IES Institute of Education Sciences

# Research Grants Focused on NAEP Process Data for Learners with Disabilities

CFDA Number: 84.324P

U.S. DEPARTMENT OF EDUCATION

*A Product of the National Center for Special Education Research*

| | | |
|---|---|---|
| **Letter of Intent Due:** | June 11, 2020 | https://iesreview.ed.gov/LOI/LOISubmit |
| **Application Package Available:** | June 11, 2020 | https://www.grants.gov/ |
| **IES Submission Guide Available:** | April 1, 2020 | https://ies.ed.gov/funding/pdf/submissionguide.pdf |
| **Application Deadline:** | 11:59:59 p.m. Eastern Time on August 20, 2020 | https://www.grants.gov/ |
| **Possible Start Dates:** | July 1 - September 1, 2021 | |

# Table of Contents

# Part I: Overview and General Requirements

## A. Introduction

The Institute of Education Sciences (IES) provides scientific evidence to improve education practice and policy and shares that evidence in a way that can be used by educators, parents, policymakers, researchers, and the public.

Within IES, the National Center for Special Education Research (NCSER) sponsors research to

(1) Expand knowledge and understanding of the needs of infants, toddlers, and children with disabilities in order to improve the developmental, educational, and transitional outcomes of such individuals
(2) Improve services provided under, and support the implementation of, the Individuals with Disabilities Education Act (20 U.S.C. 1400 et seq.)

Also within IES, the National Center for Education Statistics (NCES) is the primary federal entity for collecting and analyzing data related to education, including the National Assessment of Educational Progress (NAEP), an assessment of what U.S. elementary and secondary learners know and can do in academic subjects.

In eighth grade mathematics in 2017, the focus of this competition, 38% of students without disabilities scored at *NAEP Proficient* or above while 25 percent scored below *NAEP Basic* on the assessment. However, for students with disabilities, math achievement levels are much worse. Only about 9% scored at *NAEP Proficient* or above whereas 69% scored below *NAEP Basic*. Research that explores how learners with disabilities interact with NAEP is needed so that we can better support these learners in test-taking environments and obtain information that may be used to inform instructional practices.

The most recent administrations of NAEP have captured a variety of process data, including learners' key strokes as they progress through the assessment, how they use tools made available to all learners (such as the calculator), and how accommodations (for example, text-to-speech or more time to complete the assessment) affect performance. Besides score data, NAEP also includes survey data from learners, teachers, and schools, and information on test item characteristics. Together these data provide a unique opportunity for researchers to conduct an in-depth investigation of the test-taking behavior and the mathematics competencies of learners with disabilities compared to their peers without disabilities.

### 1. *Research Grants Focused on NAEP Process Data for Learners with Disabilities (CFDA 84.324P)*

In this Request for Applications (RFA), IES invites applications to conduct research focused on NAEP Process Data for Learners with Disabilities (NAEP-P). The goal of this competition is to use data from the 2017 eighth grade NAEP mathematics assessment to generate evidence that improves our understanding of the link between test-taking behavior and mathematics performance for learners with disabilities and contributes to the larger body of evidence on improving mathematics outcomes for these learners. Results are expected to improve the future development and administration of digital

learning assessments, identify needed enhancements to mathematics instruction, and highlight areas where further research is needed.

Projects may address a variety of questions. For example –

- What are common problem-solving patterns for learners with disabilities and how do they relate to math performance?
- Are certain accommodations associated with higher overall math performance?
- What is the difference in math performance for learners with disabilities who use extra time versus those who do not?
- What types of learners are most likely to benefit from universal design elements included in NAEP (such a text-to-speech) and other tools (such as calculators)?

To encourage rigorous education research that is transparent, actionable, and focused on consequential outcomes, all NAEP-P applications are expected to follow the principles outlined in the IES-wide Standards for Excellence in Education Research (SEER; https://ies.ed.gov/seer), as applicable. Examples of these principles include pre-registering studies; focusing on outcomes meaningful to learner success; facilitating generalization of study findings; and making research findings, methods, and data available to others.

These NAEP process data are released under a restricted-use data license. More information about the restricted-use files is provided in Part III. For this competition, all awards will be made as cooperative agreements to support IES involvement in the planning and implementation of research activities.

IES will consider only applications that are compliant and responsive to the requirements described in this Request for Applications (RFA) *and* submitted electronically via Grants.gov by the stated deadline.

## 2. *RFA Organization and the IES Application Submission Guide*

In order to submit a compliant, responsive, and timely application, you will need to review two documents:

- This RFA is organized as follows. Part I sets out the general requirements for a grant application. Parts II and III provide further detail on the requirements, including details about the NAEP assessments and process data. Part IV provides information about other narrative content for the application, including required appendices. Part V provides general information on competition regulations and the review process. Part VI provides **a checklist to ensure you have included all required application elements to advance to scientific peer review**. Part VII provides the topic code for this competition.
- *The IES Application Submission Guide* (https://ies.ed.gov/funding/pdf/submissionguide.pdf) for important information about submission procedures and IES-specific guidance and recommendations to help you ensure your application is complete and received without errors on time through Grants.gov.

## 3. Eligibility Information

Institutions that have the ability and capacity to conduct scientific research are eligible to apply. Eligible applicants include, but are not limited to, non-profit and for-profit organizations, and public and private agencies and institutions, such as colleges and universities.

Broadening Participation in the Education Sciences: IES is interested in broadening institutional participation in its research grant programs. IES encourages applications from minority-serving institutions (MSIs), alone or in combination with other institutions, that meet the eligibility criteria for this RFA. MSIs include Alaska Native and Native Hawaiian-Serving Institutions; American Indian Tribally Controlled Colleges and Universities; Asian American and Native American Pacific Islander-Serving Institutions; Hispanic-Serving Institutions; Historically Black Colleges and Universities; Native American-Serving, Nontribal Institutions; and Predominantly Black Institutions.

The Principal Investigator (PI): The institution is responsible for identifying the principal investigator (PI) on a grant application and may elect to designate more than one person to serve in this role. The PI is the individual who has the authority and responsibility for the proper conduct of the research, including the appropriate use of federal funds and the submission of required scientific progress reports.

- If more than one PI is named, the institution identifies these PIs as sharing the authority and responsibility for leading and directing the research project intellectually and logistically. All PIs will be listed on any grant award notification. However, institutions applying for funding must designate a single point of contact for the project. The role of this person is primarily for communication purposes on the scientific and related budgetary aspects of the project and should be listed as the PI. All other PIs should be listed as co-principal investigators (Co-PIs).

Please note: In order to be eligible to apply, applicants must have or applied for the NAEP process data restricted-use license for the 2017 eighth grade NAEP mathematics assessment. Before an award can be made, the applicant must document their receipt of the restricted-use data license.

## 4. Technical Assistance for Applicants

IES provides technical assistance to applicants that addresses the appropriateness of project ideas for this competition and methodological and other substantive issues concerning this competition. IES program officers work with applicants though a variety of formats up until the time of Grants.gov submission. The program officer for this competition is

> Dr. Sarah Brasiel
> Email: Sarah.Brasiel@ed.gov
> Telephone: (202) 245-6734

If you submit a Letter of Intent (LOI) on the IES Review webpage (https://iesreview.ed.gov), a program officer will contact you regarding your proposed project. IES also provides funding opportunity resources, including webinars (https://ies.ed.gov/funding/webinars/index.asp) that include advice on choosing the correct competition, grant writing, and submitting your application. Two of these webinars, as well as supporting documents, focus on content related to this 84.324P competition, which we strongly encourage you to review. In addition, IES held a Technical Working Group (TWG) on

March 18, 2020 on the topic of using NAEP Process Data for Students with Disabilities. The summary from this TWG meeting includes an appendix with short briefs written by the invited experts. This summary is available on the IES website for TWG Meeting Summaries (https://ies.ed.gov/ncser/whatsnew/techworkinggroup/).

# B. Getting Started

## *1. Documents Needed*

In order to submit a compliant, responsive, and timely application, you will need to review two documents:

1. This **RFA** to learn how to prepare an application that is compliant and responsive to the requirements. Section VI of the RFA provides a checklist that you can use to ensure you have included all required application elements to advance to scientific peer review.

2. The **IES Application Submission Guide** (https://ies.ed.gov/funding/pdf/submissionguide.pdf) for important information about submission procedures and IES-specific guidance and recommendations to help you ensure your application is complete and received on time without errors through Grants.gov.

We strongly recommend that both the PI and the authorized organization representative (AOR) read both documents.

## *2. Ensuring Your Application is Forwarded for Scientific Peer Review*

**Only compliant and responsive applications received before the date and time deadline are peer reviewed for scientific merit**. The PI and the AOR should work together to ensure that the application meets these criteria.

### *(a) On-time submission*
See the separate IES Application Submission Guide (https://ies.ed.gov/funding/pdf/submissionguide.pdf).
- Received and validated by Grants.gov **no later than** 11:59:59 p.m. Eastern Time on August 20, 2020.

### *(b) Compliance*
- Includes the required project narrative (see RFA Part II)
- Adheres to all formatting requirements (see RFA Part IV )
- Adheres to all page limit maximums for the project narratives and appendices. IES will remove any pages above the maximum before forwarding an application for peer review
- Includes all required appendices (see RFA Part IV)
  - o Appendix A: Dissemination History and Plan
  - o Appendix F: Data Management Plan

### *(c) Responsiveness*
- Meets **General Requirements** for all applications (see RFA Part I)
  - o Learners with Disabilities

- o Use of NAEP Data (including process, test item, and survey data described in Part III)
- o Use of Learner Outcomes Data (including outcomes such as performance on an individual item, number of correct items for a block of items or subscale of the assessment, or the NAEP proficiency level)
- Meets **Project Narrative Requirements** (see RFA Part II).

# C. General Requirements

Applications to the NAEP-P program **must meet the requirements** set out in this section in order to be sent forward for scientific peer review.

## 1. *Learners with Disabilities*

*Requirement*: All research supported under the NAEP-P program **must** focus on learners with disabilities.

For the purpose of this RFA, a learner with a disability is defined in Public Law 108-446 (https://sites.ed.gov/idea/statute-chapter-33/subchapter-I/1401), the Individuals with Disabilities Education Improvement Act of 2004 (IDEA), as a child "(i) with mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance (referred to in this title as 'emotional disturbance'), orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities; and (ii) who, by reason thereof, needs special education and related services" (Part A, Sec. 602).

Section 504 of the Rehabilitation Act of 1973, Pub. L. No. 93-112, 87 Stat. 394, codified at 29 U.S.C. § 701 et seq., is legislation that guarantees certain rights to people with disabilities. Students with 504 plans can be included in your sample if appropriate for the research questions. For example, the research may look at the use of accommodations by students with a 504 plan.

Learners without disabilities may be included in your sample if appropriate for the research questions. For example, the research may compare test-taking behavior and mathematics performance of learners with disabilities to those without disabilities who completed the same items on the assessment.

## 2. *NAEP Data*

*Requirement:* The proposed study **must** include NAEP process data and other NAEP data to understand learner test-taking behavior and mathematics performance. In addition to process data, other NAEP data includes the learner outcome data described below, survey data, demographic data, and more.

- Additional detail on the available data is provided in the NAEP Mathematics Glossary Appendix at the end of this RFA.

### 3.  *Learner Outcomes*

*Requirement:* All research supported under the NAEP-P program **must** address mathematics outcomes for learners with disabilities, such as performance on an individual item, number of correct items for a block of items, or the NAEP proficiency level.

### 4. *Dissemination History and Plan*

*Requirement:* All NAEP-P applications **must include** a description of their history with disseminating results from past research and a plan to disseminate project findings in Appendix A: Dissemination History and Plan of the application. IES is committed to making the results of IES-funded research available to a wide range of audiences (see IES Policy Regarding Public Access to Research; http://ies.ed.gov/funding/researchaccess.asp). Therefore, peer reviewers will score Dissemination as a separate criterion in the review process. **Applications that do not contain a Dissemination History and Plan in Appendix A will not be peer reviewed.**

## D. Award Limits

*Requirement:* Applications to the NAEP-P program **must** conform to the following limits on award duration and cost. Budgets should align with proposed project activities.

| Type of Research | Maximum Duration | Maximum Grant Award |
|---|---|---|
| NAEP-P | 30 months | $700,000 |

# Part II: Specific Requirements and Recommendations

## A. Requirements

In addition to the **General Requirements** above, applications **must meet the requirements set out under (1) Project Narrative, and (2) Data Management Plan** in order to be responsive and sent forward for scientific peer review. The requirements are the minimum necessary for an application to be sent forward for scientific peer review. In order to improve the quality of your application, IES offers recommendations following each set of requirements.

### 1. Project Narrative

The project narrative must adhere to the formatting guidelines (see RFA Part IV.B) and be no more than 22 pages. If the narrative exceeds this page limit, IES will remove any pages after the 22<sup>nd</sup> page of the narrative. The project narrative **must** include four sections explaining the rationale and plan for conducting your project - Significance, Research Plan, Personnel, and Resources.

#### (a) Significance
The purpose of this section is to explain the importance of the proposed study and the questions that you plan to investigate.

You **must describe**
- the NAEP process variables you plan to study
- the variables from other available NAEP data, including learner outcomes

#### (b) Research Plan
The purpose of this section is to describe your research design and methods and demonstrate how they will allow you to address your research questions.

You **must describe**
- the sample
- the research design and methods
- the data analysis procedures

#### (c) Personnel
The purpose of this section is to demonstrate that your team possesses the appropriate training and experience for the research and dissemination you propose and will commit enough time to the project.

You **must describe** your project team.

#### (d) Resources

The purpose of this section is to demonstrate how you have the institutional capacity and access to resources needed to execute the project and disseminate findings.

You **must describe** your resources to conduct the project.

You **must include** acknowledgement that you have the restricted-use license or have applied for the restricted-use license for the 2017 eighth grade NAEP mathematics assessment.

### *2. Data Management Plan*

All NAEP-P applications **must include** a [data management plan (DMP) placed in Appendix F](). Your DMP describes your plans for making the research data from the proposed project accessible to others while adhering to the NCES restricted-use data agreement. IES program officers will be responsible for reviewing the completeness of the proposed DMP and it is not considered in the review of scientific merit of your application. If your application is being considered for funding based on the scores received during the scientific peer review process but your DMP is determined incomplete, you will be required to provide additional detail regarding your DMP. See the Recommendations for Strong Applications section below for additional detail regarding your DMP.

## B. Award Limits

Applications **must** conform to the following limits on duration and cost.

### *1. Duration Maximums*

The maximum duration of a NAEP-P project is **30 months**.

### *2. Cost Maximums*

The maximum award for a NAEP-P project is **$700,000** (total cost = direct costs + indirect costs).

## C. Recommendations for Strong Applications

These recommendations are intended to improve the quality of your application and the peer reviewers are asked to consider these recommendations in their evaluation of your application.

### *1. Significance*

Describe the NAEP process data variables you plan to explore, including the relationships you expect them to have with NAEP mathematics outcomes based on theory and prior research.

Describe and justify any variables that need to be created using NAEP data.

Justify the practical and theoretical importance of the proposed work, including how it expands our understanding of test-taking behavior and mathematics performance of learners with disabilities.

Discuss how the results of this project will inform assessment and/or instructional practice for learners with disabilities.

In [Appendix A: Dissemination Plan](), discuss how you will make the results of your proposed research available to a wide range of audiences.

## 2. Research Plan

Specify the research questions and how they are motivated by the information provided in your Significance section.

Provide a timeline for each step in your project, including obtaining access to the NAEP data, sample selection, data coding and creation of new variables, data mining and analyses, and dissemination. Timeline tables or figures should be placed in either the project narrative or Appendix C: Supplemental Charts, Tables, and Figures. However, discussion of your project's timeline is only allowed in the project narrative.

### (a) Sample and Setting

Describe the target population.

Describe and justify sample inclusion and exclusion criteria and discuss how they will affect your ability to generalize to your target population.

Describe any limitations known about the data for this sample.

### (b) Research Design and Methods

Describe your research design with enough detail to demonstrate how it will address your research questions and how it accounts for the complexity of the NAEP data as a large-scale assessment in which no student is tested on the entirety of the full assessment.

*Data analysis plan*:
Make clear how the data analyses directly answer your research questions.

Detail your data analysis procedures for all research questions.

Address any clustering of learners in schools.

Discuss how missing data will be handled in your analysis.

Detail the specific data mining or machine learning approaches that will be used with the process data.

- IES is interested in innovative approaches to analyzing the process data, such as data mining or machine learning methods that are used by data scientists. These approaches can be used in addition to more traditional approaches.

If you intend to link multiple datasets, provide sufficient detail for reviewers to judge the feasibility of the linking plan.

### (c) Personnel

Identify and describe expertise and qualifications of the project team at the primary applicant institution and at any subaward institutions.

In its research grant programs, IES is interested in including individuals from groups that have typically been underrepresented in the education sciences. Describe the backgrounds and experiences of the project team members in light of this.

Describe how the background and experience of the project team supports the successful conduct of the proposed work.

Describe which members of the project team will carry out your plans to disseminate results as described in the required Dissemination Plan in [Appendix A. Dissemination History and Plan](#).

Discuss any practical and theoretical contributions made by previous work in using data mining or machine learning, especially any work that included learners with disabilities.

Discuss any practical and theoretical contributions made by previous work in mathematics education research and assessment research.

Provide a plan for how key personnel will maintain their objectivity in conducting the proposed research and dissemination activities.

Identify the management structure and procedures that will be used to keep the project on track and ensure the quality of its work, including
- Roles and responsibilities of personnel on the project
- Proportion of time personnel will devote to the project, expressed as percent effort over a 12-month calendar year

If key personnel have previously received one or more IES grants, briefly discuss the outcomes of that research, including products developed or tested and how the project's findings and products were disseminated, in order to demonstrate your ability to produce and disseminate project outcomes consistent with the mission of IES.

If key personnel have previously conducted research using a restricted-use data file, briefly discuss the outcomes of that research and its relevance to the current proposed project in order to demonstrate your ability to obtain access to restricted-use data, appropriately manage and store restricted-use data, and conduct analyses with such data.

Describe additional personnel at the primary applicant institution and any subaward institutions along with any consultants, including personnel who will coordinate data coding and analysis and personnel who will assist in carrying out the data management plan.

### *(d) Resources*
Describe your institution's capacity to manage a grant of this size.

Describe your access to resources available at the primary institution and any subaward institutions.

Describe your plan for acquiring any resources that are not currently accessible, will require significant expenditures, and are necessary for the successful completion of the project.

Describe your plan for accessing the NAEP restricted-use data license, storage of that data, and plan for providing access to the research team and other personnel as needed.

Describe your resources, including access to specific offices and organizations, to carry out your plans to disseminate results as described in the required Dissemination Plan in Appendix A: Dissemination History and Plan.[1]

When the PI and the AOR sign the cover page of the grant application, they will be assuring compliance with IES policy on data sharing as well as other policies and regulations governing research awards. Once the DMP is approved by IES, the PI and the institution are required to carry it out and to report progress and problems through the regular reporting channels. Compliance with IES data sharing requirements is expected even though the final dataset may not be completed and prepared for data sharing until after the grant has been completed. In cases where the PI/grantee is non-compliant with the requirements of the data sharing policy or DMP, subsequent awards to individuals or institutions may be affected. By addressing the items identified below, your DMP describes how you will meet the requirements of the IES policy for data sharing. Please note that the NAEP data is available through a restricted-use data license. Once the data is received, it cannot be shared. However, the code you use to create variables and conduct analyses can be shared.

The DMP should include the following:

- Identification of the education repository where you will pre-register your study in the first year of the study following the Standards for Excellence in Education Research (SEER; https://ies.ed.gov/seer) such as the Open Science Framework (https://osf.io/).

- Type of analytic code to be shared, such as code for creating new variables from the NAEP data and code used in data analysis to address the research questions

- Method for accessing the analytic code by those interested in using it

- Roles and responsibilities of project or institutional staff in the management and retention of research data, including a discussion of any changes to the roles and responsibilities that will occur should the principal investigator and/or co-principal investigators leave the project or their institution

The costs of the DMP can be covered by the grant and should be included in the budget and explained in the budget narrative. IES program officers will be responsible for reviewing the completeness of the proposed DMP. If your application is being considered for funding based on the scores received during the scientific review process but your DMP is determined incomplete, you will be required to provide additional detail regarding your DMP.

---

[1] Resources that may be of interest to researchers in developing a data management plan can be found at https://ies.ed.gov/funding/datasharing_policy.asp.

# Part III: NAEP Data

## A. Background

In this section we provide background on the NAEP assessments and the data that will be made available as restricted-use files for the purpose of this grant program.

NAEP was originally administered as a paper and pencil assessment; however, due to the growing role of technology in classrooms, NCES decided to transition administration of the assessments into a digital platform. The first operational digitally based administration of NAEP in reading and mathematics at grades 4 and 8 took place in 2017. The assessment was administered on Microsoft Surface Pro tablets with attached keyboard and mouse, stylus, and earbuds supplied by the NAEP administrators. The platform used to administer the NAEP is referred to as eNAEP. For more information on the administration of digitally based NAEP, please see https://nces.ed.gov/nationsreportcard/dba/.

One of the benefits of digitally based assessments is that universal design principles can be implemented to better meet the needs of all learners, including those with disabilities. In the NAEP assessment, these include
- font size adjustment
- text-to-speech (test questions read aloud)
- increased contrast (for readability)

There are also digital tools available for all students to use, which include
- highlighter tool
- rulers
- digital calculators
- interactive graphs
- equation editor (on relevant items)

In addition, the testing administrator can provide additional accommodations based on each learner's Individualized Education Program (IEP), including, for example
- extended time
- bilingual mathematics assessment

Additional information on the accommodations are available at https://nces.ed.gov/nationsreportcard/about/accom_table.aspx. This information should be considered when designing the research plan.

Digitally based NAEP captures data that can inform our understanding of how learners solve problems, use strategies, and perform on the mathematics content covered in the tasks. Process data represents the learners' use of the assessment interface, with every move logged automatically as the learner takes the assessment. Whereas pencil and paper assessments often allow for only one final response recorded on paper, digitally based assessments capture information that can shed more light on the process of how learners solve problems, including how tools are used, when learners change their answers, and their patterns of non-responses.

## B. NAEP Sampling

NAEP is a nationally representative assessment of what learners know and can do in various subjects across the nation, states, and in some urban districts. Before using NAEP data, it is important to understand how NAEP obtains a representative sample, including the sampling frame and how schools and learners are selected. For information on participant selection, visit the NAEP website at https://nces.ed.gov/nationsreportcard/assessment_process/selection.aspx. Please note that samples may not be representative of learners with disabilities. Learners' disability status is not used in drawing learner samples. Moreover, schools serving exclusively learners with disabilities are not included in NAEP samples. Therefore, NAEP results may not be generalizable to the whole population of learners with disabilities and NAEP results for learners with disabilities should be interpreted with caution.

In addition, it is important to note that each learner does not complete all items on the NAEP assessment, but rather a subset of the NAEP items. However, the items are grouped in a way that ensures that the entire content domain for mathematics is covered in the subset each learner completes using a technique called Balanced Incomplete Block (BIB) spiraling. Using this BIB technique, groups of items are systematically arranged with other groups of items within test booklets to assure that the entire content domain for the subject is covered. And all items are completed by a representative sample of learners, though individual learners only complete a fraction of the items. Therefore, when NAEP performance is reported for a learner, that performance is not for any one individual learner, but for a group of learners with similar characteristics completing that item.

More information is available at the NAEP website (https://nces.ed.gov/nationsreportcard/researchcenter/), including online training modules (https://nces.ed.gov/training/datauser/#national). NCES also offers in-person training workshops (https://nces.ed.gov/nationsreportcard/researchcenter/training.aspx).

## C. Data Available in NAEP Restricted-Use Data Files

According to NCES, in 2017 approximately 90% of learners with disabilities in participating schools were assessed in the NAEP mathematics assessments. Learners with disabilities make up approximately 12% of all the learners assessed. Students with disabilities who do not participate include those who (1) have an accommodation that NAEP does not allow AND the person at the school who knows that student decided that they could not meaningfully participate in NAEP without that accommodation, and (2) take an alternative assessment with alternative achievement standards.

The restricted-use data files include the process data file, summative feature data file, and additional information data file. The additional information data file includes information about test items, learner outcome data, and survey questionnaire data that provide information about learners and their schools. Applicants are encouraged to review the following information as they develop their research plan.

### 1. Process Data

The process data file is a raw formatted file that includes information in a table (.csv format) for each learner's actions. For example, the file includes data on when a learner changes the color scheme of the digital assessment layout, selects response "C" on a multiple-choice item, or enters the number "4" in a calculator. There is also time information that can be used to understand how long learners spent

on an item or with a certain tool. The RFA [Appendix](#) provides examples of the data that will be available in the restricted-use license data.

## 2. Summative Feature Data

This file contains some example summative data and related code for generating the summative data for variables that might be of interest to researchers. Researchers can then use the code to generate similar variables from the process data. Examples of variables that can be created using process data in a summary format include frequency counts of the number of times a calculator is opened and the amount of time learners spent on an item. This file also includes measures of time, such as time elapsed since entering an item or opening a calculator.

## 3. Additional Information Data File

### (a) Information about Test Items

This data file includes the following information about the individual test items in the process data:
- Content Area (number properties and operations; measurement; geometry; data analysis, statistics, and probability; algebra)
- Complexity (low, moderate, high)
- Item Type (multiple choice, selected response, short constructed response, extended constructed response)
- Difficulty level (easy, medium, hard)

### (b) Learner Outcomes

The data file contains information on whether an individual learner answered an item correctly and how many points they received for that item (such as whether they received partial or full credit). The file also includes learner proficiency level and number of items correct. However, note that these measures do not always reflect an individual learner but rather the composite learner they represent. As explained above, no learner takes the entire NAEP assessment; the performance is a compilation of the performance of multiple learners of similar demographic characteristics. Since no learner takes the whole assessment, estimates of the learner's proficiency in the whole domain (mathematics), such as the proficiency level, are optimized for analyses at the learner group level rather than the individual learner level.

### (c) Survey Questionnaires

Three types of NAEP survey questionnaires provide additional information.
- Student questionnaires collect information on learners' demographic characteristics, opportunities to learn in and out of the classroom, and educational experiences. They are completed by learners who participate in the assessment.
- Teacher questionnaires gather information on teacher training and instructional practices. They are completed by the teachers responsible for the content matter being assessed.
- School questionnaires gather information on school policies and characteristics (such as percentage of students eligible to receive free and reduced-price lunch and current enrollment in the school). They are completed by the principal or assistant principal. Schools also provide information about specific accommodations needed for learners with disabilities. Additional

information about accommodations is available at
https://nces.ed.gov/nationsreportcard/about/accom_table.aspx.

The questionnaire items are available at
https://nces.ed.gov/nationsreportcard/experience/survey_questionnaires.aspx. Select "Grade 8" for
the "Mathematics (2017)" row to review the survey questionnaires.

The student, teacher, and school questionnaire data are linked through a pseudo NAEP student ID
variable in the restricted-use data file(s).

# D. Additional Resources

The data available for this grant competition are the publicly released items and related process data
from two blocks of released items from the 2017 eighth grade NAEP mathematics assessment. Released
items from these blocks are available at https://nces.ed.gov/NationsReportCard/nqt/.

A picture of each item is shown with information about the item, the answer, and scoring guide. The
item can be viewed in the eNAEP platform by selecting eNAEP. When viewed in the eNAEP platform,
the tools available to the learner for the item are shown.

Some learners were administered items from only one of the blocks, whereas others were administered
items from both blocks. There is evidence that there is an order effect for items depending on the block
in which they are presented. Difficulty of an item tends to be greater when it appears in the second
block. Therefore, information about the order of the blocks should be considered when designing the
research plan. Another consideration is the number of blocks of released items administered to each
learner. Learners administered just one block will have less information about their proficiency in
mathematics. This should be considered in the design of the research plan.

There are also tutorial items on the assessment. At the beginning of each assessment, learners take a
brief interactive tutorial designed to teach them about the system and the tools they may use to take
the assessment. These tutorials help ensure that learners can effectively use the tools during the
assessment. Some parts of the tutorials are the same across subjects, whereas other parts are specific to
each subject.

An example of the directions for the assessment and other information about the 2017 eighth grade
NAEP mathematics assessment can be found at
https://nces.ed.gov/nationsreportcard/subject/field_pubs/sqb/pdf/2017_sqb_g8_mrw.pdf.

# Part IV: Appendices and Other Narrative Content

## A. Overview

The application contents–individual forms and their PDF attachments–represent the body of an application to IES. IES encourages you to refer to the IES Application Submission Guide (https://ies.ed.gov/funding/pdf/submissionguide.pdf) for additional information about preparing to submit your application and ensuring your application is sufficient.

## B. General Formatting

To ensure that reviewers can read your application and that all applicants have similar expectations for length and space, IES specifies the following formatting conventions. Adherence to type size and line spacing requirements is necessary so that no applicant will have an unfair advantage by using small type or by providing more text in their applications. These requirements apply to the PDF file as submitted, unless otherwise specified. In order for an application to be compliant and sent forward for review, the applicant should ensure that each narrative section follows both the page limit maximums and the formatting guidelines below unless otherwise specified.

### 1. Page and Margin Specifications

For all IES grant applications, a "page" is 8.5 in. x 11 in. on one side only with 1-inch margins at the top, bottom, and both sides.

### 2. Page Numbering

Add page numbers using the header or footer function and place them at the bottom or upper right corner for ease of reading.

### 3. Spacing

Text must be single spaced.

### 4. Type Size (Font Size)

Type must conform to the following three requirements:
- The height of the letters must not be smaller than a type size of 12-point.
- Type density, including characters and spaces, must be no more than 15 characters per inch (cpi). For proportional spacing, the average for any representative section of text must not exceed 15 cpi.
- Type size must yield no more than 6 lines of type within a vertical inch.

You should check the type size using a standard device for measuring type size, rather than relying on the font selected for a particular word processing/printer combination. The type size used must conform to all three requirements. Small type size makes it difficult for reviewers to read the application; consequently, the use of small type will be grounds for IES to return the application without scientific peer review.

As a practical matter, if you use a 12-point Times New Roman font without compressing, kerning, condensing, or other alterations, the application will typically meet these requirements.

### 5. *Graphs, Diagrams, and Tables*

IES encourages you to use black and white in graphs, diagrams, tables, and charts. If color is used, you should ensure that the material reproduces well when printed or photocopied in black and white.

**Text in figures, charts, and tables, including legends, may be in a type size smaller than 12-point but must be readily legible**.

# C. Required and Optional Appendices

The required project narrative – Significance, Research Plan, Personnel, and Resources (see RFA Part II: Specific Requirements and Recommendations) – is followed by several appendices. Some of these appendices are required and some are optional. When you submit your application through Grants.gov, you will create a single PDF file that *contains the project narrative and all appendices* and include it as an attachment in the application package. Include appendices in alphabetical order and simply skip an appendix if it is not required for your application or if you choose not to include one of the optional appendices. See the IES Application Submission Guide (https://ies.ed.gov/funding/pdf/submissionguide.pdf) for more information about preparing and submitting your application using the required application package for this competition through Grants.gov (https://www.grants.gov/).

The project narrative and appendices are critical parts of the IES application because they include the substantive content that will be reviewed for theoretical and practical significance and scientific merit.

### 1. *Appendix A: Dissemination History and Plan (Required)*

You **must** include Appendix A after the project narrative. Appendix A includes two sections: Dissemination History and Dissemination Plan. Appendix A **must** meet the general formatting guidelines and be **no more than three pages**, including one page for the Dissemination History and two pages for the Dissemination Plan. If Appendix A exceeds this three-page limit, IES will remove any pages after the third page of the appendix before it is forwarded for scientific peer review.

#### *(a) Dissemination History*
The dissemination history is intended to demonstrate that the research you have conducted in the past has been disseminated in a way that is consistent with the IES mission to promote scientifically valid research findings that can provide the basis for improving academic instruction and lifelong learning. Applicants who have never had an IES grant should focus on dissemination history of related, past projects. Reviewers will use this information to determine whether the project personnel have the experience necessary to carry out the proposed dissemination plan.

The dissemination history should include the following:
- A brief description of the outcomes of prior research, including products developed or tested, and how the project's findings and products were disseminated
- For interventions or assessments that were developed through one or more projects and have evidence of impact on learner outcomes or of the validity and reliability of the assessment for

intended purposes and learners, an explanation for how it has been made available to users, the number of active users of the product, the number of users of the product during its history, and funding agreements or outside investments for commercialization (if applicable)

- Other unique dissemination products or notable presentations of research findings, particularly those that were intended for practitioners, policymakers, parents, students, and/or the general public

### (b) Dissemination Plan

Describe your plan to disseminate the findings from the proposed project. Dissemination plans should be tailored to the audiences that will benefit from the findings and reflect the unique purposes of the project.

Identify the audiences that you expect will most likely benefit from your research such as federal and state policymakers and program administrators and local school system administrators, school administrators, educators, parents, learners, and other education researchers.

Discuss the different ways in which you intend to reach these audiences through the publications, presentations, and products you expect to produce.

IES-funded researchers are expected to publish and present in venues designed for policymakers and practitioners in a manner and style useful and usable to this audience. For example –

- Report findings to the education agencies and schools that provided the project with data and data-collection opportunities.
- Give presentations and workshops at meetings of professional associations of teachers and leaders.
- Publish in practitioner journals.
- Engage in activities with relevant IES-funded Research and Development (R&D) Centers (https://ies.ed.gov/ncer/research/randdCenters.asp), Research Networks (https://ies.ed.gov/ncser/research/researchNetworks.asp), or Regional Educational Laboratories (RELs) (https://ies.ed.gov/ncee/edlabs/)
- Engage in activities with relevant Department of Education, Office of Special Education Programs (OSEP)-funded Technical Assistance Centers (https://osepideasthatwork.org/find-center-or-grant/find-a-center).

IES-funded researchers are expected to publish their findings in scientific, peer-reviewed journals and present them at conferences attended by other researchers.

The Dissemination History and Plan is the only information that may be included in Appendix A; all other materials will be removed prior to review of the application.

## 2. Appendix B: Response to Reviewers (Not applicable)

Appendix B (Response to Reviewers) is not applicable for this competition.

### 3.  *Appendix C: Supplemental Charts, Tables, and Figures (Optional)*

Appendix C **must** meet the general formatting guidelines and be **no more than 15 pages.** If Appendix C exceeds this page limit, IES will remove any pages after the 15th page of the appendix before it is forwarded for scientific peer review. In Appendix C, you may include figures, charts, or tables with supplementary information like a timeline for your research project or a diagram of the management structure of your project. These are the only materials that may be included in Appendix C; all other material will be removed prior to review of the application.

### 4.  *Appendix D: Examples of Intervention or Assessment Materials (Not applicable)*

Appendix D (Examples of Intervention or Assessment Materials) is not applicable for this competition.

### 5.  *Appendix E: Letters of Agreement (Optional)*

There is **no recommended page length** for Appendix E. Use this appendix to provide copies of Letters of Agreement for people who will serve as consultants. Ensure that the letters reproduce well so that reviewers can easily read them. Do not reduce the size of the letters. See the IES Application Submission Guide (https://ies.ed.gov/funding/pdf/submissionguide.pdf) for guidance regarding the size of file attachments.

Letters of Agreement should include enough information to make it clear that the author of the letter understands the nature of the commitment of time, space, and resources to the research project that will be required if the application is funded. Letters of Agreement regarding the provision of data should make it clear that the author of the letter will provide the data described in the application for use in the proposed research and in time to meet the proposed schedule.

These are the only materials that may be included in Appendix E; all other material will be removed prior to review of the application.

### 6.  *Appendix F: Data Management Plan (Required)*

NAEP-P applications **must** include Appendix F. Appendix F **must** meet the general formatting guidelines and be **no more than five pages.** If Appendix F exceeds this page limit, IES will remove any pages after the fifth page of the appendix before it is forwarded for scientific peer review.

Include your data management plan (DMP) in Appendix F. The content of the DMP is discussed under Data Management Plan in Part II. This is the only material that may be included in Appendix F; all other material will be removed prior to review of the application.

## D. Other Narrative Content

In addition to the project narrative (see RFA Part II: Specific Requirements and Recommendations) and required and optional appendices (see above), you will also prepare a project summary/abstract, a bibliography and references cited, an exempt or non-exempt research on human subjects narrative, and biosketches for key personnel to include as file attachments in your application. See the IES Application Submission Guide (https://ies.ed.gov/funding/pdf/submissionguide.pdf) for more information about preparing and submitting your application using the required application package for this competition on Grants.gov (https://www.grants.gov/).

# 1. *Project Summary/Structured Abstract*

You must submit the project summary/structured abstract as a separate PDF attachment in the application package. If your project is recommended for funding, IES will use this abstract as the basis for the online abstracts that we post when new awards are announced. We recommend that the project summary/structured abstract be two-pages long and follow the format used for IES online abstracts (https://ies.ed.gov/funding/grantsearch/).

## *(1) Title*

- **Title:** Distinct, descriptive title of the project.
- **Topic: Identify the topic** to which you are applying (NAEP Process Data for Learners with Disabilities). This information should match the topic code entered for Item 4b: Agency Routing Number on the SF 424 Application for Federal Assistance form (see the IES Application Submission Guide; https://ies.ed.gov/funding/pdf/submissionguide.pdf).

## *(2) Project Summary*

The purpose of the project summary is to provide a high-level overview that is accessible to a range of audiences, such as policymakers, practitioners, and the general public. This section should use short, active sentences to briefly describe the significance of the project, project activities, and the intended outcomes.

- **Purpose**: A brief description of the purpose of the project and its significance for improving education in the United States. This should include why the research is important, what this project will do to address the need, and the general expected outcomes of the project.
- **Project Activities**: An overview of the sample, research design, and methods.
- **Products**: A brief description of the expected products of the project, including the information that will be learned and disseminated.

## *(3) Structured Abstract*

The purpose of the structured abstract is to provide key details about the project activities. This section is most likely to be used by other researchers but should be written in a way that is accessible to anyone who wants more information about the project.

- **Population/Sample**: A brief description of the sample including the composition of the sample - including age or grade level, race/ethnicity, or disability status as appropriate - and the population the sample is intended to represent.

- **Research Design and Methods**: Briefly describe the major features of the design and methodology to be used (e.g., Monte Carlo simulation, secondary data analysis, iterative design process).

- **Data Analytic Strategy**: A brief description of the data analytic strategies that the research team will use to answer the research questions.

- **Related IES Projects:** Indicate whether the proposed research is related to a completed or ongoing IES-funded project by noting the title of the related IES project and providing a link to the online IES abstract.

See our online search engine of funded research grants (https://ies.ed.gov/funding/grantsearch/) for examples of the content to be included in your project summary/structured abstract.

## 2.  *Bibliography and References Cited*

You **must** submit the bibliography and references cited as a separate PDF attachment in the application package. There is no recommended page length for the bibliography and references cited. You should include complete citations, including the names of all authors (in the same sequence in which they appear in the publication), titles of relevant elements such as the article/journal and chapter/book, page numbers, and year of publication for literature cited in the project narrative.

## 3.  *Human Subjects Narrative*

You **must** submit an exempt or non-exempt human subjects narrative as a separate PDF attachment in the application package. There is no recommended page length for the human subjects narrative. See *Information About the Protection of Human Subjects in Research Supported by the Department of Education* (https://www2.ed.gov/policy/fund/guid/humansub/overview.html) for a brief overview of principles, regulations, and policies which affect research involving human subjects in research activities supported by the Department of Education.

Note that the Revised Common Rule is now in effect with changes that will affect Institutional Review Board (IRB) review of your proposed research protocol. Take care to address how changes to exemption and continuing review procedures, and the use of a single IRB, will be addressed should your application be recommended for funding.

The U.S. Department of Education does not require certification of Institutional Review Board approval at the time you submit your application. However, if an application that involves non-exempt human subjects research is recommended for funding, the designated U.S. Department of Education official will request that you obtain and send the certification to the Department within 30 days of the formal request.

## 4. *Biographical Sketches for Key Personnel*

You **must** submit a biographical sketch (an abbreviated CV plus information about current and pending support) for each person named as key personnel in your application. You may also submit biographical sketches for consultants (optional). Each biographical sketch with current and pending support information **must be no more than five pages in length** and follow the general formatting guidelines. If a biographical sketch exceeds this page limit, IES will remove any pages after the fifth page before it is forwarded for scientific peer review.

Biographical sketches are submitted as separate PDF attachments in the application package. IES strongly encourages applicants to use SciENcv (https://www.ncbi.nlm.nih.gov/sciencv/) where you will find an IES biosketch form. You may also develop your own biosketch format. If you use SciENcv, the information on current and pending support will be entered into the IES biosketch template. If you use your own format, you will need to provide this information in a separate table.

Be sure to include your ORCID number (Open Researcher and Contributor; https://orcid.org/) if you have one and consider establishing one if you have yet to do so.

The biographical sketch for the principal investigator, each co-principal investigator, and other key personnel should show how key personnel possess training and expertise commensurate with their specified duties on the proposed project, for example by describing relevant publications, grants, and research experience.

Provide a list of current and pending grants for the principal investigator, each co-principal investigator, and other key personnel, along with the proportion of their time, expressed as percent **effort over a 12-month calendar year**, allocated to each project. Include the proposed IES grant as one of the pending grants in this list.

# Part V: Competition Regulations and Review Criteria

## A. Funding Mechanisms and Restrictions

### 1. Mechanism of Support

IES intends to award cooperative agreements pursuant to this Request for Applications. Through the terms of the cooperative agreement, grantees will work with IES to plan and implement their activities.

### 2. Funding Available

Although IES intends to support the research described in this announcement, all awards pursuant to this Request for Applications are contingent upon the availability of funds and the receipt of meritorious applications. IES makes its awards to the highest quality applications, as determined through scientific peer review. Please attend to the duration and budget maximums in Part II.

### 3. Special Considerations for Budget Expenses

#### (a) Indirect Cost Rate
When calculating your expenses for research conducted in field settings, you should apply your institution's federally negotiated off-campus indirect cost rate. **Please note that the** Indirect Cost Group (ICG) in the U.S. Department of Education's Office of the Chief Financial Officer will not be available for assistance during the application preparation process. If your institution does not have an indirect cost rate and you receive a grant from IES, the ICG group can help with obtaining an indirect cost rate once the grant is awarded.

Institutions, both primary grantees and subawardees, not located in the territorial United States may not charge indirect costs.

#### (b) Meetings and Conferences
If you are requesting funds to cover expenses for hosting meetings or conferences, please note that there are statutory and regulatory requirements in determining whether costs are reasonable and necessary. Please refer to the Office of Management and Budget's (OMB's) Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance), 2 CFR, §200.432 Conferences (https://www.ecfr.gov/cgi-bin/text-idx?SID=dcd3efbcf2b6092f84c3b1af32bdcc34&node=se2.1.200_1432&rgn=div8).

Federal grant funds cannot be used to pay for alcoholic beverages or entertainment, which includes costs for amusement, diversion, and social activities. In general, federal funds may not be used to pay for food. A grantee hosting a meeting or conference may not use grant funds to pay for food for conference attendees unless doing so is necessary to accomplish legitimate meeting or conference business. You may request funds to cover expenses for working meetings, such as working lunches; however, IES will determine whether these costs are allowable in keeping with the Uniform Guidance Cost Principles. Grantees are responsible for the proper use of their grant awards and may have to repay funds to the Department if they violate the rules for meeting- and conference-related expenses or other disallowed expenditures.

### *4. Program Authority*

20 U.S.C. 9501 et seq., the "Education Sciences Reform Act of 2002," Title I of Public Law 107-279, November 5, 2002. This program is not subject to the intergovernmental review requirements of Executive Order 12372.

### *5. Applicable Regulations*

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) codified at CFR Part 200. The Education Department General Administrative Regulations (EDGAR) in 34 CFR parts 77, 81, 82, 84, 86 (part 86 applies only to institutions of higher education), 97, 98, and 99. In addition 34 CFR part 75 is applicable, except for the provisions in 34 CFR 75.100, 75.101(b), 75.102, 75.103, 75.105, 75.109(a), 75.200, 75.201, 75.209, 75.210, 75.211, 75.217, 75.219, 75.220, 75.221, 75.222, and 75.230.

## B. Additional Requirements

### *1. Pre-Award*

#### *(a) Clarification and Budget Questions*
IES uses the scientific peer review process as the first step in making funding decisions. If your application is recommended for funding based on the outcome of peer review, an IES program officer will contact you to clarify any issues that were raised by the peer reviewers and to address whether the proposed budget adequately supports the scope of work and meets federal guidelines.

#### *(b) Demonstrating Access to Restricted-Use Data License*
If your application is being considered for funding based on scientific merit scores from the peer review panel and your research relies on access to the NAEP restricted-use secondary datasets, you will need to provide documentation that you have access to the necessary datasets in order to receive the grant. This means that if you do not have permission to use the proposed datasets at the time of application, you must provide documentation to IES from NCES, which controls access approvals for restricted-use data licenses for NAEP data, before the grant will be awarded. This documentation must indicate that you have permission to use the data for the proposed research for the time period discussed in the application. If you obtained permission to use a proposed dataset prior to submitting your application, IES will ask you to provide updated documentation indicating that you still have permission to use the dataset to conduct the proposed research during the project period.

In order to receive the award, the applicant must apply for and receive the restricted-use data license for the NAEP mathematics data for eighth grade from 2017. Applicants can find the directions for applying for a license at https://nces.ed.gov/pubsearch/licenses.asp. More information about applying for a License is available in the online application system instructions and in the Restricted-Use Data Procedures Manual.

In addition to obtaining evidence of access, IES strongly advises applicants to establish a written agreement, within 3 months of receipt of an award, among all key collaborators and their institutions (including principal and co-principal investigators) regarding roles, responsibilities, access to data, publication rights, and decision making procedures.

Note: To qualify for and receive a restricted-use data license and the restricted-use data, academic applicants must have the rank of post-doctoral fellow or above to serve as the principal project officer (PPO) responsible for the restricted use data license. Visiting professors or scholars cannot serve as a PPO. Applicants in research laboratories or analytic consulting firms must have the rank of research associate or above to serve in this role. (The PPO[2] is the researcher in charge of the day-to-day operations involving the use of subject data and is responsible for liaising with the IES Data Security Office.) The application also requires the signature of the Senior Official, the person having the signatory authority to legally bind the organization to the provisions of the License contract. In addition, contact information is needed for the Systems Security Officer who will oversee the security of the data. The PPO can also serve as the SSO as long as they provide documentation of relevant security access, IT expertise, and responsibility for such security of the data.

**IES will require supporting evidence prior to the release of funds**. If you cannot provide such documentation, IES may not award the grant or may withhold funds.

### (c) Assessment of Past Performance
IES considers the applicant's performance and use of funds under a previous federal award as part of the criteria for making a funding decision. Performance on previous Department of Education awards is considered as is additional information that may be requested from the applicant, including compliance to the IES Public Access Policy (applicable for all grants funded from 2012 to present; https://ies.ed.gov/funding/researchaccess.asp).

## 2. Post Award

### (a) Compliance with IES Policy on Public Access to Data and Results
**(1) Access to data**
You must include a data management plan (DMP) in Appendix F. The scientific peer review process will not include the DMP in the scoring of the scientific merit of the application. Instead, IES program officers will be responsible for reviewing the completeness of the proposed DMP. The costs of the DMP can be covered by the grant and should be included in the budget and explained in the budget narrative.

**(2) Access to results: Grantee submissions to ERIC**
IES requires all grantees to submit the electronic version of peer-reviewed scholarly publication to ERIC (https://eric.ed.gov/), a publicly accessible and searchable electronic database of education research that makes available full text documents to the public for free. This public access requirement (https://ies.ed.gov/funding/researchaccess.asp) applies to peer-reviewed, original scholarly publications that have been supported (in whole or in part) with direct funding from IES, although it does not apply to book chapters, editorials, reviews, or non-peer-reviewed conference proceedings.

---

[2] The PPO may be, but is not required to be, the PI of the NAEP-P grant.

**As the designated representative for the grantee institution, IES holds the principal investigator responsible** for ensuring that authors of publications stemming from the grant comply with this requirement.

The author's final manuscript is defined as the final version accepted for journal publication and includes all modifications from the peer review process. Submission of accepted manuscripts for public accessibility through ERIC is strongly encouraged as soon as possible **but must occur within 12 months of the publisher's official date of publication**. ERIC will not make the accepted manuscripts available to the public prior to the end of the 12-month embargo period, unless specified by the publisher.

The ERIC website includes a homepage for the Grantee and Online Submission System (https://eric.ed.gov/submit/), as well as a Frequently Asked Questions page (https://eric.ed.gov/?granteefaq). During the submission process, authors will submit bibliographic information from the publication, including title, authors, publication date, journal title, and associated IES award number(s).

### (b) Pre-Register
Grantees must register their studies on a suitable platform, such as the Open Science Framework (https://osf.io/), within the first year of receiving a new award.

### (c) Special Conditions on Grants
IES may impose special conditions on a grant pertinent to the proper implementation of key aspects of the proposed research design or if the grantee is not financially stable, has a history of unsatisfactory performance, has an unsatisfactory financial or other management system, has not fulfilled the conditions of a prior grant, or is otherwise not responsible.

### (d) Attendance at the Annual IES Principal Investigators Meeting
The principal investigator (PI) is required to attend one meeting each year (for up to 3 days) in Washington, DC with other IES grantees and IES staff. The project's budget should include this meeting. PIs who are not able to attend the meeting may designate another person who is key personnel on the research team to attend.

### (e) Restricted-Use Data License
In order to receive the award, the applicant must acknowledge access to and receipt of the restricted-use data license for the NAEP mathematics data for eighth grade from 2017.

### (f) Required Training
In order to make inferences between the NAEP process data and NAEP outcome data (such as NAEP proficiency level), researchers must understand the development, administration, and scoring of the NAEP assessment. If awarded, one to two researchers from the research team must attend a mandatory 2-day training in person in the Washington D.C. area to learn this necessary information in order to appropriately design the data analyses.

# C. Overview of Application and Scientific Peer Review Process

## 1. Submitting Your Letter of Intent

Letters of Intent (LOIs) are submitted online at the IES Peer Review Information Management Online (PRIMO) system (https://iesreview.ed.gov/LOI/LOISubmit). **Select the Letter of Intent form for the topic under which you plan to submit your application**. The online submission form contains fields for each of the seven content areas listed below. Use these fields to provide the requested information. The project description should be single-spaced and is recommended to be no more than one page (about 3,500 characters). The LOI is non-binding and optional but strongly recommended. If you submit an LOI, a program officer will contact you regarding your proposed research. IES staff also use the information in the LOI to identify the expertise needed for the peer review panels and to secure a sufficient number of reviewers to handle the anticipated number of applications.

Elements for the Letter of Intent
- Descriptive title
- Topic: NAEP Process Data for Learners with Disabilities
- Brief description of the proposed project
- Name, institutional affiliation, address, telephone number and email address of the principal investigator and any co-principal investigators
- Name and institutional affiliation of any key collaborators and contractors
- Duration of the proposed project (attend to the duration maximums for the topic)
- Estimated total budget request (attend to the budget maximums for the topic)

## 2. Multiple Submissions

You may submit applications to more than one of the FY 2021 IES grant programs. However, you may submit a given application only once for the FY 2021 grant competitions, meaning you may not submit the same application or similar applications to multiple grant programs. If you submit the same or similar applications, IES will determine whether and which applications will be accepted for review and/or will be eligible for funding.

## 3. Application Processing

**Applications must be submitted electronically and received no later than 11:59:59 p.m., Eastern Time on August 20** through the internet using the software provided on the Grants.gov (https://www.grants.gov/) website. You must follow the application procedures and submission requirements described in the IES Application Submission Guide (https://ies.ed.gov/funding/pdf/submissionguide.pdf) and on Grants.gov (https://www.grants.gov/).

After applications are fully uploaded and validated at Grants.gov, the U.S. Department of Education receives the applications for processing and transfer to the IES PRIMO system (https://iesreview.ed.gov/). PRIMO allows applicants to track the progress of their application via the Applicant Notification System (ANS).

Approximately 1 to 2 weeks after the application deadline, invitation emails are sent to applicants who have never applied to IES before to create their individual PRIMO ANS accounts. Both the PI and the AOR will receive invitation emails. Approximately 4 to 6 weeks after the application deadline, all

applicants (new and existing ANS users) will begin to receive a series of emails about the status of their application. See the IES Application Submission Guide (https://ies.ed.gov/funding/pdf/submissionguide.pdf) for additional information about ANS and PRIMO.

**Once an application has been submitted and the application deadline has passed, you may not submit additional materials or information for inclusion with your application.**

## *4. Scientific Peer Review Process*

IES will forward all applications that are compliant and responsive to this Request for Applications to be evaluated for scientific and technical merit. Scientific reviews are conducted in accordance with the review criteria stated below and the review procedures posted on the IES website (https://ies.ed.gov/director/sro/reviewers.asp) by a panel of experts who have substantive and methodological expertise appropriate to the program of research and Request for Applications.

Each compliant and responsive application is assigned to one of the IES review panels (https://ies.ed.gov/director/sro/peer_review/reviewers.asp). Applications are assigned to a panel according to the match between the overall expertise of reviewers on each panel and the content and methodological approach proposed in each application. At least two primary reviewers will complete written evaluations of the application, identifying strengths and weaknesses related to each of the review criteria. Primary reviewers will independently assign a score for each criterion, as well as an overall score, for each application they review. Based on the overall scores assigned by primary reviewers, IES calculates an average overall score for each application and prepares a preliminary rank order of applications before the full peer review panel convenes to complete the review of applications.

The full panel will consider and score only those applications deemed to be the most competitive and to have the highest merit, as reflected by the preliminary rank order. A panel member may nominate for consideration by the full panel any application that he or she believes merits full panel review but that would not have been included in the full panel meeting based on its preliminary rank order.

## *5. Review Criteria for Scientific Merit*

The purpose of IES-supported research is to contribute to solving education problems and to provide reliable information about the education practices that support learning and improve academic achievement and access to education for all learners. IES expects reviewers to assess the scientific rigor and practical significance of the research proposed in order to judge the likelihood that it will make a meaningful contribution to the larger IES mission. Information about each of these criteria is described in Part II Specific Requirements and Recommendations.

### *(a) Significance*

Does the applicant address recommendations described in the Significance section for the topic under which the applicant is submitting the application?

## (b) Research Plan

Does the applicant address recommendations described in the Research Plan section for the topic under which the applicant is submitting the application?

## (c) Personnel

Does the applicant address recommendations described in the Personnel section for the topic under which the applicant is submitting the application? Do the project director/principal investigator and other key personnel possess appropriate training and experience and will they commit sufficient time to competently implement the proposed research?

## (d) Resources

Does the applicant address recommendations described in the Resources section for the topic under which the applicant is submitting the application? Does the applicant have the facilities, equipment, supplies, and other resources required to support the proposed activities? Do the commitments of each partner show support for the implementation and success of the project?

## (e) Dissemination

Does the application address recommendations described in Appendix A: Dissemination History and Plan? Does the applicant present a dissemination plan that is tailored to the purpose of the project and designed to reach a wide range of audiences? Does the applicant describe a dissemination history that demonstrates past success in sharing results of education research widely and appropriately?

## 6. Award Decisions

The following will be considered in making award decisions for responsive and compliant applications:
- Scientific merit as determined by scientific peer review
- Performance and use of funds under a previous federal award
- Contribution to the overall program of research described in this request for applications
- Ability to carry out the proposed research within the maximum award and duration requirements
- Availability of funds

# Part VI: Compliance and Responsiveness Checklist

Only compliant and responsive applications will be peer reviewed. Use these three checklists below to better ensure you have included all required components for compliance, all general requirements, and all project narrative elements.

See the IES Application Submission Guide (https://ies.ed.gov/funding/pdf/submissionguide.pdf) for an application checklist that describes the forms in the application package that must be completed and the PDF files that must be attached to the forms for a successful submission through Grants.gov.

| Compliance | |
|---|---|
| | Have you included a project narrative (Part II)? |
| | Do the project narrative and other narrative content adhere to all formatting requirements (Part IV)? |
| | Do the project narrative and other narrative content adhere to all page maximums as described in the RFA? IES will remove any pages above the maximum before forwarding an application for peer review. |
| | Have you included Appendix A: Dissemination History and Plan (Part IV)? |
| | Have you included Appendix F: Data Management Plan (Part IV)? |
| **General Requirements for Responsiveness** | |
| | Have you met all the General Requirements for an application (Part I)? |
| | • Does your proposed research focus on learners with disabilities? |
| | • Does your proposed research include use of use of NAEP data (including process, test item, and survey data described in Part III? |
| | • Does your proposed research include use of learner education outcome data (such as performance on an individual item, number of correct items for a block of items or subscale of the assessment, or the NAEP proficiency level)? |
| | • Does your project narrative include the four required sections? Did you describe the elements required for each section? |
| **Required Project Narrative Elements** | |
| Significance | • NAEP process variables you plan to study<br>• Variables from other available NAEP data, including learner outcomes |
| Research Plan | • Sample<br>• Research design and methods<br>• Data analysis procedures |
| Personnel | • Project team |
| Resources | • Resources to conduct the project<br>• Acknowledgement that you have the restricted-use license or have applied for the restricted-use license for the 2017 eighth grade NAEP mathematics assessment |

# Part VII: Topic Code

Applications to the **Research Grants Focused on NAEP Process Data for Learners with Disabilities (CFDA 84.324P) program** are submitted under a single primary topic. You must enter the topic code in Item 4b of the SF 424 Application for Federal Assistance form (for more information about this form, see the IES Application Submission Guide at https://ies.ed.gov/funding/pdf/submissionguide.pdf).

| Topic | Code |
|---|---|
| **NAEP Process Data for Learners with Disabilities** | NCSER-NAEP |

# Appendix: NAEP Mathematics Glossary

The following information is provided by NCES to help potential users of the data files understand the types of data collected for the NAEP assessments. More detailed information will be provided with the restricted-use data license about specific variables in the 2017 eighth grade NAEP mathematics assessment files.

| Type of Data | Definition |
|---|---|
| **Accession Number** | Unique identification number for each assessment item (i.e., cognitive items, survey items, defined events such as tutorial introduction or directions) |
| **Accommodations** | See list of available accommodations below. Some are provided at the testing site and others are built within the system. Accommodations used are recorded in the data file. Additional information is available at https://nces.ed.gov/nationsreportcard/about/accom_table.aspx.<br><br>• Extended time<br>• Small group or one-on-one<br>• One-on-one<br>• Directions only read aloud in English<br>• Test items read aloud in English - Occasional or Most/All<br>• Breaks during test<br>• Calculator version of the test<br>• Must have an aide present in the testing room<br>• Responds orally to a scribe<br>• Large print version of the test<br>• Magnification<br>• Uses template/special equipment/preferential seating<br>• Cueing to stay on task<br>• Presentation in Braille<br>• Response in Braille<br>• Presentation in Sign Language<br>• Response in Sign Language<br>• Bilingual dictionary without definitions in any language<br>• Directions only read aloud in Spanish<br>• Spanish/English version of the test (not grade 12)<br>• Test items read aloud in Spanish (not grade 12 math)<br>• Zooming - from 12-pt font to 24-pt font<br>• Text-to-Speech (English) – Directions Only<br>• Text-to-Speech (English) – Occasional or Most or All<br>• Color contrast – Black text on white background or two other options, white text on black background and black text on beige background<br>• Scratchwork/Highlighter Capability<br>• Eliminating Capability – Tool for eliminating answer choices on multiple choice<br>• Closed Captioning – All voice-over narration is closed captioned |
| **Block** | Identification number for a group of assessment items |

| Type of Data | Definition |
|---|---|
| **DSEX** | Gender of the learner (1: Male, 2: Female) |
| **ELL** | Limited English proficiency (1: Yes-ELL, 2: No-formerly ELL, 3: No-not ELL) |
| **ExtendedInfo** | Additional information associated with actions captured by the system that are provided in the Observable variable |
| **EventTime** | A digital record of the time of occurrence of a specific action |
| **IEP** | Learner has individual education plan (1: Yes, 2: No) |
| **ItemType** | See list of item types and definitions below:<br>• MCSS – Multiple choice single select<br>• MatchMS – Match multiple select<br>• MultipleFillInBlank – Fill in multiple blanks<br>• FillInBlank – Fill in blank<br>• CompositeCR – Composite constructed response<br>• Directions – Block directions<br>• BlockReview – Review button<br>• TimeLeftMessage – Display time left on block<br>• TimeOutMessage – Display no more time left<br>• Help – Help button |
| **LEP** | Learner has limited English proficiency (1: Yes, 2: No) |
| **Observable** | The following list of observable data elements illustrates the actions that are captured by the system:<br>• Back – Recorded when a learner selects the back button<br>• Calculator Buffer – Recorded each time the calculator is closed, either by the learner or the system (ExtendedInfo-Calculator interactions)<br>• Change Theme – Recorded when the learner selects the Change Theme button (ExtendedInfo-Name of theme changed to)<br>• Clear Answer – Recorded when the learner selects the Clear Answer button<br>• Clear Scratchwork – Recorded when the learner selects the Clear Scratchwork button of the Scratchwork tool<br>• Clear Choice – Recorded when the learner selects/deselects a button, checkbox, selectable region (zone), or dropdown list<br>• Click Progress Navigator – Recorded when the learner selects a tab in the Progress Navigator<br>• Close Calculator – Recorded when the learner closes the calculator by selecting the Calculator button<br>• Close Equation Editor – Recorded when the learner closes the Equation Editor<br>• Decrease Zoom – Recorded when the learner selects the Zoom Out button<br>• Draw – Recorded when the learner finishes drawing with the Scratchwork Draw tool<br>• Drop Choice – Recorded when the learner drags and drops a choice into a target area or back to the parent container<br>• Eliminate Choice – Recorded when the learner eliminates or restores a button or checkbox response choice<br>• Enter Item – Recorded when the learner enters an item |

| Type of Data | Definition |
|---|---|
|  | • Equation Editor Item – Recorded when the learner selects a button in the Equation Editor tool<br>• Erase – Recorded when the learner finishes erasing with the Scratchwork Erase tool<br>• Exit Item – Recorded when the learner exits an item<br>• First Text Change<br>• Hide Timer – Recorded when the learner hides the timer by selecting the Timer button or the timer text<br>• Highlight – Recorded when the learner finishes highlighting with the Scratchwork Highlight tool<br>• Horizontal Item Scroll – Recorded when the learner scrolls an item which has a horizontal scrollbar<br>• Increase Zoom – Recorded when the learner selects the Zoom In button<br>• Last Text Change<br>• Leave Section – Recorded when the learner selects the Go to the next section button on a Block-end Review screen<br>• Lose Focus – Recorded when a response entry field in a discrete item loses focus<br>• Math Keypress – Recorded when a learner presses a keyboard key while a response entry field is activated<br>• Move Calculator – Recorded when the learner moves the calculator (ExtendedInfo – Name of Calculator)<br>• Next – Recorded when the learner selects the Next button<br>• No – Recorded when the learner selects a dialog box button meaning "No"<br>• OK – Recorded when the learner selects a dialog box button meaning "OK"<br>• Open Calculator – Recorded when the learner opens the calculator<br>• Open Equation Editor – Recorded when the learner selects the Equation Editor button to toggle the Equation Editor tool on<br>• Receive Focus – Recorded when a response entry field in a discrete item receives focus<br>• Scratchwork Draw Mode On – Recorded when the learner turns the Draw mode of the Scratchwork tool on by selecting the Draw button<br>• Scratchwork Erase Mode On – Recorded when the learner turns the Erase mode of the Scratchwork tool on by selecting the Erase button<br>• Scratchwork Highlight Mode On – Recorded when the learner turns on the Highlight mode of the Scratchwork tool by selecting the Highlight button<br>• Scratchwork Mode Off – Recorded when the learner turns Scratchwork mode off by selecting the Scratchwork button<br>• Scratchwork Mode On – Recorded when the learner turns Scratchwork mode on by selecting the Scratchwork button<br>• Show Timer – Recorded when the learner shows the timer by selecting the Timer button<br>• TextToSpeech – Recorded when the learner turns Text to Speech/Read Aloud mode on or off (ExtendedInfo – TextToSpeech Mode On/Off or Text that was read aloud)<br>• Vertical Item Scroll – Recorded when the learner scrolls an item which has a vertical scrollbar<br>• Yes – Recorded when the learner selects a dialog box button meaning "Yes" |
| **PARED** | Parents' education (1: Some HS, 2: Grad HS, 3: Post HS, 4: Grad College, 5: I don't know) |

| Type of Data | Definition |
|---|---|
| Process Data | Process data represents the learner's interactions that are logged automatically during NAEP digitally based assessments |
| SD3 | Does the learner have an IEP? (1: Yes-IEP, 2: Yes-504 Plan, 3: No IEP, 4: Not SD/ELL but accommodations) |
| SRACE10 | Race and ethnicity of the learner based on school records. (1: White, 2: African American—-not Hispanic, 3: Hispanic of any race, 4: Asian-not Hispanic, 5: American Indian/Alaskan Native, 6: Native Hawaiian/Pacific Islander, 7:>1 race, not Hispanic) |
| Learner Questionnaire (SQ) | 2017 eighth grade NAEP mathematics learner survey - survey items and responses are available at https://nces.ed.gov/nationsreportcard/subject/about/pdf/bgq/learner/2017_sq_learner_math_g8.pdf |
| WEIGHTS | Permit valid inferences to be drawn from the learner samples to ensure that the results of the assessments are fully representative of the target populations |
| Plausible Values | Permit computation of learners' groups cognitive scores |