# How to Develop State Guidelines for Access Assistants: Scribes, Readers, and Sign Language Interpreters



#### In collaboration with:

Council of Chief State School Officers (CCSSO) National Association of State Directors of Special Education (NASDSE)

#### Supported by:

U.S. Office of Special Education Programs

# How to Develop State Guidelines for Access Assistants: Scribes, Readers, and Sign Language Interpreters

Ann T. Clapper • Amanda B. Morse • Martha L. Thurlow • Sandra J. Thompson

#### June 2006

All rights reserved. Any or all portions of this document may be reproduced and distributed without prior permission, provided the source is cited as:

Clapper, A. T., Morse, A. B., Thurlow, M. L., & Thompson, S. J. (2006). *How to develop state guidelines for access assistants: Scribes, readers, and sign language interpreters*. Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.



The Center is supported through a Cooperative Agreement (#H326G000001) with the Research to Practice Division, Office of Special Education Programs, U.S. Department of Education. The Center is affiliated with the Institute on Community Integration at the College of Education and Human Development, University of Minnesota. Opinions expressed herein do not necessarily reflect those of the U.S. Department of Education or Offices within it.



#### **NCEO Core Staff**

Deb A. Albus Michael L. Moore Manuel T. Barrera Rachel F. Quenemoen

Christopher J. Johnstone Dorene L. Scott Jane L. Krentz Karen E. Stout

Kristi K. Liu Martha L. Thurlow, Director

Ross E. Moen

National Center on Educational Outcomes University of Minnesota • 350 Elliott Hall 75 East River Road • Minneapolis, MN 55455 Phone 612/626-1530 • Fax 612/624-0879 http://www.nceo.info

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

This document is available in alternative formats upon request.

# **Table of Contents**

Introduction	1
Key Features of the Design Process	3
1. Form an Action Team and a Review Team	4
2. Establish the Purpose of Developing Guidelines for Access Assistants	5
3. Compile Existing Policies, Guidelines, and Training Materials that Apply to Access Assistants	6
4. Review Examples from Other States	7
5. Draft New or Improved Guidelines	11
6. Design a Plan for Location and Statewide Dissemination	12
7. Monitor and Evaluate Use and Effectiveness of Guidelines	13
Summary	14
References	15
Appendix A. Chart to Use to Form an Action Team and a Review Team	17
Appendix B. Statement of Purpose	19
Appendix C. Compilation of Existing Policies, Guidelines, and Training Materials	
that Apply to Access Assistants	21
Appendix D. Ideas for Qualifications and Instructions for Access Assistants:  Scribes, Readers, and Sign Language Interpreters	23
Appendix E. Draft Guidelines	27
Appendix F. Questions to Guide Evaluation of Access Assistant Procedures	31

#### Introduction

For some students with disabilities, participation in state assessments is facilitated by the use of accommodations. The National Center on Educational Outcomes (NCEO) has been studying state policies and guidelines on accommodations and tracking their evolution since 1992. In a recent NCEO report on assessment participation and accommodations, Clapper, Morse, Lazarus, Thompson, and Thurlow (2005) found that many states have developed guidelines for the use of "access assistants," a term introduced to describe scribes, readers, and sign language interpreters.

Access assistants are responsible for administering test accommodations in accordance with standardized testing procedures. These individuals provide access to test content and serve as "intermediaries" between a student and his or her access needs. They include scribes, readers and sign language interpreters. Unlike other commonly used test accommodations (e.g., large print, braille, calculator, write in test booklet, extended time, and small group administration) the read aloud, dictated response, and sign language interpretation accommodations are implemented through the use of an additional person.

States use a variety of terms for access assistants. For example, one state uses "assessment administrators" while another uses "accommodators." In addition to scribes, readers, and sign language interpreters, access assistants may include page turners, transcribers, paraphrasers, and language translators. These other assistants are not addressed in this manual.

Because the use of access assistants introduces human variability into the testing situation, the potential for challenges to the validity and comparability of resulting scores is greatly increased. Consequently, the availability of guidelines that direct the work of these individuals, and the specificity of language in these guidelines, is critically important to states, students, and the individuals who provide access assistant services. If accommodations are administered inconsistently, the results will not be comparable across examinees. Detailed guidelines ensure that the efforts of students and teachers will yield meaningful information and make test administration easier.

Several states have found that in order to ensure consistency in the provision of assessment accommodations for students with disabilities, they need to develop guidelines for the people who actually administer these accommodations on test day. Many states are now in the process of developing, or have recently completed policies, guidelines, or training materials pertaining to the use of access assistants.

The purpose of this manual is to offer states a tool to assist in the development or enhancement of guidelines for access assistants. Whether a state already has guidelines or is just in the process

of establishing them, this manual will provide structure to the process and many examples of criteria already included by states.

This manual was developed to accompany *Access Assistants for State Assessments: A Study of State Guidelines for Scribes, Readers, and Sign Language Interpreters* (Clapper, Morse, Thompson, & Thurlow, 2005). The study found 22 states with policies, guidelines, or training materials for one or more types of access assistants and 11 states with policies, guidelines, or training materials describing the qualifications or characteristics of scribes, readers, or sign language interpreters.

This manual contains definitions of terms related to access assistants (see Table 1), a description of key features of the design process, worksheets to use, and several examples from states.

**Table 1. Definitions of Terms Related to Access Assistants** 

Access Assistants	Individuals who administer test accommodations in accordance with standardized testing procedures to provide access to test content or serve as intermediaries between a student and his or her mode of response (e.g., reader, scribe, and sign language interpreter).
Readers	Individuals who read test directions, items, reading passages, or prompts orally to students who are unable to decode visual text.
Scribes	Individuals who write down student responses to test items communicated by the student through speech, sign language, pointing or by using an assistive communication device.
Sign Language Interpreters	Individuals who translate test directions or items from spoken English into American Sign Language or other methods of sign language.

## **Key Features of the Design Process**

There are seven key features for designing and revising state guidelines for access assistants. Addressing each of these features will help ensure that the guidelines reflect stakeholder involvement and collaboration. They will represent a meaningful purpose and an accurate picture of what is currently available and what needs to be developed. The goal is to have a clear set of guidelines that is accessible to access assistants across the state. Here are the key features of the design process:

- 1. Form an Action Team and a Review Team.
- 2. Establish the purpose of developing guidelines for access assistants.
- 3. Compile existing policies, guidelines, and training materials that apply to access assistants.
- 4. Review examples from other states.
- 5. Draft new or improved guidelines.
- 6. Design a plan for location and statewide dissemination.
- 7. Monitor and evaluate use and effectiveness of guidelines.

#### 1. Form an Action Team and a Review Team

Though work may get finished faster when completed by a single person, it is very important to have the input and approval of a collaborative team of experts to design, disseminate, and evaluate guidelines for access assistants. The purpose of the Action Team is to establish the need for guidelines; discussions about access, test validity, and standardized administration procedures are part of establishing the need for guidelines. The Action Team also develops the guidelines. The purpose of the Review Team is to monitor and evaluate the guidelines and process for dissemination. Here are some questions to consider when assembling these teams:

- 1. Is there a group in the state education department that is responsible for developing policies and procedures on accommodations? If so, which groups do the members represent?
- 2. Is any additional or different representation needed for the Action Team?
- 3. Is any additional or different representation needed for the Review Team?

There is a chart in Appendix A with space for answering these questions and naming members of the Action Team and the Review Team.

# 2. Establish the Purpose of Developing Guidelines for Access Assistants

The first task of the Action Team is to establish the purpose of developing guidelines for access assistants. The purpose of the task needs to be clear and agreed to by all members of the Action Team. If this is not done before guidelines are developed, it is likely that there will be confusion or disagreement in the development of guidelines. Appendix B presents a process to use to document the purpose of developing these guidelines. Here is some sample language adapted from states' statements of purpose:

- A clear set of guidelines for scribes, readers, and sign language interpreters is needed that is accessible to access assistants across the state.
- Strict adherence to guidelines for access assistants is necessary to ensure that the test results reflect actual student learning. If accommodations are administered inconsistently the results will not be comparable for all students.
- All questions rely on a student's ability to comprehend and respond to the test materials
  exactly as written. Any additional information, explanation, or translation would affect
  that which the tests are designed to measure.
- When the use of an accommodation does the task or provides the answer for a student, the use of the accommodation invalidates the results of the test.
- Use of these guidelines will help ensure that tests are accessible for students.
- If accommodations are not administered using uniform and standardized procedures, the meaning of the test results may differ from school to school, classroom to classroom, and student to student.
- Uniform test administration procedures help to ensure that the results reflect real differences among individuals, and not differences in test administration.
- Check for alignment with state accommodation policies.

# 3. Compile Existing Policies, Guidelines, and Training Materials that Apply to Access Assistants

Before developing or revising guidelines for access assistants, it is important to compile existing policies, guidelines, and training materials. Gather every public, printed, and online document available that contains language specific to scribes, readers, and sign language interpreters. As this compiling takes place, consider the type and location of the existing documents. The types of documents in place in most states generally fall into these categories:

- Policy: set by some type of governing body to express intent, establish direction, and define the actions that will accompany the policy.
- Guidelines: specific procedures for the implementation of policies.
- Training Materials: tools used to illustrate the practical application of the policies and guidelines.

A careful search may reveal that information about the role of access assistants is embedded in policies describing the accommodations themselves or in footnotes that accompany accommodations tables in a procedures manual. There may also be slides, brochures, or other training or informational materials addressing accommodations in general that include instructions for access assistants. The goal is to make sure that all existing documents are on the table for review and discussion before development or revision begins.

As existing materials are collected, note their location and accessibility. Are they on the state education department Web site? Are they included in a procedural manual? Specifically noting the location of existing documents will help in making decisions about rolling out or disseminating new or revised guidelines so that they are easily accessible to schools, test administrators, access assistants, and students across the state. Appendix C contains a chart that will help organize this information.

### 4. Review Examples from Other States

Several states have developed guidelines for at least one of the three types of access assistants. These guidelines generally include qualifications and roles of the access assistants before, during, and after testing. Some of these guidelines apply across access assistants. For example, a state may require scribes, readers, and sign language interpreters all to be certified staff members. Other examples may apply specifically to a particular type of access assistant. For example, a scribe needs adequate word processing skills or very legible handwriting.

Repeat the process as you specifically address scribes (see Table 2), readers (see Table 3), and sign language interpreters (see Table 4). Sample phrases from the guidelines of a variety of states across the country that may apply to any type of access assistant are provided in Table 5. Your Action Team may agree or disagree with these examples. Carefully review these examples, compare them to your existing state guidelines, and use what is applicable to develop new guidelines or improve those already in existence. Use Appendix D as a worksheet to compare and evaluate these examples with existing state guidelines and discuss possible components to use in your state guidelines. Specific wording from a particular state can be found in Clapper, Morse, Thompson, and Thurlow (2005).

#### Table 2. Examples of Guidelines that Apply to Scribes

#### Qualifications

- demonstrated experience in scribing in the subject area tested
- · adequate word processing skills
- very legible handwriting
- if the scribe is also the reader, qualifications for both roles are required

#### **Before a Test**

- practice the art of transcribing dictated responses
- for an accuracy check, scribes may record the session on audio- or videotape for playback

#### **During a Test**

- student is responsible for formatting, punctuation, capitalization, and spelling of words longer than 2 letters (may presume that all sentences start with a capital and end with a period)
- scribes should record student answers verbatim and may not edit in any way
- · student should read questions to him/herself
- do not let the student view the scribe's copy of what he or she is saying until finished dictating an answer
- student signifies when he or she is satisfied with the work
- for multiple choice test, cards can be marked a, b, c, d, etc., and used by the student to indicate desired answer
- · scribes may not question or correct student choices
- scribes should not coach a student on the meaning or spelling of a word

#### Table 2. Examples of Guidelines that Apply to Scribes (continued)

#### After a Test

- transfer written text to the response booklet
- tape should be given to proper administrator following recorded sessions
- final transcription should be checked against recording with another official
- examinee's scores should be cancelled if scribing is inappropriately performed

#### Table 3. Examples of Guidelines That Apply to Readers

#### Qualifications

- able to read clearly and at a normal pace, with good English pronunciation
- familiar with the vocabulary used in the test
- willingness to be patient and repeat directions and questions
- if the reader is also the scribe, qualifications for both roles are required

#### **Before a Test**

- before the testing session, the reader must become familiar with the terminology used in the test
- omit general directions (i.e., please have three No. 2 pencils) that do not apply
- ensure that the reading comprehension tests are not read aloud which would invalidate score (in some states)
- review guidelines in reading mathematical expressions and numbers (2,349 should be read two-comma-three-four-nine)
- administrators should make sure the reader is given ample access to water
- test booklets should not be unspiralled in order to make it easier for readers, booklets should be distributed in the order they were packaged
- remind students to take their time and answer all questions completely

#### **During a Test**

- · do not alert the student of mistakes during testing
- do not prompt the student in any way that would result in a better response or essay
- do not influence the student's response in any way
- · do not paraphrase, clarify, elaborate or provide assistance
- read all words that appear on page
- do read all directions including example questions
- if asked to repeat a question or passage, one must repeat the entire passage or questions so as not to identify only important aspects
- administration can be recorded to ensure validity or for playback when students want questions repeated
- give special emphasis to words printed in boldface, italics, or capitals
- spell words that sound similar to other words with different meanings
- spell any words requested by the test taker
- always read all answer choices on a multiple choice test before accepting an answer
- avoid voice inflection which may be seen as a clue

#### After a Test

- · do not discuss test items or responses with others
- participate in the evaluation process

#### Table 4. Examples of Guidelines that Apply to Sign Language Interpreters

#### Qualifications

- able to translate in the same method of sign language typically used by the student
- a standard video presentation of the test in sign language is recommended to ensure quality, consistency, etc.
- if the sign language interpreter is also the scribe, qualifications for both roles are required

#### **Before a Test**

- before the testing session, the interpreter must become familiar with the test instructions and the terminology used in the test.
- under secure conditions supervised by the principal, sign language interpreters may review test materials up to four days prior to test administration in order to prepare accurate interpretations of test materials
- room in which sign language interpreters sign the test must be well lit
- one sign language interpreter should be assigned to each student for the entire assessment
- the student and sign language interpreter should each have a copy of the test, and should practice signing and reading before the test
- ensure that the reading comprehension tests are not signed which would invalidate score
- discussions with interpreter and test proctors should occur with the tester present

#### **During a Test**

- · do not alert the student of mistakes during testing
- do not prompt the student in any way that would result in a better response or essay
- do not influence the student's response in any way
- do not define words for students, provide context or teach vocabulary or concepts during testing
- passages within section may be broken into segments for ease in signing and for tester retention and comprehension
- · allow tester to take notes
- administration may be videotaped to ensure validity or for playback when students want questions repeated
- graphic materials may be described but should be available in print or tactile format
- interpreter may not paraphrase, clarify, elaborate, or provide assistance

#### After a Test

- do not discuss test items or responses with others
- participate in the evaluation process

#### Table 5. Examples of Guidelines that May Apply to Any Type of Access Assistant

#### **Qualifications**

- · completed training
- · certified staff member or teacher
- familiar with the student (some guidelines recommend that the scribe be someone who has not been working with the student on a regular basis)
- familiar with the vocabulary used in the test
- parents, school volunteers, peer tutors, and other students may not act as access assistants on state tests
- may not be a private consultant or individual whose fees are paid by the examinee or the examinee's family
- understand the distinction between the helping role of the teacher/ teacher assistant and the technical role of the access assistant

#### **Before a Test**

- · make sure substitutes are readily available
- meet with the student to review access assistant role and answer any questions about that role
- · review test security policies and directions
- access assistant shall sign a test security affidavit acknowledging that he or she will ensure that the content of the written responses directly represents the independent work of the student
- assign one access assistant to each student for the entire assessment
- plan for administration in a separate location so as not to disrupt other test takers
- provide a test copy (the same form) for both the student and the access assistant

#### **During a Test**

- · do not alert the student to mistakes during testing
- do not prompt the student in any way that would result in a better response or essay
- do not influence the student's response in any way

#### After a Test

- · do not discuss test items or responses with others
- participate in the evaluation process

## 5. Draft New or Improved Guidelines

Once existing guidelines and examples from other states have been reviewed, it is time to develop new guidelines or improve those already in existence. Discussions should take place on how to word these guidelines so that they are custom fit to match the needs of your state. Appendix E can be used to help this process—list or write in paragraphs the key aspects to be included.

The drafted guidelines should then be reviewed by the Review Team. This process ensures that individuals who have not been involved in development or revision have a chance to look at the results of your efforts. Their fresh eyes may see something you missed or may pick up wording that will be misunderstood. It is important that this happens before materials are prepared for dissemination. For examples of complete guidelines from a test company, see:

Educational Testing Service. (2004a). *ETS guidelines for a test reader*. At the ETS Web site, http://www.ets.org/, enter "guidelines for a test reader" in the search box. (Be careful to click on the exact link, <u>Guidelines for a Test Reader</u>.)

Educational Testing Service. (2004b). *ETS guidelines for a test writer/recorder*. At the ETS Web site, http://www.ets.org/, enter "guidelines for a test writer recorder."

*Note*: Using the "Advanced Search" and selecting "exact words," improves chances of finding the above documents.

## 6. Design a Plan for Location and Statewide Dissemination

Every state has its own dissemination strategies. These should be reviewed. Questions should be asked such as, *Will every school, eligible student, scribe, reader, and sign language inter-preter receive these guidelines in plenty of time to prepare for testing?* Other considerations for designing statewide dissemination include:

- Disseminate to schools *along with* test administration manuals (schools should also receive all other accommodations guidelines).
- Put in an easy-to-find place on the state education/assessment Web site with several links.
- Develop training packets and deliver to schools with guidelines, especially for schools with few access assistants. Training can also be held via video or audio conference.
- Disseminate via e-mail or through a listserv.

#### 7. Monitor and Evaluate Use and Effectiveness of Guidelines

Ongoing monitoring and evaluation of the use and effectiveness of guidelines for access assistants is very important. The information gained can be used to identify patterns and show areas where access assistants and the students they support need additional training and information. This is the role of the Action Team and the Review Team.

This type of evaluation does not require extensive "data analysis" or complex methodology. It is a fairly simple and straightforward process of "formative" evaluation. The purpose of formative evaluation is to "turn over useful information quickly to make improvements" (Brinkerhoff, 1983). This information can include comments, observations, notes, or anecdotal reports from the student, his or her teachers, parents, and other members of the IEP team.

Decisions about which students need access assistants should be made long before test day and students should have a great deal of experience working with these assistants. Before test day, preparations need to be made for the access assistants for each student who needs one. For example, rooms need to be reserved for private testing. On test day, a designated staff member should be available to answer questions from access assistants and monitor their work. After the test, transcribers may need to be available to transfer student responses to the general response format. This is a process that also needs to be monitored by another staff member and checked for accuracy. Monitoring this entire process before, during, and after test day will improve the process for future test takers.

The use of access assistants takes time and practice, requiring ongoing monitoring and evaluation. This information can be obtained by observation and by asking some basic questions of district assessment personnel, students, and the access assistants themselves. These questions can be used to formatively evaluate the use of access assistants. Appendix F has sample questions for evaluation by the district, by access assistants, and by students. School and student level questions could be addressed by the IEP team and then combined for school and district analysis. Evaluation by the students who use the services of access assistants is critical. They have the most to gain with appropriate and equitable access. Evaluation can be in interview, focus group, or survey form and should take place shortly after test completion to get the most accurate information.

## **Summary**

The seven key features covered in this manual for developing or revising state guidelines for access assistants will help ensure that your state's guidelines reflect stakeholder involvement and collaboration, represent a meaningful purpose, and provide an accurate picture of what is currently available in your state. While this report has addressed only scribes, readers, and sign language interpreters, the process could easily be adapted to other access assistants as well.

#### References

Brinkerhoff, R. O. (1983). *Program evaluation: A practitioner's guide for trainers and educators.* Kluwer Academic Pub, Boston: MA.

Clapper, A.T., Morse, A.B., Lazarus, S.S., Thompson, S.J., & Thurlow, M.L. (2005). 2003 State policies on assessment participation and accommodations for students with disabilities (Synthesis Report 56). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Clapper, A.T., Morse, A.B., Thompson, S. J., & Thurlow, M. L. (2005). *Access assistants for state assessments: A study of state guidelines for scribes, readers, and sign language interpreters* (Synthesis Report 58). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Educational Testing Service. (2004a). *ETS guidelines for a test reader*. Retrieved from http://www.ets.org/disability/readguid.html

Educational Testing Service. (2004b). *ETS guidelines for a test writer/recorder*. Retrieved from http://www.ets.org/disability/writguid.html

# Appendix A. Chart to Use to Form an Action Team and a Review Team

Answer these questions and use the chart on the following page to name members to the two teams.

1. Is there a group in the state education department that is responsible for developing policies and procedures on accommodations? If so, which groups do the members represent?

2. Is any additional or different representation needed for the Action Team?

3. Is any additional or different representation needed for the Review Team?

Action Team and Review Team Members

Local Expertise				
Assessment Expertise				
Special Education Expertise				
Review Team				
Action Team				
Name				

## **Appendix B. Statement of Purpose**

Use the process below to establish a statement of purpose of developing guidelines for access assistants by the Action Team.

1. Have Action Team members review purpose statements from other states (e.g., to provide consistency across the state, to ensure alignment with state policies).

2. Ask Action Team members to brainstorm critical aspects of a purpose statement for the guidelines for access assistants for your state.

3. Cull through the brainstormed features to create a single purpose statement to which all can agree.

Appendix C. Compilation of Existing Policies, Guidelines, and Training Materials that Apply to Access Assistants

Use this form to specifically note the location and type of information on each access assistant.

Title and Location of Document (Summarize Accessibility)	Policy, Guidelines, or Training Materials	Scribe	Reader	Sign Language Interpreter

# Appendix D: Ideas for Qualifications and Instructions for Access Assistants: Scribes, Readers, and Sign Language Interpreters

Use this chart to enter examples of qualifications and instructions that you want to consider for your state's guidelines for access assistants.

Scribe	Examples Useful for Our State Guidelines	Our State's Additions
Scribe	(Check Table 2 and Table 3)	Our State's Additions
Qualifications	(Check Table 2 and Table 3)	
Before a Test		
During a Test		
After a Test		

Examples Useful for Our State Guidelines (Check Table 2 and Table 4)	Our State's Additions
	Examples Useful for Our State Guidelines (Check Table 2 and Table 4)

Sign Language Interpreter	Examples Useful for Our State Guidelines (Check Table 2 and Table 5)	Our State's Additions
Qualifications		
Before a Test		
During a Test		
After a Test		

# Appendix E. Draft Guidelines

Use this form to write down the key aspects of your guidelines for each access assistant (may be in list or paragraph form).

Scribe	Draft Guidelines
Qualifications	
Defense a Teat	
Before a Test	
During a Test	
After a Test	

Reader	Draft Guidelines
Qualifications	
Before a Test	
During a Test	
After a Test	

Sign Language Interpreter	Draft Guidelines
Qualifications	
Before a Test	
During a Test	
After a Test	

# Appendix F. Questions to Guide Evaluation of Access Assistant Procedures

Use these evaluation questions as a starting point to guide a comprehensive evaluation of your access assistant guidelines and procedures.

#### **Evaluation by District**

- How many students with IEPs or Section 504 plans are using the services of access assistants?
- What types of accommodations are being provided for each of these students?
- Are these accommodations documented in each student's IEP/504 plan?
- Has each student learned to use the accommodations in instructional situations, with the support of access assistants?
- Has each access assistant received training and written information and is each one competent in the provision of the specific accommodation?

#### **Evaluation by Access Assistants**

- What accommodations do you provide?
- What is your perception of how well your services "work" for state assessments?
- What are some difficulties you have found when providing access assistant services?
- Did you receive adequate training on how to provide access assistant services?
- Did you receive adequate written guidelines on how to provide access assistant services?
- Were the written guidelines clear and easy to follow?
- Is there any additional information or guidance that would be helpful?
- Do you feel more qualified to provide this service since receiving the guidelines?
- How do you think the process of using access assistants during tests could be improved?

### **Evaluation by Students**

- What accommodations do you use in the classroom and on tests?
- Do you use the services of access assistants in the classroom and on tests?
- What is your perception of how well the services of access assistants work?
- Did you receive adequate training on how to use the services of access assistants?
- What are some difficulties you have found when using the services of access assistants?
- How do you think the process of using access assistants during tests could be improved?

NCEO NCEO