USING KHAN ACADEMY
IN HIGHER EDUCATION
MATH PROGRAMS

CONTENTS

On a mission to provide a free, world-class education for anyone, anywhere

WELCOME TO KHAN ACADEMY!

Students entering college or university are often across a wide spectrum in math background. Understanding where students are at, and providing resources to fill math gaps is a large undertaking.

Khan Academy, a non-profit, offers free online learning resources and real-time data about where your learners are so you can help unleash their learning potential. This guide is geared towards using Khan Academy specifically for higher education math programs.

Students learn best in environments that are:

- **Personalized** for students to move at their own pace

- **Focused on mastery** to build strong foundational understanding of concepts

- **Interactive and exploratory environments** to encourage applied learning and projects

With Khan Academy, get...

✧ A complete self-paced learning tool
✧ A dynamic system for providing students initial help
✧ Individual and class reports for all students
✧ Better intelligence for doing targeted interventions
✧ A platform that frees up your time so you can focus on activities like peer-tutoring, small groups and time for projects
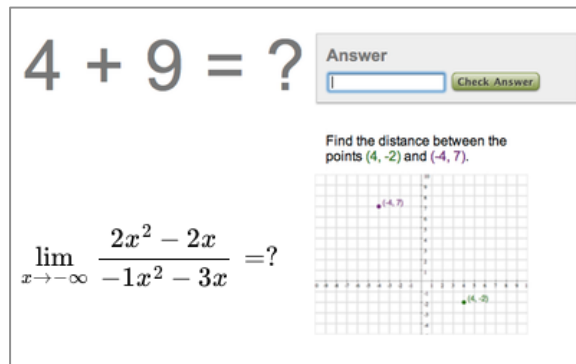
Access is completely FREE.
No contract, no ads, no fees – we actually are free.

HIGHLIGHTS OF KHAN ACADEMY
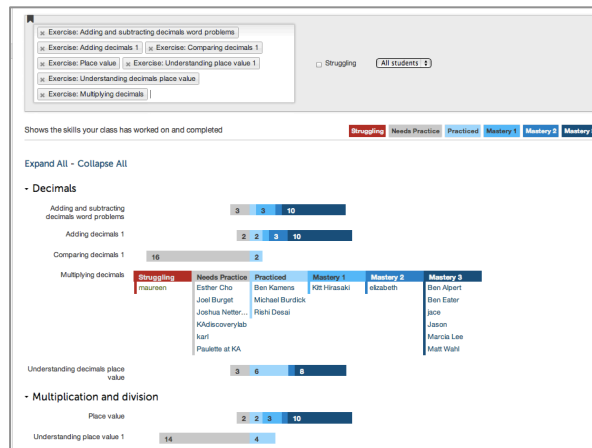
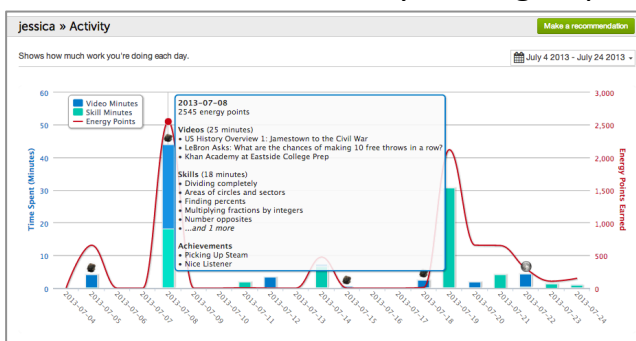**A personalized learning dashboard**
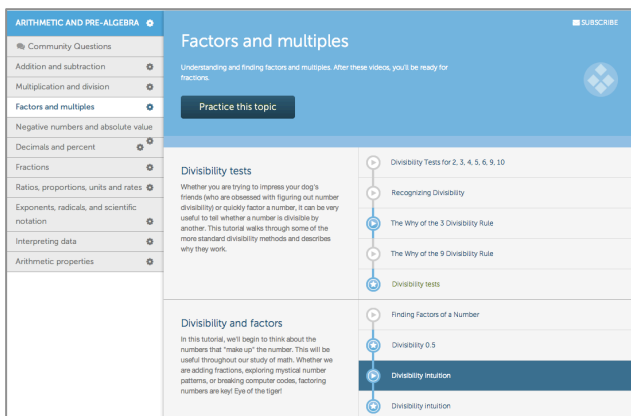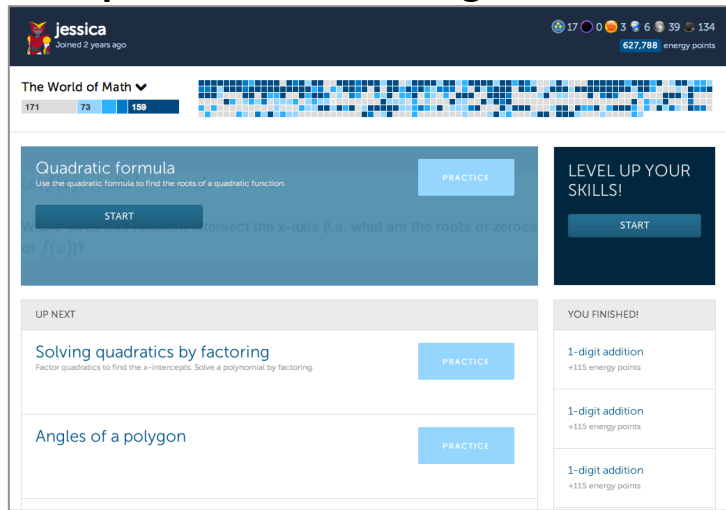
Curated tutorials across subjects with videos, exercises, and simulations

A galaxy of Infinite practice from basic addition to calculus

Real-time individual and class data at your fingertips

STEPS TO START

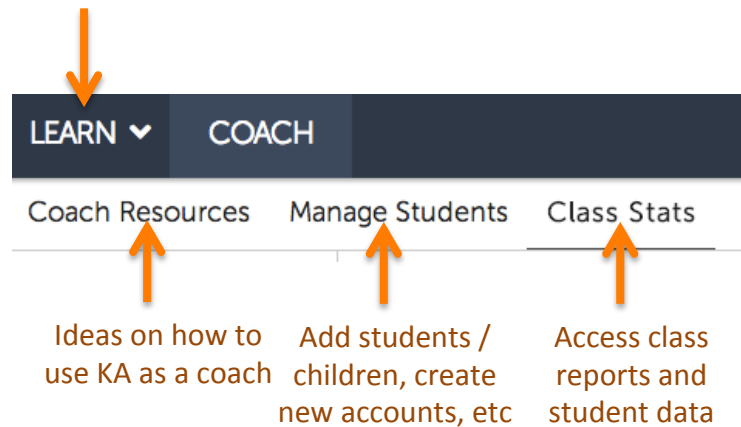**STEP 1:** Try it out

STEP 2: Consider 3 ways to use KA

STEP 3: Kickstart your team

STEP 4: Plan your first day and beyond

STEP 1: Try it out

1. **Sign up for an account** at www.khanacademy.org using an email address to try out all the functionality. From the LEARN menu in the upper left, select from a variety of topics – or use the search bar to find a specific topic.

Explore a topic

Coach Resources — Ideas on how to use KA as a coach

Manage Students — Add students / children, create new accounts, etc

Class Stats — Access class reports and student data

2. **Explore a populated class-level data set using our Coach Demo** at www.khanacademy.org/coach/demo

Click "ACCESS DEMO" *(if you are already signed in, click LOGOUT AND ACCESS DEMO).*

Demo

In addition to the tremendous content that Khan Academy provides via video lessons and practice exercises, there is also a wealth of data that a coach can access about his/her classroom. The short video on the left explains what some of the capabilities are.

To experience this first hand, we have created a way for you to access data for a classroom setting by simulating the scenario. Some of us at Khan Academy have added ourselves to a class, and you can access this class through a demo.

- Simply click on the demo button (if you are logged into your account, you will need to log out first)
- Experience the power of the data by clicking around the different reports
- Logout of the demo account when you are done (and log back into your account)

Access Demo

STEP 2: Consider 3 ways to use KA

Below are 3 common ways to use Khan Academy in higher education.

1: SELF-STUDY

Share Khan Academy as a free resource with pre-matriculated or currently enrolled students. Students can use Khan Academy to build foundational knowledge required for college level math curriculum.

PREP REQUIRED: Communication to students about Khan Academy as a free resource
TECH ACCESS NEEDED: Students access tech on their own
EXAMPLE USE CASES:
• Share a recommended list of KA math exercises to prepare for the Accuplacer exam
• Inform students Khan Academy is a free resource (email, post to website, post flyers)

2: TUTOR SUPPORTED LEARNING

Students can study at their own pace, but have the support of tutors via formal tutoring sessions, or drop-in tutoring hours. If tutors will regularly meet students, take advantage of Khan Academy's "COACH" features, which allows transparency into learning progress.

PREP REQUIRED: Varies (e.g., sign up as coach, align KA content to curriculum)
TECH ACCESS NEEDED: Computer lab environment
EXAMPLE USE CASES:
• Use as a core resource for Summer Bridge or developmental math programs (for example, have students gain mastery in a list of KA exercises)
• Use as a supplemental resource for tutoring drop-in hours

3: BLENDED LEARNING CLASSROOM RESOURCE

In a classroom setting, Khan Academy can serve as a resource to enable personalization and mastery-based learning. By blending technology into the classroom environment and leveraging data, faculty and TAs can more quickly diagnose issues and provide a more customized learning experience to students.

PREP REQUIRED: Alignment of Khan Academy content to your curriculum
TECH ACCESS NEEDED: Varies
EXAMPLE USE CASES:
• Use as a reference resource to support developmental math
• Support math understanding needed in technical training courses
• Use [Applied Math](#) section, [Computer Science](#) platform or other advanced KA content to support math concepts

STEP 3: Kickstart your pilot team

1. IDENTIFY WHO WILL LEAD THE KHAN ACADEMY PROGRAM.

Recommended criteria for lead:
- Excited to lead a Khan Academy program
- Has dedicated time to lead the program
- Well respected
- Comfortable with technology

Potential responsibilities of lead:
- Raise awareness among students (e.g. bulletin boards, email, links, etc)
- Communicate to program participants
- Recruit and train faculty / staff / tutors
- Provide on-going support of faculty
- Determine rollout and trajectory of program

2. RECRUIT THE NEEDED STAFF / TUTORS TO FACILITATE THE PROGRAM.

Most importantly, find staff who are EXCITED about using Khan Academy. Once you find excited staff, ensure they are familiar with the site, including the Coach Resources section (www.khanacademy.org/coach-res). In particular, encourage them to use data in coach reports to drive personalized, mastery based learning.

STEP 4: Plan your first day & beyond

SIGN UP YOUR STUDENTS

Having students sign up and add you as a coach means they can log in to save their progress and share their data with you. Login at www.khanacademy.org/students and click "Add new students". Your screen should look like this:
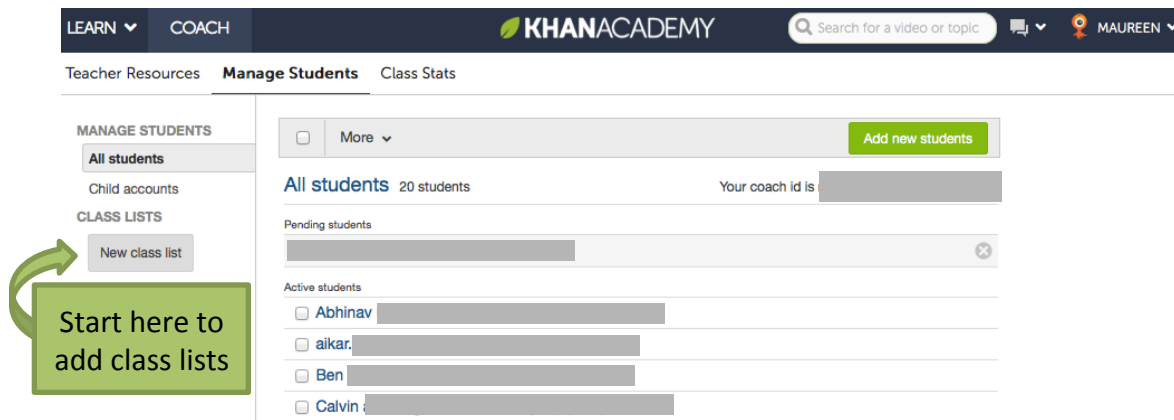
IF YOUR STUDENTS...	THEN...
Already have Khan Academy accounts	Create class lists and use the **class code** in the upper right corner of each class list. Give students the appropriate class code and have them enter that when they add you as a coach. To do this, students should login, go to their profiles, and click COACHES in the bottom left corner.
Already have email accounts	To save time, first create class lists, then directly add student emails to each list. When students receive their email and create an account, they will automatically be in the class you designated. Alternatively, copy student email addresses into the "Add Students" box. They will get an email to create their account once they click on the link.

Expert tip: Have consistent, recognizable usernames. Username guidelines make it easier to recognize everyone on your data reports.

STEP 4: Plan your first day & beyond

ON DAY 1:

❑ **Introduce Khan Academy:** Discuss how KA will benefit students. . Explain what Khan Academy is. Set the expectation that everyone learns differently and has different gaps. There is no need to feel embarrassed about filling gaps. Emphasis should be on progress, regardless of what specific content each student is focused on.

❑ **Get set-up:** Make sure students are aware of how to login, add relevant coaches, access content and track their progress. This may also include logistics like documentation (e.g., a notebook to track milestones, progress, & scratch work), and a lesson on active listening to role model / teach students how to watch a KA video (e.g., take notes, replay unclear sections). It could also include practices like a brief reflection time at the end of class.
   *If possible, ask students to sign-up and log-in ahead of time

❑ **Explain how Khan Academy will be used in the course (and if relevant, what tutoring / additional help is available)**

BEYOND DAY 1:

A few initial goals include:

❑ Continue to explore and progress through KA as a student yourself
❑ Set norms and monitor student behavior (if in-person)
❑ Check the data at the end of each day - note which students are focused solely on videos or are not making as much progress and check-in on them
❑ Start using journals to track milestones, active listening notes, scratchwork, or other assignments
❑ Use the data to decide what topics to focus on

ADDITIONAL RESOURCES

- **Data and analytics reference guide:** See a quick snapshot of all our coach and individual data reports

- **Figuring out technology access**

- **Personalize learning experiences**

Explore more Coach Resources at:
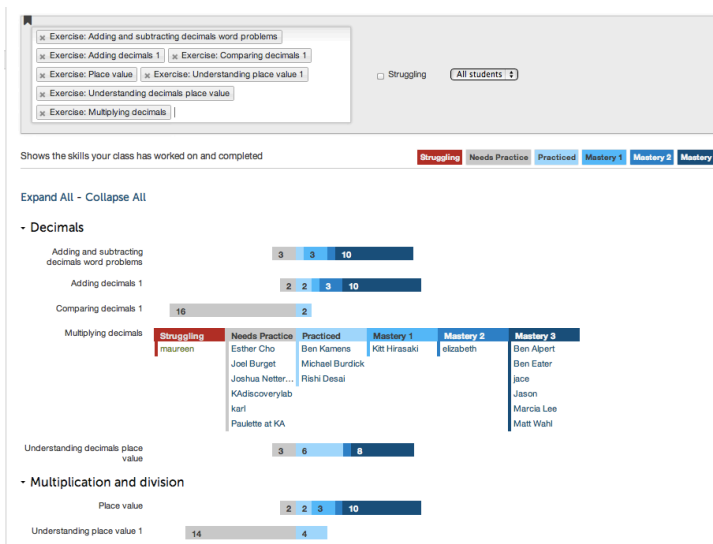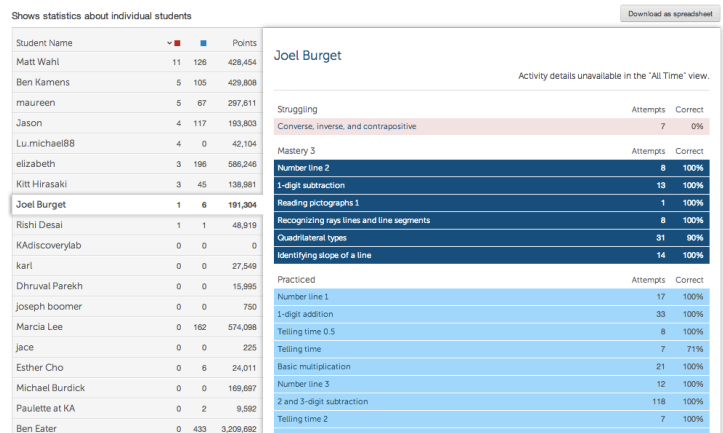www.khanacademy.org/coach-res

DATA AND ANALYTICS REFERENCE GUIDE
Class-stats: Progress

Reports can be filtered (filters may include time period, class list, exercise, topic, and keyword). Bookmark the URL to save filter settings.

BY STUDENT

This report is most useful to get a quick summary of your class, as well as to delve into an individual student's progress. It summarizes stats including how many exercises each student is struggling on, total number of skills mastered, and energy points. On the left side, sort information by clicking the top of each column. Download the data a spreadsheet by clicking in the upper right.

Click a student's name to see more details about their learning progress including attempted problems and percent correct per exercise.
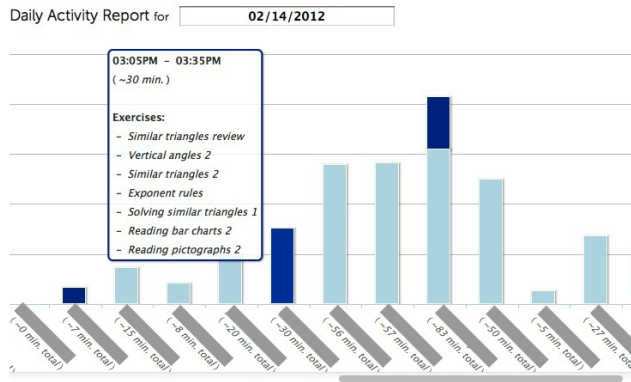

BY EXERCISE

Shows a color-coded bar for each exercise. Bars can be expanded to show which state students are in for each exercise. Exercises are grouped into topics.

The report is particularly helpful for checking students' status on individual exercises and for grouping students for skill-based activities.

DATA AND ANALYTICS REFERENCE GUIDE
Class stats: Other reports

Reports can be filtered (filters may include time period, class list, exercise, topic, and keyword). Bookmark the URL to save filter settings.

DAILY ACTIVITY REPORT

Shows how much time students spent on Khan Academy during and outside of school on a given day. Hover over bars to see the videos students watched and exercises they did. Can be filtered by class list, and any calendar day can be selected.

TABLE

Shows each student's status on each exercise. Can be filtered by time, class list, exercise, topic, keyword and struggling status.

This report is particularly helpful for getting a snapshot of your class's overall performance and identifying who is struggling.

Filter settings can be saved by bookmarking the URL.
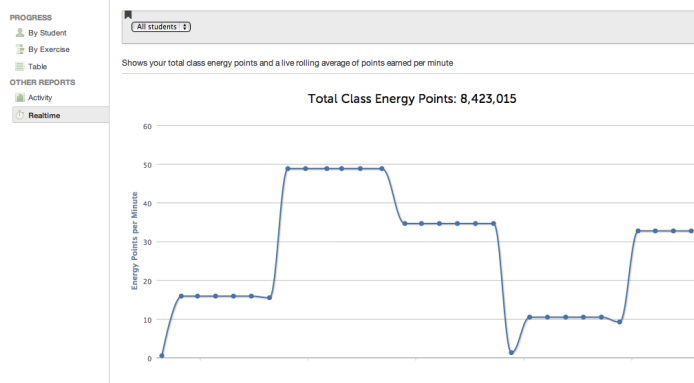

REALTIME

See your total class energy points and a live rolling average of points earned per minute. Many coaches use this with groups of students to encourage activity or as the basis for groups games in class.

DATA AND ANALYTICS REFERENCE GUIDE
Student-level

From any account, an individual has access to their personal reports from their homepage view. Click LEARN and select "Home" to see options on the left column to navigate to these reports.
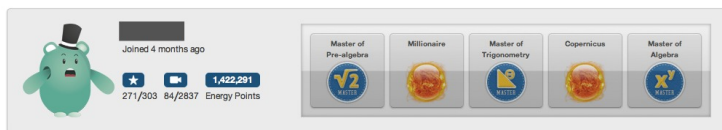
PROFILE

Quick and easy way to see a student's proudest accomplishments and how many exercises, videos, and energy points a student has earned
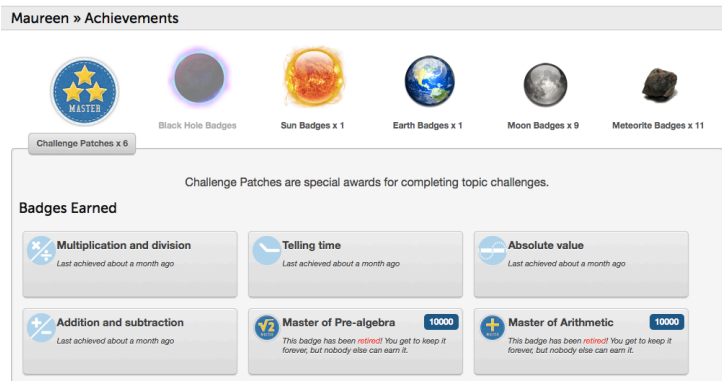
ACHIEVEMENTS

View which badges have been earned, especially useful for "challenge badges" or topic-level exercises
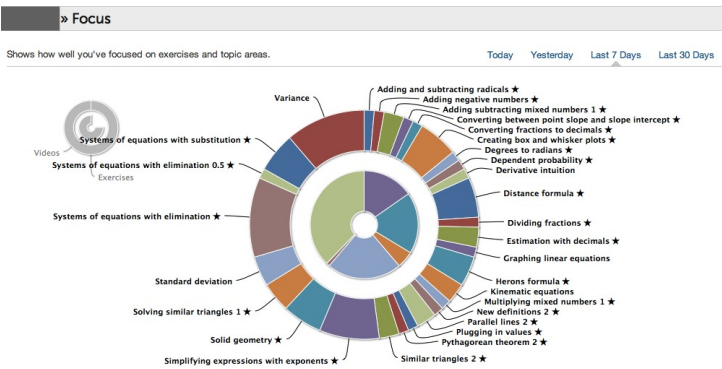
FOCUS

See exactly which exercises and videos students are spending their time on over a day, week, or month. This report easily shows how students spend the majority of their time, which enables teachers to see if students are on task, struggling, or ready to move forward
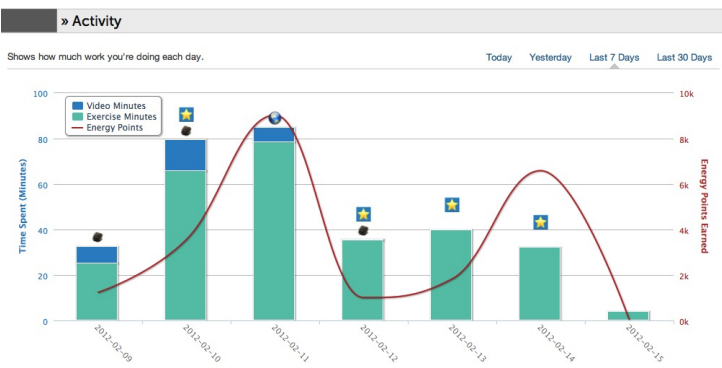
ACTIVITY

Use when you want to take a closer look at how much time a student spent on KA over a day, week, or month. This data can help facilitate conversations around work ethic, recognition, accomplishments, and more

DATA AND ANALYTICS REFERENCE GUIDE
Student-level

From any account, an individual has access to their personal reports from their homepage view. Click LEARN and select "Home" to see options on the left column to navigate to these reports.

jessica » Recommendations			Make a recommendation
1-digit addition (+1 more)	Mastery Status	Attempts	Goal
☑ 1-digit addition	■ Mastery 3	10	10 in a row
☑ 2-digit addition	■ Mastery 3	3	3 in a row
Comparing whole numbers (+1 more)			
☐ Comparing whole numbers	■ Needs Practice	0	10 in a row
☐ Comparing with multiplication	■ Needs Practice	0	5 in a row

RECOMMENDATIONS

Use to see coach suggested content and progress for each recommended skill

jessica » Skill Progress

Shows which skills you've worked on and completed.

Calculus	Attempts	Correct	Progress
Slope of secant lines	0	—	Unstarted
Limits 1	0	—	Unstarted
Limits 2	0	—	Unstarted
One-sided limits from graphs	0	—	Unstarted
Recognizing slope of curves	0	—	Unstarted
Derivative intuition	8	88%	Unstarted
Derivatives 1	0	—	Practiced
Recognizing concavity	0	—	Unstarted
Power rule	11	100%	Practiced
Special derivatives	9	100%	Mastery 3
Visualizing derivatives	25	64%	Struggling
Chain rule 1	32	78%	Practiced
Product rule	7	71%	Mastery 1
Quotient rule	0	—	Unstarted
L'Hôpital's rule	8	63%	Practiced
Implicit differentiation	0	—	Unstarted

SKILL PROGRESS

A student's view of their progress in each topic area.

Figuring out technology access

Technology is the foundation for using Khan Academy, so it's important to understand what access your students have and how often. Many higher education institutions have classrooms equipped with wireless access and/or computer labs. However, if not, consider funding for more devices or a BYOD (Bring Your Own Device) policy.

Use the list below if KA will be used in a classroom setting with your students to ensure appropriate access.

BANDWIDTH AND CONNECTIVITY

☐ **Check that the internet bandwidth can handle all students on Khan Academy at a given time.**
We recommend ~1.5 Mbps for a single machine viewing standard definition video. It's unlikely all students will watch streaming videos at the same time (exercises are significantly less bandwidth), but ~1.5Mbps per student is a safe bet.

☐ **Confirm that wifi access points are close enough**
Ensure that all students can use wifi simultaneously. To be safe, have one router in each room that will be using Khan Academy.

☐ **Check if your internet has filters that block YouTube.**
Since Khan Academy videos are run on YouTube, unblocking or signing up for YouTube for Schools are common approaches to enable full access. Find out more info about YouTube for School at www.youtube.com/schools

DEVICES & BROWSERS

☐ **Try using Khan Academy on the devices.** Generally laptops or desktops work best. Tablets are okay but some of the data report functionality and a few interactive exercises may not work as well. E-readers are not recommended.

☐ **Install the latest versions of browsers.** Older versions do not support the latest technologies and encounter more bugs. We recommend faster browsers like Chrome, Firefox, Safari and IE10.

IT SUPPORT

☐ **Learn basic troubleshooting strategies and know who to reach out to if you need tech support** (e.g., what to do is students don't have their school email set-up, internet is slow or not working, computers won't turn on, etc)

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Personalize learning experiences

As you and your students become more comfortable using Khan Academy, start using data to cultivate a personalized learning environment. Consider ideas such as:

IDEA	USE TO...	EXAMPLES OF IMPLEMENTATION
PEER TUTORING	• Enable many levels of differentiation • Help a student who is struggling with a topic that another has mastered • Help students over small <u>hurdles</u> when working on their own and you are busy • Reinforce students' knowledge and build their confidence by empowering them to explain concepts to each other	• Pair up students based on the Progress By Exercise report • Create a board that has two columns ("I need help with…" and "I can help with…") to enable students to reach out and help each other
ROUTINE CHECK-INS	• Meet regularly with students to check on progress • Focus students on skill gaps • Motivate students • Gain transparency into student progress	• Assign content by differentiated groups • Meet once per week with each student to set and discuss milestones • Intervene when students are not making sufficient progress
SMALL GROUPS	• Tailor a lesson to meet the needs of a specific group of students	• Use the Progress By Exercise report to identify who needs reinforcement • Group students based on skill-level to collaborate on challenging concepts • Create mixed-ability groups, each with an "expert" to guide peers in learning
1-ON-1 (TEACHER TO STUDENT)	• Identify struggling students for targeted intervention based on data • Provide extra guidance & motivation • Check individual student progress • Discuss progress & acknowledge accomplishments	• Look at a student's answer history on an exercise to diagnose misconceptions or errors, and prompt the student to discover the answer • Use the student's individual KA data reports to review progress, discuss how their time was spent on KA, or talk about other relevant topics

> **EXPERT TIP:** TEACH A LESSON WHEN YOU TRY A NEW PRACTICE
> - For example, teach a lesson on how to peer tutor. This can include a brainstorm on characteristics students seek in a good tutor (e.g. they don't just tell me the answer, they ask me questions that guide me to the answer, they are encouraging).
> - Another example is to teach students how to read their individual data and set reasonable milestones on their own. This self-motivates students during check-in sessions about their progress and provides a valuable skill to them.