Intellectual Curiosity and Inquiry Based Learning in Elementary Classrooms.

How centering student curiosity leverages learning and engagement with PebbleGo.

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What makes children *want* to learn? Researchers agree that children are driven by their desire to question, to wonder, and to explore the world around them. Children are known to be questioners – they interrogate and ask questions to make sense of their world and to quench their curiosity. Children's ability to investigate and find answers for themselves are at the foundation of learning itself; it is curiosity that motivates learning, drives critical thinking, and fosters reasoning skills. We call this inquiry: the drive to learn; to ask and to answer questions. There has been significant research centered on inquiry-based instruction since the 1960s, and much of the support for inquiry models emphasize the importance of curiosity and investigation within elementary school classrooms. Research also demonstrates that in classrooms where teachers prioritize inquiry-based instructional models, students are more engaged with learning activities, develop deeper critical thinking skills, and have better outcomes in their education.

Why is Inquiry Based Learning Important?

Inquiry-based teaching and learning can be traced to constructivist learning theories settled in the work of Friere (1984), Vygotsky (1962), and Dewey (1910), which support students' sense-making through the lenses and experiences that they bring to their learning: their lives, their experiences, and their prior knowledge. Constructivism emphasizes students' role in the design of learning processes and underscores the importance of teachers in supporting and fostering student curiosity and investigation. Bruner (1961) also demonstrated that teaching through an inquiry approach fosters students' ability to become self-sufficient learners outside of the classroom context and to develop tools to become lifelong learners.

Hmelo-Silver, Duncan, and Chinn (2007) suggest that inquiry-based learning supported by teacher scaffolding is more effective than traditional, teacher-directed learning. When teachers provide opportunities for students to wonder, and then support those students in answering their own questions through guided exploration and scaffolding, students have more ownership over their learning. As students ask questions and research the answers on their own, teachers provide specific guidance and support to individual student explorations and provide models to inform student investigations, deepening the learning processes. Thus, Hmelo-Silver, Duncan, and Chinn conclude that when inquiry-based learning is positioned alongside strategic scaffolding from their teachers, this has a positive effect on students' learning, their knowledge development, critical thinking skills, intrinsic motivation for learning, and on regulating and understanding their own learning processes. (p. 105)

Additionally, elementary research models, such as iSearch, championed by Macrorie (1998), emphasize the importance of student voice in the research process, and creating opportunities for students to ask

their own questions within an established framework, and focus on their own wonderings to direct inquiry and research.

Linda Darling Hammond has researched inquiry-based and student-centered practices extensively, and with Hernández, Adams, Bradley (2019) developed a framework connected to deeper learning techniques that provide supportive classroom and school structures that support student learning. This framework states that "[deeper learning] practices enable students to develop versatile skills and mindsets that are powerful and relevant to their interests and life trajectories and, in doing so, to generate improved outcomes for student learning and the development of interpersonal and intrapersonal skills" (p. 5). Students who experience deeper learning practices, which includes characteristics of inquiry-based classrooms, experience significant benefits, which positively impact their academic and personal development, their growth, and their future outcomes. Thus, classrooms that support an inquiry stance and provide activities that promote inquiry mindset are critical to students' success and their ability to understand the world around them.

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Further, a growing research base supports the notion that students are engaged in their education when they are given choices and feel that the learning is relevant to them. Children's ability to connect with content, texts, and their world is elevated by those experiences and increases their engagement in the learning processes. (Deci & Ryan, 2008, 2016; Guay, Ratelle, & Chanal, 2008; Núñez & León, 2015). Student-centered classroom models that provide opportunities for students to research, explore, experiment, collaborate, make choices, and use their imaginations put students at the core of the teaching and learning, and gives students a sense of ownership in their learning, which further motivates and drives their desire to learn.

How Does PebbleGo Support Inquiry in the Elementary Classroom?

PebbleGo supports the implementation of inquiry-based learning in elementary school classrooms through its easily accessible platform offering nonfiction articles and a variety of ways to extend learning through videos, activities, and timelines to students in kindergarten through upper elementary school. Teachers can leverage the ease of access afforded by PebbleGo to allow students to be curious and to explore wide ranging topics, which positions learning and exploration directly in the hands of elementary school students and fosters an inquiry stance. Research shows that when teachers prioritize student inquiry and provide appropriate support, student learning, knowledge development, and critical thinking skills increase. Thus, when teachers apply these paradigms to their implementation of PebbleGo as a supplemental instructional tool, it launches student-centered inquiry into a hands-on exploration leveraging unique features like authentic read-aloud audio, easy navigation, and age appropriate, current content. Students can easily traverse through the network of articles, which provide both visual and audio cues to support its use with students who are emergent or beginning readers. Additionally, PebbleGo provides a creative and flexible space for advanced learners to extend their learning through additional exploration, and opportunities for upper elementary school students to peruse a variety of interesting and relevant nonfiction articles within a safe, reliable online environment that invites curiosity and independent investigation.

PebbleGo offers not only an extensive repository of curated content and articles, it also boasts a useful creation tool, PebbleGo Create, which can enhance classroom inquiry projects as a flexible and intuitive way for students to share what they have learned in digital posters and visual representations that are appropriate and applicable at all grade levels.

This tool, when paired with an inquiry-based classroom approach that emphasizes student curiosity and independent research opportunities, offers a powerful solution for teachers who seek to engage students as investigators, wonderers, and self-motivated learners.

Strategies for Implementing PebbleGo in the Kindergarten-6th Grade Classroom

Each of these activities, while noted in a specific grade range, can be adapted for various elementary levels based on curriculum, standards, and adaptations.

K-2nd Grade Activities

"Fiction vs. Nonfiction Investigation"

Use your core ELA curriculum to incorporate a variety of texts and discuss fiction versus nonfiction. For example, in a whole group setting, introduce a fictional story, such as Goldilocks and the Three Bears, to highlight the features of fiction text. Read the fictional story to the students, and then ask questions such as: "is this a true story?" and "how do you know?" Create a T-Chart with the title of the story at the top, and document students' ideas on a chart that list the characteristics of fiction text such as characters, imagination, and dialogue on one side of the chart.

Next, introduce an article from PebbleGo, such as "Bears", as a read-aloud for the whole group and share the text with the class visually on a whiteboard or by printing the article. Have students compare and contrast the two texts. Ask the students what they notice about this text. If they need prompting, ask questions such as: "is *this* a true story?" and "how do you know?" Prompt students to identify the text features such as a glossary, text headings, and bold words. Document students' responses on the other side of the T-Chart, with the title of the article at the top.

Throughout the school year, refer to the features of fiction and nonfiction text that the students identified through this activity, and add to the chart as new ideas emerge throughout different class activities and investigations.

"Mystery Animal Book"

Students can use PebbleGo to learn about one specific animal and create a mystery book. Classmates then try to guess each student's mystery animal. The teacher can begin by reading a book aloud that introduces a variety of animals. After reading, the teacher asks students to list various animals that they would want to research, and create a list based on student interest. Then, the teacher can ask students to think about what questions they might have about these

animals. If needed, the teacher can prompt the students to think about what the animals look like, what they eat, and where they live.

Once the class has a sufficient list of animals, the teacher can direct students to pick one animal to research using PebbleGo, and to learn three to five facts about the animal, and then draw a picture on a teacher created template. Once all students are done, each can describe the facts about his or her selected animal, while the rest of the class tries to guess the animal that each student chose, either as a whole class activity or as a small group.

"Community Helper Stations"

Students can use PebbleGo to learn about community helpers. First, students discuss community helpers as a class. The teacher can ask questions such as, "who are community helpers?" and "what do these people do to help our community?" and "why are these helpers important to our community?" Once students have discussed various roles in the community as a large group, the teacher models how to use PebbleGo to research, and will have approximately 4 stations set up around the room (based on class size) to research community helpers in small groups. Each station should have one tablet or laptop for small groups to research one community helper together. Before class, the teacher should set up each station to research a different community helper (for example: police officer, fire fighter, nurse, doctor, EMT, farmer, teacher, mail carrier, military, among others). Once in stations, students should work together to learn about their particular community helper, and answer questions such as: what is their job? what kinds of things do they wear? how do they help our community? where have you seen this community helper? Students work collaboratively in each center to answer these questions and record their findings in a digital poster using PebbleGo Create to show what they have learned.

"Daily 5-Listen to Reading"

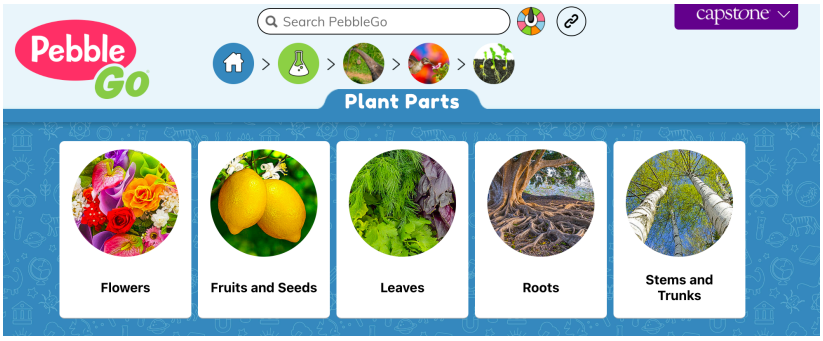
Student select article of choice. Students use headphones to listen to their article as a read aloud on PebbleGo. Once they have listened to their selected article, students can use the audio recording feature on PebbleGo Create to explain why they selected the article and to share two facts they learned and one question they have about the topic.

"Question of the Day"

Teachers can encourage students to ask questions and wonder as a part of their daily routine. The teacher can select one PebbleGo article as a quick read aloud, and then direct students to write one or two questions (or more) that they now have after hearing the article. This can foster wondering and question-asking on a regular basis and get students comfortable with asking questions. Teachers should not answer these questions, and should instead encourage students to record these questions in a daily writing journal. Students can refer to these questions during independent work time to find their own answers.

"Parts of a Plant"

In this 5-day activity, students engage in a short research block for a few minutes over a five-day period to learn about the different parts of a plant and create a Plant Resource Guide either independently or in small groups. Each day, students focus on one part of a plant that has a corresponding article on PebbleGo: flower, stem, seed, roots, leaves.



Students can work independently, or the class can research each section together. Students will show what they have learned about each part of a plant by creating a digital poster using PebbleGo Create or by creating a foldable using a teacher template. Each digital poster or foldable should have similar information including a title, 2-4 facts, 2 visuals, and various writing conventions (such as spelling, complete sentences, capitalization) that are appropriate for the particular grade level. Over the course of the week, students create their own "Plant Resource Guide." The teacher can also play a game such as bingo using the plant vocabulary, images, and definitions.

3rd-6th Grade Activities

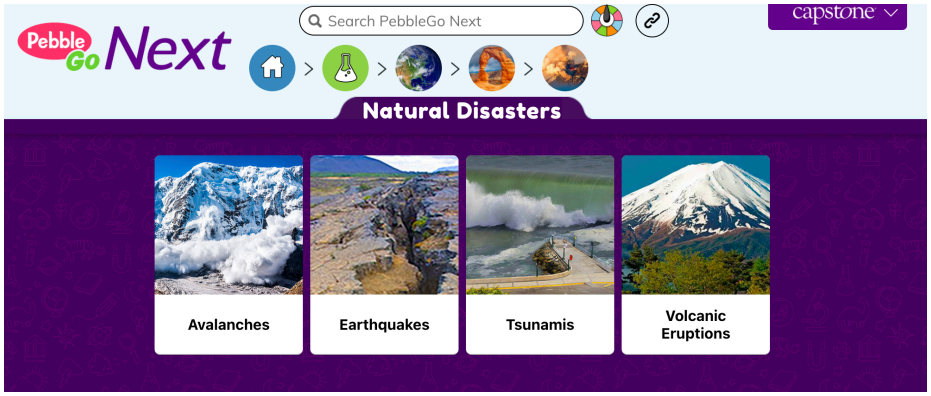
"All Around the World"

Before beginning a country research project, consider offering students independent reading time to explore various countries in PebbleGo and PebbleGo Next. Students can explore various countries around the world to generate interest and get students familiar with different countries and cultures in their independent investigation. Students can share which countries they researched during their research and create a class list to continue their project.

Next, students select a country to investigate, either through research into their family heritage or through a discussion of the various countries they read about, and which are particularly interesting to them. Once students select their country, they can use a variety of resources to learn about their country, including PebbleGo. Teachers can provide a graphic organizer to guide students while researching to help direct students in learning about particular aspects of their country such as its capital, the population, the general weather, the culture and traditions, geography, and foods. The teacher should make sure that students also have a space to ask and answer their own questions in any graphic organizer they design. Students can show what they know after their research in a variety of ways, either by creating a traditional poster, a digital poster on using PebbleGo Create, a country brochure, a travel video, or a packing list for a trip to that country explaining how each item was selected, among others. The teacher can also poll the students to determine where they would take a class trip based on the majority vote, and graph the results for a cross-curricular extension activity.

"Volcanoes, Tsunamis, and Earthquakes, Oh My!"

Students utilize PebbleGo Next to explore natural disasters and choose one to complete an in-depth inquiry. Students choose from avalanches, earthquakes, tsunamis, and volcanic eruptions, to work in small groups (with approximately the same



number of students across all groups) to become an expert on that particular natural disaster.

Students take notes using PebbleGo Create or a graphic organizer, and summarize the most important facts about each natural disaster, and explore the article to find interesting points and facts to share. Once each group has researched, they should discuss their findings among their partners. Then, form "expert groups" by having one student from each group join other students who read the other articles. Each member of the group meets with others to share what they learned in expert groups. Students take leadership roles by teaching their peers what they have learned after working in groups to determine the central ideas or conclusions about the article they read.

"Biography"

Before beginning a class biography project, consider offering students independent reading time to introduce the biography section of PebbleGo and PebbleGo Next. Students can explore various figures that meet the specific criteria outlined in the project objectives to supplement student research and allow independent investigation. Students can share interesting figures they learned about during their research and create a class list to continue their investigation into a larger biography or wax museum project.

References

Bruner, J. S. (1961). "The act of discovery". Harvard Educational Review 31 (1): 21–32.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macro-theory of human motivation, development, and health. Canadian Psychology, 49, 182- 185.

Deci, E, & Ryan, R. (2016). Optimizing Students' Motivation in the Era of Testing and Pressure: A Self-Determination Theory Perspective. In Liu, W, C., Wang, J, C, K., & Ryan, R., Building Autonomous Learners: Perspectives from 30 Research and practice using self-determination theory (pp. 9 - 29). Singapore: Springer. doi: 10.1007/978-981-287-630-0_2

Dewey, J. (1910). *How we think*. D C Heath. doi.org/10.1037/10903-000

Guay, F., Ratelle, C. F., & Chanal, J. (2008). Optimal learning in optimal contexts: The role of self-determination in education. Canadian Psychology/Psychologie Canadienne, 49(3), 233-240. doi.org/10.1037/a0012758

Freire, P. (1984) Pedagogy of the Oppressed, New York: Continuum Publishing Company.

Hernández, L. E., Darling-Hammond, L., Adams, J., & Bradley, K. (2019). Deeper Learning Networks: Taking Student-Centered Learning and Equity to Scale. *Deeper Learning Networks Series*. Learning Policy Institute.

Macrorie, K. (1998). The I-Search Paper: Revised Edition of Searching Writing. Portsmouth, NH: Heinemann-Boynton/Cook.

Magner, T., Soulé, H., & Wesolowski, K. (2011). P21 Common Core toolkit: A guide to aligning the Common Core State Standards with the Framework for 21st Century Skills. Washington, DC: Partnership for 21st Century Skills. Retrieved from www.p21.org/storage/documents/P21CommonCoreToolkit.pdf.

Mehta, J., & Fine, S. (2015). The why, what, where, and how of deeper learning in American secondary schools. Boston, MA: Jobs for the Future;

Noguera, P., Darling-Hammond, L., & Friedlaender, D. (2015). Equal opportunity for deeper learning. *Deeper Learning Research Series*. Jobs For the Future.

Núñez, J. L., & León, J. (2015). Autonomy Support in the Classroom. *European Psychologist*.

Rickles, J., Zeiser, K. L., Mason, J., Garet, M. S., & Wulach, S. (2016). Deeper learning and graduation: Is there a relationship? Washington, DC: American Institutes for Research. https://www.air.org/resource/deeper-learning-and-graduation-there-relationship-4-5 (accessed 03/08/18);

Vygotsky, L.S. (1962) Thought and Language, Cambridge, MA: MIT Press.

Yang, R., Zeiser, K. L., & Siman, N. (2016). Deeper learning and college attendance: What happens after high school? Washington, DC: American Institutes for Research. https://www.air.org/sites/default/files/downloads/report/Deeper-Learning-Postsecondary-Appendix-August-2016-rev.pdf.

Zeiser, K. L., Taylor, J., Rickles, J., Garet, M. S., & Segeritz, M. (2014). Evidence of deeper learning outcomes. Findings from the study of deeper learning opportunities and outcomes: Report 3. *American Institutes for Research*.