

# *Appendix 2*

## *Supplemental Notes*





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## Contents

Note 1:	The Current Population Survey (CPS) .....	182
Note 2:	The National Household Education Survey (NHES) .....	186
Note 3:	Educational Attainment, Race-Ethnicity, Urbanicity, and CPI Adjustments .....	189
Note 4:	Information on the Regional Classifications .....	192
Note 5:	Classification of Postsecondary Education Institutions .....	193
Note 6:	The National Assessment of Educational Progress (NAEP) .....	199
Note 7:	The Third International Mathematics and Science Study (TIMSS) .....	207
Note 8:	NAEP, NELS, and HS&B Transcript Studies .....	215
Note 9:	The College Qualification Index .....	217
Note 10:	College Remediation and Degree Completion .....	219
Note 11:	Information on Socioeconomically Disadvantaged Students .....	220
Note 12:	Fields of Study .....	222
Note 13:	Allocation of Faculty Time .....	223
Note 14:	Calculation of Indicators of Public Effort to Fund Education .....	224
Note 15:	Analysis of Variance (ANOVA) .....	225
Note 16:	Net Price of College Attendance .....	227

## Note 1: The Current Population Survey (CPS)

The Bureau of the Census uses the Current Population Survey (CPS) to collect data on the population's social and economic characteristics, including its education and participation in the labor force. Data from the CPS are used in many indicators in this volume. This note provides further detail concerning changes in CPS data collection and the construction of selected variables, both of which affect the interpretation of indicators that appear in *The Condition of Education 2000*.

### CHANGES IN DATA COLLECTION

#### Changes in Survey Questions

##### *Educational attainment*

Data from CPS questions on educational attainment are used in the analyses for *Indicators 5, 22, 23, 32, and 38*. For comparisons of educational attainment over time, it is important to note that the questions in the CPS used to collect data on educational attainment changed in 1992.

From 1972 to 1991, the CPS defined educational attainment as “years of school completed.” Individuals who completed 12 years of school were regarded as high school graduates, and those who completed 16 or more years of school were considered to be college graduates. Two questions provided data on the number of years of school completed: (1) “What is the highest grade . . . ever attended?” and (2) “Did . . . complete it?” An individual's educational attainment was considered his or her last fully completed year of schooling. Thus, individuals who responded that the highest grade they attended but did not complete was the first year of college were regarded as having completed 12 years of school.

Beginning in 1992, the CPS combined these two questions into a single question: “What is the highest level of school . . . completed or the highest degree . . . received?” In the new re-

sponse categories, several of the lower education levels were collapsed into a single summary category such as “1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> grades.” Then, several new categories were added, including “12<sup>th</sup> grade, no diploma”; “H.S. graduate—diploma or equivalent”; and “Some college—no degree.” College degrees were listed by type, allowing for a more accurate description of educational attainment. The new question places more emphasis on credentials received and less on the last grade level attended or completed in college if attendance did not lead to a credential. The new categories are as follows:

- High school
- High school diploma or equivalent (e.g., GED)
- Some college but no degree
- Associate's degree in college, academic program
- Associate's degree in college, occupational or vocational program
- Bachelor's degree (e.g., B.A., A.B., B.S.)
- Master's degree (e.g., M.A., M.S., M.Eng., M.Ed., M.S.W., M.B.A.)
- Professional school degree (e.g., M.D., D.D.S., D.V.M., LL.B., J.D.)
- Doctoral degree (e.g., Ph.D., Ed.D.)

The change in questions complicates comparisons of educational attainment over time. The implications of this change on data comparability are as follows:

##### *High school completion*

It appears that the question change has had two minor effects on measured rates of high school completion. First, the initial question about educational attainment did not address high school equivalency certificates (GEDs).

## Note 1: The Current Population Survey (CPS)

Continued

Therefore, it is possible that an individual who attended 10<sup>th</sup> grade, dropped out without completing that grade, and later took the GED test and received a high school equivalency credential would not have been counted as completing high school. The new question treats these individuals as high school graduates. Since 1988, an additional question in the CPS asks respondents whether they have a GED. People who respond “yes” are classified as high school graduates when constructing the educational attainment variable. Prior to 1988, the vast majority of high school graduates did not fall into this category, and the overall increase was small.

Second, there has been a slight reduction in the number of people who are considered high school graduates. The CPS initially counted individuals who completed 12<sup>th</sup> grade as high school graduates. The revised question added a response category: “12<sup>th</sup> grade, no diploma.” Individuals who select this response are not considered graduates. The number of individuals in this category is small.

### *College completion*

With the increasing prevalence of individuals taking more than 4 years to earn a bachelor’s degree, some researchers are concerned that the college completion rate based on the category “4<sup>th</sup> year or higher of college completed” overstates the number of respondents with a bachelor’s degree (or higher). In fact, however, the college completion rates among those ages 25–29 in 1992 and 1993 were similar to the completion rates for those in 1990 and 1991 despite the changes in questions in 1992. In sum, the change in the question has had little effect on measured college completion rates.

### *Some college*

Based on the new question, an individual who attends college for only a few months would respond “some college,” compared with the

former question to which the response would have been “attended first year of college and did not complete it.” In the past, the calculation of the percentage of the population with 1–3 years of college excluded these individuals. With the new question, these respondents are included in the “some college” category. Thus, the percentage of individuals with “some college” might be larger than the percentage with 1–3 years of college because “some college” includes those who have not completed an entire year of college, whereas “1–3 years of college” does not include these people. Therefore, it would not be accurate to make comparisons between the percentage of those with “some college or an associate’s degree” using the new question and the percentage of those who completed “1–3 years of college” using the old question.

### **Effects of Changes in Educational Attainment Questions on Earnings Data**

*Indicator 23* presents estimates of annual median earnings for wage and salary workers with different levels of educational attainment. The discussion above suggests that the “high school graduate with no further education” category based on the new item is larger than before because it includes all those with an equivalency certificate; however, the category is actually smaller because it excludes those who completed “12<sup>th</sup> grade, no diploma” and those with only a few months of college. The latter group is now included in the “1–3 years of college” category.

Nevertheless, the employment and earnings of the respondents who were added and dropped from each category are similar; therefore, the net effect of the misclassification on employment rates and average annual earnings is likely to be minor. Thus, it is still useful to compare the employment rates and median annual earnings of recent cohorts with “some college or

## Note 1: The Current Population Survey (CPS)

### Continued

an associate degree” with older cohorts who completed “1–3 years of college.”

For further information on this issue, see Kominski and Siegel (1993).

#### *Preprimary enrollment*

*Indicator 1* presents data on preprimary enrollment rates of children ages 3–5. In 1990, the wording differed from other years for a question pertaining to the school enrollment status of children ages 3–14. Before 1990 and after 1990, the question asked if children were enrolled in nursery, kindergarten, elementary, or secondary school. In 1990, the question was expanded to include preschool and prekindergarten, as well as nursery school, kindergarten, and elementary or secondary school. Due to this change, preprimary education enrollment figures for 3- to 5-year-olds in 1990 are not comparable with those for other years.

#### **Changes in Data Collection Procedures**

Over the years, data collection methods for the CPS have changed. These changes may affect the ability to compare data before and after the changes. The following discussion presents information on several changes in data collection procedures that may affect data presented in indicators in this volume.

The method in which a survey is administered can affect responses. The Bureau began using Computer-Aided Personal (and Telephone) Interviews (CAPI and CATI) to administer the CPS in 1994. For earlier surveys, interviewers used printed questionnaires. Although the Bureau performed substantial testing to minimize or predict these effects, not all questions were tested. Therefore, some statistics may be affected by the change in survey procedures.

#### **Changes in Weighting of Estimates**

In 1994, the Bureau calculated sample weights used to weight survey estimates for inferences about the general population using information from both the 1980 and the 1990 Decennial Censuses, and included adjustments for undercounted populations. These adjustments resulted in an increase in the weights assigned to any age, sex, or racial-ethnic group that was underrepresented in the 1990 Census. Adjustments for undercounted groups were not made for data collected prior to 1994.

#### **CONSTRUCTION OF SELECTED VARIABLES**

##### *Parental education, by race-ethnicity*

Data on parents’ highest level of education by race-ethnicity are presented in *Indicators 5* and *32*. Parents’ highest level of education was obtained by merging the information from parents’ records with the children’s records. Estimates of mother’s and father’s highest level of education were calculated only for children who lived with their parents at the time of the survey. For example, the estimates of mother’s highest level of education were calculated based on children who lived with “both parents” or with “mother only.” For children who lived with “father only,” the mother’s educational level was unknown; therefore, the “unknown” group was excluded in the calculation of this variable.

##### *Family income*

The October CPS includes a family income variable, which was used in *Indicators 32* and *45* to measure a student’s economic standing. Low income is the bottom 20 percent of all family incomes, high income is the top 20 percent of all family incomes, and middle income is the 60 percent in between. The table below

## Note 1: The Current Population Survey (CPS)

Continued

shows the real dollar amount (rounded to the nearest \$100) of the breakpoints between low and middle income and between middle and high income. For example, low income in 1998 was defined as the range between \$0 and

\$13,900, middle income was defined as the range between \$13,901 and \$65,000, and high income was defined as \$65,001 and over. Therefore, the breakpoints between low and middle income and between middle and high income are \$13,900 and \$65,000, respectively.

**Dollar value (in current 1999 dollars) at the breakpoint between low and middle and between middle and high income categories of family income: October 1970–98**

October	Breakpoints between:	
	Low and middle	Middle and high
1970	\$3,300	\$11,900
1971	—	—
1972	3,500	13,600
1973	3,900	14,800
1974	—	—
1975	4,300	17,000
1976	4,600	18,300
1977	4,900	20,000
1978	5,300	21,600
1979	5,800	23,700
1980	6,000	25,300
1981	6,500	27,100
1982	7,100	31,300
1983	7,300	32,400
1984	7,400	34,200
1985	7,800	36,400
1986	8,400	38,200
1987	8,800	39,700
1988	9,300	42,100
1989	9,500	44,000
1990	9,600	46,300
1991	10,500	48,400
1992	10,700	49,700
1993	10,800	50,700
1994	11,800	55,500
1995	11,700	56,200
1996	12,300	58,200
1997	12,800	60,800
1998	13,900	65,000

— Not available.

NOTE: Amounts are rounded to the nearest \$100.

## Note 2: The National Household Education Survey (NHES)

The National Household Education Survey (NHES), conducted in 1991, 1993, 1995, 1996, and 1999, collects data on education issues that cannot be addressed by collecting data on a school level. Data from NHES are used in several indicators that appear in this volume, covering such issues as enrollment in preprimary education, parents' involvement in their children's school activities, school choice, and participation in adult learning. This note provides further details on NHES data and how they are used in indicators that appear in the volume.

### INTERVIEWING PROCEDURES

NHES collects data on children primarily by interviewing parents or guardians of children, and only infrequently by interviewing the children themselves. When a child is sampled to participate in NHES, the parent or guardian who has the most knowledge about the child's care and education is selected as the respondent.

Although NHES is conducted primarily in English, provisions are made to interview persons who speak only Spanish. Questionnaires are translated into Spanish, and bilingual interviewers who are trained to complete the interview in either English or Spanish are employed.

- *Indicator 6* presents data collected from parents for their children who primarily speak English or Spanish at home.

### AGE OF THE CHILD

*Indicator 2* presents enrollment rates in preprimary education programs for 3-, 4-, and 5-year-olds by the child's age. NHES reports the "age of the child" for 1991 data as the age that child was on December 31, 1990; December 31, 1992 for 1993 data; December 31, 1994 for 1995 data; December 31, 1995 for 1996 data; and December 31, 1998 for 1999 data.

### PARENTS' HIGHEST LEVEL OF EDUCATION

Parents' highest level of education is defined as the highest level of education of the child's parents or nonparent guardians who reside in the household. It is based on the higher of the educational levels of the mother or female guardian or the father or male guardian. If only one parent resided in the household, that parent's highest level of education was used. *Indicators 2, 4, 46, 58, and 59* present data by parents' highest level of education.

### PREPRIMARY ENROLLMENT RATES

Preprimary enrollment rates are calculated for *Indicator 2* by dividing the number of 3-, 4-, and 5-year-olds who (according to NHES data) were enrolled in center-based programs or kindergarten (as of December 31 of the year preceding the survey) by the total number of children ages 3, 4, and 5 in the United States as of the same date, according to the Bureau of the Census. Children who were enrolled in first grade or higher or who were in the "ungraded" category were excluded from the calculation of enrollment rates.

In 1999, NHES allowed respondents to indicate whether a child was enrolled only in a center-based program, only in kindergarten, or dually enrolled in both a center-based program and kindergarten. However, respondents were allowed to indicate that a child was dually enrolled only if the respondent first indicated that the child was enrolled in kindergarten in a series of enrollment questions. If a respondent first stated that a child was enrolled in a center-based program, the respondent was not allowed to indicate that the child was also enrolled in kindergarten. Due to this limitation in response options, dual enrollment may be somewhat underestimated. In table 2-2, the estimates of enrollment in center-based programs or kindergarten are not affected by this consideration.



## Note 2: The National Household Education Survey (NHES)

Continued

- *Indicator 2* presents data on preprimary enrollment rates including dual enrollment for 1999. The indicator does not present data on dual enrollment for the earlier years.

### RACE-ETHNICITY

NHES data on “race” and “Hispanic” status are combined to create a composite variable for race-ethnicity. If a child is Hispanic, he or she is classified by this ethnicity, regardless of whether his or her race is classified as white, black, or other. *Indicators 2, 6, 46, 58, 59, and 60* present data by children’s race-ethnicity.

### POVERTY MEASURE

NHES data on household income and the number of people living in the household, combined with information from the Bureau of the Census on income and household size, are used to classify children as “poor” or “nonpoor.”

Children in families whose incomes are at or below the poverty threshold are classified as “poor”; children in families with incomes above the poverty threshold are classified as “nonpoor.” The thresholds used to determine whether a child is “poor” or “nonpoor” differ for each survey year. The weighted average poverty thresholds for various household sizes for 1991, 1993, 1995, 1996, and 1999 are shown in the following table.

It is not possible to determine whether respondents’ families are above or below the poverty threshold for 1991 or 1993 with the same accuracy as for 1995, 1996, and 1999. In the earlier years, respondents were asked to indicate where their incomes fell within broad categories. In later years, respondents were asked to provide more precise estimates of household income. *Indicators 2 and 58* present data by children’s poverty status.



## Note 2: The National Household Education Survey (NHES)

Continued

### Weighted average poverty thresholds, by household size: 1991, 1993, 1995, 1996, and 1999

Household size	Poverty threshold	Household size	Poverty threshold
<b>NHES:91</b>		<b>NHES:96</b>	
2	\$8,865	2	10,233
3	10,860	3	12,516
4	13,924	4	16,036
5	16,456	5	18,952
6	18,587	6	21,389
7	21,058	7	24,268
8	23,582	8	27,091
9 or more	27,942	9 or more	31,971
<b>NHES:93</b>		<b>NHES:99</b>	
2	9,414	2	10,636
3	11,522	3	13,001
4	14,763	4	16,655
5	17,449	5	19,682
6	19,718	6	22,227
7	22,383	7	25,188
8	24,838	8	28,023
9 or more	29,529	9 or more	33,073
<b>NHES:95</b>			
2	9,933		
3	12,158		
4	15,569		
5	18,408		
6	20,804		
7	23,552		
8	26,267		
9 or more	31,280		

SOURCE: U.S. Department of Education, NCES. National Household Education Survey (NHES), 1991, 1993, 1995, 1996, and 1999.

## Note 3: Educational Attainment, Race-Ethnicity, Urbanicity, and CPI Adjustments

Variables come from different sources and time periods, so the definitions used to collect the information vary from survey to survey. Some figures must be adjusted to account for changes over time. This supplemental note describes how several variables used in some indicators in this volume were measured in each of the surveys that collected that information. The note also describes how monetary figures were adjusted to reflect comparable information from different years.

### EDUCATIONAL ATTAINMENT

For surveys that NCES sponsors, the categories of educational attainment are reported here as follows:

- National Household Education Survey: *Less than high school diploma, High school diploma or GED, Some college/vocational/technical, Bachelor's degree/College graduate, and Graduate or Professional degree.*
- Early Childhood Longitudinal Survey: *Less than high school; High school diploma or equivalent; Some college, including vocational/technical; and Bachelor's degree or higher.*
- National Education Longitudinal Survey of 1988 Eighth Graders: *Less than high school, High school diploma, GED, Some postsecondary education, and Bachelor's degree or higher.*
- High School and Beyond survey: *Less than high school graduate, High school, Certificate, Associate's, Bachelor's, Master's, Professional, and Doctorate.*

Within individual indicators, these categories may be collapsed to facilitate analysis. In *The Condition of Education 2000*, the previous definitions apply to *Indicators 2, 6, 10, 11, 12, 26, 33, 34, 46, 58, 59, and 60.*

### RACE-ETHNICITY

Classifications indicating racial-ethnic heritage are based on self-identification, as in data collected by the Bureau of the Census, or on observer identification, as in data collected by the Office for Civil Rights. These categories are in accordance with the Office of Management and Budget's standard classification scheme:

*American Indian/Alaskan Native:* A person having origins in any of the original peoples of North America and maintaining cultural identification through tribal affiliation or community recognition.

*Asians/Pacific Islanders:* A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes, for example, China, India, Japan, Korea, the Philippines, and Samoa. Please note that the essay on kindergartners and *Indicators 11, 12, and 26* include Asian children, but not those classified as Pacific Islanders (i.e., Polynesian, Hawaiian, Samoan, Tongan, other Polynesian, Micronesian, Guamanian, other Micronesian and Pacific Islander, not specified).

*Black:* A person having origins in any of the black racial groups in Africa. In this report, normally excludes persons of Hispanic origin. Those measures that do not exclude persons of Hispanic origin are noted accordingly.

*Hispanic:* A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

*White:* A person having origins in any of the original peoples of Europe, North Africa, or the Middle East. In this report, normally excludes persons of Hispanic origin. Those measures that do not exclude persons of Hispanic origin are noted accordingly.

## Note 3: Educational Attainment, Race-Ethnicity, Urbanicity, and CPI Adjustments

### Continued

*Other:* Any person that is not included in the above categories (White, Black, Hispanic, Asians/Pacific Islanders, and American Indian/Alaskan Native).

Not all categories are shown in all indicators because of insufficient data in some of the smaller categories.

### URBANICITY

1. In the Census Bureau's Current Population Survey, metropolitan status is based on the concept of a metropolitan area (MA), a large population nucleus together with adjacent communities that have a high degree of economic and social integration with that nucleus.

MAs are designated and defined by the Office of Management and Budget, following standards established by the inter-agency Federal Executive Committee on Metropolitan Areas, with the aim of producing definitions that are as consistent as possible for all MAs nationwide.

Each MA must contain either a place with a minimum population of 50,000 or an urbanized area, as defined by the Bureau of the Census, and a total MA population of at least 100,000 (75,000 in New England). An MA is comprised of one or more central counties, and an MA can also include one or more outlying counties that have closed economic and social relationships with the central county. An outlying county must have a specified level of commuting to the central counties and also must meet certain standards regarding metropolitan character, such as population density, urban population, and population growth. In New England, MAs are composed of cities and towns rather than whole counties. The following terms char-

acterize MAs:

*Metropolitan:* the territory, population, and housing units in MAs.

*Inside a central city:* a subdivision of a metropolitan area, which includes only the area inside of the central city.

*Outside a central city:* a subdivision of a metropolitan area, which includes only the area outside of the central city.

*Nonmetropolitan:* the territory, population, and housing units located outside MAs.

2. In the National Household Education Survey, urbanicity is based on the Census classification for the highest percentage of households in the respondent's residential ZIP Code. Urbanicity is designated by the following terms:

*Urbanized area:* a place and the adjacent densely settled surrounding territory that combined have a minimum population of 50,000.

*Urban, outside of urbanized areas:* incorporated or unincorporated places outside of urbanized areas that have a minimum population of 25,000, with the exception of rural portions of extended cities.

*Rural:* all areas are not classified as urban.

3. In the Fast Response Survey System, urbanicity is defined in accordance with Census standards:

*City:* a central city of a Metropolitan Statistical Area (MSA).

*Urban fringe:* a place within an MSA of a central city but not primarily its central city.

*Town:* a place not within an MSA, but with

## Note 3: Educational Attainment, Race-Ethnicity, Urbanicity, and CPI Adjustments

Continued

a population greater than or equal to 2,500 and defined as urban by Census.

*Rural*: a place with a population less than 2,500 and defined as rural by the Census.

4. In CCD, urbanicity is based on Metropolitan Status Codes. This is the classification of an education agency's service area relative to an MSA. Every education agency is placed in one of the following categories:
  - A. Primarily serves a central city of an MSA
  - B. Serves an MSA but not primarily its central city
  - C. Does not serve an MSA

In *The Condition of Education 2000*, these definitions apply to *Indicators 28, 49, 60, and 61*.

### USING THE CONSUMER PRICE INDEX (CPI) TO ADJUST FOR INFLATION

The Consumer Price Indexes represent changes in the prices of all goods and services purchased for consumption by urban households. Indexes vary for specific areas or regions, periods of time, major groups of consumer expenditures, and population groups. The indicators throughout the *Condition* use the "U.S. All Items CPI for All Urban Consumers, CPI-U."

The CPI-U is the basis for both the calendar year CPI and the school year CPI. The calendar year CPI is the same as the annual CPI-U.

The school year CPI is calculated by adding the monthly CPI-U figures, beginning with July of the first year and ending with June of the following year, and then dividing that figure by 12. The school year CPI is rounded off at three decimal places. Data for the CPI-U are available on the Bureau of Labor Statistics Web site (given below). Also, figures for both the calendar year CPI and the school year CPI can be obtained from the *Digest of Education Statistics 1999* (NCES 1999-036), an NCES annual publication.

Although the CPI has many uses, its principal function in the *Condition* is to convert monetary figures (salaries, expenditures, income etc.) into inflation-free dollars to allow comparisons over time. For example, due to inflation, the buying power of a teacher's salary in 1995 is not comparable to that of a teacher in 1999. In order to make such a comparison, his or her 1995 salary must be converted into 1999 constant dollars using the following formula: the 1995 salary is multiplied by a ratio of the 1999 CPI over the 1995 CPI.

$$1995 \text{ salary} * \frac{(1999 \text{ CPI})}{(1995 \text{ CPI})} = 1995 \text{ salary in } 1999 \text{ constant dollars}$$

For more detailed information on how the CPI is calculated or the other types of CPI indexes, go to the Bureau of Labor Statistics web site at <http://www.bls.gov/cpihome.htm>.

In *The Condition of Education 2000*, this description of the CPI applies directly to the following *Indicators: 23, 55, 62, and 64*.

## Note 4: Information on the Regional Classifications

### CLASSIFICATION 1

Indicator 49 uses the following regional classifications:

Northeast	Southeast
Connecticut	Alabama
Delaware	Arkansas
District of Columbia	Florida
Maine	Georgia
Maryland	Kentucky
Massachusetts	Louisiana
New Hampshire	Mississippi
New Jersey	North Carolina
New York	South Carolina
Pennsylvania	Tennessee
Rhode Island	Virginia
Vermont	West Virginia
Central	West
Illinois	Alaska
Indiana	Arizona
Iowa	California
Kansas	Colorado
Michigan	Hawaii
Minnesota	Idaho
Missouri	Montana
Nebraska	Nevada
North Dakota	New Mexico
Ohio	Oklahoma
South Dakota	Oregon
Wisconsin	Texas
	Utah
	Washington
	Wyoming

### CLASSIFICATION 2

Data from the Bureau of the Census, including the Current Population Survey, the Common Core Data, and Indicators 3, 4, 47 and 63 used the following regional classifications:

Northeast	South
Connecticut	Alabama
Maine	Arkansas
Massachusetts	Delaware
New Hampshire	District of Columbia
New Jersey	Florida
New York	Georgia
Pennsylvania	Kentucky
Rhode Island	Louisiana
Vermont	Maryland
	Mississippi
	North Carolina
	Oklahoma
	South Carolina
	Tennessee
	Texas
	Virginia
	West Virginia
Midwest	West
Illinois	Alaska
Indiana	Arizona
Iowa	California
Kansas	Colorado
Michigan	Hawaii
Minnesota	Idaho
Missouri	Montana
Nebraska	Nevada
North Dakota	New Mexico
Ohio	Oregon
South Dakota	Utah
Wisconsin	Washington
	Wyoming

## Note 5: Classification of Postsecondary Education Institutions

The U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) employs various categories to group postsecondary institutions. These categories are different in some ways from those that have been used in IPEDS in previous years and in the Higher Education General Information Survey (HEGIS), which preceded IPEDS. In order to allow historical comparisons and proper interpretations of the data presented in some of the indicators in this volume, this supplemental note describes the different classification systems used.

### BASIC IPEDS CLASSIFICATIONS

The term postsecondary institutions is the most general category used to refer to institutions with formal instructional programs and a curriculum designed primarily for students who have completed the requirements for a high school diploma or its equivalent. For many analyses, however, comparing all institutions from across this broad universe of postsecondary education institutions would not be appropriate. In IPEDS the universe of postsecondary institutions is divided into three main categories on the basis of highest degree awarded by the institution or the length of the program:

- (1) Four-year degree-granting institutions confer recognized degrees that require four or more years to complete.
- (2) Two-year degree-granting institutions confer recognized degrees that require at least two but less than 4 years to complete.
- (3) Less than 2-year non-degree-granting institutions confer terminal occupational certificates or an award that is creditable toward a formal degree at the 2-year or higher level.

Each of these three categories is further subdivided by type of financial control: public, pri-

vate not-for-profit, and private for-profit (e.g., proprietary schools). Consequently, IPEDS divides the entire universe of postsecondary institutions into 9 different "sectors." Each of the 3 categories of degree-granting institutions contains public institutions, not-for-profit institutions, and for-profit institutions. In some sectors (for example, 4-year, for-profit, degree-granting institutions) the number of institutions is small relative to other sectors. Beginning in 1996-97, the IPEDS universe of institutions was further divided according to their participation in the Title IV-C student aid programs of the Higher Education Act administered by the U.S. Department of Education. In order to qualify for Title IV-C programs institutions must meet certain eligibility criteria and reach a participation agreement with the U.S. Department of Education.

All indicators in this volume concerning postsecondary education institutions include the first two categories of 4-year and 2-year degree-granting institutions. Within these two groups, the particular numbers and types of institutions included in an indicator can vary depending on which years of IPEDS data were used and what classification of 2- and 4-year degree-granting institutions is employed. Prior to 1996-97, institutions were distinguished in IPEDS according to their accreditation by an agency or association recognized by the Secretary of the U.S. Department of Education. This subset of institutions was called the "institutions of higher education." The Title IV-C group of 2- and 4-year degree-granting postsecondary institutions differs from the institutions of higher education group mainly in that the institutions of higher education group included fewer 2-year for-profit colleges and more 4-year, degree-granting, private not-for-profit institutions. The institutions of higher education group also included a few 4-year non-degree granting institutions and some less-than-2-year institutions that were added over

## Note 5: Classification of Postsecondary Education Institutions

### Continued

time after the beginning of IPEDS in 1986-87. The 2- and 4-year degree-granting public and not-for-profit postsecondary institutions forming the core of these institutions of higher education originated as the universe of institutions on which HEGIS was based. The institutions of higher education group differs from the Title IV-C group of 2-year and 4-year degree-granting institutions by about 1 percent in total enrollments in years where the two classifications overlap.<sup>1</sup>

- Indicator 7 relies on the institutions of higher education group of institutions for all years.
- Indicator 55 relies on the Title IV-C group of institutions for its 1997-98 data. Subdivisions of this data set include only private, nonprofit institutions under the label “private.” For its 1972-73, 1980-81, and 1996-97 data, the indicator relies on the institutions of higher education group restricted to 2-year and 4-year degree-

granting institutions. Subdivisions of these data sets include private, non-profit and private for-profit institutions.

### CARNEGIE CLASSIFICATION

Another grouping of 2- and 4-year degree-granting institutions used is the Carnegie Classification system. The Carnegie Classification groups American colleges and universities by their purpose and size. First developed in 1970 by the Carnegie Commission on Higher Education, the classification system does not establish a hierarchy among institutions of higher education; instead it groups colleges and universities with similar programs and purposes to facilitate meaningful comparisons and analysis. The Carnegie Classification system has been revised three times—in 1976, 1987, and 1994—since it was created. The current system divides institutions of higher education into 10 categories, with the tenth category—Professional and Specialized Institutions—subdivided into 10 subcategories.

#### Category name(s) and version(s) in which used

##### Research Universities I: 1987, 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

“These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They receive annually at least \$33.5 million in federal support<sup>3</sup> and award at least 50 Ph.D. degrees each year.”<sup>4</sup>

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

“These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees<sup>6</sup> each year. In addition, they receive annually \$40 million or more in federal support.”<sup>7</sup>

##### Research Universities II: 1987, 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

“These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They receive annually between \$12.5 million and \$33.5 million in federal support<sup>3</sup> for research and development and award at least 50 Ph.D. degrees each year.”<sup>4</sup>

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

“These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees<sup>6</sup> each year. In addition, they receive annually between \$15.5 million and \$40 million in federal support.”<sup>7</sup>



## Note 5: Classification of Postsecondary Education Institutions

Continued

The following indicators rely on the Carnegie Classification system. To the right of each is the version of the Carnegie system employed in that indicator to encode the data.

- *Indicator 8* 1994
- *Indicator 52* 1987
- *Indicator 56* 1987
- *Indicator 57* 1987
- *Indicator 65* 1994

Unless specified otherwise, type I and type II institutions have been combined in these indi-

cators. *Indicator 52* also combines Research Universities I and II and Doctorate-granting institutions I and II under the label “4-year doctoral,” and comprehensive universities and Colleges I and II and Liberal Arts Colleges I and II under the label “4-year nondoctoral.”

The information used to classify institutions into the Carnegie categories comes from survey data. The 1994 version of Carnegie Classifications relied on data from IPEDS, the National Science Foundation, The College Board, and the 1994 Higher Education Directory published by Higher Education Publications, Inc. (HEP).

### Category name(s) and version(s) in which used—Continued

#### Doctorate-Granting Universities I: 1987; Doctoral Universities I: 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

“In addition to offering a full range of baccalaureate programs, the mission of these institutions includes a commitment to graduate education through the doctorate degree. They award at least 40 Ph.D. degrees annually in five or more disciplines.”<sup>4</sup>

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

“In addition to offering a full range of baccalaureate programs, the mission of these institutions includes a commitment to graduate education through the doctorate. They award at least 40 doctoral degrees annually in five or more disciplines.”<sup>4</sup>

#### Doctorate-Granting Universities II: 1987; Doctoral Universities II: 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

“In addition to offering a full range of baccalaureate programs, the mission of these institutions includes a commitment to graduate education through the doctorate degree. They award annually at least 20 Ph.D. degrees in at least one discipline or 10 or more Ph.D. degrees in three or more disciplines.”<sup>4</sup>

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

“In addition to offering a full range of baccalaureate programs, the mission of these institutions includes a commitment to graduate education through the doctorate. They award annually at least 10 doctoral degrees—in three or more disciplines—or 20 or more doctoral degrees in one or more disciplines.”<sup>4</sup>

#### Comprehensive Universities and Colleges I: 1987; Master’s (Comprehensive) Universities and Colleges I: 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

“These institutions offer a full range of baccalaureate programs and, with few exceptions, graduate education through the master’s degree. More than half of their baccalaureate degrees are awarded in two or more occupational or professional disciplines such as engineering or business administration. All of the institutions in this group enroll at least 2,500 students.”<sup>8</sup>

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

“These institutions offer a full range of baccalaureate programs and are committed to graduate education through the master’s degree. They award 40 or more master’s degrees annually in three or more disciplines.”

## Note 5: Classification of Postsecondary Education Institutions

Continued

### Category name(s) and version(s) in which used—Continued

#### Comprehensive Universities and Colleges II: 1987; Master's (Comprehensive) Universities and Colleges II: 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

"These institutions award more than half of their baccalaureate degrees in two or more occupational or professional disciplines, such as engineering or business administration, and many also offer graduate education through the master's degree. All of the colleges and universities in this group enroll between 1,500 and 2,500 students."<sup>8</sup>

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

"These institutions offer a full range of baccalaureate programs and are committed to graduate education through the master's degree. They award 20 or more master's degrees annually in one or more disciplines."

#### Liberal Arts Colleges I: 1987; Baccalaureate Colleges I: 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

"These highly selective institutions<sup>9</sup> are primarily undergraduate colleges that award more than half of their baccalaureate degrees in arts and science fields."

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

"These institutions are primarily undergraduate colleges with major emphasis on baccalaureate degree programs. They award 40 percent or more of their baccalaureate degrees in liberal arts fields and are restrictive in admissions."

#### Liberal Arts Colleges II: 1987; Baccalaureate Colleges II: 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

"These institutions are primarily undergraduate colleges that are less selective and award more than half of their degrees in liberal arts fields. This category also includes a group of colleges that award *less* than half of their degrees in liberal arts but, with fewer than 1,500 students, are too small to be considered comprehensive."

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

"These institutions are primarily undergraduate colleges with major emphasis on baccalaureate degree programs. They award less than 40 percent of their baccalaureate degrees in liberal arts fields or are less restrictive in admissions."

## Note 5: Classification of Postsecondary Education Institutions

Continued

### Category name(s) and version(s) in which used—Continued

#### Two-Year Community, Junior and Technical Colleges:1987; Associate of Arts Colleges: 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

"These institutions offer certificate of degree programs through the Associate of Arts level and, with few exceptions, offer no baccalaureate degrees."

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

"These institutions offer associate of arts certificate or degree programs and, with few exceptions, offer no baccalaureate degrees."

#### Professional Schools and Specialized Institutions: 1987, and specialized institutions: 1994

1987 Definition:<sup>2</sup> *Applied to 3,389 institutions*

"These institutions offer degrees ranging from the bachelor's to the doctorate. At least 50 percent of the degrees awarded by these institutions are in a single specialized field." They are divided into the following subcategories:

- Theological seminaries, Bible colleges, and other institutions offering degrees in religion;
- Medical schools and medical centers;
- Other separate health professional schools;
- Schools of engineering and technology;
- Schools of business and management;
- Teachers colleges;
- Other specialized institutions; and
- Corporate-sponsored institutions.

1994 Definition:<sup>5</sup> *Applied to 3,595 institutions*

"These institutions offer degrees ranging from the bachelor's to the doctorate. At least 50 percent of the degrees awarded by these institutions are in a single discipline." They are divided into the following subcategories:

- Theological seminaries, Bible colleges, and other institutions offering degrees in religion;
- Medical schools and medical centers;
- Other separate health professional schools;
- Schools of engineering and technology;
- Schools of business and management;
- Teachers colleges;
- Other specialized institutions; and
- Tribal colleges.

## Note 5: Classification of Postsecondary Education Institutions

### Continued

#### NOTES

<sup>1</sup> In 1996-97 there were about 4,000 Title IV-C eligible, 2-year and 4-year degree granting institutions in the IPEDS universe compared to about 3,500 institutions in the former HEGIS, or institutions of higher education, universe in the same year. In 1996-97 the total IPEDS universe also included about 500 non-Title IV-C eligible, degree-granting institutions, and 5,400 non-degree granting institutions.

<sup>2</sup> Carnegie Foundation for the Advancement of Teaching (1987).

<sup>3</sup> The years used in calculating average federal support were 1983, 1984, and 1985.

<sup>4</sup> The academic year for determining the number of degrees awarded by institutions was 1983-84.

<sup>5</sup> Carnegie Foundation for the Advancement of Teaching (1994).

<sup>6</sup> Doctoral degrees include Doctor of Education, Doctor of Juridical Science, Doctor of Public Health, and the Ph.D. in any field.

<sup>7</sup> Total federal obligation figures are available from the National Science Foundation's annual report, *Federal Support to Universities, Colleges, and Nonprofit Institutions*. The years used in averaging total federal obligations are 1989, 1990, and 1991.

<sup>8</sup> The years used for calculating average student enrollment were 1982, 1983, and 1984.

<sup>9</sup> The Astin index is used to determine the selectivity of liberal arts colleges. This index developed by Alexander W. Astin (at the University of California at Los Angeles) was based on average SAT scores (verbal and mathematics) of freshmen entering each institution, as reported to several institutional directories in the early 1970s.

## Note 6: The National Assessment of Educational Progress (NAEP)

The National Assessment of Educational Progress (NAEP), administered regularly in a number of subjects since 1969, has two major goals: (1) to assess student performance reflecting current educational and assessment practices; and (2) to measure change in student performance reliably over time. To address these goals, the NAEP includes a main assessment and a long-term trend assessment. The assessments are administered to separate samples of students at separate times, use separate instrumentation, and measure different educational content. Consequently, results from the assessments should not be compared. Data presented in *The Condition of Education 2000* are from both assessments.

### MAIN NAEP

*Indicators 13, 14, 15, and 20* are based on the main NAEP. It periodically assesses students' performance in several subjects, following the curriculum frameworks developed by the National Assessment Governing Board (NAGB) and using the latest advances in assessment methodology. NAGB develops the frameworks using curriculum standards developed within the field, such as the mathematics standards developed by the National Council of Teachers of Mathematics.

The content and nature of the main NAEP evolves to match instructional practices, so the ability to measure change reliably over time is limited. As standards for instruction and curriculum change, so does the main NAEP. As a result, data from different assessments are not

always comparable. Recent NAEP main assessment instruments have typically been kept stable for short periods of time, allowing trend results to be reported for, at most, three time points. For some subjects that are not assessed frequently, such as civics and art, no trend data are available.

NAEP results are reported in terms of predetermined achievement levels because each assessment reflects current standards of performance in each subject. The achievement levels define what students who are performing at Basic, Proficient, and Advanced levels of achievement should know and be able to do. NAGB establishes achievement levels whenever a new main NAEP framework is adopted. It should be noted that, while the achievement levels were adopted after NAGB's careful deliberation, the NAEP legislation requires that these levels be "used on a developmental basis until the Commissioner of Education Statistics determines. . .that such levels are reasonable, valid, and informative to the public," and that the Commissioner and the Board make clear the developmental status of such levels in all NAEP reports. Upon review of the available information, the Commissioner of Education Statistics has judged that the achievement levels are still in a developmental status; that is, they currently have certain limitations that require caution about their use.

The tables that follow summarize and describe, for each grade level, the achievement levels for reading, mathematics, writing, and civics.

## Note 6: The National Assessment of Educational Progress (NAEP)

Continued

Table 1 Achievement levels for reading: Main NAEP	
<b>Grade 4</b>	
<b>Basic</b>	Demonstrate an understanding of the overall meaning of what is read. Make relatively obvious connections between the text and personal experiences and extend ideas in text by making simple inferences.
<b>Proficient</b>	Demonstrate an overall understanding of the text, providing inferential as well as literal information. Extend ideas in text by making clear inferences, drawing conclusions, and making connections to own experiences.
<b>Advanced</b>	Generalize about topics in the reading selection and demonstrate an awareness of how authors compose and use literary devices. Judge text critically and, in general, give thorough answers that indicate careful thought.
<b>Grade 8</b>	
<b>Basic</b>	Demonstrate a literal understanding of what is read and make some interpretations. Identify specific aspects of text that reflect overall meaning, extend ideas in text by making simple inferences, recognize and relate interpretations and connections among ideas in text to personal experience, and draw conclusions based on the text.
<b>Proficient</b>	Show an overall understanding of the text, including inferential as well as literal information. Extend ideas in text by making clear inferences from it, drawing conclusions, and making connections to own experience, including other reading experiences. Identify some of the devices authors use in composing text.
<b>Advanced</b>	Describe the more abstract themes and ideas of overall text. Analyze both meaning and form and support analyses explicitly with examples from the text; extend text information by relating it to experiences and world events. Responses are thorough, thoughtful, and extensive.
<b>Grade 12</b>	
<b>Basic</b>	Demonstrate an overall understanding and make some interpretations of the text. Identify and relate aspects of text to its overall meaning, extend ideas in text by making simple inferences, recognize interpretations, make connections among and relate ideas in text to personal experiences, and draw conclusions. Identify elements of an author's style.
<b>Proficient</b>	Show an overall understanding of text including inferential as well as literal information. Extend ideas of text by making clear inferences, even when implicit, drawing conclusions, and making connections to personal experiences and other readings. Analyze author's use of literary devices.
<b>Advanced</b>	Describe more abstract themes and ideas in overall text. Analyze both meaning and form of text and explicitly support analyses with specific examples from text. Extend information from text by relating it to experiences and the world. Responses are thorough, thoughtful, and extensive.

## Note 6: The National Assessment of Educational Progress (NAEP)

Continued

**Table 2** Achievement levels for mathematics: Main NAEP

<b>Grade 4</b>	
<b>Basic</b>	Estimate and use basic facts to perform simple computations with whole numbers; show some understanding of fractions and decimals; and solve some simple real-world problems. Use four-function calculators, rulers, and geometric shapes. Written responses are often minimal and presented without supporting information.
<b>Proficient</b>	Use whole numbers to estimate, compute, and determine whether results are reasonable. Solve real-world problems and use four-function calculators, rulers, and geometric shapes appropriately. Employ problem-solving strategies such as identifying and using appropriate information. Written solutions should be organized and presented both with supporting information and explanations of how they were achieved.
<b>Advanced</b>	Solve complex and nonroutine real-world problems. Display mastery in the use of four-function calculators, rulers, and geometric shapes. Draw logical conclusions and justify answers and solution processes by explaining why, as well as how, they were achieved. Go beyond the obvious in interpretations and be able to communicate thoughts clearly and concisely.
<b>Grade 8</b>	
<b>Basic</b>	Complete problems correctly with the help of structural prompts such as diagrams, charts, and graphs. Solve problems through the appropriate selection and use of strategies and technological tools, including calculators, computers, and geometric shapes. Use fundamental algebraic and informal geometric concepts in problem-solving.
<b>Proficient</b>	Make conjectures, defend ideas, and give supporting examples. Understand connections between fractions, percents, decimals, and other mathematical topics such as algebra and functions. Compare and contrast mathematical ideas and generate own examples. Make inferences from data and graphs, apply properties of informal geometry, and accurately use tools of technology. Understand process of gathering and organizing data and be able to calculate, evaluate, and communicate results within the domain of statistics and probability.
<b>Advanced</b>	Probe examples and counterexamples in order to shape generalizations from which to develop models. Use number sense and geometric awareness to consider the reasonableness of an answer. Use abstract thinking to create unique problem-solving techniques and explain reasoning processes underlying conclusions.



## Note 6: The National Assessment of Educational Progress (NAEP)

Continued

**Table 2 Achievement levels for mathematics: Main NAEP—Continued**

**Grade 12**

<b>Basic</b>	Use estimation to verify solutions and determine reasonableness of results as applied to real-world problems. Use algebraic and geometric reasoning strategies to solve problems. Recognize relationships presented in verbal, algebraic, tabular, and graphical forms, and demonstrate knowledge of geometric relationships and corresponding measurement skills. Apply statistical reasoning in the organization and display of data and in reading tables and graphs. Generalize from patterns and examples in algebra, geometry, and statistics. Use correct mathematical language and symbols to communicate mathematical relationships and reasoning processes, and use calculators appropriately to solve problems.
<b>Proficient</b>	Demonstrate an understanding of algebraic, statistical, and geometric and spatial reasoning. Perform algebraic operations involving polynomials, justify geometric relationships, and judge and defend the reasonableness of answers as applied to real-world situations. Analyze and interpret data in tabular and graphical form, and understand and use elements of the function concept in symbolic, graphical, and tabular form. Make conjectures, defend ideas, and give supporting examples.
<b>Advanced</b>	Understand the function concept and be able to compare and apply the numeric, algebraic, and graphical properties of functions. Apply knowledge of algebra, geometry, and statistics to solve problems in more advanced areas of continuous and discrete mathematics. Formulate generalizations and create models through probing examples and counterexamples. Be able to communicate mathematical reasoning through clear, concise, and correct use of mathematical symbolism and logical thinking.

## Note 6: The National Assessment of Educational Progress (NAEP)

Continued

**Table 3** Achievement levels for writing: Main NAEP

<b>Grade 4</b>	
<b>Basic</b>	Be able to produce a somewhat organized and detailed response within time allowed that shows a general grasp of the assigned writing task. Grammar, spelling, and capitalization should be accurate enough to communicate to a reader, although there may be mistakes that get in the way of meaning.
<b>Proficient</b>	Be able to produce an organized response within time allowed that shows an understanding of the assigned writing task. Writing should include details that support and develop the main idea and should show that a student is aware of the audience. Grammar, spelling, and capitalization should be accurate enough to communicate to a reader. There may be some mistakes, but these should not get in the way of meaning.
<b>Advanced</b>	Be able to produce an effective, well-developed response within time allowed that shows a clear understanding of the assigned writing task. Writing should include details and be clearly organized, should use precise and varied language, and show signs of analytical, evaluative, or creative thinking. Grammar, spelling, and capitalization should be accurate enough to communicate clearly and mistakes should be so few and so minor that a reader can easily skim over them.
<b>Grade 8</b>	
<b>Basic</b>	Be able to produce an effective response within the time allowed that shows a general understanding of the assigned writing task. Writing should show that the student is aware of the audience, and it should include supporting details in an organized way. Grammar, spelling, and capitalization should be accurate enough to communicate to a reader, although there may be mistakes that get in the way of meaning.
<b>Proficient</b>	Be able to produce a detailed and organized response within time allowed that shows an understanding of both the assigned writing task and the audience. Writing should include precise language and varied sentence structure, and it may show analytical, evaluative, or creative thinking. Grammar, spelling, and capitalization should be accurate enough to communicate to a reader. There may be some mistakes, but these should not get in the way of meaning.
<b>Advanced</b>	Be able to produce a fully developed response within the time allowed that shows a clear understanding of both the assigned writing task and the audience. Writing should show some analytical, evaluative, or creative thinking and may make use of literary strategies to clarify a point; it should also be clearly organized, demonstrating precise word choice and varied sentence structure. There should be few errors in grammar, spelling, punctuation, capitalization, and sentence structure; writers should demonstrate good control of these elements and may use them for stylistic effect in their work.

## Note 6: The National Assessment of Educational Progress (NAEP)

Continued

**Table 3 Achievement levels for writing: Main NAEP—Continued**  
Grade 12

<b>Basic</b>	Be able to produce a well-organized response within time allowed that shows an understanding of both the assigned writing task and the audience. Writing should show some analytical, evaluative, or creative thinking and should include details that support and develop the main idea. Grammar, spelling, and capitalization should be accurate enough to communicate to a reader. There may be some mistakes, but these should not get in the way of meaning.
<b>Proficient</b>	Be able to produce an effectively organized and fully developed response within the time allowed that uses analytical, evaluative, or creative thinking. Writing should include details that support and develop the main idea and should show that the student is able to use precise language and variety in sentence structure to engage audience. There should be few errors in grammar, spelling, punctuation, capitalization, and sentence structure; writers should demonstrate good control of these elements and may use them for stylistic effect in their work.
<b>Advanced</b>	Be able to produce a mature and sophisticated response within time allowed that uses analytical, evaluative, or creative thinking. Writing should be detailed and fully developed, and it should show that the student is able to use literary strategies to develop ideas. Writing should be well crafted and coherent and show that the student is able to engage the audience through rich and compelling language, precise word choice, and variety in sentence structure. There should be few errors in grammar, spelling, punctuation, capitalization, and sentence structure; writers should demonstrate a sophisticated command of these elements and may use them for stylistic effect in their work.

## Note 6: The National Assessment of Educational Progress (NAEP)

Continued

**Table 4** Achievement levels for civics: Main NAEP

<b>Grade 4</b>	
<b>Basic</b>	Have an understanding of what government is and what it does, be able to identify some things that American government is not allowed to do, have some understanding of the foundations of the American political system, and know that the world is divided into many countries. Understand rules and laws, rights and responsibilities, and ways to participate in governing, in the context of the student's school and community.
<b>Proficient</b>	Have a good understanding of what American government does and why it is not allowed to act in certain ways and have an age-appropriate understanding of the foundations of the American political system. Understand purposes of laws, ways shared beliefs unify Americans, what it means to be a citizen, rights and responsibilities of citizens, and the idea of public participation in governing. Describe ways in which countries interact with one another.
<b>Advanced</b>	Understand and be able to explain some purposes of government and recognize differences between power and authority and between limited and unlimited government. Be able to explain the importance of shared values in American democracy, to identify ways citizens can participate in governing, and to understand that with rights come responsibilities. Be able to explain how nations benefit when they resolve conflicts peacefully.
<b>Grade 8</b>	
<b>Basic</b>	Have some understanding of competing ideas about purposes of government, be able to describe advantages of limited government, and be able to define government, constitution, the rule of law, and politics. Be able to identify the fundamental principles of American democracy and the documents from which they originate. Understand the importance of a shared commitment to the core values of American democracy. Recognize the components of the political process and understand personal, political, and economic rights and responsibilities. Be able to describe the purposes of some international organizations.
<b>Proficient</b>	Understand and be able to explain purposes that government should serve. Have a good understanding of differences between government and civil society and of the importance of the rule of law. Recognize discrepancies between American ideals and reality and be able to describe continuing efforts to address them. Understand the separation and sharing of powers among branches of government and between federal and state governments and be able to explain how citizens influence government. Be able to describe events within the United States and other countries that have international consequences.
<b>Advanced</b>	Have a developed understanding of how civil society helps to maintain limited government and why the rule of law is important. Have a clear understanding of issues in which democratic values are in conflict and of past efforts to address the discrepancies between American ideals and reality. Understand how citizens can monitor and influence government and how responsible citizens support democracy. Recognize the impact of American democracy on other countries, as well as other countries' impact on American politics and society.

## Note 6: The National Assessment of Educational Progress (NAEP)

Continued

**Table 4. Achievement levels for civics: Main NAEP—Continued**

**Grade 12**

<b>Basic</b>	Have an understanding of what is meant by civil society, constitutional government, and politics. Know that constitutional governments can take different forms and understand the fundamental principles of American constitutional government and politics, including functions of political parties and other organizations. Understand both rights and responsibilities in a democratic society, and recognize value of political participation. Be familiar with international issues that affect the United States.
<b>Proficient</b>	Have a good understanding of how constitutions can limit the power of government and support the law. Be able to describe similarities and differences among constitutional systems of government. Be able to explain fundamental American democratic values, their applications, and their contribution to expanding political participation. Understand the structure of American government, be able to evaluate activities of political parties, interest groups, and media in public affairs, and be able to explain the importance of political participation, public service, and political leadership. Be able to describe major elements of American foreign policy and the performance of major international organizations.
<b>Advanced</b>	Have a thorough and mature understanding of the strengths and weaknesses of various forms of constitutional democracy. Be able to explain fully the structure of American government and the political process. Understand differences between American ideals and realities, explain past and present responses to those differences, and understand why civic dispositions and individual and collective political actions sustain democracy. Be able to explain objectives and consequences of American foreign policy.

### LONG-TERM TREND NAEP

*Indicators 16, 17, and 25* are based on the long-term trend NAEP. The long-term trend NAEP measures student performance in science, reading, writing, and mathematics. The long-term assessments have used the same instruments since their first administrations in the late 1960s and early 1970s for science, reading, and mathematics and the early 1980s for writing. Accordingly, the long-term trend NAEP does not reflect current teaching standards or curricula. Nonetheless, the long-term trend NAEP facilitates comparisons of student performance over time.

Results from the long-term trend NAEP are presented as mean scale scores. Unlike the main NAEP, the long-term trend NAEP does not define achievement levels. Another important difference between the two assessments is that they collect data from different groups. In the main NAEP, results are reported for grades 4, 8, and 12. In most long-term trend assessments, average scores are reported by age. For science, reading, and mathematics, students at ages 9, 13, and 17 are assessed.

## Note 7: The Third International Mathematics and Science Study (TIMSS)

Under the auspices of the International Association for the Evaluation of Educational Achievement (1997a, 1997b, 1997c, 1997d, 1998), the Third International Mathematics and Science Study (TIMSS) assessed and collected data for more than half a million students at five grade levels (the 3<sup>rd</sup>, 4<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grades plus the final year of secondary school), providing information on student achievement, student background characteristics, and school resources in 45 countries in 1995. TIMSS data presented in *The Condition of Education 2000* are taken from the assessment components (*Indicators 18 and 19*) and the Videotape Classroom Study (*Indicator 44*).

### TIMSS ASSESSMENT COMPONENTS

The assessment components of TIMSS tested students in three populations:

- *Population 1*: Students enrolled in the two adjacent grades that contained the largest proportion of 9-year-old students at the time of the assessment—3<sup>rd</sup>- and 4<sup>th</sup>-grade students in most countries.
- *Population 2*: Students enrolled in the two adjacent grades that contained the largest proportion of 13-year-old students at the time of the assessment—7<sup>th</sup>- and 8<sup>th</sup>-grade students in most countries.
- *Population 3*: Students enrolled in their final year of secondary education, which ranged from 9<sup>th</sup>- to 14<sup>th</sup>-grade. In many countries, students in more than one grade participated in the study because the length of secondary education varied by type of program (e.g., academic, technical, vocational).

The results should be interpreted carefully because countries varied in how they defined their population and in their compliance with the TIMSS sampling guidelines. Consequently, reasons for differences in performance are not

clear, and assumptions cannot easily be made about the relationship between performance and the differences among countries' *Population* samples.

For example, particularly in *Population 3*, countries showed considerable variation in the age of the students tested. This assessment was intended to measure what students know when they leave the secondary school system, and therefore reflected differences among countries in how they prepare students to enter society after their schooling ends. A majority of countries participating in the assessment of *Population 3* tested students who were older, on average, than those tested for this *Population* in the United States, but no clear relationship exists between the age of the students tested and their performance. In some countries, data showed that their older students performed better than their younger students on the *Population 3* assessment. In other countries however, including the United States, younger students outperformed the older students on this same assessment. In fact, analyses of these data also show that, when including only students under the age of 18 in international comparisons, the average student in the United States still scored lower than the international average, and higher than the average student in only two other countries: Cyprus and South Africa. (NCES forthcoming)

All countries that participated in the study were required to administer assessments to the students in the two grades at *Population 2* but could choose whether to participate in the assessments of other populations. Forty-six countries participated in the survey of *Population 2*, of which 14 participated in the general assessment for all three *Populations*. For *Population 3*, in addition to general knowledge, countries were able to test two subgroups of students in their last year of secondary education: students taking advanced mathematics and students taking physics.

## Note 7: The Third International Mathematics and Science Study (TIMSS)

Continued

Country	Population 1	Population 2	Population 3		
			General knowledge	Advanced mathematics	Physics
Argentina		•			
Australia	•	•	•	•	•
Austria	•	•	•	•	•
Belgium (Flemish)		•			
Belgium (French)		•			
Bulgaria		•			
Canada	•	•	•	•	•
Colombia		•			
Cyprus	•	•	•	•	•
Czech Republic	•	•	•	•	•
Denmark		•	•	•	•
England	•	•			
France		•	•	•	•
Germany		•	•	•	•
Greece	•	•		•	•
Hong Kong	•	•			
Hungary	•	•	•		
Iceland	•	•	•		
Indonesia	•	•			
Iran, Islamic Republic	•	•			
Ireland	•	•			
Israel	•	•	•	•	•
Italy	•	•	•		
Japan	•	•			
Korea	•	•			
Kuwait	•	•			
Latvia (Latvian-speaking schools)	•	•			•
Lithuania		•	•	•	
Mexico	•	•			
Netherlands	•	•	•		
New Zealand	•	•	•		
Norway	•	•	•		•
Philippines		•			
Portugal	•	•			
Romania		•			
Russian Federation		•	•	•	•
Scotland	•	•			
Singapore	•	•			
Slovak Republic		•			
Slovenia	•	•	•	•	•
South Africa		•	•		
Spain		•			
Sweden		•	•	•	•
Switzerland		•	•	•	•
Thailand	•	•			
United States	•	•	•	•	•



## Note 7: The Third International Mathematics and Science Study (TIMSS)

Continued

Four countries—Argentina, Indonesia, Mexico, and the Philippines—were unable to complete the steps necessary for data to appear in the international TIMSS reports, chose not to release their results in the international report, or had their results published in a separate appendix to the international reports. Achievement scores and sampling information for these four countries are not included in *The Condition of Education 2000*.

The achievement scores for Italy are included in *The Condition of Education 2000* only for *Population 3*. Italy was unable to complete the steps necessary for its data to appear in the TIMSS reports for *Populations 1* and *2*.

For all *Populations*, participating countries were required to meet sampling and other guidelines. These guidelines, and the extent to which countries met them for each of the *Populations*, are described in the following sections.

In some situations, where it was not possible to implement testing for the entire International Desired Population (*Population 1, 2, or 3*), countries defined a National Desired Popula-

tion, which excluded some portion of the International Desired Population. For example, Israel's and Latvia's populations covered less than 100 percent of the International Desired Population because they defined their population according to the structure of their school systems.

Countries were also permitted within their desired population to define a population that excluded a small percentage (less than 10 percent) of schools or students that would be difficult to test (e.g., small schools or schools located in a remote area). Only England exceeded the 10-percent level for *Populations 1* and *2*, excluding 12.1 and 11.3 percent of schools, respectively. Among countries that participated in the assessment of general knowledge for *Population 3*, Austria, Cyprus, Germany, the Netherlands, and the Russian Federation exceeded the 10-percent level.

TIMSS used a two-stage sample design. For *Populations 1* and *2*, the first stage involved selecting 150 public and private schools within each country. Random sampling methods were then used to select from each school one math-

**Table 2 Countries covering less than 100 percent of the International Desired Population**

Country	International Desired Population	
<b>Population 1</b>		
	<b>Coverage</b>	<b>Note on Coverage</b>
Israel	72%	Hebrew Public Education System only
Latvia	60%	Latvian-speaking schools only
<b>Population 2</b>		
	<b>Coverage</b>	<b>Note on Coverage</b>
Germany	88%	15 of 16 regions
Israel	74%	Hebrew Public Education System only
Latvia	51%	Latvian-speaking schools only
Lithuania	84%	Lithuanian-speaking schools only
Switzerland	86%	22 of 26 cantons
<b>Population 3</b>		
	<b>Coverage</b>	<b>Note on Coverage</b>
Israel	74%	Hebrew Public Education System only
Italy	70%	16 of 20 regions
Latvia	50%	Latvian-speaking schools only
Lithuania	84%	Lithuanian-speaking schools only

## Note 7: The Third International Mathematics and Science Study (TIMSS)

### Continued

ematics class for each grade level within a population (generally 3<sup>rd</sup> and 4<sup>th</sup> for *Population 1* and 7<sup>th</sup> and 8<sup>th</sup> for *Population 2*). For *Population 3*, the first stage involved selecting 120 public and private schools in each country, and, within each school, 40 students were selected using random procedures. In addition, for *Population 3*, students were classified according to their preparation in physics and mathematics. For those countries that chose to participate in the assessments of physics and advanced mathematics, an additional sample was drawn from these classifications of students

who had taken physics or advanced mathematics, respectively.

The required participation rates from the samples for all *Populations* were at least 85 percent of both schools and students or a combined rate of 75 percent for schools and students. Countries that did not reach a 50-percent participation rate without the inclusion of replacement schools, or failed to reach the required rate even with the inclusion of replacement schools, failed to meet the sampling standards for participation.

**Table 3 Countries participating in TIMSS, by compliance with sampling guidelines for Population 1**

Compliance with sampling guidelines	Countries
Countries satisfying guidelines for sample participation rates, grade selection, and sampling procedures	Canada Cyprus Czech Republic England <sup>1,2</sup> Greece Hong Kong Iceland Iran, Islamic Republic Ireland Japan Korea New Zealand Norway Portugal Scotland <sup>2</sup> Singapore United States
Countries not satisfying guidelines for sample participation rates	Australia Austria Latvia (LSS) <sup>3</sup> Netherlands
Countries not meeting age/grade specifications	Slovenia
Countries with unapproved sampling procedures at the classroom level and/or not meeting other guidelines	Hungary Israel <sup>3</sup> Kuwait Thailand

<sup>1</sup> National defined population covers less than 90 percent of national desired population.

<sup>2</sup> Met guidelines for sample participation rates only after replacement schools were included.

<sup>3</sup> National desired population does not cover all of the international desired population. Latvia is noted LSS for Latvian-speaking schools only.

## Note 7: The Third International Mathematics and Science Study (TIMSS)

Continued

**Table 4 Countries participating in TIMSS, by compliance with sampling guidelines for Population 2**

Compliance with sampling guidelines	Countries
Countries satisfying guidelines for sample participation rates, grade selection, and sampling procedures	Belgium (Flemish) <sup>1</sup> Canada Cyprus Czech Republic England <sup>1,2</sup> France Hong Kong Hungary Iceland Iran, Islamic Republic Ireland Japan Korea Latvia (LSS) <sup>3</sup> Lithuania <sup>3</sup> New Zealand Norway Portugal Russian Federation Singapore Slovak Republic Spain Sweden Switzerland <sup>3</sup> United States <sup>1</sup>
Countries not satisfying guidelines for sample participation rates	Australia Austria Belgium (French) Bulgaria Netherlands Scotland
Countries not meeting age/grade specifications	Colombia Germany <sup>1,3</sup> Romania Slovenia
Countries with unapproved sampling procedures at the classroom level and/or not meeting other guidelines	Denmark Greece Israel <sup>3</sup> Kuwait South Africa Thailand

<sup>1</sup> Met guidelines for sample participation rates only after replacement schools were included.

<sup>2</sup> National defined population covers less than 90 percent of national desired population.

<sup>3</sup> National desired population does not cover all of the international desired population. Latvia ia noted LSS for Latvian-speaking schools only.

## Note 7: The Third International Mathematics and Science Study (TIMSS)

Continued

**Table 5** Countries participating in TIMSS, by compliance with sampling guidelines for Population 3—General Knowledge

Compliance with sampling guidelines	Countries
Countries satisfying guidelines for sample participation rates and sampling procedures	Cyprus <sup>1</sup> Czech Republic Hungary Lithuania <sup>2</sup> New Zealand <sup>3</sup> Russian Federation <sup>1</sup> Sweden Switzerland
Countries not satisfying guidelines for sample participation rates	Australia Austria <sup>1</sup> Canada France Iceland Italy <sup>2</sup> Norway United States
Countries with unapproved sampling procedures and/or low participation rates	Denmark Germany <sup>3</sup> Netherlands <sup>1</sup> Slovenia South Africa

<sup>1</sup> National defined population covers less than 90 percent of national desired population.

<sup>2</sup> National desired population does not cover all of the international desired population.

<sup>3</sup> Met guidelines for sample participation rates only after replacement schools were included.

## Note 7: The Third International Mathematics and Science Study (TIMSS)

Continued

**Table 6 Countries participating in TIMSS, by compliance with sampling guidelines for Population 3—Advanced Mathematics**

Compliance with sampling guidelines	Countries
Countries satisfying guidelines for sample participation rates and sampling procedures	Canada Cyprus <sup>1</sup> Czech Republic France Germany <sup>2</sup> Greece <sup>2</sup> Lithuania <sup>3</sup> Russian Federation <sup>1</sup> Sweden Switzerland
Countries not satisfying guidelines for sample participation rates	Australia Austria <sup>1</sup> Italy <sup>3</sup> United States
Countries with unapproved sampling procedures and low participation rates	Denmark Slovenia

<sup>1</sup> National defined population covers less than 90 percent of national desired population.

<sup>2</sup> Met guidelines for sample participation rates only after replacement schools were included.

<sup>3</sup> National desired population does not cover all of the international desired population.

**Table 7 Countries participating in TIMSS, by compliance with sampling guidelines for Population 3—Physics**

Compliance with sampling guidelines	Countries
Countries satisfying guidelines for sample participation rates and sampling procedures	Canada Cyprus <sup>1</sup> Czech Republic France Germany <sup>2</sup> Greece <sup>2</sup> Latvia (LSS) <sup>3</sup> Norway <sup>2</sup> Russian Federation <sup>1</sup> Sweden Switzerland
Countries not satisfying guidelines for sample participation rates	Australia Austria <sup>1</sup> United States
Countries with unapproved sampling procedures and low participation rates	Denmark Slovenia

<sup>1</sup> National defined population covers less than 90 percent of national desired population.

<sup>2</sup> Met guidelines for sample participation rates only after replacement schools were included.

<sup>3</sup> National desired population does not cover all of the international desired population. Latvia is noted LSS for Latvian-speaking schools only.

## Note 7: The Third International Mathematics and Science Study (TIMSS)

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### Continued

#### VIDEOTAPE CLASSROOM STUDY

TIMSS also included a Videotape Classroom Study of 231 8<sup>th</sup>-grade classrooms selected to be representative of the classrooms in the main study (NCES 1999–074). The study examined the mathematical content of lessons, the organization and process of mathematics instruction, and teachers' beliefs about reform and how these beliefs related to instructional practices.

One hundred German classrooms, 81 U.S. classrooms, and 50 Japanese classrooms were included in the study. In each country, schools were randomly selected from the original TIMSS sample, and classrooms were then selected from these schools for videotaping. In the United States, one 8<sup>th</sup>-grade classroom was randomly selected from each school. Teachers received a \$300 grant, the use of which was to be decided upon jointly with the principal. In Germany, the classroom in each school that participated in the TIMSS assessment was videotaped. A modest stipend was given to the teachers for their participation. In Japan, classrooms selected for the study were those that had not participated in the TIMSS assessment. Where there was more than one 8<sup>th</sup>-grade mathematics classroom that had not participated in the assessment, the principal chose which classroom would participate. In all three countries, if a teacher in the original sample of schools refused to be videotaped, then the school was dropped from the study.

Videotaping of U.S. and German classrooms was spread between October 1994 and May 1995. In Japan, the academic year begins in April, so all videotaping was conducted between November 1994 and March 1995. The national curriculum in Japan devotes the first half of the academic year to algebra and the second half of the year to geometry. Consequently, geometry lessons were overrepresented in the sample of lessons from Japanese classrooms. Five additional Japanese classrooms were sampled in the following school year to increase the number of Japanese algebra lessons and were included in the specialized analyses of the “Math Content Group.”

After their classroom was videotaped, teachers were asked to complete a 28-item questionnaire. English, German, and Japanese versions of the questionnaire were created and judged to be equivalent by a group of researchers, each of whom was fluent in at least two of the languages. Over 90 percent of teachers in each country who were videotaped returned the questionnaire—91 percent in Germany, 94 percent in Japan, and 98 percent in the United States. Teachers were asked to describe the videotaped lesson, the typicality of that lesson, and their understanding of current reform efforts and to what extent these reforms were evident in the videotaped lesson.

## Note 8: NAEP, NELS, and HS&B Transcript Studies

*Indicators 39 and 40* summarize data from transcripts of high school graduates collected as part of the U.S. Department of Education's National Assessment of Educational Progress (NAEP) and the High School & Beyond study (HS&B). Based on these transcripts, completed courses in subject areas (such as science and mathematics) are placed in different levels of an academic "pipeline." The pipeline organizes courses in each subject based on the normal progression and difficulty of courses within that subject area. In mathematics, as an illustration, algebra I is less difficult than and is traditionally taken before algebra II; thus, algebra I is placed lower in the pipeline hierarchy than is algebra II.

The pipeline for a subject can be used to assess the rigor and difficulty of courses that high school graduates have completed. Graduates at the high end of a pipeline have completed more advanced coursework than graduates at a lower level of the pipeline. The pipeline classifies graduates by the highest level courses completed in a subject area, not the highest level attempted.

### MATHEMATICS PIPELINE

The mathematics pipeline has eight levels: *No mathematics*, *Nonacademic*, *Low academic*, *Middle academic I*, *Middle academic II*, *Advanced I*, *Advanced II*, and *Advanced III*. Middle levels I and II and Advanced levels I, II, and III can be combined to create one middle level and one Advanced level, respectively, thus creating a five-level pipeline (*No mathematics*, *Nonacademic*, *Low academic*, *Middle academic*, and *Advanced*).

#### No mathematics

Students who did not complete any courses in mathematics are placed in the no-mathematics level as are students who completed only basic

or remedial-level mathematics. Thus, it is possible for a student to have taken one or more courses in mathematics but to be placed in the no-mathematics level.

#### Non-academic

This level includes courses in "general mathematics" or "basic skills mathematics," such as:

General mathematics I or II; basic mathematics I, II, or III; consumer mathematics; technical or vocational mathematics; and mathematics review.

#### Low academic

This level includes preliminary courses (e.g., pre-algebra) or mathematics courses of reduced rigor or pace (e.g., algebra I taught over the course of 2 academic years). These courses are considered to be more rigorous than Nonacademic courses and include:

Pre-algebra; algebra I, part I; algebra I, part II; and geometry (informal).

#### Middle academic

Courses at this level begin with algebra I (or unified mathematics I) and include approximately three full-year courses in mathematics (e.g., algebra I and II and geometry). The Middle academic pipeline is divided into sub-levels according to their rigor (Middle academic I and II). These courses are more rigorous than Nonacademic and Low academic level courses.

#### Middle academic level I

Algebra I; plane geometry; plane and solid geometry; unified mathematics I and II; pure mathematics; other.

#### Middle academic level II

Algebra II and unified mathematics III.



## Note 8: NAEP, NELS, and HS&B Transcript Studies

### Continued

#### ADVANCED ACADEMIC

Advanced academic courses include precalculus and calculus as well as other courses labeled as “advanced,” including trigonometry, statistics, and probability. These courses are considered more rigorous than Nonacademic, Low-academic, and Middle academic courses. Advanced courses are divided into three pipeline levels according to their rigor:

##### Advanced academic level I (least rigorous)

Algebra III; algebra/trigonometry; algebra/analytical geometry; trigonometry; trigonometry/solid geometry; analytical geometry; linear algebra; probability; probability/statistics; statistics; statistics (other); and independent study.

##### Advanced academic level II

Precalculus and introduction to analysis.

##### Advanced academic level III (most rigorous)

Advanced Placement calculus; calculus; and calculus/analytical geometry.

#### SCIENCE PIPELINE

Unlike mathematics and other subjects such as foreign languages, coursework in science does not follow a common or easily defined sequence. Depending on a school’s curriculum, students may be able to choose from several courses with minimal sequencing. Consequently, the method used to construct the science pipeline differs from that of the mathematics pipeline. First, all science courses were placed in one of four groups based on subject matter: (1) life science (biology); (2) chemistry; (3) physics; and (4) all other physical sciences (e.g., geology, earth science, physical science). Second, a pipeline was constructed for each of these four groups. Third, the pipelines for chemistry, physics, and all other physical sciences were combined into a single pipeline

(a physical science pipeline). Finally, the physical science and life science pipelines were combined to create a single pipeline measure. The result is a pipeline with seven levels: *No science*; *Primary physical science*; *Secondary physical science*; *Biology*; *Chemistry I or Physics I*; *Chemistry I and Physics I*; and *Chemistry II or Physics II*.

##### No science

Students who did not complete any courses in science are in this category as are students who completed only basic or remedial-level science. Thus, it is possible for a student to have taken one or more courses in science but to be placed in the no-science level.

##### Primary physical science

Physical science; applied physical science; earth science; college preparatory earth science; and unified science.

##### Secondary physical science

Astronomy; geology; environmental science; oceanography; general physics; basic biology I; and consumer or introductory chemistry.

##### Biology

General biology I; secondary life sciences (including ecology, zoology, marine biology, and human physiology); general or honors biology II; and advanced biology.

##### Chemistry I or Physics I

##### Chemistry I and Physics I

##### Chemistry II or Physics II

For more information on the construction of the pipelines, see Burkam, Lee, and Smerdon 1997.

## Note 9: The College Qualification Index

### WHO IS PREPARED FOR COLLEGE?

The college qualification index was developed for *Access to Postsecondary Education for the 1992 High School Graduates* (NCES 98–105). The index measures a student’s readiness to attend a 4-year institution and uses up to five sources of information about a student’s preparation: high school grade-point average (GPA) in academic courses, senior class rank, scores on the NELS 1992 cognitive test battery, and scores on the ACT or SAT college entrance examination. Since admission standards and requirements vary widely among 4-year colleges and universities, the analysis for the indicator examined the actual distribution of these five measures of academic aptitude and achievement among those graduating seniors who did attend a 4-year institution. Approximately half (45 percent) of the NELS graduating seniors had data available for four or five of the criteria: class rank, GPA, the NELS test, and ACT or SAT scores. For about one-third of the students only three data sources were available because they lacked ACT or SAT scores. All of these students had NELS test scores, however. In order to identify as many students as possible who were potentially qualified academically to attend a 4-year college, students were assigned the highest level of qualification yielded by any of the five criteria that were available.

Students were classified in a two-stage process. The initial classification was determined as follows:

- *Very highly qualified:* those whose highest value on any of the five criteria would put them among the top 10 percent of 4-year college students (specifically the NELS 1992 graduating seniors who enrolled in 4-year colleges and universities) for that criterion. Minimum values were GPA=3.7, class rank percentile=96, NELS test percentile=97, combined SAT=1250, composite ACT=28.
- *Highly qualified:* those whose highest value on any of the five criteria would put them among the top 25 percent of 4-year college students (but not the top 10 percent) for that criterion. Minimum values were GPA=3.6, class rank percentile=89, NELS test percentile=90, combined SAT=1110, composite ACT=25.
- *Somewhat qualified:* those whose highest value on any of the five criteria would put them among the top 50 percent (but not the top 25 percent, i.e., in the second quartile) of 4-year college students for that criterion. Minimum values were GPA=3.2, class rank percentile=75, NELS test percentile=76, combined SAT=960, composite ACT=22.
- *Minimally qualified:* those whose highest value on any of the five criteria would put them among the top 75 percent (but not the top 50 percent, i.e., in the third quartile) of 4-year college students for that criterion. Minimum values were GPA=2.7, class rank percentile=54, NELS test percentile=56, combined SAT=820, composite ACT=19.
- *Marginally or not qualified:* those who had no value on any criterion that would put them among the top 75 percent of 4-year college students (i.e., all values were in the lowest quartile). In addition, those in vocational programs (according to their high school transcript) were classified as not college qualified.

Next, adjustments were made for programs of rigorous academic coursework, defined as including at least 4 years of English; 3 years each of science, mathematics, and social studies; and 2 years of a foreign language. Those who had

## Note 9: The College Qualification Index

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### Continued

taken a program of rigorous academic courses were moved into one higher level of qualification. Students initially placed in the “very highly qualified” category who had not taken the rigorous academic coursework were placed into the “highly qualified” category.

Students were identified as “college qualified” if they were at least minimally qualified according to this index. It is important to recognize that some “marginally or not qualified” stu-

dents enrolled at a 4-year institution. Admission standards vary widely and admission may be based on factors other than academic preparation (for example, some public 4-year institutions are open to any in-state high school graduate).

NOTE: This procedure affected the classification of less than 1 percent of students. Few students in vocational programs met any of the criteria for a higher classification.

## Note 10: College Remediation and Degree Completion

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The source of student transcripts used in *Indicator 34* is the U.S. Department of Education's High School and Beyond Postsecondary Transcript File. Courses defined as remedial include: precollege mathematics, arithmetic-based business mathematics, remedial writing, remedial speech, basic reading (but not speed reading), business English: punctuation and grammar, English-as-a-second language, and basic academic skills. For a description of how courses were coded from the High School and Beyond Postsecondary Transcript File, see Adelman (1999).

In the analysis, students were assigned to one of five mutually exclusive patterns of remedial coursework, according to the courses on their transcripts. These patterns followed a logical cascade. Students with (a) any remedial courses were first identified, then (b) students with two or fewer remedial mathematics courses only, then (c) students with two or more courses in English, mathematics, or other courses other than reading (but not solely two courses in mathematics), then (d) students with only one remedial course other than reading or mathematics, and, finally, (e) students with no remedial courses.

## Note 11: Information on Socioeconomically Disadvantaged Students

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For *Indicator 35*, which uses data from the 1996 Beginning Postsecondary Student Longitudinal Study, “First Follow-up” (BPS:1996/1998), students are classified as “at risk” of not persisting at a 4-year institution if they meet one or more of the criteria listed below. Note that this definition of “at risk” is specific to this indicator and differs from definitions of at risk used in other NCES publications. Each of the three components is independently related to persistence. Students were at risk if:

- Their total family income in 1994 was below 125 percent of the federal poverty level for their family size. (In BPS:1996/1998, family income was derived from national student loan files, student and parent interviews, and imputation.) Sixty-three percent of students from low-income families persisted versus 76 percent of students from other families.
- The highest educational level completed by either parent was a high school diploma or less. These data were obtained primarily from the BPS telephone interviews. Sixty-three percent of students whose parents did not go beyond high school persisted versus 78 percent of other students.
- The proportion of the student body in the student’s high school who were eligible for free or reduced-price lunch in 1994–95 was 25 percent or more. This information was obtained by matching high schools identified by admission test takers with the NCES Common Core of Data (CCD). In

1994–95, 10 states did not report free-lunch eligibility data for at least 70 percent of their schools. Students missing data on this criterion could be categorized as “at risk” based on family income or parents’ education. Eligibility for free or reduced-price lunch under the national Free School Lunch Act is one of four measures of poverty specified in the basic program requirements for Title I federal funding. Because only public high schools are included in the CCD, and the NCES Private School Survey does not collect free or reduced-price lunch eligibility data, attendance at a private high school could not solely be the basis of “at-risk” status. However, students who attended private high schools could be classified as “at risk” based on family income or parents’ education. (Ninety percent of the BPS:1996/1998 sample graduated from public high schools, and among students entering 4-year institutions, which are the focus of this indicator, 86 percent graduated from public high schools.) Seventy-two percent of students from high poverty high schools persisted versus 78 percent of other students.

Among students entering 4-year institutions, 44 percent were at risk of not persisting. Each of the three variables considered is associated with persistence as defined in this indicator, and does not highly overlap with the other two variables, as indicated below.

## Note 11: Information on Socioeconomically Disadvantaged Students

Continued

Percentage distribution according to responses to variables determining at-risk status for nonpersistence for students with complete data on all three variables

Only low family income (as a percent of the poverty level)	12.2%
Only low parents' education	32.2%
Only high percent free lunch eligible (high school)	22.0%
Both low family income and low parents' education	7.7%
Both low family income and high percent free lunch eligible	6.3%
Both low parents' education and high percent free lunch eligible	11.1%
At risk on all three variables	8.6%
<b>Total</b>	<b>100.0%</b>

## Note 12: Fields of Study

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### DEFINITIONS OF FIELDS OF STUDY

Following the procedure used in the *Digest of Education Statistics*, the fields in each category in *Indicator 37* are based on the 1991–92 Classification of Instructional Program (CIP) codes, 1990 edition, in order to provide consistent data for 1970–71 and 1996–97.

*Agriculture and natural resources:* agricultural business and production; agricultural sciences; and conservation and renewable natural resources.

*Biological/life sciences:* biology; biochemistry and biophysics; botany; cell and molecular biology; microbiology/bacteriology; zoology; and other biological sciences.

*Business management and administrative services:* business management/administrative services; marketing operations/marketing distribution; and consumer and personal services.

*Communications:* communications, general; advertising; journalism; broadcast journalism; public relations and organizational communications; radio and television technology; communications, other; and communications technologies.

*Computer and information sciences:* computer and information sciences, general; computer programming; data processing technology/technician; information science and systems; computer systems analysis; and other information sciences.

*Education:* education.

*Engineering:* engineering; engineering-related technologies; mechanics and repairs; and construction trades.

*English language and literature/letters:* English language and literature, general; comparative

literature; English composition; English creative writing; literature; creative American literature; English literature; speech and rhetorical studies; English technical and business writing; and English language and literature/letters, other.

*Health professions and related sciences:* Communication disorders sciences; community health liaison; dentistry; dental services; health services administration; health and medical assistants; health and medical diagnosis and treatment services; medical laboratory technologies; predentistry; premedicine; prepharmacy; preveterinary; medicine; medical basic sciences; mental health services; nursing; optometry; pharmacy; epidemiology; rehabilitation and therapeutic services; veterinary medicine; and other health professions.

*Mathematics:* mathematics; statistics.

*Physical sciences:* physical sciences, general; astronomy; astrophysics; atmospheric science and meteorology; chemistry; geology; miscellaneous physical sciences; physics; science technologies; and other physical sciences.

*Psychology:* psychology.

*Social sciences and history:* social sciences, general; anthropology; archeology; criminology; demography and population studies; economics; geography; history; international relations and affairs; political science and government; sociology; urban affairs/studies; and social sciences and history, other.

*Visual and performing arts:* visual and performing arts, general; crafts, folk art, and artisanry; dance; design and applied art; theatre arts and stagecraft; film/video and photographic arts; fine arts and art studies; music; and visual and performing arts, other.

## Note 13: Allocation of Faculty Time

The National Study of Postsecondary Faculty (NSOPF-93), conducted in 1992–93, included anyone who was designated as faculty, whether or not their responsibilities included instruction, and other personnel with instructional responsibilities. The analysis for *Indicator 56* includes only those respondents with faculty status and some instructional responsibilities. Instructional responsibilities include teaching one or more classes for credit or advising or supervising students' academic activities.

### TIME ALLOCATION

Survey respondents were asked to estimate the percentage of total working hours they spent on each of the following activities:

*Teaching:* Includes teaching; grading papers; preparing courses; developing new curricula; advising or supervising students; or working with student organizations or intramural sports.

*Research/scholarship:* Includes research; reviewing or preparing articles or books; attending or preparing for professional meetings or

conferences; reviewing proposals; seeking outside funding; giving performances or exhibitions in the fine or applied arts; or giving speeches.

*Administration:* Performing managerial or other organizationally supportive activities.

*Professional growth:* Includes taking courses or pursuing an advanced degree or other professional development activities to remain current in their field of practice.

*Outside consulting or freelance work:* Conducting outside consulting or other employment.

*Service/other:* Includes providing legal or medical service or psychological counseling to clients or patients; providing paid or unpaid community or public service, or service to professional societies/associations; or participating in other activities or work not listed above.

The last three activities on this list were combined into an “other” category for the indicator.



## Note 14: Calculation of Indicators of Public Effort to Fund Education

Many indices of public investment in education could be constructed. Choosing the most appropriate measure has been an issue in international comparisons as well as national trends. Two indices were selected for presentation in *Indicator 62*. The first is revenue per student, which is the amount of public revenue for elementary and secondary education divided by the total number of public and private elementary and secondary students, or public revenues for postsecondary education in degree-granting institutions divided by the total number of postsecondary education students enrolled in postsecondary degree-granting institutions. Education revenue is in 1998 dollars, based on the Consumer Price Index (CPI), prepared by the Bureau of Labor Statistics, U.S. Department of Labor, adjusted to a school-year basis. Personal income is in constant 1998 dollars, adjusted by CPI for the calendar year. Data for the indicators are for the calendar year in which the school year ended, except for 1930 and 1940, for which the data are for the calendar year in which the school year began.

The second indicator is revenue per student divided by per capita personal income. This indicator of public effort provides a measure of public investment in each student compared with available societal resources. Public education revenue per student is the ratio of total public revenue for education to public and private enrollment. No adjustments were made for part-time enrollment. Per capita income is

$$\text{Effort index} = \frac{\text{Public revenue for education/total enrollment}}{\text{Total personal income/total population}} \times 100$$

the ratio of total personal income to total population. The index can be expressed algebraically, therefore, as:

Revenue data from elementary/secondary and postsecondary education are based in different accounting systems and are not entirely comparable. For example, elementary and secondary public revenues represent additions to assets (cash) from taxes, appropriation, and other funds, which do not incur an obligation that must be met at some future date (loans) in all public schools. These include revenues that are spent on construction of buildings and other investments in the physical plant. Because of the difficulty in constructing a comparable time series, public funds going to private schools (for Head Start, disabled children, etc.) have been excluded. For postsecondary education, educational and general public revenues are those available from public sources at both public and private institutions for the *regular or customary activities* of an institution that are part of, and contributory to, or necessary to its instructional or research program. These include salaries and travel of faculty and administrative or other employees; purchase of supplies or materials for current use in classrooms, libraries, laboratories, or offices; and operation and maintenance of the educational plant. In contrast to elementary/secondary public revenues, postsecondary education public revenues, as defined in this indicator, do not include public funds that would be used for expansion of the physical plant. As a result, the reader should focus on the changes over time within the elementary/secondary and postsecondary education measures rather than make comparisons across levels.

To facilitate comparisons between the two indicators of public effort, the data shown in the figures were calculated as a percentage of their values in 1970.

## Note 15: Analysis of Variance (ANOVA)

The method used for comparisons of average values of three or more groups is called the *analysis of variance* (ANOVA). Using ANOVA the total variation can be separated into two parts: (1) variation due to differences between groups and (2) variation due to differences within each group.

- (1) Variation due to differences represents how far group means deviate from the overall sample mean. In order to calculate the variation across groups, the difference between a group mean and the overall sample mean is calculated for each group. The differences are then squared and summed up using all the groups. Finally, the sum of the squared differences is multiplied by the number of subjects in each group. The resulting product of this calculation is called the *sum of squares between (among) groups* in the ANOVA table (see below).
- (2) Variation due to differences within each group represents how much individual scores within each group differ from their group mean. In order to calculate the variation within groups, the differences between an individual score and its group mean are squared and summed using all the individuals within each group. Finally, the sums of the squared differences of all the groups are added. The resulting product is called the *sum of squares within groups* in the ANOVA table.

Dividing the average sum of squares between groups (also called the *mean square between groups* in the ANOVA table) by the average sum of squares within group (called the *mean square within groups*) yields an F-value. The F-value is used to test the differences in mean values of three or more groups. If the variation among the groups is large compared to the variation within the groups, then the F-value will be larger than 1. If the null hypothesis is true, the expected value for the two *mean squares* will be equal, and the F-value will be equal to 1.

*Indicator 64* applies ANOVA table for the percentage distributions of disparity among states and within states in the chart were calculated by dividing among-state disparity (*sum of squares among states*) by the total disparity (*total sum of squares*) and by dividing within-state disparity (*sum of squares within states*) by the total disparity, respectively, for each year. The proportions of the total disparity attributable to within- and among-state differences identify the sources and the shares of the total disparity.

While the universe of school districts was surveyed for each state in 1992–93, 1995–96, and 1996–97, a sample of school districts was collected for some states while a universe was collected for others in 1993–94 and 1994–95.

## Note 15: Analysis of Variance (ANOVA)

Continued

**Supplemental Table: Analysis of variance (ANOVA) results for instructional expenditures per pupil: School years 1992–93 to 1996–97**

Year and source	Degree of freedom	Sum of squares	Mean square	F-value	Prob > F
<b>1992–93</b>					
Among states	50	9149.80	183.00	255.60	0.0000
Within states	10631	7611.11	0.72		
Total	10681	16760.91			
<b>1993–94</b>					
Among states	50	8679.22	173.58	224.54	0.0000
Within states	9374	7246.65	0.77		
Total	9424	15925.87			
<b>1994–95</b>					
Among states	50	7831.17	156.62	304.34	0.0000
Within states	9427	4851.52	0.51		
Total	9477	12682.70			
<b>1995–96</b>					
Among states	50	8133.99	162.68	321.75	0.0000
Within states	10520	5318.95	0.51		
Total	10570	13452.95			
<b>1996–97</b>					
Among states	50	8143.33	162.87	312.24	0.0000
Within states	10522	5488.30	0.52		
Total	10572	13631.64			

NOTE: Only unified school districts are included in the analysis. The school year Consumer Price Index (CPI) was used to adjust expenditures to constant 1996 dollars. Details may not add to totals due to rounding.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Elementary–Secondary School District Finance Data Files, 1992–93 to 1996–97 school years.

## Note 16: Net Price of College Attendance

The following definitions, used in *Indicator 67*, clarify who or what is included or excluded in the various statistics. The sample consists of dependent full-time, full-year students who attended one postsecondary institution during the 1995–96 academic year. During that year, approximately 20 percent of all undergraduates were dependent and full time, full year (defined as 8 or more months of attendance). The specific terms used in the Indicator are as follows:

*Family income:* The four income categories, “low income,” “lower middle,” “upper middle,” and “high income” are calculated on the basis of family income for dependent students and correspond to the four quartiles of the distribution of parental family income. The quartile cutpoints for dependent student income are about \$25,000, \$47,000, and \$71,000.

*Dependency status:* Students were considered dependent for purposes of federal financial aid programs unless institutional records indicated they were:

- (1) Age 24 or older as of December 31, 1995 (born before January 1, 1972)
- (2) A veteran of the U.S. Armed Forces
- (3) Enrolled in a graduate or professional program (beyond a bachelor’s degree) in 1995–96
- (4) Married
- (5) Orphan or ward of the court
- (6) Had legal dependents, other than spouse

If any of these conditions were met, the student was classified as independent for purposes of financial aid.

*Tuition and fees:* Indicates tuition the student was charged for the academic year, as reported

by the institution in the National Postsecondary Student Aid Study (NPSAS). If tuition was not reported, tuition was estimated based on the average per credit or per term charges for other students at the institution according to their class level, degree program, and attendance status.

*Total cost:* The attendance-adjusted student budget at the sampled NPSAS institution for students who attended only one institution during 1995–96. The student budget is the sum of tuition and fees and the sum of nontuition expenses, including room and board, transportation, books and supplies, and other costs. For students attending at least half time but less than full time, nontuition costs are reduced to 75 percent of the allowance for full-time, full-year students, to 50 percent for students with unknown attendance status, and to 25 percent for students attending less than half time. The actual tuition is added to the estimated nontuition costs. Students who attended more than one institution are excluded from the tables.

*Grants:* Total amount of all grants and scholarships: federal, state, institutional, and other received during 1995–96, including employer tuition reimbursements.

*Net price:* Total cost to student, which includes tuition and fees and nontuition costs) minus total grants. Net price does not include the future cost of interest payments on loans that must be repaid. This definition of net price differs from an earlier version that appeared in *The Condition of Education 1998*. The 1998 definition was total cost minus total aid, which includes loans that students or their families must repay. The present definition more accurately reflects the price that students and their families pay.