

The National Council of Teachers of Mathematics

- Situation** The National Council of Teachers of Mathematics (NCTM), based in Reston, VA, is the world's largest mathematics education organization. It provides resources, guidance, and advocacy for its membership which comprises math educators, math tutors, staff development professionals, school and district administrators, and others.
- NCTM needed a firm with the expertise and capacity to assume most of the design and production responsibilities previously handled by its in-house creative services department. One of its most immediate needs was finding a creative partner to develop a new annual meeting brand identity that better conveyed the spirit and energy of the event and organization.
- Solution** A key challenge of the assignment was designing a conference brand that not only conveyed a more dynamic presence but also easily accommodated updates for ensuing years and meeting locations. Examples of our work can be seen on the following pages.
- As part of the new meeting brand identity, we developed a style guide as well as save-the-date materials that included postcards, print ads, and a suite of online graphics. We are continuing to create conference support and communications materials through next year that include emails, digital ads, website updates, various templates, signage, and more.
- In addition to the conference work, TDC has created an extensive range of branding and marketing communications assets for NCTM's internal and external clients and stakeholders. These include:
- Updated website graphics
 - Digital banner graphics
 - Social media materials
 - Print ads
 - Email templates and PPT graphics
 - Annual reports, workbooks, and collateral materials
 - Classroom support materials and more
- Results** NCTM has been extremely pleased with our delivered work and support to date. The organization has extended its relationship with TDC beyond the original contract time period and continues to expand the scope of projects it entrusts to us.

- identities
- annual meeting graphic
- brand standards

2023
ANNUAL MEETING & EXPOSITION
 Oct. 25-28, Washington, DC

2024
ANNUAL MEETING & EXPOSITION
 Sept. 25-28, Chicago

2025
ANNUAL MEETING & EXPOSITION
 Oct. 15-18, Atlanta



Meeting Logos 2

The two Annual Meetings have primary logos and variations based on back grounds. The variations were designed to accommodate a wide variety of situations. The chart highlights their differences and suggested application. All logos are provided in 4-color, 1-color, and reversed options.

Washington, DC 2023	Chicago 2024	Atlanta 2025

Design Elements 6

The Annual Meeting for 2023 is based on action, excitement, and fun. Each year is defined by a uniquely-themed graphic and colorway. The graphic style and shared blue hues provide continuity through the years while keeping each meeting fresh.

There are abstract backgrounds that are also linked to specific years but may be used together for those projects that have a 3-year life cycle.

We have provided a library of elements for the Annual Meetings to be used together or individually. The graphic may be dissected and used as separate design elements.

Washington, DC 2023	Chicago 2024

Color Palette 5

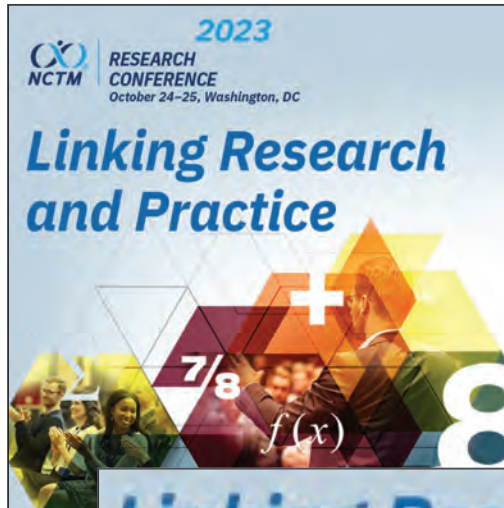
The Annual Meeting color palette is separated into two distinctive sets, the Primary colors and Accent colors. All type should be set using the primary color palette. The accent colors are pulled from the conference imagery and should be used sparingly outside of the image cluster.

Primary Annual Meeting Primary Colors		
CMYK: 85,15,0,0 RGB: 27,118,208 Hex: 1B7DD9	CMYK: 70,15,0,0 RGB: 238,4,238 Hex: D604E6	CMYK: 100,65,65,55 RGB: 65,104,104 Hex: 007766

2023 Annual Meeting Accent Colors		
CMYK: 100,0,0,0 RGB: 255,0,0 Hex: FF0000	CMYK: 100,100,0,0 RGB: 255,255,0 Hex: FFCC00	CMYK: 100,0,0,0 RGB: 255,255,255 Hex: FFFF00

- postcard
- print ad
- buckslip

* Valid with full nonmember registration.
 SAVE THE DATE | OCT. 25-28, 2023 | nctm.org/annualmeeting



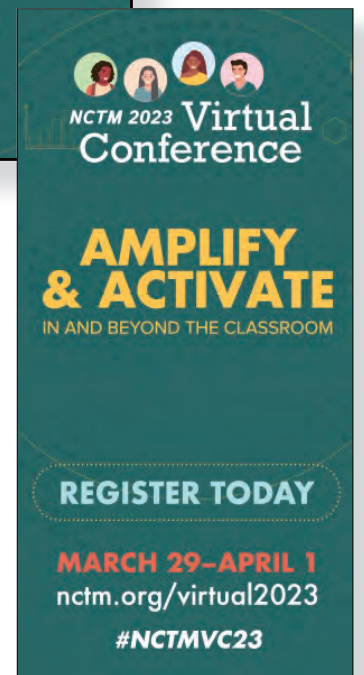
regional conference

- powerpoint slide
- print ad
- online graphics



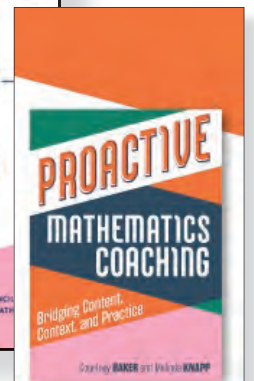
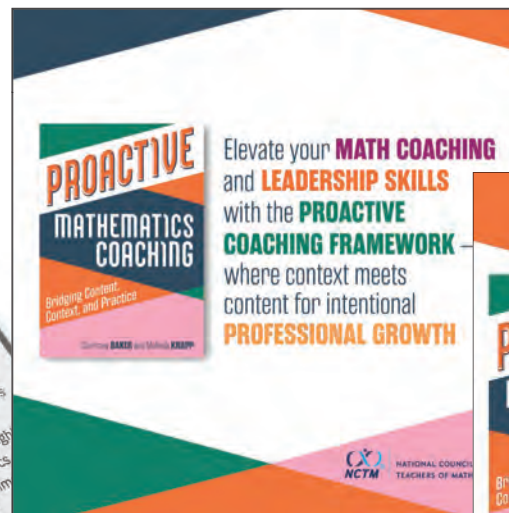
virtual conferenece

- cocktail postcard
- print ad
- online graphics



proactive coaching book

- powerpoint slide
- print ad
- online graphics



- annual report
- print ad



Grants and Scholarships for NCTM Members



The Mathematics Education Trust (MET) provides funds to support prospective teachers, classroom teachers at all levels, and NCTM's Affiliates in the areas of improving classroom practices and increasing teachers' mathematical knowledge.

Grants include funds for supporting coursework scholarships for prospective teachers, professional development for in-service teachers and teacher leaders, higher education research, classroom research from PK-12, early career researchers, and the design of innovative mathematics activities.

Summer cycle applications are accepted from February 1st to May 1st.
Winter cycle applications are accepted from August 1st to November 1st.

Learn more and apply for a MET Grant at nctm.org/Grants/
 Donate and support a MET Grant at nctm.org/donate

nctm.org/MET

Apply for a Grant Here!



- end-of-year postcard
- speaker print ad
- event signage

Have money to spend before the end of the year? **NCTM has the resources for your teachers!**
WORKSHOPS • BOOKS • CONFERENCES • RESOURCES

Receive discounts on membership for groups of 10+
 Give your entire team access to practical classroom tools, key research, and the latest resources from the preeminent home for mathematics educators through NCTM memberships.

Membership benefits include:

- Searchable database of 700+ math lessons and classroom resources for students PreK-12—updated monthly!
- Access to MyNCTM, the online community dedicated solely to the math profession
- Subscriptions to peer-reviewed journals
- Exclusive discounts—up to 30%—on NCTM books and events
- Access to live and on-demand webinars

Send your teachers to the NCTM Annual Meeting & Exposition
 Thousands of mathematics education professionals will be at the NCTM 2023 Annual Meeting & Exposition—October 25-28 in Washington, DC—to build a strong foundation for the upcoming school year and beyond.

As attendees, your teachers will discover opportunities, techniques, and content ideas that are working in classrooms around the country.

Save an extra 15% for groups of 10+

Visit nctm.org/Solutions or call 800.235.7566 to learn more and make the purchase that is right for your teachers!

NCTM IS THE SOLUTION FOR YOUR TEACHERS
Whether you are a principal, superintendent, district or school leader—NCTM offers your teachers evidence-based solutions.

TEACHING STRATEGIES • ENGAGING STUDENTS • SUPPORTING TEACHERS • PRODUCTIVE STRUGGLE

The National Council of Teachers of Mathematics (NCTM) has supported Pre-K through High school teachers of math for more than 100 years. NCTM's mathematics teaching practices, expectations for learning, and PK-12 guidance are the world standard for the teaching and learning of mathematics. Let NCTM work with you to build customized packages and learning solutions that best serve your school or district.

Visit nctm.org/Solutions or call 800.235.7566 to learn more and make the purchase that is right for your teachers!

Receive discounts up to 30%!

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Stay Connected
#NCTMLA22

SOCIAL MEDIA CONTEST



Snap a selfie with our

...ome for a chance
 ...ize!
 ...on Twitter
 ...or Instagram
 ...math) and use
 ...tag #NCTMLA22
 ...he contest!

NATIONAL COUNCIL OF
 TEACHERS OF MATHEMATICS

**Get Inspired. Implement New Techniques.
 Watch Your Students Excel.**

Scan the QR code or visit nctm.org/DC2023 to register.

2023 ANNUAL MEETING & EXPOSITION
 Oct. 25-28, Washington, DC

#NCTMDC23

Don't miss the opportunity to connect with thousands of your peers at the NCTM 2023 Annual Meeting & Exposition, October 25-28 in Washington, DC.

As an attendee, you'll have access to more than 500 sessions across key topics, led by some of the most engaging voices in the profession. Let them inspire you and help you build your path to practice the ideas and techniques you learn during their sessions in your classroom.

Group rates available.

Upcoming Events

ANNUAL MEETING

Washington, DC
 Oct. 25-28
2023

Chicago, IL
 Sept. 25-28
2024

REGIONAL CONFERENCES & EXPOSITIONS

Baltimore, MD
 Nov. 30-Dec. 2
2022

2024 Seattle, WA
 Feb. 7-9

VIRTUAL CONFERENCE

Baltimore, MD
 Mar. 29-Apr. 1
2023

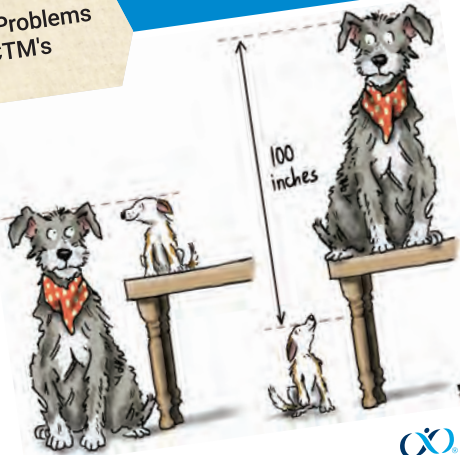
NCTM NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

STUDENT BOOK

One Hundred Problems Involving the Number

100

A Collection of Problems to Celebrate NCTM's First Century



NCTM NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

G. PATRICK VENNEBUSH

Celsius and Fahrenheit

The following problem is modified from the Temperature problem appearing on the NRICH website:

Temperatures are often measured in degrees Celsius, °C, or degrees Fahrenheit, °F. These two temperature scales are related.

- The freezing point of water is 0°C and 32°F.
- The boiling point of water is 100°C and 212°F.

At what temperature are the Celsius and Fahrenheit scales equal?

One possibility is to make a table showing corresponding temperatures in each scale. The table below started with two known equalities, 0°C = 32°F and 100°C = 212°F, which are shown in italics.

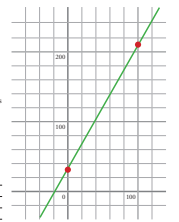
Temperature °C	0	50	100
Temperature °F	32	122	212

From there, other corresponding temperatures could be added. Assuming that both scales are linear, which seems like a reasonable assumption, then halfway from 100 to 0 is 50°C and halfway from 212 to 32 is 122°F. That reflected in the second column. But then, if 50 = 0 + 50, then 1/5 of the way from 0 to 50 would be 10°C. Likewise, 122 = 32 + 90, and 1/5 of 90 is 18, so 32 + 18 = 50°F would correspond to 10°C. That's reflected in the third column.

For all positive temperatures in the table, the Celsius is hotter temperature. That is, if y is below 0°C, for the equal temperature in the table were continued by 8 from Fahrenheit in each row to -40°F.

Find an equation to solve and $100^\circ\text{C} = 212^\circ\text{F}$, the 212 could be plotted on a graph of the temperature

in degrees Celsius and the vertical axis represents the temperature in degrees Fahrenheit.



A straight line connecting these points would have a slope of $(212 - 32)/(100 - 0) = 180/100 = 9/5$. Since the y-intercept occurs at 0, 32, the equation showing the correspondence between temperatures is $y = 9/5x + 32$, where y is the Fahrenheit temperature and x is the Celsius temperature. The temperature in both scales will be the same when $x = y$, or when $x = 9/5x + 32$. This happens when $-4/5x = 32$, or when $x = -40$.

Of course, if you already know the relationship between the Celsius and Fahrenheit scales, then the equation $y = 9/5x + 32$ may look familiar. In many reference books, the relationship is written as $F = 9/5C + 32$. If you are familiar with the equation, you can use a formula to solve the problem. The work is the same as above; simply replace F with C , then solve to find $C = -40$.

The temperature in degrees Celsius that equals the temperature in degrees Fahrenheit is $-40^\circ\text{C} = -40^\circ\text{F}$.

STUDENT BOOK

PROBLEM 20
Farey Tales

A Farey sequence F_n is the set of all fractions from 0 to 1 with every possible denominator less than or equal to n . For instance—

$$F_4 = \left\{ \frac{0}{1}, \frac{1}{4}, \frac{1}{3}, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{1}{1} \right\}$$

What is the 100th term of F_{100} ?

WORK AREA

STUDENT BOOK

PROBLEM 29
The Locker Problem

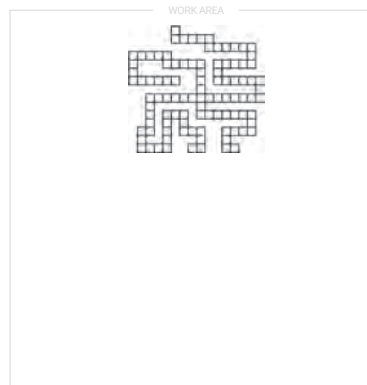
A school with 100 students has 100 lockers numbered 1 to 100. The first student goes along and opens every locker. The second student closes every even-numbered locker. The third student changes the state (that is, opens it if it's closed, or closes it if it's open) of every locker whose number is a multiple of 3. The fourth student changes the state of every locker whose number is a multiple of 4. And so on, with the n th student changing the state of every locker whose number is a multiple of n . When all 100 students have finished opening and closing lockers, how many lockers will be open? Which ones?

WORK AREA

STUDENT BOOK

PROBLEM 66
Around the Squares

This figure consists of 100 square units with adjacent squares sharing a side. What is the perimeter of the figure?



WORK AREA

Notice and Wonder[®]

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I NOTICE

- » Glass pyramids. The pyramids are all different sizes.
- » There are black lines on each face of the pyramid.
- » Each face of the pyramid is in the shape of a triangle, and each glass panel is a quadrilateral.
- » The building in the back is made of multi-colored bricks.
- » The reflection of the sky and clouds in the glass.
- » Lines and geometric shapes around the entryway of the building.
- » The glass panels form a tessellation.
- » The reflection of trees in the windows of the building.
- » The pyramids resemble the pyramids at the Louvre in Paris, France.

I WONDER

- » Why are there glass pyramids at this building?
- » How many pyramids are there?
- » Are the black lines engraved in the glass or painted on the glass?
- » Who created the glass pyramids, and what is their significance?
- » Are the pyramids hollow inside?
- » What type of quadrilaterals are the glass panels?
- » Are the pyramids all the same size? Do they have the same volume and/or surface area?
- » How tall are the pyramids?
- » Are the lines on the glass parallel?
- » Is every quadrilateral the same size? Are the quadrilaterals all parallelograms?

Notice and Wonder[®]

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I NOTICE

- » A reflection of the building in the water.
- » Four columns at the entrance of the building.
- » Four statues on the top of the building.
- » A triangle at the top of the structure. There are people sculpted inside of the triangle.
- » Several figures on the sides of the statue.
- » The words "Equal Justice Under Law" engraved at the top of the building.
- » Rectangular columns at the top of each column.
- » Columns have grooves. They do not have smooth faces.
- » Building is constructed of white marble.

I WONDER

- » Who does the statue represent and are they a historical figure? Why are they seated in a circle?
- » Why there are so many rows of columns?
- » How many columns are on the entire building? How tall are the columns?

Notice and Wonder[®]

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I NOTICE

- » A subway for metro train.
- » There are circular lights on the front of the train and alongside the train tracks.
- » The tiles on the floor have six sides, so they must be hexagons.
- » There are people at the train station.

I WONDER

- » Is the tunnel a cylinder? Why did they build a circular tunnel and not a rectangular tunnel?
- » How did they build the metro station?
- » Is the tunnel underground? How far underground is it?
- » How many lights are along the track? Are they evenly spaced?

Notice and Wonder[®]

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I NOTICE

- » About halfway up the monument, the stones change color.
- » The monument is very tall.
- » There are American flags around the base of the monument. The flags form a circle.
- » There are people standing at the base of the monument. They look very small compared to the monument and the flags.
- » A building with a red-tiled roof behind the monument. The monument is much taller than the building.
- » The sky is blue, and the grass is green. There are a few clouds in the sky.

I WONDER

- » What is the significance of the monument? When was it built?
- » Why was it built?
- » Who built the monument? How long did it take?
- » Why were there so many colors of stones used?
- » How many American flags are at the base of the monument? What do the flags represent?
- » How tall is the monument? How tall are the flags?
- » Can visitors go to the top?
- » Are there windows at the top for visitors to see out?
- » How many steps does it take to get to the top? How long would it take you to climb the stairs?
- » How many people visit the monument each day?
- » Is it the tallest monument in the country? In the world?