The Archimedes Standards: Activist Toolkit

Overview

The National Association of Scholars (NAS) and Freedom in Education (FIE), organizations dedicated to improving America's mathematics education, have created *The Archimedes Standards: Model PreK-12 State Mathematics Standards*.

State standards are the single most influential documents in America's education system. State education departments use them to provide guidance to each public K-12 school district and charter school as they create their own courses. State standards also influence what textbook authors write and what assessment companies such as the College Board test for in their advanced placement examinations. They affect teacher training and they provide the framework for teachers' individual lesson plans. Private schools and homeschool parents also keep an eye on state standards.

Yet too many state education departments have imposed state mathematics standards drawing on sources such as the Common Core State Standards for Mathematics (CCSSM), which provide a vague outline of content knowledge, it lack rigor, and were rushed into public use without sufficient testing and evaluation. America at large has suffered from their success. Too many Americans have emerged from our schools ignorant of the basics of mathematical knowledge, mathematical reasoning, and mathematical habits and character. We have too few mathematically expert scientists, engineers, and technicians—and too few citizens with the mathematical knowledge to prepare themselves for college, career, and civic readiness. Furthermore, the failure of our schools is becoming a national security risk, as America faces ever sharper scientific and technological rivalry from its peer competitor, China. Americans cannot compete scientifically without a bedrock of mathematical knowledge. We must restore rigorous, depoliticized American mathematics instruction if we are to ensure the liberty, the prosperity, and the security of the United States of America.

NAS and FIE want to improve every aspect of American mathematics instruction by inspiring America's state education departments to provide similarly improved mathematics standards. The *Archimedes Standards* will allow Americans to reclaim their mathematical heritage as a nation second to none of mathematicians devoted to the pure and practical uses of mathematics—much like Archimedes himself.

The *Archimedes Standards* will prepare our children for college and career because it provides comprehensive content knowledge in mathematics. The *Archimedes Standards* integrates its content-rich standards with sustained attention to lucidity, practicality, flexibility, and democratic accessibility.

The *Archimedes Standards* also will educate students act as informed and confident citizens by acquiring the mathematical habit of precise and rigorous thought.

Mathematics education that prepares students for college and career requires substantial mathematical content knowledge. The *Archimedes Standards* have been keyed to allow students to study Algebra I in Grade 8, which will provide enough time in high school mathematics for solid preparation for undergraduate mathematics. Yet the *Archimedes Standards* does not require Algebra I in Grade 8, since it recognizes that America's students have varying levels of mathematics readiness. The *Archimedes Standards*, rigorous and flexible, will provide a benchmark for states that intend to reform their Mathematics standards.

The *Archimedes Standards*' straightforward structure makes it easy for teachers to use and easy for parents to hold teachers accountable for how well they teach mathematics. The intensive content standards also facilitate reliable assessment, whether by state-level testing or tests by school districts and individual teachers.

The *Archimedes Standards* will especially benefit the most disadvantaged students. Disadvantaged students benefit from intensive content instruction even more than better-off students, who receive large amounts of content knowledge from their families and peers. Content standards that abbreviate content foster an unequal society because they especially harm the education of disadvantaged children. The *Archimedes Standards*' intensive content standards fulfill America's promise of equal educational opportunities for everyone.

Americans of all parties want to take back their schools. NAS and FIE drafted the *Archimedes Standards* to equip governors, state legislators, school boards, and grassroots activists for that fight. Every American needs to know what proper mathematics instruction should be. We encourage all citizens to get in touch with state policymakers, to call for adopting some or all of the *Archimedes Standards*' as a state mathematics standard. Each state should judge how to adapt the *Archimedes Standards* to best serve its students.

The *Archimedes Standards* are intended above all as models for state education standards—but we would be delighted if they informed mathematics education in school districts, charter schools, private schools, and home schools. We have crafted them to be useful for every variety of education.

But state mathematics standards are the linchpin of mathematics education—they stand halfway between state laws and school district policies, and they have more power to shape American mathematics education than any other single document. We absolutely need good state mathematics standards—a positive vision of what they should be, and not just a critique of the shortcomings of existing mathematics standards. Policy institutes, grassroots organizations and policymakers all can use them to press the education establishment: *Why don't you teach this?*

States and school districts should create mathematics standards modeled on the *Archimedes Standards* because it teaches American students their heritage of mathematical excellence.

Activists' Brief: Condensed

1. **States and school districts should create mathematics standards modeled on the *Archimedes Standards*, to teach students thorough mathematics knowledge and to act as informed and confident citizens.**

2. State academic content standards are the most influential documents in American education because they shape what public school districts teach, what textbook authors write, teacher training, and state and local assessment.

3. The *Archimedes Standards* appeal to a broad majority of Americans because it does not pursue a narrow ideological agenda. The *Archimedes Standards* removes the low standards imposed by the Common Core State Standards for Mathematics (CCSSM) and similar standards.

4. The *Archimedes Standards* provide a content-rich summary of required mathematical knowledge, with equal standards for every student, so as to restore a culture of high expectations. They include rigorous instruction through Calculus and Statistics, including Mental Mathematics and History of Mathematics.

5. The *Archimedes Standards* increase teacher accountability by focusing on factual content.

6. The *Archimedes Standards*' intensive content standards facilitate reliable assessment.

7. The *Archimedes Standards*' straightforward structure makes it easy for teachers to use and easy for parents to hold teachers accountable for how well they teach mathematics.

8. The *Archimedes Standards* is designed so that states and school districts can alter the sequence as they see fit. States and school districts can create equally rigorous standards by abbreviating some topics, expanding others, or adjusting the course sequences.

9. The *Archimedes Standards*' intensive content standards fulfill America's promise of equal educational opportunities for everyone because disadvantaged students benefit from intensive content instruction even more than better-off students, who receive large amounts of content knowledge from their families and peers.

10. The *Archimedes Standards* prepare students for college and career, because good colleges and good jobs require competitive and ambitious students and workers with broad background knowledge and the talent to absorb, synthesize and make use of large numbers of facts.

Activists' Brief

Introduction

Headline Argument

States and school districts should create mathematics standards modeled on the *Archimedes Standards* because they provide comprehensive content knowledge, integrate that content knowledge with sustained attention to the scientific method and how to think scientifically, and educate students to act as informed and confident citizens and policymakers.

What is the Archimedes Standards?

The National Association of Scholars (NAS) and Freedom in Education (FIE), organizations dedicated to improving America's mathematics education, have created *The Archimedes Standards: Model PreK-12 Mathematics Standards*. The *Archimedes Standards* help Americans to craft the mathematics standards, curricula, textbooks, and lesson plans we need to sustain our republic and our nation.

Why Do State Mathematics Standards Matter?

State academic content standards are the most influential documents in American education. They shape what public school districts and charter schools teach. They also influence what textbook authors write, and what knowledge assessment companies (such as the College Board) test for in their Advanced Placement examinations. They affect teacher training and they provide the framework for teachers' lesson plans.

What's Wrong With Existing State Mathematics Standards?

Too many state education departments have imposed state mathematics standards drawing on sources such as the Common Core State Standards for Mathematics (CCSSM), which provide a vague outline of content knowledge, it lack rigor, and were rushed into public use without sufficient testing and evaluation. America at large has suffered from their success. Too many Americans have emerged from our schools ignorant of the basics of mathematical knowledge, mathematical reasoning, and mathematical habits and character. We have too few mathematically expert scientists, engineers, and technicians—and too few citizens with the mathematical knowledge to prepare themselves for college, career, and civic readiness. Furthermore, the failure of our schools is becoming a national security risk, as America faces ever sharper scientific and technological rivalry from its peer competitor, China. Americans cannot compete scientifically without a bedrock of mathematical knowledge. We must restore rigorous, depoliticized American mathematics instruction if we are to ensure the liberty, the prosperity, and the security of the United States of America.

The *Archimedes Standards*: The Standard for Mathematical Excellence

The *Archimedes Standards* inspire America's state education departments to provide mathematics standards that teach American students their mathematical heritage as a nation second to none of mathematicians devoted to the pure and practical uses of mathematics—much like Archimedes himself. It also equips policymakers and the public to challenge the education establishment: *Why don't you teach this?*

The *Archimedes Standards*: Principled Standards for All Americans

The *Archimedes Standards* appeals to a broad majority of Americans because it provides excellent mathematics content, presents it clearly, and does not pursue a narrow, ideological agenda. Too much of America's educational establishment has abandoned the commitment to high standards and depoliticized instruction. The *Archimedes Standards* invites teachers and education administrators to join the reform movement for clear, excellent, and depoliticized mathematics education.

Contents

Content-Rich Knowledge

The *Archimedes Standards* provide a content-rich summary of required mathematical knowledge, with equal standards for every student, so as to restore a culture of high expectations. In the PreK-Grade 8 grade bands, the standards are grade-level-appropriate and build a strong framework for students' math proficiency to grow grade-by-grade. Though the recommended scope and sequence is relatively inflexible in these grades, such rigidity is essential to ensuring a solid foundation for all students. At the high school level, however, the standards divide into course sequences – Algebra I, Geometry, Algebra II, Pre-Calculus, Calculus, and Statistics – rather than grade bands. Schools may teach these six courses in whatever sequence they think appropriate, and may even divide instruction within grades. Such a combination of specific instruction for PreK-Grade 8 and maximum flexibility throughout high school, will best equip students for mathematical fluency and success.

Algebra I: Grade 8 *or* Grade 9

Many education reformers have argued strongly that Algebra I needs to be taught in Grade 8 rather than Grade 9 to ensure that students have enough instruction time in high school to be properly prepared for undergraduate mathematics.15 While a proper set of standards should allow students to take Algebra I in Grade 8, not every student will be ready for such a pace. The Archimedes Standards' middle school sequence therefore allows for both regular and accelerated instruction. While the standards schedule Algebra I for Grade 9, schools can consolidate the Grade 6-8 material into two grades, allowing students to proceed to Algebra I a year early in Grade 8. The specific details of such a consolidation will vary from school to school, but middle school math teachers will see that the standards facilitate accelerated instruction.

This flexible approach to Algebra I exemplifies how the *Archimedes Standards* aim for both achievement and accessibility. To prescribe Algebra I for either Grade 8 or Grade 9 would be too narrow; leaving open the opportunity for students to take it in either grade ensures that all students will receive the best possible mathematics education.

Calculus and Statistics

The *Archimedes Standards* were designed to provide rigorous math education for all students rather than encouraging schools to skim hastily toward advanced placement classes. However, at the end of such a robust progression through mathematics, many high school students will be prepared to take advanced placement courses, and thus the Calculus and Statistics standards are approximately equivalent in content and rigor to AP Calculus BC and AP Statistics. While many schools will not require these courses, good standards are available for the schools that offer them.

Depoliticized

The *Archimedes Standards* removes the lower standards imposed by the Common Core State Standards for Mathematics (CCSSM), which provide a vague outline of content knowledge, it lack rigor, and were rushed into public use without sufficient testing and evaluation. It rejects the growing urge by ideologically extreme education theorists and administrators to subordinate mathematics instruction to politicized instruction and the discriminatory and counterproductive ideology of so-called "diversity, equity, and inclusion" (DEI). No ideologies permeate the problems and tasks, no ethnomathematics guides the pedagogies, and no tangential applications have been inserted that politicize. Mathematics is a discipline that is free of cultural bias, universally true, and accessible to all, which can and should provide unifying principles that Americans of all backgrounds, cultures, and political affiliations can rally behind.

Mental Mathematics

The *Archimedes Standards* are committed to encouraging students to practice mental math in order to develop number sense and number flexibility. While mathematics is fundamentally a creative endeavor that cannot be reduced to a set of memorizable processes, math instruction cannot be divorced from the art of memory. Memorizing facts, processes, and formulas is useful for daily life, equipping students with the tools to quickly and efficiently solve practical problems at home, at work, and at play. Mental math also greatly facilitates the ability to engage in higher-level mathematics, providing a solid foundation from which to explore advanced concepts. Practically speaking, a true preparation for undergraduate and professional mathematics requires early memorization, which should remain central to math instruction.

Throughout the K-6 sequence, each grade level includes several Mental Mathematics standards, each of which specify mathematical knowledge that teachers should encourage students to commit to memory. Individual districts, schools, and teachers should choose the specific methods of doing so (flashcards, games, etc.), but every classroom should develop a culture of mental math that helps make mathematical reasoning second nature for students.

History of Mathematics

The *Archimedes Standards* restores History of Mathematics to state standards. Mathematics instruction can be enriched by the history of mathematical discovery, by helping both teachers and students to learn how we came to know what we know about the mathematical world. The History of Mathematics standards have been crafted to include stories and themes that complement the math being taught at each specific grade level. In Grade 5, for example, Brahmagupta's discovery of negative numbers accompanies classroom instruction on negative numbers. Stories like this can spark student interest and help them participate in the process of guided reinvention as they investigate the origins of mathematical concepts.

The *Archimedes Standards* incorporate these sections in moderation: not all schools and teachers will have the classroom time to incorporate these sections, and they easily be reduced or even eliminated. Still, for states, districts, and schools that do adopt them, these sections can provide an instructive and stimulating access point for students to encounter the narrative side of math.

Mathematical Practices

The *Archimedes Standards*' emphasis on content-rich knowledge contrasts with pedagogical approaches, such as "inquiry-based learning." While not bad in and of themselves, such pedagogies too often encourage teachers to replace robust instruction in content with hollow instruction in "skills." Yet the *Archimedes Standards* do not mandate or forbid specific instructional methods. As a result, teachers may use the standards to choose freely from appropriate content-focused pedagogies that will promote student learning. State education departments, likewise, are equally free to provide pedagogy guides for teachers.

Centering mathematical content, however, does not mean ignoring the specific skills that students should learn at various levels, skills which are included in the Mathematical Practices section for each grade. We provide six core practices, repeated in each grade band, which are associated with a variety of pedagogical techniques, so that teachers can employ the particular instructional methods that they see fit. Skills instruction does have an appropriate time and place in math teaching and learning, and the Mathematical Practices section provides a helpful guide to teachers without diminishing the primary task of teaching content.

Interdisciplinary Integration

While remaining centered around content-rich math instruction, the *Archimedes Standards* have an interdisciplinary ambition that complements instruction in science, social studies, and English language arts. This integrated, liberal-arts approach to learning helps students to make connections between different academic subjects, providing a well-rounded approach to mathematics. As such, the *Archimedes Standards* complement the two previous model standards drafted by the National Association of Scholars (NAS) and Freedom in Education (FiE), *The Franklin Standards* (science) and *American Birthright* (social studies) as well as future model standards for English language arts. But more broadly, such an integrated approach will help students to see how math overlaps with other disciplines and extends into our daily lives.

Advantages

Clear Format

The *Archimedes Standards* emphasize clarity far more than rival mathematics standards. We have eliminated the tangle of skills and crosswalks and concentrated on facts to learn, presented in a simple list. The *Archimedes Standards*' straightforward structure makes it easy for teachers to use and easy for parents to hold teachers accountable for how well they teach mathematics. We expect the states and school districts to modify the sequence we offer—but they can do so knowing with absolute clarity what is the total mathematics education we believe they should provide.

Broad Appeal and Flexibility

The *Archimedes Standards* have been designed to appeal to a broad majority of Americans. In addition to being depoliticized, they are flexible, so states and school districts can alter the sequence as they see fit. States and school districts can create equally rigorous standards by abbreviating some topics, expanding others, or adjusting the course sequences. States and school districts that adjust the course sequence can make age-appropriate adjustment to the learning standards. The *Archimedes Standards* should provide a broadly acceptable model for mathematics standards.

Teacher Freedom

The *Archimedes Standards* do not provide an entire curriculum. Teachers are free to teach each topic as they see fit, to add new topics, to incorporate independent lesson plans and sequences, and to unite items from these learning standards into thematic units. They also are free to reorganize the sequence in which they teach these topics, as well as to review material from earlier grades in any course of instruction.

Accountability: Clear Organization

The *Archimedes Standards* emphasizes clarity far more than rival mathematics standards. We have eliminated the tangle of skills and crosswalks and presented a simple list of factual items. The *Archimedes Standards*' straightforward structure makes it easy for teachers to use and easy for parents to hold teachers accountable for how well they teach mathematics.

Accountability: Pedagogy

The *Archimedes Standards* aligns with pedagogies that emphasize rigorous standards, individual effort, classroom instruction, and content knowledge. These pedagogies increase school accountability to parents and policymakers. You can't tell how well teachers instruct an individual student when they're assessing group projects, "skills," or ideological commitments—or when all students pass, no matter how little they learn.

True Preparation for College and Career

The *Archimedes Standards* prepares students for college and career with broad background knowledge; the talent to absorb, synthesize and make use of large numbers of facts; the capacity to listen sympathetically to multiple points of view and to engage in free debate; the readiness to be judged for their ability to produce timely and competent work; and independence of conscience and mind.

Mathematics For All Americans

Content standards that focus on "skills" and abbreviate content especially harm the education of disadvantaged students, and thereby foster an unequal society. When disadvantaged students receive intensive content instruction, they learn eagerly and well. The *Archimedes Standards* offers comprehensive content knowledge to ensure that America's schools fulfill the promise of equal educational opportunities for everyone.

Reliable Assessment

The *Archimedes Standards*' intensive content standards facilitate reliable assessment, whether by national companies such as the Educational Testing Service (ETS), state-level testing, or tests by school districts and individual teachers. Its content standards provide enough material to make it easy both for teachers and for large organizations such as ETS to create tests that accurately assess student knowledge.

Teacher Training

The *Archimedes Standards*' guides proper teacher training. If teachers do not already know this material, it tells them what they need to learn for their professional development. It also guides the teachers of teachers, in colleges and education schools, as they create courses and instruction sequences in mathematics.

Complements

Companion Legislation

State policymakers should pass the Archimedes Standards Taskforce Act, which establishes a commission to draft mathematics standards based on the *Archimedes Standards*.

Action Guide

Grassroots activists will need to take part in a long campaign to ensure both that the *Archimedes Standards* is adopted by states and school district, and to ensure that it is actually used properly in the classroom by teachers. We cannot plan out what precisely grassroots activists should do in each part of the United States–but we can provide a rough Action Guide, to help orient grassroots activists in their work.

The Situation in Each State

Each state has its own K-12 Mathematics Standards and its own statutes governing mathematics education. Most importantly, each state delegates a different amount of authority to the states and the school districts. State standards have great informal influence in any case, but it is important to determine precisely how much formal power they have to determine local standards and curricula. The National Association of Scholars and Freedom in Education are working on producing an information packet for each state, but grassroots activists should research the situation in their own state, so they can know precisely how to press for reform.

Standards Are Not Curricula

State content standards are not curricula, which are determined by school districts and individual teachers. It is important to make that distinction—not least because fixing standards is only the beginning of education reform. Standards allow citizens to hold school districts and teachers accountable, but they still need to be held accountable. Moreover, they need to be provided proper curricula—individual lesson plans. Grassroots activists also should call for local school districts to adopt complementary curricula.

Citizen Education

Most Americans don't understand how important state content standards are in shaping K-12 education. Grassroots activists must tell them that it matters, by every means at their disposal. Our *Activists Brief: Condensed* provides a good short explanation about why to support the *Archimedes Standards*; the *Activists Brief* gives a longer version.

State Policymakers

Grassroots activists should work to inform state policymakers of the trouble with existing mathematics standards, and why the *Archimedes Standards* provides a good model for an alternative. They should urge state policymakers to endorse the *Archimedes Standards* publicly, to hold legislative hearings on mathematics standards, and to make clear to state Education Departments that their standards, and all accompanying teacher training and written resources, should follow the *Archimedes Standards* model. State policymakers should also make sure that the revision process for state standards includes education reformers, and not just be delegated to the permanent education bureaucracy.

State Legislation

States can pass simpler legislation to shape content standards, in ways that will ensure that state Education Departments have to craft their mathematics standards in ways that align with the *Archimedes Standards*. We particularly recommend pushing for state policymakers to pass the Archimedes Standards Taskforce Act, which establishes a commission to draft mathematics standards based on the *Archimedes Standards*.

School Districts

School districts also possess considerable power to set standards—although often severely constrained by state standards. Grassroots activists should work to get their school boards and school district administrators to adopt mathematics standards based on the *Archimedes Standards*. (Work on state legislation to make school boards more accountable would also be useful, notably to shift the school board elections to Election Day, and to make it easier to recall school board members.)

School Districts: Follow-Through

Grassroots activists also need to make sure that school district administrators and teachers follow through and teach according to the *Archimedes Standards*. School Board members should exercise their oversight powers and make sure that teachers use curriculum that aligns with these standards. Grassroots activists should also work for curriculum transparency and financial transparency in the public schools (both as state law and as school district rule), so as to ensure that administrators and teachers actually comply with the *Archimedes Standards* and with citizen intent.

State and Local Assessment

Reliable state and local assessments, crafted outside the classroom, would be a wonderful way to assess whether teachers are teaching the *Archimedes Standards* properly. The problem is that assessments also can become tools by the education establishment to smuggle in radical education standards. Grassroots activists should consider whether to call for external state and local assessments, as a way to increase school accountability, but only if they are sure they cannot be misused by the education establishment.

Local Modification

The *Archimedes Standards* isn't meant to be a one-size-fits-all model. Grassroots activists ought to modify it to fit their states and their school districts. But grassroots activists also should be aware that the education establishment can use the argument of local modification to sabotage the *Archimedes Standards*—to water it down, to include mandated and counter-productive skills instruction, to include elements of radical identity-politics or action civics. Activists should make sure that the personnel of whatever committee decides on local modification includes education reformers who will preserve the core of the *Archimedes Standards*, and keep out poison-pill modifications.

Action Guide: Tips for New Activists

Citizens who don't have experience at grassroots activism should use these tips.

- **Organization: Local Allies**. Find like-minded allies quickly. Activism becomes much more effective when you have a group of supporters and when you can coordinate with other groups.

- **Organization: National Groups**. Ask national groups for help. They often have resources and contacts you can use, and they can provide publicity.

- **Publicity: Social Media**. Use social media—Facebook, Twitter, Instagram, etc. Develop **hashtags** to promote your cause (e.g., #ArchimedesStandards, #EducationReform).

- **Publicity: Graphics Software**. Use PowerPoint and other free/cheap software to create graphics for your handouts, PDFs, and other web or printed resources.

- **Research: Substance**. Research your topic thoroughly. Where mathematics standards are concerned, please read both the *Archimedes Standards* **and** the existing mathematics standards in your state/school district, so you can speak in detail about the advantages of the *Archimedes Standards* and the flaws of the existing state standards.

- **Research: Funding Sources**. Find out who's paying for materials referred to in mathematics standards, including recommended curriculum. Research their ideological affiliations.

- **Research: Process**. State education departments frequently have a highly technical process and schedule for recruiting personnel to craft mathematics standards, and for accepting comments from the public. Legislative committees also have a complicated process and schedule for accepting testimony. School boards have their own process for putting new items on the agenda and for listening to citizens. Research the process needed to get the *Archimedes Standards* on policymakers' agendas, to submit comments to education department website, and everything else you need to do to argue for it most effectively.

- **Research: Reference Material**. Read the footnotes, endnotes, and bibliography of state standards. Vague language in the text often references radical ideology such as Critical Race Theory that is stated explicitly in the documents referred to in the reference material. Effective arguments against the ideological assumptions of mathematics standards frequently depend upon reading the bibliography.

- **Outreach: Contact Policymakers**. Contact your governor, your state superintendent, your state representative, your state senator, and your school board. Look up their web pages to see where to direct your correspondence. Make your arguments—always in a civil tone. We provided model letters below. Combine email with phone calls and letters—phone calls and letters still make more of an impression with some policymakers. Policymakers won't know what you want if you don't tell them. It's also important in your later work to be able to say that you *have* contacted policymakers, especially if they haven't responded positively to your requests—or responded at all. You can ask them to give the public a good reason for their noncompliance.

- **Outreach: Ask for Commitment.** Ask policymakers to make a simple commitment: e.g., "Will you commit to adopting the *Archimedes Standards* as the model for the state mathematics standards?" Be polite, but include a request that has a simple Yes/No answer. Don't ask vague questions which will allow them to reply with vaguely supportive but noncommittal language.

- **Outreach: Occasions to Write**. Whenever there's a piece of relevant news, use it as an occasion to write—to your fellow supporters, to policymakers, to the media. Keep up a drumbeat of news—but you have to have a reason for each new letter.

- **Outreach: Testimony**. Prepare yourself to give concise, even-tempered, well-grounded testimony in public venues. Practice out loud giving a two-minute piece of testimony, grounded in personal experience and in precise references to text. Write it out so it can be re-used as a letter or publicity—and so you can see how persuasive it is, cold on the page. Send this written testimony in along with your spoken testimony, CC-ed broadly to everyone who needs to know about what you're saying, so that officials cannot hide your testimony.

- **Instant Resources**: Read the materials at Parents Defending Education's "Engage" webpage. (https://defendinged.org/engage/) Also look at the Civic Alliance's "Local Policy Resources" webpage. (https://civicsalliance.org/local-policy-resources/) These will provide many more useful tips.

Model Resolution

Grassroots activists should consider drafting Resolutions in favor of the *Archimedes Standards*. Resolutions express the public sentiment of a group of citizens, a public body such as a city council, or a private organization such as a parents' league. They don't make law, but they encourage policymakers to pass laws and resolutions–and they're useful sources of publicity in themselves, since grassroots activists can issue a press release every time an organization passes a Resolution.

Resolutions should call either on a state authority such as the State Education Department, or a local authority such as a particular School District, to adopt the *Archimedes Standards*. We have crafted one model resolution, adaptable for either purpose.

Model Resolution Text

We call on the **{State Education Department} / {Name School District}** to adopt new mathematics standards, based upon *The Archimedes Standards: Model PreK-12 State Mathematics Standards*. The *Archimedes Standards* are rigorous, clearly written, depoliticized, and appeals to a broad majority of Americans. The *Archimedes Standards* provide comprehensive content knowledge, integrate that content knowledge with lucidity, practicality, and democratic accessibility, and educate students to act as informed and confident citizens.

The *Archimedes Standards* provide a content-rich summary of required mathematical knowledge, with equal standards for every student, so as to restore a culture of high expectations. In the PreK-Grade 8 grade bands, the standards are grade-level-appropriate and build a strong framework for students' math proficiency to grow grade-by-grade. Though the recommended scope and sequence is relatively inflexible in these grades, such rigidity is essential to ensuring a solid foundation for all students. At the high school level, however, the standards divide into course sequences – Algebra I, Geometry, Algebra II, Pre-Calculus, Calculus, and Statistics – rather than grade bands. Schools may teach these six courses in whatever sequence they think appropriate, and may even divide instruction within grades. Such a combination of specific instruction for PreK-Grade 8 and maximum flexibility throughout high school, will best equip students for mathematical fluency and success.

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The *Archimedes Standards* have been designed to appeal to a broad majority of Americans. In addition to being depoliticized, they are flexible, so states and school districts can alter the sequence as they see fit. States and school districts can create equally rigorous standards by abbreviating some topics, expanding others, or adjusting the course sequences. States and school districts that adjust the course sequence can make age-appropriate adjustment to the learning standards. The *Archimedes Standards* should provide a broadly acceptable model for mathematics standards.

The *Archimedes Standards* does not provide an entire curriculum. Teachers are free to teach each topic as they see fit, to add new topics, to incorporate independent lesson plans and sequences, and to unite items from these learning standards into thematic units. They also are free to reorganize the sequence in which they teach these topics, as well as to review material from earlier grades in any course of instruction.

The *Archimedes Standards* emphasizes clarity far more than rival mathematics standards. We have eliminated the tangle of skills and crosswalks and presented a simple list of factual items. The *Archimedes Standards*' straightforward structure makes it easy for teachers to use and easy for parents to hold teachers accountable for how well they teach mathematics.

The *Archimedes Standards* aligns with pedagogies that emphasize rigorous standards, individual effort, classroom instruction, and content knowledge. These pedagogies increase school accountability to parents and policymakers. You can't tell how well teachers instruct an individual student when they're assessing group projects, "skills," or ideological commitments—or when all students pass, no matter how little they learn.

The *Archimedes Standards* prepares students for college and career with broad background knowledge; the talent to absorb, synthesize and make use of large numbers of facts; the capacity to listen sympathetically to multiple points of view and to engage in free debate; the readiness to be judged for their ability to produce timely and competent work; and independence of conscience and mind.

The *Archimedes Standards* are intended to boost mathematics knowledge of all students and are not intended to substitute for early college classes, such as dual credit (taught in high school) and dual enrollment (taught in college) courses in advanced mathematics. We also encourage ambitious and qualified students to take early college courses, the better to stimulate their love of mathematics and prepare them for college and career.

Content standards that focus on "skills" and abbreviate content especially harm the education of disadvantaged students, and thereby foster an unequal society. When disadvantaged students receive intensive content instruction, they learn eagerly and well. The *Archimedes Standards* offers comprehensive content knowledge to ensure that America's schools fulfill the promise of equal educational opportunities for everyone.

The *Archimedes Standards*' intensive content standards facilitate reliable assessment, whether by national companies such as the Educational Testing Service (ETS), state-level testing, or tests by school districts and individual teachers. Its content standards provide enough material to make it easy both for teachers and for large organizations such as ETS to create tests that accurately assess student knowledge.

The *Archimedes Standards*' guides proper teacher training. If teachers do not already know this material, it tells them what they need to learn for their professional development. It also guides the teachers of teachers, in colleges and education schools, as they create courses and instruction sequences in mathematics.

{State Education Department} /{Name School District} should work immediately to adopt new mathematics standards, based upon the *Archimedes Standards*.

Model Letter to the Editor

Grassroots activists should consider drafting a Letter to the Editor in favor of the *Archimedes Standards*. A Letter to the Editor can help persuade public opinion. The Letter to the Editor is also a good model for any very short writing in favor of the *Archimedes Standards*.

Model Letter to the Editor Text

The **{Name School District} / {State Education Department}** should adopt new mathematics standards, based upon *The Archimedes Standards: Model PreK-12 State Mathematics Standards*. The *Archimedes Standards* are rigorous, clearly written, and appeals to a broad majority of Americans. The *Archimedes Standards* provide comprehensive content knowledge, integrate that knowledge with lucidity, practicality, and democratic accessibility, and educate students to act as informed and confident citizens and policymakers. The *Archimedes Standards* already has been endorsed by large number of organizations and individuals from around the country.

The *Archimedes Standards* provides a content-rich summary of required mathematics knowledge, with equal standards for every student, which includes Calculus and Statistics, as well as History of Mathematics and Mental Mathematics. The *Archimedes Standards* focuses on lucid statements of mathematical knowledge that every student can learn.

The *Archimedes Standards* prepares students for college and career with broad background knowledge. The *Archimedes Standards*' straightforward structure makes it easy for teachers to use and easy for parents to hold teachers accountable for how well they teach mathematics. The *Archimedes Standards*' intensive content standards also facilitate reliable assessment, whether by state-level testing or tests by school districts and individual teachers.

The *Archimedes Standards* will especially benefit the most disadvantaged students. Disadvantaged students benefit from intensive content instruction even more than better-off students, who receive large amounts of content knowledge from their families and peers. Content standards that abbreviate content foster an unequal society because they especially harm the education of disadvantaged children. The *Archimedes Standards*' intensive content standards fulfill America's promise of equal educational opportunities for everyone.

The **{Name School District} / {State Education Department}** should work immediately to adopt new mathematics standards, based on *The Archimedes Standards: Model PreK-12 State Mathematics Standards*.

Model Letter to a Policymaker

Grassroots activists should consider drafting a Letter to a Policymaker in favor of the *Archimedes Standards*. A Letter to a Policymaker can help persuade a policymaker to take action in favor of the *Archimedes Standards*.

Our modern Letter to a Policymaker differs from our Letter to an Editor most importantly by including room for Personal Information such as: I am a constituent; I live in X; my children attend school at X; their current mathematics instruction is not sufficient because X. Policymakers (rightly) care more when you can link a request to your own personal experience. Grassroots activists should be sure to connect the call to support the *Archimedes Standards* with their own experience about the problems with mathematics education in their local schools.

A Policymaker can include a governor, an education commissioner, a state senator, a state representative, a principal, a school board member, and more. Grassroots activists should tailor this letter to the particular policymaker they're writing to, and make sure that what they're asking for is something that lies within their correspondent's power.

Model Letter to a Policymaker Text

Dear **{Title} {Name}**,

I urge you to publicly support *The Archimedes Standards: Model PreK-12 State Mathematics Standards*, and to tell the **{State Education Department}** that they should adopt new mathematics standards based upon the *Archimedes Standards*. The *Archimedes Standards* are rigorous, clearly written, and appeal to a broad majority of Americans,. The *Archimedes Standards* provide comprehensive content knowledge, integrate that knowledge with lucidity, practicality, and democratic accessibility, and educate students to act as informed and confident citizens and policymakers. The *Archimedes Standards* already has been endorsed by large number of organizations and individuals from around the country.

The *Archimedes Standards* provides a content-rich summary of required mathematics knowledge, with equal standards for every student, which includes Calculus and Statistics, as well as History of Mathematics and Mental Mathematics. The *Archimedes Standards* focuses on lucid statements of mathematical knowledge that every student can learn.

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The *Archimedes Standards* will especially benefit the most disadvantaged students. Disadvantaged students benefit from intensive content instruction even more than better-off students, who receive large amounts of content knowledge from their families and peers. Content standards that abbreviate

content foster an unequal society because they especially harm the education of disadvantaged children. The *Archimedes Standards*' intensive content standards fulfill America's promise of equal educational opportunities for everyone.

{Personal Information: I am a constituent; I live in X; my children attend school at X; their current mathematics instruction is not sufficient because X.}

Please publicly support the *Archimedes Standards* and urge the **{State Education Department}** to work immediately to adopt new mathematics standards, based upon the *Archimedes Standards*.

Best wishes,
{Name}

Model Speeches and Letters

Grassroots activists should be prepared to make a more detailed argument in favor of the *Archimedes Standards*. This argument can take the form of a speech at a City Council Meeting, a speech at a School Board Meeting, or a Letter to a School board. These Speeches and Letters should be longer than a Letter to the Editor or a Letter to a Policymaker. This resource should be used for any purpose that requires a longer argument in favor of the *Archimedes Standards*.

Model Speeches and Letters Text

The **{Name School District}** should adopt new mathematics standards. I recommend that we adopt standards based on *The Archimedes Standards: Model PreK-12 State Mathematics Standards*. The *Archimedes Standards* are rigorous, clearly written, and appeal to a broad majority of Americans. The *Archimedes Standards* already has been endorsed by large number of organizations and individuals from around the country. The *Archimedes Standards* provide comprehensive content knowledge, integrate that knowledge with lucidity, practicality, and democratic accessibility, and educate students to act as informed and confident citizens and policymakers.

The *Archimedes Standards* provides a content-rich summary of required mathematics knowledge, with equal standards for every student, which includes Calculus and Statistics, as well as History of Mathematics and Mental Mathematics. The *Archimedes Standards* focuses on lucid statements of mathematical knowledge that every student can learn.

The *Archimedes Standards* removes the lower standards imposed by the Common Core State Standards for Mathematics (CCSSM), which provide a vague outline of content knowledge, it lack rigor, and were rushed into public use without sufficient testing and evaluation. It rejects the growing urge by ideologically extreme education theorists and administrators to subordinate mathematics instruction to politicized instruction and the discriminatory and counterproductive ideology of so-called "diversity, equity, and inclusion" (DEI). The *Archimedes Standards* is designed so that states and school districts can alter the sequence as they see fit. States and school districts can create equally rigorous standards by abbreviating some topics, expanding others, or making age-appropriate adjustments.

The *Archimedes Standards* does not provide an entire curriculum. Teachers are free to teach each topic as they see fit, to add new topics, to incorporate independent lesson plans and sequences, and to unite items from these learning standards into thematic units. They also are free to reorganize the sequence in which they teach these topics, as well as to review material from earlier grades in any course of instruction.

The *Archimedes Standards* emphasizes clarity far more than rival mathematics standards. We have eliminated the tangle of skills and crosswalks and presented a simple list of factual items. The *Archimedes Standards*' straightforward structure makes it easy for teachers to use and easy for parents to hold teachers accountable for how well they teach mathematics.

The *Archimedes Standards* aligns with pedagogies that emphasize rigorous standards, individual effort, classroom instruction, and content knowledge. These pedagogies increase school accountability to parents and policymakers. You can't tell how well teachers instruct an individual student when they're assessing group projects, "skills," or ideological commitments—or when all students pass, no matter how little they learn.

The *Archimedes Standards* prepares students for college and career with broad background knowledge; the talent to absorb, synthesize and make use of large numbers of facts; the capacity to listen sympathetically to multiple points of view and to engage in free debate; the readiness to be judged for their ability to produce timely and competent work; and independence of conscience and mind.

The *Archimedes Standards* are intended to boost mathematics knowledge of all students and are not intended to substitute for early college classes, such as dual credit (taught in high school) and dual enrollment (taught in college) courses in advanced mathematics. We also encourage ambitious and qualified students to take early college courses, the better to stimulate their love of mathematics and prepare them for college and career.

Content standards that focus on "skills" and abbreviate content especially harm the education of disadvantaged students, and thereby foster an unequal society. When disadvantaged students receive intensive content instruction, they learn eagerly and well. The *Archimedes Standards* offers comprehensive content knowledge to ensure that America's schools fulfill the promise of equal educational opportunities for everyone.

The *Archimedes Standards*' intensive content standards facilitate reliable assessment, whether by national companies such as the Educational Testing Service (ETS), state-level testing, or tests by school districts and individual teachers. Its content standards provide enough material to make it easy both for teachers and for large organizations such as ETS to create tests that accurately assess student knowledge.

The *Archimedes Standards*' guides proper teacher training. If teachers do not already know this material, it tells them what they need to learn for their professional development. It also guides the teachers of teachers, in colleges and education schools, as they create courses and instruction sequences in mathematics.

{Name School District} should work immediately to adopt new mathematics standards, based on the *Archimedes Standards*.

Action Suggestions for State Policymakers

State policymakers (governors, state senators, and state representatives) play a crucial role in improving state mathematics standards. They must work for reform, however, partly by means of state education departments, which, in most states, have been delegated authority over much state education policy. They also should work for reform in ways that respects the power of school districts to set their own curriculum.

We provide below a series of Action Suggestions for State Policymakers. We do so keenly aware that state policymakers know their state and their business better than we do. (Indeed, we would welcome suggestions from any state policymakers about how to refine our advice.) We hope, nevertheless, that these suggestions will be useful to policymakers who wish to introduce the *Archimedes Standards* into their states—or to forward any sort of education reform.

Personnel

- Governors should appoint Superintendents who are dedicated to the cause of mathematics standards reform, and who will themselves appoint more reformers to the state education department. Governor Ron DeSantis (R-Florida) forwarded mathematics standards reform by appointing Richard Corcoran as Education Commissioner, while the bipartisan Louisiana State Board of Elementary and Secondary Education did likewise by appointing Dr. Cade Brumley as State Superintendent of Education.

- State legislators should communicate to governors that they would favor appointments of individuals who will press for mathematics standards reform.

- Governors and state legislators should assemble lists of education reformers who will champion mathematics standards reform, to be ready for appointment as Superintendents, and throughout the state education department. Education reformers who can serve on standards writing committees will be particularly useful.

Mathematics Standards Revision

Some states have regular academic standards revision processes; others depend on legislative or gubernatorial initiative for academic standards revision.

- State policymakers should inform themselves about the particular standards revision process in their state. They should communicate with state education departments to discover what is the precise nature of the process in their state, so they may exert effective influence on the process of mathematics standards revision.

- State policymakers should inform themselves about the state education department's selection of committee members to determine the revision of mathematics standards. State policymakers should make sure that these committees include champions of mathematics education reform, and ideally champions of the *Archimedes Standards*.

- State policymakers should inform themselves in each stage of the review process of the contents of draft revised mathematics standards, keep their constituents informed about these contents, and encourage public participation and input. In 2021-2022, the Louisiana State Board of Elementary and Secondary Education accepted public comments throughout the social studies standard revision process. These comments from concerned citizens provided crucial support for improved social studies standards as Louisiana developed its "Freedom Framework" Content Standards. State policymakers should facilitate similar public comment in favor of the *Archimedes Standards*.

- State policymakers should communicate their preference for the *Archimedes Standards*, and similar reformed mathematics standards that provide comprehensive content knowledge, integrate content knowledge with lucidity, practicality, flexibility, and democratic accesssibility, and educate students to act as informed and confident citizens and policymakers, in letters to education departments, in committees where they seek testimony from education department personnel, in public debate in the state legislature, and in public speeches. By all these means they should exert influence on state education departments, to encourage them to incorporate as much as possible of the *Archimedes Standards* into the state's revised mathematics standards.

- State policymakers should use the *Archimedes Standards* particularly as a counter-model to draft mathematics standards, or existing mathematics standards, which do not serve their state well. They can use the *Archimedes Standards* to make critiques in detail of misguided standards—but the *Archimedes Standards* can be more effective as a counter-model as a whole. State policymakers should use the *Archimedes Standards* as a way to say, *Why don't you start over entirely the process of drafting mathematics standards?*

- State policymakers should inform grassroots activists of occasions for public testimony on behalf of the *Archimedes Standards*. The National Association of Scholars and Freedom in Education will be glad to provide testimony on behalf of the *Archimedes Standards*, but we know that such testimony is more effective when complemented by similar testimony from state citizens.

- State policymakers should be willing to initiate special means for mathematics standards revision. In South Dakota, Governor Kristi Noem first halted the regular social studies revision process and set aside the existing draft standards. She then appointed a special

commission, whose personnel largely came from outside South Dakota's education establishment. Whenever it is an appropriate means to forward mathematics standards reform, state policymakers should follow Governor Noem's example.

Other Education Department Mathematics Materials and Regulations

State education departments produce a great deal of material and regulations tied to mathematics standards, including model curricula, curriculum frameworks, licensure requirements, teacher training, resources, and assessments. State policymakers should follow up on work to reform mathematics standards with work to ensure that all these mathematics materials also have been reformed to align with the *Archimedes Standards*.

Mathematics Standards Legislation

We particularly recommend to state policymakers to consider the Archimedes Standards Taskforce Act. The Archimedes Standards Taskforce Act establishes a commission to draft mathematics standards based on the *Archimedes Standards*.

Teacher Training Legislation

Mathematics standards reform ultimately depends upon educating a body of mathematics teachers who are equipped to teach the *Archimedes Standards*. State policymakers also should work to reform their public universities and their education schools, to ensure that they will produce this body of mathematics teachers. We recommend that state policymakers consider several of the National Association of Scholars' model bills, from our Model Education Licensure Code. These bills, which also align with the *Archimedes Standards*, would forward teacher training reform at the level appropriate to statute law.

- Education Licensure Certificate Act. The Education Licensure Certificate Act creates a new, simplified education licensure pathway, which requires students to take a number of undergraduate courses, focused on subject matter content.

- Education Licensure Review Act. The Education Licensure Legislative Review Act requires all existing education licensure requirements, and all forthcoming revisions, to be submitted to the state legislature and the governor for review and possible veto.

- Education Licensure Nondiscrimination Act. The Education Licensure Nondiscrimination Act depoliticizes all state education requirements, processes, and materials.

School Districts

The *Archimedes Standards* can and should be adopted at the school district level. State policymakers should inform school board members and school district administrators of the existence of the *Archimedes Standards* and encourage them to adopt it.

Publicity & Cooperation with Grassroots Efforts

We recommend that state policymakers work to publicize the *Archimedes Standards* to their constituents, and to work with grassroots activists to inspire public efforts in favor of the *Archimedes Standards*. We believe that joint efforts by policymakers and the public will effectively promote mathematics standards reform keyed around the *Archimedes Standards*.