STATS IN BRIEF
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Career Paths of Beginning Public School Teachers

Results From the First Through Fifth Waves of the 2007–08 Beginning Teacher Longitudinal Study

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Statistics in Brief publications present descriptive data in tabular formats to provide useful information to a broad audience, including members of the general public. They address simple and topical issues and questions. They do not investigate more complex hypotheses, account for inter-relationships among variables, or support causal inferences. We encourage readers who are interested in more complex questions and in-depth analysis to explore other NCES resources, including publications, online data tools, and public- and restricted-use data sets. See nces.ed.gov and references noted in the body of this document for more information.

Teacher attrition, defined as the loss of teachers from the teaching profession, is an ongoing concern in the field of education. Research suggests that attrition can be disruptive and undermine school performance, having a negative effect on teacher quality and student learning and exacerbating school staffing problems (Guarino, Santibanez, and Daley 2006; Harris and Adams 2007; Ingersoll 2001). High teacher attrition rates cause schools to expend resources on the recruitment, hiring, and training of new teachers that could otherwise be spent on academic programs and services (Barnes, Crowe, and Schaefer 2007; Darling-Hammond and Sykes 2003). High attrition can also undermine the sense of community in a school, which has been linked to student achievement (Bryk, Lee, and Holland 1993; Bryk and Schneider 2002). Recent empirical evidence suggests a significant negative impact of teacher attrition on student achievement, particularly in schools serving low-performing and minority students (Ronfeldt, Loeb, and Wyckoff 2013).

Other researchers have emphasized that some attrition may reflect the proportion of the teaching workforce comprised of teachers who view teaching as "temporary work in building a varied career." The recruitment of short-term teachers can sometimes bring expertise in high-need areas such as math and science (Rinke 2014).

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Attrition is highest among new teachers—namely, those in their first 3 years of teaching—and older teachers reaching retirement (Ingersoll 2001; Kelly 2004; Marvel et al. 2007). Because retirement is an unavoidable aspect of attrition, school systems may focus attention on reducing attrition among their new teachers, where they have more control over the teaching environment. In 2013, Perda found attrition rates as high as 41 percent within the first 5 years (as cited in Ingersoll, Merrill, and Stuckey 2014). In 2004, it was reported that the attrition rates are higher in schools that are urban, higher poverty, and lower performing (Hanushek, Kain, and Rivkin 2004).

Research has identified several factors affecting teacher retention and attrition, including support for new teachers through induction programs and mentoring, personal life events (e.g., caring for family), satisfaction with working conditions, salary and benefits, and career objectives (Johnson, Berg, and Donaldson 2005; Gonzalez, Brown, and Slate 2008; Borman and Dowling 2008; Greiner and Smith 2006). Factors identified in teachers' decisions to return to teaching after leaving include age, sex, salary, years of experience, and child-rearing responsibilities (Grissom and Reininger 2012).

Studies on teacher attrition are most often cross-sectional or cover a limited portion of teachers' careers and therefore cannot provide information on the career paths of teachers (Ingersoll and Strong 2011; Borman and Dowling 2008). The Beginning Teacher Longitudinal Study (BTLS), which is the focus of this report, contributes to policymakers' understanding of beginning public school teachers and their careers as they enter, leave, or reenter the teaching workforce and make important career and life decisions during the critical first 5 years of their careers. Increasing our understanding of the factors that may be related to attrition and mobility as teachers progress in their careers improves the ability of schools and districts to identify changes that can be implemented to reduce teacher attrition.

DATA AND VARIABLES

The National Center for Education Statistics (NCES) of the Institute of Education Sciences (IES) within the U.S. Department of Education (ED) conducted BTLS, which includes five waves of data collection. Data collection for the first wave of BTLS was part of NCES's 2007–08 Schools and Staffing Survey (SASS), which began in August 2007 and ended in June 2008. SASS 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. The approximately 1,990 eligible first-year public school teachers who completed the 2007–08 SASS compose the cohort followed in BTLS.[1] Data collection for the second wave was conducted together with NCES's 2008–09 Teacher Follow-up Survey (TFS), which began in February 2009 and ended in August 2009. Data were collected for the third through fifth waves of BTLS during January through June of the subsequent three years.

Survey responses were weighted to produce national estimates. For this report, the wave 1 through 5 retrospective longitudinal weights were used. These weight the approximately 1,440 sample members who responded to all 5 waves, either during the wave or retrospectively,[2] to the national population of beginning public school teachers.

[1]BTLS includes teachers who began teaching in calendar year 2007 or 2008 and taught at least one regularly scheduled class in a public school in the 2007–08 school year. About 89 percent of these were regular full-time teachers in 2007–08 (data not shown in tables). Note that 1,990 is an unweighted rounded count of BTLS sample members. More information about the sample design can be found in the technical notes section.
[2]In the third, fourth, and fifth waves of data collection, sample members who did not respond during the previous wave were asked selected items about the previous wave. These are retrospective respondents.

This report examines the career paths of beginning public school teachers and how these career paths vary by characteristics during the teachers' first year of teaching and most recent year of teaching. The career paths in this report are based on those developed for the NCES research and development (R&D) 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.* The purpose of the R&D report was to use BTLS data from waves 1–4 to develop a strategy for longitudinal analysis related to teacher attrition, retention, and mobility. This report extends the longitudinal analysis to all 5 years of BTLS data.

The career paths are divided into the broad groups of beginning teachers who taught all 5 years and those who did not teach all 5 years. Among teachers who taught all years, three career paths are defined based on the teachers' mobility over the years. Among teachers who did not teach all years, four career paths are defined based on whether the teacher returned to teaching or was expected to return to teaching. A variety of longitudinal survey items are used to classify respondents by whether or not they are expected to return to teaching.

Exhibit 1 shows the criteria used to define beginning teachers' 5-year career paths discussed in this report.

Career paths are analyzed by teacher and school characteristics. The analysis includes characteristics from two time frames, the first teaching year and the most recent teaching year. The most relevant time frame was chosen for each type of characteristic, as described below.

Teacher characteristics during the first year of teaching that are used in this report include demographic information that does not change over time (age,[3] sex, race/ethnicity). It also includes one-time events and characteristics at the time teaching started (highest degree, entered teaching through an alternative certification program, participated in a teacher induction program, and whether the teacher was assigned a mentor during the first year).

Characteristics during the most recent year of teaching that are used in this report include items that may change over time or where the teacher's decision to stop or continue teaching, or to move to a different school, might be more influenced by the current characteristic than by the first-year characteristic (e.g., specific school or teaching conditions). These characteristics include salary, teaching grade level, percentage of students in the school approved for free or reduced-price lunch, and the teacher's satisfaction with the school.

The most recent year characteristics were created by first identifying a teacher's most recent year of teaching and then using the characteristic from that year. For teachers who were teaching during the fifth year of the study (i.e., 2011–12), year 5 was their most recent year of teaching. For teachers who left teaching at some point during the study and did not return, the most recent year of teaching was their last year of teaching before they left.

All comparisons of estimates were tested for statistical significance using the Student's *t* statistic,[4] and all differences cited are statistically significant at the $p < .05$ level unless otherwise noted.[5] Because the BTLS sample size is relatively

[3]Relative age stays the same over time.

[4]No adjustments for multiple comparisons were made. The standard errors for the estimates can be found in appendix A.

[5]One comparison is noted in the report as not significantly different at the $p < .05$ level but significantly different at the $p < .10$ level. This is the comparison of the percent of beginning teachers who taught all 5 years by whether or not they participated in an induction program. Past research has found that induction programs affect teacher retention and attrition (Johnson, Berg, and Donaldson 2005; Greiner and Smith 2006; Ingersoll and Strong 2011).

small, the standard errors for many estimates are relatively large. This means that many estimates in this report that appear to have large differences cannot be said to be different after accounting for sampling error.

Exhibit 1. CRITERIA USED TO DEFINE THE DETAILED 5-YEAR CAREER PATH

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 to teaching (taught in 5th year):** Teachers who did not teach all years but went back to teaching. Teachers who taught in the most recent year but did not teach during all years were classified into Career Path 4.
5. **Are expected to return:** Teachers who did not teach all years but are expected to 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 are expected to return to teaching.
   - Applied for position of a pre-K–12 teacher during most recent school year—this action 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 who do not** have any of the criteria indicating they are **not** expected to return to teaching as described for Career Paths 6 and 7. These reasons for leaving are not related to dissatisfaction with teaching as a profession and may indicate that the teacher expects to return to teaching. Because these reasons alone may not be sufficient to indicate expectation to return to teaching, if factors defining Career Paths 6 or 7 exist, the teacher is classified into one of those paths.

     Left teaching position involuntarily/contract not renewed.[1]

     Changed residence or wanted job more convenient to home.

     Was pregnant or needed more time to raise children.[2]

     Was being involuntarily transferred and did not want the offered assignment.

     Was concerned about job security at last year's school.

     Decided to take courses to improve career opportunities **within** the field of education.
6. **Are not expected to return**: Teachers who did not teach all years and are not expected to return to teaching. Teachers were classified into Career Path 6 if they (1) did not teach all years; (2) were not assigned to Career Path 4; (3) were not assigned to Career Path 5 based on one of the first two criteria listed for path 5; and (4) met one or more of the criteria below.

See notes at end of exhibit.

Exhibit 1. CRITERIA USED TO DEFINE THE DETAILED 5-YEAR CAREER PATH—CONTINUED

Career Path 6—Continued

- Did not apply for position of a pre-K–12 teacher and met one of the following criteria:[3]

  Gave one of the following reasons for not applying:

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

  "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 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. 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.[4] 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, 5, or 6 were classified into Career Path 7.

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[1] For waves 2 and 3, former teachers were asked "Did you leave teaching because your contract was not renewed?" In waves 4 and 5, 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 waves 4 and 5, respondents were asked about "other personal life reasons (e.g., health, pregnancy/childcare, caring for family)."

[3] 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, 4, and 5, respondents who did not apply were asked whether they would ever consider returning to the position of a pre-K–12 teacher.

[4] In the third, fourth, and fifth waves of data collection, sample members who did not respond during the previous wave were asked selected items about the previous wave. These respondents are referred to as retrospective respondents. 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.

STUDY QUESTIONS

1 What are the 5-year career paths of beginning public school teachers?

2 How do the 5-year career paths of beginning public school teachers vary by first-year teaching characteristics?

3 How do the 5-year career paths of beginning public school teachers vary by most recent teaching year characteristics?

KEY FINDINGS

- About 155,600 public school teachers began their careers in 2007–08 and about three quarters of these teachers taught all 5 years of the study (77 percent). Among those who taught all 5 years, about three-fifths taught in the same school during this time (62 percent). Among the 23 percent of teachers who did not teach all 5 years of the study, about one quarter had returned to teaching (26 percent) and about one-third are expected to return (32 percent; table 2).
- Seventy-five percent of male and 78 percent of female beginning teachers taught all 5 years. Among teachers who left teaching during the study, a larger percentage of female teachers had returned or are expected to return than male teachers (64 percent compared to 44 percent; figure 2).
- Seventy-six percent of beginning teachers who entered teaching through an alternative certification program and 78 percent of those who were not in such a program taught all 5 years. Among beginning teachers who did not teach all 5 years, the percentage that had returned or are expected to return was 43 percent for those who entered teaching through an alternative certification program compared to 65 percent for other beginning teachers (figure 4).
- Having a mentor and participating in an induction program were related to teacher attrition. A larger percentage of teachers who were assigned a mentor during their first year of teaching taught all 5 years of the study (80 percent) compared to those who were not assigned a mentor (64 percent). Eighty percent of beginning teachers who participated in an induction program taught all 5 years and 69 percent of those who did not participate in such a program taught all 5 years[6] (figures 5 and 6).
- The percentage of beginning teachers who taught all 5 years was smaller for teachers with base salaries less than $40,000 during their most recent year of teaching (68 percent) than for teachers whose base salaries were $40,000 or more during their most recent year of teaching (85 percent; figure 8).
- The percentage of students eligible for free or reduced price lunch (FRPL) programs in a school is often used as a measure of the economic background of students served by teachers. About 80 percent of beginning teachers who taught most recently in schools with below 50 percent FRPL-eligible and 75 percent of those who taught in schools with 50 percent or above FRPL-eligible taught all years. (figure 10).

[6]This difference is not statistically significant at the .05 level but is statistically significant at the .10 level.

1 What are the 5-year career paths of beginning public school teachers?

DETAILED CAREER PATHS

During 2007–08, 155,600 public school teachers began their K–12 teaching careers (table 1). Over the 5 years that followed their entry into teaching, 48 percent of beginning teachers[7] taught all 5 years in the same school, 13 percent taught in the same district but in different schools, and 16 percent taught all 5 years but not in the same district.[8] Among all beginning teachers, 6 percent left teaching at some point during the study but had returned to teaching by the fifth year, 7 percent left teaching and are expected to return to teaching in the future, and 6 percent left teaching and are not expected to return. An additional 4 percent of beginning teachers left teaching and their return status is undetermined.

Table 1. DETAILED CAREER PATHS
Number and percentage distribution of 2007–08 beginning public school teachers, by their detailed 5-year career paths: 2007–08 through 2011–12

Career path	Number of teachers	Percentage distribution of teachers
All 2007–08 beginning teachers	155,600	100
Detailed 5-year career path		
Taught all years in same school	74,800	48
Taught all years in same district but not same public school	20,400	13
Taught all years but not in same district	24,800	16
Did not teach all years but returned to teaching (taught in 5th year)	9,400	6
Did not teach all years and are expected to return	11,500	7
Did not teach all years and not expected to return	9,200	6
Did not teach all years and return status undetermined	5,600	4

NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). 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 Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

[7]The term "beginning teachers" is used in this report to mean teachers who began teaching in calendar year 2007 or 2008 and taught at least one regularly scheduled class in a public school in the 2007–08 school year.
[8]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.

CAREER PATHS FOR THOSE WHO TAUGHT ALL YEARS

Overall, 77 percent of teachers who began their teaching careers in public schools in 2007-08 taught all 5 years of the study (table 2). Among these teachers, 62 percent taught all 5 years in the same school, 17 percent taught in the same district but in different public schools, and 21 percent did not teach in the same district during all 5 years.

CAREER PATHS FOR THOSE WHO DID NOT TEACH ALL YEARS

Among the 23 percent of teachers who did not teach all 5 years of the study, 26 percent had returned to teaching by the fifth year of the study and 32 percent are expected to return to teaching. On the other hand, 26 percent of beginning teachers who had left the profession at some point during the study are not expected to return to teaching. The return status of an additional 16 percent of those who did not teach all 5 years was undetermined.

Table 2. BROAD AND DETAILED CAREER PATHS
Number and percentage distribution of 2007–08 beginning public school teachers, by their broad and detailed 5-year career paths: 2007–08 through 2011–12

Career path	Number of teachers	Percentage distribution of teachers
All 2007–08 beginning teachers	155,600	100
Broad 5-year career path		
Taught all years	119,900	77
Did not teach all years	35,700	23
Detailed 5-year career path among those who taught all years		
In same school	74,800	62
In same district but not same public school	20,400	17
Not in same district	24,800	21
Detailed 5-year career path among those who did not teach all years		
Returned to teaching (taught in 5th year)	9,400	26
Are expected to return	11,500	32
Not expected to return	9,200	26
Return status undetermined	5,600	16

NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). 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 Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

2 How do the 5-year career paths of beginning public school teachers vary by first-year teaching characteristics?

This section first presents the distribution of 2007–08 beginning public school teachers by various teacher characteristics during the first teaching year and then examines teacher career paths by these characteristics.

To examine career paths by characteristics, some career paths were collapsed in order to increase the sample sizes and decrease the sampling errors for categories. In this section, the following career paths are presented by first-year teaching characteristics.

- **Taught all years**—this path represents the overall percentage of beginning teachers who taught all 5 years of BTLS. The percentage that did not teach all years is not presented because it is simply the reverse of those who taught all years.
- **Among those who taught all years: taught all years in same school**—this path represents the percentage of beginning teachers who taught all 5 years in the same public school, calculated as a percentage of those who taught all 5 years of BTLS.
- **Among those who did not teach all years: returned or are expected to return**—the career paths of those who returned and those who are expected to return to teaching combined together, calculated as a percentage of those who did not teach all 5 years of BTLS. The percentages of those who are not expected to return or whose return status is not known are not presented by teacher characteristics because of small sample sizes.

DISTRIBUTION BY CHARACTERISTICS

An examination of demographic information reveals that 71 percent of beginning teachers were younger than 30 in 2007–08, 75 percent were female, and 78 percent were White, non-Hispanic (figure 1).

Seventy-nine percent of beginning teachers started teaching with a bachelor's degree and 18 percent started with a master's degree. In addition, 26 percent of beginning teachers entered teaching with alternative certification.

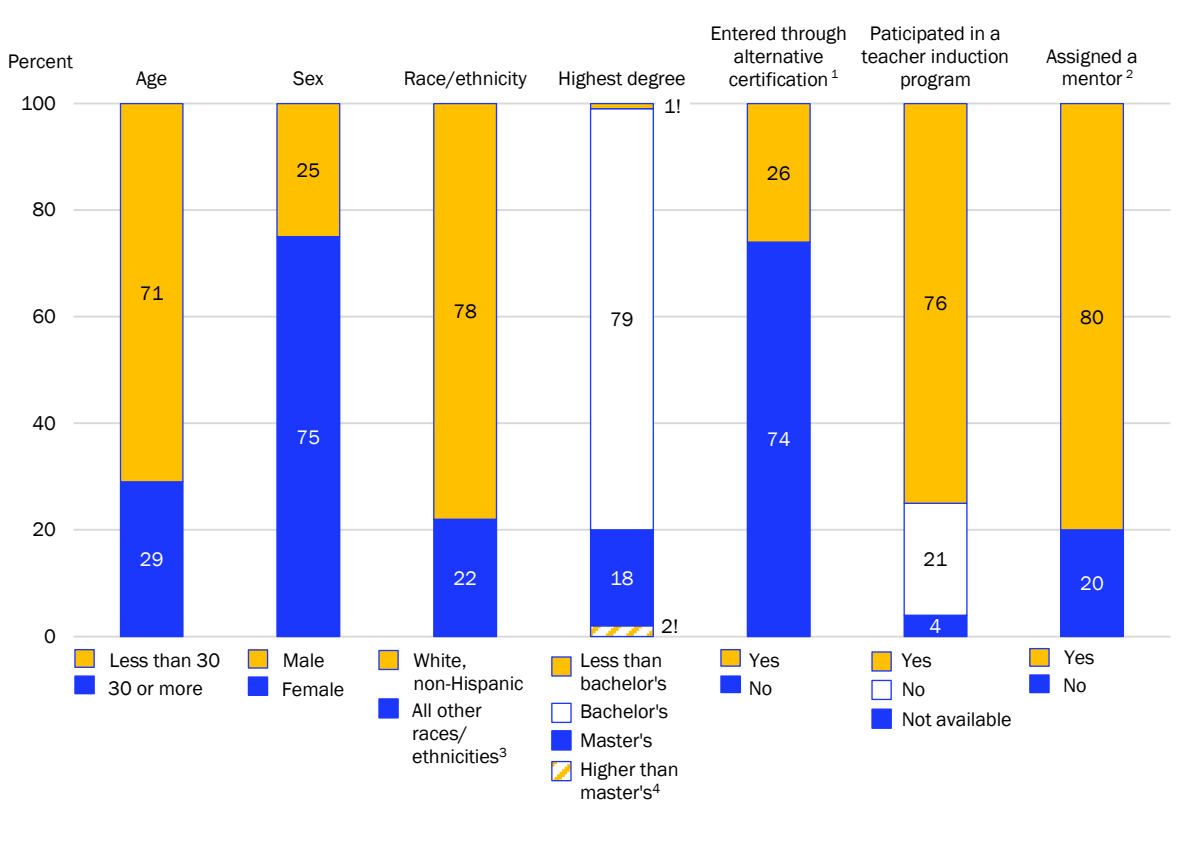
During their first year as teachers, 76 percent of beginning teachers participated in a teacher induction program and 80 percent were assigned a mentor.[9]

[9]Information for teacher induction programs was collected on the first-wave questionnaire with the question, "In your FIRST year of teaching, did you participate in a teacher induction program?" Information on mentors was collected on the second-wave questionnaire with the question, "Last school year (2007–08), were you assigned a master or mentor teacher by your school or school district?" The terms "induction program" and "mentor" were not defined for respondents.

FIGURE 1.

SELECTED TEACHER CHARACTERISTICS DURING FIRST YEAR OF TEACHING

Percentage distribution of 2007–08 beginning public school teachers, by selected teacher characteristics during their first year of teaching: 2007–08



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

[1] Data on alternative certification programs were collected during the first wave with the question, "Did you enter teaching through an alternative certification program?" An alternative certification program is designed to expedite the transition of nonteachers to a teaching career; for example, a state, district, or university alternative certification program.

[2] Data were collected in 2008–09 regarding a mentor during the first year of teaching.

[3] All other races/ethnicities include Hispanic or Latino, Black or African American, Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, and two or more races.

[4] Higher than a master's degree includes educational specialist or professional diploma, certificate of advanced graduate studies, and doctorate or first professional degree.

NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Unless otherwise specified, characteristics were collected during the first wave. Categories of "not available" indicate data are not available due to item nonresponse. 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 Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

DEMOGRAPHICS

An examination of the career paths of beginning teachers by demographic characteristics shows that 80 percent of those who were under 30 years old and 71 percent of those who were age 30 or older when they began teaching were still teaching 5 years later (figure 2).

Among those who taught all years, 60 percent of the younger teachers and 70 percent of the older teachers remained in the same school for all 5 years.

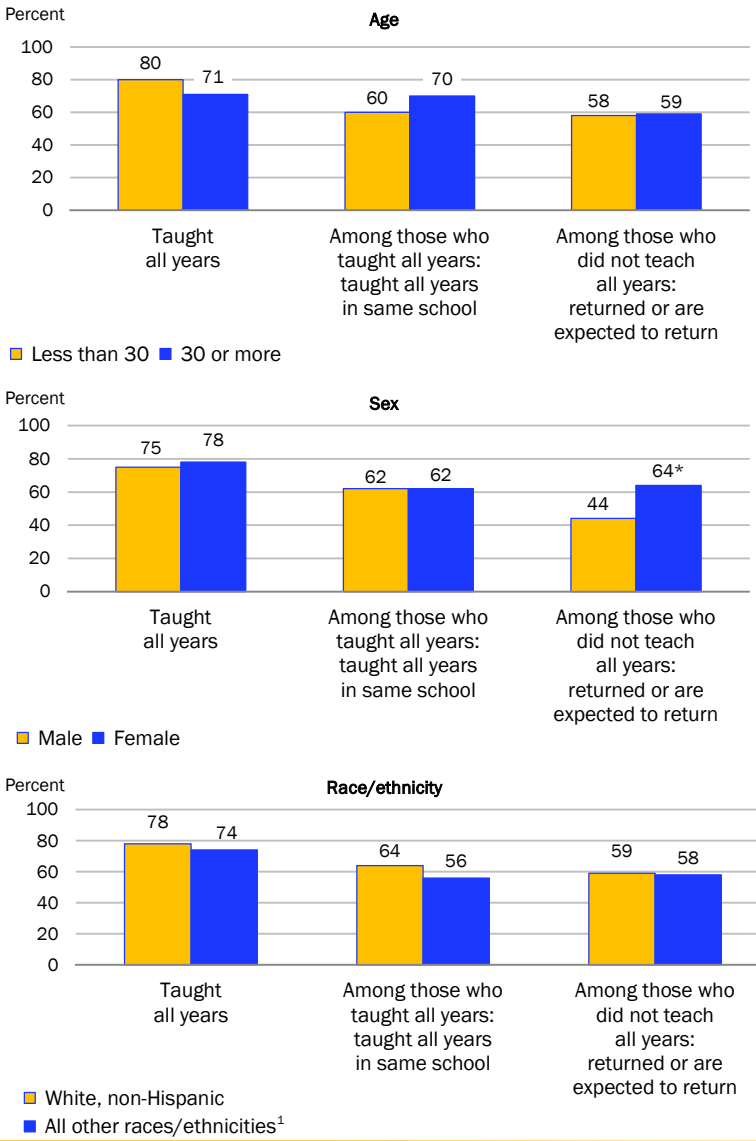
Seventy-five percent of male beginning teachers and 78 percent of female beginning teachers taught all 5 years. However, among those beginning teachers who did not teach all 5 years, a larger proportion of female teachers than male teachers had returned to teaching or are expected to return (64 percent compared to 44 percent).

Seventy-eight percent of White, non-Hispanic beginning teachers and 74 percent of beginning teachers of all other races and ethnicities taught all 5 years.[10] Among those who taught all years, 64 percent of White, non-Hispanic teachers and 56 percent of teachers with other race/ethnicities stayed in the same school all 5 years.

FIGURE 2.

CAREER PATHS BY DEMOGRAPHICS

Percent of 2007–08 beginning public school teachers, by their 5-year career paths and selected demographics during their first year of teaching: 2007–08 through 2011–12



* Statistically significantly different ($p < .05$) from the male group.
[1] All other races/ethnicities include Hispanic or Latino, Black or African American, Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, and two or more races.
NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Characteristics were collected during the first wave.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

[10] Racial and ethnic categories were combined to provide sufficient sample sizes for analysis.

HIGHEST DEGREE

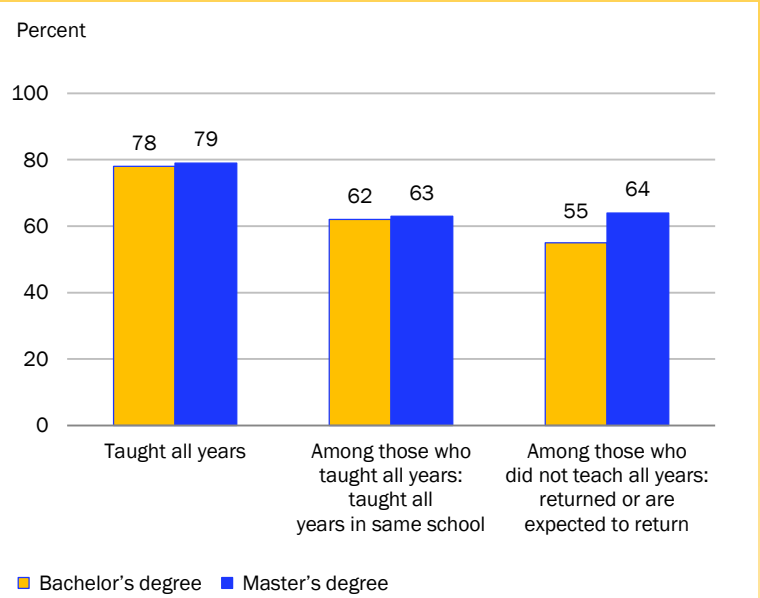
Similarities existed with respect to the career paths of beginning teachers whose highest degree was a bachelor's degree in their first year of teaching and those whose highest degree was a master's degree. Seventy-eight percent of those who entered with a bachelor's degree and 79 percent of those who entered with a master's degree taught all 5 years (figure 3).

Among beginning teachers who taught all years, 62 percent of those who entered teaching with a bachelor's degree taught in the same school across all 5 years as did 63 percent of those who entered with a master's degree.

Among beginning teachers who did not teach all years, the proportion of those who returned or are expected to return was 55 percent among those who started teaching with a bachelor's degree and 64 percent among those who started teaching with a master's degree.

FIGURE 3.

CAREER PATHS BY HIGHEST DEGREE
Percent of 2007–08 beginning public school teachers, by their 5-year career paths and highest degree during their first year of teaching: 2007–08 through 2011–12



NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Highest degree data were collected during the first wave. Data for "less than a bachelor's degree" and "higher than a master's degree" are not shown in figure because reporting standards were not met or data should be interpreted with caution for these categories.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

ALTERNATIVE CERTIFICATION PROGRAM

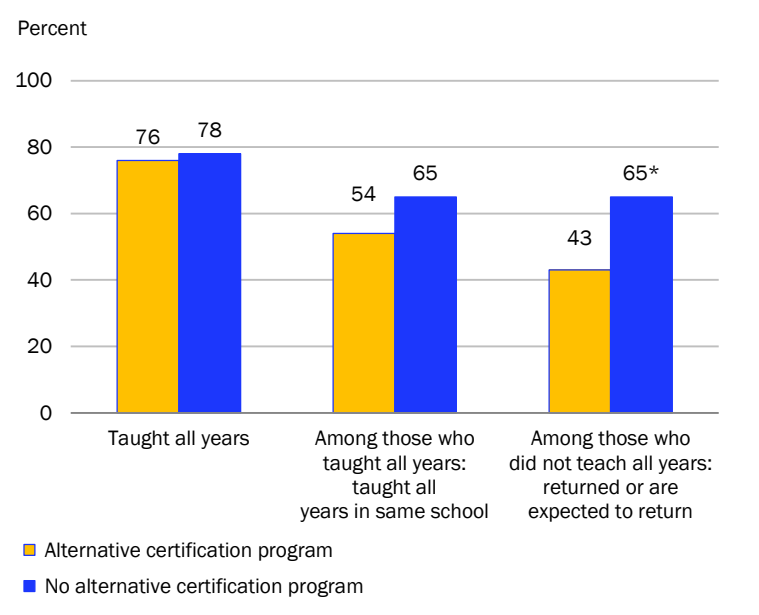
Seventy-six percent of beginning teachers who entered teaching through an alternative certification program and 78 percent of those who were not in such a program taught all 5 years (figure 4).

Among beginning teachers who taught all years, 54 percent of those who entered teaching with alternative certification taught in the same school all 5 years and 65 percent of those who did not enter teaching through an alternative certification program remained in the same school all 5 years.

Among teachers who did not teach all years, the percentage that had returned or are expected to return was 43 percent for those who entered teaching through an alternative certification program, which was lower than the 65 percent for those who entered teaching through a regular certification program.

FIGURE 4.

CAREER PATHS BY ALTERNATIVE CERTIFICATION
Percent of 2007–08 beginning public school teachers, by their 5-year career paths and entry through an alternative certification program during their first year of teaching: 2007–08 through 2011–12



* Statistically significantly different ($p < .05$) from the alternative certification program group.
NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Data on alternative certification programs were collected during the first wave with the question, "Did you enter teaching through an alternative certification program?" An alternative certification program is designed to expedite the transition of nonteachers to a teaching career; for example, a state, district, or university alternative certification program. The table category, "alternative certification program" includes those who answered "yes" to this question, and the category, "no alternative certification program" includes those who answered "no" to this question.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

PARTICIPATION IN A TEACHER INDUCTION PROGRAM

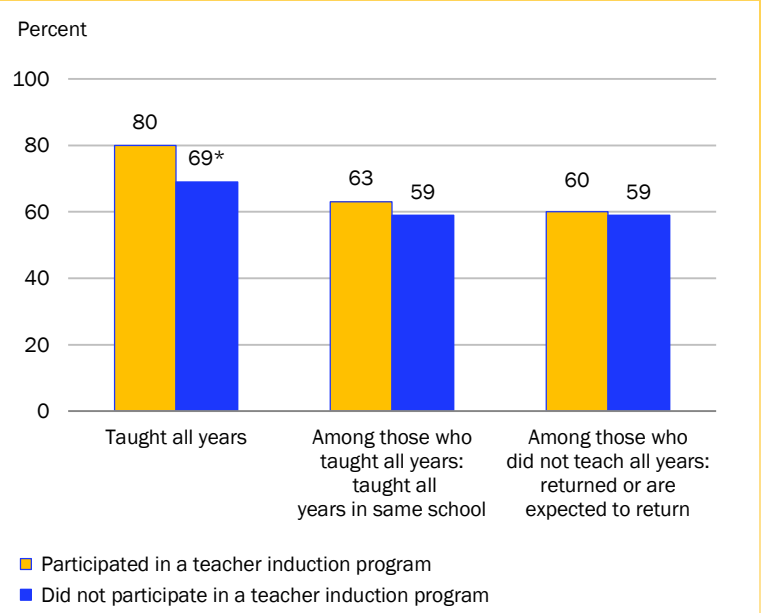
Among all beginning teachers, 80 percent of those who participated in an induction program during their first year of teaching[11] taught all 5 years of the study and 69 percent of those who did not participate in such a program taught all 5 years (figure 5).[12]

Among beginning teachers who taught all years, 63 percent of induction program participants and 59 percent of nonparticipants remained in the same school for the duration of the study. Among those who did not teach all years, about three-fifths of induction program participants and nonparticipants had returned to teaching or are expected to return (60 percent and 59 percent, respectively).

FIGURE 5.

CAREER PATHS BY PARTICIPATION IN A TEACHER INDUCTION PROGRAM

Percent of 2007–08 beginning public school teachers, by their 5-year career paths and participation in a teacher induction program during their first year of teaching: 2007–08 through 2011–12



* Not statistically significantly different at the $p < .05$ level but statistically significantly different at the $p < .10$ level from the participated in a teacher induction program group.

NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Data for participation in a teacher induction program were collected during the first wave. Figure does not include the 4 percent of teachers for whom information about a teacher induction program was not available.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

[11] Analyses by participation in a teacher induction program exclude the 4 percent of teachers for whom this information was not available.

[12] The apparent difference is not statistically significant at the .05 level but is significant at the .10 level.

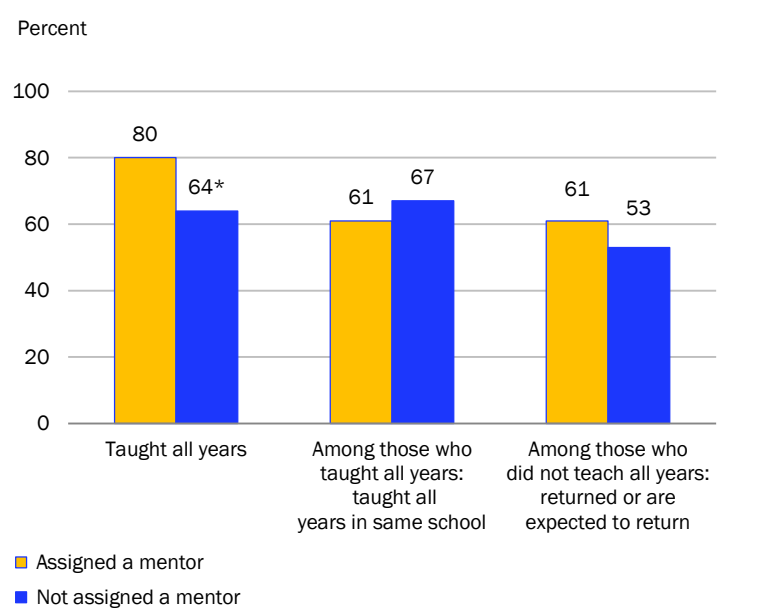
ASSIGNED A MENTOR

A larger percentage of BTLS teachers who were assigned a mentor during their first year of teaching taught all 5 years of the study (80 percent) compared to those who were not assigned a mentor (64 percent; figure 6).

Among beginning teachers who taught all years, 61 percent of those assigned a first-year mentor and 67 percent of those not assigned a first-year mentor remained in the same school all 5 years. Among beginning teachers who did not teach all years, 61 percent of those who had been assigned a mentor and 53 percent of those who had not been assigned a mentor had returned or are expected to return to teaching.

FIGURE 6.

CAREER PATHS BY WHETHER ASSIGNED A MENTOR
Percent of 2007–08 beginning public school teachers, by their 5-year career paths and whether they were assigned a mentor during their first year of teaching: 2007–08 through 2011–12



* Statistically significantly different ($p < .05$) from the assigned a mentor group.
NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Data for assigned a mentor were collected in the second wave regarding a mentor during the first year of teaching.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

3 How do the 5-year career paths of beginning public school teachers vary by most recent teaching year characteristics?

This section first presents the distribution of 2007–08 beginning public school teachers by various teacher and school characteristics during the most recent teaching year and then examines career paths by these characteristics.

As discussed in the introduction, characteristics during the most recent year of teaching were created by first identifying a teacher's most recent year of teaching and then using the characteristic from that year. The most recent year of teaching was identified for each teacher using the following definitions.

- Year 1: taught in year 1 and did not teach in any of years 2–5.
- Year 2: taught in year 2 and did not teach in any of years 3–5.
- Year 3: taught in year 3 and did not teach in either year 4 or 5.
- Year 4: taught in year 4 and did not teach in year 5.
- Year 5: taught in year 5.

As discussed in the section for study question 2, to examine career paths by characteristics, some career paths were collapsed in order to increase the sample sizes and decrease the sampling errors associated with related estimates.

DISTRIBUTION BY CHARACTERISTICS

During their most recent year of teaching, 52 percent of beginning teachers had a base salary of $40,000 or more (figure 7). Thirty-four percent of beginning teachers taught grades at the primary level, 25 percent taught middle school grades, 31 percent taught high school grades, and 9 percent taught combined grades.

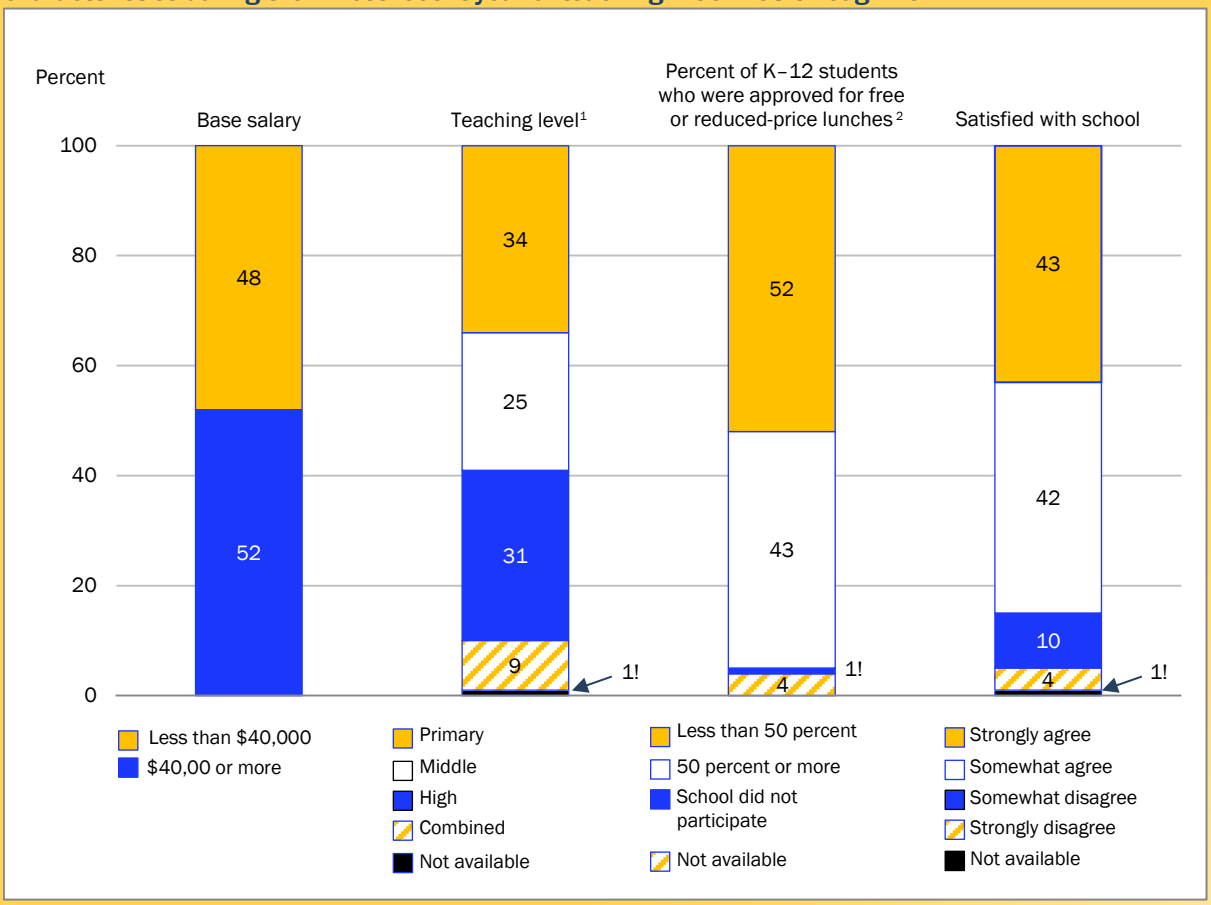
Fifty-two percent of beginning teachers most recently taught in schools with fewer than 50 percent of their students approved for free or reduced-price lunches.

With respect to their satisfaction with the school where they most recently taught, 43 percent of beginning teachers reported that they strongly agreed with the statement that they were generally satisfied with being a teacher at their school. An additional 42 percent reported that they somewhat agreed that they were satisfied, and 10 and 4 percent, respectively, reported that they somewhat disagreed or strongly disagreed.

FIGURE 7.

SELECTED TEACHER AND SCHOOL CHARACTERISTICS DURING MOST RECENT YEAR OF TEACHING

Percentage distribution of 2007–08 beginning public school teachers, by selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2011–12



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

[2] In wave 1, data reflect the percentage of students approved for free or reduced-price lunch. In waves 2–5, data reflect the percentage of students eligible for free or reduced-price lunch.

NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Characteristics were created by first identifying the teacher's most recent year of teaching using the teaching status variables for the second through fifth waves, W2FCSTS, W3FCSTS, W4FCSTS and W5FCSTS and then using the characteristic variable from the appropriate wave. Categories of "not available" indicate data are not available due to item nonresponse. 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 Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

SALARY

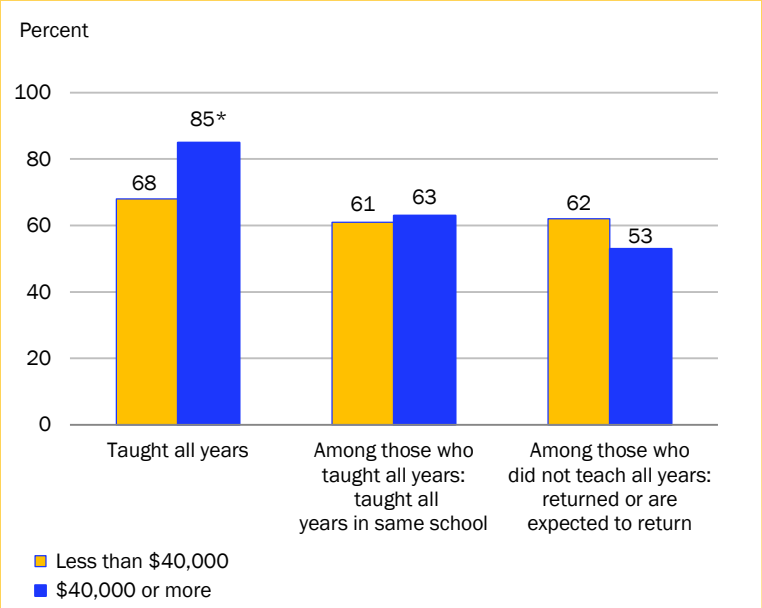
This section presents results from comparisons of beginning teachers' career paths by base salary categories of less than $40,000 and $40,000 or more during their most recent year of teaching. The proportion of beginning teachers who taught all 5 years of the study was smaller among teachers with salaries of less than $40,000 (68 percent) than among teachers with salaries of $40,000 or more (85 percent; figure 8).

However, for each of the two salary groups, about three-fifths of those who taught all years taught in the same school during the 5 years between 2007–08 and 2011–12 (61 percent of those making less than $40,000 and 63 percent of those making at least $40,000).

Among teachers who left teaching at some point during the study, the percentage that returned or are expected to return to teaching was 62 percent for those with salaries of less than $40,000 and 53 percent for those with salaries of $40,000 or more.

FIGURE 8.

CAREER PATHS BY BASE SALARY
Percent of 2007–08 beginning public school teachers, by their 5-year career paths and base salary during their most recent year of teaching: 2007–08 through 2011–12



* Statistically significantly different ($p < .05$) from the less than $40,000 group.
NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Characteristics were created by first identifying the teacher's most recent year of teaching using the teaching status variables for the second through fifth waves, W2FCSTS, W3FCSTS, W4FCSTS and W5FCSTS 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 Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

TEACHING LEVEL

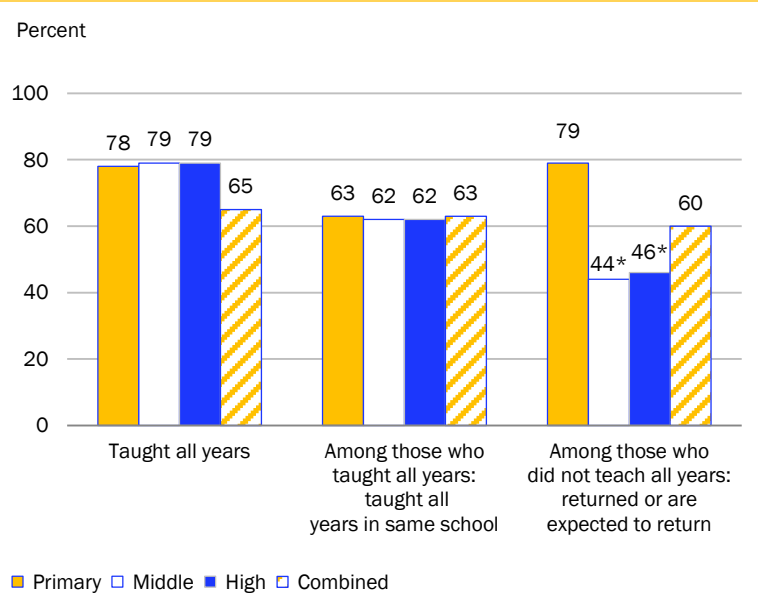
Beginning teachers were asked which grade levels they taught during each wave of the study. The proportion of beginning teachers who taught all 5 years across primary, middle, and high school grades was 78 percent, 79 percent, and 79 percent, respectively. The 65 percent rate for those teaching a combination of grade levels was not measurably different from rates for other teachers once sampling error was accounted for (figure 9).

In addition, among teachers who taught all 5 years, similar proportions stayed at the same school across grade levels; 63 percent of teachers who taught primary grades, 62 percent who taught middle grades, and 62 percent who taught high school grades did not teach in different schools during the study.

However, among beginning teachers who left teaching at some point during the study, a larger percentage of those who taught primary grades returned or are expected to return compared to those who taught middle or high school grades (79 percent for primary compared to 44 percent for middle grades and 46 percent for high school grades).

FIGURE 9.

CAREER PATHS BY TEACHING LEVEL
Percent of 2007–08 beginning public school teachers, by their 5-year career paths and teaching level during their most recent year of teaching: 2007–08 through 2011–12



* Statistically significantly different ($p < .05$) from the primary group.
NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Characteristics were created by first identifying the teacher's most recent year of teaching using the teaching status variables for the second through fifth waves, W2FCSTS, W3FCSTS, W4FCSTS and W5FCSTS and then using the characteristic variable from the appropriate wave. Figure does not include the 1 percent of teachers for whom teaching level was not available.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

FREE OR REDUCED-PRICE LUNCH

The poverty status of schools in which beginning teachers most recently taught was divided into two categories: less than 50 percent of students approved or eligible for free or reduced-price lunch (FRPL) and 50 percent or more of students FRPL-eligible.[13]

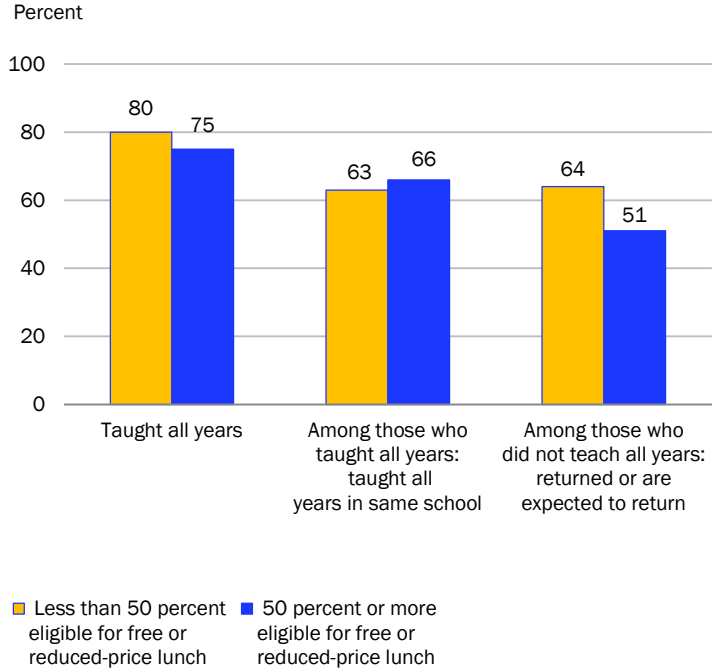
About 80 percent of beginning teachers in schools with less than 50 percent FRPL-eligible, and 75 percent of those in schools with 50 percent or more FRPL-eligible taught all 5 years of the study (figure 10).

Among beginning teachers who taught all years, 63 percent of those in schools with less than 50 percent FRPL-eligible and 66 percent of those in schools with 50 percent or more FRPL-eligible taught in the same school all 5 years of the study.

Among teachers who did not teach all 5 years, 64 percent of those who most recently taught in schools with less than 50 percent FRPL-eligible and 51 percent of those who most recently taught in schools with 50 percent or more FRPL-eligible had returned or are expected to return to teaching.[14]

FIGURE 10.

CAREER PATHS BY FREE OR REDUCED-PRICE LUNCH STATUS
Percent of 2007–08 beginning public school teachers, by their 5-year career paths and the free or reduced-price lunch status of the school where they taught during their most recent year of teaching: 2007–08 through 2011–12



NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Characteristics were created by first identifying the teacher's most recent year of teaching using the teaching status variables for the second through fifth waves, W2FCSTS, W3FCSTS, W4FCSTS and W5FCSTS and then using the characteristic variable from the appropriate wave. Figure does not include the 1 percent of teachers in schools that did not participate in this program and the 4 percent of teachers for whom the free or reduced-price lunch status of the school was not available.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

[13]Analyses by free or reduced-price lunch exclude the 1 percent of teachers in schools that did not participate in this program and the 4 percent for whom this information was not available.

[14]The apparent difference is not statistically significant.

TEACHER SATISFACTION WITH SCHOOL

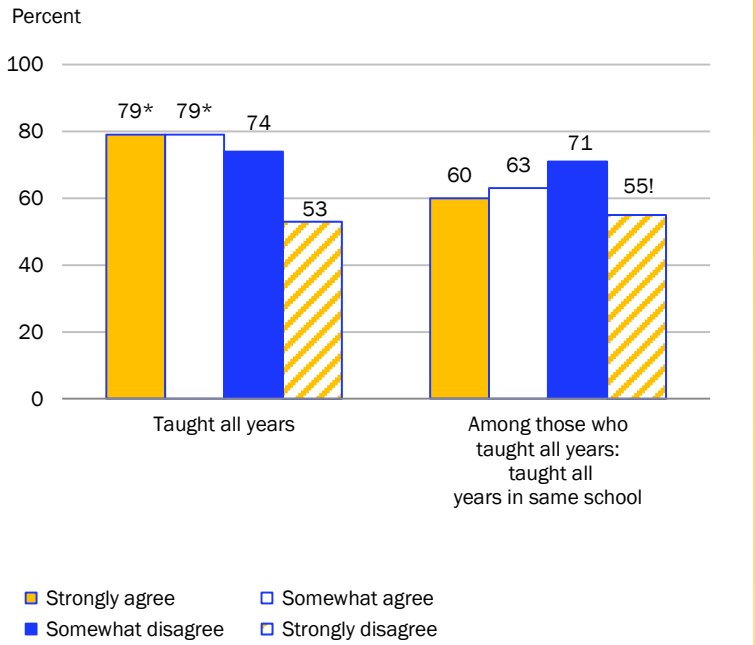
Figure 11 presents career path information for beginning teachers based on the extent to which they agreed or disagreed with the statement, "I am generally satisfied with being a teacher at this school" in regard to the school in which they most recently taught.

Of the beginning teachers who strongly disagreed that they were satisfied, 53 percent taught all 5 years of the study. This is a smaller percentage than the percentages who taught all years among those who reported strongly agreeing (79 percent) or somewhat agreeing (79 percent) with the satisfaction statement.[15]

Among the beginning teachers who taught all years, the percentages who taught all years in the same school were 60 percent for those who strongly agreed, 63 percent for those who somewhat agreed, and 71 percent for those who somewhat disagreed with the satisfaction statement.

FIGURE 11.

CAREER PATHS BY SATISFACTION WITH SCHOOL
Percent of 2007–08 beginning public school teachers, by their 5-year career paths and level of agreement with the statement, "I am generally satisfied with being a teacher at this school" during their most recent year of teaching: 2007–08 through 2011–12



! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 percent and 50 percent (i.e., the standard error is at least 30 percent and less than 50 percent of the estimate).
* Statistically significantly different ($p < .05$) from the strongly disagree group.
NOTE: Estimates are weighted using the wave 1 through 5 retrospective longitudinal weight (W5RLWGT). Characteristics were created by first identifying the teacher's most recent year of teaching using the teaching status variables for the second through fifth waves, W2FCSTS, W3FCSTS, W4FCSTS and W5FCSTS and then using the characteristic variable from the appropriate wave. Figure does not include the 1 percent of teachers for whom the school satisfaction information was not available.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

[15] Analyses by school satisfaction exclude the 1 percent of teachers for whom this information was not available.

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http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015196

For additional information on the Beginning Teacher Longitudinal Study, go to the BTLS home page http://nces.ed.gov/surveys/btls/

Readers may also be interested in the following NCES products related to the topic of this Statistics in Brief:

Public School Teacher Attrition and Mobility in the First Five Years: Results From the First Through Fifth Waves of the 2007–08 Beginning Teacher Longitudinal Study (NCES 2015-337) http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015337

User's Manual for the First Through Fifth Waves of the 2007–08 Restricted-use Beginning Teacher Longitudinal Study Data File (NCES 2015-338) http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015059

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 (NCES 2013-336) http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2013336

Beginning Teacher Attrition and Mobility: Results From the First Through Third Waves of the 2007–08 Beginning Teacher Longitudinal Study (NCES 2011-318) http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011318

TECHNICAL NOTES

Survey Methodology

The Beginning Teacher Longitudinal Study (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 sample survey of public and private kindergarten through grade 12 (K–12) school districts, schools, teachers, and administrators in the United States today. 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. For additional information on BTLS, go to the BTLS home page http://nces.ed.gov/surveys/btls/.

Sampling Frames and Sample Selection

Teachers sampled for BTLS are part of the SASS teacher sample, which is based on the SASS school sample. For details on SASS school and teacher samples, please see *Documentation for the 2007–08 Schools and Staffing Survey* (Tourkin et al. 2010).

All 2007–08 SASS traditional public and 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.

Data Collection Procedures

The Census Bureau conducted data collection for all waves of BTLS. The 2007–08 SASS data for teachers who began teaching in 2007 or 2008 are the first wave of BTLS data. The first-wave collection utilized a mail-based methodology with telephone and field follow-up. The 2007–08 SASS included several questionnaire components, which collected data from schools, school districts, principals, library media centers (public schools only), and teachers. BTLS cases were identified during the teacher collection. SASS teacher data collection began in August 2007 and ended in June 2008.

The Census Bureau conducted the second wave of BTLS together with the Teacher Follow-up Survey (TFS) during the 2008–09 school year. BTLS teachers used the longitudinal versions of the questionnaires, which contained more questions than the TFS questionnaires. The second-wave data were primarily collected using an internet instrument. Telephone follow-up was conducted for nonresponse and data clarification. The TFS data collection began in February 2009 and ended in August 2009.

The Census Bureau conducted the third, fourth, and fifth waves of BTLS during the 2009–10, 2010–11, and 2011–12 school years, respectively. Each of these waves of BTLS data was collected using an internet instrument. Telephone follow-up was conducted for nonresponse and data clarification.

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

Data Processing and Imputation

For each wave with paper questionnaires, the Census Bureau electronically captured the data from the completed paper questionnaires and combined these

data with data from the internet instrument. For each wave, 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. Data collected retrospectively during the third wave were added into the second-wave data file. Similarly, data collected retrospectively during the fourth and fifth waves were added into the data file for the previous wave.

Data from the first through fifth waves of BTLS were used for imputation of item nonresponse.

For each of the second through fifth waves of BTLS, 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 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. 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.

Response Rates and Nonresponse Bias Analysis

The BTLS weighted unit response rate for a wave was produced by dividing the weighted number of respondents for that wave by the weighted number of eligible sampled cases, using the base weight.[16] The overall response rate for each wave represents the response rate to the survey, taking into consideration each stage of data collection for that wave. The overall response rate for the BTLS first wave is the product of response rates for two stages of collection: (1) SASS Teacher Listing Form response rate; and (2) survey response rate of sampled SASS public school teachers with 1 to 3 years of experience.[17] The overall response rate for each of the remaining waves (second through fifth) is the product of three factors: (1) SASS Teacher Listing Form response rate; (2) response rate of sampled SASS public school teachers with

[16]For the formula used to calculate the unit response rate, see *NCES Statistical Standards* (U.S. Department of Education 2012).

[17]Whether or not a teacher was a first-year teacher was not known prior to the collection of the SASS teacher data. It was only known 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. Therefore, the overall response rates are based on the 2007–08 SASS public school teachers reported to have 1 to 3 years of experience, not just the first-year teachers included in BTLS.

1 to 3 years of experience; and (3) BTLS unit response rate for that wave. For the fifth wave, the BTLS weighted unit response rate is 78 percent and the overall response rate is 57 percent.

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 BTLS achieved close to an 85 percent base-weighted response rate in most 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 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. 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.[18] Table 3 contains summary statistics of the findings for BTLS wave 1–5 longitudinal with retrospective cases, which are the cases analyzed in this report. The table shows that the estimated bias is smaller after nonresponse adjustment than before nonresponse adjustment. In general, a bias ratio of 10 percent or less has little effect on confidence intervals or tests of significance.

Table 3. Summary of nonresponse bias statistics for BTLS wave 1–5 longitudinal with retrospective cases: 2007–08 through 2011–12

Type of bias statistic	Nonresponse bias statistic
Before nonresponse adjustment	
Mean estimated percent relative bias	-2.39
Median estimated percent relative bias	-0.05
Percent of variable categories significantly biased	5.43
After nonresponse adjustment	
Mean estimated percent relative bias	-1.33
Median estimated percent relative bias	0.00
Percent of variable categories significantly biased	3.62

NOTE: Longitudinal cases are those that responded to all five waves. Longitudinal retrospective cases responded to the first and fifth waves at the time of data collection but provided replies to second-wave items during the third wave, to third-wave items during the fourth wave, or to fourth-wave items during the fifth wave.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Waves Documentation Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

[18] For the formulas to calculate nonresponse bias and relative bias, see *NCES Statistical Standards* (U.S. Department of Education 2012).

Weighting

All estimates were weighted using sample weights to provide unbiased estimates of the national population. For the BTLS first wave, weights are obtained directly from the 2007–08 SASS, since all interviewed beginning teachers in SASS were eligible for BTLS. For the analysis final weights for the BTLS second through fifth waves, and all waves longitudinally, 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. This adjustment ensures that the weighted number of BTLS teachers (including interviews, noninterviews, and out-of-scope cases) will be consistent with the weighted number of teachers from the 2007–08 SASS.

Longitudinal weights were used in this analysis, as they are designed for analyses 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 weights used in the tables and figures in this report are the wave 1–5 retrospective longitudinal weights (variable name W5RLWGT), which include wave 2 data collected during wave 3, wave 3 data collected during wave 4, and wave 4 data collected during wave 5.

Variance Estimation

In surveys with complex sample designs, such as SASS and BTLS, direct estimates of sampling errors that assume a simple random sample will typically underestimate the variability in the estimates. The SASS and BTLS 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 a complex sample design 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. For this report, the Statistical Analysis Software (SAS 9.3) was employed to compute the estimates and standard errors, using the wave 1–5 retrospective longitudinal weights (full sample and 88 replicates) provided on the BTLS data file. Appendix A contains tables of standard errors for the reported estimates.

Statistical Procedures

The tables and graphs in this report contain counts and percentages demonstrating bivariate relationships between variables. All of the results have been weighted to reflect the sample design and to account for nonresponse and other adjustments. Many of the variables examined are related to one another, and complex interactions and relationships have not been explored.

Comparisons of proportions were tested using Student's *t* statistics. Differences between estimates were tested against the probability of a Type I error[19] or significance level. The statistical significance of each comparison was determined by calculating the Student's *t* value for the difference between each pair of proportions and comparing the *t* value with published tables of significance levels for two-tailed hypothesis testing. Student's *t* values were computed to test differences between independent estimates using the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}}$$

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large *t* statistics may appear to merit special attention. This can be misleading because the magnitude of the *t* statistic is related not only to the observed differences in percentages but also to the number of respondents in the specific categories used for comparison. Hence, a small difference compared across a large number of respondents would produce a large (and thus possibly statistically significant) *t* statistic.

A second hazard in reporting statistical tests is the possibility that one can report a "false positive" or Type I error. Statistical tests are designed to limit the risk of this type of error using a value denoted by alpha. The alpha level of .05 was selected for findings in this Brief [20] and ensures that a difference of a certain magnitude or larger would be produced when there was no actual difference between the quantities in the underlying population no more than 1 time out of 20.[21] When analysts test hypotheses that show alpha values at the .05 level or smaller, they reject the null hypothesis that there is no difference between the two quantities. Failing to reject a null hypothesis (i.e., detect a difference), however, does not imply that the values are the same or equivalent.

[19] A Type I error occurs when one concludes that a difference observed in a sample reflects a true difference in the population from which the sample was drawn, when no such difference is present.

[20] One comparison is noted in the report as not significantly different at the $p < .05$ level but significantly different at the $p < .10$ level.

[21] No adjustments were made for multiple comparisons.

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APPENDIX A. STANDARD ERROR TABLES

Table A-1. Standard errors for Table 1: Number and percentage distribution of 2007–08 beginning public school teachers, by their detailed 5-year career paths: 2007–08 through 2011–12

Career path	Number of teachers	Percentage distribution of teachers
All 2007–08 beginning teachers	9,140	†
Detailed 5-year career path		
Taught all years in same school	6,820	2.8
Taught all years in same district but not same public school	3,700	2.1
Taught all years but not in same district	3,730	2.4
Did not teach all years but returned to teaching (taught in 5th year)	1,760	1.2
Did not teach all years and are expected to return	1,940	1.4
Did not teach all years and not expected to return	1,910	1.3
Did not teach all years and return status undetermined	1,510	1.0

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

Table A-2. Standard errors for Table 2: Number and percentage distribution of 2007–08 beginning public school teachers, by their broad and detailed 5-year career paths: 2007–08 through 2011–12

Career path	Number of teachers	Percentage distribution of teachers
All 2007–08 beginning teachers	9,140	†
Broad 5-year career path		
Taught all years	9,470	2.7
Did not teach all years	3,660	2.7
Detailed 5-year career path among those who taught all years		
In same school	6,820	3.1
In same district but not same public school	3,700	2.6
Not in same district	3,730	3.1
Detailed 5-year career path among those who did not teach all years		
Returned to teaching (taught in 5th year)	1,760	3.9
Are expected to return	1,940	4.2
Not expected to return	1,910	4.3
Return status undetermined	1,510	4.0

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

Table A-3. Standard errors for Figure 1: Percentage distribution of 2007–08 beginning public school teachers, by selected teacher characteristics during their first year of teaching: 2007–08 through 2011–12

Characteristic in first teaching year	Percentage distribution of teachers
Age	
Less than 30 years	2.5
30 or more years	2.5
Sex	
Male	2.1
Female	2.1
Race/ethnicity	
White, non-Hispanic	2.4
All other races/ethnicities	2.4
Highest degree	
Less than a bachelor's degree	0.4
Bachelor's degree	1.8
Master's degree	1.8
Higher than a master's degree	0.6
Entered teaching through an alternative certification program	
Yes	2.4
No	2.4
Participated in a teacher induction program	
Yes	1.8
No	1.8
Not available	1.0
Assigned a mentor	
Yes	2.4
No	2.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

Table A-4. Standard errors for Figures 2–6: Percent of 2007–08 beginning public school teachers, by their 5-year career paths and selected teacher characteristics during their first year of teaching: 2007–08 through 2011–12

Characteristic in first teaching year	Taught all years	Among those who taught all years: taught all years in same school	Among those who did not teach all years: returned or are expected to return
Age			
Less than 30 years	2.5	3.8	5.7
30 or more years	5.3	4.8	8.3
Sex			
Male	5.5	6.0	8.1
Female	2.8	3.4	5.0
Race/ethnicity			
White, non-Hispanic	2.8	3.1	5.1
All other races/ethnicities	6.1	10.2	11.9
Highest degree			
Bachelor's degree	2.8	3.7	5.8
Master's degree	4.4	6.2	12.8
Entered teaching through an alternative certification program			
Yes	4.5	6.6	8.8
No	2.9	3.4	5.1
Participated in a teacher induction program			
Yes	3.1	3.6	5.9
No	4.7	7.5	8.5
Assigned a mentor			
Yes	2.5	3.7	5.3
No	6.5	6.0	9.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

Table A-5. Standard errors for Figure 7: Percentage distribution of 2007–08 beginning public school teachers, by selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2011–12

Characteristic	Percentage distribution of teachers
Base salary	
Less than $40,000	2.7
$40,000 or more	2.7
Teaching level	
Primary	2.7
Middle	2.3
High	2.4
Combined	1.3
Not available	0.3
Percent of K–12 students who were approved for free or reduced-price lunches	
Less than 50 percent	2.8
50 percent or more	2.8
School did not participate in free or reduced-price lunch program	0.6
Not available	0.8
Satisfied with school	
Strongly agree	3.5
Somewhat agree	3.2
Somewhat disagree	1.6
Strongly disagree	1.0
Not available	0.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

Table A-6. Standard errors for Figures 8–11: Percent of 2007–08 beginning public school teachers, by their 5-year career paths and selected teacher and school characteristics during their most recent year of teaching: 2007–08 through 2011–12

Characteristic	Taught all years	Among those who taught all years: taught all years in same school	Among those who did not teach all years: returned or are expected to return
Base salary			
Less than $40,000	3.3	3.8	5.4
$40,000 or more	3.3	4.8	9.2
Teaching level			
Primary	4.8	6.5	7.0
Middle	4.8	6.6	12.2
High	3.6	4.8	7.0
Combined	6.9	6.7	10.2
Percent of K–12 students who were approved for free or reduced-price lunches			
Less than 50 percent	3.3	3.9	7.7
50 percent or more	4.2	5.0	7.1
Satisfied with school			
Strongly agree	3.6	4.6	†
Somewhat agree	3.6	5.2	†
Somewhat disagree	7.2	8.8	†
Strongly disagree	12.2	22.4	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Beginning Teacher Longitudinal Study (BTLS), "First Through Fifth Wave Data File," 2007–08, 2008–09, 2009–10, 2010–11, and 2011–12.

APPENDIX B. DESCRIPTION OF VARIABLES USED

This appendix describes the variables used in this report. They include those collected during the base year (2007–08 SASS, referred to as BTLS wave 1) and each subsequent wave of BTLS (waves 2–5). All variables listed in this appendix can be found on the BTLS *First Through Fifth Waves 2007–08 Restricted-use Beginning Teacher Longitudinal Study Data File*.

The variables are described in sections for career paths, characteristics for first year of teaching, and characteristics for most recent year of teaching. The career paths appear in all text tables and figures (study questions 1–3), characteristics for first year of teaching appear in figures 1–6 (study question 2), and characteristics for most recent year of teaching appear in figures 7–11 (study question 3).

CAREER PATHS

As discussed in the introduction, a variety of longitudinal survey items are used to assign career paths. The specific criteria used to define career paths are shown in exhibit 1 of the introduction. The variables used to create the detailed 5-year career path are shown in exhibit B-1.

Exhibit B-1. VARIABLES USED TO CREATE THE DETAILED 5-YEAR CAREER PATH

Career Path 1. Taught all years in same school	W2FCSTS, W3FCSTS, W4FCSTS, W5FCSTS, W2MOVYN, W3MOVYN, W4MOVYN, W3NRSAS, W4NRSAS, W5NRSAS
Career Path 2. Taught all years in same district but not same public school	W2FCSTS, W3FCSTS, W4FCSTS, W5FCSTS, W2MVTYP, W3MVTYP, W4MVTYP, W5MVTYP
Career Path 3. Taught all years but not in same district	W2FCSTS, W3FCSTS, W4FCSTS, W5FCSTS, W2MVTYP, W3MVTYP, W4MVTYP, W5MVTYP, W2FORYN, W3FORYN, W4FORYN, W5FORYN
Career Path 4. Did not teach all years but returned to teaching (taught in 5th year)	W2FCSTS, W3FCSTS, W4FCSTS, W5FCSTS, W5ONLEA, W5ONSAB, W5APPYN, W5LCINV, W4LCINV, W3LCNYN, W2LCNYN, W5LVWHY, W4LVIMP, W3LVIMP, W2LVIMP
Career Path 5. Did not teach all years and are expected to return	W2FCSTS, W3FCSTS, W4FCSTS, W5FCSTS, W5ONLEA, W5ONSAB, W5APPYN, W5LCINV, W4LCINV, W3LCNYN, W2LCNYN, W5LVWHY, W4LVIMP, W3LVIMP, W2LVIMP
Career Path 6. Did not teach all years and not expected to return	W2FCSTS, W3FCSTS, W4FCSTS, W5FCSTS, W3RETYN, W4RETYN, W5RETYN,W2APNOI, W2APNCL, W2APNED, W5OCCST, W5SCOCC, W5LVWHY, W4LVIMP, W3LVIMP, W2LVIMP, W4NRIMP, W3NRIMP, W2NRIMP
Career Path 7. Did not teach all years and return status undetermined	W2FCSTS, W3FCSTS, W4FCSTS, W5FCSTS

CHARACTERISTICS FOR FIRST YEAR OF TEACHING

The variables used to create the teacher and school characteristics for the first year of teaching are shown in exhibit B-2. The specific definitions for the characteristics are listed below.

Age during first year of teaching (W1AGE_T): W1AGE_T is a continuous variable created by subtracting the teacher's reported year of birth (W1T0160) from the year of data collection (2007). Age was coded into categories for this report.

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

Entered teaching through an alternative certification program (W1T0153): The data for this variable were collected on the first-wave questionnaire with the question, "Did you enter teaching through an alternative certification program?" An alternative certification program is designed to expedite the transition of nonteachers to a teaching career; for example, a state, district, or university alternative certification program.

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 for this report.

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

Race/ethnicity (W1RACETH_T): A created variable based on respondents' reported race and ethnicity (W1T0353−W1T0358). The first wave allowed respondents to mark more than one racial category. This variable was recoded into two categories for this report: White, non-Hispanic and all other races/ethnicities.

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

Exhibit B-2. VARIABLES USED TO CREATE TEACHER AND SCHOOL CHARACTERISTICS FOR THE FIRST YEAR OF TEACHING

Age during first year of teaching	W1AGE_T
Assigned a mentor during first year of teaching	W2MNTYN
Entered teaching through an alternative certification program	W1T0153
Highest degree during first year of teaching	W1HIDEGR
Participated in a teacher induction program	W1T0220
Race/ethnicity	W1RACETH_T
Sex	W1T0352

CHARACTERISTICS FOR MOST RECENT YEAR OF TEACHING

The variables used to create the teacher and school characteristics for the most recent year of teaching are shown in exhibit B-3. The specific definitions for the characteristics are listed below.

Base salary (W1T0343, W2TCHSA, W3TCHSA, W4TCHSA, W5TCHSA): The data for these variables were collected on the questionnaire for each wave of the survey. The distribution for this variable was examined in order to determine the categories reported in the tables.

Percent of K–12 students who were approved for free or reduced-price lunches (W1NSLAPP_S, W2TEFRPL, W3TEFRPL, W4TEFRPL, W5TEFRPL): 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 students enrolled (S0047) in schools that participated in the National School Lunch Program (NSLP) (S0215 = 1). W2TEFRPL measures the percentage of students eligible for free or reduced-price lunches and is drawn firstly from data on the 2008−09 Common Core of Data (CCD). If data were missing or a school could not be matched on the 2008−09 CCD, the 2007−08 CCD was used.

Schools that did not participate in the NSLP have valid skip values. S0217, S0047, and S0215 can be found on the SASS Public School Data File. 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 and W5TEFRPL were created in the same way for these schools, but the 2009–10 CCD data were used to create the percentage eligible for NSLP.

In wave 1, data reflect the percentage of students approved for free or reduced-price lunch. In waves 2 through 5, data reflect the percentage of students eligible for free or reduced-price lunch.

In this report, W1NSLAPP_S, W2TEFRPL, W3TEFRP, W4TEFRPL, and W5TEFRPL are recoded as categorical variables describing the proportion of students approved or eligible for free or reduced-price lunches. The distribution for this variable was examined in order to determine the categories reported in the tables.

Satisfied with school (W1T0302; W2SATIS; W3SATIS; W4SATIS, W5SATIS): The data for this variable were collected on the questionnaires for each wave.

Teaching level (W1TLEVEL, W2TLEVEL, W3TLEVEL, W4TLEVEL, W5TLEVEL): These are created variables based on the grades teachers reported teaching during each wave.

Exhibit B-3. VARIABLES USED TO CREATE TEACHER AND SCHOOL CHARACTERISTICS FOR THE MOST RECENT YEAR OF TEACHING

Base salary	W1T0343, W2TCHSA, W3TCHSA, W4TCHSA, W5TCHSA
Percent of K−12 students who were approved for free or reduced-price lunches	W1NSLAPP_S, W2TEFRPL, W3TEFRPL, W4TEFRPL, W5TEFRPL
Satisfied with school	W1T0302, W2SATIS, W3SATIS, W4SATIS, W5SATIS
Teaching level	W1TLEVEL, W2TLEVEL, W3TLEVEL, W4TLEVEL, W5TLEVEL

NOTE: Variables were created by first identifying the teacher's most recent year of teaching using the teaching status variables for the second through fifth waves, W2FCSTS, W3FCSTS, W4FCSTS, and W5FCSTS, and then using the characteristic variable from the appropriate wave.