

NOTICIAS de TODOS

TODOS: Mathematics for ALL Newsletter

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Questions from Mathematics Teachers about English Language Learners

By Luciana C. de Oliveira
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Mathematics teachers often have many questions about teaching English language learners (ELLs). The National Clearinghouse for English Language Acquisition (2006) reports that 10% of the K-12 student population is comprised of ELLs, which represents over 5 million students in the U.S. The ELL population is burgeoning in most states of the country. Thus, even if you do not have ELLs in your mathematics classrooms now, very likely you will in the near future.

Based on my 20-years experience as an English as a Second Language (ESL) teacher and teacher educator, I have compiled a list of common questions mathematics teachers ask me during professional development sessions. The questions reflect the concerns practicing mathematics teachers have about working with ELLs. I hope by providing some answers to these questions I can help other teachers in their work. These are not the only questions mathematics teachers often ask me in professional development workshops, but they are definitely important ones to consider-at any state of a teacher's career.

Why can my ELLs speak English so well in social settings, and yet they still have so much difficulty with mathematical academic tasks at school?

While ELLs may develop their "everyday" language for social purposes rather quickly, it takes a lot longer for them to develop *academic language*-or the *language of schooling* (Schleppegrell, 2004). Students learn academic language at school and this language is different from ordinary language for communicative purposes. The work

of Jim Cummins (2008) established that it takes between six months to two years for ELLs to develop this *everyday language* for communicative purposes and between five to seven years to develop academic language.

Should I require my ELLs to speak only English in the mathematics classroom? Is it definitely important for ELLs to develop their literary skills in English. However, much research has established the importance of home languages and cultures for development of English in the context of mathematics classrooms (Moschkovich, 2009).

The teachers should consider home languages and cultures as a resource more than a limitation in teaching and learning (de Oliveira, 2012). For example, ELLs who speak the same language could problem solve together to express their ideas with ease. Then, they would try to communicate their conclusions in English. ELLs feel reassured when the teachers value their languages and cultures in the classroom.

Why are my Level 5 ELLs still struggling with their language in school? Even though ELLs may be considered at an advance level of language proficient

De Olivera, cont. p. 2

TODOS Mission Statement

The mission of *TODOS: Mathematics for ALL* is to advocate for equity and high quality mathematics education for all students—in particular, Latina/o students.

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(level 5 in a 1-5 scale), they continue to have language needs. Unfortunately, most ELL or bilingual services stop when ELLs reach level 5, but this does not mean that ELLs stop having language needs in schools. These students still need support and assistance from teachers and require scaffolding of instruction.

I really do not have a lot of time for planning; what can I do as a mathematics teacher to support my ELLs?

Collaborating and sharing planning time with the ESL teachers is very beneficial. A must-do for all mathematics teachers of ELLs is to use the ESL *multimodal strategies* or different ways that information can be presented and communicated in class. Some examples include using **oral language, written language, visual materials** (pictures, flash cards, graphs, objects, manipulatives), **auditory materials** (video, music, songs), **direct experience** (field trips, walks around school), and **nonverbal communication** (body movements and expressions). ELLs need to engage with content in multiple ways, so using multimodal strategies can really help them access the grade-level curriculum.

If I focus on the vocabulary words that are important in mathematics, would I be addressing my ELLs' mathematical academic language needs? Vocabulary is a significant component of academic language, but the challenges go beyond learning vocabulary. Academic language also consists of grammatical patterns through which meanings are made. Knowing a word does not mean knowing how to use it effectively in appropriate contexts (de Oliveira, 2012). In addition, ELLs may not know the everyday language used in word problems, as they may describe contexts unfamiliar to these students. Thus, teachers should be aware of the need to use contexts that correspond to the cultural experiences of all their students.

References

Oliveira, L. C. (2012). The language demands of word problems for English language learners. In S. Celedón-Pattichis & N. Ramirez (Eds.), *Beyond good teaching: Advancing mathematics education for ELLs* (pp. 195-205). Reston, VA: National Council of Teachers of Mathematics.

Moschkovich, J. N. (2009). Using two languages when learning mathematics: How can research help us understand mathematics learners who use two languages? Research Brief and Clip, National Council of Teachers of Mathematics.

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News From the President

by Susie W. Håkansson



Happy New Year to all of you! The 2014-2015 TODOS Board has been working hard to support the new and ongoing goals for the year. In the last issue of Noticias, I mentioned a focus on recruitment of new members and retention of current members. Some of you sent in some ideas on services that would be useful for members, and we welcomed all of them. During the three 2014 NCTM Regional Conferences (Indianapolis, Richmond, and Houston), TODOS, along with Benjamin Banneker Association and Women in Mathematics Education, co-sponsored an NCTM Equity Affiliates Booth, with each of the groups taking the lead at one of the conferences. We hope that this effort gave greater visibility to all of the equity affiliates.

TODOS offers a variety of professional development (PD) opportunities for its members and all mathematics educators. TODOS members have been keynote speakers, featured speakers, and general session speakers in many local, regional, and national mathematics education conferences. At some of these conferences, a dedicated TODOS strand has been part of the program, where TODOS selects members who apply to give presentations specifically on the mission and goals of TODOS. Attendees gain expertise on how to focus on excellence and equity in the classroom. TODOS also offers TODOS Live! webinars throughout the year for its members, with many of the webinars archived for members to access afterwards. A Professional Development Task Force has been created to expand upon and introduce new professional development opportunities that will provide updated information and additional materials and resources to its members. One professional development opportunity will be the planning for the second TODOS Conference scheduled for June 23-25, 2016. All these efforts support the following TODOS goal statement:

To advance educators' knowledge and ability that lead to implementing an equitable, rigorous, and coherent mathematics program that incorporates the role language and culture play in teaching and learning mathematics.

The *Working with Latina/o Students Task Force* formed in Spring 2014 plans to have a draft of their efforts at the TODOS Members Meeting during the 2015 NCSM Boston Conference. They hope to include strategies to support the mathematics learning of Latina/o students, particularly bilingual students, English learners, and recent immigrants.

Although some states did not adopt either the Common Core State Standards in Mathematics and English Language Arts or the Next Generation of Science Standards (NGSS), it's important to note that in all three disciplines, Mathematics, Science, and ELA, there are relationships and convergences regarding the practices of each.¹ Where all three converge are the following:

EPI (ELA). Support analysis of a range of grade-level complex texts with evidence.

MP3 (Mathematics) and EP3. Construct viable and valid arguments from evidence and critique reasoning of others.

SP7 (Science and Engineering). Engage in argument from evidence.

(**EP** represents the CCSS-ELA “practices” as defined by the ELPD Framework; **MP** represents the CCSS Mathematical Practices; **SP** represents the NGSS Science and Engineering Practices)

The goal is for students to justify the statements they make with evidence instead of just grabbing at an answer.

One of the most important things that we as educators need to focus on is excellence and equity. The international community uses the term “quality and equity.” In either case, we are talking about high cognitive demand mathematics for ALL students. One cannot focus only on excellence without providing access to ALL students. Similarly, one cannot focus only on equity without providing high cognitive demand mathematics that students need to acquire. This requires educators to gain expertise in teaching rigorous mathematics content **AND** in providing access to all students. Excellence and equity is what TODOS is about! In a recent Marshall Memo from NCSM, an overview of an article indicated social-class differences in students asking for help in class.² Some students come from a culture where asking the teacher for help is considered disrespectful.

Teachers need to find ways to access the mathematical understanding of all of their students, whether or not they request help. Similarly, teachers need to scaffold learning and not “water down” the mathematics content. All must focus both on excellence and equity.

TODOS continues to be visible and active in the broader mathematics education community. As part of reciprocity agreements with several mathematics educator organizations, I as President representing TODOS have spoken at two conferences last fall focusing on excellence and equity:

School Science and Mathematics Association and American Mathematics Association of Two-Year Colleges. TODOS will be very visible at NCSM and NCTM in Boston. I hope to see you at the TODOS Members meeting on Wednesday 4/15 during NCSM, the TODOS Salsa Party on Thursday 4/16 at NCTM, at one of the TODOS Strand Sessions at NCTM, and/or at the TODOS booth at NCSM and NCTM. Look for information about Boston in the E-news!

References

1. Cheuk, T. (2013). Relationships and convergences among the mathematics, science, and ELA practices. Refined version of diagram created by the Understanding Language Initiative for ELP Standards. Palo Alto, CA: Stanford University.

http://ell.stanford.edu/sites/default/files/VennDiagram_practices_v11%208-30-13%20color.pdf

- [2] Calarco, J. (2014-2015). Help-seekers and silent strugglers: student problem-solving in elementary classrooms. In American Educator, Winter 2014-15 (Vol. 38, #4, pp. 24-27, 30-33, 44), <http://www.aft.org/ae/winter2014-2015/calarco>

Report from the Nominations and Elections Committee

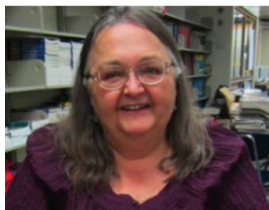
The Nominations and Elections Committee offers a sincere thanks to the outstanding candidates who agreed to run for office as well as to the members who sent in the nominations. The committee thanks members for reviewing the candidates profiles and voting.

The Committee is pleased to report that the following individuals have been elected as officers of TODOS:

Diane Kinch: President-Elect. Diane currently serves TODOS as a Director and brings a long and distinguished history of experience and leadership on equity and mathematics world-wide and in California.

Dr. Marta Civil: Vice President. Marta has supported TODOS in many ways and currently serves as Vice President completing an unexpired term for the prior officer. She is a Professor in the Department of Mathematics at the University of Arizona and director of the Center for Mathematics Education of Latinos/as.

Dr. Julia Aguirre: Director. Julia has been an active contributor to the TODOS Research Monograph and is currently an Associate Professor of Mathematics Education at the University of Washington-Tacoma.



Diane Kinch
President-Elect



Marta Civil
Vice President



Julia Aguirre
Director

We are fortunate to have these three outstanding professionals with illustrious careers in mathematics education and strong commitments to equity as leaders. Each individual will assume office on April 15, 2015, at the conclusion of the TODOS Business Meeting in Boston, MA.

On behalf of the Nominations and Elections Committee Ed Dickey, Chair. Committee Members: Ellen Barger, Jim Barta, José Franco, and Miriam Leiva.

TODOS Student Recognition Awards

TODOS honored students and their nominating teachers during two mathematics education conferences. The awardees are students who belong to underserved populations, and have demonstrated continued success in mathematics while striving to go "above and beyond" in some areas of their interest. The students received a **Texas Instruments Calculator** and their teachers received a one year membership in TODOS and a Certificate of Recognition.

CMC-S Annual Mathematics Conference Palm Spring, CA. October 24 & 25, 2014

TODOS thanks Texas Instruments and CMC-S for hosting and supporting this event.



Awardees: (Back row, L to R): Annette Kitagawa, Gerardo V., Marco L., Romi Kim (TI rep.), and Diane Kinch. Front row: Yliana F., Janelle H., and Melissa F. Not shown, Sandra H.

Going to the 2015 NCTM Annual Meeting & Exposition April 15 – 18 in Boston ?



Attend a session from the
TODOS Strand!

Check the TODOS webpage to find out the presentations for the TODOS Strand.

And ... meet a friendly TODOS member
@the TODOS Booth

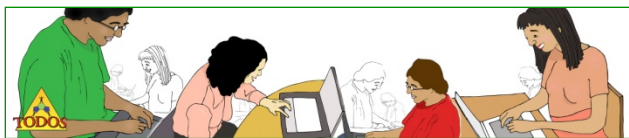
NCTM Regional Conference & Exposition- Houston - November 19-21, 2014

TODOS thanks Didax, Freeman, NCTM, NASA Houston and TI for their support for these awards.



From left to right: Gabriel C, Alexis Marie P, Adrianna T, Luis Alfredo P, Carmen V.

TODOS Live! WEBINARS



Take advantage of your membership and participate in a free **TODOS Live! Webinar**. Check the TODOS website or the eNews for upcoming webinars.

There are many TODOS Live **Archived Sessions** from **our three seasons** available after login in the TODOS website.

Want to collaborate? The TODOS Live Committee (TLC) could use some assistance in terms of technical support from interested members.

TODOS thanks ETAhand2mind for their continuing sponsorship of TODOS Live!

ON the right, teacher Jeremy Lamonte shares the excitement with one of his students awardees.



TODOS member Bill Jasper at the TODOS booth during the conference in Houston, TX.



Mendez vs. Westminster School District:

A Turning Point in the history of School Segregation in America

By Susana Davidenko
Associate Professor
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I learned about the *Mendez vs. Westminster* (M vs. W) case just a few months ago. To my surprise, most people I asked about it were not aware of the story of Gonzalo and Felicitas Mendez and how their fight led to the end of the segregation of Mexican children in California's schools. I thought that it would be an interesting piece of information to include in *Noticias* so members can pass it on to students.

The information for this article was obtained from the websites included in the Reference section below ([1], [2], [3]). Readers can consult these and many other available resources for deeper and richer information that cannot be included in this article.

Minority students who face inequitable education opportunities and Latina/o students in general will be proud to know how this case marked a turning point in the path towards school desegregation in the United States. They will see that the efforts initiated by a small group of people who fight for their rights *can and will* make a difference.

The Mendez vs. Westminster case developed during a dark period in US history. This period included the establishment of the Japanese internment camps (1942-1945) and school segregation in the Plessy vs. Ferguson era (1896-1954).

The Story

1943 –The Minemitsu, a Japanese-American family who had a prosperous farmland in Westminster CA, was ordered to relocate to a Japanese internment camp. Before moving to the camp, they decided to lease their land.

Gonzalo and Felicitas Mendez leased the Minemitsu land and moved with their three children, Sylvia, Gonzalo Jr., and Gerónimo, from Santa Ana, CA to their new location in Westminster.

Soledad, Gonzalo's sister, took her children and the Mendez' children to enroll in the neighborhood school in Westminster. Her two children, who had light skin and an European last name, were accepted. But the Mendez' children were denied enrollment at the school: they were told to attend "the Barn", a separate facility for Mexican students. After arguing about this discrimination, Gonzalo's sister took her children and Gonzalo's children home.

Gonzalo and Felicitas Mendez were appalled when they learned about this event. It was the beginning of their saga and their fight for equal education rights for all children.

After failed attempts to change the situation in the district and the county, the Mendez family along with other Mexican families hired a Jewish American civil rights attorney, David Marcus, with the support of the League of United Latin American Citizens (LULAC).

1945 –Mendez vs. Westminster was taken to federal court. It was a class action lawsuit filed on behalf of the more than 5,000 Mexican American students in Orange County (Westminster, Santa Ana, Garden Grove and El Modena, now Eastern Orange).

Notes on Marcus's strategies that made this case distinctive:
- Claimed that segregating students based on their nationality or ethnic background was unconstitutional, violating the 14th Amendment (previous cases claimed that separated schools were not equal).
- Marcus brought scientists to testify on the negative impact that segregation had on Mexican children. Anthropologists, sociologists, psychologists, and experienced educators explained how children developed a sense of inferiority that prevented them from becoming productive Americans.
- Marcus brought children who attended segregated school to testify. One of these children was 9-year old Sylvia Mendez, the oldest daughter of Gonzalo and Felicitas.

1946 –Federal district court judge Paul McCormick ruled in favor of Mendez and his co-plaintiffs finding that having segregated schools had a damaging psychological and pedagogical impact on Mexican-American children, and it was unconstitutional because it denied equal protection as laid out in the 14th amendment to the constitution.

Trial transcripts can be downloaded from <http://mendezetalvwestminster.com/court2.html>

1947 (April) –After rejecting appeals by the Orange county districts, McCormick confirmed that the segregation practices violated the Fourteenth Amendment.

1947 (June) –California Governor Earl Warren soon signed into law the repeal for the rest of the provisions that forced segregation in the California statutes. That allowed for non-segregation of Native American and Asian American students.

1954 –Seven years after Mendez, in a unanimous opinion, the Supreme Court in *Brown vs. Board of Education* overturned *Plessy*. This landmark US Supreme Court case declared state laws establishing separate public schools for black and white students to be unconstitutional. It was the end of *de jure* segregation.

Several meaningful events took place in the past 25 years to call the attention to and acknowledge the significance of M vs. W.

2001 –The Santa Ana Unified School District dedicated the Intermediate Fundamental School in Santa Ana, California to Gonzalo and Felicitas Mendez.

2003 –The NPR documentary "Mendez vs. Westminster: For All the Children / Para Todos los Niños," produced by Sandra Robbie, received an Emmy Award.

<https://www.youtube.com/watch?v=LI7MpcuvGdg>

Felicitas Mendez in the documentary.



2007 –The United State Postal Service issued a stamp to honor the 60th anniversary ruling of *Mendez vs. Westminster*. The stamp was designed by Ethel Kessler and illustrated by painter Rafael Lopez, a native of Mexico City.



<http://arago.si.edu/index.asp?con=1&cmd=1&tid=2047512>

<http://sylviamendezinthemendezvswestminster.com/school.html>

2008 –Mendez vs. Westminster is included in the California School Curriculum. In a final amendment the bill AB 531 requires that M vs. W and its impact on the civil rights movement and the desegregation of public schools in California be included in the history-social science framework, provide guidelines for teaching and evaluating, and make instructional materials be available. http://www.leginfo.ca.gov/pub/07-08/bill/asm/ab_0501-0550/ab_531_bill_20080115_amended_asm_v96.html

2011 –President Barack Obama awarded the 2010 Presidential Medal of Freedom to Sylvia Mendez, the daughter of Gonzalo Mendez. President Obama remarked, “She has made it her mission to spread her message of tolerance and opportunity to children of all backgrounds and all walks of life.”

<http://neatoday.org/2011/02/16/sylvia-mendez-school-desegregation-pioneer-honored-at-white-house/>

Sylvia Mendez receives the 2010 Presidential Medal of Freedom



Mendez v Westminster in the Mathematics Classroom

The information provided in the section above mainly focuses on the Mendez case and it is limited with respect to the history of the civil rights movements of the 50s and 60s. Teachers can share the information with students and watch and discuss the 2003 video “*For All the Children / Para Todos los Niños*” in just one class period. Then, they can use this experience as a springboard to address broader issues of racism and school segregation.

Some students feel safer talking about historical events of *the past* and experiences of people they might see as *others* than openly expressing their own conflicts. Still, the teachers can perceive students’ personal views and feelings as these would be evident in the students’ discussions. Teachers should strive to create a classroom environment where *all* students can feel at ease talking about social justice issues; those who have and those who have not experienced segregation of limitations in their lives.

Brown is presented as a turning point that ended *de jure* segregation in schools. But, more than 60 years after *Brown* many students still attend *de facto* segregated schools. “The causes of *de facto* segregation vary and are complex. Unquestionably, racism and the lingering effects of past racism play a role. So too do housing patterns” [4]. Bringing up the topic of *de facto* segregation that followed *Brown* would engage students in making connections between the past with the *present*, the others with *us*.

What kind of information and data sets would pave the way for students to comprehend *de facto* segregation and its impact on inequities in students’ educational opportunities? “Using real data sets of interest to students is also a good way to engage them in thinking about the data and relevant statistical concepts” [5].

In mathematics, from 5th grade to high school, students can identify the variables and describe the graphs, create bar/pie graphs from charts, and derive new information from the data. More advanced students can calculate measures of central location and variability and even do some higher level inferential statistics.

However, a most essential aspect of examining real data with students is the development of their *statistical thinking*. Statistical thinking “has been described as understanding the need for data, the importance of data production, the omnipresence of variability, and the quantification and explanation of variability” [5]. For example, after describing a graph that displays student achievement disaggregated by race –e.g., white, black, Latina/o, Native Americans—and that makes the achievement gaps evident, the teacher can have students brainstorm ideas about possible underlying variables that might somehow explain the gaps. What are the life conditions and experiences of each group of students that might have an impact on their school performance? What are the average income levels in the communities? What learning opportunities do the different groups have?

In his 2007 article *Critical Values and Transforming Data: Teaching Statistics with Social Justice*, TODOS member Larry Lesser makes the case for teaching statistics for social justice. He claims that “some datasets from the real world may have the power to effect a lasting appreciation of or even commitment to statistics as a tool to help understand (and maybe improve) some of our society’s most profound or pressing matters” [6]. Lesser’s article would be a great resource for teachers interested in teaching statistics for social justice. It provides many references to articles and data sets that would be relevant to students and includes explanations on how to use the data to teach and apply specific statistics content.

There are many historical events related to issues of social justice that can be discussed in class and then compared to the current status of those matters. The following are some examples:

- The *Indian Removal Act*, the *Trail of Tears* (1830), the *Indian Appropriations Acts* (1851/1871), the creation of *Reservations*: Opportunities to discuss the current state of the reservations as well as the education of Native American students.
- *Selma* and *Bloody Sunday* (1965): Opportunities to discuss Selma after 50 years, police racial profiling and violence; *de facto* segregation & achievement gaps.
- The *Japanese internment camps* (1942-1945) and discrimination during (and after) World War II: Opportunities to discuss the discrimination, the stereotype and defamation of newer immigrant groups; immigration reform.
- The *Lau vs. Nichols* case of 1974 and the Equal Education Opportunity Act: Opportunities to discuss the current state of the education of English Language Learners, achievement gaps, opportunities and support for equity.

Books for Students from 3rd Grade to 6th Grade

Listed below are two award-winner books that could be used to design a unit with a social studies theme integrating ELA, mathematics, art and music. These books present accurate historical information and they depict injustice, segregation and stereotypes along with hope and resilience from a child’s point of view.

- Amy Lee-Tai and Felicia Hoshino (Illustrator). (2006). *A Place Where Sunflowers Grow*. Lee & Low Books, Inc.
- Duncan Tonatiuh (2014). *Separate Is Never Equal: Sylvia Mendez and Her Family’s Fight for Desegregation*. Abrams Books for Young Readers.

A Timeline for Mendez v Westminster

Creating a timeline to locate historical events supports students' development of *chronological thinking*, a skill emphasized in the NCSS National Standard for Social Studies Teachers [7]. This type of thinking facilitates understanding of an event as part of a historical process, that includes the effects from past events and its future impact.

After the construction of a timeline for a historical process, the teacher can pose a variety of questions to students, such as how long between A and B? How old was Sylvia Mendez when she received the Medal of Freedom?

The teacher should also pose thought provoking questions and encourage students to pose their own questions. For example: Why did it take so long between Mendez and Brown? How old were the adults in your household when the Supreme Court ruled in favor of Brown? Did any of them experience the need to use separate facilities? Students should pose questions to relate to the historical events: How long before I was born was Selma? What other civil rights leaders have received a Medal of Freedom? Why? (e.g., Rosa Parks/Bill Clinton; Dolores Huerta/Barak Obama) How long did it take a president to acknowledge these leaders? Then, the numerical answers that the students have calculated will become meaningful.

Making the Timeline

Students will work in small groups of 3 or 4 to construct a timeline for the time period 1800 to 2100. The materials needed for each group are:

- A large piece of paper and thick markers or strips of poster board paper to represent each century; markers, pens/pencils; draft paper; tape, glue and scissors
- Centimeter rulers, meter sticks, or cm-measuring tapes; calculators
- Small cards that include a year and event (e.g., 1947 M vs. W)

Directions for Students

Your group will create a timeline by placing the important events written on small cards at the appropriate locations.

- Make a straight line with a marker on a large piece of paper to represent three centuries from 1800 to 2100. Alternatively, tape three strips of construction paper, without overlapping them, on a large piece of paper.
- To make the timeline meaningful, the strips for the centuries should be the same length – make each 60 cm long or longer.
- Mark points of the first and middle years of each century.
- Then, for the year of the event on each card, calculate its place on the timeline *proportionally*. Indicate this place as its distance in cm to the beginning of the corresponding century.

Note: To guide the students the teachers can suggest that the distance (*length*) from the point at the beginning of the century to the point at the year of the event should be proportional to the number of *years* of the event "into" the century.

Once the students find the places for the events, they *will share their approaches* with the class. All approaches should be acknowledged and discussed while the teacher highlights the common ideas underlying the different approaches. Even when students only use estimation, there is always some proportional reasoning involved.

For example: If a student says “the distance for 1947 is a little bit less than 35 cm”, the student has already done a proportion mentally. “Half a century is the half of 100 years; it is 50 years.

Then, the length is the half of 70 cm, which is 35 cm.” This is already a foundation for the proportion $50:100 = x:70$. Finally, since 47 is smaller than 50, the distance is smaller than 35 cm.

Students tend to combine proportional and linear reasoning. They calculate the length of a decade thinking “100 years is 70 cm, so 10 years are 7 cm long.” Then they find that the length for 40 years is $4 \times 7 = 28$ cm.

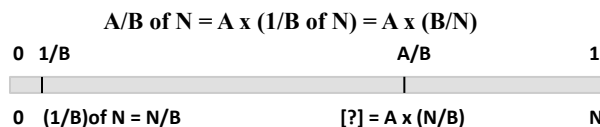
Then, the students compute the length of a year as $70/100 = 0.7$ cm and use it to find the length of 7 years as $7 \times 0.7 = 4.9$ cm. Finally, they find the place for 1947 adding $28 + 4.9 = 32.9$ cm.

More advanced students might find that if 1 yr. measures 0.7 cm then 47 years measure $47 \times 0.7 = 32.9$ cm. Yet, others students might set up a proportion $x \text{ yr.} : 70 \text{ cm} = 47 \text{ yr.} : 100 \text{ cm}$.

Tape diagram

The segment (or the rectangular strip) that represents one century is basically a "tape diagram model." It could be used in similar ways to represent problems related to percentages (% instead of years), a fraction of a number and proportions. The key ideas are: there are four numbers involved: *two "wholes"* and *two "parts"* which are related proportionally and one of these 4 numbers is unknown.

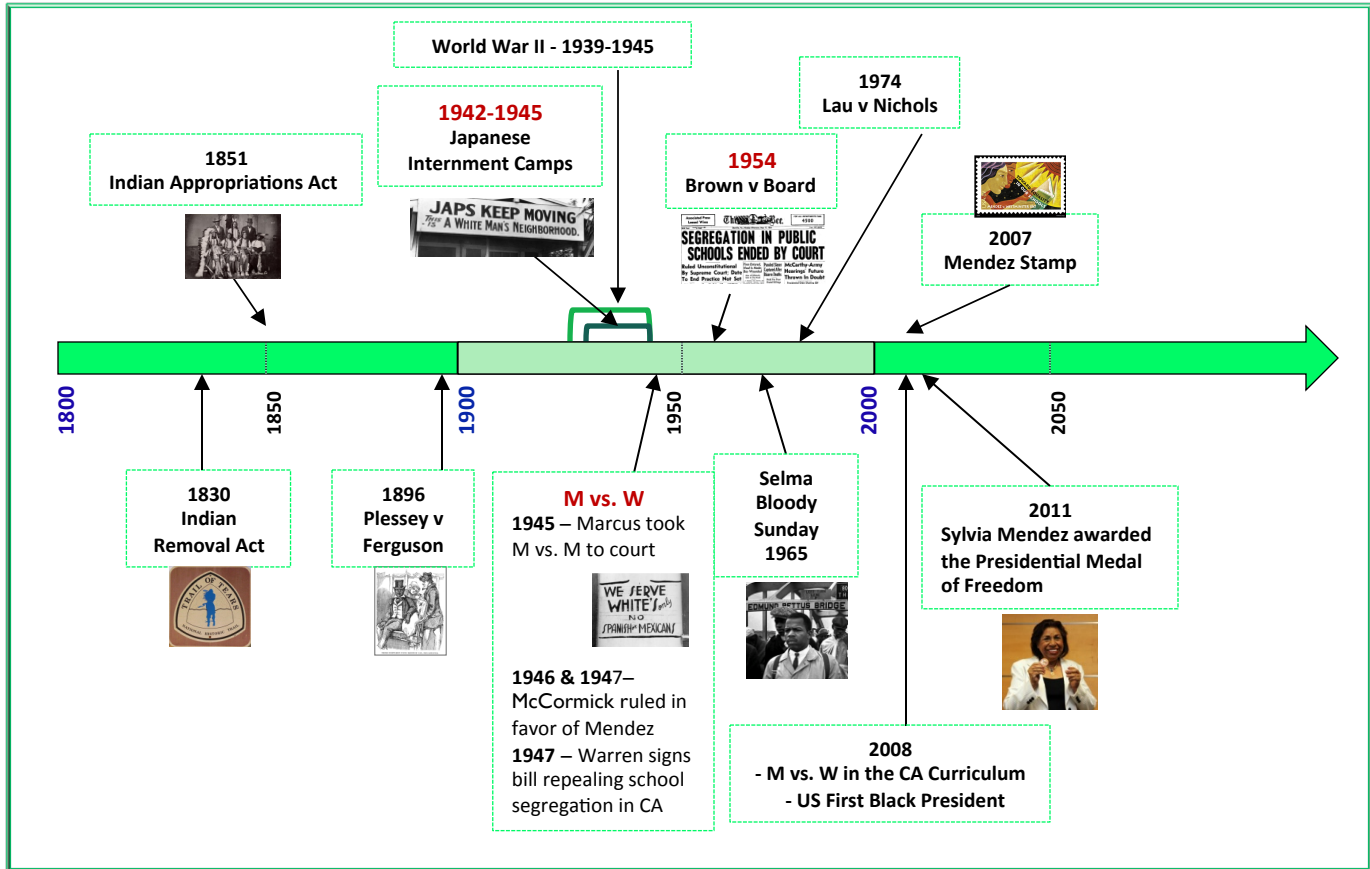
For example, if we have to find the value of “A/B of N” (a fraction of a number) the two wholes are 1 and N; the two parts are A/B and the unknown “A/B of N”. The tape diagram provides a visual that supports the reasoning that if we first calculate 1/B of N, then A/B of N is A times 1/B of N.



The following page includes an illustration of how a timeline might look. It will include arrows that point to the locations of each event and can include drawing or pictures of the events related to Mendez. Students can later on include in the timeline other *events* that had an impact on the path towards equality and freedom.

References

- [1] Jeremy Rosenberg. ‘No Dogs or Mexicans Allowed’: Mendez vs. Westminster and its Legacy on the Southwest <http://www.kcet.org/social/departures/columns/laws-that-shaped-la/no-dogs-or-mexicans-allowed-mendez-v-westminster-and-its-legacy-on-the-southwest.html>
- [2] Maria Blanco. Before Brown there was Mendez http://immigrationpolicy.org/sites/default/files/docs/Mendez_v_Westminster_032410.pdf
- [3] Nannette Regua’s Blog: A resource for information on Mendez vs. Westminster. Includes *guides for teachers and ideas for lessons*. <http://mendezwestminstercase.blogspot.com>
- [4] Michael J. Friedman. US State Department, International Information Programs May, 2004; http://www.policyalmanac.org/culture/archive/brown_v_board.shtml
- [5] http://www.amstat.org/education/gaise/GaiseCollege_full.pdf
- [6] Lesser, Laurence M. (2007) www.amstat.org/publications/jse/v15n1/lesser.html
- [7] <http://www.socialstudies.org/standards/teacherstandards>



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News from TODOS: Mathematics for ALL

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TODOS Mission Statement

The mission of TODOS: Mathematics for ALL is to advocate for equity and high quality mathematics education for all students—in particular, Latina/o students.