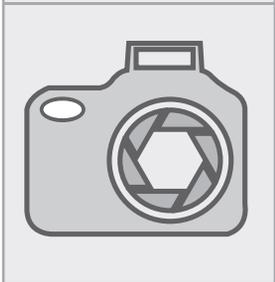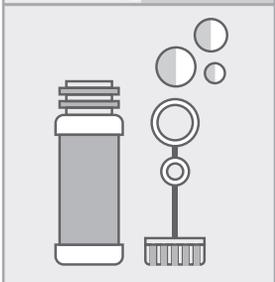# Collaborate for Success

Integrating student-centered projects in the classroom can be extremely rewarding; most of my favorite teaching moments come from these types of lessons, in fact. At the same time, however, project-based lessons can be extremely time-consuming and overwhelming during the planning phase. For example, creating a list of copyright-friendly photo resources takes up time that could be spent designing engaging mini-lessons to accompany a project. As educators, we encourage students to work together during projects, yet often feel like we need to be a superhero and go it alone during the planning phase. You don't have to! Collaborating and sharing resources with other educators will help decrease the amount of time you spend creating tedious rubrics, project outlines, and reflection documents. These collaborations can also increase the time you have to brainstorm creative ideas, provide feedback for your students' work, and check in with students on the status of current projects. Basically, by crowdsourcing the project planning with your personal learning network (PLN), you can free up time to spend on what really matters: your students.

Back in the early days of my career, connecting with other educators beyond my school walls was difficult. Crowdsourcing wasn't yet common, Pinterest was years from launching, and Twitter had only just appeared. Now, though, we can easily reach out to a plethora of resources and online friends ready to talk through ideas with us and share their expertise and resources. ISTE recognizes the benefits of sharing beyond the bubble of a school or district, encouraging us to "dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology" (ISTE Standards for Educators, Collaborator 4a, 2017). The potential rewards that come as we build these channels of communication among global educators affect not only us but also our students. Modeling these connections with students helps them see the benefits of networking and building their own PLNs, of collaborating in the classroom and beyond. To that end, this chapter explores ways to leverage the network of educators in your PLN and collaborate effectively. Additionally, we will explore student collaboration methods, including peer review, authentic audience members, expert videoconferences, and global collaboration.

Some Lesser-Known Educator Sharing Tools

Pinterest, Twitter chats, and TeachersPayTeachers are all excellent resources for connecting with other educators, but if we stay only on the well-established paths, we see only what everyone else sees. Take a step beyond "the usual," and try some of these lesser-known resources that are great for reaching out to and sharing ideas with other educators:

✦ Voxer. A walkie-talkie type app, Voxer (**voxer.com**) allows users to send audio messages back and forth. You can communicate with one friend or in a larger chat room with many colleagues. Educators quickly recognized the value of this app, creating topic rooms for a multitude of educational subjects, which serve as less-public venues for educators to tackle challenging questions and issues they are facing. The EdSquad curates a list of Voxer chats and educators at **theedsquad.org/voxer**.

✦ Facebook Live. Calling Facebook "lesser-known" may seem odd, but does it come to mind when you hear "education resource?" It should. Numerous educators use Facebook Live (**live.fb.com**) to share their favorite tips and provide small tours of their classrooms. Again, there are educational Facebook groups for nearly any program or app, as well as some to explore topics such as virtual reality, social-emotional learning, and many others. Facebook has a list of many of these groups, which can be found at **bit.ly/2XhiC31**. Live video is fun, as you never know what will happen, often making it more interesting than professionally edited videos that typically show only the polished version of a lesson.

✦ Feedly. The Feedly platform (**feedly.com**) allows you to curate collections of blogs and websites that you can peruse each day. Rather than visiting numerous websites and blogs to find resources, you can simply use Feedly, which maintains everything in one place. I typically check it once or twice per week, and I am able to keep up with all the educators I follow. Feedly also allows educators to bookmark resources to save and revisit. This helps coaches support other coaches and techy educators, while staying current on the latest tools and strategies.

Enhance Projects with Content Experts

Along with sharing project resources, our PLNs can help us locate guest experts to serve as guides to students during projects. It can be as simple as phoning a friend. For instance, reach out to your school's media specialists, instructional and edtech coaches, or STEM teachers to ask if they'd be willing to help facilitate and organize your project. These experts typically welcome any opportunity to work with students, and having an extra set of hands can be helpful. Students also benefit from hearing a variety of voices and learning unique perspectives and ideas. This is also a great way to model collaboration and show students how adults work together to support a common goal. Most projects incorporate some type of research, so including your media specialists is a natural fit. Media specialists are often able to provide lessons on effective and reliable searches. They are also typically experts in digital citizenship and can help explain copyright and fair use guidelines with students. Instructional coaches and Special Education teachers are helpful with scaffolding information for students who need extra support.

Beyond Face-To-Face Guest Speakers

Depending on the project, your students could also benefit from the assistance of authors, engineers, marketing professionals, and others who are willing to share their knowledge. A classroom exchange with an expert typically includes a presentation from the speaker, along with time for students to interact with them and ask questions. If the expert can't visit your classroom in person, perhaps they could virtually through videoconferencing. Not only does this enable your students to hear from and discuss projects with distant experts, but it is also a great opportunity to increase cultural diversity in your classroom. Let students see that anyone can become a writer, game designer, or historian. University of Florida research demonstrated that engagement is better when students are able to learn from someone of their same race and gender. Even an hour learning from

someone who looks like them can make a world of difference (Spence, 2019). What a gift we can give our students by allowing them to engage with professionals who look like them and can inspire them in ways that we cannot.

How do you connect with professionals to meet your class face-to-face or online? Try reaching out to your local universities for a start. Many PhD students and professors are eager to connect with classrooms and participate in ongoing projects. In my home state, for example, University of Florida's Thompson Earth Systems Institute offers a program called "Scientist in Every Florida School" that seeks "to build long-term collaborative relationships between teachers and scientists" (Thompson Earth Systems Institute, 2020). Another great resource, Skype in the Classroom (see the "Videoconferencing Tools" sidebar) maintains the most comprehensive list I have found for connecting students with professionals: authors, biologists, doctors, historians, and more—even a monorail driver. For technology professionals, Code.org maintains a database of computer scientists who are willing to connect with classrooms. Visit **code.org/volunteer** to find one in your area or book a virtual exchange. Finally, you could try a paid website, such as Nepris (**nepris.com**) and FieldTripZoom (**fieldtripzoom.com**) to find a guest speaker. However, I have been able to find the connections I need through free sites and quick shout-outs to my PLN.

Another alternative is to let your students take the lead. While implementing a project, why not encourage your students to reach out to experts—and practice writing skills at the same time? If you decide to do this, I recommend using a platform that allows you to moderate all communication. This ensures that your students are protected and unable to share personal information, such as their home address. Initially, students can write a letter, and later connect with the experts using a tool such as Flipgrid (**info.flipgrid.com**) or Padlet (**padlet.com**), which enables you to moderate and monitor all communication.

Tips for Successful Guest Speaker Exchanges

Guest speaker events can be exciting and memorable for students, but they can also be full of pitfalls and stress for you as a facilitator. I recently facilitated a session with an author for an elementary class in which her screen kept freezing. Students thought this was hilarious, but she didn't understand why they were laughing. Technology issues like this are not uncommon, so to ensure a smooth running day (or at least fewer headaches), here are a few tips:

Check your school or district policy pertaining to student videoconferencing. You may need to engage in videoconferencing as a class using your teacher computer, for example. Knowing the policy before you begin helps not only ensure a smooth session but also that you'll be allowed to book subsequent professionals as speakers and mentors for your class.

✦ Provide the speaker a list of guidelines. Remind them about the amount of time they have to speak and about your project or unit goals. Encourage them to use visuals in their presentations and make it interactive. You can also help them prepare by providing them with a short description of your students. For example, if you are hosting a guest speaker for a class of students with autism, it is important for the speaker to understand their communication style and need for a routine and schedule.

✦ Hardwire your technology. If you use an Apple TV or other screencast device, this might be a time to plug in with an HDMI or other cable instead, to ensure that you have the most stable connection possible. It is preferable that you hardwire with an Ethernet cable to the computer you will be using for the exchange, rather than relying on a Wi-Fi network. Reach out to your school's tech support specialist to see if they are available to help with your exchange. If not, ask if they can help you get set up ahead of time.

✦ Have a Plan B ready. Whenever humans and technology are involved in anything, it is wise to have a Plan B. For classroom exchanges, you will

need to have an engaging backup plan ready in case you are unable to connect or your guest speaker cancels. For instance, as Plan B you could ask students to view the speaker's website or articles the speaker wrote to research answers to the questions they had prepared. Students can share these on a Padlet wall or other digital discussion board. Students can also write their questions and use a tool such as Flipgrid to send them to the speaker, who will respond when they are able. With younger students, I use Google Earth when exchanges are cancelled, allowing them to take a virtual tour to the guest speaker's location.

Provide an Authentic Audience

Just as hearing from guest speakers and content experts can benefit students, having these same guests hear *them* can increase their self-regulation and build confidence in skills related to their project. For this reason and more, access to authentic audience members for students as they create and publish their projects is part of the Gold Standard PBL model (PBLWorks, 2020). An authentic, public audience can take many forms, and some authentic audience members may be closer to home than you realize.

Typically, when we think about inviting an "authentic audience" into our classroom, it can sound like a daunting task full of online research, scheduling, and extensive conversations. For many school projects, however, students can present their content to experts within their own school walls, many of whom are not typically provided opportunities to engage with students in this type of way. Consider including school administrators, custodians, cafeteria staff, and other staff members or volunteers. Most non-instructional staff are pulled in many directions and spend little time truly engaging with students and seeing the results of their contributions. Allowing them to visit the classroom and participate in projects benefits them just as much as your students.

VIDEOCONFERENCING TOOLS

When students collaborate with "visiting" experts or peers in classrooms across the globe through videoconferencing, the technology almost becomes invisible as the learning and connections take the focus. Despite this disappearing act, videoconferencing tools are some of the most valuable technology tools you can add to your classroom. They provide students with opportunities to hear from and collaborate with content experts and cultures they might never encounter otherwise. Likewise, virtual collaborations can help you expand and deepen the connections in your personal learning network, as well as provide learning and growth opportunities as you exchange ideas with distant peers. Here are three popular and free videoconference tools for classrooms:

➤ Skype in the Classroom (**education.skype.com**) is used by educators all over the world. The platform helps teachers and coaches connect with guest speakers, find virtual field trips, and connect with other classrooms. I recommend Skype in the Classroom if you are looking for professionals to connect with, as I have found their expert list to be the most comprehensive of any platform I've used.

➤ Google Meet (**meet.google.com**) is the simplest tool of the three. It includes a chat feature and the ability to screen share, and it is a good choice if students are leading the videoconference independently, as there are fewer "rabbit holes" for them to follow.

➤ Zoom (**zoom.us/education**) supports up to 100 people in a video call, as well as such custom features as polling, screen sharing, whiteboard capabilities, and breakout rooms. Students love expressing their style and interests by adding a virtual background to their video. Zoom allows the teacher to customize features for each videoconference, such as disabling the chat or restricting students from talking. This is helpful when determining the level of interactivity you would like students to have with each speaker.

In addition, check your district or school learning management system; most use some type of videoconference tool. For example, Schoology uses a platform called BigBlueButton that integrates with its management system.

I recommend becoming well-versed in these main platforms so you are able to adapt and provide flexibility to those who may not be as tech-savvy. Usually, your guest speakers and classrooms will want to use the platform with which they feel most comfortable.

Extending your audience beyond your classroom walls or community is also easy and an important step in helping students become Global Collaborators, which the ISTE Standards for Students describe as students who "use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally" (2016). Many teachers are willing to connect their classes with your students, and a variety of tools and programs exist to locate and connect willing classrooms. Here are a few of my favorites:

✦ Empatico. Devoted to cultivating an empathetic future generation with a greater understanding of others around the world, Empatico (**empatico.org**) is a free tool for connecting classrooms of 6- to 11-year-olds. Simply register your class, listing your grade level and availability, and Empatico will locate available matching classrooms from around the world. Further, the site provides lesson plans and guidelines to make the transition to videoconferencing easy for teachers and students. Empatico also offers seasonal projects, such as STEMpatico, that combine professional development and student learning. In collaboration with Cisco, STEMpatico provides teachers with professional learning opportunities to help encourage empathy while students participate in design thinking and STEM projects.

✦ TeachSDGs. The TeachSDGs organization (**teachsdgs.org**) is dedicated to teaching the United Nations Sustainable Development Goals (SDGs) in K–12 classrooms. Including such goals as Climate Action and Gender Equality, the SDGs were developed in an effort to transform our world for the better by the year 2030. The #TeachSDGs movement has encouraged thousands of students to take action and participate in shared projects that inspire change, ranging from public service announcements to inventions. If you are interested in participating, visit **worldslargestlesson.globalgoals.org**, which features free lesson plans and resources to support each SDG goal. Additionally, TeachSDGs offers valuable lessons and connects educators with SDG ambassadors who serve as mentors.

- ✦ Flipgrid GridPals. GridPals (**blog.flipgrid.com/news/gridpals**) is an initiative that educators using Flipgrid can turn on with the click of a button. GridPals provides access to projects created by teachers around the world. Create and post your own projects and invite other educators to participate in your shared grid, connecting students through video.

- ✦ Skype in the Classroom. In addition to being a great source for finding guest speakers, Skype in the Classroom also enables you to connect your students with other classrooms around the globe. The Mystery Skype program (**education.skype.com/p/notes**) pairs classes to guess each other's location or guess a mystery number or animal. This program is a great way to prepare students for the public speaking and problem solving involved in most projects.

Practicing diverse types of communication with their peers will help students become more skilled at interacting with others, progressing from being awkward, nervous, and quiet to valuing the opportunity to connect online and confidently speak their ideas or ask questions. Remember, it takes practice for students to become skilled at this, so providing a multitude of opportunities will build their confidence and comfort with using collaboration tools and communicating in unique ways. If these types of projects interest you, I recommend the book *Teach Boldly: Using Edtech for Social Good* by Dr. Jennifer Williams (iste.org/TeachBoldly). Her inspiring book provides detailed steps to help you engage students in collaborative global projects.

ENGAGING STUDENTS IN PEER REVIEW

One vital communication skill that will benefit students in collaborative projects—whether in the classroom, online, or their future careers—is the ability to provide and respond to peer review. Peer review is a powerful tool

that helps encourage reflection and self-regulation, while building student confidence in their writing and other academic skills. Peer review is particularly beneficial for collaborative projects, as student reviewers are more invested in the outcome, leading to thoughtful feedback. For example, if one group member designs a flyer, their teammates are invested and want to ensure that the text makes sense and is error-free. Peer-review strategies are not only useful for creating high-quality products; they are also a great way to practice indicator 7b of the Global Collaborator standard, which states, "students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints" (ISTE Standards for Students, 7b, 2016).

Peer-Review Benefits

Boud, Cohen, and Sampson conducted research and found several benefits of the peer-review strategy. One is that peer review helps students feel more comfortable giving and receiving feedback, as well as helping to self-regulate their learning (2014). Think of a time when you experienced something and then wondered how your own project, art, movement, or the like compared. This happens both when we experience something wonderful, as well as when we experience something that is not up to par. Further, Boud, Cohen, and Sampson found that students learn more from people at their own level of learning (2014). This makes a great case for peer review and also prompts educators to create homogenous groups during collaborative projects.

Watson found that peer review is better suited for an online environment. Students provide more honest and conscientious feedback when provided more time for reflection and when engaging in an online versus face-to-face conversation (2008). In addition to this research, Wisniewski, Zierer, and Hattie listed feedback as one of the top ten influences on student achievers

(2020). Some ways to ensure that students are receiving the most effective, high-quality feedback from their peers are:

✦ Train your students. Your students need to be taught what constitutes quality feedback and that "Great job!" is not sufficient. Before my students engage in peer review, I recommend modeling the process with students: Display a piece of student writing, provide a constructive compliment, and then ask students to do the same. When a student offers a comment such as "great job," ask them if they feel this is specific feedback that will help the writer improve. Discuss this each time students suggest general feedback, as well as what more specific feedback they might offer instead. One strategy for younger students is to ask them to provide two compliments and one critique. With older students, challenge them to ask questions rather than offering feedback, for example: "Do you feel that your writing flows when you read it out loud? How can you use sentence fluency to help with this?" ReadWriteThink (2003) expands on this with the Praise, Question, Polish strategy of peer review. You can locate their Narrative PQP Peer-Review Form at **bit.ly/39LWDX9**.

✦ Include a rubric. Similar to their use with projects, rubrics assist students in meeting expectations during the peer-review process. For older students, I ask peer reviewers to use the same rubric I will use to grade their papers. For K–2 students, you could include prompts or stickers that represent comments. If a student's writing is detailed and descriptive, students could place a sticker of a picture frame. The picture frame represents how descriptive writing creates a visual image in the reader's brain. Younger students can use paper and pencil to peer review but then snap a picture to post online. Technology is not always the best answer, and using stickers may help engage your students in the peer-review process.

- Provide opportunities to reflect on feedback. Providing and receiving feedback are only the beginning of the review and revision process. Students need time to reflect on the feedback they've received, whether through journal writing, student-teacher conferencing, or student-created videos. Reflection is often neglected due to time constraints, but it is the most important step in this process. To increase self-regulation, ask students to reflect on how (or if) they plan to make changes to their own paper based on their peer reviews.

Types of Peer Review

There are many ways to initiate peer review in your classroom, depending on the grade level, ability, and interest of your students. Here are three ways to get you started:

- Multi-Student Peer Review. Students post their work on a website or document that is accessible to all students. Students provide feedback to two or more of their peers. Additionally, students can use other students' feedback as examples, to serve as scaffolding for those struggling. The downside is that all students will be able to see the feedback and could potentially copy responses. I find this type of peer review works well in primary classrooms, where students are more comfortable with others viewing their work.

- Partner Peer Review. This is more likely what came to mind when you considered the peer-review process. Students are paired, and each reviews their partner's work, providing feedback. This method is more private and more comfortable for students who are reluctant to display their work. With some technology programs, you can even arrange for both student work and reviews to appear anonymously.

- Mixed Methods Peer Review. Another option is to incorporate these two strategies in a tiered peer-review process. Students are partnered during the first round of revisions, then make revisions and post their second draft for the entire class to critique.

Peer Review Tools

Although students can certainly provide feedback to their peers using pen and paper, by employing digital tools they can also apply indicator 1c of the Empowered Learner standard, which states that "students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways" (ISTE Standards for Students, 1c, 2016). Here are some of my favorite tools, most of which are simple enough for even your youngest learners to use:

✦ Buncee. Although a paid program, Buncee (**app.edu.buncee.com**) is my top choice for multi-student peer review, especially with younger students. This program allows students to record audio over their slides and post their presentations on a Buncee board (a digital bulletin board) for other students to watch and provide comments.

✦ Padlet. Like a digital bulletin board, Padlet (**padlet.com**) allows students to post their presentations or projects on a shared wall. They can also upload pictures, audio, and video files. Other students can comment to add feedback. A free account allows teachers to create three boards. Padlet is a good option for multi-student peer review.

✦ Classkick. Available in free and paid versions, Classkick (**classkick.com**) enables students to write, type, and draw while the teacher can monitor students as they work live. My favorite optional feature is how Classkick allows students to anonymously help each other and provide comments. For example, a message will pop up on a student's screen as "Helpful Hare gave you a suggestion." Helpful Hare is actually one of their randomly selected classmates. The talking avatar feature makes Classkick very kid-friendly and a great collaboration tool.

✦ Google Workspace (formerly G Suite). Comprised of Google Docs, Slides, and Sheets, Google Workspace/G Suite (**edu.google.com/products /gsuite-for-education**) allows students to collaborate to edit documents in real time. My favorite feature is the version history, which

enables students and teachers to review individual contributions and restore the document to previous versions if a student deletes their partner's work or makes a mistake that alters the document. Google Workspace is a great option for partner peer review.

✦ Canvas. If your school or district uses the Canvas LMS (**instructure.com /canvas**), you can take advantage of its peer-review feature for assignments. I frequently use this with my college students. Students can be manually or automatically paired with a partner who will review their work. You can also choose to make peer reviews anonymous.

As with most other skills associated with projects and PBL, peer review will take time to perfect. Students need modeling, training, and practice to become better at giving and receiving constructive reviews. The following lesson plans will help you get them started.

LESSON PLANS

As you read through the lesson plans, consider how these projects are strengthened by the inclusion of an authentic audience, guest experts, and peer review. These examples can also help you make adjustments to your existing projects to provide students with unique perspectives and opportunities to connect with others globally.

LESSON PLAN 3.1 Algorithmic Thinking Project

Subject: Math/Entrepreneurship

Target Grades: 6–12

Duration: 3–4 class periods

Students will have the opportunity to become entrepreneurs as they explore math concepts and algorithmic thinking. They will interview school staff members (teachers, cafeteria managers, maintenance workers, administrators, etc.), and determine problems and challenges they are facing due to lack of efficiency and automation. Next, each group of students will select one problem to solve. They will use spreadsheets or coding programs to automate tasks and help school members solve their problem more efficiently and effectively.

Objectives

Grades 6–12 students will be able to:

✦ Recognize how to make tasks more efficient through automation.

✦ Design their own algorithms in order to solve problems.

✦ Test their algorithms for bugs and revise their prototype.

✦ Train others on using their algorithm.

ISTE STANDARDS FOR EDUCATORS	ISTE STANDARDS FOR STUDENTS	CONTENT AREA STANDARDS
Citizen 3a Collaborator 4b, 4c Designer 5b Facilitator 6a, 6c	Empowered Learner 1c, 1d Innovative Designer 4a, 4c, 4d Computational Thinker 5a, 5d Creative Communicator 6c, 6d Global Collaborator 7c, 7d	Students will engage in computational thinking, applying their math concepts to help solve an authentic problem. Students will engage in computer science concepts.

Preparation

Materials:

✦ Spreadsheet program (Microsoft Excel, Google Sheets, Numbers, or similar)

✦ Optional: Coding program (Scratch or similar)

Advanced Preparation:

✦ Prepare examples of automation and algorithmic thinking.

Instructions

Show students several examples of automation and explain the meaning of the words *automation* and *algorithmic thinking.* Show several simplistic algorithms, such as a cooking recipe. Ask students to list other examples of automation and algorithmic thinking (2–3 minutes).

Explain that students will interview staff members to discuss challenges they are facing. Inform students that they will be working with their group to solve one of the identified issues by automating the task and designing an algorithm for staff members to follow. Students will use a spreadsheet program or coding platform to design algorithms that help automate common tasks. You may want students to sign up to interview specific staff members so nobody gets bombarded by multiple students.

Split students into small groups (three or four students) and provide them time to begin brainstorming questions to help them identify challenges they can solve.

Students email staff members to schedule interview times during the next class period. Alternately, students can create an online form using Microsoft Forms or Google Forms and distribute it to students and staff. This form includes questions to help students determine how to help employees automate their task.

Provide time for students to conduct their interviews and begin creating plans.

Provide time for students to develop algorithms in their spreadsheet or coding platform and begin testing them.

Students facilitate beta testing with staff members. During this time, students should develop a survey for staff members to complete, focusing on design issues or challenges, bugs, usability, and clarity of instructions.

Provide time for students to tweak their algorithms and/or code, addressing the issues from their customers.

Provide ways for students to publish their algorithms and begin testing with other employees, other schools, or community members.

Extensions

Students could locate leaders in their community or global leaders online and build algorithms for them. Students could focus on the career path they would like to explore and contact workers in that field.

ONLINE AND REMOTE LEARNING ADAPTATION

In an online learning environment, students can host an online form and allow teachers and staff members to submit common issues they face in their job role. Students can schedule videoconferences with individual staff members to learn more about their specific issues and/or needs. Students collaborate via videoconference tools or online discussion forums to create their algorithms, using Microsoft Excel online or Google Sheets. Students can use pair programming in Scratch, Code.org, or most other coding platforms. Pair programming is commonly used by professional programmers, and it typically involves two programmers working side by side with one writing the code while the other checks and describes it. In this adaptation, one student would create and explain the code, while the other would check the code for accuracy. Some programs allow for commenting, or students can learn how to add comments in the code. Next, students can create their algorithm or code and create a video in Flipgrid or their LMS to present their product to the teachers or staff members.

LESSON PLAN 3.2 **Pick Your Path Stories**

Subject: ELA, Science, or Social Studies

Target Grades: 3–8

Duration: 2–3 class periods

Pick Your Path stories are a way for students to have fun with writing while demonstrating their knowledge of content area topics. Teachers can incorporate research, novel studies, historical events and people, and other concepts. This project also provides students opportunities to practice logic needed for coding, with a variation on conditionals (if/else statements). This is a great opportunity for ELA and science or social studies teachers to collaborate, with students learning about concepts during their content classes and then writing the stories in English class.

Objectives

Grades 3–5 students will be able to:

✦ Write detailed narrative stories for an intended audience.

✦ Explain how they used literary elements and figurative language such as anachronism, metaphors and similes, hyperbole, and so on to make their stories more interesting.

✦ Demonstrate knowledge of content in their subject area.

Grades 6–8 students will be able to:

✦ Write detailed narrative stories for an intended audience, with attention to plot and establishing a clear point of view.

✦ Explain how they used literary elements and figurative language such as anachronism, metaphors and similes, hyperbole, and so on to make their stories more interesting.

✦ Demonstrate knowledge of content in their subject area.

Standards Implemented in Lesson 3.2

ISTE STANDARDS FOR EDUCATORS	ISTE STANDARDS FOR STUDENTS	CONTENT AREA STANDARDS
Citizen 3a, 3c Designer 5b Facilitator 6d	Knowledge Constructor 3a Creative Communicator 6d Global Collaborator 7c	Students will utilize their ELA narrative writing skills to write their stories. They will incorporate content vocabulary and information to demonstrate their knowledge of historical events, science concepts, or any other content.

Preparation

Materials:

✦ Presentation software (Google Slides, Google Forms, or similar)

✦ Optional: Pick Your Path Story Map (**bit.ly/2AVawVn**)

Advanced Preparation:

✦ Provide students with lists of online resources, along with guidelines for conducting safe and effective research.

✦ Provide students with a rubric that demonstrates the content area standards and topics that need to be included in the story.

Instructions

Ask students about their background knowledge with Pick Your Path–style books, such as *Pick Your Quest: King Tut's Adventure* by Connor Hoover. Provide this story for students to read. Allow about 10–15 minutes for students to read and choose one adventure in the story, then write a short reflection about their experience.

Ask students to share their experience with a partner. Discuss how their stories and endings were the same or different. Demonstrate how students will create their own stories using presentation software or Google Forms. Show how to link from slide to slide in Google Slides, for example, or to add sections in Google Forms. Be sure to practice this yourself prior to implementing this lesson for a smoother demonstration. Educator Amanda Anderson created a tutorial video you can watch at **bit.ly/3135nnG**.

Divide students into groups to begin writing their stories on paper or in an online document. Inform students that their story will need approval prior to adding it to their slideshow. Provide students with the Pick Your Path Story Map (optional). This is also a good time to provide writing mini-lessons to review literary elements and writing techniques. You can also include videos and other resources to review the science or social studies content.

Allow students class time to write and post their stories in your LMS, Flipgrid, or Padlet for peer reviews. Peer review is important in this lesson, as it is easy to make errors in their story maps. After incorporating corrections and suggestions from peer review, students publish their stories online. This can be a class blog, website, or other online source for their schoolmates and families to read, creating an authentic audience.

▶ Extensions

Students can add drawings and pictures to their stories to make them more interesting. Students can use a coding platform, such as Scratch, to make their stories interactive.

ONLINE AND REMOTE LEARNING ADAPTATION

During a class videoconference, explain the project and provide examples. Provide a writing mini-lesson about literary and writing elements you would like included in the stories. Distribute the example story and provide a discussion board for students to reflect on it after reading. Create writing groups, and ask students to create a shared document using Google Docs or Microsoft Word online to brainstorm ideas for how to include the content instruction in their stories. Provide time for students to begin writing collaboratively. Lead another videoconference to distribute the Pick Your Path Story Map and explain how to create the Pick Your Path story in the platform you chose (slideshow, forms, etc.). Provide students time to work with their groups and complete the story. Students can post their completed stories in their LMS or other online platform such as Padlet or Flipgrid.

LESSON PLAN 3.3 Invent It Challenge

Subject: Science/ELA

Target Grades: K–12

Duration: 3–4 weeks

Sponsored by the Smithsonian and Cricket Media, the annual Spark!Lab Dr. InBae and Mrs. Kyung Joo Yoon Invent It Challenge features a different challenge each year, such as creating an invention to provide healthy food to everyone around the world (**inventitchallenge2020.epals.com**) or an invention that enhances daily life and activities of older adults (**inventitchallenge2019.epals.com**). Students engage in the design process as they explore their creativity and engineering skills to create an invention that helps solve a global problem (Figure 3.1).

3.1 A second-grade student designed this Popsicle holder for the 2014 Invent It Challenge.

Objectives

Grades K–12 students will be able to:

✦ Engage in the design process.

✦ Demonstrate their knowledge of science concepts while creating a realistic invention.

- Conduct research to learn more about global problems.
- Create a presentation and marketing material to help "sell" their invention.

Standards Implemented in Lesson 3.3

ISTE STANDARDS FOR EDUCATORS	ISTE STANDARDS FOR STUDENTS	CONTENT AREA STANDARDS
Citizen 3a, 3c Collaborator 4a, 4c Designer 5b Facilitator 6a Facilitator 6c, 6d	Digital Citizen 2b, 2c Knowledge Constructor 3b, 3d Innovative Designer 4a, 4b, 4c, 4d Creative Communicator 6a Global Collaborator 7b, 7c, 7d	Students will use ELA research standards and work through the engineering and design process. They will explore other science content standards such as physics, life science, and other areas specific to their invention.

Preparation

Materials:

- Spark!Lab Invent It Challenge rules and resources (**inventitchallenge2020.epals.com/how-to-enter**)
- Lists of research websites and databases

Advanced Preparation:

- Preview the Invent It Challenge website for the appropriate contest year to ensure that you understand the rules and download all the necessary materials.
- Create or locate a list of student-friendly research websites and databases.

Instructions

Ask students what they already know about inventions. You can relate this to the *Shark Tank* TV show and bring in examples of student inventions from previous years. Ask students what they notice about each invention. Provide students with information about the current year's challenge.

Divide students into groups and give them time to brainstorm inventions that will help solve the challenge.

Students conduct additional research to determine if their invention will work and if anything similar has already been created. If students create an invention that already exists or is not feasible to make, begin asking them questions and providing research opportunities that will help them arrive at this conclusion themselves.

After each group finalizes their idea, have them create a supply list of materials they need to build their prototype.

Students work though the engineering and design process, as well as create prototypes of their invention.

Students analyze data and begin discussions (in an LMS board or through a videoconference tool) about how to revise their prototypes.

Students revise their prototypes based on feedback. They will create a marketing campaign for their invention. This can include podcasts, commercials, flyers, and other marketing materials. Determine which students are interested in entering the contest, obtain parent permission, and submit their inventions.

Extensions

Students can apply for patents for their invention and learn about the patent process.

ONLINE AND REMOTE LEARNING ADAPTATION

Students may need to work individually or create their own prototypes at each group member's house. Equity is also something to consider, as some students may not have the supplies needed to complete their prototype. As an alternative, you could ask students to design their invention without creating a prototype or to design their prototype using 3D printing software, such as Autodesk Tinkercad. Another option is to mail supplies to the students; however, this places extra work (and possibly financial burden) on the teacher. The fourth option is to consider projects that will be easy to create using regular household objects or materials found in nature. Students will work collaboratively using a shared online document and videoconference with team members if permitted by your school or district.

LESSON PLAN 3.4 Student-Led Citizen Science

Subject: Science/Math

Target Grades: 6–12

Duration: 1–2 weeks

Students will have the opportunity to engage in citizen science projects, which enlist the general public to help research scientists with data collection. Initially, students will participate in one or more existing projects using sources such as Zooniverse or NASA. For example, the Chimp&See project on Zooniverse tasks students with classifying animals in video footage of countries across Africa. In this particular project, scientists utilize the citizen science data to better understand chimpanzee behaviors and how they interact in their environment. After students document the research design and data collection process for the project they select, they will design their own citizen science projects and enlist the help of other students around the world.

Objectives

Grades 6–12 students will be able to:

✦ Identify the methods and data in an existing citizen science project.

✦ Apply science content knowledge while designing their projects.

✦ Create their own citizen science project and data collection process.

✦ Create a website to host their scientific research.

Preparation

Materials:

✦ Citizen science websites, such as Zooniverse (**zooniverse.org),** NASA (**science.nasa.gov/citizenscience**), or National Geographic (**nationalgeographic.org/idea/citizen-science-projects**)

- ✦ Website creation platform (Google Sites, Weebly, WordPress, or similar)
- ✦ Data Collection Sheet (**bit.ly/31Yu72H**)
- ✦ Citizen Science Project Planning Sheet (**bit.ly/3e1E95k**)
- ✦ Citizen Science Project Rubric (**bit.ly/2YXFjdQ**)

Advanced Preparation:

- ✦ Preview some citizen science projects and select several that align with your course content standards.
- ✦ Locate resources for additional relevant projects so students choose one of your options or locate another project that aligns with course content.

Standards Implemented in Lesson 3.4

ISTE STANDARDS FOR EDUCATORS	ISTE STANDARDS FOR STUDENTS	CONTENT AREA STANDARDS
Leader 2a Citizen 3a, 3c Collaborator 4a, 4c Designer 5a, 5b Facilitator 6a, 6c, 6d Analyst 7a	Empowered Learner 1b, 1c Digital Citizen 2b, 2c, 2d Knowledge Constructor 3a, 3d Innovative Designer 4a, 4b, 4d Computational Thinker 5a, 5b Creative Communicator 6a, 6b, 6c, 6d Global Collaborator 7a, 7b, 7c, 7d	Students will engage in a variety of science content, as well as use the scientific process and scientific research. Students will use ELA skills such as informative writing, as well as speaking and listening skills to inform others about their citizen science project.

Instructions

Ask students what the term *citizen science* means to them. Provide 1–2 minutes for students to discuss with a partner or team. Provide a few examples of citizen science projects and ask students to determine the purpose of these projects. Why are scientists enlisting the help of citizens? Inform them that they will be creating their own citizen science projects. Provide a list of relevant citizen scientist projects from Zooniverse, NASA, or other sources.

Group students and allow them to select the project they feel is most interesting. Provide a class period for students to begin engaging in the citizen science project and recording their experience on their Data Collection Sheet. Provide an additional 15–20 minutes for students to discuss their experience with their teammates and compare data in an online discussion forum. You may want to allow students to engage in more than one project, to understand different methods they can consider when designing their own.

Distribute the Citizen Science Project Rubric and Project Planning Sheet and provide time for students to begin brainstorming their citizen science projects and how they will host their project online. If possible, secure some grant funds for this project ahead of time in case students need supplies, such as livestream or time-lapse cameras. Inform students their project could also require students to collect samples or data in their own area, allowing them to track and compare research in various locations and regions.

Provide time for students to videoconference with experts. They can ask questions to ensure that they are setting up an ethical and valid research project. Students will make changes to their plan based on the feedback they receive.

Next, students begin creating directions, their website, and any forms that will be used to collect data from their citizen scientists. Each group will create a marketing plan to recruit citizen scientists.

Students create a website with Google Sites, Weebly, or another tool and begin marketing to ensure citizen scientists are helping track data for them. Students share their projects with at least one other group and collect feedback.

Provide class time for students to check their data on a weekly or monthly basis. Students should create reports to share with the class, as well as with the citizen scientists who are helping with their research.

Extensions

Students videoconference with an expert during each step of their citizen science project. This person serves as a guide and mentor to ensure that students are using modern tools and methods to conduct their research.

ONLINE AND REMOTE LEARNING ADAPTATION

Relay directions during a videoconference call and use breakout rooms to allow groups time to discuss the citizen science projects. If breakout rooms are not possible, students can use a discussion in their LMS or in an online platform such as Padlet. Students can use a shared online document to begin planning their citizen science project and check in during videoconference calls to ensure that all teammates understand the goal of their project. You can schedule weekly videoconference check-ins with each group, to ensure that they remain focused and are creating a valid research project. When each group completes a draft project, they can post it in an LMS discussion and allow others to provide feedback.

Coach's Connection

As coaches, making connections not only allows us to gain new knowledge in our practice but also helps us connect teachers with others who have knowledge about certain topics or are interested in project collaboration. Many of the projects I initiate with teachers were brought to my attention by coaches and educators in my PLN. So where can coaches find connections?

One of the most valuable resources to me as a coach has been the International Society for Technology in Education (**istg.org**). ISTE conferences offer numerous coaching sessions, including the Edtech Coaches Playground, which is a three-hour interactive event with poster-style presentations. This playground is always packed with enthusiastic coaches sharing ideas and resources, making it my favorite part of the conference each year. A PLN meeting and other networking opportunities are always available to coaches throughout the conference. Additionally, coaches can connect through the Edtech Coaches PLN Network. This network offers forum discussions, monthly newsletters, monthly Twitter chats, and book studies. The annual ISTE Conference & Expo also includes a coaches membership meeting and several other networking events. In addition to ISTE, the Future of Education Technology Conference (FETC, **fetc.org**) offers a coaching track. Attendees can search the program to locate sessions specific for coaches.

Most states also offer an ISTE affiliate consisting of edtech leaders from across the state. Through these groups, coaches and other district leaders are able to make strong connections, receive feedback when making purchasing decisions, advocate for technology at the state and federal level, as well as organize events and meetups to share ideas and resources. While not all affiliates are alike, I highly recommend joining your affiliate and getting involved.

Facebook also offers groups to support coaches, such as the Edtech Coaches Unite PLN group and the Future Ready Instructional Coaches group.

Effective Long-Distance Collaborations and Professional Learning

The Connected Learner standard encourages edtech coaches to "pursue professional learning that deepens expertise in the ISTE Standards in order to serve as a model for educators and leaders" (ISTE Standards for Coaches, 2a, 2019). ISTE provides some avenues and resources to help coaches develop a deeper understanding of these standards:

✦ ISTE U. This platform (**iste.org/learn/iste-u**) provides coaches and other educators training in the ISTE Standards and other current technology topics, such as AI in education. Although there is a fee, these online courses are taught by content experts and offer graduate credit for an additional fee.

✦ ISTE Blog. With content by edtech leaders from around the world, the ISTE blog (**iste.org/explore**) regularly features posts focused on the ISTE Standards, among other topics.

Similarly, the Connected Learner standard encourages us to "actively participate in professional learning networks to enhance coaching practice and stay current with emerging technology and innovations in pedagogy and the learning sciences" (ISTE Standards for Coaches, 2b, 2019). Within my own district, opportunities are rare for coaches to attend professional learning, as we are tasked with providing our own training. For many coaches, looking beyond our schools or districts might be our only option for continuing our education and receiving training to increase our knowledge and help maintain current teaching certifications.

In addition to the opportunities afforded by an ISTE membership, you could look into massive open online courses (MOOCs) and the Future Ready Schools network (**futureready.org**). If you aren't familiar with MOOCs, they typically feature reading, videos to watch, and discussions. Once or twice a year, for example, the Friday Institute for Educational Innovation through North Carolina State offers a free MOOC to edtech

coaches called Coaching Digital Learning: Cultivating a Culture of Change (**bit.ly/3cUQ9pv**). Meanwhile, the Future Ready Schools organization offers PLN networking opportunities and professional development to district leaders, including coaches.

OVERCOMING BUDGET HURDLES

Rather than finding professional learning opportunities, is your challenge getting there or funding the cost? Many budgets do not allow for educators and district leaders to attend conferences, especially for out-of-state events. Here are some tips to help you advocate for your continued learning:

➤ Share your current professional learning. When submitting a proposal to attend a conference or professional development training, describe what you currently are doing to improve your knowledge and coaching strategies. This can include books you read, Twitter chats you participated in, edcamps you attended, and so on. Describe what you have accomplished as a result of these sessions and their limitations. This helps demonstrate that you will participate fully in the event and the impact it will have on your district's schools and teachers.

➤ Share helpful sessions. Provide a list of the available sessions that you plan to attend. Give a short description of each session and how you think it will benefit you and your school or district.

➤ Share your plans for after the event. Provide a plan for how you will share information with teachers. For example, you could host a mini-conference or edcamp, provide a series of trainings, create a train-the-trainer initiative with two or three teachers at each school, or make more informed decisions when purchasing products and programs.

➤ Be thrifty. Are you able to get a roommate? Use your own frequent flyer points? Making an effort to reduce costs helps encourage leadership to provide the remainder of the funds. Additionally, if you are in the process of writing a larger grant, you may be able to include this in your proposal. Many grants allow funding for educators to attend conferences with sessions that match the grant subject area.

Help Teachers Make Connections

As a coach it is easy to do things for the teachers, but is more impactful to show them how to find resources and assistance on their own. Previously, I worked for a professional development director who instructed our coaching staff that we should be "working ourselves out of a job." There will always be a need for coaches and new products and strategies for us to teach, but what teachers will find most valuable is if we can help them become self-reliant and confident in their abilities to use technology in their classroom—just as they are trying to help their students become empowered learners. The following ideas will help you inspire and empower teachers to make connections and begin exploring and researching technology tools and strategies on their own:

✦ Try an edcamp unconference. One of my favorite ways to help teachers make valuable connections is by hosting an edcamp or other type of unconference. I am currently a co-founder and organizer for three edcamps in Florida that have brought educators together from more than thirty districts around our state. Edcamps energize and inspire teachers to try new ideas and provide connections they might not be able to make in their own district. For example, I have a friend who is the only game design teacher in her entire district. This can get lonely, but at an edcamp she may meet others in similar positions and begin a collaboration that is mutually beneficial. One benefit of hosting an edcamp rather than a traditional conference is that the Edcamp Foundation (**edcamp.org**) provides financial support, as well as guidance for creating your event. Another benefit of an edcamp is that the session topics are determined based on the participants' interests. This not only makes the event more exciting with the possibilities and potential, but it also ensures that the content will be timely and relevant to everyone who attends.

✦ Create a Twitter chat or hashtag for your school or district. The chats do not need to occur weekly or even monthly, but they will help teachers connect with others outside of their own team and school. You can also create a hashtag with monthly themes.

✦ Incorporate PLNs into your PD. You can easily incorporate PLN development during the professional development training that you offer. Allow participants to reflect on areas of need or where they are lacking in training or information, and provide time and resources for teachers to find groups, chats, blogs, and individuals to connect with online.

Create a Shared Vision

Collaborations and networking are often the first step toward a shared vision that leads to positive change. The ISTE Standards for Coaches encourage this with the Change Agent standard. Indicator 1a states that coaches should "create a shared vision and culture for using technology to learn and accelerate transformation through the coaching process," while 1e states that coaches should "connect leaders, educators, instructional support, domain experts and solution providers to maximize the potential of technology for learning" (ISTE Standards for Coaches, 1a and 1e, 2019).

This standard can only be accomplished with efforts to include all stakeholders in the strategic planning process. In my current district, we were fortunate to purchase a data analytics program that helps our department determine shared goals that can make the biggest impact. We then communicate these goals annually to school leaders, educators, parents, and students. Even with this process in place, however, there are always opportunities to improve.

For example, who in your school or district do you think feels on the outskirts of planning or often disregarded? I suspect positions these individuals fill would not vary much between our districts. These educators and support staff employees can provide us with insights that we would not receive otherwise, however, and could inform our school's goals. They meet regularly with individual or small groups of students, as well as parents, and have access to valuable information. To truly create a shared vision, all stakeholders need to feel part of the planning process. Even a short survey to ask for opinions and ideas can go a long way to make staff members feel

supported and appreciated. Additionally, there is a tremendous amount of research, including that discussed in *The Wisdom of Crowds* by James Surowiecki, to show that the collective voice of many is more beneficial than the voice of a few experts.

Connect with Stakeholders

Reach out beyond your usual connections: Include instructional support staff in all communication with teachers. I have never had anyone complain about being included, but I have definitely received complaints when I neglected to include someone. Additionally, notify them of any educational technology training opportunities you are offering. In my Google Drive account, I have a folder with documents listing all staff members at my schools. When I communicate through email or other means, I review those documents to ensure that I do not miss anyone.

Communicate Your Shared Vision

The best way to ensure that your vision is understood and remembered is to share it in numerous ways and often. Here are some ideas for how to do this:

✦ Train the trainer. The most effective method I have used to communicate a shared vision and goals is through a Train-the-Trainer initiative. In one district where I worked, we asked school administrators to select two teachers to be a part of our School Technology Leader program. Our first criterion was that these individuals were great teachers and well-liked amongst staff. We wanted teachers who could inspire others and who others would feel comfortable seeking out. Technology expertise was helpful but not as important as the other criteria. These technology leaders participated in yearlong training sessions, half face-to-face and half virtual, and they were required to present a certain number of sessions back in their schools.

- ✦ Offer consistent professional learning. I recommend creating a rubric to ensure that you are communicating a shared vision during all professional learning sessions. This should be shared with all edtech coaches and trainers, ensuring that you are meeting the needs of your teachers and delivering a consistent message. Often in schools, initiatives come and go, so teachers may tune out when we communicate a new philosophy or learning model. By providing a consistent message that teachers hear regularly in their training, teachers are more likely to see its relevance.

- ✦ Reach out through newsletters, websites, and other communications. Again, getting the message out in as many places as possible is key. The shared vision should definitely be included on your public and internal district website, along with any flyers distributed to parents and community stakeholders. Additionally, if you send a newsletter to teachers, this is a great way to communicate your progress toward goals and highlight teachers and schools who are finding unique and innovative ways to support your vision.

- ✦ Using these strategies consistently will communicate ideas to all stakeholders and help bring your vision to fruition.

The best way to practice the strategies in this chapter is to get started with making connections. Using the hashtag #AuthenticEdVentures, share projects you have in the works, and let's work together to make them a success.