

Middle School Math Curriculum Pilot

Presentation to Governing Board, June 2022
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Where We've Been & Where We're At

2010s

CCSS-M, which include Standards for Mathematical Practice are adopted by the state of CA

State assessments using the CCSS-M begin, which re reading heavy

Technology takes a more active place in teaching and learning, including during state assessments

Research shows a problem-solving and balanced approach is more effective for student achievement

Desire for more alignment between K-16 mathematics course offerings, including limiting advanced courses before grade

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2022

Continue using CCSS-M

More balanced approach to reading in content areas

Technology becomes a necessity in learning, even prior to the covid pandemic

Continue balanced approach, emphasizing both concepts and procedures

Emphasize alignment between K-12 course offerings and allow for advancement when appropriate

CPM Curriculum, 2013-2021

Standards aligned and state-adopted curriculum

Reading heavy, with expectations for students to be reading at grade level

Textbook and some manipulatives provided online

Problem-solving heavy; lacks procedural fluency

Aligns with multiple pathways for courses

License good for 8 years

CPM met our needs at the time. However, it is no longer meeting the needs of our educational system, our students, or SPU's goals. In addition, the license has ended and must be repurchased to continue using.

Pilot, 2021-2022

Summer of 2021

- Researched potential programs
- Decision was made to use Open Up Resources in the form of Illustrative Mathematics Kendall Hunt and Desmos

Open Up is a non-profit organization whose mission it "to increase equity in K-12 education by making excellent , top-rated curricula openly accessible to districts and schools. " Their curricula are free to use and used by publishing companies as a foundation for creating textbooks, workbooks, and other curricula. Illustrative Mathematics, Kendall Hunt created a curriculum based on Open Up. Desmos created a curriculum based on Illustrative Mathematics & Open Up. Thus, both curricula are based on the Open Up foundations.

See [EdReports.com](https://edreports.com) for independent ratings of [Open Up](#)

Pilot, 2021-2022

Fall of 2021

- Piloted Illustrative Mathematics Kendall Hunt
- Purchased student workbooks
- Supplemented with Desmos curriculum and CPM (old curriculum) notes

Spring of 2022

- Piloted Desmos Mathematics

Analyzed both curriculum using the Math Curriculum Evaluation Toolkit produced by the CCSESA and CISC as well as student surveys and our direct experience. Scores on next slides are based on this criteria.

Summer of 2022

- Presenting to Governing Board for Purchase of Desmos Curriculum



Illustrative Mathematics



Based on Open Up

“IM 6–8 Math is a **problem-based** core curriculum rooted in content and practice standards to foster learning and achievement for all. Students **learn by doing** math, solving problems in mathematical and **real-world contexts**, and **constructing arguments** using precise language.

Teachers can shift their instruction and facilitate student learning with high-leverage routines that guide them in understanding and making **connections between concepts and procedures.**”

Primarily paper based

Online activities not available in Spanish

Print activities available in Spanish

Online activities are not intuitive nor engaging

Materials are tedious to use for teachers





Desmos

Based on Open Up

“Every student is brilliant, but not every student *feels* brilliant in math class, particularly students from [historically excluded communities](#). We design our curriculum to **put students’ ideas at its center**. Our lessons pose problems that invite a **variety of approaches**. And our technology helps teachers celebrate and develop all of that interesting thinking in their classrooms.

We apply our expertise in technology, pedagogy, and design to enhance the top-rated curriculum from [Illustrative Mathematics](#) and [Open Up Resources](#). We offer **learning experiences on computers** that are dynamic and interactive **as well as experiences on paper** that are flexible and creative.”

Primarily computer based

Online activities available in Spanish

Print activities promised for 22-23 school year in Spanish

Interface is engaging and intuitive

Provides real-time feedback for students and teachers

Students can access/attempt more easily when a guest teacher is in class or when accessing lessons from home



Student Survey Results

- **80%** of students **prefer Desmos** over IM overall
- **85%** of students said it was **easier to learn** using Desmos than IM workbooks and felt that they **learned more** using Desmos compared to IM
- **90%** stated Desmos was **more “fun”** to learn math compared to IM

Students were asked open endedly to give comments about both curricula. While there were many negative comments about IM, there was only 1 regarding Desmos and that was that the tools/interface took some learning to use. However, once students used them a few times, it wasn't a problem anymore.

Cost Comparison

\$22.99 / book + misc copies

Total cost for 170 students: \$4294.05

**Illustrative Mathematics, per
year**

\$20 / student + misc copies

Total cost for 170 students: **\$3989.55**

Desmos, per year

Recommendation for Adoption

Based on our experiences with the two curricula and the data that follows, **we recommend adopting the Desmos Curriculum** as SPUSD's 6-8 mathematics curriculum. We found it more engaging for students, easier to use for teachers, and easier for both teachers and students to see real-time performance and achievement. The two curricula are based on Open Up Resources and similar in their balanced approach to mathematics instruction. Both curricula are yearly subscriptions/purchases.

We analyzed both curricula based on the Math Curriculum Evaluation Toolkit produced by the CCSESA and CISC as well as our personal experiences in using the curricula. Illustrative Math earned an overall score (out of 5) of 4.05, while Desmos earned an overall score of 4.33

Overwhelmingly, students prefer Desmos to IM, stating they learned more and it was more fun.

In addition, Open Up and Illustrative Mathematics provides a K-5 curriculum. Desmos provides an Algebra I (advanced) curricula with the middle school subscription, allowing students to engage in advanced material when appropriate.



FAQ



See a complete list of FAQs for Desmos [here](#).

- How will families be able to support their child?



The **Family Resource** contains explanations of key concepts so that students and families have common language. It also includes exercises for students and families to try together.

- How much digital vs. paper work is there for students?

In lessons where we're [Desmos] able to represent mathematical ideas with animations and let students power contexts through their mathematical ideas, we use digital. In lessons where students would benefit from moving around a classroom, manipulating paper, or sketching, we use paper. The current balance is roughly 80% digital lessons and 20% paper lessons. Each digital and paper lesson also includes access to paper or digital practice problems and printable student notes. All assessments are also available on paper.

- What program supports are included?

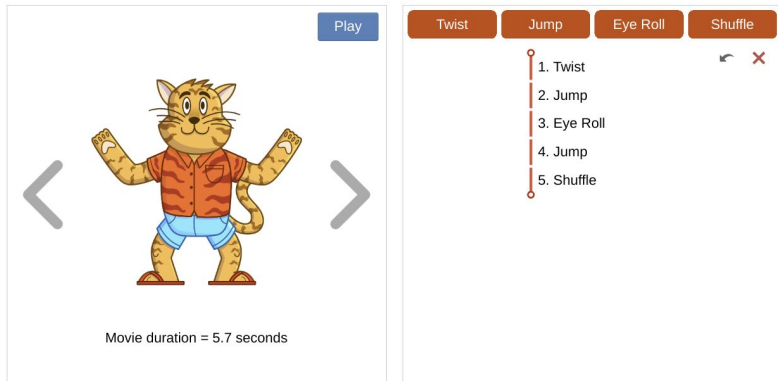
We've added built-in professional learning support. Each site will also have a dedicated Desmos Coach, onboarding webinars, unit overviews, and more.



Sample Desmos Lesson - 6th Grade

Your Movie

Now it's time to make your own movie. First, choose a character. Then select some dance moves and press "Play."



Play

Twist Jump Eye Roll Shuffle

1. Twist
2. Jump
3. Eye Roll
4. Jump
5. Shuffle

Movie duration = 5.7 seconds

Example: Movie Time!

Concept: Decimal Multiplication and Division

Try it [here](#) if you have time! Join as a student
Code: F3GDV6

Engaging & Balanced

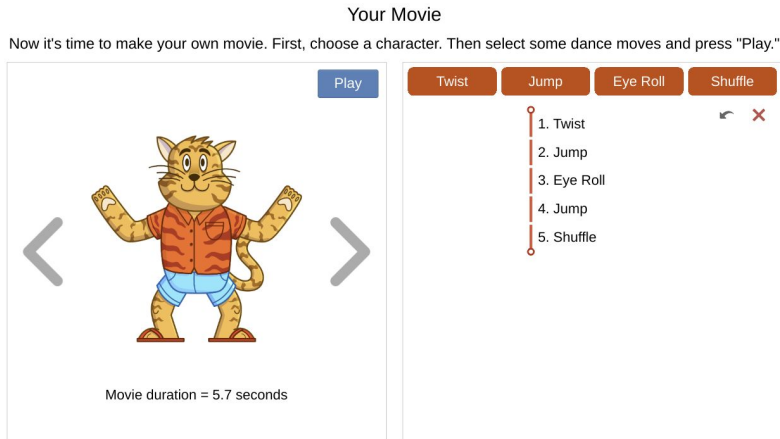
- ★ Fun to use and makes connections to something students have experience with
- ★ Starts with conceptual learning and moves to procedural learning (including the following lessons)

Universally Accessible

- ★ No pre-requisite skills necessary to create a movie
- ★ Teacher can add, delete, or edit any slide or activity based on student needs
- ★ Explanations use student-led words until more formal language is developed
- ★ Students choose whether they are “Ready for More” and engage in challenge problems

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Data-Driven

- ★ Teacher dashboard provides real-time data on each student (see below)
- ★ Teacher has the ability to send individual or group messages to students for specific screens
- ★ Teacher has the ability to allow students to move at their own pace or keep students together in addition to pausing an entire class to allow for discussion or direct instruction
- ★ Students receive immediate feedback on whether procedural answers are correct/incorrect

← 6B Math - Trimester 3 - Movie Time ▾

Snapshots Summary Teacher Student

Warm-Up Activity 1 Activity 2 Synthesis Cool-Down

1 Warm-Up 2 Notice a... 3 Expressi... 4 More or ... 5 Your Mov... 6 Movie Ti... 7 Dance ... 8 Dance ... 9 Dance ... Are Y... 10 Lesson... 11 Cool-D...

Anonymize Pacing Pause

26 of 29 Time Entered ▾

Anonymize mode is on. Your students' names have been changed to the names of notable mathematicians. [Learn more](#)

Student Name	1 Warm-Up	2 Notice a...	3 Expressi...	4 More or ...	5 Your Mov...	6 Movie Ti...	7 Dance ...	8 Dance ...	9 Dance ...	Are Y...	10 Lesson...	11 Cool-D...
Florence Glanfield	●	●	●	✓	—	●	✓	✓	✓	✓	●	●
MC Escher	●	●	●	✓	—	●	✓	✓	✓	✓		
Kunihiko Kodaira	●	●	●	✓	—	●	✓	✓	✓	✓	●	●
Rediet Abebe	●	●	●	✓	—	●	✓	✓	✓	✓	●	●
Lynn Conway	●	●	●	✓	—	●	✓	✓	✓	✓	●	●
Ruth Gonzalez	●	●	●	✓	—	●	✓	✓	✓	✓	●	✗
Alexander Diaz-...	●	●	●	✓	—	●	✓	✓	✓		●	●



Thank you for your time and
consideration

~SPU Middle School Math Department