

SUPPORTING STATEMENT
Part A

NATIONAL SURVEY OF TEACHERS OF
ALGEBRA

FOR THE
NATIONAL MATHEMATICS ADVISORY
PANEL

National Mathematics Advisory Panel
U.S. Department of Education

March 28, 2007

TABLE OF CONTENTS

Introduction

Section A: Justification	
A.1. Necessity for Information Collection.....	3
A.2. Uses of Information.....	3
A.3. Use of Information Technology.....	4
A.4. Efforts to Identify Duplication.....	4
A.5. Method Used to Minimize Burden on Small Businesses.....	4
A.6. Consequences of Less Frequent Data Collection.....	4
A.7. Special Circumstances.....	4
A.8. Consultations Outside the Agency.....	5
A.9. Payment of Gifts to Respondents.....	5
A.10. Assurance of Confidentiality.....	6
A.11. Justification for Sensitive Questions.....	6
A.12. Estimates of Hour Burden to Respondents.....	6
A.13. Estimates of Cost Burden to Respondents.....	6
A.14. Cost Burden to Federal Government.....	7
A.15. Reason for Program Changes or Cost Adjustments.....	7
A.16. Project Schedule.....	7
A.17. Display of OMB Expiration Date.....	8
A.18. Exception to the Certification Process.....	8

LIST OF ATTACHMENTS

- Attachment 1: Proposed Questionnaire
- Attachment 2: Federal Register Announcement
- Attachment 3: Proposed Contact Letters for Sampled Teachers
- Attachment 4: Confidentiality Assurances and Protective Measures

INTRODUCTION

The National Mathematics Advisory Panel (Panel) was established within the Department of Education as part of the President's *American Competitiveness Initiative* through Executive Order 13398, April 18, 2006, with the requirement to complete its charge and submit a final report by February 29, 2008.

The Panel's precise charge, set forth in the Executive Order, is to advise the President and the U.S. Secretary of Education on means "...to foster greater knowledge of and improved performance in mathematics among American students...with respect to the conduct, evaluation, and effective use of the results of research relating to proven effective and evidence-based mathematics instruction." Further, the Executive Order defines a particular set of topics for the Panel to examine:

- a) the critical skills and skill progressions for students to acquire competence in algebra and readiness for higher levels of mathematics;
- b) the role and appropriate design of standards and assessment in promoting mathematical competence;
- c) the processes by which students of various abilities and backgrounds learn mathematics;
- d) instructional practices, programs, and materials that are effective for improving mathematics learning;
- e) the training, selection, placement, and professional development of teachers of mathematics in order to enhance students' learning of mathematics;
- f) the role and appropriate design of systems for delivering instruction in mathematics that combine the different elements of learning processes, curricula, instruction, teacher training and support, and standards, assessments, and accountability;
- g) needs for research in support of mathematics education;
- h) ideas for strengthening capabilities to teach children and youth basic mathematics, geometry, algebra, and calculus and other mathematical disciplines;
- i) such other matters relating to mathematics education as the Panel deems appropriate; and
- j) such other matters relating to mathematics education as the Secretary may require.

Item (a) in the President's list clearly indicates that the Panel's focus should be on the preparation of students for entry into and success in algebra, which itself is a foundation for higher mathematics. Thus, the Panel sees its role as addressing aspects of teaching and learning in mathematics in preparation for and understanding of algebra.

With this goal at the forefront, the Panel intends to conduct a national survey of public school algebra teachers currently teaching during 2007 spring semester. It is essential that the Panel understand current, day-to-day experiences of algebra teachers in public school classrooms

across the nation to obtain thought-provoking, revealing information and to conduct further research. And because learning algebra is so often a turning point in a student's math education – when the student either thrives and moves forward or struggles and perhaps gives up on math – algebra teachers can offer a unique perspective on math education that is well worth understanding in some detail.

This survey will capture teachers' detailed observations on student preparation, motivation, work habits, and skills – as well as their insights on how math is now taught, how earlier math education could be improved to better prepare children to succeed at algebra, and what would help all math teachers do a better job. This survey will also explore the degree to which algebra teachers nationwide share concerns motivating many in national leadership – (i) a broad dissatisfaction with the math skills of American students overall and (ii) a deep unease about achievement gaps between poorer minority students vs. more affluent white ones. This survey will illuminate the experiences of algebra teachers in different kinds of school systems – for example, low-income, mainly minority schools vs. higher income, mainly white schools.

SECTION A: JUSTIFICATION

This request is for OMB clearance for six months for the National Survey of Algebra Teachers (NSAT). This request is for a new data collection. The questionnaire is presented as Attachment 1.

A.1. Necessity for Information Collection

The National Survey of Teachers of Algebra (NSTA) is sponsored by the U.S. Department of Education (USED) in support of the National Mathematics Advisory Panel. USED has monitoring responsibility for the data collection project, which is being conducted under contract by the National Opinion Research Center (NORC), affiliated with the University of Chicago.

Statutory authority for collection of information for this project comes through the Presidential Executive Order 13398 of April 18, 2006 (Attachment 4) that charges the Department of Education through a National Mathematics Advisory Panel to advise the President and the Secretary of Education "...on means to implement ...policy" to "foster greater knowledge of and improved performance in mathematics among American students," particularly the strengthening of capabilities in the teaching and learning of algebra.

The National Mathematics Advisory Panel has conducted a series of public hearings on algebra education and other topics in mathematics education over the past several months, and there exists a clear gap in the information being gathered that includes input from algebra teachers on how they view their profession, current teaching situations, and the preparation of the students they teach. The NSTA is critical in order to fill this void of information not available through any other sources and to provide information about algebra teachers' views of the main challenges they face and how best to address them. To meet this critical need, the NSTA is designed to select a nationally-representative sample of algebra teachers and to administer a standardized questionnaire to them. The questionnaire has been constructed to collect information about how well students are prepared to succeed in algebra I classes, and how algebra courses might be improved to increase student success.

A.2. Uses of Information

The NSTA will be conducted just once (in spring 2007) and is designed to provide timely information on algebra curriculum and instruction and student preparation from a national sample of public school teachers of algebra I. There is little burden on the respondents and the resulting information will be used extensively and exclusively by the National Mathematics Advisory Panel to formulate and refine their recommendations on how to improve math education to place in their final report to the President and Secretary of Education in February 2008.

The NSTA will be the only data source that provides information on the challenges faced by a nationally-representative sample of public school algebra teachers. The resulting information

will be an essential and valuable resource for the National Mathematics Advisory Panel that will subsequently affect researchers and local, state, and other federal policymakers concerned with mathematics education.

A.3. Consideration of Using Improved Technology

The data will be collected by means of a mailed questionnaire, and teachers will be prompted to respond via mailed letters, phone reminders, and e-mailed notes. The proposed questionnaire is included in Attachment 1.

The pros and cons of implementing a Web-based data collection system for the survey were examined by the data contractor, NORC at the University of Chicago, and a decision was made not to invest in that technology for this particular survey. The advantages of Web-based data collection are lower costs of data entry and lower postal costs. Arguing against it were the lower response rates likely to result from requiring teachers to take the additional effort to connect to the internet and type in the URL and PIN/password information, compounded by the possibility that some portion of the teachers would not have easy internet access at school. While some cost savings might be realized, the savings would be fairly small and the risk of lower response rates is great enough to argue against implementing this mode.

In addition, each teacher will be mailed a check for agreeing to complete the survey. A mailing would go out to each teacher and these costs would be incurred anyway. Therefore, NORC will mail the paper survey to each teacher and at the same time include the check for participating in survey to increase the response rate as mentioned above.

A.4. Efforts to Identify Duplication

The National Mathematics Advisory Panel and NORC have reviewed other governmental surveys of teachers. At the present time, no survey gathers identical or similar information from a nationally-representative sample of teachers of algebra.

A.5. Efforts to Minimize Burden on Small Business

Not applicable. The NSTA will not collect information from small businesses.

A.6. Consequences of Less Frequent Data Collection

Not applicable. The NSTA will be conducted only once, in spring 2007, with no plans at this point to conduct follow up or replication studies.

A.7. Special Circumstances

The NSTA will not involve any special circumstances that require extraordinary burden on respondents or that deviate from valid statistical practice. Specifically, the NSTA will not require respondents to:

- report information to the USED more than quarterly;
- prepare a written response in fewer than 30 days after receipt;
- submit more than an original and two copies of any document;
- retain records for more than three years;
- submit proprietary trade secrets or other confidential information without procedures to protect confidentiality to the extent permitted by law.

In addition, the NSTA:

- is designed to produce valid and reliable results that can be generalized to the universe of the study;
- does not require the use of a statistical data classification that has not been reviewed and approved by OMB;
- includes a pledge of confidentiality that is supported by authority established in statute of regulation (the Privacy Act), is supported by disclosure and data security policies, and does not impede sharing of data with other sponsoring agencies for confidential use.

A.8. Federal Register Announcement and Consultations Outside the Agency

The Federal Register announcement for the NSTA is being submitted along with this Supporting Statement (see Attachment 2). No comments have been submitted at this time.

A.9. Payment or Gifts to Respondents

The NSTA will send a check for \$20 to each individual teacher who receives a survey; these payments will be sent with the survey and will not be contingent upon response. The total amount of incentives for the project will be \$20,000.

Support for providing incentives is found in studies showing that when used appropriately, incentives are a cost-effective means of significantly increasing response rates (e.g., Dillman, 1978). As Groves, Cialdini, and Couper (1992) note, people feel obligated to reward positive behavior (such as being provided with an incentive) with positive behavior in return—in the current context, such positive return behavior would be defined as a completed survey. Surveys that use incentives can actually be less expensive than those that do not. Respondent incentives

can substantially increase cooperation rates and may make the survey less expensive if they result in less need for callbacks or lower missing-data rates.

Information and experience in conducting the following two studies adds to the need for and recommended process to obtain successful response rates. These studies include:

- the 2006-2007 school year Secondary Mathematics Teacher Survey for the National Longitudinal Study of No Child Left Behind (NLS-NCLB) and
- the base year (2002) survey of high school sophomores' mathematics teachers included in the Educational Longitudinal Study of 2002 (ELS: 2002)

A.10. Assurance of Confidentiality

The NSTA will be collected in conformance with the Privacy Act of 1974, including the section of the Privacy Act requiring notification of the respondent concerning the uses to be made of the data and the voluntary nature of his/her responses.

The proposed NSTA questionnaire (see Attachment 1) contains an explicit statement that the information collected will be protected under the Privacy Act of 1974. The statement indicates that the data will be used for statistical purposes only and also cites the specific circumstances under which identifying data may be released. Specific procedures for protecting both hard copy and electronic data are used by NORC (see Attachment 4). Data files with personal identifiers will not be provided to USED or any other agency. No one outside of NORC can obtain data files with direct identifiers such as names, phone numbers, and addresses. The National Mathematics Advisory Panel and any collaborating researchers can obtain microdata on selected variables (but no direct identifiers) only by executing a License Agreement between USED, the individual researcher(s), and their employer(s) assuring that information will only be used for statistical and research purposes.

A.11. Justification for Sensitive Questions

There are no sensitive questions asked in this survey.

A.12. Estimate of Respondent Burden

The NSTA is a sample of about 1,000 public school algebra I teachers in the spring of 2007. A response rate of 80 percent is anticipated. The resulting number of completed responses is expected to be approximately 800. The time to complete the questionnaire is estimated at 25 minutes, based on the results of cognitive interviews and staff testing with the proposed questionnaire form. Therefore, the entire information burden for the respondents is estimated to be 333 hours. Time for each principal is estimated to be 10 minutes. For 300 principals the

estimated burden is 50 hours. Total estimated burden for this information collection is 383 hours.

The total cost to all respondents for this data collection is estimated to be \$9,324-- based on the estimated 333 response burden hours times \$28.00 per hour. The \$28.00 estimate is derived from data indicating the median income of public secondary school teachers was \$58,240 ($\$58,240/52\text{weeks}/40\text{hours} = \28.00). For each individual respondent, the cost is approximately under \$14 given that the survey will take less than 30 minutes (half of the \$28.00 average hourly wage). Incentives to each teacher will be \$20.00. For the cost of the principals' time at \$40 per hour is ($\40×50 hours) is estimated at \$2000. Combined estimated cost is \$11,324.

A.13. Cost Burden to Respondents

There is no cost to the NSTA respondents other than the burden hour cost noted in A.12. Respondents need not purchase, operate, or maintain capital equipment, software, or storage facilities.

A.14. Cost to the Federal Government

The cost to the Federal Government for this annual data collection is approximately \$200,000. This amount was determined by adding to the recently negotiated contract cost for the 2007 NSTA (\$150,000), a federal staff salary and related overhead costs of \$50,000 (2 FTE plus overhead) for the USED COTR and CO.

A.15. Program Changes or Adjustments

There is a program change of 383 burden hours since this is a new collection.

A.16. Tabulation and Publication Plans and Project Schedule

The results of the NSTA will be disseminated in a report to the President due not later than February 2008.

As noted above, microdata will also be disseminated to the National Math Panel and their collaborating researchers (with legal licenses) in order to conduct additional analyses. These analyses, in turn, are expected to result in reports and other publications further disseminating the data. Finally, it is anticipated that substantive analyses of the NSTA data will be presented by National Mathematics Advisory Panel members or designated representatives at appropriate professional meetings, such as the annual meetings of the American Education Research Association, the American Sociological Association, etc.

The survey form will be mailed to the sampled teachers in early April 2007. Returned survey forms received by June 30, 2007 will be edited, coded, and data-entered. Data from the NSTA will be released to the National Mathematics Panel by July 16, 2007. NORC research staff will tabulate the data and produce a report for the National Panel by August 2007. NORC will provide a final presentation of the survey data to the National Mathematics Advisory Panel for the September 2007 public meeting.

Project Schedule

The 2007 project survey schedule follows.

Phase	Time
Sample selection and recruitment	March 2007
OMB clearance approval	April 2007
Mailing of questionnaires to teachers	April 2007
Data collection close-out	June 30, 2007
Preparation of data file	July 2007
Production of tabulations	August 2007
Final Report to USED	September 2007

A.17. Display of OMB Expiration Date

The OMB Expiration Date will be displayed, as indicated.

A.18. Exception to the Certification Statement

The NSTA will comply with the certification statement on form OMB 83 1.

ATTACHMENT 1: PROPOSED 2007 QUESTIONNAIRE

ATTACHMENT 2:

Proposed Federal Register Announcement:

NATIONAL SURVEY OF TEACHERS OF ALGEBRA

The National Mathematics Advisory Panel (Panel), established within the Department of Education as part of the President's *American Competitiveness Initiative* through Executive Order 13398, April 18, 2006, intends to conduct a national survey of algebra teachers currently teaching during 2007 spring semester. Through this survey, the Panel seeks to understand day-to-day experiences of algebra teachers in public school classrooms across the nation to obtain thought-provoking, revealing information and to conduct further research. Because learning algebra is so often a turning point in a student's math education – when the student either thrives and moves forward or struggles and perhaps gives up on math – algebra teachers can offer a unique perspective on math education that is well worth understanding in some detail.

ATTACHMENT 3:

ATTACHMENT 4: AUTHORIZING LEGISLATION OF SPONSORING AGENCY

ATTACHMENT 5: FEDERAL REGISTER ANNOUNCEMENT