

# Technical Notes and Data Appendix

## Sampling and Weighting

The schools and students who participate in NAEP assessments are selected to form a representative sample of the nation. The national sample of eighth-graders in the 2008 arts assessment was chosen using a multistage design that involved drawing students from the sampled public and private schools across the country. The results from the assessed students were combined to provide accurate estimates of the overall performance of students in the nation.

Each school that participated in the assessment, and each student assessed, represents a portion of the population of interest. Results are weighted to make appropriate inferences between the student samples and the respective populations from which they are drawn. Sampling weights are adjusted for the disproportionate representation of some groups in the selected sample. This includes the oversampling of schools with high concentrations of students from certain racial/ethnic groups and the lower sampling rates of students who attend very small schools.

## School and Student Participation Rates

The school and student participation rates for public and private schools in the 2008 arts assessment are provided in table A-1.

NCES statistical standards require that a nonresponse bias analysis be conducted for any school or student group with a participation rate that falls below 85 percent. The participation rates for the 2008 NAEP arts assessment indicated a need for a school nonresponse bias analysis for the private school sample. The results showed that school substitution and nonresponse adjustments were not effective in reducing nonresponse bias for the percentage of Hispanic students enrolled and type of private schools (Catholic and other private schools). The disproportionate nonresponse resulted

in an overestimation of the percentage of Hispanic students, an overestimation of the percentage of Catholic school students, and an underestimation of the percentage of other private school students.

**Table A-1. School and student participation rates in NAEP arts at grade 8, by subject and type of school: 2008**

Subject and type of school	School participation		Student participation	
	Number of schools participating	Weighted percent	Number of students assessed	Weighted percent
<b>Music</b>				
<b>Nation</b>	<b>260</b>	<b>97</b>	<b>4,000</b>	<b>93</b>
Public	220	99	3,400	93
Private	30	76	500	97
<b>Visual arts</b>				
<b>Nation</b>	<b>260</b>	<b>97</b>	<b>3,900</b>	<b>92</b>
Public	220	99	3,400	92
Private	30	76	500	94

NOTE: The numbers of schools are rounded to the nearest ten, and the numbers of students are rounded to the nearest hundred. Detail may not sum to totals because of rounding.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2008 Arts Assessment.

## Interpreting Statistical Significance

Comparisons over time or between groups in this report are based on statistical significance at the .05 level using *t*-tests with appropriate adjustments for multiple comparisons (using the False Discovery Rate procedure). These statistical tests consider both the size of the differences and standard errors of the two statistics being compared. Standard errors are margins of error, and estimates based on smaller groups are likely to have larger margins of error relative to estimates based on larger groups. Note, for example, that differences based on school-administrator-reported estimates have smaller sample sizes than differences based on student-reported estimates, resulting in smaller significant differences in the student-reported data than in the

school-administrator-reported data. The size of the standard errors may also be influenced by other factors such as how representative the students assessed are of the entire population.

When an estimate has a large standard error, a numerical difference that seems large may not be statistically significant. Differences of the same magnitude may or may not be statistically significant depending upon the size of the standard errors of the estimates. For example, a 10-point difference between male and female students may be statistically significant, while a 10-point difference between students attending public and private schools may not be. Standard errors for the estimates presented in this report are available at <http://nces.ed.gov/nationsreportcard/naepdata/> and on the 2008 arts results website at [http://nationsreportcard.gov/arts\\_2008/](http://nationsreportcard.gov/arts_2008/).

## National School Lunch Program

NAEP collects data on student eligibility for the National School Lunch Program (NSLP) as an indicator of poverty. Under the guidelines of NSLP, children from families with incomes below 130 percent of the poverty level are eligible for free meals. Those from families with incomes between 130 and 185 percent of the poverty level are eligible for reduced-price meals. (For the period July 1, 2007 through June 30, 2008, for a family of four, 130 percent of the poverty level was an annual income of \$27,000, and 185 percent was \$38,000.) For more information on NSLP, visit <http://www.fns.usda.gov/cnd/lunch/>.

## School Location

Results of the 2008 NAEP arts assessment were reported for four mutually exclusive categories of school location. These categories are based on standard definitions established by the Federal Office of Management and Budget using population and geographic information from the U.S. Census Bureau. The classification system is referred to as “urban-centric locale codes,” which classifies territory into four major types:

city, suburb, town, and rural. More details on the classification system can be found at [http://nces.ed.gov/ccd/rural\\_locales.asp](http://nces.ed.gov/ccd/rural_locales.asp).

## The Creating Task Score

Students’ performance on questions assessing the creating process in visual arts is presented as the average creating task score in this report. The creating task score for each creating question (task) is the sum of the percentage of students receiving full credit and a fraction of the percentage of students receiving partial credit. The individual scores are then averaged together to report an average creating task score for the entire set of the visual arts creating questions.

An example of computing the creating task score is provided below for a sample question in this report that asks eighth-graders to draw a self-portrait. Responses to this question were scored “Sufficient,” “Uneven,” “Minimal,” or “Insufficient.” The percentages of students falling into these four scoring levels are 4 percent, 25 percent, 57 percent, and 14 percent, respectively (table A-2). Responses at these four levels receive score weights of 1,  $\frac{2}{3}$ ,  $\frac{1}{3}$ , and 0, respectively. The creating task score for this question is computed as  $1(4) + \frac{2}{3}(25) + \frac{1}{3}(57) + 0(14) = 40$ .

**Table A-2. Example showing how the creating task score was computed for a sample question in NAEP visual arts at grade 8: 2008**

Scoring level	Percentage of students	Score weight	Percentage of students × score weight
Sufficient	4	1	4
Uneven	25	$\frac{2}{3}$	17
Minimal	57	$\frac{1}{3}$	19
Insufficient	14	0	0
<b>Creating task score (4 + 17 + 19 + 0) = 40</b>			

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2008 Arts Assessment.

## Comparing Results Between the 1997 and 2008 Assessments

Although the assessment questions administered in 2008 were selected from those used in the 1997 assessment, due to changes in scoring procedures and materials, the 2008 score results in music and visual arts could not be directly compared to the results in 1997.

In the 2008 arts assessment, the scoring guides for constructed-response questions, the sample questions and student responses used to train scorers, and the standardized training procedures were updated to reflect changes in training and scoring procedures that have been adapted for use across all NAEP assessments since 1997. In addition, because the student artwork used as training samples for visual arts in 1997 had degraded over time and because of differences in the availability of certain types of art supplies and tools between 1997 and 2008, new samples were developed for scoring students' responses to the creating questions in 2008.

However, since the scoring method for multiple-choice questions was the same in 1997 and 2008, direct comparisons could be made between the two years on results for these questions in music and visual arts (tables A-3 and A-4). Because multiple-choice questions were only a portion of the assessment and only assessed certain types of topics in the responding process of music and visual arts, the changes in students' performance between 1997 and 2008 on these questions did not represent the performance changes for the constructed-response questions or the entire assessment.

**Table A-3. Percentage correct for multiple-choice questions in NAEP music at grade 8: 1997 and 2008**

Question description	Percent correct	
	1997	2008
<b>Overall</b>	<b>53*</b>	<b>51</b>
Identify directional contour of part of melodic phrase	79	77
Identify form of vocal music in a recording (musical excerpt 1)	78	76
Identify the type of instrumental ensemble performing an excerpt	75	71
Identify form of musical examples as theme and variations	64	64
Identify a bass clef symbol	63	62
Identify pitch contour of melody in a recording	63*	56
Identify saxophone as instrument playing melody	66*	56
Identify a half note in printed music	52	56
Identify a correct time signature for a piece of printed music	55	52
Select a line drawing reflective of the texture of an example of music	52	52
Identify the solo instrument beginning "Rhapsody in Blue"	52	50
Identify form of vocal music in a recording (musical excerpt 2)	60*	49
Identify an appropriate texture drawing for a homophonic excerpt	51	48
Identify term best describing the texture	47	47
Identify an appropriate description of the texture of a recorded excerpt	50*	44
Identify correct time signature for recorded excerpt	42	43
Identify the name of a pitch shown in the treble clef	42	41
Identify an octave interval in a printed score	37	38
Identify the term for fermata symbol	38*	33
Identify which voices enter first in a choral excerpt	32	28
Identify the quality of a triad in a printed score	15*	21

\* Significantly different ( $p < .05$ ) from 2008.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1997 and 2008 Arts Assessments.

**Table A-4. Percentage correct for multiple-choice questions in NAEP visual arts at grade 8: 1997 and 2008**

Question description	Percent correct	
	1997	2008
<b>Overall</b>	<b>42</b>	<b>42</b>
Identify purpose of insulating package material	61	62
Identify an example of 20th-century western art	55	59
Infer from photograph advantages of shrink-wrap packaging	57	57
Identify an example of a Renaissance painting	48	50
Identify compositional emphasis in a Bearden collage	49	46
Identify genre of a Bearden collage	34	37
Identify a technical similarity between Schiele and Kollwitz self-portraits	36	37
Identify an important compositional aspect of a Kollwitz self-portrait	40	37
Identify a stylistic emphasis in a Bearden collage	29	35
Identify a compositional feature of a medieval artwork	39*	32
Identify the style of an artwork as surrealism	27	31
Identify an artistic style that influenced cubism	25	23

\* Significantly different ( $p < .05$ ) from 2008.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1997 and 2008 Arts Assessments.

**Table A-5. Percentage of students in NAEP arts assessment at grade 8, by selected student and school characteristics: 2008**

Student and school characteristics	Music	Visual arts
<b>Race/ethnicity</b>		
White	61	61
Black	15	14
Hispanic	18	17
Asian/Pacific Islander	5	5
American Indian/Alaska Native	1	2
Unclassified	1	1
<b>Gender</b>		
Male	50	51
Female	50	49
<b>Eligibility for free/reduced-price school lunch</b>		
Eligible	36	37
Not eligible	57	56
Information not available	7	8
<b>Type of school</b>		
Public	93	92
Private	7	8
<b>School location</b>		
City	29	29
Suburb	37	36
Town	12	13
Rural	22	22

NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2008 Arts Assessment.

**Table A-6. Percentage of students with disabilities (SD) and/or English language learners (ELL) identified, excluded, and assessed in NAEP music and visual arts at grade 8, as a percentage of all students: 2008**

Student characteristics	Music	Visual arts
<b>SD and/or ELL</b>		
Identified	17	17
Excluded	2	2
Assessed	15	16
Without accommodations	6	6
With accommodations	8	10
<b>SD</b>		
Identified	12	12
Excluded	1	2
Assessed	10	11
Without accommodations	3	2
With accommodations	7	8
<b>ELL</b>		
Identified	6	6
Excluded	1	1
Assessed	5	6
Without accommodations	4	4
With accommodations	2	2

NOTE: Students identified as both SD and ELL were counted only once under the combined SD and/or ELL category, but were counted separately under the SD and ELL categories. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2008 Arts Assessment.



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