 2007–08 through 2010–11

Career path	Unweighted number		Weighted number		Weighted percentage distribution		Weighted percentage distribution of teachers with coded Career Paths 1–6	
	All BTLS sample members	Respondents to all waves	All BTLS sample members	Respondents to all waves	All BTLS sample members	Respondents to all waves	All BTLS sample members	Respondents to all waves
All teachers	†	†	9,330	9,330	†	†	†	†
1 Taught all years in same school	†	†	6,590	6,980	2.22	2.36	2.30	2.35
2 Taught all years in same district but not same public school	†	†	2,470	2,570	1.40	1.47	1.55	1.51
3 Taught all years but not in same district	†	†	2,820	3,130	1.77	2.04	1.92	2.09
4 Did not teach all years but returned	†	†	910	1,090	0.60	0.67	0.66	0.69
5 Did not teach all years but expected to return or may return	†	†	1,730	1,980	1.14	1.29	1.25	1.33
6 Did not teach all years and not expected to return	†	†	1,080	1,410	0.70	0.91	0.77	0.93
7 Did not teach all years and cannot determine if returning	†	†	1,030	1,290	0.69	0.87	†	†
8 Status undetermined	†	†	1,490	†	0.92	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table A-3. Standard errors for the weighted percentage distribution of respondents to waves 1–4, including retrospective respondents, by career path based on responses to waves 1–3 and career path based on responses to waves 1–4: 2007–08 through 2010–11

Career path based on responses to waves 1–4	Career path based on responses to waves 1–3: 1 Taught all years in same school	2 Taught all years in same district but not same public school	3 Taught all years but not in same district	4 Did not teach all years but returned	5 Did not teach all years but expected to return or may return	6 Did not teach all years and not expected to return	7 Did not teach all years and cannot determine if returning	8 Status undetermined
All teachers	†	†	†	†	†	†	†	†
1 Taught all years in same school	2.01	†	†	†	†	†	†	†
2 Taught all years in same district but not same public school	1.10	3.29	†	†	†	†	†	†
3 Taught all years but not in same district	1.01	†	3.86	†	†	†	†	†
4 Did not teach all years but returned	†	†	†	12.15	5.52	†	†	†
5 Did not teach all years but expected to return or may return	0.79	†	2.52	†	6.88	†	†	†
6 Did not teach all years and not expected to return	0.54	†	†	†	†	6.76	†	†
7 Did not teach all years and cannot determine if returning	†	†	†	†	†	†	20.78	†
8 Status undetermined	†	†	†	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table A-4. Standard errors for the weighted percentage distribution of respondents to waves 1–4, including retrospective respondents, by career path based on responses to waves 1–2 and career path based on responses to waves 1–4: 2007–08 through 2010–11

	Career path based on responses to waves 1–2							
Career path based on responses to waves 1–4	1 Taught all years in same school	2 Taught all years in same district but not same public school	3 Taught all years but not in same district	4 Did not teach all years but returned	5 Did not teach all years but expected to return or may return	6 Did not teach all years and not expected to return	7 Did not teach all years and cannot determine if returning	8 Status undetermined
All teachers	†	†	†	†	†	†	†	†
1 Taught all years in same school	2.42	†	†	†	†	†	†	†
2 Taught all years in same district but not same public school	1.52	8.00	†	†	†	†	†	†
3 Taught all years but not in same district	1.18	†	7.68	†	†	†	†	†
4 Did not teach all years but returned	0.41	†	†	†	8.79	†	14.18	†
5 Did not teach all years but expected to return or may return	0.92	3.64	6.96	†	7.63	†	†	†
6 Did not teach all years and not expected to return	0.76	†	†	†	†	8.71	†	†
7 Did not teach all years and cannot determine if returning	†	†	†	†	†	†	†	†
8 Status undetermined	†	†	†	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table A-5. Standard errors for the weighted percentage distribution of respondents to waves 1–4, including retrospective respondents, by career path based on responses to waves 1, 3, and 4 and career path based on responses to waves 1–4: 2007–08 through 2010–11

Career path based on responses to waves 1–4	Career path based on responses to waves 1, 3, and 4: 1 Taught all years in same school	2 Taught all years in same district but not same public school	3 Taught all years but not in same district	4 Did not teach all years but returned	5 Did not teach all years but expected to return or may return	6 Did not teach all years and not expected to return	7 Did not teach all years and cannot determine if returning	8 Status undetermined
All teachers	†	†	†	†	†	†	†	†
1 Taught all years in same school	2.12	†	†	†	†	†	†	†
2 Taught all years in same district but not same public school	2.12	†	†	†	†	†	†	†
3 Taught all years but not in same district	†	†	0.54	†	†	†	†	†
4 Did not teach all years but returned	†	†	†	†	†	†	7.87	†
5 Did not teach all years but expected to return or may return	†	†	†	†	†	†	5.50	†
6 Did not teach all years and not expected to return	†	†	†	†	†	†	3.90	†
7 Did not teach all years and cannot determine if returning	†	†	†	†	†	†	8.65	†
8 Status undetermined	†	†	†	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table A-6. Standard errors for the weighted number and percentage distribution of all BTLS sample members, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
All 2007–08 beginning teachers	9,330	†	2.22	1.40	1.77	0.60	1.14	0.70	0.69	0.92
Age										
Less than 30 years	7,110	†	2.61	1.76	2.06	0.79	0.90	0.69	0.89	1.21
30 or more years	4,740	†	4.67	2.01	3.14	0.93	2.93	1.91	1.06	1.24
Sex										
Male	4,050	†	4.36	2.29	1.68	0.48	2.01	1.76	0.58	2.00
Female	7,530	†	2.74	1.71	2.21	0.76	1.34	0.72	0.88	1.22
Race/ethnicity										
White, non-Hispanic	7,680	†	2.48	1.28	1.95	0.61	1.01	0.86	0.58	1.04
All other races/ethnicities	4,080	†	6.02	5.06	3.07	†	3.83	1.55	†	2.41
Highest degree										
Less than a bachelor's degree	370	†	10.75	†	†	†	†	5.55	†	†
Bachelor's degree	8,490	†	2.47	1.67	1.99	0.64	1.33	0.76	0.77	1.14
Master's degree	3,240	†	5.57	3.03	3.49	2.11	1.31	†	1.59	1.34
Higher than a master's degree	710	†	12.92	†	†	†	†	†	†	†
Entered teaching through an alternative certification program										
Yes	3,800	†	4.57	3.21	3.74	1.18	1.46	1.75	†	1.48
No	7,540	†	2.44	1.25	1.71	0.74	1.49	0.72	0.57	1.18
Length of practice teaching										
None	2,840	†	5.61	3.08	4.4	†	3.41	1.97	†	2.29
11 weeks or less	2,930	†	6.82	3.98	2.94	1.03	3.41	2.66	†	2.82
12 or more weeks	7,100	†	2.92	2.13	2.00	1.00	1.23	0.83	0.55	1.43
Nonresponse	1,650	†	7.18	4.45	7.16	†	†	†	†	4.65

See notes at end of table.

Table A-6. Standard errors for the weighted number and percentage distribution of all BTLS sample members, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Certification type										
Regular teaching certificate	6,790	†	2.66	1.39	2.23	0.91	1.40	0.88	0.62	1.28
Other certificate	4,660	†	4.69	3.23	2.18	0.91	2.21	1.44	†	1.89
No certificate	1,980	†	8.53	†	2.51	1.25	4.46	3.71	†	2.78
Participated in a teacher induction program										
Yes	7,430	†	2.68	1.47	2.23	0.59	1.43	0.74	0.83	1.18
No	2,900	†	4.22	3.73	2.99	1.77	1.95	2.26	1.08	2.44
Nonresponse	1,510	†	9.01	†	†	†	†	†	†	6.33
Number of teaching methods courses										
None	2,830	†	5.47	3.97	2.21	1.36	2.28	2.38	†	2.22
1 to 2 courses	3,090	†	7.49	4.28	3.53	1.85	†	†	†	2.02
3 to 4 courses	3,550	†	4.53	1.97	2.31	1.07	1.65	1.44	†	2.90
5 to 9 courses	3,890	†	5.23	2.11	4.60	1.57	1.81	1.37	1.39	1.41
10 or more courses	3,350	†	5.07	4.10	2.63	†	2.86	†	†	2.57
Nonresponse	740	†	15.31	†	†	†	†	†	†	†
Had ongoing guidance from a mentor										
Yes	7,770	†	2.33	1.75	2.07	0.74	1.33	0.70	0.83	0.95
No	4,180	†	7.60	†	2.83	†	1.66	3.09	†	3.96
Nonresponse	690	†	10.38	†	6.23	†	†	†	†	6.80
Assigned a mentor										
Yes	7,860	†	2.55	1.76	2.26	0.67	0.94	0.61	0.83	0.34
No	3,410	†	5.30	3.10	2.31	1.03	4.44	2.92	1.35	†
Nonresponse	1,610	†	†	†	†	†	†	†	†	6.11

See notes at end of table.

Table A-6. Standard errors for the weighted number and percentage distribution of all BTLS sample members, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Had a mentor in the first year of teaching who helped the teacher to improve teaching										
Did not have a mentor	3,410	†	5.30	3.10	2.31	1.03	4.44	2.92	1.35	†
Not at all	3,190	†	12.74	†	6.71	†	2.78	†	†	†
To a small extent	2,450	†	4.91	2.96	2.67	1.28	3.09	1.20	†	†
To a moderate extent	4,530	†	5.13	3.80	5.51	1.19	1.31	0.74	†	†
To a great extent	2,980	†	4.19	2.33	2.00	1.32	1.49	1.46	†	†
Nonresponse	2,560	†	4.45	1.56	3.14	†	2.39	†	†	4.09
Had special supports in first year										
Yes	9,030	†	2.32	1.47	1.87	0.64	1.18	0.66	0.71	0.95
No	1,020	†	11.43	†	7.23	†	†	8.46	†	7.09
Nonresponse	690	†	10.38	†	6.23	†	†	†	†	6.80
If had to do it over again, would still become a teacher										
Certainly/probably become a teacher	7,780	†	2.21	1.44	1.87	0.70	1.34	0.62	0.52	1.08
Chances are about even for or against	1,910	†	7.01	2.68	†	1.55	2.87	2.68	†	2.44
Probably/certainly not become a teacher	2,210	†	11.62	†	†	†	2.71	6.45	†	2.49
Nonresponse	400	†	23.85	†	†	†	†	†	†	†
Length of time teacher anticipated remaining in teaching										
As long as I am able	6,910	†	2.89	1.64	2.11	0.79	1.63	0.64	†	1.29
Undecided	2,560	†	5.24	4.01	2.39	2.00	2.41	2.33	1.37	2.03
Other	2,960	†	5.88	2.59	4.01	1.73	1.48	2.30	†	2.13
Nonresponse	410	†	25.66	†	†	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table A-7. Standard errors for the weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
All 2007–08 beginning teachers	9,330	†	2.36	1.47	2.04	0.67	1.29	0.91	0.87	†
Age										
Less than 30 years	7,320	†	2.94	1.88	2.44	0.91	1.02	0.83	†	†
30 or more years	4,670	†	4.77	2.20	3.23	1.20	3.38	2.30	1.31	†
Sex										
Male	4,050	†	4.50	2.51	1.89	0.73	1.94	2.38	0.86	†
Female	7,530	†	2.89	1.77	2.53	0.87	1.57	0.86	1.12	†
Race/ethnicity										
White, non-Hispanic	7,710	†	2.52	1.43	2.13	0.84	1.13	1.10	0.69	†
All other races/ethnicities	4,180	†	6.90	4.92	3.70	†	5.10	1.79	†	†
Highest degree										
Less than a bachelor's degree	540	†	11.23	†	†	†	†	†	†	†
Bachelor's degree	8,270	†	2.73	1.77	2.29	0.88	1.53	0.98	0.99	†
Master's degree	3,440	†	5.64	3.16	4.03	2.67	1.49	†	†	†
Higher than a master's degree	900	†	13.11	†	†	†	†	†	†	†
Entered teaching through an alternative certification program										
Yes	3,610	†	5.01	3.60	4.19	1.56	1.79	2.00	†	†
No	8,360	†	2.81	1.80	1.99	0.87	1.70	0.92	0.71	†
Length of practice teaching										
None	3,190	†	6.39	3.77	4.64	†	†	2.25	†	†
11 weeks or less	3,130	†	7.72	4.65	3.37	1.56	3.47	3.56	†	†
12 or more weeks	7,550	†	3.13	2.17	2.15	1.10	1.52	0.98	0.73	†
Nonresponse	1,790	†	8.09	4.81	8.99	†	†	†	†	†

See notes at end of table.

Table A-7. Standard errors for the weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Certification type										
Regular teaching certificate	7,400	†	2.89	1.43	2.59	1.02	1.73	1.16	0.78	†
Other certificate	4,160	†	4.99	4.31	2.52	1.53	2.31	1.79	†	†
No certificate	2,490	†	10.42	†	2.80	†	5.63	3.61	†	†
Participated in a teacher induction program										
Yes	7,910	†	2.98	1.59	2.53	0.81	1.63	0.87	1.06	†
No	2,950	†	5.02	5.00	3.03	1.64	2.37	2.87	1.58	†
Nonresponse	1,720	†	11.41	†	†	†	†	†	†	†
Number of teaching methods courses										
None	3,190	†	6.46	3.82	2.57	2.12	3.01	2.97	†	†
1 to 2 courses	3,360	†	8.37	5.04	3.07	2.84	5.37	†	†	†
3 to 4 courses	3,900	†	5.41	2.35	3.26	1.21	2.13	2.13	†	†
5 to 9 courses	4,080	†	5.40	2.22	4.85	1.97	1.76	†	1.58	†
10 or more courses	3,800	†	5.93	5.65	3.20	†	3.50	†	†	†
Nonresponse	590	†	19.54	†	†	†	†	†	†	†
Had ongoing guidance from a mentor										
Yes	7,930	†	2.45	1.80	2.42	0.82	1.54	0.87	1.04	†
No	4,550	†	8.10	†	3.25	†	2.34	3.74	0.48	†
Nonresponse	770	†	11.26	†	†	†	†	†	†	†
Assigned a mentor										
Yes	8,170	†	2.70	1.69	2.36	0.81	0.99	0.67	0.97	†
No	3,850	†	5.73	3.38	2.56	1.44	5.10	3.58	1.76	†
Nonresponse	†	†	†	†	†	†	†	†	†	†

See notes at end of table.

Table A-7. Standard errors for the weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their first year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Had a mentor in the first year of teaching who helped the teacher to improve teaching										
Did not have a mentor	3,850	†	5.73	3.38	2.56	1.44	5.10	3.58	1.76	†
Not at all	3,390	†	13.22	†	6.99	†	2.48	†	†	†
To a small extent	3,110	†	5.08	3.15	2.95	1.08	3.41	0.88	†	†
To a moderate extent	5,370	†	5.55	4.89	6.06	1.75	1.65	0.95	†	†
To a great extent	3,610	†	4.48	2.31	2.02	1.55	1.74	1.65	†	†
Nonresponse	2,010	†	7.90	3.58	6.52	4.42	3.43	†	0.80	†
Had special supports in first year										
Yes	9,130	†	2.46	1.53	2.17	0.71	1.34	0.87	0.89	†
No	1,180	†	12.96	†	8.78	†	†	11.84	†	†
Nonresponse	770	†	11.26	†	†	†	†	†	†	†
If had to do it over again, would still become a teacher										
Certainly/probably become a teacher	8,120	†	2.41	1.79	2.19	0.81	1.60	0.72	0.64	†
Chances are about even for or against	2,220	†	7.41	3.50	†	2.60	2.42	3.74	†	†
Probably/certainly not become a teacher	2,140	†	11.69	2.83	†	†	3.14	8.18	†	†
Nonresponse	400	†	22.86	†	†	†	†	†	†	†
Length of time teacher anticipated remaining in teaching										
As long as I am able	7,270	†	3.07	2.07	2.41	0.82	1.80	0.70	†	†
Undecided	2,660	†	5.03	2.91	2.97	3.54	3.09	3.31	1.80	†
Other	3,640	†	6.14	2.97	4.49	2.44	1.89	2.56	†	†
Nonresponse	400	†	23.39	†	†	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table A-8. Standard errors for the weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
All 2007–08 beginning teachers	9,330	†	2.36	1.47	2.04	0.67	1.29	0.91	0.87	†
Base salary										
Less than $40,000	6,140	†	3.14	1.87	1.56	1.20	2.37	1.43	0.88	†
$40,000 or more	6,840	†	4.04	2.54	3.90	0.73	1.03	0.84	†	†
Class organization										
Departmentalized instruction	5,820	†	3.18	2.43	2.13	0.93	1.91	1.51	1.24	
Elementary subject specialist	2,010	†	11.02	6.97	†	†	†	†	†	†
Self-contained class	5,670	†	5.71	2.98	4.17	1.22	2.43	0.97	†	†
Team teaching	1,520	†	11.30	†	†	†	†	†	†	†
”Pull-out” class or “push-in” instruction	1,760	†	8.93	4.53	5.20	5.06	4.64	†	†	†
Teaching level[1]										
Primary	5,920	†	5.08	3.03	2.92	1.37	3.12	0.87	†	†
Middle	4,190	†	5.17	2.78	4.44	1.26	†	2.17	†	†
High	2,740	†	3.18	2.49	2.43	1.22	1.13	1.60	0.67	†
Combined	2,510	†	6.47	†	5.08	4.54	2.86	†	†	†
Nonresponse	950	†	†	†	5.47	†	†	†	†	†
Community type										
City/suburban	6,930	†	3.44	2.32	2.62	0.91	2.11	0.98	†	†
Town/rural	5,280	†	3.55	1.70	2.96	0.98	1.54	1.61	1.07	†
Nonresponse	870	†	†	†	15.79	†	†	†	†	†

See notes at end of table.

Table A-8. Standard errors for the weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Percent of K–12 students who were approved for free or reduced-price lunches										
Less than 50 percent	6,910	†	3.13	2.26	2.49	1.00	1.33	1.13	†	†
50 percent or more	5,860	†	3.71	2.07	2.87	1.20	1.71	1.45	0.88	†
School did not participate in free or reduced-price lunch program	880	†	†	†	14.26	†	8.14	†	†	†
Nonresponse	1,590	†	7.12	†	9.38	†	†	†	†	†
Teaching status										
Full time	8,860	†	2.43	1.53	2.06	0.70	1.34	0.92	0.85	†
Part time	1,240	†	5.12	3.03	7.39	6.01	5.23	4.53	†	†
Assigned a mentor										
Yes	2,260	†	3.64	2.34	4.67	2.65	4.33	3.29	†	†
No	9,240	†	2.38	1.70	2.03	0.74	1.34	0.82	0.51	†
Highly qualified teacher status										
Fully qualified	8,750	†	2.55	1.68	2.30	0.74	1.48	1.00	0.97	†
Qualified in at least one subject	1,100	†	11.29	†	12.16	†	9.27	†	†	†
Not highly qualified	1,460	†	6.27	†	4.23	3.01	3.62	4.48	2.32	†
Nonresponse	1,050	†	13.91	†	3.97	†	11.99	7.22	†	†

See notes at end of table.

Table A-8. Standard errors for the weighted number and percentage distribution of respondents to all waves, including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Satisfied with school										
Strongly agree	7,310	†	3.77	2.71	2.57	1.11	1.55	0.93	†	†
Somewhat agree	4,670	†	4.66	2.58	4.13	1.02	2.68	1.44	2.11	†
Somewhat disagree	2,740	†	7.60	3.05	3.63	†	4.15	3.96	†	†
Strongly disagree	1,090	†	11.23	†	4.09	†	2.69	†	†	†
Nonresponse	940	†	†	†	5.47	†	15.08	†	†	†
Had an additional job outside the school system										
Yes	3,170	†	6.33	1.86	6.12	2.62	1.54	2.79	†	†
No	9,240	†	2.61	1.83	1.82	0.70	1.63	0.91	0.97	†
Nonresponse	930	†	†	†	5.35	†	14.67	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Table A-9. Standard errors for the weighted number and percentage distribution of respondents to all waves, not including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
All 2007–08 beginning teachers	9,330	†	2.40	1.65	2.24	0.70	1.33	0.93	0.97	†
Base salary										
Less than $40,000	5,770	†	3.28	2.13	1.59	1.35	2.48	1.55	1.02	†
$40,000 or more	7,000	†	4.20	2.74	4.21	0.74	0.90	0.82	†	†
Class organization										
Departmentalized instruction	5,780	†	3.32	2.55	2.49	0.96	1.91	1.61	1.45	†
Elementary subject specialist	2,080	†	11.65	7.69	†	†	†	†	†	†
Self-contained class	6,010	†	5.65	3.09	4.23	1.45	2.61	0.95	†	†
Team teaching	1,710	†	12.24	†	†	†	†	†	†	†
”Pull-out” class or “push-in” instruction	1,700	†	8.95	†	5.37	5.87	5.24	†	†	†
Teaching level[1]										
Primary	6,170	†	5.26	3.37	3.08	1.58	3.30	0.83	†	†
Middle	4,790	†	5.31	3.06	5.00	0.87	†	†	†	†
High	2,910	†	3.53	2.89	3.03	1.36	1.33	1.92	0.67	†
Combined	2,380	†	6.99	†	5.25	4.95	2.82	†	†	†
Nonresponse	†	†	23.72	†	†	†	†	†	†	†
Community type										
City/suburban	7,160	†	3.65	2.52	2.98	0.91	2.02	1.04	†	†
Town/rural	5,360	†	3.62	2.01	3.11	1.15	1.77	1.56	1.19	†
Nonresponse	990	†	†	†	18.48	†	†	†	†	†

See notes at end of table.

Table A-9. Standard errors for the weighted number and percentage distribution of respondents to all waves, not including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Percent of K–12 students who were approved for free or reduced-price lunches										
Less than 50 percent	6,760	†	3.25	2.53	2.48	1.06	1.50	1.14	†	†
50 percent or more	6,010	†	3.93	2.28	3.36	1.16	1.82	1.44	0.96	†
School did not participate in free or reduced-price lunch program	1,000	†	†	†	14.30	†	†	†	†	†
Nonresponse	1,690	†	8.25	†	†	†	†	†	†	†
Teaching status										
Full time	8,950	†	2.46	1.69	2.26	0.72	1.39	0.97	0.96	†
Part time	1,180	†	5.67	3.74	†	5.92	5.67	2.36	†	†
Assigned a mentor										
Yes	2,350	†	4.06	2.71	5.41	1.95	5.06	3.97	†	†
No	9,340	†	2.49	1.87	2.17	0.83	1.42	0.76	0.55	†
Highly qualified teacher status										
Fully qualified	9,240	†	2.59	1.81	2.48	0.78	1.55	0.99	1.06	†
Qualified in at least one subject	1,080	†	12.34	†	11.94	†	8.61	†	†	†
Not highly qualified	1,300	†	5.84	†	4.52	3.45	3.69	5.15	3.03	†
Nonresponse	1,110	†	16.77	†	5.97	†	†	†	†	†

See notes at end of table.

Table A-9. Standard errors for the weighted number and percentage distribution of respondents to all waves, not including retrospective respondents, by 4-year career path and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2010–11—Continued

Characteristic	Number of teachers	Percentage distribution								
			Taught all years			Did not teach all years				
		Total	1 In same school	2 In same district but not same public school	3 Not in same district	4 Returned	5 Expected to return or may return	6 Not expected to return	7 Return status undetermined	8 Status undetermined
Satisfied with school										
Strongly agree	7,360	†	4.12	2.97	2.70	1.24	1.83	0.95	†	†
Somewhat agree	5,210	†	5.28	3.09	4.69	1.01	2.69	1.69	†	†
Somewhat disagree	2,900	†	8.12	3.33	4.15	†	4.52	3.10	†	†
Strongly disagree	1,200	†	11.91	†	4.79	†	2.86	†	†	†
Nonresponse	†	†	21.48	†	†	†	†	†	†	†
Had an additional job outside the school system										
Yes	3,620	†	7.32	2.36	†	2.97	1.78	2.57	†	†
No	9,940	†	2.62	1.99	1.83	0.73	1.71	1.05	1.06	†
Nonresponse	†	†	21.52	†	†	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, 2010–11.

Appendix B: Description of Variables

Description of Variables

Variables used in this report are listed in tables B-1 through B-3. They include those collected during the base year (2007–08 Schools and Staffing Survey (SASS), referred to as the Beginning Teacher Longitudinal Study (BTLS) wave 1) and each subsequent wave of BTLS (waves 2–4). The report also used "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 *First Through Fifth Waves of the 2007–08 Restricted-use Beginning Teacher Longitudinal Study Data File.* The definitions for BTLS variables used in this report follow each table B-1 through B-3.

Table B-1. Variables used to create teacher and school characteristics for the first year of teaching in the research and development report, *Strategies for Longitudinal Analysis of the Career Paths of Beginning Teachers: Results From the First Through Fourth Waves of the 2007–08 Beginning Teacher Longitudinal Study:* 2007–08 through 2010–11

Age during first year of teaching	W1AGE_T
Assigned a mentor during first year of teaching	W2MNTYN
Certification type during first year of teaching	W1T0160, W1T0186
Entered teaching through an alternative certification program	W1T0153
Had a mentor in the first year of teaching who helped the teacher improve teaching	W2MNTYN, W2MNIMP
Had ongoing guidance from a mentor during first year of teaching	W1T0226
Had special supports in first year of teaching	W1T0221, W1T0222, W1T0223, W1T0224, W1T0225
Highest degree during first year of teaching	W1HIDEGR
If had to do it over again, would still become a teacher	W1T0320
Length of practice teaching	W1T0152
Length of time anticipated remaining in teaching	W1T0321
Number of teaching methods courses taken	W1T0150, W1T0151
Participated in a teacher induction program	W1T0220
Race/ethnicity	W1RACETH_T
Sex	W1T0352

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, and 2010–11.

Age (W1AGE_T): This 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.

Assigned a mentor during first year of teaching (W2MNTYN): The data for this variable were collected on the second-wave questionnaire.

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

Entered teaching through an alternative certification program (W1T0153): The data for this variable were collected on the first-wave questionnaire.

Had a mentor in the first year of teaching who helped the teacher improve teaching (W2MNTYN, W2MNIMP): The data for this variable were collected on the second-wave questionnaire.

Had ongoing guidance from a mentor (W1T0226): The data for this variable were collected on the first-wave questionnaire.

Had special supports in first year (W1T0221, W1T0222, W1T0223, W1T0224, W1T0225): The data for this variable were collected on the first-wave questionnaire. Because each of these questions was asked separately, the variable was coded as whether or not the teacher had any supports other than mentoring.

Highest degree during first year of teaching (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 variables W1T0110, W1T0120, W1T0132, W1T0135, W1T0138, and W1T0141. The categories for this variable were collapsed due to small size.

If had to do it over again, would still become a teacher (W1T0320): The data for this variable were collected on the first-wave questionnaire. The categories for this variable were collapsed due to small sample size.

Length of time practice teaching (W1T0152): The data for this variable were collected on the first-wave questionnaire. The categories for this variable were collapsed due to small sample size.

Length of time anticipated remaining in teaching (W1T0321): The data for this variable were collected on the first-wave questionnaire. The categories for this variable were collapsed due to small sample size.

Number of teaching methods courses (W1T0150,W1T0151): This a created variable that indicates the number of teaching methods courses that had been taken.

Participated in a teacher induction program (W1T0220): The data for this variable were collected on the first wave of the questionnaire.

Race/ethnicity (W1RACETH_T): A created variable based on respondent's 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.

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

Table B-2. Variables used to create teacher and school characteristics for the most recent year of teaching in the research and development report, *Strategies for Longitudinal Analysis of the Career Paths of Beginning Teachers: Results From the First Through Fourth Waves of the 2007–08 Beginning Teacher Longitudinal Study:* 2007–08 through 2010–11

Assigned a mentor during most recent year of teaching	W2MNTYN, W2M08YN, W3M08YN, W4M08YN
Base salary	W1T0343, W2TCHSA, W3TCHSA, W4TCHSA
Class organization	W1T0068, W2TECLD, W3TECLD, W4TECLD
Community type	W1URBANS12, W2URBANS12, W3URBANS12, W4URBANS12
Full-time/part-time teacher status	W1FTPT, W2TCHFP, W3TCHFP, W4TCHFP
Held an additional job outside the school system	W1T0348, W2EROUT, W3EROUT, W4EROUT
Highly qualified teacher status	W1T0211, W1T0212; W2TEHQT, W2THQTA; W3TEHQT, W3TEQTA; W4TEHQT, W4TEQTA
Percent of K–12 students who were approved for free or reduced-price lunches	W1NSLAPP_S, W2TEFRPL, W3TEFRPL, W4TEFRPL
Satisfied with school	W1T0302, W2SATIS, W3SATIS, W4SATIS
Teaching level	W1TLEVEL, W2TLEVEL, W3TLEVEL, W4TLEVEL

NOTE: Variables were created by first identifying the teacher's most recent year of teaching using the teaching status variables for the second through fourth waves, W2FCSTS, W3FCSTS, and W4FCSTS, and then using the characteristic variable from the appropriate wave.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, and 2010–11.

Assigned a mentor during most recent year of teaching (W2MNTYN, W2M08YN, W3M08YN, W4M08YN): The data for wave 1 were collected in the second-wave questionnaire. The remaining variables were collected on the wave 2, 3, and 4 questionnaires, respectively.

Base salary (W1T0343, W2TCHSA, W3TCHSA, W4TCHSA): The data for these variables were collected on all waves of the questionnaire. The distribution for this variable was examined in order to determine the categories reported in the tables.

Class organization (W1T0068, W2TECLD, W3TECLD, W4TECLD): The data for these variables were collected on the questionnaires for all 4 waves.

Community type (W1URBANS12, W2URBANS12, W3URBANS12, W4URBANS12): Taken from the SASS Public School Data File, W1URBANS12 is a created variable collapsed from the 12-category urban-centric school locale code (SCLOP_ 12) that was assigned using the 2000 Decennial Census data and recoded into 4 categories: city, suburban, town, and rural. The same process was used to create W2URBANS12, W3URBANS12, and W4URBANS12. The categories for this variable were collapsed due to small size.

Full-time/part-time teacher status (W1FTPT, W2TCHFP, W3TCHFP, W4TCHFP): These two-category variables indicate whether the teacher is a full- or part-time teacher. W1FTPT is based on W1T0025 and W1T0028, and W2TCHFP, W3TCHFP, and W4TCHFP were collected on the questionnaires for waves 2, 3, and 4, respectively.

Held a job outside the school system (W1T0348, W2EROUT; W3EROUT, W4EROUT): The data for this variable were collected on the first-, second-, third- and fourth-wave questionnaires.

Highly qualified teacher status (W1T0211, W1T0212; W2TEHQT, W2THQTA; W3TEHQT, W3TEQTA; W4TEHQT, W4TEQTA): A created variable that indicates whether a teacher meets the definition of "highly qualified." Teachers were provided the following definition for this question: *"Generally, to be Highly Qualified, teachers must 1) have a bachelor's degree; 2) hold full state certification or licensure, including an "alternative certification"; and 3) demonstrate competency in the subject area(s) they teach. The Highly Qualified Teacher requirement is a provision under No Child Left Behind (NCLB)."*

Percent of K–12 students who were approved for the free or reduced-price lunches (W1NSLAPP_S, W2TEFRPL, W3TEFRPL, W4TEFRPL): 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 primarily 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. W3TEFRLP also measures the percentage of students eligible for free or reduced-price lunches and was created using the same process described for W2TEFRPL for these schools. W4TEFRPL was created in the same way for these schools, but the 2009–10 CCD data were used to create the percentage eligible for NSLP.

For those teaching in public schools, in this report W1NSLAPP_S, W2TEFRPL, W3TEFRP, W4TEFRPL 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, W1NSLAPP_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.

Satisfied with school (W1T0302; W2SATIS; W3SATIS; W4SATIS): The data for this variable were collected on the first-, second-, third-, and fourth-wave questionnaires.

Teaching level (W1TLEVEL, W2TLEVEL, W3TLEVEL, W4TLEVEL): These are created variables based on the grades teachers reported teaching during each wave.

Table B-3. Variables used to create teacher career path variable in the research and development report, *Strategies for Longitudinal Analysis of the Career Paths of Beginning Teachers: Results From the First Through Fourth Waves of the 2007–08 Beginning Teacher Longitudinal Study:* 2007–08 through 2010–11

Career Path 1 Taught all years in the same school	W2FCSTS, W3FCSTS, W4FCSTS W2MOVYN, W3MOVYN, W4MOVYN, W3NRSAS, W4NRSAS
Career Path 2 Taught all years in the same district but not the same public school	W2FCSTS, W3FCSTS, W4FCSTS, W2MVTYP, W3MVTYP, W4MVTYP
Career Path 3 Taught all years but not in the same district	W2FCSTS, W3FCSTS, W4FCSTS, W2MVTYP, W3MVTYP, W4MVTYP, W2FORYN, W3FORYN, W4FORYN
Career Path 4 Did not teach all years, returned	W2FCSTS, W3FCSTS, W4FCSTS
Career Path 5 Did not teach all years, expected to return or may return	W2FCSTS, W3FCSTS, W4FCSTS, W4ONSAB, W4ONLEA, W3ONSAB, W3ONLEA, W2ONLVE, W4APPYN, W3APPYN, W2APPYN, W4LCINV, W3LCNYN, W2LCNYN, W4LVIMP, W3LVIMP, W2LVIMP
Career Path 6 Did not teach in all years, not expected to return	W2FCSTS, W3FCSTS, W4FCSTS, W4RETYN, W3RETYN, W2APNOI, W2APNCL, W4APNED, W4OCCST, W3OCCST, W2OCCST, W4SOCC, W3SOCC, W2SOCC, W4LVIMP, W3LVIMP, W2LVIMP, W3NRIMP, W2NRIMP
Career Path 7 Did not teach in all years, return status undetermined	W2FCSTS, W3FCSTS, W4FCSTS

NOTE: The Career Path variable was created by the authors 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, and 2010–11.

Career Path: The Career Path variable was created by the authors of this report and does not appear on the data file. The criteria used to create the career path variable are shown in exhibit 1 of this report. Exhibit B-1 contains the programming specifications for coding the career path variable (CAREER) for wave 1–4 respondents.

Exhibit B-1. Specifications for coding career paths for wave 1–4 respondents

Add new variable called CAREER with Label: "W1-W4 Career Path" and the following codes:

1 = Taught all years in same school
2 = Taught all years in same district but not same public school
3 = Taught all years but not in the same district
4 = Did not teach all years, returned
5 = Did not teach all years, expected to return or may return
6 = Did not teach all years, not expected to return
7 = Did not teach all years, cannot determine if returning
8 = Status undetermined

```
***Taught all years***
    IF W2FCSTS=2 AND W3FCSTS=2 AND W4FCSTS=2 THEN DO;

    ***Taught in same school ***
        IF W2MOVYN =1 AND (W3MOVYN = 1 OR W3NRSAS = 1) AND (W4MOVYN = 1
        OR W4NRSAS = 1) THEN CAREER = 1;

    ***Taught same district but not same public school ***
        ELSE IF W2MVTYP = 1 OR W3MVTYP = 1 OR W4MVTYP = 1 THEN CAREER = 2;

    ***Taught all years but not same district (it is correct for code 3 to overwrite some code 2
        cases so an ELSE statement should NOT be used below)***
        IF W2MVTYP IN (2,3,4,5) OR W3MVTYP IN (2,3,4,5) OR W4MVTYP IN (2,3,4,5) OR
        W2FORYN = 1 OR W3FORYN = 1 OR W4FORYN = 1 THEN CAREER = 3;
    END;

***Did not teach all years***
    IF W2FCSTS = 1 OR W3FCSTS = 1 OR W4FCSTS = 1 THEN DO;

    ***Returned ***
        IF W4FCSTS = 2 THEN CAREER = 4;
    ***Expected to return or may return (excluding most important reason)***
        ELSE IF W4ONLEA=1 OR W4ONSAB=1 OR W4APPYN IN (1,3) THEN CAREER=5;

    ***Not expected to return ***
        ELSE IF W4RETYN = 2
        OR (W2APNOI = 1 OR W2APNCL = 1 OR W2APNED = 1)
        OR W4OCCST=6
        OR W4SCOCC IN (1,2,3,4,9)
        OR W4LVIMP IN (LVRET, LVNPO, LVOED, LVTCH)
        OR W3LVIMP IN (LVRET, LVNPO, LVOED, LVTCH)
        OR W3NRIMP IN (W3NRNPO, W3NRTCH)
        OR W2LVIMP IN (d, m, p, q)
        OR W2NRIMP IN (W2NRNPO, W2NRTCH)
        THEN CAREER = 6;
```

Exhibit B-1. Specifications for coding career paths for wave 1–4 respondents—Continued

```
        ***Expected to return or may return based on most important reason for leaving (only used if
            not already coded in group 6 above)***
            ELSE IF W4LCINV = 1 OR W3LCNYN = 1 OR W2LCNYN = 1
            OR W4LVIMP IN (LVHOM, LVCHI, LVITR, LVSEC, LVWED)
            OR W3LVIMP IN (LVHOM, LVCHI, LVITR, LVSEC, LVWED)
            OR W2LVIMP IN (a, b, f, l, o)
            THEN CAREER = 5;


        ***Cannot determine if returning ***
            ELSE CAREER = 7;
        END;

***Cannot determine status***
        ELSE CAREER = 8;
```

Appendix C: 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 and private kindergarten through grade 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, 2009–10, and 2010–11 school years. The first follow-up was conducted together with the Teacher Follow-up Survey (TFS), and subsequent follow-ups were conducted as stand-alone data collections. Data are currently being processed for the follow-up survey collected during the 2011–12 school year. At this time, no additional collections are planned. 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 K–12 teaching profession, and teachers who left and subsequently 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 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)[1] Nonfiscal School Universe Data file. The CCD includes regular and nonregular schools (special education, alternative, vocational, or technical), public charter schools, and Bureau of Indian Education (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

[1] For more information about the CCD, see http://nces.ed.gov/ccd.

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 that 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 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. For 5 states with large school districts where it was determined by variance analysis that all districts in the state should be sampled, the school probabilities of selection within each school district were analyzed. 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 5 states would have at least one school in the sample. The sampling

procedures produced a national 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 members 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. During data collection for the follow-up surveys, the Census Bureau found that about 110 sample members did not meet the study definition of a beginning teacher, either because they did not start teaching in 2007 or 2008, or were not teaching regularly scheduled classes in the 2007–08 base year. Therefore, the total number of sampled, eligible BTLS teachers is about 1,990. Note that these are rounded unweighted counts of sample members.

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.[2] 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. SASS teacher data collection began in August 2007 and ended in June 2008. For complete details regarding 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 about 100 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 and fourth waves of the BTLS during the 2009–10 and 2010–11 school years, respectively. These waves are the third and fourth data collections from respondents who reported 2007 or 2008 as their first year of teaching in the 2007–08 SASS Teacher Questionnaire. Each of these waves of BTLS data was collected using a single internet instrument, so that all sample members responded to the same questionnaire, regardless of their teaching status during that year. For each of the two waves, telephone follow-up efforts were conducted to encourage participation or to collect BTLS data over the phone from nonrespondents. During data collection for the third and fourth waves, the Census Bureau discovered that about 10 sample members were not first-year teachers in 2007 or 2008 and therefore were not eligible for BTLS. These cases were removed from the BTLS sample.

Approximately 1,990 eligible teachers are included in the BTLS sample. All questionnaires used to collect data for the BTLS are available on the BTLS website: http://nces.ed.gov/surveys/btls/.

Data Processing and Imputation

The BTLS first-wave data were 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.[3] All BTLS first-wave data processing was

[2] 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.

[3] 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.

conducted within the single SASS Teacher Questionnaire Data File.[4]

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,[5] 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.[6] 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 preparation for the next stage of data processing—imputation. For further details about the TFS, refer to Graham et al. (2011).

The third and fourth waves of BTLS were collected as their own entities during the 2009–10 and 2010–11 school years, respectively. Data were collected using an internet instrument only. Data from completed internet instruments were processed separately within each survey respondent type.[7] 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 for a wave, they created the edited BTLS data file for that wave in preparation for the next stage of data processing—imputation. Data collected from third-wave retrospective respondents were added into the second-wave data file. As a result, the 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. Similarly, the fourth-wave retrospective respondents were added into the third-wave data file. These retrospective respondents represent 2.3 percent of the weighted total of 2009–10 current teachers (3.1 percent of the movers) and 8.3 percent of the weighted total of 2009–10 former teachers.

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[4] After all data processing of the SASS Teacher Questionnaire data was completed, the BTLS First Wave Data File was created. It 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.

[5] 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 through fourth waves.

[6] Two questionnaires 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.

[7] The BTLS third-wave internet instrument contained a single survey with a variety of questionnaire paths based on whether respondents were current or former teachers during the second and third waves of the BTLS, and whether they were respondents in the second wave of data collection. The BTLS fourth-wave internet instrument was similar, with branches based on teaching and response status during the third and fourth waves.

Once processing for the fourth wave was complete, data from the first through fourth waves of BTLS were used for imputation of item nonresponse. 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. 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 waves of BTLS 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. In other words, the cross-wave imputation from later waves replaced the initial imputation developed in wave 1 when cross-wave imputation was possible. If data were not available from subsequent waves, then the existing wave 1 imputed value remained. For further details about SASS, refer to Tourkin et al. (2010). 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.

After the imputation of the key variables was completed, data from the 4 waves were then combined into one 4-wave BTLS file. Data from the fifth wave will be added to this file for release by NCES as a restricted-use data file to licensed users in 2013. This file will be called the *First Through Fifth Waves of the 2007–08 Restricted-use Beginning Teacher Longitudinal Study Data File* (NCES 2013-338 forthcoming). The analysis in this report can be replicated using this restricted-use file because the wave 1–4 data and weights used for this report will be included in the file.

Response Rates

Unit response rate. The unit response rate is the rate at which the sampled units respond by substantially completing the questionnaire (i.e., meeting the criteria above). 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 of experience, 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 exclude 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 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, third, and fourth 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 C-1 summarizes the unweighted and base-weighted unit response and overall response rates for the BTLS.

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 close to 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 nonrespondents) 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_m = the number of 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, where n_r = the number of respondent cases, using the base weight

Table C-1. Unweighted and base-weighted response rates by stage of data collection, by wave and type of weighting: 2007–08 through 2010–11

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 without retrospective cases				
Unweighted	86.2	86.7	84.6	63.3
Base-weighted	86.1	86.2	84.3	62.5
Third wave with retrospective cases				
Unweighted	91.2	86.7	84.6	66.9
Base-weighted	91.4	86.2	84.3	66.4
Fourth wave				
Unweighted	83.7	86.7	84.6	61.4
Base-weighted	83.7	86.2	84.3	60.8

† Not applicable.

NOTE: Second-wave retrospective cases are sample members that were noninterviews during the second wave but provided replies to second-wave survey items during the third wave. Similarly, third-wave retrospective cases did not respond during the third wave but answered third-wave survey items during the fourth 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 Fourth Wave Preliminary Documentation Data File," 2007–08, 2008–09, 2009–10, and 2010–11.

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:

$$\mathrm{Re}lB(\bar{y}_r) = \frac{B(\bar{y}_r)}{\bar{y}_r}$$

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, third, and fourth 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 C-1.

Exhibit C-1. Variables used in the unit nonresponse bias analysis of the second, third, and fourth waves of the BTLS: 2008–09 through 2010–11

- Age
- Average number of students taught
- Base salary
- Census region
- Certification type
- Class organization
- Community type
- Entered through alternative certification
- Full- or part-time status
- Grade level of students taught
- Highest degree
- Highly Qualified Teacher status
- Main teaching assignment
- National Board for Professional Teaching Standards certification status
- Number of areas of classroom planning and teaching over which the teacher has no control or minor control
- Number of school-related activities outside of normal teaching duties
- Number of separate class periods taught
- Percentage of teacher's students who are limited-English proficient (LEP)
- Percentage of teacher's students with an Individualized Education Program (IEP)
- Percentage of students in the school approved/eligible for the National School Lunch Program
- Race/ethnicity
- School level
- School type
- Serious or moderate problems at school
- Sex
- Stayer/mover/leaver/returner status
- Teacher career reflection
- Teacher dissatisfaction
- Teacher has been physically attacked by a student
- Teacher participated in induction program in first year of teaching
- Teacher participated in professional development activities
- Teacher plans to remain in teaching
- Teacher's main activity in the last school year
- Teacher's evaluation of the usefulness of professional development activities
- Teacher's Praxis or other exam results
- Teacher's subject matter taught
- Total hours per week spent on all school-related activities
- Total hours per week spent on classroom instruction
- Total K–12 and ungraded enrollment in school
- Total number of students taught
- Total out-of-pocket expenses
- Union member status

Several steps were followed to compute the relative bias. First, the nonresponse bias was estimated and tested to determine if the bias was 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 C-2 contains summary statistics of the findings.

As shown in table C-2, the weighting adjustments eliminated some, but not all, significant bias. For example,

- Among the 2007–08 SASS public school teachers with 1 to 3 years of experience, both the mean and median estimated percent relative bias decreased after the nonresponse adjustment, but the percentage of variable categories that were significantly biased increased to about 5 percent.
- For the second wave without retrospective cases, about 7 percent of the variable categories were significantly biased before nonresponse weighting adjustments, but only about 3 percent were significantly biased after adjustments.
- For the third wave without retrospective cases, the percentage of the variable categories that were significantly biased decreased from about 10 percent before weighting adjustments to about 6 percent after adjustments.
- For the wave 1–4 longitudinal respondents without retrospective cases, the weighting adjustments reduced significantly biased variable categories from about 7 to 4 percent.

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 C-3 provides a brief summary of the base- and final-weighted item response rates for BTLS public school teachers in the first through fourth waves.

Table C-2. Summary of SASS new teacher and BTLS nonresponse bias, by wave and nonresponse bias statistic: 2007–08 through 2010–11

Nonresponse bias statistic	2007–08 SASS public school teachers with 1 to 3 years of experience	Second wave without retrospective cases[1]	Second wave with retrospective cases[1]	Third wave without retrospective cases[2]	Third wave with retrospective cases[2]	Fourth wave	Waves 1–4 longitudinal without retrospective cases[3]	Waves 1–4 longitudinal with retrospective cases[3]
Before nonresponse adjustment								
Mean estimated percent relative bias	-0.08	-2.02	-1.38	-1.92	-1.19	-1.80	-3.00	-2.29
Median estimated percent relative bias	0.21	-0.10	0.09	0.31	0.23	0.23	0.12	0.23
Percent of variable categories significantly biased	#	6.79	9.05	9.95	7.69	5.88	6.79	5.43
After nonresponse adjustment								
Mean estimated percent relative bias	#	-1.28	-1.09	-1.49	-0.64	-1.36	-1.63	-1.53
Median estimated percent relative bias	0.13	0.21	0.14	0.29	0.22	0.14	-0.06	-0.06
Percent of variable categories significantly biased	4.55	2.71	6.33	5.88	4.98	2.71	3.62	5.43

Rounds to zero.

[1] Second-wave retrospective cases are sample members that were nonrespondents during the second wave but provided replies to second-wave survey items during the third wave.

[2] Third-wave retrospective cases are sample members that were nonrespondents during the third wave but provided replies to third-wave survey items during the fourth wave.

[3] Longitudinal cases are those that responded to all 4 waves. Longitudinal retrospective cases responded to the first and fourth waves at the time of data collection but provided replies to second-wave items during the third wave or to third-wave items during the fourth wave.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), "Public School Sample File" and "Public School Teacher Documentation File," 2007–08, and Beginning Teacher Longitudinal Study (BTLS), "First Through Fourth Wave Documentation Data File," 2007–08, 2008–09, 2009–10, and 2010–11.

Table C-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 to 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 cases				
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 without retrospective cases				
Base-weighted	0.0–100.0	86.3	9.8	3.9
Final-weighted	0.0–100.0	86.7	9.4	3.9
Third wave with retrospective cases				
Base-weighted	0.0–100.0	85.5	10.6	3.9
Final-weighted	0.0–100.0	85.9	9.8	4.3
Fourth wave				
Base-weighted	46.6–100.0	85.6	10.9	3.5
Final-weighted	47.9–100.0	84.7	11.8	3.5

NOTE: Second-wave retrospective cases are sample members that were nonrespondents during the second wave but provided replies to second-wave survey items during the third wave. Similarly, third-wave retrospective cases did not respond during the third wave but answered third-wave survey items during the fourth 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 Schools and Staffing Survey 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 Fourth Wave Preliminary Data File," 2007–08, 2008–09, 2009–10, and 2010–11.

Weighting

The general purpose of weighting is to scale up the sample estimates to represent the target survey population. As discussed in the section on sampling frames and sample selection, of the original BTLS sample of 2,100 teachers, about 110 were found to be ineligible because they inadvertently reported 2007 or 2008 as their first year of teaching or were misidentified as teachers. These ineligibles were dropped from the sample, leaving about 1,990 sampled, eligible BTLS teachers. During the fourth wave, a small number of teachers (less than 5) were found to be deceased. For purposes of this report, these teachers were considered part of the eligible population for BTLS because they were beginning teachers in 2007 or 2008. The weighted estimates of teachers presented in this report represent the target survey population, estimated as 156,100 total beginning teachers. That is, the appropriate survey weight was used for each of the three sample groups: all BTLS sample

members, respondents to all waves (including retrospective respondents), and respondents to all waves (not including retrospective respondents) to weight up to this total.

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 the BTLS data file.

For the BTLS second, third, and fourth 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, third, and fourth waves of BTLS.

For longitudinal analysis over multiple waves, longitudinal weights are provided for waves 1–3 and waves 1–4. Longitudinal weights are used when change over time within a single population is being examined by using more than one wave of data. Only sample units with unit response in all waves are viewed as longitudinal respondents and are given positive longitudinal weights. The following longitudinal weights are provided on the data file:

- W3LWGT (applies to W1-W3 respondents);
- W3RLWGT (applies to W1-W3 respondents and retrospective respondents);
- W4LWGT (applies to W1-W4 respondents); and
- W4RLWGT (applies to W1-W4 respondents and retrospective respondents).

W4RLWGT differs from W4LWGT in that sample units with retrospective responses in wave 2 or wave 3 are accepted as responding units for W4RLWGT and are viewed as longitudinal nonrespondents for W4LWGT. One has a larger set of sample units using W4RLWGT, but there is considerable item nonresponse then as only key items are collected retrospectively.

The weights used in the tables in this report may vary by table and within table, as described below.

- Table 1 contains unweighted sample sizes.
- Table 2 varies by column. Data columns 1 and 2 are unweighted sample sizes. Data columns 3, 5, and 7 are based on all BTLS sample members and therefore use the first-wave weight W1TFNLWGT. Data columns 4, 6, and 8 are based on respondents to all waves, including retrospective respondents, and use a modified version of the waves 1–4 retrospective longitudinal final weight W4RLWGT. This weight was adjusted for this report to include the sample members found to be deceased during wave 4. These teachers were considered part of the eligible population for BTLS because they were beginning teachers in 2007 or 2008.

- Tables 3–5 and 7–8 are based on respondents to all waves, including retrospective respondents, and use the waves 1–4 retrospective longitudinal final weight W4RLWGT, adjusted to include the sample members found to be deceased during wave 4.

- Table 6 is based on all BTLS sample members and uses the first-wave weight W1TFNLWGT.

- Table 9 is based on respondents to all waves, not including retrospective respondents, and uses the waves 1–4 longitudinal final weight W4LWGT, adjusted to include the sample members found to be deceased during wave 4.

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 designed to produce variance estimates for each cross-sectional and longitudinal weight listed in the Weighting section above.

Reliability of Data

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.