

NCTM COMMUNICATIONS GUIDE

EXPANDING OUR REACH

Communication
Outreach
News
Media



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

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The National Council of Teachers of Mathematics is a public voice of mathematics education, providing vision, leadership, and professional development to support teachers in ensuring mathematics learning of the highest quality for all students.

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EDUCATE, COMMUNICATE, AND ADVOCATE

An important part of the mission of the National Council of Teachers of Mathematics (NCTM) is to act as a public voice for mathematics education by informing and educating the public and policymakers as well as the education community. We do this in various ways—from interaction with the news media, to participation in public forums, to meetings with elected officials.

As the attention on education increases, these opportunities will continue to grow. It will become more important for NCTM to be a part of the public debate as decisions are made that will have a significant effect on the future of mathematics education. Furthermore, it is essential that we not only take advantage of these opportunities but also reach out on our own.

Although the NCTM president is the national spokesperson for the Board and the Council, clearly there is a need for much more communicating than one person or a relatively few members in leadership positions can do. That is why we are extending our communications outreach to include more mathematics educators and their expertise in an effort to expand our sphere of influence and advocate for a quality mathematics education for all students.

NCTM and its members must participate in this outreach effort together. Although the Council reaches out most often in the national arena, we also rely on our members to keep us informed on education issues in their communities and states or provinces.

This communications guide was developed to assist you and to support your efforts on behalf of mathematics education. It is designed to provide the working tools you may need to reach out proactively to elected officials and your local media. It explains how to initiate and maintain positive relationships with reporters and elected officials and how to educate the public and policymakers through letters to the editor, written testimony, personal testimonials, interviews, and news conferences. It will help you become an informed resource and an advocate for mathematics education.

In preparing this information, we have taken care to incorporate detailed information in an easy-to-use format with sample materials included throughout. We encourage you to tailor these materials to suit your individual needs and interests.

As we work together, we will shape the Council into a more vibrant, effective organization—one better able to address issues at both the local and the national level and better able to serve our membership and set the direction for mathematics education in the twenty-first century.

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MEDIA OUTREACH



STEP-BY-STEP PLANNING

Whether you're working on your own or as part of a large group, securing media coverage can be made easier by following these steps:

- Determine what you want publicized or reported in the media.
- Develop a media list of those who would be interested in the event. Include city, state or provincial, national, trade, and education press.
- Develop and execute a publicity plan. Decide what needs to be done when and by whom.
- Assign someone to collect newspaper clippings.
- Evaluate your publicity results.

WHAT MAKES NEWS

For your activities and programs to be newsworthy, they must have some relevance to the community. For example, how does NCTM's *Principles and Standards for School Mathematics* affect the local and national school systems? Does it include new requirements for both public and private schools?

When planning your approach to reporters, the key is to identify the angles that would interest them. *Hint:* Before approaching a reporter with your story, try it on your family members. If you can get them interested in it, you have a chance with a reporter. To shape your story, ask questions such as the following:

- Can the implementation of the *Principles and Standards* in mathematics education improve standardized test scores?
- How do U.S. students compare to the rest of the world?
- How will *Principles and Standards* affect local school systems?
- How can *Principles and Standards* help students understand mathematics?

DEVELOP A MEDIA LIST

To contact reporters, you need a current media list. The list can include magazines, newspapers, television and radio stations, and state or local bureaus of national wire services such as the Associated Press. If you do not already have such a list, check with NCTM headquarters. You may also be able to obtain one from a convention or civic center, chamber of commerce or board of trade, newswire or press clipping service, advertising or public relations agency, or press club. The media list should include the names of appropriate reporters and editors. Don't forget editors of professional and technical societies' and employers' newsletters.

When contacting different editors, be sure to emphasize why NCTM's *Principles and Standards* is important from their point of view. For example, when contacting—

Education editors—"NCTM's Standards in mathematics for prekindergarten through twelfth grade are designed to improve math education and to bring practical applications of math to the classroom."

Metro and city desk editors—“NCTM’s Standards in mathematics have a positive impact on local school systems, classrooms, and students.”

Technology or science editors—“NCTM’s Standards in mathematics will better prepare our nation’s students for careers in such fields as mathematics, technology, science, and engineering.”

In addition to the editors listed above, television and radio stations also have assignment editors. They are the people who make daily decisions about which stories get covered.

Keep a file of printed stories that you generate to evaluate your publicity results. At the end of the year, be sure to distribute copies of them to schools and sponsors. In addition to speaking with reporters, there are a variety of ways to work with your local newspapers; we detail these in the section “Getting the Word Out.”

CHOOSING THE RIGHT MEDIA

Keep in mind that although all media sources search out and present news stories, newspapers, radio, and TV each have individual attributes that will influence their degree of interest in your story.

Newspapers—More than any other type of media, printed news has the ability to provide in-depth analysis by means of longer news stories. Newspapers can have long shelf lives and can be saved and referred to in the future.

Radio—Radio coverage may not be your first choice, but radio is often the medium with greatest immediacy. Radio interviews may air live or be produced to be broadcast within the hour. Also, morning drive-time and evening rush-hour programming have the highest listenership.

Television—Television can merge pictures with storytelling, creating a broadcast that can leave a strong and lasting impression. When it comes to covering *Principles and Standards*, television operates at a small disadvantage because such stories are short on visual elements (pictures). Nevertheless, because mathematics education is of interest to a high percent of the population (especially parents), TV news as well as special newsmagazine programs such as *Dateline* may be interested in your story.



MEDIA RELATIONSHIPS



HOW TO FOSTER MEDIA RELATIONSHIPS

Why is it important for you to foster a relationship with the media? It is essential to let the public know about the positive reforms taking place in mathematics education today.

A carefully cultivated relationship with your local media will prove to be an invaluable asset in your media outreach efforts. An important first step is to identify the reporters who cover education issues in the newspaper, radio, and television outlets you want to reach. When you have done this, you will know whom to call to pitch your story or get your side of an issue covered.

For example, a reporter for a local weekly newspaper may cover many topics, whereas on a metropolitan daily there may be several reporters responsible for covering different aspects of education. Radio and television stations cover more timely, breaking-news stories, but many also have reporters assigned to cover education issues. An important element in establishing a relationship with a reporter is providing the appropriate ingredients—statistics, anecdotes, spokespersons—needed to tell the story to the target audience.

In developing a good relationship with reporters, you need to remember it is a two-way exchange; they need your information, and you need them to get the information out.

ACCESSIBILITY AND CREDIBILITY

The keys to developing good relationships with the media are accessibility, cooperation, and credibility. If you consistently supply them with reliable information in a timely manner, you will undoubtedly be the first one they call on issues pertaining to mathematics education. Journalists will trust and believe you if they are able to get useful and accurate information from you in a form that best meets their needs. It is valuable for you to be regarded as a helpful, knowledgeable news source who gives as much information as possible without jeopardizing your interests.

NEWS JUDGMENT

To deal effectively with the media, you must first answer the basic question: What is news?

News is not necessarily good or bad. It is usually out of the ordinary. Editors, reporters, and producers decide what is news on the basis of what they believe interests or affects their audiences. Since there is much competition for media coverage, you must help the editor or reporter choose your story by making it newsworthy.

Journalists both report and shape the news. Most of the time, they do so by asking, “How does the story affect the average person?” Your job is to help the reporter see the broad appeal of your story as well as its unique angle. For example, if your story tells of a challenging mathematics curriculum that is helping your city’s public school students better understand problem solving, you probably would have a better chance of getting favorable coverage than you would with a story on a mathematics curriculum introduced in a local private school. If you can add how many students are affected, your chances are better yet.

PROFESSIONAL RESPECT

To keep things in perspective when establishing relationships with reporters and other media professionals, realize that the journalist is not necessarily either your friend or your enemy. Establishing a friendly relationship is certainly desirable. But developing a professional relationship based on mutual respect is better. This will result in the reporters being willing to give more consideration to your viewpoints and positions. Don't ever assume that a reporter will put your interest ahead of the story or emphasize your perspective in the story.

A journalist is never off duty. So you should be careful even with casual remarks while socializing. Don't say anything you wouldn't want to read in the newspaper or hear on the air.

Good reporters can't be bought by flattery or gifts, and they resent attempts to influence their work through intimidation, particularly threats to go over their heads to an editor or publisher or news director. Avoid the temptation to exercise indirect influence, such as pointing out that you personally know a large advertiser in the newspaper or on the station involved. This kind of approach will backfire and make an even better news story than the one you may have wanted to get reported.

Reporters won't like you to tell them how to do their jobs. Don't ask to see a story before it is printed or aired. However, you may be asked, or you may offer, to review technical or complex material for accuracy before publication or airing. And it is always wise to tell a reporter to feel free to call you back should clarification or additional information be needed.

Last but not least, be aware of reporters' and editors' deadlines. Don't call a radio announcer near the top of the hour when he or she is preparing the news; the same goes for local television reporters near their evening broadcast time. And always ask reporters their deadlines.

Adapted from Hill & Knowlton "Guide to Effective Communication"

INTERVIEWING



THE BASICS

First, you need to determine your target audience. This will help you decide who is likely to cover the event—a local reporter or someone with a broader reach. If the story has state, provincial or national relevance as well as local interest, many local reporters can handle it effectively through their working arrangements with national wire services or larger metropolitan dailies. It's best to start at the local level and expand out rather than to work the other way around.

For a national news story, you may decide that it's also appropriate to have the reporter contact the president of the National Council of Teachers of Mathematics. The president of NCTM is the best spokesperson for national issues. Contact NCTM Media Relations Manager Gay Dillin (703-620-9840, ext 2189) to assist you in obtaining an interview with the president.

SPEAK SIMPLY AND DIRECTLY

Whether or not the reporter has a sophisticated understanding about your field of expertise, you should speak in simple, direct terms that the average person can understand. This is particularly true when you are dealing with radio and television, where a 5- to 15-second segment of what you say may be used to tell your entire side of the story. This is also a good policy when dealing with newspaper reporters, since a brief, well-constructed comment will increase comprehension and decrease the likelihood of being misquoted.

BE PREPARED

Preparation is the key to success in dealing with the news media. When a reporter calls, it is important that you ask some pertinent questions. For example: What is the issue about? With whom has the reporter spoken or with whom is he or she planning to speak? For what audience is the reporter covering the story—parents, educators, children, community, regulators, or legislators? And most important, what is the reporter's deadline?

To begin the process of tailoring your message, develop concise answers to all the questions you can anticipate, including those you feel certain you will never be asked. Map out your key messages that relate to the topic of the interview.

Develop a key message for your interview, such as "This is about better education." Repeat that message in an interview so that it becomes clearly identified with your position. If you do this, journalists will begin to pick up and use your theme line on a regular basis to explain your side of the story.

Organize your thoughts into complete sentences that are colorful, understandable, quotable, and relevant to the reporter's readership or listeners. The following nine message shapers will assist you in fine-tuning your message to maximize media coverage:

1. **Specific examples.** Illustrate your point with examples that condense your position into a graphic statement of a specific event or situation. For example:

“Having a calculator for a child is no more expensive than going to a movie. Even a graphing calculator is less than the cost of a new pair of athletic shoes. We seem to get the money we want for sports, and it’s time we realized it takes more than chalk to teach mathematics.”

2. **Analogy and Relevance.** Compare mathematics to an easily recognizable situation. For example:

“Teaching mathematics through rote memorization and drill is like teaching a language using only the rules of grammar.”

3. **Be Quotable.** Remember to use colorful *active* words and *contemporary* references to add punch to your message. Make reference to popular television characters, people in the media, or current political leaders to enliven your responses. (A favorite used by former President Ronald Reagan was the Clint Eastwood quote “Make my day.”) Avoid negatives like “We don’t believe in,” but instead emphasize the positive in statements like “We stand behind the *Principles and Standards*.”

4. **One-liners.** Speak in short, memorable statements that are pithy and quotable. For example:

“What happens to our children in family and community settings is at least as important to learning as what happens during the five hours they are in school.”

5. **Numbers.** Shocking or staggering statistics can illustrate your point. For example:

“More than 10 percent of our educational resources are devoted to mathematics education. That’s about \$25 billion annually, so we must ask ourselves if we’re getting a good bang for our buck.”

6. **Absolutes.** Be careful using words like *always*, *never*, *first*, *last*, *largest*, *smallest*, and so on. Make sure you're accurate, as in this example:

“NCTM was the first professional organization to set voluntary standards for education, and its efforts serve as the foundation for the reform movement taking place across the nation.”

7. **Quote the opposition.** Who better to lend support for your point of view than your opposition? For example:

“Even critics of our education system who published ‘A Nation at Risk’ in 1983 agree that NCTM has taken positive steps toward reforming and improving mathematics education.”

8. **Second-person perspective.** Address your point directly to “you,” that is, the public. For example:

“You need mathematics to compare loans, budget groceries, estimate travel time, and understand sports statistics. It also helps you comprehend the magnitude of more global issues, such as determining the national debt or the longevity of national resources.”

9. **Personal experience.** Use stories from your experiences in the classroom to back up your assertions.

Take a few minutes to develop your chief points, using several of the elements above. Review what you have written to make sure that your statements appeal to the audience you are addressing.

During the interview, find ways to use all the work you have prepared. Don't think of the reporter as your audience. The reporter is simply the conduit through which you are communicating your message. Your audience is his or her readership, listeners, or viewers. Never lose sight of that fact.

After the reporter asks you a question, think about how you can answer it using your key messages and the nine elements above in a way that strikes a nerve in your audience. This takes some practice, but it will become second nature if you work hard at limiting your responses to the points you've decided are the most important and repeating your key messages.

Prepared with a strong sense of the points you want to make and a wide array of sound bites, you'll feel more relaxed during the interview and will increase your effectiveness as a spokesperson.

AVOID “OFF THE RECORD” AND “NO COMMENT”

Never speak “off the record” or say “no comment.” There's no guarantee that reporters will not use “off the record” comments. “No comment” creates a perception of guilt or deception. Try for a limited response that satisfies a reporter without causing you problems. Then steer the discussion to a key point on your agenda.

Say as much as you're certain about without allowing the reporter to steer you out of your field of expertise or responsibility. It is not necessary for you to answer every question you are asked.

STAY CALM

Always be polite and considerate even if you don't like the reporter or his or her perspective on the story. Stay calm even in the face of what you might view as outrageous or insulting questions and make your points calmly and deliberately. Don't let a reporter get you to say something in anger that he or she could use later to your detriment.

Sometimes you may have to say you don't know an answer. Be sure to tell the reporter you will get the answer. Then make certain that you do. Be polite but firm in your responses.

TELEVISION INTERVIEWS

Because of the limited amount of time that television devotes to news, few news stories can be given more than superficial treatment. Yet the majority of the public gets its news only through television. Therefore, it is essential to know how to communicate effectively in this medium.

Preparation is a key to successful television appearances. It involves getting facts and figures ready before the event and establishing a “game plan.”

With planning, it’s possible to predict almost every reasonable question you might be asked. You should construct concise, carefully considered responses and messages that will outline your positions with clarity and conviction.

KEY MESSAGES

You should prepare at least three key messages that you want to include in the interview regardless of whether you are asked about them. Preparation also includes deciding what you will say in response to negative questions. (See page 23 for NCTM key messages.)

BRIDGING

Look for ways to reverse negative questions and turn them into positive points. For example, a response to a question about a disciplinary incident at your school could be accompanied by a citation of the school’s record of academic achievement over the years. You would accomplish this by “bridging”—for example, by saying, “It’s important that your viewers know that this is an isolated incident. Our school’s academic achievements clearly show that the majority of students come to school to learn.”

Other examples of “bridges” include the following expressions:

- “And that’s another reason that we need (insert main point).”
- “An example of that is (insert main point).”
- “You should also know that...”
- “Let me add...;” “Let me explain...;” “For instance...”
- “I think ultimately the answer lies in...”
- “It’s important that your viewers know....”

Never allow yourself to become defensive. Remain calm, positive, friendly, and well meaning. You’ll be most effective when your answers are positive. That way, even if you’re asked negative or leading questions, you can bridge to one of your principal points.

Be aware of aspects of your field that are of particular interest to the media. Follow news stories on education carefully to see what they are emphasizing. That will give you a good indication of the areas of questioning you can expect. Be prepared as well for questions about general news of the day.

THE INVERTED PYRAMID

A television viewer's attention span is short. So keep your answers brief, simple, and free of unfamiliar jargon. Give headline responses—short and to the point. And just as a news reporter will write a story with the most important point at the beginning, tell your story in the classic inverted pyramid style—with the most important point at the beginning, followed by supporting facts and details in descending order of importance. But don't get bogged down in details.

APPEARANCE AND DEMEANOR

Because television combines video with sound, your demeanor and appearance are often just as important as what you say. Positive perceptions are based on viewers' assessment of your sincerity, likability, clarity, and directness of response.

First impressions are critical. Your body language speaks, too. A friendly smile and use of the interviewer's name can help to establish your likability with television audiences, for whom visual images are an important part of the message.

EYE CONTACT

Maintaining eye contact with the interviewer throughout the question and into the first part of your answer also is critical to your credibility. Losing eye contact is known as the "crossover" moment. Shifting eye contact between question and answer may be perceived as representing evasion, anxiety, or dishonesty.

POSTURE

Remain fairly erect during the interview. Sit up straight. Doing so will help you maintain a high energy level, and you'll look attentive and eager to participate. Avoid any tendency to swivel or lean to one side.

DICTION

Speak clearly, distinctly, and with an even pace so that your messages will not be lost. To avoid speaking too slowly, which may bore the audience, maintain a high energy level. And emphasize your key messages with vocal inflections.

VISUALS

If the interview takes place on school property and the story is positive, try to position yourself with the school's name or logo in the background. Try to see the background through the viewers' eyes and avoid including anything that might distract them from your message.

TELEPHONE INTERVIEWS

The telephone is the workhorse of the news-gathering business. More information is acquired by phone than by almost any other means. More interviews—especially those for radio news—are conducted by phone than in person. Print journalists also rely heavily on the phone to obtain information.

There are some precautions and procedures to observe that are common to telephone interviews for both broadcast and print media. Find out first when and how the material is to be used so your responses will be appropriate to the target audience.

Even in preliminary remarks before an interview, be careful not to say something casually that you wouldn't want to see in print or hear on the air. Remember that a reporter is a reporter 24 hours a day.

Don't be pressured into doing an interview on the spot if you are inadequately prepared. Try to comply with deadlines as best you can but not at the expense of your performance. Delay the interview for as much time as you feel you'll need to prepare yourself on the topic. Develop key messages just as you would for a television interview. And after the interview takes place, get the reporter's phone number so you can call back with corrections or new information, if necessary.

Get to your most important statement early, and present it in clear and simple language. Always summarize an interview by repeating this main theme plus any other key messages that you want to emphasize.

HUMOR

Handle humor with caution. Statements that sound like clever one-liners in live contexts can often boomerang in print or can be pulled out of context on radio, making you appear insensitive or foolish. Remember that subtlety and satire will often translate badly in radio or newspaper editing.

CALL BACK

Don't go out on a limb with information that you're not sure about. Tell the reporter you will need to call back, and then do so. Similarly, call back if new information develops that changes what you have given the reporter. These follow-up phone calls may be crucial both to accuracy and your credibility.

Be sure to spell out any unusual or difficult terms and all names (including your own) for reporters. Always give your title.

REVIEW OF A STORY

Don't ask for prepublication or prebroadcast approval rights. But do offer to review any complicated, scientific, or highly technical material, if appropriate.

RADIO INTERVIEWS

There is a sense of immediacy to radio news that often makes a telephone interviewer press for an instant response. But it may be in your best interest to delay the interview, even for a short time, to prepare your principal points. If so, offer to call back in a few minutes, and then do so.

FORMAT—IS IT LIVE OR TAPED?

Ask whether the interview is to be aired live, taped for use in its entirety, or taped for excerpting. If the tape is edited for newscasts, your answers should be kept to 10 to 20 seconds in length. Get right to the point. A longer interview to be aired in its entirety permits more detailed responses.

You should ask whether it is appropriate to use the interviewer's name in your responses. Often, this is not done in taped interviews that will be edited for newscasts, since the person conducting the interview may not be the one who presents the news.

GROUND RULES

Before agreeing to the interview, you can establish ground rules with the interviewer. Depending on the occasion and the news organization, these can include arrangements for you to repeat an answer if you fumble a word so that the good take will be used, to stop the tape if you need more time to develop a more concise answer, and to include updated information if something changes in your facts before the scheduled air time. But don't expect every reporter to agree to such conditions.

To reduce extraneous noise, turn off room air conditioners, block other phone calls, and close your office door.

YOUR VOICE

Raise your energy level. Sit up in the chair or stand for more alertness and vocal animation. Use gestures to increase vocal emphasis.

Avoid shouting or whispering. To reduce popping or hissing sounds on the tape, talk in normal tones across the telephone mouthpiece, not directly into it.

Guard against vocalized pauses. These "uh" sounds stand out badly on radio. Silence sounds better, and it won't cost you any precious time.

NUMBERS

Avoid the use of numbers unless they're absolutely essential to make your point. If you must use numbers, round them off and use them sparingly.

PRINT INTERVIEWS

Interviews for print media differ from interviews for broadcast media in a number of ways. Most important, print is the standard medium of record. What you are quoted as saying in print lives on in computer files that virtually all journalists have access to. Print interviews also are longer. The reporter has more time to pursue a point, and you have more time to blurt out something inadvertently that would have been better left unsaid.

That's why it's especially important to prepare yourself thoroughly in advance of the interview, anticipating the questions, choosing the points you will stress, and deciding how to handle difficult or negative questions.

Before agreeing to an interview, ask the reporter what will be discussed and when and how the material is to be used. Then you will have time to prepare answers that will be appropriate to the target audience.

SET TIME LIMITS

Try to determine the amount of time needed for the interview and whether it's to be in person or by phone. You will want to set a time limit for the interview to reduce the risk of wandering into irrelevant or undesirable areas.

Avoid going "off the record." And remember that a reporter can use even casual, preliminary remarks in a story. Don't say anything that you don't want to see in print.

Keep in mind the key messages that you want to appear in the finished interview. Get these points across early in the interview—and don't hesitate to repeat them.

PAINT A PICTURE

Make short, simple, and specific statements. If possible, use colorful and vivid language. The more context you can give, the better. Make generous use of specific illustrations, comparisons, and anecdotes.

Again, don't try to make serious points through humorous, subtle, or wry remarks. As noted before, these comments often can be misinterpreted or translate poorly in print. The result can damage your credibility and image.

AVOID SAYING "NEVER"

Avoid using absolutes in statements to reporters. A flat denial of a reporter's assertion can backfire on you when it's later shown to be true. A good rule of thumb is "Never say never."

ACCURACY

It's to the benefit of the reporter and yourself that a story be accurate. If you need to give additional thought to your response or if you're in doubt about an essential fact, don't hesitate to tell the reporter you'll get the information and call back—then be sure you do.

Be prepared with specific examples to back up general statements about programs or accomplishments that you mention. Volunteer this type of information rather than wait for the reporter to pull it out of you; otherwise, the opportunity may never arise to talk about what is most important.

STICK TO YOUR MESSAGE

Go beyond answering the questions only if you are bridging to a key message. Make sure what you're saying is relevant to the question, and always remember to bridge to your key messages. If you're speaking on a sensitive subject, don't volunteer information or comments that are not essential to a concise answer.

SUPPORTING MATERIALS

Don't forget to offer any photographs, graphs, or other illustrations that would be appropriate and would heighten the reader's comprehension or interest. Select visual materials best related to the style and audience of the newspaper, magazine, or journal.

Keep a supply of background material on hand for reporters who are not completely familiar with your organization. It's a good idea to provide the news organization with a current, professional-quality photo of yourself and other designated spokespersons. Be available for follow-up calls for clarification.

THE UNEXPECTED INTERVIEW

Before considering what to do in the event of an unexpected confrontation by camera and microphone, consider whether such an event couldn't have been foreseen. Most of the time it could have.

Ask yourself if the media's increasing attention to your situation would make you a logical target for a so-called ambush interview. After all, ambush interviews are not random events.

If there is a reasonable likelihood of an unexpected interview, make time for advance preparation of key messages and answers to expected questions. Set parameters for yourself beforehand of what you will say and what you won't. Then stick to your plan.

Pull your thoughts together before you leave the office—or the courtroom. Select a key point that you are going to make no matter what the question is.

SEIZE CONTROL

Stay calm and take control of the situation. Slow down the process. Identify the reporter or reporters and the media that they represent. Take a moment to compose yourself and then look the questioner right in the eye and respond in a friendly, cooperative manner.

Make your main points—for example, “The issue here is ...”—and steer back from other questions to your key messages.

Control the interview by permitting one question at a time. If you find yourself in an impromptu news conference, designate each questioner clearly and tell reporters you will give each of them a chance to ask a question in turn.

FINISH YOUR ANSWERS

Insist on finishing your responses. If you are cut off, repeat your answer and then take the next question. This helps establish your control of the situation, tones down the atmosphere, and allows broadcasters to get a clean excerpt of your comments.

Don't feel that the ambush interview is a situation where you can only answer questions. You can open the proceedings with a statement. Since the first words you say are often the likeliest to be broadcast—particularly if you are speaking about breaking news—this can give you an advantage.

MOVE THE INTERVIEW

You may want to defuse an ambush at the outset by suggesting a change of location to a more comfortable setting. If, for example, you arrive at your office parking lot and find reporters and camera crews racing toward you, do not answer their shouted questions but do not attempt to walk away. Instead, ask them in a calm and friendly manner if they might be more comfortable inside, say, in your office or a conference room. Explain that you will be happy to arrange an

interview there for them, if they will wait in the lobby. This approach will allow you to have a few more minutes of preparation, perhaps on the basis of the shouted questions you have just heard.

It also tells the reporters that you are not only cooperative but trying to help them get their interview in the best possible location and setting. It also shows that you will not be bullied.

If you are questioned about a specific event on which you cannot comment, say so politely and explain why. Then go back to your theme and cover the points you want to emphasize.

MAKING YOUR EXIT

Above all, avoid beating a hasty retreat for shelter or saying “No comment.” “No comment” generally is interpreted as an affirmation of the question. When you have given everyone a chance to ask one or two questions, thank them politely and exit with a confident smile. You have neutralized the ambush situation.

TEST YOUR SKILLS

1. **Watch Television—Frequently and Analytically.** Now that you have practiced NCTM’s media training techniques, you can learn how effective they can be by watching interviews with a more critical eye. Tune in frequently to the locally produced news programs in your own area in addition to network evening news and other programs such as *Nightline*, *Dateline*, *60 Minutes*, *The Today Show*, *Larry King Live*, *Moneyline*, *Meet the Press*, or *Face the Nation*.

Analyze these programs from the standpoint of eye contact, bridging, bottom-line answers, and the presence or absence of key messages. Watching the success and shortcomings of others analytically is one of the best ways of refining the communication skills you have acquired.

2. **Review Newspaper Headlines.** Check the headlines in both the general and local news sections to see if those stories could lead to a question for your organization or you. Ask yourself, “If I had an interview today, could that story lead to a question for me? If so, what is the question and what is my answer?” Second, “Is there any way I could use one of those current stories as a lead-in to one of my key messages?” And scan other relevant publications such as the *Wall Street Journal* or education publications. Make this a daily habit to refine your perception for the news interviewer’s interests. It doesn’t take much time and will pay big dividends.
3. **Practice, Practice, Practice.** An occasional question-and-answer session with a member of the staff or a run-through of a speech with a tape recorder can keep you fresh, up to speed, and on message. Take time to listen to the playback and evaluate your performance.
4. **Make Special Preparations for Special Challenges.** A major speech or public appearance deserves extra work on your part. Give it the time it requires for you to be at your best. Consider additional training for appearances before analysts, a legislative body, or a large organization. Whether you are facing such a special challenge or just want to keep your communication skills sharp, NCTM recommends refresher courses to keep yourself at peak levels.

Adapted from Hill & Knowlton “Guide to Effective Communication”

NCTM KEY MESSAGES

- Mathematical literacy is essential for every child's future. A solid mathematics education is essential for an informed public, our national security, a strong economy, and national well-being.
- All students should receive a quality mathematics education, regardless of sex, ethnicity, or race.
- Teachers should encourage and inspire every student to continue the study of mathematics. To be able to do so, teachers must themselves have a solid knowledge of both mathematics content and teaching strategies and also enjoy teaching mathematics.
- A workforce of strong mathematics teachers that reflects the demographic characteristics of the student population is essential.
- Teachers, administrators, and counselors at all educational levels should expect students from all segments of the population to be successful in mathematics.
- There is a strong, direct correlation between learning and teaching: High-quality learning requires good teaching. Furthermore, content knowledge alone is not enough to make a good teacher; effective teaching practice can and must be learned.
- The primary focus of all professional development is helping teachers teach mathematical content to their students. Effective programs of teacher preparation and professional development help teachers understand the mathematics they teach, how their students learn that mathematics, and how to help each student learn.
- Teachers must have access to professional programs and activities that will lead them to help students learn with understanding, as advocated in *Principles and Standards for School Mathematics*.

KEY MESSAGES ON PRINCIPLES AND STANDARDS FOR SCHOOL MATHEMATICS

- *Principles and Standards for School Mathematics* presents a timely, updated vision of school mathematics, defining a future where all students have access to high-quality, engaging mathematics instruction.
- Yesterday's basics are no longer enough; we're expanding the basics to match the needs of tomorrow.
- *Principles and Standards* sets forth guidelines for excellence in mathematics education and calls for all students to engage in more-challenging mathematics.
- *Principles and Standards* presents a vision of higher standards for students and teachers and more and better mathematics for all students.
- Students who are taught with curricula modeled after *Principles and Standards for School Mathematics* will learn more mathematics, be better problem solvers, and be better prepared for the future.

GETTING THE WORD OUT



COMMON METHODS TO REACH THE MEDIA

There are many ways to get your information out to the media, whether in print, on television, or on radio. The most common method used to contact all the various media outlets is the news release. Other tools that can be used for the print media are the media alert, letters to the editor, and the op-ed or opinion column.

NEWS RELEASE

The news release is one of the most important tools used to grab the attention of the media—television, radio, and newspapers. Reporters rely heavily on news releases for information and story ideas, and because of that it is your pipeline to the public. The power of the news release is that you control the message by determining what information is included. Think of the news release as a sales pitch, and like any advertisement you need to grab the attention of your audience in the first few seconds. (See pages 28 and 29 for examples.)

A few points to consider:

- Write an eye-catching headline.
- Grab the reporter’s attention with your lead paragraph.
- Be brief—one page is enough.
- Remember your audience and tailor the message.
- Include the five “Ws”—Who, What, Where, When, and Why.
- Don’t forget a contact name and phone number.

MEDIA ALERT

The media alert is a notice to the local media of an event. It can be used to announce a visit by the president of NCTM to a local school, a speech or workshop given by an NCTM board member, or a display of math projects at a high school. The media alert is used most often when the event can be described by simply listing *Who, What, Where, When, and Why*. If additional information is needed, it can be included at the bottom of the media alert under *Background*. (See page 30 for an example.)

LETTERS TO THE EDITOR

Just about every newspaper, regardless of size, has an editorial page that publishes letters to the editor on issues of the day. Letters to the editor are an effective way of informing and influencing the public. When you see an article about the quality of mathematics education or current education standards, write a letter to the editor and include information about the *Principles and Standards*, with a reference to the National Council of Teachers of Mathematics.

Letters to the editor can have a significant impact on public perceptions. They help gain exposure in the media for positions or information that otherwise may never be published. This media coverage has the potential to reach thousands of local residents. In addition, elected

officials and local decision makers often look to letters in the newspaper as gauges of public reaction to activities or issues.

In a letter to the editor, you can do the following:

- Correct inaccurate or misleading coverage.
- Educate or inform readers.
- Agree or disagree with a position previously expressed.
- Voice your opinions on issues you feel strongly about.
- Persuade readers to act in a specific way.

GUIDELINES

There are a few guidelines to keep in mind when writing a letter to the editor. (See page 31 for an example).

- Actively seek opportunities to write a letter to the editor.
- Keep it short and concise, no more than 150 words.
- Contact the publication for guidelines on style as well as on sending methods.
- If you are advised to send the piece by e-mail, paste it into the body of the e-mail instead of sending it as an attachment. This way you won't have to worry about technical problems in opening the file.
- Send the original copy and keep a copy for your records. Include a self-addressed, stamped envelope if you would like your piece returned.
- Write intelligently, and be professional. You can increase your frequency of positive media exposure by establishing yourself as a reliable source with whom reporters will want to work.

HOW TO WRITE AN EFFECTIVE LETTER

1. Compose an opening sentence that relates your point to recent events, news stories, or other opinion pieces.
2. Clearly state your most important point in the first paragraph.
3. Support your point concisely with meaningful details.
4. Write a closing sentence restating your point.
5. Edit your work for clarity, length, grammar, spelling, and diction.
6. Have someone read your letter and give you feedback on clarity, style, mistakes, and so on.
7. Copy the letter for your files.
8. Send the letter to the publication.
9. If your letter is published, photocopy the published version and put it in your files with the original for future reference.
10. If your letter is not published, contact the editor and ask why your letter was rejected. Make notes of why the letter was not published for your files to refer to the next time you write to that publication.

OTHER IDEAS TO CONSIDER

- Make it clear that you are a reliable source for the topic. Say, for example, "As a math teacher, I believe that those who can do math can do anything."

- Support your arguments with examples, facts, and quotes from authorities.
- Be specific; try to avoid generalized statements.
- Your conclusion could outline a course of action along with restating your opinion.
- Focus on a single issue. If your piece becomes too general, it loses effectiveness.
- Avoid using long or obscure words and jargon.
- Do not state the obvious. Do not say, “Education is a good thing.” Instead, explain what will improve education, and how it will do it.
- Eliminate all clichés from your writing.
- Any number you use must be accurate, and you must include a note stating where the number came from and how it was calculated.

OP-ED ARTICLE

An op-ed article is commonly found on the page opposite the editorial page; thus its name. It is used for columns and opinion articles, including those by outsiders. Writing an opinion column is not easy. It must be carefully written to be persuasive. Above all, your facts must be accurate. If you have an opportunity to write a column, make certain you alert NCTM or your Affiliate leadership. You will want to review with them the arguments and points to be made in the article. (See page 37 for an example).

APPROACHES FOR LOCAL NEWSPAPERS

The following suggestions will help you develop a variety of approaches for working with your local newspapers:

Features—Some of your activities may lend themselves to feature stories, which are generally longer and take on more of a human-interest flavor than straight news stories. For instance: how have local mathematics test scores compared to national averages? Has your state or province developed higher expectations? Are more students studying mathematics? (See pages 32–34 for examples.)

Fillers—Fillers are short pieces of interesting facts and statistics. Examples are these:

- Since NCTM’s *Curriculum and Evaluation Standards* was published in 1989, average SAT math scores have increased from 500 in 1991 to 519 in 2003. (Source: www.nctm.org)
- Only 77 percent of fourth graders performed at or above the basic level in math, and only 8 percent are above the proficient level, according to the 2003 NAEP mathematics assessment.
- Only 68 percent of eighth graders performed at or above the basic level in math, and only 3 percent are above the proficient level, according to the 2003 NAEP mathematics assessment.

Challenges—Approach your local newspaper to become a National Council of Teachers of Mathematics partner. Suggest, for instance, that the paper publish a challenge to students as a regular feature. Ask students to solve a clever word problem. Tie the math problem to news of the day. Or provide hands-on activity ideas for parents to use to engage their children’s interest in mathematics over the summer break.



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

FOR IMMEDIATE RELEASE

Contact:
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Media Relations Manager

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NEWS
RELEASE

NAEP Reports Continued Improvement In Math Scores Nationwide in Grades 4 and 8

RESTON, VA, November 13, 2003—The rise in mathematics scores of the nation's fourth and eighth graders in the 2003 National Assessment of Educational Progress (NAEP) released today show the continuing effect of mathematics standards developed by the National Council of Teachers of Mathematics (NCTM). NCTM developed its first standards in 1989 and updated them as *Principles and Standards for School Mathematics* in 2000. The NAEP results are evidence of the effective implementation of those standards, NCTM said today.

NAEP results show improvement for fourth and eighth graders at the basic, proficient, and advanced levels. Results for this year's NAEP, better known as the Nation's Report Card, show that 77 percent of fourth graders and 68 percent of eighth graders performed at or above the basic level in math, compared to 65 percent and 63 percent in 2000. Nearly one-third of both fourth and eighth graders scored at or above the proficient level, 8 percent and 3 percent improvements.

Responding to the results, NCTM President Johnny Lott said, "NAEP's 2003 results show encouraging national progress. This progress is a very good indicator for mathematics programs across the nation. However, NAEP is only **one test** and the math community still has much work to do to improve scores for **all** students. The results for minority students and children in poverty lag far behind; that gap must be eliminated."

The number of reported black, Hispanic, American Indian, and Alaskan Native students achieving math proficiency is significantly lower than for white and Asian students in fourth and eighth grades. Eighty-seven percent of fourth grade white and Asian students were at the basic level, while black, Hispanic, American Indian and Alaskan Native students scored at 54, 62, and 65 percent. Results were similar for eighth-grade students.

"Since the first standards were released by the National Council of Teachers of Mathematics in 1989, we have looked at the achievement gap to see what this organization can do to close that gap. The Council's platform states that every child should have the opportunity to receive a strong mathematics education in a safe learning environment. We will continue to work toward that goal," said Lott.

The National Council of Teachers of Mathematics was founded in 1920 and is a nonprofit, nonpartisan education association with more than 90,000 members located in the United States and Canada. It is the world's largest organization dedicated to improving mathematics education for all students. The Council's Principles and Standards for School Mathematics provides guidelines for excellence in mathematics education.

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NEWS RELEASE



NATIONAL COUNCIL OF
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FOR IMMEDIATE RELEASE

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NEWS RELEASE

Salt Lake City: A Beehive of Activity Oct. 2–4

Math Conference Abuzz with Teachers Learning New Ways to Help Students Excel

Reston, Va., September 23, 2003—The National Council of Teachers of Mathematics (NCTM) and the Utah Council of Teachers of Mathematics (UCTM) will host the NCTM western regional conference in Salt Lake City, October 2–4. The conference, “Ignite the Mathematics Within,” will offer sessions that challenge educators not only to add to their math knowledge but to increase their instructional skills as well.

Local host UCTM has organized a conference offering more than 225 workshops, sessions, and mini-courses, featuring nationally known speakers from around the region as well as throughout the United States and Canada. The three-day conference will bring together math educators from the preschool through the university level to exchange ideas on how students learn math and to look at new ways to solve old problems.

NCTM President Johnny Lott, a professor of mathematical sciences at the University of Montana, will speak at the opening session on Thursday, October 2, at 8:00 a.m. In his address “How to Ignite the Mathematical Fire Within,” Lott will demonstrate motivational tools that teachers can use to inspire their students to *want* to learn mathematics.

With high-stakes tests grabbing headlines, the conference offers “Ten Practical Strategies for Helping Our Students Beat the Tests.” The session on Friday (#143 at 10:30 a.m.) will present easy-to-adapt strategies to aid students in performing better on the “one strike and you’re out” tests.

Other sessions geared to helping teachers reduce their students’ fear of taking tests include “Reducing Mathematics Anxiety through Teaching and Learning Styles,” on Thursday (Session #19 at 9:15 a.m.) and “Oh, No! Word Problems!” on Friday (Session #136 at 10:30 a.m.).

Another offering, “Why is Subtraction So Much Harder than Addition?” will take a look at research to explain why subtraction is a difficult process for young children. The keynote session, #217, will be held at 9:15 a.m. on Saturday, October 4.

The conference will offer seven sessions and workshops devoted to teaching math to deaf or hearing-impaired students. To learn more about these sessions and other details related to the conference, visit www.nctm.org, and click on Salt Lake City.

All conference activities will be held in the Salt Palace Convention Center.

With 90,000 members and nearly 250 Affiliates throughout the United States and Canada, NCTM is the world’s largest organization dedicated to improving mathematics teaching and learning for grades preK–12.

Media interested in arranging an interview with NCTM President Johnny Lott or attending the conference, please contact: Gay Dillin, Media Relations Manager, 703/620-9840, ext. 2189. (September 30–October 4, please call: 703/731-7110).

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NATIONAL COUNCIL OF
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MEDIA ALERT

For Immediate Release: September 24, 2003

NCTM President Visits Salt Lake City Schools Challenges All Students to "Raise the Math Bar"

WHO: Johnny Lott, President, National Council of Teachers of Mathematics

WHAT: Lott will teach a high school geometry class where he will explain how angles figure in the construction of airport runways. Students also will have a hands-on lesson with Miras and explore other uses of angles and mirror images. During an elementary school visit Lott will engage the students in estimating the number of grains of rice in a bowl and making other large number estimations. In both classrooms he will show students some of the many ways math appears in their daily lives and its importance in today's high-tech world.

WHEN: Wednesday, October 1, 2003

TIME (First Visit): 9:07 AM

Teacher: Heather Call, Geometry

WHERE: West High School

241 N 300 W, Salt Lake City

Principal: Kenneth Grover

School phone: (801) 578-8500

TIME (Second Visit): 12:30 PM

Teacher: Machelie Dahl

Class: Grade 4

WHERE: Escalante Elementary School

1810 W. 900 N, Salt Lake City

Principal: Dr. Nancy McCormick

School phone: (801) 578-8496

The National Council of Teachers of Mathematics has 90,000 members and nearly 250 Affiliates in the United States and Canada. It is the world's largest organization dedicated to improving mathematics education from pre-K through grade 12. The Council recommends that math education for all students go beyond the basics to include higher levels of mathematics.

###

LETTER TO THE EDITOR



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

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Letter to the Editor *The Arizona Republic*

There appeared several errors and misstatements that need correcting in Johanna Haver's opinion piece of January 31. First, the National Council of Teachers of Mathematics (NCTM) does not endorse any mathematics curriculum, textbook, or instructional program. Rather our mission is to provide the vision and leadership to ensure a mathematics education of the highest quality for all students.

While the author labels all math as "fuzzy" that doesn't jibe with her idea of how math should be taught, her mantra of "Back to basics" is not the answer. For the record, NCTM strongly supports students' mastery of basic math facts and skills. However, basic skills must develop *along with* an understanding of math concepts and may involve multiple ways to solve a problem. Merely adding up numbers or learning multiplication tables is not sufficient for today's students and will leave them poorly prepared for math in the world outside their classrooms.

While the author tries to make the case that math wars are a clash between math educators and mathematicians, NCTM went to great lengths to involve mathematicians in the writing of *Principles and Standards for School Mathematics*, printed in 2000. Many Association Review Groups not only reviewed *Principles and Standards*, but the organizations represented by those groups supported the document, including the Mathematical Association of America, American Mathematical Society, and the Conference Board of the Mathematical Sciences—groups that have leading mathematicians as members.

Really isn't it the best of both worlds to have someone who knows the subject and also knows how to teach it.

Finally, there is nothing "fuzzy" about NCTM's vision for math instruction: more and better mathematics for all students, regardless of socioeconomic status.

Johnny W. Lott
Sincerely,

Johnny Lott
President, National Council of Teachers of Mathematics

POP QUIZ

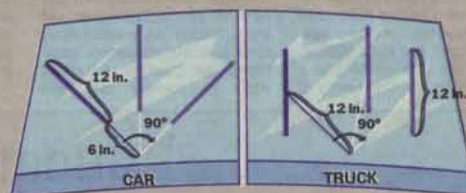
Math in the Middle

Many parents have been there: snug to the kitchen table with a struggling tween, pencil poised—and totally lost. "Middle school is the place where kids have the most problems, the place where parents reach the level where they're not able, or willing, to help the kids with math anymore," says Johnny W. Lott, president of the National Council of Teachers of Mathematics, an association with some 90,000 teachers as members. To help out, the council developed 80 math "challenges," kicky standards-based problems for fifth to eighth graders. "We thought these would suck in kids and families," Mr. Lott says. The council hopes to devise problems for early grades, too. More challenges are at figurethis.org.



A. Is the Statue of Liberty's nose too long? Figure this: The arm of the Statue of Liberty is 42 feet long. How long is her nose? (Hint: How long is your nose? How long is your arm?)

B. It's raining! Who sees more: the driver of the car or the truck? Figure this: Which wiper cleans the greater area? (Hint: Draw models of the areas, then cut them out and compare.)



C. If each side of the triangle in Figure 1 is one inch long, this means the triangle has a perimeter of three inches. Suppose you continued the pattern in the diagram until you reached Figure 5. What is the sum of the perimeters of all the white triangles in Figure 5? (Hint: Find the sum of the perimeters for all the white triangles in each of the figures above. What pattern do you see?)

Illustrations from figurethis.org

1. What letters, when written in lowercase, can be read the same upside down as right side up?

2. Spread out your fingers and look at your hand. Do people with big hands have larger angles between their fingers? Figure this: Estimate the measures of the angles between your fingers when you spread out your hand. (Hint: When you hold your hand so that your thumb and index finger form an "L," the angle formed measures about 90 degrees.)

3. Mark McGwire became baseball's home-run king in 1998 with 70 home runs. His 70th home-run ball sold for slightly over \$3 million in 1999. Babe Ruth, an earlier home-run king, hit 60 in 1927. His home-run ball was donated to the Hall of Fame. Suppose that Ruth's ball was valued at \$3,000 in 1927 and, like many good investments, doubled its value every seven years. Would you rather have the value of Ruth's ball or McGwire's? (Hint: How many times would you need to double the value of Ruth's ball to reach the value of McGwire's?)

4. Are you superstitious? Do you avoid the number 13? Figure this: Is there a Friday the 13th every year? (Hint: If Jan. 1 were on a Monday, on what day of the week would Jan. 13 fall? What about Feb. 1 and Feb. 13? Other months?)

Sum

	+		+		=	\$40
	+		+		=	\$32
	+		+		=	\$35
	+		+		=	\$37
Sum		\$52		\$50		\$42

5. Your team is down by one point. Your teammate, who makes free throws about three-fourths of the time, is at the free throw line. She gets a second shot if she makes the first one. Each free throw that she makes is worth one point. If there is no time left, what are the chances you win the game with no overtime? (Hint: Tossing two different coins can be used to represent making or missing a shot. What are the outcomes when you toss two coins? How can you use this to model the free throws?)

6. I forgot the combination to my lock! I'm ready to cry. How many combinations will I have to try? Figure this: A combination lock uses three numbers from 0 to 39. It opens when these numbers are dialed

D. The costs of combinations of frowns, smiles and neutral faces are shown. How much is a smile worth? (Hint: Find a way to combine two rows or columns that have something in common.)

in a particular order: right, left, right. How many possible combinations are there? (Hint: Think about how many choices you have before dialing each number.)

7. At least two people in a school have the same initials? No way! Figure this: How many people would have to be in a school before it contained at least two people with the same first and last initials? (Hint: Consider a simpler problem. How many people would have to enter a room before it contained at least two people with the same first initial?)

8. Do you have a radar bill in your pocket? Figure this: Paper money, such as dollar bills, with serial numbers that read the same backward as



E. During the 100-meter dash in the 1988 Olympic Games in Seoul, South Korea, Florence Griffith-Joyner was timed at 0.91 seconds for 10 meters. At that speed, could she pass a car traveling 15 miles per hour in a school zone? (Hint: How many meters in a mile? How many seconds in an hour?)

forward are sometimes called radar bills. How common are radar bills? (Hint: Serial numbers on United States bills have eight digits. How many different serial numbers are possible?)

9. In March, the National Collegiate Athletic Association holds a basketball tournament. As soon as a team loses one game, it is out of the tournament. The last unbeaten team is the winner. There were 64 teams in the 1999 men's tournament. In 1985, there were only 32 teams. How many more games were played in the 1999 tournament than in 1985? (Hint: When the final winner is determined, how many teams will have lost?)

10. The water control valve on the cover of a fire hydrant has five sides of equal length and five angles of equal measure. Many common household wrenches will not turn these valves. Why not? (Hint: Think about an ordinary household wrench. Most wrenches have two parallel sides; that is, the sides are the same distance apart everywhere.)

11. Suppose the "standard play" setting on a VCR allows two hours of recording with an ordinary 120-minute tape. Changing the setting to "extended play" allows six hours of recording. After taping a 30-minute show on standard play, the VCR is reset to extended play. How many more 30-minute shows can be recorded on this tape? (Hint: What fraction of the tape was used to record the first show?)

Answers are on Page 45.

EDUCATION LIFE 43

FEATURE ARTICLE

QUIZ ANSWERS

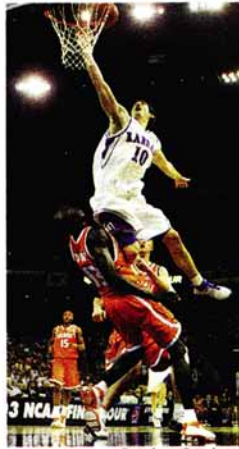
Questions are on Page 43. Detailed solutions are at figurethis.org. Discuss the problems online at nytimes.com/educationlife.



Mark McGwire hits a \$3 million ball. Would you rather have the Babe's?

1. Depending on the way the letters are written, l, o, s, x and z can be read the same upside down and right side up.
2. The size of your hand does not make any difference in the size of the angles. The angles are approximately 90 degrees, 45 degrees, 20 degrees and 20 degrees.
3. Babe Ruth's ball would have greater monetary value than Mark McGwire's. If the value of the Babe's ball started at \$3,000 and doubled every seven years since 1927, its value in 1997 would be about \$3,072,000, and even more in 1999.
4. There is at least one Friday the 13th every year.

5. The probability that your team wins is $\frac{9}{16}$ (or $\frac{3}{4} \times \frac{3}{4}$) or about 56 percent of the time.
6. There are 64,000 (or $40 \times 40 \times 40$) different combinations for the lock.
7. At least 677 people must be in a school. There are 26 letters in the alphabet, so there are 26 possibilities for the first initial. Consider all the possible pairs of two initials.
8. In the 100 million eight-digit serial numbers from 00000000 to 99999999, there are 10,000 that read the same forward and backward. Considering this fact, you might expect one in every 10,000 banknotes to be a radar bill.
9. 32 games. Here's one way to solve the problem: Consider that every team except the winner loses exactly one game. If there are 64 teams in the tournament and one winner, then there were 63 losing teams. This means there were 63 games. If there are 32 teams and one winner, there were 31 games. So, $63 - 31 = 32$ games.
10. Most household wrenches will not work on the valves of a fire hydrant because there are no parallel sides on the five-sided (pentagonal) valve.
11. Nine more shows. You can consider this problem in terms of minutes or units of half-hour shows. One way to solve it: On the standard-play setting there are four half-hour shows in two hours. One half-hour show used a fourth of the tape. Three-fourths of the tape is left. With extended play, you can do 12 half-hour shows, and then you have enough tape for $\frac{3}{4} \times 12$, or nine shows remaining.



March Madness: How many games must a team win to be an N.C.A.A. champion?

- A. The actual length of her nose is about 4 feet 6 inches.
- B. The car wiper cleans a greater area.
- C. $15\frac{3}{16}$ inches. As the figure numbers increase, the side length of each white triangle is halved, and the number of white triangles is tripled. This means that the sum of the perimeters in any particular figure is: $3 \times \frac{1}{2}$ or $1\frac{1}{2} \times$ the sum in the previous figure. The sum of the perimeters in Figure 5 would be $243\frac{3}{16}$ or $15\frac{3}{16}$.
- D. A smile is worth \$15. A frown is worth \$10.
- E. Her speed would be about 24.6 miles per hour; she could pass the car.

Teacher Says

The Geometric Appeal of Quilting

By EVELYN PORRECA VUKO
Special to The Washington Post

Katie's concepts about middle-school geometry are prehistoric. She thinks isosceles is a dinosaur with three toes on its left foot and five on its right. And when you say she'll need geometry when she grows up, her look transforms you into yet another ancient beast.

Teacher Says: Use quilting to teach geometry. Behind its quaint mask of fabric and stitches, quilting is actually a geometry-rich learning tool that might even give kids insight into family history. And you don't have to know how to sew.

As a middle-schooler, Katie will have "transformational geometry," which describes the sizes, positions and orientations of shapes as they flip, slide, turn and grow or shrink. This helps kids develop a strong understanding of the lines, rotation, scale and properties of multi-sided shapes. Quilting does all that.

"Quilting is an excellent tool for teaching math," says Johnny Lott, president of the National Council of Teachers of Mathematics and an avid quilter. Obviously, it's not just a girly thing. Jane McMaster, a fourth-grade teacher at the Lewis and Clark Elementary School in Missoula, Mont., is doing a year-long quilting project with her class, which is mostly boys, Lott says. "When I worked with her class, they were learning symmetry, perspective, measuring, cutting, constructing patterns and how different colors can change a pattern and make it look entirely different," says Lott.

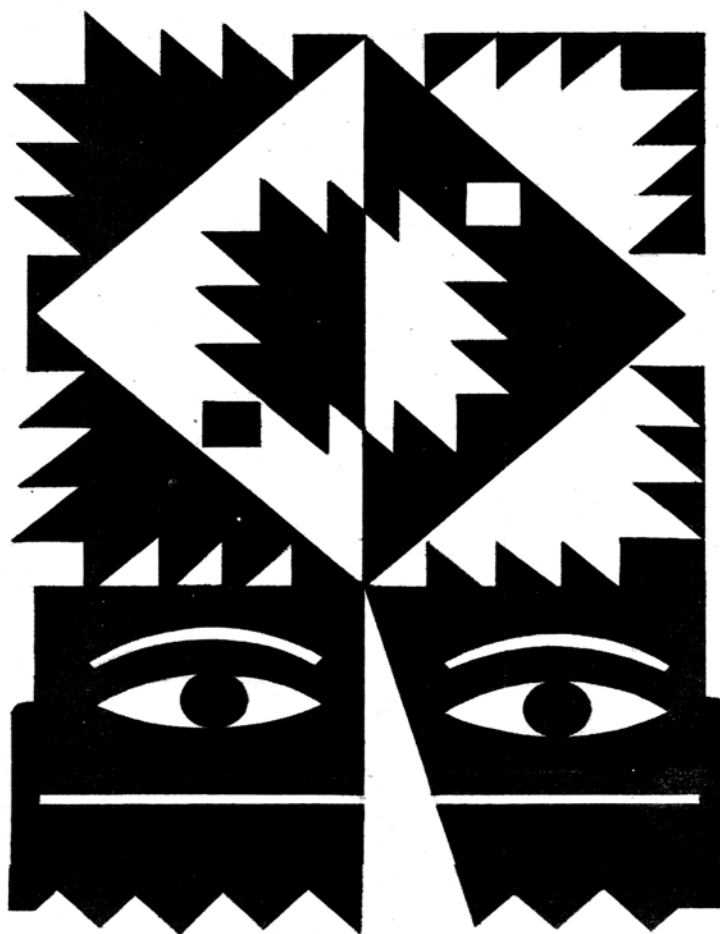
Quilting also teaches history. "Use it as a jump-off point to learn about the people who made them," says Doris Bowman, a textile collection specialist at the National Museum of American History. "Quilts tell about environment, economic conditions and skills of the people who made them. They reflect what they might have used in clothing or household furnishings because they were made from scraps," she says.

They also can be a "great diagnostic tool to see who's going to have trouble with geometry," says educational diagnostician Patricia Lerner of Developmental Delay Resources in Bethesda.

Quilting fits life and learning styles. The activity easily meshes with the developmental and learning skills of kids 5 and older, and can be adapted to family schedules and resources. Best of all, quilting does not hinge on laborious sewing. One can construct geometry-enriching quilts in 15 to 20 minutes using colored markers and poster paper or paper or fabric pieces and glue. Or such a quilt can be designed on the computer. For younger kids, Lott recommends a program called Logo; for older children use Geometer's Sketchpad.

Adapt the following quilting process to suit your child, your time and resources:

Start your project by providing examples from your grandmother's attic, a flea market, a quilting show or a museum. Take a small ruler along for the ride. As you view the quilts, ask your child to ex-



BY DAVID McLIMANS FOR THE WASHINGTON POST

amine, define and describe the shapes achieved with straight lines. To demonstrate the critical relationships between shapes like a square, rectangle and rhombus, discuss their side length, perimeter and area. How is a rectangle related to a square or a rhombus? By observing, then using a small ruler to check assumptions, your child is taking the first step toward creating and understanding the more formal geometric proofs that will be learned in later grades. For rhombus shapes, look for quilt patterns called "Texas Star" or "Lone Star."

Work together to select or invent the basic shapes for a quilt—a rhombosaurus and a parallelogram perhaps? Remind your child that quilts are constructed by shapes that match in size and symmetry, so encourage the use of a ruler to make templates. For easier cutting using fabric, Lott recommends using fine-grade sandpaper for making templates.

Then, select quilt colors, which have geometric impact, too. "The color emphasizes the geometry of the pattern and the shapes become more evident based on the color choices," says Judy Sieker of the National Quilting Association. Include some highly tactile fabrics such as velvet and ones that have "a different scale of print to add visual texture," adds Sieker.

Next, work on "transformational geometry" by having your child create the pattern that will be re-

peated to complete the quilt. Encourage the child to flip cut pieces, or to turn or slide them around to create a unique design.

"A flip teaches kids about line symmetry because a flipped shape is a reflection that is the same shape and size as the original. Slides are repeated shapes like in wallpaper. A turn teaches angle symmetry because you have to turn the shapes to get them to fit together," says Lott. Visualizing and reasoning about spatial relationships are fundamental elements in geometry.

How big does your "Katie" want her quilt to be? "The size of the quilt is a product of the length times the width. By counting or scaling up all their blocks, kids will automatically 'enlarge' their design. This is a good lesson in proportion," says Lott. What is the ratio of blue to green parallelograms? Will velvet-accent pieces make up 20 percent or 30 percent of the total area? If she makes the shapes larger in scale, how will that affect the final appearance? Talking about ratios, percentages and scaling all help develop a mathematical sense of proportion.

Though your child can complete a quilt on paper using crayons or markers or with cut paper and glue, if fabric sewing is your choice, you'll incorporate another excellent spatial and visual challenge. Patricia Lerner explains: "You put the quilt into the sewing machine upside down and backwards, and you have to visualize how it will look when you turn it right side up and forward."

As Katie is designing, coloring, flipping, turning and rotating pieces to make her quilt, two things are bound to happen. A beast will be tamed and she will learn that behind her great-grandmother's faded blue eyes lies a raging geometry machine.

RESOURCES

- Math Quilts Bookstore: <http://members.aol.com/mathquilt/text/amazon.html>.
- National Council of Teachers of Mathematics: www.nctm.org.
- National Quilting Association: <http://www.nqaquilts.org>.
- Quilters Unlimited 30th Annual Quilt Show, May 30-June 1, Dulles Expo Center, Fairfax.

Students' Scores Rise in Math, Not in Reading

By DIANA JEAN SCHEMO

WASHINGTON, Nov. 13 — Elementary and middle school children have continued a decade of progress on a nationally administered math test, with all groups showing gains in every state. But reading scores remained essentially flat in most of the country, according to test results released here on Thursday.

The math results showed achievement rising among blacks and Latinos as well as white and Asian students, with greater gains among fourth graders than among eighth graders. North Carolina showed the largest gain among students since 1992, with the share of students ranked proficient in math soaring to 41 percent from 13 percent in fourth grade and to 32 percent from 12 percent in eighth grade.

The test, officially called the National Assessment of Educational Progress, is widely referred to as the nation's report card. It ranks students on a numerical scale as having either advanced, proficient, basic or below-basic skills in math, reading and a variety of other subjects.

The guidelines have come under attack in recent years. Several months ago, the Education Department sponsored an "education summit," where invited researchers, mathematicians, scientists and business executives called for greater emphasis on basic arithmetic, which many said the national math council's standards had slighted.

Secretary of Education Rod Paige, who has often used the release of the national test scores to lament the quality of public education, hailed the math results as "stellar" and said, "I think our nation's teachers, administrators and students have a lot to be proud of."

Zalman Usiskin, a professor of math education at the University of Chicago and a former member of the math council's board, said, "The decade of the '90's — and it looks like it's continuing in this decade — was a decade of great success in school mathematics: more kids taking math in high schools, scores up in fourth and eighth grade N.A.E.P."

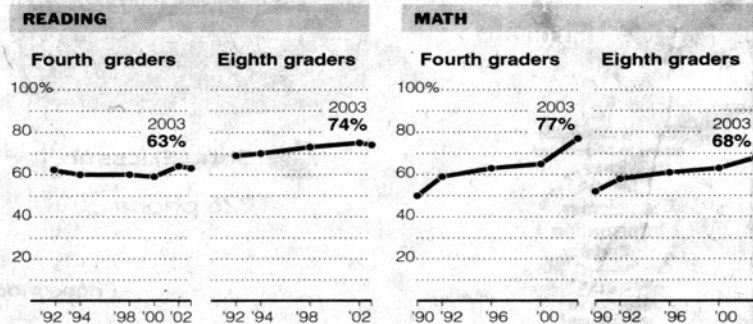
"There really hasn't been a decade like that since the time of Sputnik," Dr. Usiskin said.

Still, the Education Trust, which represents urban schools, expressed concern because the math scores of white students in eighth grade rose more than those of Latinos and black students, meaning a widening achievement gap.

In 1990, only 1 percent of black fourth graders, and 2 percent of black eighth graders were proficient at math. The new results showed 10 percent of black fourth graders, and

The Nation's Report Card

Percentage of students testing at or above basic levels.



Source: National Center for Education Statistics

Note: Since 1996, testing accommodations have been permitted for students with learning disabilities or limited English proficiency.

The New York Times

7 percent of black eighth graders, have reached proficiency.

"Clearly there's more work that needs to be done," said Johnny W. Lott, president of the National Council of Teachers of Mathematics.

Grover J. Whitehurst, director of the Institute of Education Sciences, said that the results indicated significant progress in some math skills, but that the national exam "might underassess" arithmetic.

The results released on Thursday came from a test given in February to a national sample of 686,000 students at 13,600 schools in all 50 states. Under the No Child Left Behind law, states must administer the national tests every two years as a gauge for measuring progress on state-sponsored exams.

The rising math scores were seen as a vindication for curriculum guidelines developed by the National Council of Teachers of Math in 1989 and now used in nearly all states. They recommended that teachers spend less time on computational drills and more on data analysis, probability and reasoning.

In reading, the results were far less encouraging than in math.

Unlike the math results, where scores along each level of achievement rose, reading scores have remained fairly stagnant since 1992.

The share of students considered proficient in reading rose to 32 percent, from 29 percent, among both fourth and eighth graders, and the increases in the share of children with basic skills rose only modestly.

The greatest gains in reading came in Delaware, where 33 percent of fourth graders and 31 percent of eighth graders were proficient.

Nor was there any real narrowing of the gap in reading ability between whites, blacks and Latinos at either the fourth or the eighth grades.

Among whites, 41 percent were proficient in reading in both grades, up from 35 percent in 1992. Among black students, only 13 percent in both grades were proficient readers, up from 8 percent of fourth graders, and 9 percent of eighth graders, in 1992. About 15 percent of Latino fourth and eighth graders were proficient in reading, up from 12 and 13 percent in 1992 respectively.

With the last national reading exam given only in February 2002, few expected to see significant differences in scores. Florida was the only state that showed a statistically significant increase in reading scores among fourth graders since last year. Massachusetts, which tied with New Hampshire and Connecticut for the highest score in the nation, was still the only state where fourth grade scores dropped significantly since last year.

Dr. Paige called the math results the early fruit of No Child Left Behind, saying, "These numbers represent a turning point for our nation."

But Dr. Lott of the math teachers' council said he saw little connection between the act and a trend that has held steady since the 1990's.

"These standards have been out for 14 years now, and it takes 10 to 15 years to see changes take effect in education," Dr. Lott said. "It's certainly a strong indicator that what's been recommended now is working."

DO NOT FORGET THE NEEDIEST!

THE INDIANAPOLIS STAR - WWW.INDYSTAR.COM

SCHOOLS

Math whiz relates to both 3rd-graders, sophomores

By Scott Miley

Franklin Township Schools

Johnny W. Lott, president of a prestigious national math organization, stood in a third-grade Franklin Township classroom this week and held a beanbag bear in his hand.

The bear had four legs.

Two bears, of course, would have eight legs.

Lott's simple observation was a

FRANKLIN TOWNSHIP

fun way to introduce third-graders to the basic idea behind multiplication, a concept the students will explore in fourth grade at Bunker Hill Elementary.

"One of the things you're trying to do in mathematics is think and reason. You want to give a reason for doing what you do. That goes beyond math," said Lott, president of the National Council of Teachers of Mathematics.

"The more you can think through that reasoning, the better off you'll be."

The council, which represents 100,000 teachers in the United States and Canada, is having a three-day regional conference in Indianapolis.

Lott was drawn to Bunker Hill, where Rick Callan's third-grade class is tutored once a month by Brenda Perkins' 10th-grade geometry class from Franklin Central High School.

"When I heard about that, I asked if I could come to this class because it's not often you get them together," Lott said. "It's a good role model for the young kids to see the high school kids doing math."

Lott found he could easily make one presentation on multiplication to two distinctly separate groups by taking beanbag bears to the third-graders and converting that into equations and graphs for the high school



Scott Miley / photo

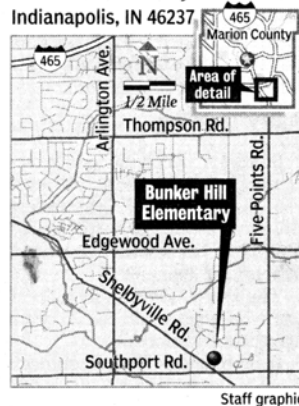
Fun with numbers: Johnny W. Lott, president of the National Council of Teachers of Mathematics, visited Bunker Hill Elementary School to promote fun ways to learn mathematics.

At a glance

School: Bunker Hill Elementary

Phone: 1-317-787-3421

Address: 6620 Shelbyville Road
Indianapolis, IN 46237



Staff graphic

students.

"He talked to both of us instead of just the third-graders," said Meghan Dillie, a 10th-grader. "He added us in and talked to both grades."

Callan, who has taught at Franklin Township 21 years, is

program chairman for the conference and arranged for its 274 speakers. Perkins is conducting a workshop, "Mathematical Adventures Across the Grades," based on her partnership with Callan's class.

Bringing math home to the third-graders, Lott asked them to envision covering a doughnut with leather or filling an ice-cream cone with bumpy bubble wrap, both as examples in determining volume.

He asked the students how they see math applied in their lives. Answers included writing checks and buying gas.

Following his hour in Callan's class, Lott wound up signing autographs for the third-graders, who knew he was important to mathematics though they may not have known of his exact title.

"A fifth-grade class once asked me if I was the president of mathematics," he said, laughing. "I said, 'It sounds good to me.'"

THE CHRISTIAN SCIENCE MONITOR

csmonitor.com

Reform math education

By Robert Reys

COLUMBIA, MO. - I am tired of hearing from doomsday educational critics who would have us abandon new ideas and return to the "good old days" - particularly in math education, where American students fall way behind the rest of the world.

Efforts to reform mathematics education are under way, but they have not reached many classrooms in the United States. While some math teachers are emphasizing thinking and problem solving, many students still experience mathematics that is dominated by memorization and drill, without any meaningful context. Reform classrooms are using technology to model and explore ideas. Students are challenged to find ways to solve problems based on what they know and understand. They have opportunities to link math to real-world problems.

While some schools are embracing reform mathematics, many others are persuaded by naysayers. But if schools continue to do more of what they've always done, they'll continue to produce too many students uninterested and unmotivated to study mathematics beyond high school.

I graduated from a small Missouri high school more than 40 years ago. Although I had caring teachers, and went on to major in mathematics in college, my high school experience with mathematics was weak. Most of my peers hated math. Algorithms and tedious procedures were demonstrated with little or no explanation of why they work. Sensemaking and understanding were not a part of my experience of learning mathematics. Students left class thinking that math consisted only of dull procedures and rules to memorize.

Performances over the past 30 years on the National Assessment of Education Progress and the International Mathematics and Science Studies document that traditional mathematics curricula and methods of teaching have not been effective. However, research is emerging that shows reform mathematics is increasing student learning.

The National Council of Teachers of Mathematics, a nonprofit organization of mathematics teachers, has published a set of content standards in math called Principles and Standards for School Mathematics (<http://nctm.com>). Consistent with these standards, some textbooks are now integrated - topics from arithmetic, algebra, geometry, statistics, and probability are naturally connected. Integration is commonplace in countries, such as Japan, whose students excel on international mathematics tests. But most US schools are still mired in a 19th-century course sequence of Algebra I, Geometry, and Algebra II.

Throughout most of the 20th century, statistics and probability were not taught in school. Yet today, one cannot read and understand Newsweek, USA Today, or countless other news sources without being able to interpret statistical information. As a student, I used a slide rule to do some computations; today, I use a calculator. I also spent endless hours doing computations and rarely learning to estimate. Now I rarely do any tedious computations but regularly call upon estimation to decide if a calculator result is reasonable.

True reform would allow calculators, graphing calculators, and other readily available technological tools to help students solve equations in an instant, replacing pages of written procedures and hours of work. A mathematics curriculum should reflect what is important for the future and include advances in technology.

My college-aged son benefited from the reforms used by progressive public high school teachers and standards-based reform mathematics curricula. His classes were driven by interesting problems that teachers used to challenge students' thinking and engage them in learning mathematics. He scored at the 99th percentile on the ACT and SAT and graduated from high school with more mathematical knowledge than I learned in my first two years of college.

My grandchildren are learning from standards-based reform mathematics curricula in public elementary school. They are actively engaged in problem solving. They are developing fluency with their basic facts and also using calculators. They realize that while it is not always easy, math can be fun to learn. They typify thousands of US children who are benefiting from a mathematics education that is better than what many of their parents and grandparents experienced. Their growth underscores the fact that the problem of low achievement is not in the unconventional ways of reform math, but in too little exposure to it.

Change in the real world is inevitable, and so, too, is change in the education of students who are preparing to enter that world. Approaches such as rote memorization proved to be ineffective in the 20th century.

The good old days of mathematics never were. It's time to help our current generation of children prepare for their future and kiss the good old days goodbye for good.

- Robert Reys, a former high school mathematics teacher, is a professor of mathematics education at the University of Missouri-Columbia.

Erosion of basic math skills hinders students' progress

Our view:

Tests show ability to perform simple computations is declining.

At the Waverly-Shell Rock school district in northeast Iowa, Superintendent Stan Slessor takes pride in the complex algebra, geometry and other advanced math taught there. But Slessor worries about declining scores in tests measuring simple arithmetic skills — an eight-percentage-point drop among fourth-graders in the past five years.

The slippage in arithmetic scores is even more dramatic statewide. On the highly regarded Iowa Test of Basic Skills, the ability of students to do basic calculations — subtraction, multiplication, fractions — has hit a 20-year low. And this week the Brookings Institution released a report that says weakening math skills also can be seen nationally on federal tests.

The trend is worrisome. The mastery of basic math is a vital lifelong skill. Without it, people can't compare the price of products, determine whether they should refinance their mortgages, or calculate how their retirement accounts are doing.

Basic arithmetic also is required at all levels of advanced math. Calculators are handy substitutes, but not everyone will carry a calculator forever. Plus, calculators are only as accurate as the data entered into them. Estimating skills are needed to know whether they produce correct answers.

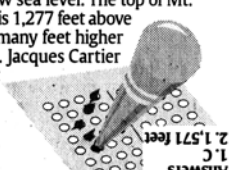
Basic math

Sample questions from an eighth-grade test. (Answers below):

1. Of the following, which is the closest approximation of a 15% tip on a restaurant check of \$24.99?
a) \$2.50
b) \$3
c) \$3.75
d) \$4.50
e) \$5
2. The lowest point of the St. Lawrence River is 294 feet below sea level. The top of Mt. Jacques Cartier is 1,277 feet above sea level. How many feet higher is the top of Mt. Jacques Cartier than the lowest point of the St. Lawrence River?

Source: National Assessment of Educational Progress

By Adrienne Lewis, USA TODAY



The decline in the knowledge of arithmetic corresponds with a shift in math education in 1989 at the recommendation of the National Council of Teachers of Mathematics. Responding to complaints that U.S. schools spend too much time on basic arithmetic, the council urged schools to move quickly to more advanced problem-solving skills used in geometry and algebra.

The shift was needed, the council says, to keep U.S. students from falling further behind the rest of the world in advanced math. While the problem-solving skills of U.S. stu-

dents now appear to be improving, evidence shows a price is being paid:

► Scores on a national math test that allows the use of calculators on some portions show gains. However, scores on a second national test that places more emphasis on mental computation are either flat or declining. Some scores dropped sharply, including 17-year-olds' ability to handle fractions.

► In Iowa, where the state's basic skills test is administered to students in all districts, scores were rising through the 1980s on both the problem-solving and arithmetic portions of the test. But in 1992, arithmetic scores began declining. Most disturbing are the drops among those in the eighth grade, a crucial math year for students who are about to learn algebra and geometry.

What's needed is corrective action that doesn't delay the faster shift to higher math. Students don't need to spend grade after grade on arithmetic work sheets. But they do need to master the basics. Part of that solution may mean reducing students' dependence on calculators for simple problems.

Plus, schools need better testing to set off early alarms when students display a drop in their ability to compute. Few states have that capability, and the federal tests failed to sound a timely warning about arithmetic weaknesses surfacing in elementary school.

Eventually, the loss of basic arithmetic skills will limit advances in higher math. Unless educators shift their strategies, U.S. math students can't become the crack problem solvers they must be to compete with the rest of the world.

Criticism doesn't add up

Opposing view:

Students' math scores are rising. Their skills haven't suffered.

By Johnny W. Lott

In the past, math critics have relished reports and test scores indicating that students were not doing well. Today, the game has changed, with students doing better than ever. So what are the critics saying now? They're running around like Chicken Little, crying, "Computation skills are falling!" What is the truth?

The National Assessment of Educational Progress (2000) showed students improving in mathematics. Those findings are echoed by recently released SAT results showing average math scores hitting a 32-year high. Ask yourself, "How do students' math scores go up if they can't do basic computations?" That doesn't compute.

The National Council of Teachers of Mathematics (NCTM) has been blamed for the slide in basic computation skills, as NCTM has pushed for problem solving. This is a distortion of the facts. You can't do one without the other. And NCTM supports computation in its "Principles and Standards for School Mathematics": "Computational fluency — having and using efficient and accurate methods for computing — is essential."

Also, students should be able to perform computations in different ways, including mental calculations and paper-and-pencil calculations using mathematically sound algorithms. But problem solving is a higher NCTM goal, as it should be. Iowa's ACT scores, which are the third highest in the USA, are the best indicator of high school students' computation skills in the state.

The "Principles and Standards for School Mathematics" states, "All students should use calculators at appropriate times, setting the calculator aside when the instructional

focus is on developing computational algorithms." Critics often distort this view. Research shows that wise calculator usage enhances students' computational abilities.

Let's face it, today's basics are not yesterday's. Today's students haven't used a slide rule; their cellphones and calculators fit in the palms of their hands. Computers used to be room size; now they sit in your lap.

NCTM's interest is in improving mathematics for all students. Its reform efforts are producing positive results. Let's work together and focus on the real task: providing more and better math instruction for all students by blending the best of past practices with the best that emerging approaches and technology have to offer.

Johnny W. Lott is president of the National Council of Teachers of Mathematics.

Q&A PROFILE

District Administration, October 2003

Back Home: Q&A with Cathy Seeley

Q: During your two years teaching secondary math with the Peace Corps in West Africa, what did you miss most about the U.S. educational system?

A: I missed access to resources. Here, we take for granted access to textbooks for every subject area and even technology. I would never dream of teaching mathematics at the secondary level without technology that lets us make use of graphical and visual representations. There I had no technology of any kind and not even any textbooks. My teaching aid was a chalkboard. (I taught in a large city, so [we] had electricity, including overhead lights and an electrical outlet. But I never found anything to plug into the outlet.)



When I started working with American schools again, I was reminded how rigid our daily schedules are. My schedule in Burkina Faso was a flexible block. A five-hour class might meet three times in a week. I really liked the longer class periods to go more deeply into problems and mathematical ideas. And teachers had a lot of unscheduled time ... to plan and grade papers.

Q: What did your experiences in a country with a host of complex social, political and human rights issues teach you about the importance of education?

A: The solutions to severe problems begin with education. Whether dealing with the AIDS crisis, water shortage or basic ideas about democracy, solutions start with knowledge about issues, as well as wisdom and creativity about how to solve complex problems. I [saw] first-hand the difficulties generated by widespread ignorance and poverty. I also saw the hope for the future of a nation in the young adults I worked with as they became increasingly able to think, discuss, challenge and generate solutions to problems. We must educate young [Americans] so that they can [help solve] our important societal problems.

Q: In what ways have you shared your Peace Corps experience with other educators upon your return home?

A: It's difficult for me to do any presentation without incorporating my Peace Corps experience a bit. My outlook on life and on mathematics education was both reinforced and transformed. I have become an even stronger advocate for making use of our resources, especially technology, to capitalize on the rich mathematics every student can learn in the hands of a knowledgeable teacher. And I believe more than ever in the importance of a rich education for every student, since human resources are even more valuable than material resources. I developed a Web site, csinburkinafaso.hitspot.net.

Q: Why was algebra chosen as the focus for your ASK ME-Algebra online math initiative at the University of Texas at Austin?

A: Every [U.S.] community has debated how and when we should teach [algebra]. The subject should be incorporated throughout the grades, not reserved for a course called "algebra." In this way, students are much more likely to succeed when they do take an algebra course. The project, at courses.eimc.lac.utexas.edu/askme/index.html, implements the best we know about how to make a rigorous algebra course meaningful and accessible to all students.

Q: When you become president of NCTM, on what issues do you plan to concentrate?

A: We will continue to advocate a high-quality mathematics education for every child, especially through professional development of teachers. We also have to explore how we can support teachers as they deal with increasing demands of high-stakes tests and accountability systems. I will promote the notion of personal leadership—that all mathematics educators have to keep learning and reach out beyond our own classrooms and school buildings to promote excellence in mathematics teaching and learning.

A 30-year educator and change facilitator at the local, state and national levels, Cathy Seeley is president-elect of the National Council of Teachers of Mathematics.

BROADCASTING AND THE MEDIA



TELEVISION OPPORTUNITIES

There are four basic television formats in which you might participate:

- The stand-up interview
- The debate
- The panel discussion
- The promotion

STAND-UP INTERVIEW

The stand-up (or spot news) interview usually is taped for evening news shows. It can be done in a studio, in an office, on the street, at a legislative or governmental hearing, or at some other location. Such interviews often attract onlookers, so if you're interviewed in this environment, block out distractions and concentrate.

You may be asked as many as five or ten questions, but probably only one or two of your responses will be used. Keep your answers short and emphasize the points you want to communicate. Keep repeating those points throughout the interview. The importance of knowing in advance what you want to say cannot be overemphasized. It will enable you to influence the line of questioning and thereby control the interview.

Usually the reporter or interviewer will discuss the subject of the story with you a few minutes in advance. Structure your comments and answers as if this were the interview. This will give you a chance to rehearse and, even more important, narrow the scope of questioning.

Keep these points in mind:

- Don't hesitate to suggest what you believe to be the most relevant points.
- When the interview begins, don't reach for the microphone.
- Stand up straight.
- Look at the reporter.
- Speak slowly and calmly. Resist the tendency to imitate the reporter's pace and style, which often is rapid-fire. Don't speak until you are ready.
- Don't worry about a pause; it can be edited out later.

Often, stand-up news interviews deal with controversial or emotional issues. Try to defuse the situation. Don't get caught up in the reporter's excited or urgent tone. Stay calm and cool. Make your statements in an authoritative but matter-of-fact manner.

If you think a question is "loaded" or deliberately meant to embarrass or trap you, delay your response. Buy time by asking the reporter to expand on the question. The expanded version may contain information that you can respond to more readily.

Always correct erroneous statements by the reporter.

DEBATE

In a debate, you'll be pitted against an expert with the opposite point of view. Your purpose is to get your message across—forcefully and persuasively. When given the chance to speak, take the time to build your arguments carefully. If your opponent tries to dominate, appeal to the moderator for equal and ample time to present your case.

Don't fall into the trap of using your allotted air time to answer your opponent's charges. Deal with them quickly, then introduce information that you want to get across. Don't overreact to the charges, and don't get into a shouting match. Stay calm and cool. Feel free to downgrade the relevancy of the charges and introduce a point you believe to be relevant.

Your opponent may represent a special-interest group. Don't hesitate to bring that up, casting suspicion on his or her motives.

Be especially conscious of time. An hour can go by like a few minutes. Make sure you cover the points you want to make and be prepared to sum up and restate your key messages at any time.

If possible, arrange it so that you will have the closing comments.

PANEL DISCUSSION

You may be able to organize a panel discussion regarding mathematics education on a local cable station. Possible topics might include improved math curricula in inner-city or impoverished schools, changes in standardized test scores since the implementation of the NCTM *Standards*, or the growing demand for mathematically intelligent graduates.

PROMOTION

Work with a local radio station to sponsor a mathematics quiz. Have the station ask one question each day throughout a certain week, such as, How many seconds longer is two percent of an hour than 30 percent of a minute? (Answer: 54 seconds)(Source: www.mathcounts.org) In the fall, when children prepare to go back to school, urge the station to consider awarding prizes such as school supplies to the first caller with the correct answer.

RESPONDING TO THE NEWS MEDIA



ACTIVELY SEND OUT YOUR MATERIAL

If media outlets get letters from several people raising the same issue, they are likely to publish one or two of them. So even if your letter is not published, it may help another one with a similar point of view to reach the newsstands.

RESPONDING TO BAD NEWS COVERAGE

Even if you are honest and perform with only the best intentions, you may find that you or NCTM has become the target of negative publicity. If so, take the following actions:

1. Respond promptly.
 - The longer you wait to react, the more likely it is that the negative publicity will infiltrate public opinion.
 - Call reporters, and consider faxing a news release highlighting the positive aspects of your issue.
 - If the news coverage is exceptionally negative, consider holding a news conference.
2. Show that you are actively solving the problem.
 - Make it evident that you are taking steps to rectify the predicament.
3. Demonstrate leadership.
 - In general, if the issue is a national one, the president of NCTM may be the best spokesperson to address it. Consult the manager of media relations at NCTM headquarters to enlist the president's involvement. A high-ranking NCTM member, rather than a hired spokesperson, should speak directly with reporters.
4. Make yourself accessible to the media.
 - Remember that hiding from the media makes it appear as if you have something to hide.
5. Show concern.
 - Showing that you care not only about your organization but also about those affected by the situation will help you gain public support.

HOW TO HANDLE UNCOOPERATIVE REPORTERS

1. Do not answer any question that you feel could put you in a compromising position.
 - You could simply say, "I am not in a position to answer that," and then explain why.
 - If you feel that the question is unfair, say so.
2. If the reporter repeats questions, simply repeat your answers.
3. If the reporter paraphrases your comments in a way that you do not agree with, restate your position in your own words.

HOW TO MEET WITH NEWS MANAGEMENT

If you have detected an overall pattern of bias from a particular publication, you may decide to go beyond communicating with individual journalists. The next step is to attempt to set up a meeting with management at the news outlet.

In the case of newspapers, try to meet with the editorial board. This body consists of a group of persons who discuss and ultimately decide the editorial policy for the paper; in other words, they decide what stance the paper will take on issues in its editorials. The makeup of this board varies from publication to publication but is most likely to consist of the editor, chief of the editorial page, and editorial writers, and might include the publisher and the managing editor of news. The editorial policy does not always align with stories carried in the news sections of the paper. In fact, they should be independent.

To prepare for a meeting with an editorial board, you should do the following:

1. Gather evidence of bias.
 - Clip articles that are misleading or contain false statements.
 - Keep track of inaccurate, misleading, or inappropriate comments in television and news coverage.
2. Document the pattern of bias.
 - Prepare yourself to explain how the particular pattern of bias gives people an inaccurate or misleading impression of the issue.
3. Plan your presentation.
 - Meet with colleagues in advance to decide who will say what and to decide what not to say at all.
 - Plan what statistics or documentation you will bring and who will provide them.
 - Remember that first impressions are the strongest. Communicate professionalism from the first minute.
4. Present your case.
 - Be polite but firm; be persistent and yet calm at all times during the meeting.
 - Speak only on issues that you are prepared to back up with evidence or other forms of proof.
 - Conclude your meeting with specific requests for improvements in the coverage of your issue—for example, the inclusion of views that are being excluded to provide balance, give history on a specific issue, and so forth.
5. Follow up.
 - Send a letter outlining the agreed-on issues to everyone who attended the meeting.
 - If you notice a positive change in a particular publication's coverage of your issue, contact the highest-ranking media representative who was present at the meeting and thank him or her for responding to your concerns.
 - If the publication's coverage continues to be poor, write or call to object (still maintaining your professionalism).

ATTRACTING THE MEDIA



CONFERENCES AND OTHER PUBLIC FORUMS

Don't neglect the media in planning conferences and meetings where important issues will be discussed. If a well-known speaker, such as a public official, is part of the program, the media may be interested in attending.

An open debate or dialogue on a specific education issue, such as minority achievement or standardized testing, also will be of interest to the news media. In organizing such an event, make sure the expert representing your side is a capable debater. Do not try to stack the debate in your favor; the media will be able to tell that the event has been staged, and you'll lose credibility.

STUDIES AND SURVEYS

The news media love statistics. Nearly any survey or study of consequence will be of interest to reporters—just take a look at the coverage given to test scores as well as state or provincial and national rankings. Make sure whatever results you release are statistically valid and will hold up under close scrutiny. You also must be prepared to defend your study.

Depending on the nature and significance of your findings, consider a range of media relations possibilities, including news releases, speeches, and news conferences.

TESTIMONY AND TESTIMONIALS

Testimony is a persuasive communications tool, so bear in mind that its usefulness extends well beyond the immediate audience of the legislative committee or regulatory body. Your testimony becomes a written record of your position on an issue. Draft your testimony with this in mind, so it can be used as widely as possible to get your message across. Once you have written your testimony, issue a news release highlighting its main points.

Also, testimonials by leading professionals who support or endorse your program or project can assist in garnering favorable media attention. Their endorsement adds credibility to your efforts, so feel free to seek it out and use it to your advantage. (See pages 48–51 for an example).

GOVERNMENT RELATIONS



ADVOCATING FOR MATHEMATICS EDUCATION

In 2003, the Board of Directors of the National Council of Teachers of Mathematics adopted political advocacy as one of its four strategic initiatives. Different stakeholders and external audiences were surveyed about their perceptions of NCTM and its work within the current public policy environment. On the basis of that survey, the Council has placed a high priority on becoming effectively engaged in advocating for mathematics education and speaking out on a broad range of education issues.

NCTM serves as the governmental relations voice for mathematics teachers. Its current government relations efforts are focused at the federal level through interactions with members of Congress, their legislative staffs, and the Department of Education in Washington. However, advocacy on issues often is carried out most effectively at the local and state or provincial levels.

As mathematics teachers, you know best from firsthand experience the challenges facing teachers and students in today's mathematics classrooms. Active involvement by NCTM members and teachers like you is needed to make the vision of the NCTM *Standards* a reality. One idea and one voice can make a difference. Collective voices—organized and orchestrated—are the heart of the political process for influencing decisions. Both politics and education are constantly in a state of change, and you can help shape that change.

The following section presents some useful advice on how to become engaged in the political debate of issues that affect mathematics education. It outlines how you can begin to influence the many decisions being made that are altering the face of education. NCTM has developed an Advocacy Toolkit to assist individuals in participating in the public policy process. If the need or opportunity arises for you to become involved in state or local government affairs, you are encouraged to call NCTM Director of Communications Ken Krehbiel (703-620-9840, ext.2102). This process will help ensure that you are communicating positions and messages that are consistent with NCTM's, and it will enable staff members at headquarters to provide support and assistance when possible.

Some material in the Government Relations section of the NCTM Communications Guide has been reprinted with permission of the Triangle Coalition for Science and Technology Education and the National Science Teachers Association.

This Legislative Platform was approved by the NCTM Board of Directors on October 25, 2003, and serves as the foundation for NCTM's government relations and advocacy activities.

NCTM LEGISLATIVE PLATFORM

Mathematics is the key to opportunity, and every individual in an economically competitive nation must be mathematically literate. One who is mathematically literate can analyze data, reason, and solve problems by applying mathematical concepts and skills. The National Council of Teachers of Mathematics (NCTM) believes that teachers and what they do are at the heart of making this vision a reality.

NCTM is the world's largest organization dedicated to improving mathematics education for all students. The Council's *Principles and Standards for School Mathematics* provides guidelines for excellence in mathematics education. The Council is committed to a constructive public dialogue to ensure a mathematics education of the highest possible quality for all students. To this end, the Council has adopted the following legislative platform.

EQUITY

The National Council of Teachers of Mathematics—

- Supports the right of every child to be taught by a highly qualified teacher of mathematics, one who is knowledgeable in content, who understands how students learn, and who uses appropriate instructional methods.
- Expects every child to have the opportunity to receive a strong mathematics education, required for an economically secure future.
- Believes that no single test should limit future opportunities for students to learn mathematics.
- Expects every school to be a safe and supportive learning environment for students to learn mathematics.

TEACHER QUALITY

The National Council of Teachers of Mathematics—

- Supports the goal that every student be taught by a highly qualified teacher of mathematics, one who is knowledgeable in content, who understands how students learn, and who uses appropriate instructional methods.
- Endorses the development of multiple effective routes to the certification of highly qualified teachers. All routes should include strong mathematics content, knowledge of student learning, appropriate instructional methods, mentoring, and classroom experience.

- Believes that teachers of mathematics must commit to career-long professional growth, and supports the allocation of resources to achieve this goal.

RESEARCH

The National Council of Teachers of Mathematics—

- Believes that, to improve the teaching and learning of mathematics, the complexity of schools and school systems requires the use of a variety of research methods.
- Supports significantly increased funding for research about student mathematics learning, curriculum materials, and effective classroom practices.
- Supports research on the impact of policies on school mathematics programs and on closing the achievement gap.

ASSESSMENT

The National Council of Teachers of Mathematics—

- Endorses holding teachers of mathematics, schools, districts, students, families, and communities accountable for student achievement in mathematics.
- Supports providing the resources required for the development of accurate and powerful tools to measure student learning of mathematics.
- Supports the use of testing only to improve student learning.

TECHNOLOGY

The National Council of Teachers of Mathematics—

- Endorses the inclusion of and access to appropriate technologies, for all students, as part of a balanced mathematics program.
- Supports teachers' use of innovative technologies that offer students better ways to learn mathematics and prepare for the changing workplace.
- Supports the allocation of funds to provide teachers of mathematics the time, training, and resources to incorporate technology into the learning environment.

TEACHER SHORTAGE AND RETENTION

The National Council of Teachers of Mathematics—

- Joins with other professional organizations in efforts to attract and retain teachers of mathematics, elevate the status of the profession, and improve the working environment of teachers.

WHY ADVOCATE?

“We [business] have to join with schools and send a clear message to teenagers and their parents: academic work in high school matters.” —Louis Gerstner, Jr., former chairman and CEO, IBM Corporation

“In an increasingly global economy where workforce quality and skill levels are critical factors in achieving success, American business requires a world-class workforce if we are to continue to lead the world’s economy.” —Ed Rust, Jr., chairman and CEO, State Farm Insurance Companies

“If we are going to be competitive in the global marketplace, it has to happen both in the classroom and on the factory floor.” —Albert Hoser, chairman and CEO, Siemens Foundation

“From the perspective of having enough skilled employees tomorrow, math and science education is the key to our future.” —Laurie Sachtleben, Chevron, Inc.

From “The Formula for Success: A Business Leader’s Guide to Supporting Math and Science Achievement” published by the Business Coalition for Education Reform (1998)

GETTING STARTED

SEVENTEEN CARDINAL RULES FOR WORKING WITH CONGRESS

1. Convey that you understand something about Congress.
2. Demonstrate your grasp of the fundamentals of the congressional decision-making system.
3. Don’t seek support of mathematics education as an entitlement.
4. Don’t convey negative attitudes about politics and politicians.
5. Perform good intelligence-gathering in advance.
6. Always use a systematic checklist.
7. Do your homework on the issue or problem.
8. Timing is vital.
9. Understand congressional limitations.

10. Make it easy for those in Congress to help you.
11. Keep the “bottom line” in mind.
12. Use time—yours and theirs—effectively.
13. Remember that members of staff are mostly generalists.
14. Don’t patronize either members of Congress or staff.
15. Don’t underestimate the role of staff in Congress.
16. Consider and offer appropriate follow-up.
17. Remember that the great majority of members of Congress and staff are intelligent, hardworking, and dedicated to public service.

From “Working with Congress: A Practical Guide for Scientists and Engineers” by William G. Wells, Jr. (1996)

KNOW YOUR MEMBERS OF CONGRESS

The first step is to identify your members of Congress (representatives and senators). If you’re unsure who they are, go to the Web:

www.congress.org/congressorg/home/

Every member of Congress maintains at least one office in his or her home state. These satellite offices are there to provide constituent services. Most representatives and senators make a point of scheduling several days each month for appointments with local constituents. If you would like to make an appointment to share information about an upcoming event, the state or district office staff is there to assist you. These offices can also assist you if you need information from an agency in Washington or help in completing a federal grant application.

COMMUNICATING WITH YOUR MEMBERS OF CONGRESS

Although your members of Congress maintain offices in their home states, today’s heavy congressional work schedule limits the frequent and extended visits they use to keep themselves in close touch with their constituents. As a result, letters from home have become the main form of voters’ contact and the primary source of constituency views. Your representative and senators need and want to hear from you in order to keep informed about what the people back home really care about.

Remember that most policymakers are alike in the following respects:

- They want to do a good job.
- They want to be responsive.
- They are not experts in your business.
- They are busy.
- They live in the world of the possible.
- They are constantly dealing with conflicting pressures.
- They want to be reelected (or reappointed).

TEN STEPS TO COMPOSING PERSUASIVE LETTERS

IDENTIFY YOURSELF AS A CONSTITUENT

Put your name and complete address on both the envelope and the letter. Legislators feel responsible only to constituents, so it's important to establish immediately that you live in their district.

USE PROPER FORMS OF ADDRESS

Address your lawmaker as "The Honorable." Also be sure to use the correct title, for example, Senator, Representative, or Assembly member. Use "The Honorable" in the address and the office title in the salutation (Dear Senator Smith). Courtesy is important because it conveys professionalism and will make the legislator or staff more receptive to your message.

BE BRIEF AND SIMPLE

Keep your letter to no more than two pages. Try to stay on one page. In the first paragraph, state your purpose and what you want. Avoid the temptation to be comprehensive in explaining the legislation and making all possible arguments. And avoid jargon.

STATE (AND REPEAT) YOUR POSITION

Make your position or request clear in both your opening and closing paragraphs. Be specific. State what action you want. If you want to advance a piece of legislation, say so. If you want to know the legislator's stand on an issue, ask what it is. If you want support on a particular issue, request it and request a response.

PERSONALIZE YOUR MESSAGE

A personal letter is much more effective than a form letter. Although form letters, postcards, and petitions are read and counted, they don't carry the weight of a personalized, individual letter. Persuasive constituent mail humanizes issues by placing them in a local, personal context. When sample letters are provided for your use, revise them to incorporate your own words and personal perspective into the text.

BE POLITE, AND AVOID ULTIMATUMS OR RUDENESS

Everyone responds better to praise than to criticism. Threats and ultimatums do little to convince a legislator to adopt your position. And if a legislator does take the course of action that you suggest, send a note of thanks. This will only help build your long-term relationship with the legislator and staff.

DO NOT ENCLOSE ADDITIONAL MATERIAL

Additional reports or newspaper articles are rarely read or filed. If you have a particularly useful resource, mention it in your letter and offer to provide a copy on request. Overwhelming an office with paper runs the risk of your letter being discarded along with the offending pile of paper.

DO NOT EXAGGERATE OR LIE

Stick to your facts and experiences. Fabricating or exaggerating stories or facts to prove your point only runs the risk of undermining your credibility. Many legislators and staff become adept at spotting a tall tale.

MAKE YOUR MESSAGE TIMELY

Don't procrastinate! Your letter is not helpful if it arrives after a vote. Be aware of the legislative process (is the bill in committee or coming up for a vote on the floor?), and time your letter accordingly. Faxes can allow you to get your letter to a legislator at critical junctures in the process.

SEND A COPY OF YOUR LETTER TO NCTM AND YOUR NCTM AFFILIATE

Knowing that you've contacted a legislator helps your national or local organization staff coordinate legislative strategy and additional lobbying. Also, send them a copy of any response you receive.

Electronic mail is quicker and often handled more efficiently than postal mail in some congressional offices. It also hasn't been subject to the delays that have affected regular mail because of the recent anthrax and ricin incidents.

Find addresses for your representatives in Congress at www.congress.org or from www.senate.gov or <http://www.house.gov>.

Adapted from the American Planning Association Web site

TIPS FOR SENDING EFFECTIVE E-MAIL TO ELECTED OFFICIALS

PUT YOUR NAME AND ADDRESS AT THE TOP OF THE MESSAGE

The first thing your representative wants to determine is if you live in his or her district. If you don't ... hit delete. Representatives and staff do not have any obligation and little time to read messages from people who are not constituents, so it is vital that you make it clear that you live in the district.

HUMANIZE YOUR MESSAGE

This is one of the most important things you can do to ensure your e-mail makes an impact. Many people are uncomfortable sharing their feelings or talking about their own experiences, or they believe that such information is inappropriate to the legislative process. Yet, it is this information that separates one's message from the standardized, bulk messages drafted by interest groups. These messages are more likely to be read than simply tallied.

BE BRIEF

Members of Congress and their staffs are extremely busy. Respect their time and try to tell them only what they need to know. Two or three paragraphs should be sufficient. Do not feel that you have to make every single argument that relates to the issue; make only the strongest points.

BE CLEAR ABOUT YOUR POSITION

Your request should be stated as a concrete, actionable item, for example, "I would like you to support H.R. 100."

MAKE YOUR MESSAGE TIMELY

Send your message when the legislation is being considered. Your message is worthless if it arrives after a critical vote.

DON'T "FLAME"

You are allowed to disagree with your members of Congress, but you will not be effective if you abuse or threaten them. Abusive letters seem more desperate than intimidating to the recipient, and they're seldom taken seriously.

AVOID ATTACHMENTS

Congressional offices rarely print or read attachments to e-mail. Offer to provide supporting documents on request, but avoid sending attached files.

DON'T BECOME SPAM

Do not send Congress a message every single day about every issue you read about or develop an opinion on. An office that receives numerous messages from a single person quickly loses sight of the urgency or expertise that the constituent can bring to a specific issue.

ESTABLISH YOUR CREDIBILITY

Explain if you are an expert in some area. Also, do not shy away from saying that you are either a personal supporter or a party supporter. (But never imply that because you voted for somebody or contributed money to their campaign that they owe you a vote.)

DON'T LIE

Political professionals are adept at spotting a tall tale. Any story that sounds too perfect or any statistic that is not substantiated will not bolster your position.

DON'T CC EVERYBODY

Resist the urge to send a copy of your message to every member of Congress. You will persuade no one and annoy everybody. A legislative office wants to know that you have appealed to them for specific action, not just sent a copy of a memo distributed to all.

PROOFREAD YOUR E-MAIL

Too often the speed and ease of sending e-mail is reflected in poor grammar and sloppy spelling. Even if a congressional staffer is able to determine your meaning, such errors reflect badly on your overall argument. Take a break before you press "send," and proof your message.

Find addresses for your representatives in Congress at www.congress.org.

Adapted from the American Planning Association Web site

CALLING YOUR ELECTED OFFICIALS

A phone call to a congressional office is an effective way to make your views known when you are interested in an upcoming vote and when your opinion can be concisely stated. It is unlikely you would be able to talk directly with a member, but again, staff is assigned to respond to phone messages and your position is recorded. If you do have an established rapport with a member of Congress so that your call will be put through, use this kind of influence sparingly.

PREPARATION

The key to effective telephone calls is in the preparation. Before you lift the receiver, jot down a few talking points—and be prepared to leave a voice-mail message if necessary.

CONVERSATION

When you telephone a legislator's office, ask to speak with the legislative aide responsible for covering education issues. If the aide is not available, leave a clear message, including your name and address, with the person who answers the phone. You might begin by saying, "I'm Jane Educator calling from Anytown, and I'd like to leave a message for Senator Smith." State the issue you are calling about and what you want your representative to do. Be as brief as possible, recognizing that legislative offices are very busy.

FOLLOW-UP

Be sure to thank elected officials. A follow-up letter is a perfect opportunity to restate your position and include additional materials, such as a position statement or relevant articles.

TIPS FOR SUCCESSFUL LEGISLATIVE MEETINGS

Meeting in person with elected officials or legislative staff is the most effective means of political advocacy. Here are some important "dos" and "don'ts" to ensure that your lobbying meeting is successful and effective.

DO...

MAKE AN APPOINTMENT IN ADVANCE

Time is always at a premium in legislative offices. Contact the legislator's scheduler in advance to arrange a meeting. It is best to make your meeting request in writing and follow up with a phone call. Be clear about who will be attending the meeting and the specific reason for the meeting. Legislative schedules are unpredictable, so don't be put off if your meeting is rescheduled or if you have to meet with staff in lieu of the elected official.

YOUR HOMEWORK

Prepare carefully and thoroughly for your meeting. Take the time to “know” your legislator by reviewing past votes or statements on the issue, his or her party’s position, and committee assignments. Develop an agenda that all your participants clearly understand. Know your talking points in advance and be prepared to make your case. Research the opposition’s arguments against your position and, if possible, acknowledge and refute those arguments in your presentation.

STAY ON MESSAGE

Effective legislative meetings should be narrow in scope. Stick to a single issue, state only a few key points in support of your position, and make a definite request for action. Many meetings are ineffective because a participant brings up other issues or strays from the key arguments supporting your position. Have a message and stick to it.

GO LOCAL

Your effectiveness is based on geography. Legislators want to hear your thoughts and opinions because you are a constituent. One of your most useful strategies is to relate the issue and your position to your community. Legislators have many other avenues to get national or state analysis, reports, and statistics. Local statistics and stories are important, and you can be the only source for such rich information. Don’t be afraid to humanize the issue by relating it to your local community or personal experience.

MAKE A CLEAR, ACTIONABLE REQUEST

Many people are afraid that it’s impolite to make a direct request. But don’t forget that the purpose of your meeting is to secure support for your issue. It’s appropriate and expected that you will make a request at your meeting. The key is to make sure that your request is clearly articulated and actionable by the legislator. Keep in mind that your request should be timely and consistent with the legislative process. It’s usually not enough to ask for generic support for an issue or cause; instead, make a direct and specific request that’s tied to pending legislative activity (if possible). For example, ask that a legislator cosponsor a bill. You should refer to bill numbers and be knowledgeable about the status of the bill. Making a specific request gives you the opportunity to evaluate the legislator’s response.

CULTIVATE A RELATIONSHIP WITH STAFF

Many grassroots advocates underestimate the important role of legislative staff. A supportive staff person can often make the difference between success and failure. Staff plays an invaluable role in shaping a legislator’s agenda and position on issues. It’s important that you make every effort to cultivate a positive working relationship with staff. Over time, staff may even come to regard you as a helpful resource for information on your issue.

DO...

FOLLOW UP

What happens after a meeting is almost as important as the meeting itself. Send a thank-you letter after the meeting that not only expresses appreciation but reinforces your message and any verbal commitment of support made by the legislator or staff. If you promise during the meeting to get back in touch with additional information, be sure that you do so. Failure to follow up on your promise will call your credibility into question. Also, don't forget to report the results of your meeting back to NCTM. This information is vital to coordinating overall legislative strategy and evaluating the impact of advocacy efforts. Follow-up is important even if the legislator does not agree to support your request, because you are building a long-term relationship.

DON'T...

GO OFF MESSAGE OR DISCUSS UNRELATED ISSUES

You must deliver a unified message during your meeting. Sending different messages or discussing unrelated subjects will only undermine your ability to secure support. Limit your advocacy to a single issue. Legislators meet with many groups and constituents, so it's important that your message and request, be clear and uniform.

ENGAGE IN PARTISAN CRITIQUES

It is best to keep the discussion based on the merits of the policy or issue. Avoid characterizing your position in strictly partisan terms. Worse, do not make snide or disparaging partisan comments. You are working on behalf of an issue, not a party. So you want legislators of both parties to support your position. Be careful not to alienate legislators or staff based on partisanship.

ISSUE THREATS

Although it may be tempting to tell a legislator who has rebuffed your request that you'll "never vote for him again" or that you "pay her salary," such discourtesy only ensures that your arguments will be discounted—now and in the future.

BE LATE

Time is a valuable and scarce commodity for legislators. Punctuality conveys professionalism and demonstrates your commitment to your issue, which is after all the reason for the meeting. Arrive early, and if you are meeting as a group, allow time to calm nerves and make a final review of the talking points and message.

GET TOO COMFORTABLE

Advocates are sometimes surprised by the courteous reception they receive, even from lawmakers who disagree with their position. As a constituent you will be accorded respect by the legislator and staff. Don't mistake this respect for agreement. Don't let the comfortable nature of the exchange deter you from making your request. And don't mistake "concern" for your issue with support for your position.

FORGET TO FOLLOW UP

Immediately send a thank-you letter. Stay informed on your issue and track how your legislator responds. Did the legislator follow through on his or her promise? If not, request an explanation. If so, express your appreciation.

Adapted from American Planning Association Web site

THE TOP 10 THINGS CONGRESSIONAL STAFF HATE TO HEAR

NUMBER 10: BUT I THOUGHT MY APPOINTMENT WAS WITH THE SENATOR!

Never, ever indicate that you're disappointed to be meeting with a staff person. On Capitol Hill, having a good relationship with a staff person can make or break your cause. One congressional staff person said, "I remember one person who came to our office who threw his talking papers at me and stormed out when he realized he would be meeting with me, the person who handled his issues, and not the Congressman. He left such a bad impression that my boss told me I did not have to ever meet with him again!"

NUMBER 9: HERE'S SOME READING MATERIAL FOR YOU—OUR 300-PAGE ANNUAL REPORT.

"Our office once saved all the unsolicited material we received over a one-week period. This included reports, magazines, newsletters, information from meetings, and the like. It did not include constituent letters, correspondence regarding legislation, or other materials regarding specific legislative issues. At the end of the week, we had a stack three feet high and nowhere to store it. Most of it was thrown away!" remembers a former congressional staff person.

When meeting with a member of Congress or staff person, try to limit your leave-behind materials to one or two pages and include details on where this information can be located on the Web, if appropriate. Offering the information in a file folder with your organization's name on the label will also help ensure that the materials are put in a file drawer, as opposed to the round file.

NUMBER 8: HOW LARGE A CAMPAIGN CONTRIBUTION DID YOUR BOSS GET TO VOTE AGAINST (OR FOR) THIS BILL?

Believe it or not, most staff have no idea who contributed to their boss's campaigns. Not only is this question insulting, but even if it were fair and reasonable, the staff person isn't likely to know.

NUMBER 7: I ASSUME YOU KNOW ALL ABOUT H.R. 1234.

With thousands of bills being introduced during each Congress, no staff person will be able to keep them all straight. Always provide information on the bill title, number, and general provisions when communicating with a congressional office.

NUMBER 6: NO, I DON'T HAVE AN APPOINTMENT, BUT I PROMISE I'LL TAKE ONLY HALF AN HOUR OF YOUR TIME.

Unless it's an emergency, or you are good friends with the staff person, try not to engage in the dreaded "stop by." Most staff are happy to try to set up a meeting if you are relevant to the office (i.e., you are a constituent). And even if you have an appointment, never expect a half hour.

As Clair Seaver, executive assistant and health legislative assistant to Rep. Blumenauer (D-Oreg.) points out, "The Congressman's schedule is chaotic. It changes from minute to minute, and meetings are sometimes postponed or canceled altogether. When the meetings do occur as planned, the Congressman often has only a few minutes to focus on the discussion. Being able to make the point quickly and succinctly is very important. It's particularly important to start the meeting with a request. That way, if you're cut off, you've at least put the most important point out there."

NUMBER 5: NO, I DON'T REALLY NEED ANYTHING SPECIFIC.

If you don't ask for something, a bill cosponsorship, a *Congressional Record* statement, a meeting in the district, whatever, some staff will wonder why you came by. Updates on your issue are fine, as long as they are accompanied by a request. That will ensure that someone in the office thinks about you and your request for longer than five minutes. According to Michael Harrison, legislative director to Rep. Blumenauer, "Constituents who contact me with great solutions to local problems always get my attention and frequently impact our decisions and policymaking efforts at the federal level."

NUMBER 4: WE HAVE TEN (OR MORE) PEOPLE IN OUR GROUP.

Congressional offices are tiny. If you have more than five people in your group, you'll be standing out in the hallway. Plus, having so many people talking at once can dilute the impact of your message. Try to limit your group to no more than five.

NUMBER 3: WHAT YOU'RE TELLING ME CAN'T BE RIGHT. I HEARD (FILL IN NAME OF TALK SHOW HOST) SAY OTHERWISE.

Most staff, or members for that matter, won't lie to you. They know that lying will get them in big trouble. Sometimes, they may see things differently than you do, but if they say a bill definitely is not going to be considered on the floor, or if there is no such legislation, believe them.

A perfect example is a petition that was floating around the Internet about a House bill number 602P from a Congressman Schnell that would impose fees on the use of e-mail. There is no such thing as either House bill 602P (that's not even a valid number) or a Congressman Schnell.

NUMBER 2: WHAT DO YOU MEAN WE HAVE TO STAND IN THE HALL?

See number 4. A request to meet in the hallway is simply an indication of space limitations. Nothing else.

NUMBER 1: NO, I DON'T REPRESENT ANYONE FROM YOUR DISTRICT. I JUST THOUGHT YOU'D BE INTERESTED IN WHAT I HAVE TO SAY.

“As someone who works for an appropriator, I get more than my fair share of meeting requests. Frankly, constituents always come first. That’s who my boss is here to serve,” says Lesley Turner, legislative assistant to Congressman Norm Dicks (D-Wash.). Members are elected to represent their constituents. Period. If you are not their constituent, you are not relevant to them. Although some members do rise to a higher position, such as chairperson of a committee or subcommittee, they are appointed to that position to represent their party’s position in legislation. Your time is always best spent working with your own elected officials and turning them into advocates for your cause.

From Public Education Network Web site

THE LEGISLATIVE PROCESS

HOW A BILL BECOMES LAW

From *Congressional Record*, Thursday, February 8, 1979
(Hon. Robert H. Michel of Illinois in the House of Representatives)

MR. MICHEL: Mr. Speaker, those of us in Congress are so close to the legislative process that we sometimes forget the way in which a bill becomes law is not clearly understood by many of our fellow Americans. I receive inquiries from time to time about this question. I have prepared a brief summary of the process in the hope it may be useful to anyone who is interested in the machinery of government.

HOW A BILL BECOMES A LAW

Ours is a government “of the people, by the people, for the people.” It is not a pure democracy. It is a republic in a democracy. Our laws are the embodiment of the wishes and wants, the ideas and ideals of the American people expressed through their representatives in the Congress: 435 in the House of Representatives and 100 in the Senate. Any Member of the House or Senate may introduce a bill embodying a proposed law or revision of existing laws, at any time when his respective House is in session. When introduced, the bill will be entered in the *Journal of the House*, and the title and sponsor of it printed in the *Congressional Record* of that day.

EACH BILL NUMBERED

Each bill introduced is assigned a number by the clerk of each House and referred to the committee having jurisdiction over the subject matter by the presiding officer, that is, the speaker of the House or the president of the Senate. Copies of the bill are printed by the Government Printing Office and made publicly available from the congressional document rooms. Acting through its chairman, the committee decides whether a bill should be taken up by the full committee or referred to a subcommittee for its initial consideration.

THE DELIBERATIVE STAGE

The committee's deliberations are the most important stage of the legislative process. It is here that detailed study of the proposed legislation is made and where people are given the right to present their views in public hearings. When the chairman has set a date for public hearings it is generally announced by publication in the *Congressional Record*.

Copies of the bill under consideration by the committee are customarily sent to the executive departments or agencies concerned with the subject matter for their official views to be presented in writing or by oral testimony before the committee. The number of witnesses, pro and con, heard by the committee is largely dictated by the importance of the proposed legislation and degree of public interest.

TESTIMONY HEARD

The transcript of the testimony taken is available for inspection in the individual committee offices. Quite frequently, dependent on the importance of the subject matter, the committee hearings on a bill are printed and copies made available to the public.

After conclusion of the hearings, the committee proceeds to meet in executive sessions (sometimes referred to as "markup" sessions) to discuss the bill in detail and to consider such amendments as any Member of the committee may wish to offer. Each committee has its own rules of procedure but they generally conform to the rules of the House itself.

THE COMMITTEE VOTE

By a formal vote of the committee, it decides whether to report favorably to the House the bill with or without committee amendments. A committee report must accompany the bill, setting forth the nature of the bill and reasons for the committee's recommended approval. The report sets forth specifically the committee amendments and, in compliance with the rules of each House, indicates all changes the bill would make in existing law. Any committee Member, individually or jointly, may file additional supplemental or minority views to accompany the majority committee report. The committee report, accompanying the bill, is viewed by the courts and the administrative agencies as the most important document as to the intent of the Congress in the proposed legislation.

AFTER REPORTING

When the committee reports a bill it is placed on the appropriate calendar. The majority leadership decides how and when the bill will be considered on the floor. In general the bill is allowed to remain on the calendar for several days to enable Members to become acquainted with its provisions.

In both the House and Senate innumerable measures of relatively minor importance are disposed of by unanimous consent. In the Senate, where debate is unlimited, major bills are brought up on motion of the majority leader and in the House are called up under a privileged resolution reported from the Rules Committee which fixes the limits of debate and whether amendments may be offered from the floor. The Rules Committee resolution is called a “rule” for consideration of a bill; a “closed rule” if no amendments are allowed as is generally the case in tax bills; and an “open rule” if amendments can be offered.

REACHING CONSENSUS

While there are distinct differences between the House and Senate procedures, in general a bill is debated at length with the proponents and opponents presenting their views to acquaint the Membership, as well as the general public, with the issues involved, and all with a view to arriving at the consensus. Amendments are frequently offered to make the measure more in conformity with the judgment of the majority. In the course of consideration of the bill there are various parliamentary motions, in both the House and the Senate, which may be offered to determine the sentiment of the Members with respect to the pending legislation. The measure may be postponed to some future date or referred back to the committee that reported it. With the conclusion of general debate and the reading of the bill for amendments, the question becomes whether the House or Senate, as the case may be, will pass the bill in its final form. The *Congressional Record* of the day the bill was under consideration will set forth the verbatim debate on the bill and the disposition made of such amendments as were offered.

AFTER PASSAGE

With the passage of a bill by either body, it is messaged to the other with the request that they concur. If no action has been taken on the like measure by the body receiving the message, the bill is usually referred to the appropriate committee of that body for consideration. Hearings are again held and the bill reported for floor action. On relatively minor or noncontroversial matters, the Senate or the House accepts the measure as messaged to it by the other body.

If there are substantial differences between the House and Senate versions of a given bill, the measure is sent to a conference committee, which is appointed by the speaker and the president of the Senate from the ranking committee Members of each body having original jurisdiction over the bill. The object of the conference committee is to adjust the differences between the two bodies, and to report back to each its agreement. The report of the conference committee must be in writing and signed by those agreeing thereto and must have the signature of the majority of the conferees of each house.

CONFERENCE REPORT

The report of the conference committee cannot be amended and must be accepted or rejected by each House as it stands. If either House finds itself unable to accept the conference committee report, a further conference is usually requested.

When the bill has been agreed to in identical form by both bodies, a copy of the bill is enrolled, signed by the speaker and by the president of the Senate, for presentation to the president. The bill becomes law with the president's signature of approval, or it may become law without his signature if he does not return it, with his objections, to the Congress within 10 days of its presentation to him. If the president should return the bill, with his objections, to the originating body of the Congress, his veto may be overridden by two thirds of both the House and Senate, respectively, voting to have the measure become law, the president's objections to the contrary notwithstanding. Both the president's veto message and a record of the vote of the individual Members in the motion to override are required by the Constitution and set forth in the *Congressional Record*.

TESTIMONY

U.S. HOUSE OF REPRESENTATIVES

APPROPRIATIONS SUBCOMMITTEE ON

LABOR, HEALTH AND HUMAN SERVICES, EDUCATION AND RELATED AGENCIES

Public Witness Hearing

May 7, 2002

2358 Rayburn House Office Building

2:00 - 4:00 p.m.

James M. Rubillo

Executive Director

National Council of Teachers of Mathematics

1906 Association Drive

Reston, VA 20191-1502

Mr. Chairman and Members of the Committee:

Thank you for the opportunity to appear before your Subcommittee on behalf of the National Council of Teachers of Mathematics (NCTM). My name is James Rubillo. Though I am now the Executive Director of NCTM, I came to that position last year with more than 35 years of mathematics teaching experience, and I consider myself first and foremost a teacher. I feel privileged to speak on behalf of mathematics teachers on the FY 2003 appropriations for the Elementary and Secondary Education Act and in particular, the Math-Science Partnerships Program in Title II, Part B of the No Child Left Behind Act.

The National Council of Teachers of Mathematics was founded in 1920 and today is the world's largest mathematics education organization, with nearly 100,000 members and 250 Affiliates throughout the United States and Canada. In 1989, NCTM was the first professional organization to develop and release standards for shaping content and instruction in K-12 mathematics programs with its *Curriculum and Evaluation Standards for School Mathematics*. More recently, in April 2000, NCTM published *Principles and Standards for School Mathematics*, which takes into account current research on mathematics teaching and learning. Following the publication of *Principles and Standards for School Mathematics*, NCTM created a professional development academy to help teachers bring these standards to best effect in classrooms. Our mission is to provide the vision and leadership necessary to ensure a mathematics education of the highest quality for *all* students.

As countless reports have documented, American students do not compare favorably with their international peers on measures of math and science achievement. After thoroughly examining those results, experts have concluded that our education system has two significant weaknesses. First, our curriculum is rich in the topics covered but shallow in the depth of understanding required of students. And second, many of our teachers are ill prepared to teach math and science, and they have limited access to ongoing professional development to assist them in their continued growth.

Recently, the findings from the Third International Mathematics and Science Study (TIMSS) captured the attention of the public and of policymakers. TIMSS was conducted in 1995 and involved 42 countries at three grade levels. It was the largest, most comprehensive and rigorous assessment of its kind ever undertaken. In 1999, an update study, TIMSS-R, collected data in 38 countries at the eighth-grade level to provide information about change in the mathematics and science achievement of our students compared to those in other nations over the last 4 years. The report shows that while U.S. fourth-grade students scored above the international average in mathematics and science, eighth-grade students scored far below their international counterparts. The 1999 update showed no significant changes in students' achievement level from 1995 to 1999.

Similarly, scores from the National Assessment of Educational Progress (NAEP), the “Nation’s Report Card,” confirm that fewer than one-third of all students in grades 4, 8, and 12 performed at or above the proficient level in mathematics and science. If we do not give our students a superior education in mathematics and science, our students will fall further and further behind.

A more recent report assessed the challenges we face in education today and made clear recommendations for action. *Before It’s Too Late: A Report to the Nation from the National Commission on Mathematics and Science Teaching for the 21st Century* culminated a year-long study by a blue ribbon panel of educators, policymakers, and state leaders, led by Senator John Glenn. There are three key conclusions in the Glenn Commission’s work:

“The Commission is convinced that the future well-being of our nation and people depends not just on how well we educate our children generally, but on how well we educate them in mathematics and science specifically.”

“Our children are falling behind; they are simply not ‘world-class learners’ when it comes to mathematics and science.”

“The most powerful instrument for change, and therefore the place to begin, lies at the very core of education—*with teaching itself*.”

Our children are simply not receiving the world-class education in mathematics and the sciences that they deserve. While this fact alone is serious, the long-term implications on our nation’s economic growth, national security, work force development and science, mathematics, and technology literacy cannot be ignored. Our K-12 education is not producing the intellectual capital necessary to ensure that future generations of scientists and engineers can maintain the research and development vital to our continued economic growth. As the economy becomes increasingly global and technologically complex, it is essential that K-12 education be strengthened to prepare today’s students to be tomorrow’s productive workers and citizens.

The less-than-adequate preparation of potential scientists, mathematicians, and engineers in the formative K-12 years can also pose a serious threat to national security. Teachers have been joined by private industry in our efforts to promote a renewed federal investment in math and science education.

A report issued in February 2001 from the Commission on National Security for the 21st Century calls attention to the serious problems inherent in K-12 mathematics and science education. *Roadmap for National Security: Imperative for Change* states that “Americans are living off the economic and security benefits of the last three generations’ investment in science and education, but now we are consuming capital. Our systems of basic scientific research and education are in serious crisis, while other countries are redoubling their efforts. . . . The quality of the U.S. education system has fallen behind those of scores of other nations. This has

occurred at a time when vastly more Americans will have to understand and work competently with science and math on a daily basis. . . . In this commission's view, the inadequacies of our systems of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine. American national leadership must understand these deficiencies as threats to national security. If we do not invest heavily and wisely in rebuilding these two core strengths, America will be incapable of maintaining its global position long into the 21st century."

Mathematics, science, and engineering supply the basis for the development of satellite communications technologies, information technologies, and other high-tech systems now employed by our nation's armed forces. Our changing work force means that new workers will need even sharper skills in science, mathematics, engineering, and technology. In today's market, businesses are begging for skilled, technical workers to fill open positions. For several years now, Congress has raised the ceiling on the number of H-1B visas allowing more skilled foreign workers into the United States. As you know, Congress recently raised that ceiling to just under 200,000 workers per year until 2003. What's more, U.S. businesses spent \$62.5 billion last year to upgrade basic employee skills. There is an urgent need to develop a technologically capable work force that can compete in the global economy. Employers are increasingly concerned about the lack of technically skilled workers. Much more emphasis must be placed on the education we provide to K-12 students if this skill deficit is to be overcome. No issue should carry greater weight than our future economic vitality and security than mathematics and science education.

Now that I've told you about the need for better math and science education in grades K-12, let me tell you about the needs of K-12 mathematics and science teachers.

The National Council of Teachers of Mathematics has been working for many years to expand and improve the number and quality of mathematics teachers in our country. Despite our efforts, it is notable that most teachers who teach mathematics do not consider themselves mathematics teachers, particularly those who are teaching at the elementary and middle school levels. And in many cases, they don't consider themselves qualified for the task of teaching mathematics. Often, the few who feel confident with the curriculum are unskilled about the pedagogy. In other words, their own knowledge of mathematics is not solid and they simply don't know ways of teaching the subject effectively to their students. K-6 teachers in the United States—of whom virtually all are required to teach math—often have had at most a single course in instructional methods. According to the *2000 National Survey of Science and Mathematics Education*, among teachers in grades 5 through 8, only 14 percent have a major in mathematics. Sadly, in grades 8 to 12 the situation is only slightly better.

Recent data indicate that while 72 percent of middle school teachers were certified to teach math, only 19 percent were familiar with the national math standards. Given these facts,

the poor performance by 12th-grade students on NAEP assessments can't be considered surprising. Only 17 percent scored at the proficient level in mathematics, while 18 percent demonstrated similar proficiency in science.

Teachers, like doctors and lawyers and architects and many other professionals, must have a license to teach. Unlike many other professionals, these licenses don't come up for renewal and never expire. The information a math or science teacher studied in 1980 is considered adequate to teach children in the 21st century. We wouldn't accept this standard for dentists or doctors and we shouldn't accept it for educators.

Nationally, only 53 percent of the total number of teachers of high school mathematics have their main assignment in the field. Moreover, from 1999 to 2000, the national percentage of high school mathematics teachers certified in their field declined 4 percent. We have all heard of the pending 2 million teacher shortage facing the nation. Math teachers top that list. Therefore, our task is doubly challenging. We must retrain those teachers now in the classroom and reinvigorate the training offered to students in the higher education pipeline. NCTM has worked closely with our education colleagues, with the Congress, and the Administration to enact the No Child Left Behind Act. We support education reform and agree that sustained, focused teacher professional development programs need to be strengthened and expanded.

For 5 years, I presented a summer program for teachers that consisted of 30 hours of professional development in 2-week summer sessions for groups of 15 teachers. Sessions were on integrating technology into the teaching of mathematics and related directly to the curricula they would be teaching in the upcoming year. The program included demonstrating calculator use in business practices with site visits to various businesses. Following these sessions, an ongoing support network was established for reflection on teaching practices, and during the academic year there were five 3-hour meetings of attendees at the summer institutes. This is an example of the kind of long-term professional development that could be augmented if the Math and Science Partnership Program were fully funded. If as a nation we are to meet the challenges embedded in No Child Left Behind—making all students academically proficient within 12 years and all classroom teachers highly qualified within 5 years—an enormous amount of work must be accomplished.

Needless to say, we were disappointed that the Math and Science Partnership Program—authorized at \$450 million in the No Child Left Behind Act—was appropriated at only \$12.5 million in the 2002 fiscal year. The \$1 billion increase in Title II—Teacher Quality will likely be spent in part on initiatives that will benefit math teachers and other important programs for teachers in all disciplines. There is no requirement, however, that any of that funding be spent on professional development. Given the deep cuts in state spending that have been reported throughout the country, the need for hiring incentives to fill shortages in certain fields, the desire to

reduce class size and to meet other important priorities outlined in the legislation, it is unlikely that states will match the important focus on math and science that the previous law required.

If fully funded at \$450 million in FY 2003, which is not much more than was dedicated to math and science by the Eisenhower Program, the Math and Science Partnership Program would provide grants to local school districts to develop high-quality professional training programs for teachers in collaboration with business and higher education. These programs would be locally designed and administered with all states receiving funds that they in turn distribute on a competitive basis. Low-performing schools would be assured an opportunity to participate. Programs would be designed to meet local needs.

What we are asking for today—I say we because a coalition of education and business groups endorses this request—is that the Congress invest in math and science education as generously as it has in the teaching of reading. In a colloquy entered into on the floor of the House of Representatives on December 19, 2001, Rep. Ehlers noted that, “The conference report states that ‘as much as \$375 million was actually expended on math and science in fiscal year 2001’ and that ‘the conferees therefore strongly urge the Secretary and the States to continue to fund math and science activities within the Teacher Quality Grant Program at a comparable level in fiscal year 2002.’” In replying, Rep. Regula confirmed that it was the intention of the conferees that no less than \$375 million be expended on math and science professional development in fiscal year 2002.

No Child Left Behind requires annual testing in math and reading for students in grades 4 through 8. In later years, science will be included. It holds schools accountable for dramatic improvement in student achievement in these two subjects over the next decade. And it requires the hiring of qualified college graduates to fill K-12 classrooms.

If we are to have a chance to reach those important benchmarks in mathematics and science, we need a significant investment in math and science educators. Just as reading competency forms the foundation for academic achievement of any kind, a sound foundation in mathematics is vital for success in the sciences, technology, and engineering. Today’s teachers of math and science are preparing our next generation of scientists, engineers, explorers, inventors, and workers. According to the National Science Board, the demand for engineers and scientists in the next decade alone will outpace all other occupations by 100 percent. Reforming math and science teaching through the establishment of these new Partnerships is not the complete answer, but it will get us started in the right direction.

I sincerely thank the subcommittee for the opportunity to offer testimony and express NCTM’s views on this important issue. I would be pleased to answer any questions you might have.

Thank you.

FREQUENTLY USED TERMS

Members of Congress and congressional staffers use jargon that is not always clear to those new to the legislative process. Here are a few terms that you may encounter as you venture toward Capitol Hill.

ACT

A bill that has already been approved by either the House or the Senate

APPROPRIATION

A formal congressional approval in specific dollar figures to fund a program

AUTHORIZATION

Legislation that creates or extends a program, generally including an outline for funding (although no funding is assured until after the formal appropriations process)

BILL

A piece of legislation, especially in its early stages. When identical measures are introduced in the House and Senate chambers, they are referred to as “companion” bills.

BUDGET AUTHORITY

Appropriations, contract authority, and borrowing authority are set forth to insure that federal agencies may incur financial liability.

CALENDAR

The official lineup of business awaiting action on the House or Senate floor

CLOTURE

Relevant only in the Senate; a rule imposing a 100-hour limit for debate on the Senate floor when agreed to by three-fifths of the members

CONFERENCE COMMITTEE

Selected members of the House and Senate meeting to produce one document by resolving differences in similar House-passed and Senate-passed legislation in preparation for final passage

CONTINUING RESOLUTION

Joint appropriations measure that provides funding for an authorized program for which a regular appropriations bill has not been passed in time to ensure an uninterrupted flow of services

FISCAL YEAR

The duration for which funds are appropriated for the federal government, October 1 - September 30

GERMANENESS

A standing rule in the House that all amendments to a piece of legislation must relate to the subject matter under consideration

MARKUP

The amendment and passage of a piece of legislation by a committee or subcommittee to prepare it for consideration on the floor of the House or Senate

POINT OF ORDER

An objection raised by a member of Congress that a specific matter currently under consideration is somehow in violation of the chamber's standing rules of debate

QUORUM

The number of members required to be present to conduct official business (218 in the House, 51 in the Senate)

RANKING MEMBER

The majority member holding the most seniority on a given committee, following the chairperson

RANKING MINORITY MEMBER

The most senior minority member on a committee

RIDER

An unrelated amendment to a piece of legislation to ensure its passage (more common in the Senate than in the House because of a germaneness rule)

SUSPENSION OF THE RULES

A mechanism used only in the House that significantly restricts time for floor debate, disallows amendments, and requires passage by a two-thirds majority—generally used for noncontroversial measures at the close of a legislative session

WHIP

Appointed member of each party in each chamber to assist leadership in developing the legislative agenda and to monitor the likelihood of passage on controversial measures (count votes), among other duties

RESOURCES

KEY INTERNET SITES

THOMAS: U.S. legislative information on the Internet (thomas.loc.gov)

THOMAS provides updates on any bill pending in Congress that may be of interest. You can check the status, read the bill, retrieve a summary of the bill, and read any amendments offered to the measure during floor debate. In addition, THOMAS offers the ability to read the goings-on in Congress every day by putting the *Congressional Record* online.

THOMAS also provides users with numerous cross links that will connect you with other federal government resources.

FirstGov.gov (www.firstgov.gov/) —The official U.S. government portal to 30 million pages of government information, services, and online transactions

The Biographical Directory of the United States Congress (bioguide.congress.gov/biosearch/biosearch.asp)

Roll Call (www.rollcall.com/) —The newspaper of Capitol Hill since 1955

U.S. Department of Education (www.ed.gov)

National Science Foundation (www.nsf.gov)

Eisenhower National Clearinghouse for Mathematics and Science Education (www.enc.org) —Curriculum materials, professional development resources, and other information on mathematics and science education

GENERAL INFORMATION

United States Senate — (202) 224-3121
www.senate.gov

United States House of Representatives — (202) 225-3121
www.house.gov

Senators
(202) 224-extension

Representatives
(202) 225-extension

Mailing Addresses

The Honorable (Senator's name)
Senate Office Building
United States Senate
Washington, DC 20510

The Honorable (Representative's name)
House Office Building
U.S. House of Representatives
Washington, DC 20515

Senate Office Buildings

SR – Russell Senate Office Building
(Room numbers have three digits; first digit is the floor number.)
SD – Dirksen Senate Office Building
(Room numbers have four digits; first digit is the floor number.)
SH – Hart Senate Office Building
Annex – 119 D Street, NE

House Office Buildings

CHOB – Cannon House Office Building
(Room numbers have three digits; first digit is floor number.)
LHOB – Longworth House Office Building
(Room numbers have four digits starting with 1; second digit is floor number.)
RHOB – Rayburn House Office Building
(Room numbers have four digits starting with 2; second digit is floor number.)
Annex 1 – 300 New Jersey Avenue, SE
Annex 2 – Second and D Streets NE

How to Order House and Senate Bills

Copies of all “H.R.” bills may be obtained by writing the House Documents Room, Ford House Office Building, Room B-18, Washington, DC 20515.

Copies of all “S.” bills may be obtained by writing the Senate Documents Room, Hart Senate Office Building, Room B04, Washington, DC 20510.

Please include a self-addressed mailing label with your request.

Bills may also be obtained through *THOMAS* Web page.

Useful Numbers

Cloakroom:
Provides information on scheduling and floor action.
Senate: (202) 224-4691 (Democrat)
(202) 224-6191 (Republican)
House: (202) 225-7400 (Democrat)
(202) 225-7430 (Republican)

Document Rooms

Information on availability of and copies of bills, reports, and public laws.

Senate: (202) 224-7860

House: (202) 225-3456

White House General Information

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