

Conference Board of the Mathematical Sciences
One Hundred and Twenty-fourth Meeting of the Council
Friday, December 4, 2020

Zoom meeting, ID 673-517-2130, password CBMS
See **Guidelines** for the Zoom meeting on page 2 of this agenda
All times are Eastern Time

- 12:30–1:15 **Business Meeting of the Council**
1. Introductions and Overview of Meeting – David Levermore
 2. Secretary-Treasurer's Report – Charles Steinhorn
 - a. Approval of Minutes of the Meeting of May 1, 2020 (appendix A)
 - b. FY 2020 Operating Budget Income/Expense Report (appendix B)
 - c. Unrestricted Net Assets History (appendix C)
 - d. FY 2021 Dues Assessments (appendix D)
 3. Director's Report – David Bressoud (appendix E)
 - a. CBMS COVID-19 Survey (appendix F)
 - b. Summary of CBMS Forum on Mathematics Alignment Initiative (appendix G)
 4. Announcements
 - a. National Math Festival —Kirsten Bohl
 - b. Update on continuing Equity breakout group discussions —Shelly Jones
- 1:15–2:00 Breakouts
1. Equity
 2. Membership Issues
 3. Expanding Online Offerings
 4. Future of Graduate Student Programs
- 2:00–2:15 Reports from breakout groups
- 2:15–2:45 Break with informal breakouts, all seven topics will be open
- 2:45–3:45 NAS updates from Kathie Bailey, BISO; Lida Benison, BHEW; Michelle Schwalbe, BMSA; and Heidi Schweingruber, BOSE
- 3:45–4:30 Second round breakout groups
1. Equity
 2. Running Online Conferences
 3. Classroom Issues
 4. Future of STEM Education
- 4:30–5:00 Final reporting and discussion

Guidelines for Zoom Meeting of CBMS Council

Please download the latest version of Zoom before the meeting. You need to be using version 5.3.0 or later in order to choose your breakout room.

If you have trouble entering the Zoom meeting, please email the Director, David Bressoud, at bressoud@macalester.edu.

The main meeting will be recorded. The breakout sessions will not be recorded.

Please ensure that your Zoom name includes your family name for identification purposes. If you need to change your Zoom name once you are in the meeting, click on **participants**. Under **more**, click on **rename**. If you are joining via telephone, please email the Director in advance to inform him of the telephone number from which you will be calling, since that number is the only identification provided by Zoom.

The host of the meeting will be the Director. The members of the Executive Committee and those scheduled to make presentations will be the co-hosts. Anyone else who wishes to share their screen should request permission from the Director, either via email before the meeting or in a private chat to David Bressoud once the meeting has started.

In the main meeting room, those wishing to speak should so signal by using the **raise hand** button in the list of **participants**. Voting that is not evident after a voice vote will also be done using the **raise hand** button. Remember that you are limited to one vote per society, which is given by the president or the person so designated by the president. If the president is not present, be certain you are clear who from the society is voting on their behalf.

You will be allowed to choose your breakout rooms for all breakout sessions. Please sign up before the Council meeting for the themes you wish to discuss at https://docs.google.com/document/d/1oV0PdhBUXVLawL5DeeSj62PIU7oeKX_ts5m_AxSXzrw/edit?usp=sharing

You will be alerted when the breakout rooms open. Click the button to enter your breakout room. At the end of each session, you will be given a 60 second warning before your breakout room closes. You can either go directly back to the main meeting or wait until the room closes and you are automatically returned.

Each breakout room will have an assigned Google doc where the recorder and other members of the breakout room can keep notes of the discussion. The link to the folder containing these Google docs is at

<https://drive.google.com/drive/folders/1zfGBx6C6nkxiWwDoMfBpAbb-uTvDQNu1?usp=sharing>

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Appendix A

Minutes of the 123rd Meeting of the Council of the Conference Board of the Mathematical Sciences Held via Zoom Friday, May 1, 2020

The following were present for all or part of the meeting, held at the ASA Headquarters.

Executive Committee: Diane Briars, Chair; David Levermore, Chair-Elect; Charles Steinhorn, Secretary-Treasurer; Deanna Haunsperger, Member-at-Large; Edray Goins, Member-at-Large

Council Members: Kathryn Kozak, AMATYC; Catherine Roberts, AMS; Michael Steele, AMTE; Dona Lalonde, ASA; Charles Steinhorn, ASL; Joleigh Honey, ASSM; Ruth Haas, AWM; Shelly Jones, BBA; Missie Bowers, INFORMS; Jessica Utts, IMS; Michael Dorff, MAA; Leona Harris, NAM; Paul Gray, NCSM; Trena Wilkerson, NCTM; Cindy Lawrence, MoMath; Lisa Fauci, SIAM; Jeremy Brown, SOA; Linda Fulmore, TODOS; Lorraine Howard, WME.

Additional society representatives: Ray Levy, MAA; Darla Kremer, AWM; Abbe Herzig, AMS; Kathleen Kavanaugh, SIAM; Anne Dudley, AMATYC; Ray Levy, MAA; Megan Burton, AMTE; Michael Pearson, MAA; Shari Stockero, AMTE; Mona Toncheff, NCSM; Ken Krehbiel, NCTM; Jim Crowley, SIAM; Ron Wasserstein, ASA; Crystal Morton, BBA;

Invited Guests: Juan Meza, NSF; Karen Marrongelle, NSF; Kirsten Bohl, MSRI; Mike Ferrara, NSF; Dave Kung, TPSE; Ted Coe, NWEA; Kim Gattis, AIR; Tyler Kloefkorn, NAS; Doug Sovde, Dana Center; Beth Eisenmann, NSF; Talitha Washington, NSF

Staff: David Bressoud, Javon Barnes

Reports from the presenters are available at <https://www.cbmsweb.org/2017/12/cbms-council-meeting-december-7-2018/>

I. Business Meeting

Chair Diane Briars welcomed those who were present and outlined the agenda.

- 1. Nominating Committee.** The nominees for open positions were Charlie Steinhorn for Secretary-Treasurer and Michael Steele for member-at-large. Both were unanimously elected.
- 2. Admission of the National Museum of Mathematics to CBMS.** The Council voted unanimously to accept the National Museum of Mathematics as a member of CBMS
- 3. Approval of Minutes.** The minutes of the December2019 CBMS Council meeting were

approved unanimously.

4. **Financial Report and Budget.** Charlie Steinhorn presented the half-year financial report. The FY2021 budget was approved as presented.
5. **Director's Report.** David Bressoud reported on the ongoing work with the state task forces that initiated their work at the Pathways Forum in May. At the time this report was given it was still hoped that the second Forum could be held in person October 4–6, 2020. There were six summer research conferences that had been funded for summer 2020. Three CBMS conference monographs had been published were in the production since the last report.
6. **Announcements.**

Kirsten Bohl announced the plans for the National Math Festival in 2021.

II. NSF updates from Juan Meza and Karen Marrongelle

Karen Marrongelle began by reminding participants that France Córdoba has now left NSF and Sethuraman Panchanathan has been named as the new NSF Director. Both Karen and Juan emphasized that in these uncertain times, NSF program officers are operating with maximum flexibility, recognizing that many timelines for accomplishing work have been disrupted.

They also emphasized the RAPID grants that had already gone out, including a DRL grant to the University of North Carolina and the University of Missouri that is studying student responses to and concerns about the coronavirus virus pandemic and building a curriculum that addresses those and other scientific issues that impact students, a grant that is studying how remote learning is impacting issues of equity, and several grants within DMS that are developing a variety of mathematical models for the study of the spread of the pandemic, the genomic structure of the virus, and other aspects of COVID-19.

III. Breakout Discussions

The participants went into breakout rooms for two rounds, each followed by time for reporting back. The break-out sessions focused on

Assessment. How do we ensure the availability, security, and flexibility of online formats for certification and assessment? There are (at least) two ways to think about assessment in this context. 1. How can we (or even should we) maintain our long-established habits for how we do assessment? 2. What are optimal means for authentic assessment, both online and in other environments

Equity. As instruction goes online, access to the internet and technology becomes more critical than ever before. How do we ensure that those from under-resourced or otherwise challenged communities continue to have access to quality education?

Pedagogy. How do we continue to work toward the vision of a classroom in which all learners are actively engaged in constructing their understanding of mathematics?

Support. What is being, can be, and should be done to support our professionals who must operate in this new world?

Technology. What are technologies with which our members need facility? What are the promising technologies that need to be more widely distributed? Where are the greatest technological needs?

Online resources that were mentioned during the breakouts and the notes submitted from each of the breakout sessions can be found at <https://www.cbmsweb.org/council-meeting-materials/>. The following is a brief summary of what I saw as the main take-aways from the extensive discussions that took place during these breakouts. This summary was also reported in my *Launchings* column of August, 2020:

Resources. Tight budgets were a fact of life in education before we entered the era of COVID-19. Many universities were struggling with declining enrollments and had already put a freeze on salaries and the replacement of tenure-line faculty. Resources for PreK-12 education were stretched and teacher salaries had not kept up with inflation. This fall we face the double blow of increased expenditures for technologies and protective measures and the need to cut budgets as taxes and revenue streams diminish.

Probably the most valuable resource that will be in short supply this fall is time, time to plan and prepare in an ever-shifting environment, time to meet the competing demands of family and profession. At the May CBMS meeting, both Lisa Fauci of SIAM and Ruth Haas of AWM stressed how these pressures fall especially on women who are seen as the primary care-givers of the family. Most colleges and universities are allowing, even encouraging, faculty to pause the tenure and promotion clock. More than this is needed. Given the conflicting demands of teaching, research, and family, departments need to convey the message that it is okay not to be “productive” right now.

Equity. This goes well beyond access to computers and the internet. As the previous paragraph indicated, there are vast disparities in the sorts of external pressures that both students and teachers are experiencing. One effect of the pandemic is that inequities that have always been present are now far more visible. We will have missed an enormous opportunity if we ignore the lessons of this time and try to go back to the status quo ante once the crisis is over.

There are other opportunities to improve equity within the present situation. Some students do well in an online environment where they can control the timing and pacing of their instruction, get immediate feedback on assignments, revisit videos, or work in a text-based environment. This fall will present students with a variety of experiences and options. Faculty should be refining their ability to operate in variety of modes, increasing future options. This will be especially important as departments expand supplemental support.

Assessment. One of the lessons from this past spring is that when high-stakes testing is attempted in an online environment, there is widespread cheating. There are a variety of technologies and services that promise to deal with this, but the message that came out of the May CBMS meeting is that we should grab this as an opportunity to rethink assessment.

We have known for a long time that students learn much better when classes incorporate frequent low stakes assessments. In the current situation, these have the added advantage that there is much less pressure to cheat, especially when these assessments are formative as well as summative. I have long advocated for down-playing final exams. This year should be forcing this position.

The CBMS presidents also see the present situation as an opportunity to examine the goals of our courses and rethink what assessments will most effectively measure progress toward those goals. How important is it for students to memorize information they can easily access via Google? What problem-solving skills do they need to develop that go beyond those that modern technology can do better and faster? Beyond assessment, this is an opportunity to engage in backward design of the entire curriculum.

Appendix B

FY 2020 Actual and FY 2021 Budget: fiscal year runs Oct 1 through Sept 30

FY 2019 Actual and FY 2020 Budget Shown for Comparison

	Income			
	FY 2019 Actual	FY 2020 Budget	FY 2020 actual	FY 2021 Approved Budget
Dues	\$67,950	\$66,500	\$68,200	\$65,000
Interest	\$305	\$100	\$106	\$100
Royalties	\$5,000	\$1,000	\$1,073	\$1,000
NSF Regional Research Conferences				
Salaries	\$34,377	\$29,865	\$30,500	\$30,000
Indirect Costs	\$7,636	\$4,487	\$3,886	\$6,000
Forum 6				
Salaries	\$15,750			
Indirect Costs	\$13,478			
Other				
Total Income	\$144,496	\$101,952	\$103,765	\$102,100
	Expense			
	FY 2019 Actual	FY 2020 Budget	FY 2020 actual	FY 2021 Approved Budget
Compensation				
Director	\$50,000	\$45,000	\$45,000	\$45,000
Administrative Coordinator	\$16,149	\$16,500	\$7,029	\$16,500 a
Postage and Shipping	\$210	\$500	\$253	\$200
Supplies	\$2,369	\$3,000	\$546	\$3,000
Internet	\$1,381		\$1,000	\$1,200
QuickBooks license	\$ 645		\$755	\$800
Website	\$556	\$600	\$55	\$300 a
Council Meetings				
Travel	\$9,129	\$7,500	\$4,929	\$10,000 a
Food and Other Meeting Expenses	\$9,202	\$12,000	\$5,443	\$10,000 a
Staff Travel	\$7,690	\$7,000	\$100	\$7,000 a
Accounting Fees	\$2,810	\$4,000	\$1,525	\$3,500 a
Auditing Fees	\$0	\$2,250	\$7,500	\$2,500 b
Insurance		\$700	\$715	\$750
Unbudgeted Expenses				
Bank Service Charges			\$49	
Charitable contributions	\$300		\$1,000	
Total Expense	\$100,440	\$99,050	\$75,899	\$100,750 a
Operating Surplus or (Deficit)	\$44,056	\$2,902	\$27,866	\$1,350

Notes

a - See the Director's Report for a discussion of the actual FY2020 budget.

b - These are only paid every third year. This is in anticipation of auditing fees of approximately \$7500 in FY 2023.

Appendix C

Unrestricted Net Assets as of September 30, 2020

unrestricted cash on hand	\$85,704
accounts receivable	
NSF	\$8,446
dues	\$2,925
other	\$0
accounts payable	\$0
Net	\$97,075

Investments

Vanguard Balance Mar 31, 2019	\$142,140	
Vanguard Balance Sept 30, 2019	\$146,272	
Vanguard Balance Mar 31, 2020	\$164,576	transferred \$20,000 from savings to Vanguard on 1/9/2020
Vanguard Balance Sept 30, 2020	\$172,424	
Total Unrestricted Net Assets	\$269,499	

Appendix D

FY2021 dues assessment

These assessments do not include dues relief. The actual dues owed for FY2021 is being communicated privately to the relevant Executive Directors.

Society	I=Interest	Dues Rounded	Change	Quarterly
AMATYC	1	\$ 1,200	\$ 100	\$ 300
AMS	0.5	\$ 7,900	-\$ 6,400	\$ 1,975
AMTE	1	\$ 600	\$ 0	\$ 150
ASA	0.5	\$ 5,600	\$ 200	\$ 1,400
ASL	0.5	\$ 400	\$ 0	\$ 100
ASSM	1	\$ 400	\$ 0	\$ 100
AWM	1	\$ 700	\$ 0	\$ 175
BBA	1	\$ 400	\$ 0	\$ 100
IMS	0.8	\$ 1,200	\$ 100	\$ 300
INFORMS	0.5	\$ 3,900	\$ 300	\$ 975
MAA	1	\$ 6,300	\$ 500	\$ 1,575
NAM	1	\$ 400	\$ 0	\$ 100
NCSM	1	\$ 1,300	-\$ 300	\$ 325
NCTM	0.6	\$ 10,500	-\$ 1,200	\$ 2,625
MoMath	1	\$ 3,900		\$ 975
SIAM	1	\$ 7,500	\$ 1,400	\$ 1,875
SOA	0.5	\$ 12,700	-\$ 1,100	\$ 3,175
TODOS	1	\$ 400	\$ 0	\$ 100
WME	1	\$ 400	\$0	\$ 100
TOTAL		\$65,300		\$16,325

Half of dues assessment is based on Annual Revenue times Interest at \$0.35 per thousand dollars.

Half of dues is based on number of dues-paying U.S. members times Interest at \$0.47 per member

Dues assessments are either rounded to nearest multiple of \$100 or set at \$400, whichever is larger.

Appendix E

Director's Report

This has been a very unusual year. This report will focus on five areas: the budget and dues, the CBMS 2020 Departmental Survey, the NSF/CBMS Summer Research Conferences, the CBMS Forums on the Transition from High School to College Mathematics, and my own plans for stepping down from the directorship.

Budget and Dues. Because of travel restrictions and the switch to an online Council meeting in May, this year has seen our expenditures go way down. Council meetings were at roughly half the usual cost and there has been almost no staff travel. In addition, because of the cancellation of the in-person Council meeting and the postponement of the summer research conferences, Javon, who has been paid on an hourly basis, has seen her compensation drastically reduced. Website costs were cut when we migrated from the service that had originally assisted in setting up our website to hosting under the umbrella of Macalester College's website provider. We also switched accountants to a firm here in Minnesota. That both ensured that we are in compliance with Minnesota regulations and significantly reduced our expenses. The one item that appears to be well above budget was the auditing fee. This is paid every three years, with a third of the cost budgeted each year. This was the year that the bill came in.

Dues have been affected by two changes: the decrease in the AMS interest level from 1 to 0.5 and the addition of the National Museum of Mathematics. The coronavirus has affected the budgets of the member societies in very different ways. Some have seen almost no impact on membership or revenues, others have seen these very significantly affected. It was the decision of the Executive Committee to use some of the budget surplus from FY2020 to provide dues relief for those societies that requested it. We were able to meet the requests of all of the societies that asked for this relief, in the amount of \$7,424. This will, accordingly affect our FY2021 income from dues. But FY2021 also looks to be a year in which our expenses come in well below budget since travel is still restricted and at least one of the Council meetings will again be virtual.

CBMS 2020 Survey. Since 1965, CBMS has surveyed undergraduate departments in the mathematical sciences every five years to gather data on faculty, course enrollments, and other aspects of the undergraduate program, gaining a snapshot of the undergraduate that has been very useful for following trends. By late June, the 2020 survey was ready for final approval when questions were raised about whether it should be distributed this year given the increasing likelihood that many colleges and universities would be operating remotely and with decreased enrollments. The leadership committee decided to postpone the survey until fall 2021, both because fall 2020 would be so atypical and because we were concerned that chairs, facing enormous pressures on their time, might be reluctant to fill out the full survey that had been planned.

In its place, a much shortened survey was distributed to the selected departments to gauge how the pandemic is affecting departments. The list of questions from the survey that went out is attached as Appendix F.

NSF/CBMS Summer Research Conferences. These conferences have been a major source of funding for CBMS. Salary reimbursement for overseeing the conferences contribute

\$30,000/year, with indirects bringing in an additional \$4000. In other words, they make up about a third of our budget. Six summer research conferences had been funded for this past summer. They were all postponed until next year. Soliciting applications for summer 2021 and helping organizers plan for this past summer was work that was done before we were shut down for the pandemic, so it did not affect salary reimbursement for FY2020. All six summer conferences expect to run in 2021, and there will be no new conferences funded for 2021. The new fiscal year will still involve soliciting applications for 2022 conferences as well as advertising and supporting the rescheduled 2021 conferences, so the effect on salary reimbursement should be minimal.

The greatest concern is the continued health of the AMS, SIAM, and IMS/ASA monograph series. This past summer was to have been the first time conference leaders were not paid a \$5000 bonus for producing a monograph based on the talks. Rather there was to be a \$3000 bonus for extensive online supporting materials that we hoped would provide a framework for and a start on an eventual monograph. We will now have to wait to see whether the online requirement will, in fact, lead to monographs. There is also concern whether all six of the planned conferences planned for summer 2021 will actually take place. The current grant to CBMS for the oversight of these conferences expires at the end of 2022. Since a big part of the CBMS role has been encouraging and facilitating the creation of the monographs, the changes to the structure exacerbated by the current crisis has raised concerns about the long term health of this program.

CBMS Forums on the Transition from High School to College Mathematics. The first of these forums was held in May 2019. Twenty-three state leadership teams began the process of identifying the critical issues and problems for their state around this transition, building a task force that could identify and vet solutions, and prepare for implementation. Over the 18 months from May 2019 until October 2020, the teams met remotely every three months with policy experts at the Charles A. Dana Center to share progress and problems. The intention was to hold an in-person forum in October 2020 to share the experiences of the past 18 months and to get suggestions from the Dana Center staff on how to turn proposed solutions into actual policy.

The proposed budget for the October 2020 forum was \$225,000. In March we received grants of \$50,000 from the Carnegie Corporation of New York and \$20,000 from Texas Instruments. The requested grant of \$155,000 from NSF was approved in August. At the time of the May 2020 Council meeting it was unclear whether an in-person gathering in October would be possible, and we began planning for an online Forum. By June it was clear it would not be possible. At that point, we were liable for a \$92,000 penalty for cancellation of our contract with the Hyatt Regency Reston, and I began negotiations to avoid the penalty. In July we reached an agreement that we would pay the hotel \$46,000 which would be held as a deposit against an eventual in-person gathering at the Reston Hyatt that would need to occur before the end of 2022.

While the online Forum would be considerably cheaper, it did involve a considerable investment of time from Dana Center staff, which was billed at \$20,000. Wishing to preserve the money for the eventual in-person forum, we obtained a grant of \$20,000 from COMAP to cover this expense

The online forum was held over three afternoons, October 5, 6, and 13 with over two hundred participants. Two of the original 23 states did not participate: Kansas and Minnesota. We picked up two additional states: New York and Texas. Keynote speakers were Maria Echaveste of the

Opportunity Institute, Grace Suh, VP for Education at IBM, and Sol Garfunkel of COMAP. In addition to state sharings and the gathering of information, the state teams began the process of developing plans for their actions over the next three, six, and nine months. The full agenda with links to videos of the speakers is at

<https://app.smartsheet.com/b/publish?EQBCT=a13b16e366704b559d6934f5acfe9a41>

The final report summarizing state plans and the results of the Forum is included as Appendix G.

We are still sitting on \$225,000 for an in-person forum (\$46,000 of which is held by the hotel). Because we need to decide at least six months in advance, the earliest this next forum could be held is October 2021. Spring 2022 seems more likely.

Stepping down. I have informed the CBMS Executive Committee that I will be stepping down from the position of Director in December, 2021. That will complete five years in this position. When I began the directorship of CBMS in January, 2016, I promised to stay in the position for at least three years. I have enjoyed this position, but my wife's chronic health issues make it impossible for me to travel. It is time to turn the position over to someone who can be a more active advocate for CBMS. The Executive Committee has begun the process of forming a search committee to select my successor. I will continue to work with CBMS as needed, in particular I will help with the continuing work on the transition from high school to college mathematics.

Appendix F

CBMS Survey on Impact of COVID-19

This short survey asks about your department's experiences and perspectives in dealing with the COVID-19 pandemic. These data will be made available to mathematics and statistics departments to help them in their planning for their future.

This survey is being conducted under the aegis of the Conference Board of the Mathematical Sciences (CBMS), which has conducted a survey of mathematics and statistics departments at two- and four-year colleges every five years since 1965. The quinquennial survey had been planned for fall 2020, but is being postponed to 2021 because statistics for 2020 may be atypical. Findings from this survey will be used to help update the regular repeating survey. The survey is funded by the National Science Foundation.

Your prompt response will help to assure that we are able to publish results that are timely and useful to the mathematical and statistical communities.

1. **Based on your current plans for the fall 2020 term, what proportion of your department's mathematical sciences sections are taught in the following formats?** A section is any class that is listed independently on the course schedule. For example, Calculus 1 might be taught in multiple sections in the same term. Do not classify recitation sessions as sections.

	Almost all	More than half	Less than half	Almost none
a. Sections are taught only online, and only asynchronously.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Sections are taught only online, with an opportunity to meet synchronously online.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Sections are taught only face-to-face (physically in person).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Sections use a mixture of online and face-to-face sessions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. **What actions have occurred in your department in response to the COVID-19 pandemic?**

	Yes	No
a. Fall term is subdivided into two or more blocks of fewer weeks.	<input type="checkbox"/>	<input type="checkbox"/>
b. Fall term was shortened to span fewer weeks.	<input type="checkbox"/>	<input type="checkbox"/>
c. Some class sizes have been reduced.	<input type="checkbox"/>	<input type="checkbox"/>
d. Some class sizes have been increased.	<input type="checkbox"/>	<input type="checkbox"/>
e. Some classes were cancelled from the Fall 2020 offerings.	<input type="checkbox"/>	<input type="checkbox"/>
f. Additional full-time faculty were hired to meet the needs of additional sections of classes.	<input type="checkbox"/>	<input type="checkbox"/>
g. Additional part-time faculty were hired to meet the needs of additional sections of classes.	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No
h. The number of full-time faculty was reduced.	<input type="checkbox"/>	<input type="checkbox"/>
i. The number of part-time faculty was reduced.	<input type="checkbox"/>	<input type="checkbox"/>
j. Full-time faculty were asked to teach more classes.	<input type="checkbox"/>	<input type="checkbox"/>

3. During the summer and/or fall in 2020, what proportion of instructional staff in your department received training in the following?

	Almost all	More than half	Less than half	Almost none
a. Online teaching effectiveness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Face-to-face teaching with social distancing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Please state how strongly you personally agree or disagree with the following statements about your department's experiences and plans relating to the COVID-19 pandemic in fall 2020.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
a. Students' learning outcomes from a face-to-face course experience are better than those from an online experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Students have a choice of which mode of instruction they receive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Students taking courses online have the equipment and internet connections required for taking courses online.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Instructional staff teaching online have access to adequate equipment and technology for teaching online.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Instructional staff prefer to teach face-to-face classes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Instructional staff have a choice of which mode of teaching they provide.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. During the terms listed below, what proportion of your department's instructional staff were/are adequately prepared to teach online?

	Almost all	More than half	Less than half	Almost none
a. In winter/spring 2020 (before pandemic-caused pivoting).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. In fall 2020.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. How has the COVID-19 experience influenced your department's plans for the future(after fall 2020)? Only report on changes that your department is considering because of your COVID-19 experience. Do not consider changes that you would have made anyway.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Not applicable
a. We are considering offering a greater number of distance learning mathematical sciences classes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. We are considering offering a broader range of distance learning formats in mathematical sciences classes (e.g., more types of mathematics courses).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Additional faculty are showing interest in participating in distance learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. What are the total Fall enrollments in mathematics and statistics courses in your department for 2019 and 2020? If your Fall term has been split into shorter blocks, combine enrollments for all of the blocks in the term.

Fall 2019 mathematics enrollment _____
 Fall 2020 mathematics enrollment _____

8. What stands out to you as the greatest difficulty your department has faced with relation to the COVID-19 pandemic? List only one.

9. What is the greatest benefit, if any, that you see as arising because of the COVID-19 pandemic? List only one.

Appendix G

CBMS Mathematics Alignment Initiative Summary

A collaboration of the Conference Board of Mathematical Sciences and the Charles A. Dana Center

Background

The Conference Board of Mathematical Sciences and the Charles A. Dana Center at the University of Texas at Austin have collaborated for almost ten years to improve students' experiences and success in mathematics in postsecondary education through the multiple mathematics pathways movement. In 2018, the growing need to bridge the work of higher education and K–12 mathematics inspired the CBMS Mathematics Alignment Initiative. The goal of the Initiative was to support states in developing plans and recommendations for improving mathematics alignment from secondary to postsecondary education in their state. Too many barriers, many of them arbitrary, make it difficult for students to make this mathematics transition which should be clear and seamless.

Improving the transition and alignment requires changes to state and institutional policies and practices like graduation, placement, and admissions, as well as an examination of course content, sequences, and advising in K–12 districts. CBMS and the Dana Center invited teams of K–12 and higher education state leaders, as well as faculty and administrative leaders from both sectors, to identify their challenges, solutions, and ultimately make recommendations to improve mathematics transition and alignment in their states.

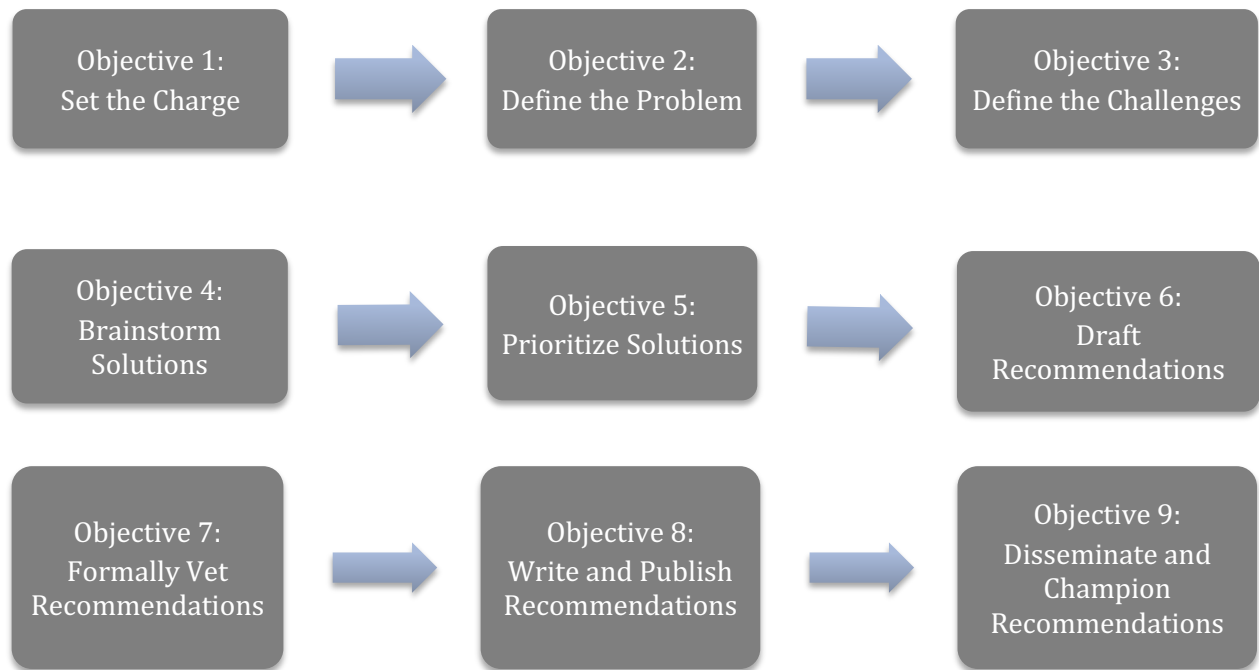
CBMS and the Dana Center reviewed the applications of twenty-nine states and ultimately chose twenty-three to participate based on the presence of the enabling conditions for successful participation.

Alabama	Indiana	Minnesota	Tennessee
Arizona	Iowa	Missouri	Utah
Arkansas	Kansas	Nebraska	Virginia
California	Maine	Ohio	Washington
Georgia	Maryland	Oklahoma	Wisconsin
Idaho	Massachusetts	Oregon	

States participated in Forums in May 2019 and October 2020 with quarterly virtual work sessions in cohorts of states in between.



The Dana Center guided states through a taskforce process with the following nine objectives.



Culminating Forum, October 2020, Action Plans, Recommendations

CBMS and the Dana Center hosted a three-day virtual forum on October 5, 6, and 13, which marked the formal end to this phase of the project. Over 200 participants registered with around 135 participants attending whole-group and breakout sessions. Participation was consistent over the three days of the forum. Participants represented 21 states with representatives from K–12 and higher education state agency and system leaders, math faculty, district leaders, and higher education institution leaders. The Forum programming was a mix of keynote speakers, key learnings sessions to highlight and share the work of states, and a variety of facilitated breakouts by role, state cohort, and implementation topic. A description of the speakers and forum objectives follow. The Forum dashboard with the agenda and session recordings as well as other information can be accessed at bit.ly/CBMSForum2020.

Forum Objectives:

- State teams will reflect on the work of their task force and that of other states over the past year to gain new knowledge and insight about the work.
- State teams will build on their previous work and will draft an action plan for secondary-to-postsecondary mathematics alignment work for the next 3, 6, and 9 months, with a focus on expanding opportunities for historically marginalized groups of students.

Keynote Speakers:

- **Maria Echaveste**, President and CEO, The Opportunity Institute
- **Grace Suh**, Vice President for Education, IBM
- **Uri Treisman**, Professor of Mathematics, Professor of Public Affairs, The University of Texas at Austin; Executive Director, Charles A. Dana Center

- **Sol Garfunkel**, Executive Director, Consortium for Mathematics and Its Applications (COMAP)

Topical Breakout Sessions:

- Implementing Mathematics Pathways in Rural Communities
 - **Bob Klein**, Professor and 2019–2020 American Council on Education Fellow, Ohio University, Athens, Ohio, Author of Why Rural Matters annual report
- Avoiding Tracking in Mathematics Pathways
 - **Paul Gray**, President Elect, NCSM; Chief Curriculum Officer, Cosenza & Associates
 - **Shelly Jones**, Positions Papers Editor, NCSM; Associate Professor of Mathematics, Central Connecticut State University
 - **Connie Schrock**, Past President, NCSM; Professor of Mathematics and Economics, Emporia State University
- Building Teacher Capacity and Support in Mathematics Statewide
 - **Nicole Bono**, Deputy, Office of Talent, Louisiana Department of Education
- Engaging Students with Mathematics for Life
 - **Doug Sovde**, Former Director, K–12 Strategy, Policy, and Services, Charles A. Dana Center at The University of Texas at Austin
 - **Josh Recio**, Course Program Specialist, Secondary Mathematics, Charles A. Dana Center at The University of Texas at Austin

Based on forum feedback, 86.4 percent of those completing the survey agreed or strongly agreed that “the forum offered guidance to advance the work of mathematics alignment in my state or organization.” Participants noted how much they appreciated the time with leaders in their same roles and wanted opportunities for on-going collaboration with this group of states and leaders, their interest in taking the work to scale, and wanting further national support to communicate about the modernization of mathematics with local stakeholders.

Two states, Kansas and Minnesota, had to withdraw from the initiative. A key staff member in Kansas left their role in the middle of the project and though many parties were interested in continuing, there was not an entity that had capacity to lead the work. Minnesota formally withdrew from the project because they felt that higher education institutions in the state needed further progress on mathematics pathways implementation before starting work to align with K–12.

States’ Priorities in Action Plans and Recommendations

Participating state teams have written recommendations, created action plans for work over the next nine months, and/or begun implementation of new policies and practices to improve mathematics alignment in their state. States’ documents for private review, not for distribution, can be found [at this link](#). In the chart below, you can see where states are choosing to focus their work of mathematics alignment at this time. The chart is based on documents that the states submitted for this project and their current areas of focus, though may not indicate the full breadth of their work. Some states are in the beginning stages of the work, and thus have not attended to the many facets of this work yet.

State	State Leadership and/or Taskforce in Place and Plan to Move Forward	Institutionalize Math Alignment Work	Teacher Recruitment and/or Support	Course Sequence/Math Pathways Definition, Alignment	Standards, Course Creation	Advising	College Readiness and Placement	Specific Equity Priorities or Actions	Policy (e.g Assessment, Accountability, Corequisite, Graduation Requirements)	Evaluation, Targets for Continuous Improvement	Communications
Alabama	x	x	x	x		x	x				x
Arizona	x	x	x	x			x				
Arkansas	x			x	x	x	x	x			x
California	x		x	x					x		
Georgia	x	x	x	x	x				x		x
Idaho	x										
Indiana	x	x	x	x	x					x	
Iowa	x	x	x	x			x	x		x	x
Maine	x	x	x	x	x		x		x		x
Maryland	x			x					x	x	x
Mass	x		x	x		x		x	x		
Missouri	x			x		x		x		x	x
Nebraska	x				x						
Ohio	x		x	x	x	x				x	x
Oklahoma	x		x	x	x	x	x				x
Oregon	x	x		x	x		x	x		x	x
Tennessee	x			x	x	x	x	x	x	x	x
Utah	x			x		x	x		x		x
Virginia	x			x	x	x			x		
Washington	x	x	x	x	x		x	x	x		
Wisconsin	x	x	x	x	x			x			x

Examples of Recommendations

Below are samples of recommendations from participating states.

APPROACH	STATE EXAMPLES
Institutionalize Mathematics Alignment Work	<p>Alabama Create a statewide organization to extend the work of Strategic Task Force to Accelerate Mathematics Pathways (STAMP). Membership will include members of the STAMP leadership team, the task force, and ex officio members from various stakeholder groups such as ACTM, AlaMATYC, AMTEA, AACTM, and NCSM affiliate.</p> <p>Oregon Establish a state level coordinating group that coordinates projects and resources at the K-16 levels. A non-profit umbrella organization would support change management practices to create system level reforms.</p> <ul style="list-style-type: none"> • Establish collaborative math networks of educational leaders to support the development and advocacy of systemic change within the K–12 and postsecondary levels. • State-level coordinating group to identify and organize efforts over time (see engagement over time below) • Support PK–12 Math Leadership Network • Support Post-Secondary Math Leadership Network. • Identify funding sources to support coordinated effort of the math non-profit including dedicated FTE support for communication, project management, and administrative needs of the math organization.
Teacher Support	<p>Arizona Reimagine the training of pre-service and in-service teachers that includes a focus on the active learning guiding principles:</p> <ol style="list-style-type: none"> 1. Support students’ deep engagement in mathematical reasoning; 2. Encourage peer-to-peer interaction; 3. Support instructors' interest in and use of student thinking; and 4. Develop instructors' attention to equitable and inclusive practices. <ul style="list-style-type: none"> • Implement a state-wide effort towards coherent, intensive, long-term professional development program be implemented with acritical mass of site-based teacher teams participating together. • Encourage school and district administrators to participate in all or part of the professional development in an effort to reframe their perspective and insights on the teaching and learning of mathematics for teacher evaluation and other purposes.
Standards, Course Creation	<p>Georgia Revise Algebra II standards to better prepare students for the range of mathematics pathways in addition to the Path to Calculus. Revised standards are under review by the Georgia State Board of Education.</p> <p>Ohio</p>

	Develop two new Algebra 2 Equivalent courses: Data Science Foundations & Computer Science/Discrete Math with plans for pilot, evaluation of pilot, and creation of implementation toolkits for administrators, teachers, counselors, parents, etc.
Advising	<p>Arkansas</p> <p>Develop mathematics pathways advising guides for high school counselors and teachers involved in student success plans. Arkansas Department of Elementary and Secondary Education has developed draft pathway guidance that will evolve into advising guides with a format similar to degree plans used in post-secondary.</p>
<p>College Readiness and Placement,</p> <p>Course Sequences / Math Pathways Definition</p>	<p>Massachusetts</p> <p>Streamline course options, instructional resources, and secondary to postsecondary transition practices that build a coherent mathematics pathway for all:</p> <ul style="list-style-type: none"> • Audit postsecondary admissions practices for consistency and transparency as they relate to K–12 mathematics pathways, • Audit postsecondary mathematics written and enacted curriculum for alignment, rigor, and relevance within and across institutions, • Incorporate student and family decision making in secondary mathematics course selection based on future interests as they connect to pathways and to business and industry opportunities (i.e. externships), • Streamline secondary mathematics courses across all levels to include more articulated model course pathway options, • Eliminate middle grades (6-8) tracking, and minimize leveling within secondary mathematics courses, and • Identify tools to signal high quality, pathways-aligned course curricular materials to follow Algebra II or Math 3 and continued mathematics learning. <p>Tennessee</p> <ul style="list-style-type: none"> • Make statistical concepts should be more prominent in the required high school mathematics course sequence. • Establish a single sequence of courses: High School Math 1, 2, and 3 for all students. • Reduce the number of state-level summative assessments in high school mathematics from three to two. Assess students on a state-level summative instrument for High School Mathematics 1 and 2 and eliminate the assessment attached to the third course in the sequence. The ACT exam will serve as a comprehensive assessment inclusive of content in the third course. • Reduce the number of course options offered the senior year. • Develop recommendations that address structural inequities - recruiting, advising, transitioning, completing - in mathematics pathways, especially at the postsecondary level as they pertain to underrepresented populations.