INQUIRY-BASED TEACHING WITH PBL

34 Projects

BY
JACQUI MURRAY
AND
ASK A TECH TEACHER

Inquiry-based Teaching

With PBL

34 Projects

by Jacqui Murray and Ask a Tech Teacher

Introduction

Today's classroom is all about authentic lessons that are inquiry-driven, student-centered, with technology that is critical but invisible—just another part of the lesson. The new educational mandates require students share, show evidence of learning, collaborate on outcomes, and publish their work.

The question we get often from teachers—both new and seasoned—is: *How do you teach technology skills (i.e., the use of foundational programs like word processing and keyboarding) in an inquiry-based classroom?*

Inquiry-based teaching requires a mindset that makes curiosity a cornerstone of learning, that organizes a classroom to encourage that, and forms lessons that value and ultimately assess it. Before we get into how this book accomplishes that, let's discuss:

The Inquiry-based Teacher

The Inquiry-based Classroom

The Socratic Method

Project-based Learning (PBL)

The next four sections detail what an inquiry-based teacher is, how s/he can set up an inquiry-based classroom, and how to implement this using either the Socratic Method and/or project-based learning.

The Inquiry-based Teacher

Inquiry is considered an effective education strategy that develops passionate, life-long learners. It sounds simple enough--ask questions and observe answers—but it's much more. You listen with all your senses, respond to what you heard (not what you wanted to hear), keep your eye on the class Big Ideas, value everyone's contribution, and plug into the class's energy. You step in when needed and step aside when required. You aren't a teacher, rather a guide. You and the class find your way from question to knowledge together.

Because everyone learns differently.

You use a textbook as a map to show how to get from here to there, not as a to-do list.

In an inquiry-based classroom, you know where you're going but not quite how to get there and that's a good thing. You are no longer that teacher who stood in front of rows of students and pointed to the blackboard. You operate well outside your comfort zone as you try out the flipped classroom, student-led conferences, gamified learning, SEL, peer feedback, and more--and are thrilled with the results.

And then there's the issue of assessment. What your students accomplish can't neatly be summed up by a multiple choice test. When you review what you thought would assess learning (back when you designed the lesson), none measure the organic conversations the class had, the risk-taking they engaged in to arrive at answers, knowledge transfer that popped up independent of class time. You realize you must open your mind to learning that you never taught--never saw coming in the weeks you stood amongst your students guiding their education.

Let me digress. I visited the Soviet Union (back when it was one nation) and dropped in on a classroom where students were inculcated with how things must be done. It was a polite, respectful, ordered experience but lacked cerebral energy, without the joy of learning and the wow factor as students independently figured out how to do something. When that nation ended, I arrived at different conclusions than the politicians and the economists. I saw a nation starved for creativity. Without creativity, learning didn't transfer. Without transfer, it collapsed in on itself like a hollowed out orange.

So how do you become an inquiry-based teacher? Here's advice from fellow teachers:

1. *ask open-ended questions and be open-minded about conclusions*
2. *provide hands-on experiences*
3. *use groups to foster learning*
4. *encourage self-paced learning*
5. *be open to the student who learns less but deeper as well as the student who learns a wider breadth*
6. *differentiate instruction*
7. *look for evidence of learning in unusual places. It may be from the child with his/her hand up or the learner who teaches mom how to use email.*
8. *understand assessment comes in many shapes--a summative quiz, a formative simulation, a rubric, or a game that requires knowledge to succeed. It may be anecdotal or peer-to-peer. Whatever approach shows students are transferring knowledge from your class to life is legitimate.*

9. *be flexible. Class won't always (probably never) go as your mind's eye saw it. That's OK. Learn with students. Observe their progress and adapt to their path.*
10. *give up the idea that teaching requires control. Refer to #8--Be flexible*
11. *facilitate student learning in a way that works for them. Trust they will come up with the questions required to reach the Big Ideas.*

In the end, know that inquiry-based teaching creates life-long learners. These are the individuals who will solve the world's future problems.

The Inquiry-based Classroom

Let's say you consider yourself an inquiry-based teacher. The next step is to make your classroom fit that model.   Until the inquiry-based classroom became popular, the goal of teaching seemed to be to follow a well-trod path rather than to achieve an important goal. When the concept of the inquiry-based classroom arrived, you came alive. This was what you'd hoped to do when you started teaching. But how do you turn a traditional entrenched classroom into one that's inquiry-based?

You do it one step at a time. Here are fifteen.

Remember: Inquiry is about curiosity and exploration, not about following a to-do list. Pick which e work for you. With these, morph your classroom from passive to sparkling, from boring to brilliant.

Pages intentionally omitted

Table of Contents

Pages intentionally omitted

#3—Practice Letters on the Internet

Collaborations	OVERVIEW	Troubleshooting
• *Communication* • *Information fluency* • *Reading* • *Research* • *Writing*	*Students review letters and words learned in class by participating in activities on letter/word websites* ***Appropriate for grades K,1***	How do I prevent students from rushing through stories? *Read the story silently, then engage students in a conversation.*

Time Required	NETS-S Standards
20 minutes, repeat	2, 3

Examples of webtools that teach letters to students. If you can't find these by Googling the website, visit Ask a Tech Teacher and their Letters resource page:

- *Alphabetimals–learn the alphabet with animal sounds*
- *Find the letter–easy, medium, hard*
- *Fischer Price Learning Letters (app)*
- *GeoGreeting*
- *Learn Letters with Max (video)*
- *Learn Letters (app)*
- *Starfall Letters*
- *Spin and Spot Safari — explore letters through a safari (app)*
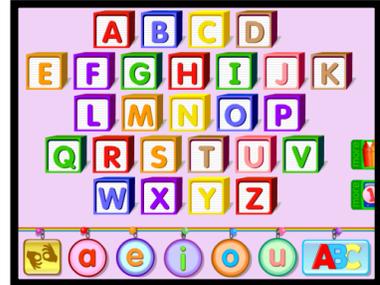
Steps

_____Have sufficient helpers when using online websites. This is particularly important for young users who are easily frustrated.

_____Review letters in the order they are introduced in the classroom by showing them on the class screen.

_____Discuss what 'letter' means. What happens when they are combined? What is their importance in words? Sentences? Paragraphs and stories?

_____List letter recognition websites on the class internet start page so students can access them with a click.

_____List letters students will work with in class to avoid confusion. For example, if students start with c, o, a, d, and g, list those.

_____Demo each website on the class start page so younger students will be comfortable using them.

_____This activity is self-directed. Students work as independently as possible. Encourage students to trace the

letters with their finger on the screen, say them out loud, notice space between words and upper/lower case. When ready, students can count syllables.

_____If this is students' first time on the internet, review basics before beginning: how to select a link, how to go back to where they were, how to use tabbed internet to toggle between websites, how to use *Favorites* (if appropriate).

_____Remind students of best practices for internet use: never click ads, stay on the appropriate website, use tab on internet toolbar to return to main page.

_____When students are ready to move on to words, use the class screen to share (these can be found by searching your internet browser or visiting Ask a Tech Teacher's Reading resource page):

- *Aesop Fables—no ads*
- *Aesop's Fables*
- *Audio stories*
- *Classic Fairy Tales*
- *Fairy Tales and Fables*
- *Listen/read–Free non-fic audio books*
- *Owl Eyes (classics)*
- *Starfall*
- *Stories read by actors*
- *Stories to read for youngsters*
- *Storyline*
- *Unite for Literacy*

or your favorite site. See the list in a prior lesson.

_____Follow words from left to right, top to bottom, and page by page. Recognize that spoken words are represented in a written language with a specific sequence of letters. Understand that words are separated by spaces when printed. Recognize and name upper- and lowercase letters.

_____Have students follow a sentence on the screen with their finger. Point out the space between words and the punctuation after a sentence.

_____Encourage students to work independently. They can read aloud (in a whisper) if this helps.

_____Discuss their thoughts as a group or with the class. What was different about digital books from a traditional print book? What did they like less? More? Why?
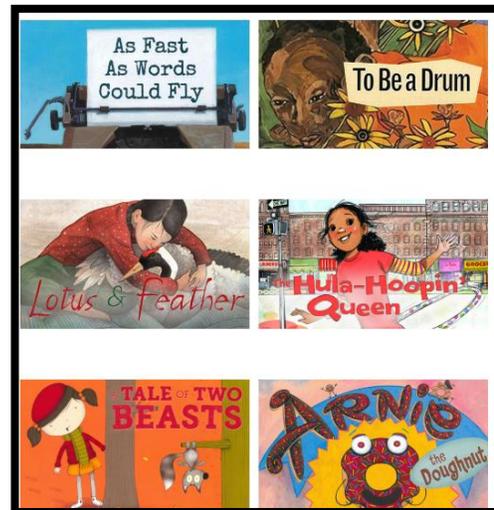
Extensions:

Have students read stories by themselves, without you joining them on the class screen. If they start one they don't like, they can move on to another choice.

Visit Ask a Tech Teacher and select from their reading resources (many free).

Pages intentionally omitted

#5—I am a Puzzle

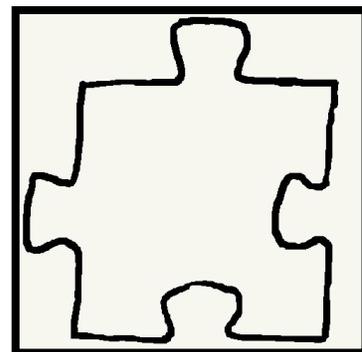| Collaborations	OVERVIEW	Troubleshooting
• *Art* • *Critical thinking* • *Writing*	*Visually represent who the first grade student is and how s/he fits into the Big Picture*	The pieces don't fit together well. *(That's OK. Isn't that the way life is?)*
Time Required 30 minutes (2 sessions	**NETS-S Standards** 2, 6	

Examples of drawing webtools. If you can't find these by Googling the website, visit Ask a Tech Teacher and the Art-Drawing resource page:

- *ABCYa Paint*
- *Doodle Buddy*
- *GIMP*
- *KidPix*
- *Paint*
- *TuxPaint*
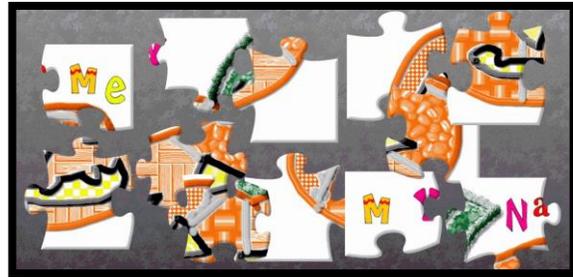
Steps

_____Nothing makes first graders happier than sharing who they are. Use that to facilitate technology practice, writing skills, and art while creating a visual quilt of your class.

_____Why a puzzle piece? Discuss this with students. Who are they? What do they remember that made a big difference in their lives? The arrival of a sibling? The death of a beloved dog? The school they went to? Aren't most memories when they are part of something else? Discuss how who they are is a culmination of many decisions, many activities, small and large.

_____Extend the discussion to the class. It is made up of all children. What it is depends upon who they are daily. Last year's first grade class was different because of its unique mix of students.

_____This can be an opportunity for serious discussions on behavior issues, disagreements among students, cultural clashes that are otherwise sensitive to discuss with first graders.

_____Create the puzzle piece template from your favorite drawing program. You can fill it with a solid color, color in it, or add a texture. There are also many shapes. You can create one of each and let students choose which they want.

_____Save as a .jpg to student network folder.

_____Have each student open the template in the school drawing program.

_____Draw a picture of themselves using the drawing program's art tools. Discuss mouse use as they draw and the need to click, drag, drag-and-drop to make the pencil or paint brush work.

_____Save to network folders and print.

_____Cut the puzzle pieces out. Paste them on your classroom wall in a shape your students select (like the tree in the inset). It can be a traditional quilt, a border of interlinking pieces around the classroom, or an object.

_____When done, ask students to reflect on this. What did they learn?

Extension:

Adjust pieces throughout the year to reflect seasons, class events, holidays, or whatever suits the class.

Besides the picture, add one sentence about who they are and one sentence about what they like in first grade (or pick a topic that fits your classroom discussion).

Have students make multiple puzzle pieces with snippets of information about themselves. Print individual quilts of what suits each child.

Create a bulletin board with all puzzle pieces displayed. I do this on a door in the classroom, shape it like a student and call it the 'Computer Student'.

Notes

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Pages intentionally omitted

#3—Classify Animals Like a Pro

Collaborations	OVERVIEW	Troubleshooting
• *Critical thinking* • *History (or other)* • *Researching* • *Science*	*Use a graphic organizer to visually organize animal classifications* ***Appropriate for Grades 4-6***	There are no thumbnails. *No problem. Review how to resize images to fit in the bubble.*

| Time Required	NETS-S Standards
30 minutes	2, 4, 6

Examples of graphic organizer webtools . If you can't find these by Googling the website, visit Ask a Tech Teacher and the Graphic Organizer resource page:

- *Education Oasis Graphic Organizers*
- *Eduplace Graphic Organizers*
- *Enchanted Learning Graphic organizers*
- *Holt Graphic organizers*
- *Scholastic Graphic Organizers*
- *Teacher Visio Graphic organizers*
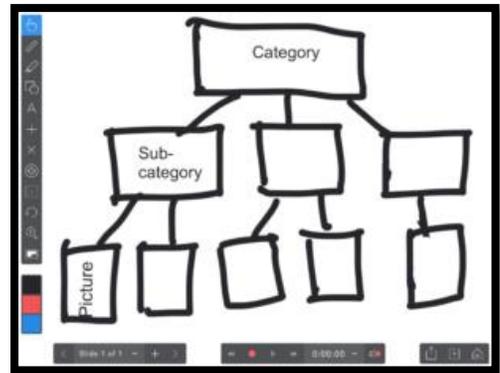
Steps

_____An important competency for all learners is to be able to organize thinking, make connections, and draw conclusions based on available information.

_____One way to accomplish that is with graphic organizers—two-dimensional visual arrays that show relationships among concepts. Graphic organizers sort information to be learned, connect it to what is known, and allow the reader to interact with the text.

_____Why are they effective? It's got to do with the human brain and its natural inclination to arrange information in categories. This approach is particularly helpful in breaking down text when students are reading new or complicated material.

_____This lesson mixes visual with written learning strategies, supporting different learning styles.

_____Demonstrate how a graphic organizer works on the class screen by having students suggest adaptations that have allowed animals to survive environmental changes. Add the framework; add the bubbles and link them as needed.

_____Students work in pairs (or groups) to come up with six animal adaptations and find pictures of them on the internet (remind students to pay attention to copyright protections on images as discussed in
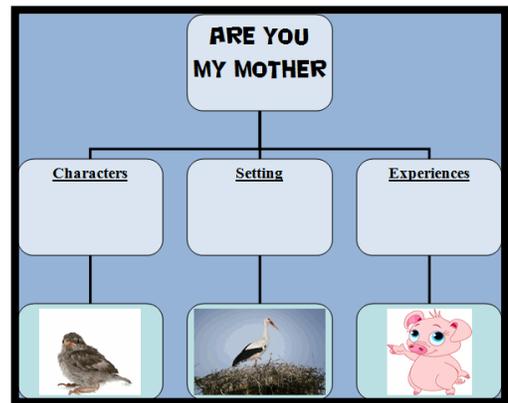
other lessons). Encourage them to think back to class discussions, independent research, and information in textbooks as they gather data.

_____Allow ample time for students to enjoy the plethora of amazing animal pictures that represent the selected adaptations.

_____Open your graphic organizer program. This could be MS Word, Google Draw, Popplet (for iPads), Bubbl.us, or another option of your choice. Add a heading at the top (name, teacher, date using Shift+Alt+D shortkey). Explain the importance of a heading on every document.

_____Insert an organizer diagram from one of the collections listed earlier in this lesson. It might look like one of the insets in this lesson.

_____Add 'Animal Adaptations' as the first tier.
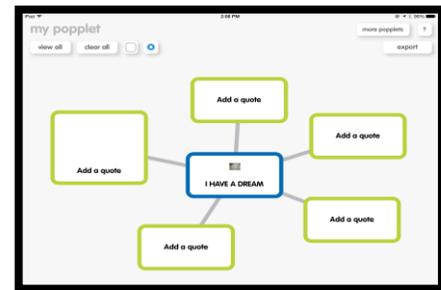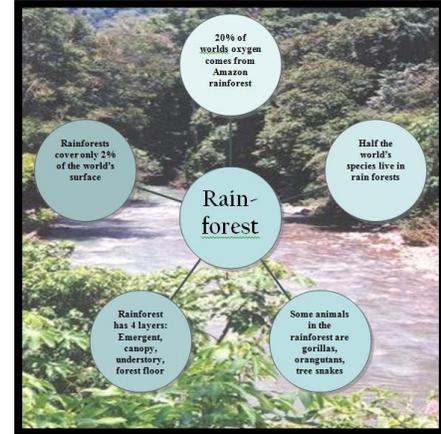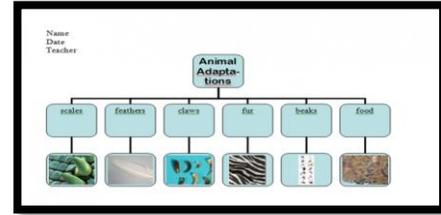
_____Add the six adaptations that each student group came up with as the second tier.

_____Add a bubble under the adaptation. Use Google images to find a picture that visually represents each adaptation. I suggest using the thumbnail for this bubble–it fits perfectly and saves a lot of resizing. Plus, it provides a link to information for future research

_____Save. Publish to class wiki, blog, or website, or have students upload to their own blogs.

_____Overall, this is a popular project easily completed in 30 minutes.

_____When done, ask students to reflect on this exercise. What did they learn? Could they visualize the variety of adaptations more easily with this approach than other methods?

Notes

_____

_____

_____

_____

_____

_____

_____

_____

Pages intentionally omitted