

Best practices for using KBase in the classroom

Here you will find guidance on how to use KBase within your course. Educators and the KBase team developed these recommendations and best practices from the process of creating concept workflows using the KBase Narrative Interface and using these modules within classes. This is a living document that will change as we receive more feedback and refine the use of KBase in the classroom. The sections in this document include [KBase Educator Resources](#) for peer and KBase support, [Teaching Logistics](#) to use for planning, and [Resources to Share with Students](#) for troubleshooting in KBase.

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PDF Locations: [KBase for Educators](#) News post, KBase Educators Org 'About'

KBase Educator Resources

KBase Educator's Organization

- A place to share concept Narratives, instructional Narratives, and other KBase resources
- For instructors, not students
- Create an account and request to join: <https://narrative.kbase.us/#org/kbase-educators>
- So we can verify you are an instructor, please also send an email from your work account to engage@kbase.us letting us know your interest in using KBase in your classroom
 - What course - topics and grade/level
 - When the course will be offered
 - How we might be able to help!
- Accessing a Narrative in the Org
 - If you haven't opened the Narrative before, there should be a "Click for Access/View Access" button.
 - Click the button to enable access
 - Click on the Narrative name to open
 - There are several icons that may appear in the Narrative cell: open lock, closed lock, eye, crown, globe - hover over these icons to see your edit or view privileges and if the Narrative is public or private

KBaseUsers Slack Group

- KBase hosts a Slack workspace for KBaseUsers to network and communicate. Email the KBase team for a link to join (engage@kbase.us).
- Join the education channel Education channel to:
 - Network with fellow educators
 - Ask questions
 - Share resources

- Give KBase a heads up about an upcoming class (size and class time)
- New to Slack? Here is a [quickstart guide](#) written by Lou Woodley and Katie Pratt of the [Center for Scientific Collaboration and Community Engagement](#).
Woodley, Louise, & Pratt, Catherine. (2020, April 23). Slack quick start guide. Zenodo. <http://doi.org/10.5281/zenodo.3763730>

KBase Shared Google Drive

Community shared resources for teaching, including lecture points and materials, background resources, answer keys and more can be found in the [Resources for Educators folder](#). All are encouraged to contribute.

Teaching Logistics

Creating Orgs for Classes

- Orgs can be created for classes and/or a course
- This is an easy way to share your classroom Narrative with students in one place
- Instructions are available on the [documentation for Orgs](#) page.
- Hint - so students can search and join your Org, make it 'Visible'

Copying and Sharing Narratives

- Instructional Narratives from the Educator's Org should not be shared directly with students or classes
- Narratives can be copied and adjusted for instructional purposes. When you copy a Narrative, you are able to edit everything within the Narrative, including adding/deleting data, adding/deleting Apps and any previously run results, and all markdown cells
 - Once you have copied and begun customizing an instructional Narrative, do not forget to save your work!
 - If the Narrative is one in a series that are linked together, update the corresponding Narrative hyperlinks. One shortcut is to edit the unique Narrative ID number in an existing link versus changing the entire web address.
- You can "share" the modified Narrative(s) with your course Organization by clicking on the "share" button, and selecting the appropriate Org.
- Warning: If you use data from a Narrative copied from the Educators Org, your students may run into a "[Copy of a copy](#)" access problem
 - If you or a student encounters an "Object not available or accessible by user" error, it means that the original Narrative is private or shared only with the Educators Org.
 - *For colleagues or students to access all data and results, the original Narrative needs to be public.*

- One option is to leave the data and analysis portions that you don't want students to run in class within the Narrative so they can just review and answer questions based on results.

Setting up your course

- The modified instructional Narrative can also be modified to create any level of engagement you prefer for the course.
 - a. Minimal engagement - leave the instructional Narrative with all the data, App, and analyses run, and update the questions to fit your educational goals.
 - b. Moderate engagement - reset all the analysis so the students have to set parameters and run the Apps
 - c. Full engagement - remove all the App runs and just provide markdown instructions on how to move from data (provided in the data pane, or uploaded by the students) to full analysis and evaluation of results.
- A few answer keys and teaching resources are located in this [folder](#). If you would like to share your instructional guides with other educators, please add them to the folder.
- Have students create their free KBase account BEFORE the start of class.
- Share with your class Org (see Sharing above for details).
- After each student joins the course Org, they can copy your instructional Narrative to their own account
 - a. Recommend they add their name to the title
 - b. They now have full edit privileges for their copy
 - i. Add data and/or Apps
 - ii. Run analysis
 - iii. **Edit the markdown to answer questions** throughout the tutorial. *Alternatively*, have students submit answers in your preferred forum hosted by your institution/school.
 - c. They should "share" their Narrative with your KBase user name, so you can review their work in detail. This way you have access to their Narratives for grading, viewing completeness, or to help with troubleshooting.
- Copy of a copy - be careful with data that is from a copied Narrative. It might be a good idea to do a fresh data import to your instructional Narrative, prior to the students making a copy. The copy of a copy can result in errors (see above).

Scheduling estimates for core modules

- Estimating for how long a concept workflow will take depends on the time allotted and ability of students.
 - Time to spare?
 - If you have more time and/or students have more experience with bioinformatics or KBase, you can increase the amount of student independence and engagement, such as running different parameters on

one application to compare the results or having students compare between groups.

- Trying to cover as much as possible?
 - If you are short on time, it may be helpful to try using modules that are pre-run; demonstrating configuration and launch and also having the finished products ready, like a cooking show.
- Use the [engagement scale](#) to help determine what you may have time for while preparing for the course.
 - As an example, the Genomics workflow includes four sections. Including a week to introduce students to KBase, one instructor went through this module over six weeks with minimal/moderate student engagement. In this case, some Apps were already run, while others students ran the analysis themselves. In another example, this same module was spread across a semester of 15 weeks. In this example, students were introduced to a module over one week and given two weeks to finish a module. The students were then given an iteration of the entire workflow to use to analyze different data over the course of one month as an exam.
 - In another course, KBase was used for one week of a course. In this case, the Narrative acted as a show-and-tell example of an analysis pipeline, with student time focused on understanding the logic of the pipeline and interpreting the output.

Resources to share with students

Introduction to KBase

- [Introduction to KBase webinar](#)
- Past webinars can be found on the kbase.us [Learn page](#) and [Webinar playlist](#) on YouTube.
- For how-tos, FAQs and other common topics, there is the Documentation site: docs.kbase.us
 - These include:
 - [Quick Start Guide](#)
 - [Comprehensive guide to the Narrative](#)
 - [How to format Markdown cells](#)
- [Intro Activity Narrative](#)

Getting help with KBase

- [Troubleshooting](#) Section in Documentation
- If that doesn't work contact the [KBase Help Desk](#)
 - How to [submit a ticket](#)

Getting student feedback

- [Student Feedback Form](#)
 - *Create a copy* and edit your copy for your needs
 - KBase focused versus content questions