
KNOWLEDGE FORUM

KNOWLEDGE FORUM: TECHNOLOGY TO SUPPORT CREATIVE WORK WITH IDEAS

Knowledge Forum (KF) is an online environment that supports **Knowledge Building Discourse** and creative work with ideas. In Knowledge Forum, students enter questions, ideas, information, and so on, as multimedia notes into a shared community space. KF notes can include images, videos, and documents. Students can also build-on, annotate, and co-author notes. Knowledge Forum's visual interface gives an overview of a discussion as it is unfolding, making student thinking visible and the process of idea improvement tangible (see Figure 10).

Students' contributions can be organized thematically within views, which are the spaces in which discussion occurs. Views allow for multiple dialogues to take place within the KF community at the same time, and help to give organization to community knowledge (see Figures 11 and 12). Images and drawings can be uploaded onto the background of views, so that students can take charge of their own discussion spaces by re-arranging notes and customizing their views to help organize and express their ideas.

While it is certainly possible to do Knowledge Building without using Knowledge Forum, the technology offers invaluable support and enhancement to the idea improvement process by giving community ideas an infinite space to live and grow, and by offering powerful new ways to assess students' discourse through the use of automated tools and assessments. As an open and ever-evolving space, it supports assessment-for-learning by giving teachers an opportunity to trace students' ideas over time and a chance to see where student research is heading.

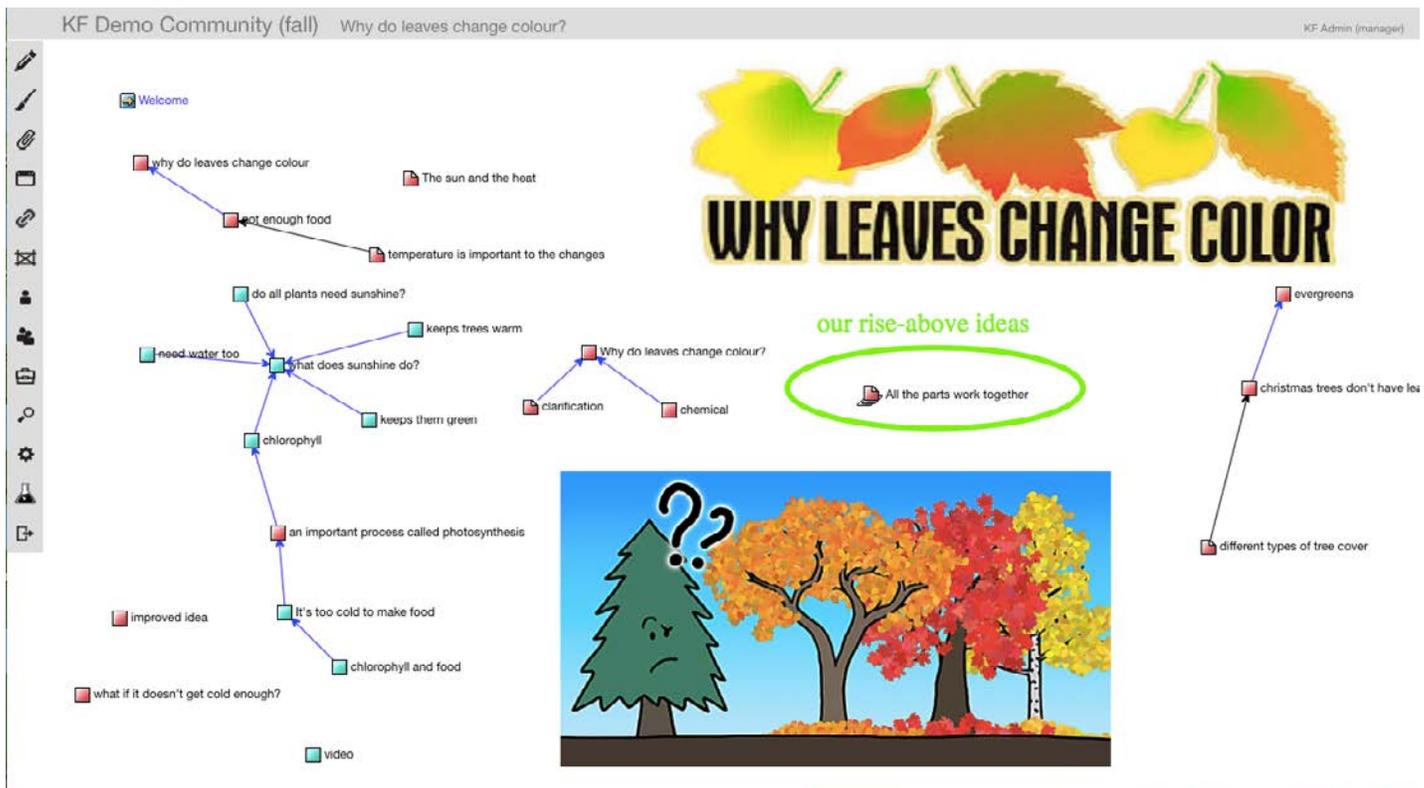


Figure 10. A Knowledge Forum view with build-on threads consisting of student contributions.



Cycles of Nature

New view



The Wood Wide Web?!

Why do leaves change colour?

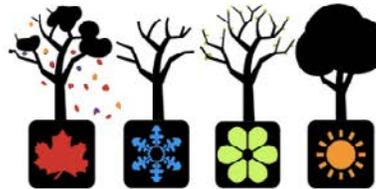


student note
Monica Resendes



How do roots work?

Fall Cycle



Our Next Knowledge Advances

Figure 11. A screenshot of a Knowledge Forum homepage or Welcome view, which can act as a kind of 'table of contents' for the various discussions and investigations that are taking place within the community space.

Figure 12. Three of the five Knowledge Forum views within the community, each dedicated to a distinct but related question or area connected to the main theme Exploring Cycles of Nature. The views include The Wood Wide Web?! (above left), Fall Cycle (above right), and "Why do leaves change colour?" (bottom).

BRINGING “COMMUNITY KNOWLEDGE, COLLECTIVE RESPONSIBILITY” TO LIFE

By contributing to a public space, students’ ideas become part of the community’s knowledge capital – ideas become “ours” instead of “mine.” The principle of **Community Knowledge, Collective Responsibility** becomes real as students’ ideas are validated and built on by others, and they take on the task of acknowledging, valuing, and working with everyone else’s ideas. The technology allows the process of idea improvement to become tangible, and unlike the classroom wall, the digital format allows for an infinite amount of space for discussion and growth of ideas. KF also opens up another space in which community discourse can take place, and through which students can voice their thoughts and build onto one another’s contributions. Something we hear repeatedly from students and teachers alike is that students who are shyer or who do not tend to speak up in verbal discussions really open up on Knowledge Forum, as the online platform provides a safe space for them to share their ideas and contribute meaningfully to collective dialogue.



“It was really cool how we just kept building on to each other’s stuff... cuz like we started with one thing, and then people builded onto that, and then people builded onto that, and then just, it’s basically like going through generations”

— Grade 1 RCDSB student talking about why he liked improving ideas on KF



SPECIALLY-DESIGNED KNOWLEDGE BUILDING SUPPORTS

There are special supports embedded within Knowledge Forum to help students engage in Knowledge Building Discourse and Idea Improvement, including the **KF Scaffolds, Rise Above Notes, and Note Referencing**.

The **KF Scaffolds** are an automated feature in KF that supports the pedagogical tool we have been referring to throughout this resource as the KB Scaffolds. As seen in Figure 13 on the following page, the scaffolds are available right within a KF note, and help students to frame their thinking and writing in powerful ways. All a student needs to do is simply click on these scaffolds and the selected scaffold appears in the student’s note. KF Scaffolds are customizable, so teachers can create their own sets of scaffolds depending on the subject area their students are focusing on. For instance, one could use the Historical Thinking scaffolds (see pg. 43) alongside the Theory-Building set if students are engaging in an historical inquiry, or the Scientific Thinking set if the focus is on science and technology. Teachers can also co-create scaffolds with students to help them engage in deep discourse and theory building, like Suzana did with her students in mathematics (See Getting KB Started in Mathematics in the KB Case Studies package available via [The Learning Exchange](http://thelearningexchange.ca/wp-content/uploads/2017/04/2_5-Getting-KB-Started-in-Mathematics_Accessible.pdf) at http://thelearningexchange.ca/wp-content/uploads/2017/04/2_5-Getting-KB-Started-in-Mathematics_Accessible.pdf). A growing body of research shows the KF scaffolds to be effective Knowledge Building tools for students across Grade levels (e.g., Ma et al. 2015; Resendes et al. 2015;

THE PRACTICE:

Get started with KB Discourse by introducing the Knowledge Building Scaffold. The KB Scaffolds represent the kind of talk that helps students actively develop their opinion and information-sharing to growing ideas and constructing new knowledge represented below are typically referred to as the KB Theory-Building Scaffolds. They represent very powerful "epistemic markers" -- essentially, ways of thinking and how can help support student engagement in expert-like processes and behaviours, an culture of knowledge creation within a classroom. Post them around the classroom and students to use these phrases during group discussions, such as KB Circles (see page 10) will become second nature.

- I wonder...
- I still need to understand...
- My theory is...
- Building onto this idea...
- New information + source...
- This theory does not explain...
- Felling our knowledge together...
- An improved idea...
- We need evidence for...
- We need an experiment to...
- A promising idea...
- Our next steps...
- Another way of looking at it...
- An example...
- An analogy/comparison...



Knowledge Building Gallery / Leading Student Achievement: Networks for Learning

Created by: KF Admin
Last modified: 2/27/2017, 2:58:34 PM

Read Edit Author(s) Connections History Attachments Properties

Please write a title.

Formats B I U S A A [List Icon] [List Icon] [Link Icon] [Double Arrow Icon]

Scaffolds:

- Theory Building
- My theory
- A better theory
- This theory cannot explain
- Putting our knowledge together
- I need to understand
- New Information

Keyword(s): [Search Icon]

Attachments: Attach

There is no image attachment in this contribution.

Contribute

Figure 13. The Knowledge Forum scaffolds embedded within a note. The Theory-Building set is shown here, and includes scaffolds such as “My Theory,” “I Need to Understand,” and “Our Improved Theory.”

RISE ABOVE NOTES:

Rise Above notes play a crucial role in idea improvement. A Rise Above idea is not about selecting between opposing ideas or creating a compromised idea that gives up some of the power of those ideas that play into it; rather, Rise Above ideas are about “creat[ing] a new idea that preserves the value of the competing ideas while ‘rising above’ their incompatibilities” (Scardamalia, 2004, p. 7).

All the parts work together

Created by: KF Admin
Last modified: February 11, 2016 at 9:58 AM EST

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Riseabove View:

Our improved theory - It's not leaves and trees that work it's the roots and leaves that work together to make leaves green. The roots make the chlorophyll, it goes up the tree trunk, and goes into the leaf.

Source of information: - We learned from circle time -

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    graph TD
      A[Why do leaves change colour?] --> B[clarification]
      A --> C[chemical]
      B --> C
      C --> D[Chlorophyll leaks]
      D --> E[improved idea]
      F[It's too cold to make food] --> A
  
```

Build on Contribute

Figure 14. A Rise Above note. On the left, students have created an improved theory: “it’s not leaves and trees that work it’s the roots and leaves that work together to make leaves green. The roots make chlorophyll, it goes up the tree trunk, and goes into the leaf.” They cite their source of information as KB Circle time. On the right, community contributions that played a role in helping develop this new understanding are displayed.

Creating a Rise Above note helps to take community knowledge to the next level. A Rise Above note can be created as a community or by an individual student. Rise Above notes include a feature that allows students to gather certain existing notes that played a role in contributing to the knowledge advance and include them within the note itself (see Figure 14, previous page). Rise Above notes are represented on a KF view by means of a slightly altered contribution icon, which makes them easily recognizable.

REFERENCE FEATURE:

The reference feature allows students to work actively with each other's ideas and contributions on KF. Students can select and copy any piece of another person's note, and then paste it into their note. The program automatically generates the appropriate citation, including a link to the referenced note and the name of the note's author. Cited text shows up in italics (see Figure 15).

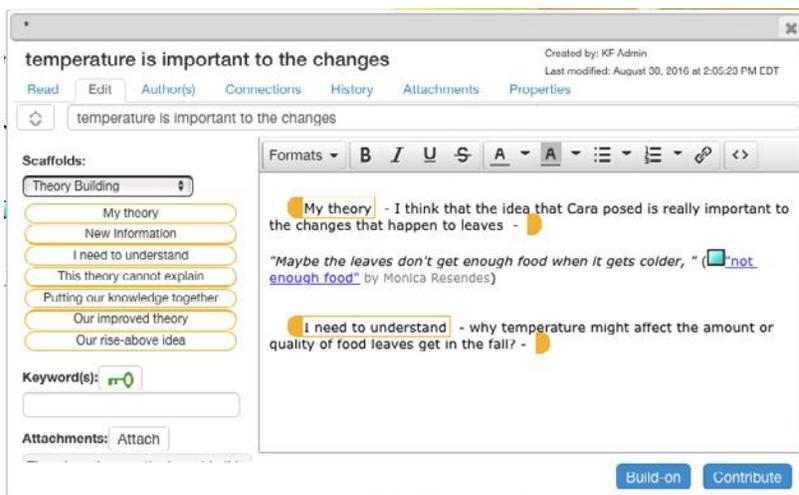


Figure 15. A note with a reference to other community member's note shown in italics.

HOW DO I GET STARTED WITH KF?

There are many ways in which to introduce or integrate KF into your classroom work. To give you some inspiration for how to take step one, we've provided a few different accounts of how to integrate the use of KF into classroom practice. These approaches can be adapted and utilized in both elementary and secondary classrooms. Note: there are also a number of case studies that focus on the use of KF in the classroom. For instance, check out how Nancy Raynor utilized KF as a teacher-librarian with her students (see Knowledge Building Using Knowledge Forum: A Teacher-Librarian's Story in the KB Case Studies package available via [The Learning Exchange](http://thelearningexchange.ca/wp-content/uploads/2017/04/2_4-Grade-6-KB-Using-Knowledge-Forum-A-Teacher-Librarian-Story_Accessible.pdf) at http://thelearningexchange.ca/wp-content/uploads/2017/04/2_4-Grade-6-KB-Using-Knowledge-Forum-A-Teacher-Librarian-Story_Accessible.pdf). Or, see how Angela Hoffman and Mubina Panju used KF with their Grade 1 and SK classes in the case study Knowledge Building in Primary: What Makes a Community? also at http://thelearningexchange.ca/wp-content/uploads/2017/04/1_2-KB-in-Primary_What-Makes-a-Community_AODA.pdf also on [The Learning Exchange](http://thelearningexchange.ca).

Knowledge Forum YouTube Tutorials

Check out the series of KF tutorials on YouTube (3-5 mins. each). These mini-tutorials provide a review of the program's various features and tools, starting with the most basic features and continuing to explore more advanced tools and functions. You'll be ready to start using Knowledge Forum after the first tutorial!



Knowledge Forum Youtube Tutorials

<https://www.youtube.com/playlist?list=PLNdWjAw9WQK0keMvP4YBCQxmlIzXAYqnK>

1. START WITH KF RIGHT AWAY AS PART OF THE KB PROVOCATION.

Glenn Wagner, Secondary School teacher, UGDSB, outlines his approach to using KF in his classrooms:

1. Identify the curriculum strand, theme or subject area to be explored.
2. KB provocation: For example, show students a short video from a reputable source such as *ASAP! Science* to stimulate students' ideas and questions.
3. Have students note any questions or ideas the video provokes.
4. Share questions and ideas as a class.
5. Organize students into small groups. As a group, they list all of their questions and ideas together. Next, they evaluate their questions to select one or two of the most promising questions (for more on "*promisingness*" see pg. 38). "Promising" in Knowledge Building work basically means something that is worth spending more time on. Promising questions are deep and rich, engage the how and why of a problem, and are not easily Google-able! For instance, whereas the question "How old is the universe?" can be easily answered, the question "How do scientists know how old the universe is?" is promising in that it can be explored in great depth and can give rise to many other rich questions and avenues of inquiry.
6. Share all of the most promising ideas as a class. Students self-organize into small groups (4-6) according to the question they are most interested in exploring.
7. The teacher sets up the Knowledge Forum space so that students can explore their promising questions. Each question gets its own KF view. The question is written and put up on the background of the view (see Figure 16 on next page). Students can create subsequent views if they find it necessary. Small groups can work in their own views, but can also visit and contribute to other groups' views so that knowledge can be shared and developed across the whole class, with no barriers. Also, the teacher sets up a Welcome page to list all of the different views. Setting up a welcome page helps to organize a KF space, which can get quite populated with views and contributions. It can also help orient students into the space and help them navigate their KF world quickly and easily.
8. Students spend the next few weeks researching and developing their theories on Knowledge Forum in their group. One rule of thumb for work on KF – "Work a question, leave a question!" The teacher provides mentoring and monitoring.
9. Students engage in two forms of summative assessment. i) They produce an individual culminating assignment in the form of an **E-Portfolio** (see pgs. 122-125, 148-153) for more on this assessment practice) in which they demonstrate their deepest understandings and where they went the farthest with their ideas. ii) In the small groups they have been working in, students engage in a **Summative KB Circle** (see pg. 122) in which they are required to verbally communicate, as fluently as possible, the knowledge they have gained and tell the story of how their ideas have improved.

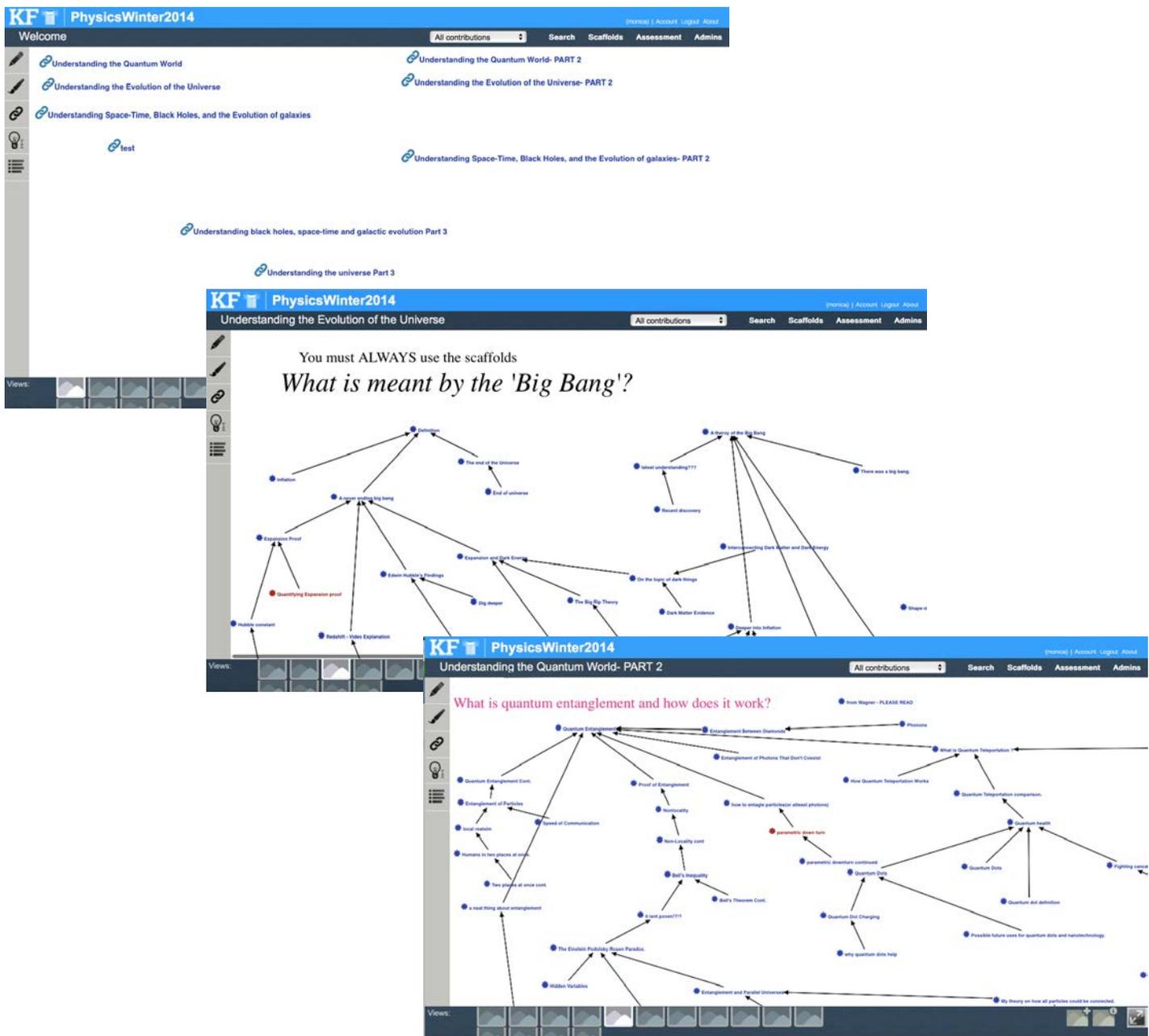
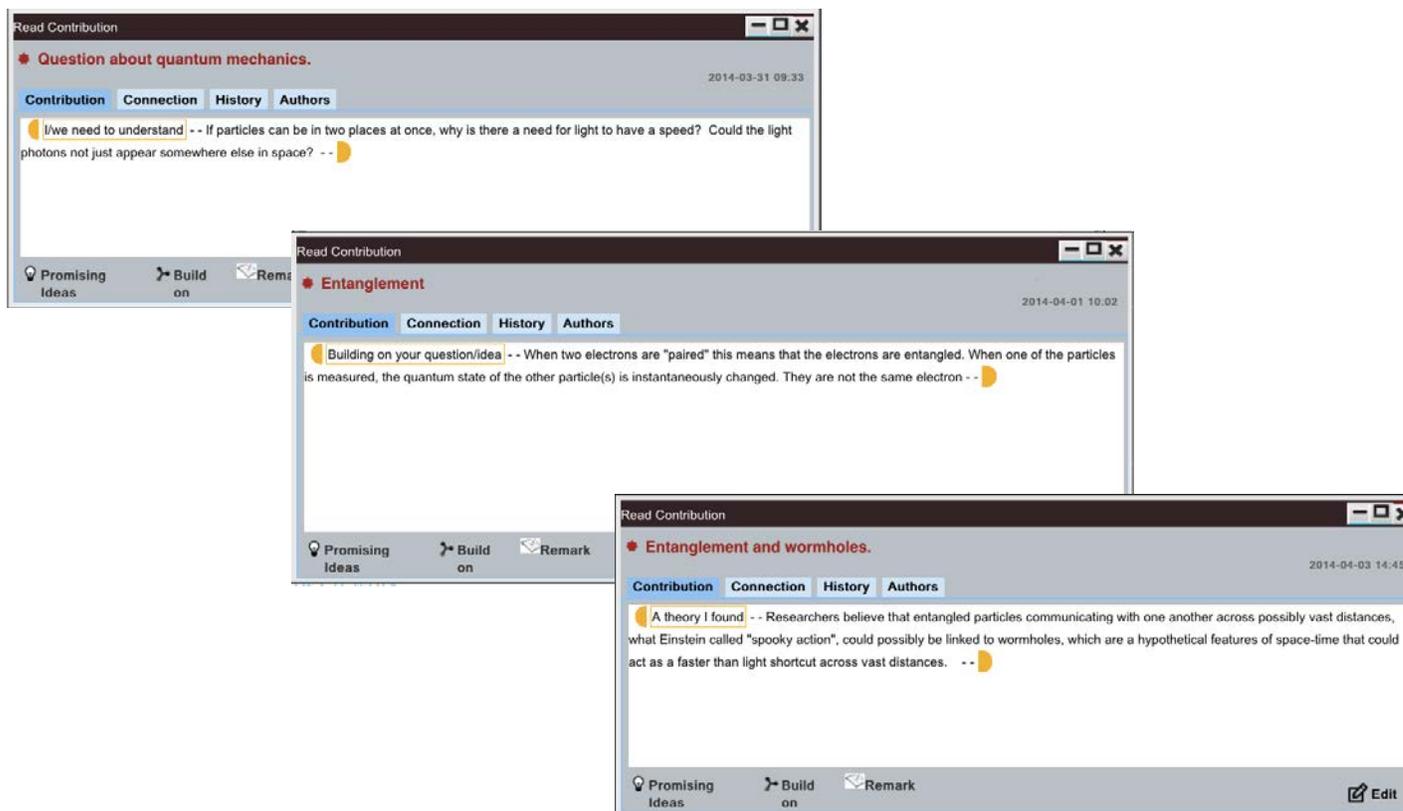


Figure 16. The top image shows a KF Welcome view for Glenn Wagner’s class. This view lists all of the other views that have been created in this KF community, such as “Understanding the Quantum World,” in the form of view links (represented by the chain link icons). The Welcome view is the place that students will automatically land on when logging onto KF. The tabs that run along the bottom of the screen also represent all the different views that have been created in this community, and provide another way of navigating through the community space. **The screenshots at the bottom left and right** represent two of the other views in this KF Community that focus on the big questions that students decided they wanted to explore: “What is meant by the Big Bang?” and “What is quantum entanglement and how does it work?”.



Samples of student discourse demonstrating varied KF Scaffold use.

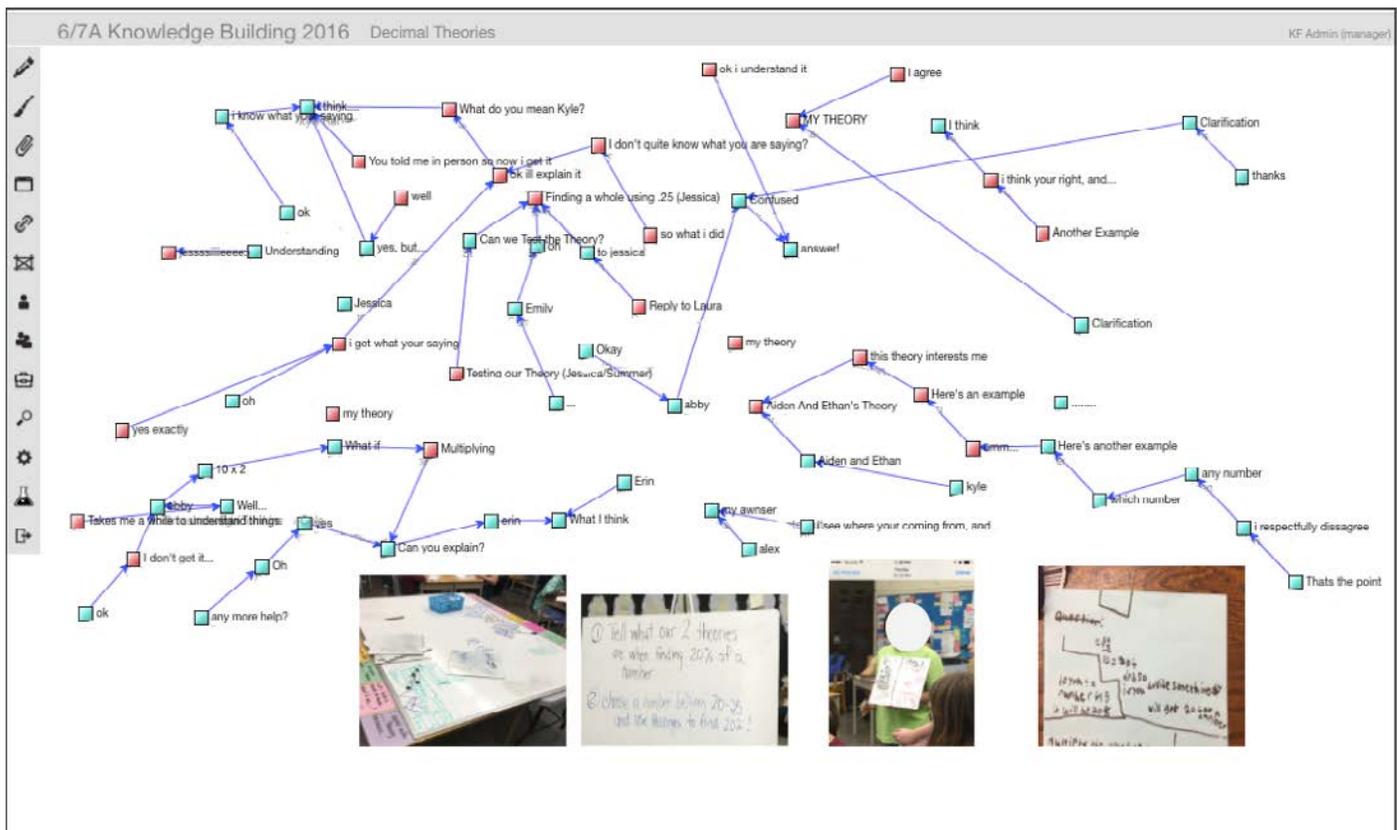
2. PAIR KNOWLEDGE FORUM WITH KB CIRCLES

There is a great dynamic that can happen with ideas when online and offline dialogue are paired together on a regular basis. For instance, there are always those students who tend to be quieter in KB Circles or who may speak but do not go so far as to challenge another's idea or introduce an "out of the box" idea. However, giving students the opportunity to go onto Knowledge Forum to engage in free discussion directly after a KB Circle allows them to get the ideas and thoughts that are fresh in their minds from the face-to-face talk out into the collective space. Likewise, students who need more time to think and ruminate about their ideas before making them public have the time to do so. Oftentimes, contributions come from quieter or shyer students, those who would otherwise never have expressed their ideas. Many times we've heard from both teachers and students alike — "I never thought this student had so many unique ideas!"

This tactic also supports differentiated instruction, enabling opportunities for engagement for students with different learning styles. Auditory learners could benefit from group discussion, while visual learners can benefit from the text and visual features on Knowledge Forum. Sometimes, an artifact, object, or experiment can be the focus of a KB Circle, which can offer an opportunity for more tactile or kinesthetic learners to engage more easily.

- In a primary classroom, there are approximately 26 students and only one third as many computers. Twice a week, the class has their KB talk periods. On day one, half of the class engages in KB Circles that are about 25 minutes long. Immediately following the KB Circle, these students go onto Knowledge Forum for another 20-25 minutes until lunch. They pair

- up two to a computer and take turns logging on and contributing a note. The other half of the students go to the library to do research and read with the librarian, who helps them with their KB work. Students also engage in other kinds of knowledge work as a whole class — going on field trips, taking Nature Walks, engaging in read-alouds, and so on. KB talk time, both face-to-face and on Knowledge Forum, are deeply integrated into the daily work.
- In Suzana Milinovich’s Grade 6 math class, students gather together at the T.O.G.A. table (the Table of Great Achievement) for their daily KB Circle Number Talks. A variety of KB Scaffolds, many co-created by students and focused on math, are written on coloured paper and are posted around the table. Students are invited to write on the whiteboard-covered table, or use their own mini whiteboards to jot down ideas. Suzana poses a question for students to puzzle over together (e.g., “How do we get 20% of a number?”). Students explore their initial ideas and theories together for about 20 minutes. Then they break off into small groups for approximately 15 minutes and use a variety of media (paper, tablets, whiteboards) to generate more ideas and work out their problem-solving strategies. Finally, everyone comes back together for another 15 minutes or so to share their ideas and tactics. In regular intervals after the talks, students are invited to go onto Knowledge Forum to further explore the ideas they shared as a group. Photos from the KB Circle work are sometimes posted up on the KF views, and the KB Scaffolds that frame the T.O.G.A. table are also programmed in the KF notes using the custom Scaffold tool (for more information, see *Getting KB Started in Mathematics*, pgs. 84-88).



A KF view dedicated to exploring students’ “Decimal Theories.”

3. START WITH KB WALLS, WORK TOWARDS KF

As illustrated on page 50-54, KF can also be integrated in the KB work after students have generated their questions and spent some time exploring their theories using a KB Wall. Creating KB Walls with students gives them practice using the KB Scaffolds and contributing their ideas to a public space before engaging in the same activities online, using KF. The image below shows the KF community that Elaine Heaver's Grade 6 students worked in once they moved into this digital space. Elaine included a Welcome page (see Figure 17) to help orient students and, with the help of students, created views (represented on the interface by the tabs running along the bottom of the screen) to correspond to each of the main questions that had arisen during the KB work, such as "What happens to sound in space?", and "How does space exploration affect our lives?" The infinite space afforded by KF allowed the students to keep adding views to give room for discussion as needed, without losing the important ideas and knowledge they were generating from the onset of the study.

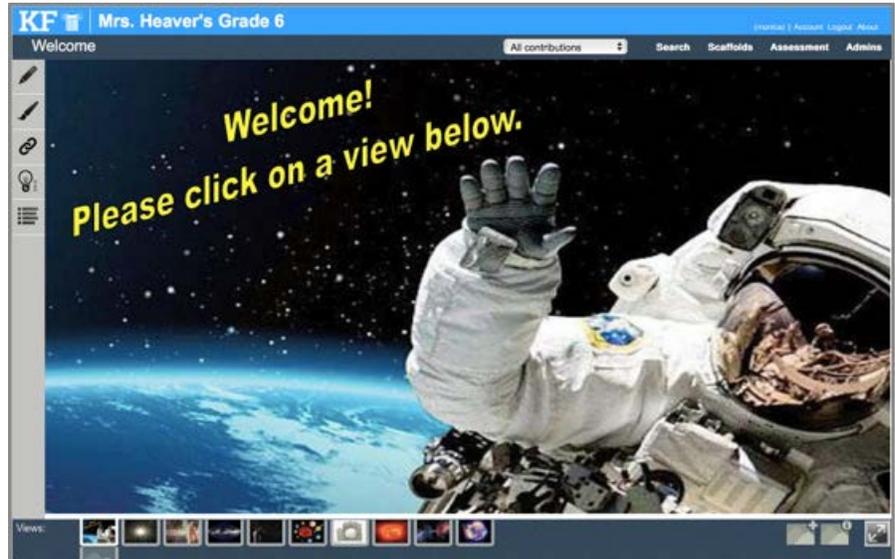


Figure 17. The Welcome view for the Grade 6 KF community exploring astronomy and space exploration.

A SNEAK PEAK AT KNOWLEDGE FORUM'S COMING ASSESSMENT TOOLS

There are a variety of assessment tools being developed for Knowledge Forum that are specifically designed to support Knowledge Building work. In Knowledge Building, group-level assessment is critical for helping the community understand its own strengths and weaknesses, and evaluate how best to move forward. At the same time, a teacher is responsible for reporting on individual students' progress and understanding. For this reason, KF's powerful assessments tools can be applied to both the individual and the group level. Likewise, all of the tools are designed to be used by both teachers and students. They are geared to help a KB community see the progress of their idea development, reflect on important aspects of their community discourse, get an overview of meaningful community dynamics and interactions, and help them evaluate how to best move forward. For example, tools are being designed so that students can get a sense of how they're progressing as an individual but, more importantly, to understand and see concretely: **"How am I helping to advance the community's knowledge?"** We describe the basic suite of KF assessment tools under development below:

THE CONTRIBUTION TOOL

With this tool, teachers can search individual students' online activity to get a quick and comprehensive overview of the quality and quantity of a student's contributions and participation patterns to collective dialogue. The Contribution Tool provides information in the form of a simple bar graph on the following measures: number of notes read; notes written; build-on notes created; notes edited; notes referenced, and notes cited. Such information helps the teacher direct attention to students who may need more support or instruction, and helps them identify barriers preventing students from participating fully in the Knowledge Building community. Similarly, students' notes are displayed in an easy-to-read list which allows the teacher to skim over notes and get a sense of the overall quality of students' contributions. Are they using the KF Scaffolds in their notes? If so, which ones? What is the quality level of their contributions? Are they using key terms and vocabulary? Teachers can use this tool immediately after each KF session the students have, or on a timed basis (weekly, biweekly, monthly). Likewise, students can also make valuable use of the feature by looking up their own contribution profile and evaluating their own participation patterns. This activity can encourage self-reflection and promote greater awareness of students' own engagement and contributions to community work. Pair KF contribution self-evaluations with other student-centred assessment tools such as the **KB Circle Rubrics** and **Self-Evaluations** (pg. 116, 139-141), or the **My Self-Assessment Log** (see pgs. 118-119, 145).

THE VOCABULARY GROWTH TOOL

Looking at the growth of vocabulary relative to outside measures or benchmarks gives the teacher a good indication of whether the students are learning and using key disciplinary concepts. Information about the complexity and quality of children's notes can also give the teacher clear direction as to the type of guidance or instruction the class may need. All of the tools support the teacher in planning in a way that is responsive to the students' evolving needs (see Teplov, Donahue, Scardamalia, & Philips, 2007).

THE PROMISING IDEAS TOOL

The Promising Ideas tool (Chen, Scardamalia, Resendes, Chuy, & Bereiter, 2012) allows students to select promising ideas from their own and other's notes so that they can be easily searched, called upon and explored further. Students can select any part of the note that they believe represents a promising idea, from a single phrase to whole sentences. Selected ideas can be tagged and can also be ordered from most to least promising, based on number of selections of the same idea. The selected ideas can be shown in a list, with the most frequently selected ideas at the top and the least popular ideas near the bottom. Observing this list as a community can serve as a basis for group discussion of next steps — which ideas do we want to move forward with? Selected promising ideas can also be exported to new views to enable more space for growing and developing those ideas. A simple procedure for using the tool can be to have students make individual promisingness selections, and then come back as a group to view the aggregated list and discuss them. The community can then choose 3-5 ideas to work with, and export them to new views, with the knowledge that these new views will be their new community workspaces. This process can be repeated as the work advances to sustain idea advancement. Research shows that students as young as Grade 3 can participate and benefit from this process by making significant knowledge gains (Chen, 2016; Chen et al., 2012).