INTEGRATING PLAY-BASED LEARNING IN A HYBRID CLASSROOM TO ACCELERATE STEM EDUCATION

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Introduction There's Always Room for Play

When it comes to the COVID-19 pandemic, one thing is certain: this school year is unlike any other. With new rules being implemented into classrooms all across the country — such as minimizing interactions between students, adding sneeze guards around desks, and delaying the first day of in-person classes — many educators are rushing to create new teaching models to adapt to these unusual learning environments. One existing approach to education, however, is capturing all the attention: hybrid learning.

Combining online and in-person education into one curriculum, hybrid learning allows students to learn in both remote environments and a traditional classroom setting simultaneously. And, while hybrid learning has been around for quite some time, many educators are now seeing the real-world benefits of adapting their lesson plans to incorporate virtual learning during the pandemic.

To ensure teachers worldwide maximize the learning potential of both in-person and online experiences, the play-based learning experts at Sphero are here to help. By joining forces with littleBits to offer a full suite of STEAM solutions for both connected and screenless activities, Sphero makes play-based learning through robotics and circuitry easier and more accessible than ever before.

Through implementing this type of learning into tried-and-true hybrid learning models, students will be able to accelerate their STEM-based education while having a whole lot of fun during these unusual, unpredictable times.

With this guide, you will uncover the importance of guided play-based learning in the classroom, how you can integrate it into your curriculum, and how you can merge it with STEM education for captivating experiences — all of which will help you establish the perfect hybrid learning environment for all types of learners.

The Role of Play-based Learning in the Classroom

From social-emotional development to encouraging scientific thinking, play-based learning enacts a major role in every classroom across the globe.

What is play-based learning?

Play-based learning (more specifically, guided play-based learning) involves a blend of student-initiated and educator-supported learning — both of which build upon a child's innate desire to play. Like free play, guided play is **fun, flexible, and voluntary**. However, it requires a careful balance of child-directed learning and gentle guidance from an educator toward a learning goal.

"It is not just about playing, it is about discovery," explains Nicholas Provenzano, Sphero Hero & Makerspace Director, University Liggett Middle School, Grosse Pointe Woods, MI. "When you discover something, it holds meaning to you in a way that copying information from a screen onto another tab on the screen will never be able to replicate."

An educator's role in this education method is to encourage in-depth subject matter inquiry through playful interactions, all while allowing the child to take control of their learning experiences and absorb pivotal educational lessons organically. When establishing a learning environment focused on play, educators can either incorporate a learning goal into a controlled setting that gives students autonomy to explore, or they can watch child-directed activities and make recommendations to encourage deep thinking or expand interest.

What are the benefits of play-based learning?

Through play, students are able to hit **four major situational benchmarks** for successful learning, including:
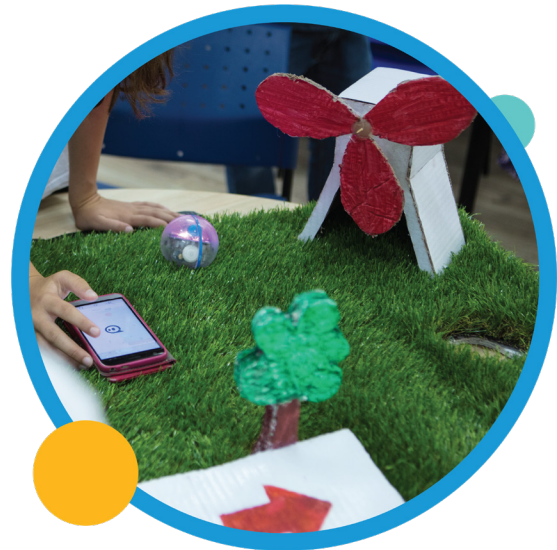

Staying mentally active

Remaining engaged

**Interacting socially with peers and/or adults**

Building meaningful connections to their lives and the world around them

When all four of these elements are met in a play-based learning session, students are able to rapidly advance their skills in areas like language, mathematics, science, and social-emotional cognition while having fun.

What are examples of play-based learning in the classroom?

Play-based learning takes on a variety of forms, as it can be implemented into classrooms with students of all ages. "Play-based learning should not be viewed as an instructional approach that is limited to younger students," writes Provenzano. "Everyone can learn through play."

But, to easily understand how this learning works at its core, it is best to consider these simple activities for young learners:
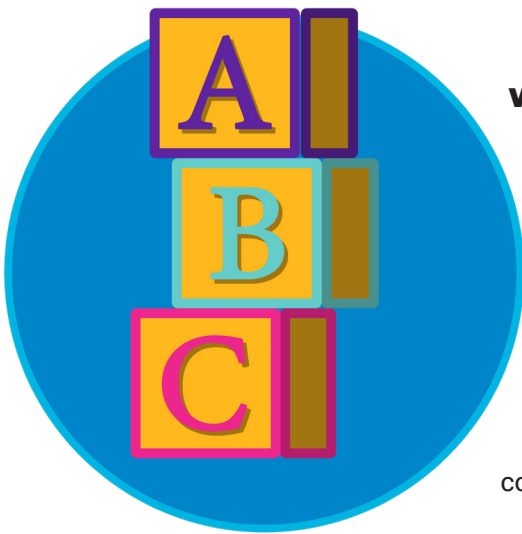
Wooden Blocks

While wooden blocks can be used in a free play scenario, they can also be used to facilitate critical thinking and problem-solving. As an educator, you can pose questions that direct your students' awareness of mathematics, science, and literacy skills as they play. By asking them questions like, "How tall can you build up your blocks?" or "How many blocks does your building have?" you can encourage hypothesizing and cognitive processing in a fun and entertaining way.

Shape Sorters

Another simple example of play-based learning is your students playing with a shape sorter. Rooted in collaboration, this activity allows your students to work together to place the correct shape into a corresponding slot. As they continue to place shapes through the sorter, they will realize that some of them will not fit, but they may not understand why. As a teacher, you can provide gentle guidance or suggestions to help them realize what shapes they have already tried and what move they can make next.

How To Integrate Play-based Learning Into Your Hybrid Classroom

From a distance, implementing play-based learning into your hybrid classroom might seem challenging, if not impossible. However, the societal shift to remote learning provides the opportunity to incorporate it in new and exciting ways. But, in order to include the appropriate learning scenarios into your curriculum, it's important to start with the overall design of your hybrid course.

Designing Your Hybrid Course

Creating a well-rounded **hybrid learning model** can be tricky, especially because in-person and online learning have their own innate benefits. "In-person learning allows for a much more personable learning experience, while online learning often facilitates a better work-at-your-own-pace learning experience," says Jeremy Macdonald, Sr. Education Content & Training Manager, Sphero. "Preparing for a hybrid learning environment, you have to really understand the needs of the learners."

Macdonald goes on to explain that when preparing your hybrid learning environment, it is critical to ensure the structure of your curriculum and play-based learning scenarios are set up for success. This means designing your online, play-based activities to focus on independent thinking and self-direction while designing in-person class time to focus on group discussions, collaborative work, and relationship building among students and teachers.

Sourcing Course Content

Once you establish coursework that's specifically designed for each learning environment, you can begin to source course content. If your school currently offers hybrid learning programs, you will likely have access to archived learning materials and content to use within your curriculum. However, there are numerous digital resources on educational websites, including discipline-specific sites such as MERLOT, OER Commons, and Educause.

In addition, educators using Sphero's educational tools gain access to valuable lesson plans, a standards-aligned supplemental curriculum, and countless activity ideas contributed by Sphero experts and the Sphero community. Educators like Provenzano regularly turn to Sphero's toolkit to find lessons and activities that align to what they're teaching in the classroom while enhancing students' STEAM skills.

Choosing Program Software

When it comes to choosing the appropriate software, your students should have access to a platform that makes submitting, analyzing, collaborating, and assessing work simple. Provenzano recommends **SeeSaw** as an easy-to-use tool that works well in a hybrid learning environment.

He explains, "SeeSaw has been a great tool in the classroom because it helps create an online portfolio that allows students to demonstrate their understanding of a wide variety of concepts over the course of a school year."

Using built-in annotation tools, students will be able to easily submit and keep track of their work while you gain insights into your students' growth. Plus, tools like SeeSaw allow parents to get an in-depth look at what their child is learning and engage with school happenings.

Structuring Your Play-based Learning Activities

In-Person Play Activities

In a hybrid learning environment, in-person, play-based activities should emphasize face-to-face interactions and collaborative teamwork between peers that supplement your online coursework and deliver feedback to students.

Macdonald explains why:

"Play often provides immediate feedback to participants, either from the experience itself or from the other participants. This is why so many are infatuated with online, multiplayer games. The feedback is real and in real-time. Ideally, all learning experiences should provide some sort of feedback, but this is easiest when it's achieved in a group setting."

With this rapid feedback, students are able to experiment, discover, and solve problems in real-time, which boosts whole-brain learning and proper social-emotional responses. From in-depth discussions to team-building exercises, in-person classwork facilitates things like social-emotional learning and relationship building among students and teachers. teacher-student bonding.

In-person learning activities should include:

- Defining assignments, including play-based activities

- Establishing social connections through play

- Group thinking or brainstorming sessions

- Presentations or group projects

- Demonstration of psycho-motor skills

- Discovering conceptual problems during play-based learning

Online Play Activities

Because online, play-based learning experiences should focus on independent thinking, your digital activities should include asynchronous coursework (assignments that can be completed via self-paced exploration) that promotes critical thinking and thoughtful collaboration via discussion boards. Your virtual learning environment is also a great place to prepare your students for in-person activities, too.

Online learning activities should include:

- Individual content consumption and activity completion

- Self-paced, learning, practicing, and reflecting

- Critical analyses and summaries of subject matter learned during play

- Pop-quizzes that feature true or false or fill-in-the-blank questions

- Discussion board dialogue with peers and active participation from educators

Incorporating Play-based Learning Into Your Hybrid Curriculum

Play is naturally exploratory and can happen alone or in a group. This means that learning can be used to promote both self-directed and collaborative learning at home and in the classroom.

In a virtual environment, learning experiences can be designed to encourage your students to work through a play-based scenario, record and reflect on what was learned, and bring that information back to the group (either via online discussion boards or in-person) to further subject matter enrichment, as well as contribute to a broader individual or group goal.

While this design approach yields the best results in a virtual environment, Provenzano acknowledges that online engagement issues are the largest concern for teachers. "Being on the screen so much makes students shut down and disengage from the work as a whole."

He shares this remedy: "Make sure the play the students are doing is removed from the screen as much as possible. Also, giving students much more choice and voice in the project is key for higher engagement. If students are just ticking boxes for completion, they are less likely to stay engaged."

Providing students with the agency to experience play-based scenarios in their own way reduces the risk of students disengaging in a virtual environment. As a result, they can effectively learn the course content.

Merging Play-based Learning and STEM in Your Hybrid Classroom

Whether your students are learning in the classroom or remotely, play-based learning will set them up for success in the 21st century. But, in order for guided play to have a truly positive impact well into adulthood, it's important to incorporate science, technology, engineering, and math (STEM) into your activities.

The Importance of STEM in a Hybrid Classroom

As STEM careers have **increased by nearly 80% since the 1990s** and are projected to **grow by at least 13% into 2027**, it is imperative that young learners are exposed to these subjects as early as possible.

STEM education allows students to become complex problem solvers for real-world scenarios as well as develop lasting literacy skills that can seamlessly integrate into our technology-driven world.
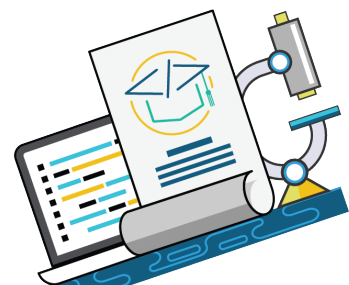
398,857
OPEN COMPUTER SCIENCE JOBS

71,226
CS STUDENTS GRADUATED INTO THE WORKFORCE LAST YEAR

Numbers are for the United States
Source: code.org/promote

Incorporating Play-based STEM & STEAM Activities with Sphero

STEM and STEAM activities are easy to incorporate in your hybrid learning model with Sphero's programmable robots. For example, if your students' online lesson plan deals with shapes and numbers, the related activities could incorporate an interactive Sphero robot and the Sphero Edu app. As students learn how to program with blocks using Sphero's tools, they'll play dice games, design guessing games, and create their own figure skating routines.

With these tools, your students can visualize the impacts of programming by coding their Sphero BOLT, or RVR through a myriad of hands-on activities. If your current lesson plan is more engineering-oriented, littleBits modular electronic building blocks and littleBits Classroom allow for innovative creations that support open-ended circuit building.

Many teachers that already use Sphero robots in their in-person classrooms are continuing to use them in virtual learning environments. Macdonald describes one of the most effective ways to incorporate Sphero robots in a remote setting is to have students complete a programming challenge at home and submit it to the teacher for testing.

During online class time (or shared as a pre-recorded video), the teacher then runs the program for all students to see, encouraging discussion around what went well and what still needs to be worked on. This allows the student programmer to see their program run on the robot, as well as engage in a brain-nurturing conversation with their peers.

## 5 Play-based STEAM Activities That Promote Coding, Programming, Building

With these five STEAM activities from Sphero and littleBits, you can easily incorporate whole-brain learning and computational thinking in your hybrid learning environment while using fun, educational tools:

The Masked Sphero

Going to school during a pandemic can be a confusing time for students, especially when it comes to explaining changes in our daily routines to prevent germ transmission. With The Masked Sphero, you can easily explain why wearing a mask in public spaces is necessary.

For example, during your online lesson plans, you can describe the history and importance of cloth face coverings and how wearing a mask can help protect others by minimizing airborne bacteria. Then, during in-class instruction, your students can create a mask out of tissue paper for a Sphero BOLT to protect its sensor against incoming light. This activity provides a direct representation of how germs can spread more easily without face coverings.
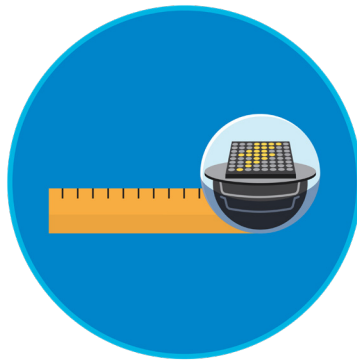
Keep Your Distance!

In addition to teaching your students the benefits of wearing a face covering, it's also important to teach them social distancing guidelines from the Center for Disease Control (CDC). With this activity, your students can turn two BOLTs into measuring devices, which helps make understanding social distancing fun and easy. This activity also explores the practical applications of infrared communication, showcasing how it's an inexpensive way to wirelessly send a signal.
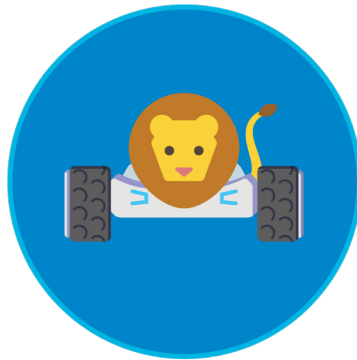
Animal Imitation

Allow your students to become ethologists and technologists in the classroom or at home. With this hands-on activity, your class will study the movements of their favorite animal and program RVR to mimic how this animal navigates in the wild. In addition, your students will also be able to utilize littleBits inventions to mimic this animal's behavior.
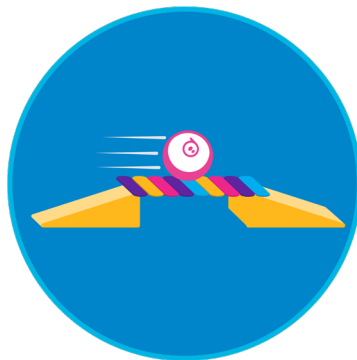
Bridge Challenge

This hybrid classroom activity can also be used for at least two sessions. The challenge starts with your students researching and learning about different types of bridges used in architecture, which would be perfect for online instruction. Then, using common household belongings or craft supplies — such as tape, string, glue, and popsicle sticks — they can build a bridge to drive a Sphero robot across.

Hand Washing Timer

Along with face coverings and social distancing, it's important to teach your students the first line of defense against germs and bacteria: hand washing. Using littleBits, this activity challenges your at-home learner to create a circuit containing a power source, inputs, and outputs. Then, they will put together an invention that counts to 20 seconds (the CDC's recommended amount of time for effective handwashing) and indicates when the time is up.

Other Tips and Tricks

While providing all of your students with a Sphero robot or littleBits modular circuitry kits circuit set might be challenging, there are plenty of workarounds to ensure each one of your students gets to experience our play-based activities.

If your school budget or resources are limited, you can utilize a handful of Sphero robots and alternate play-based activities between your remote students and in-class students. For example, you can develop informational resources and study guides surrounding your chosen Sphero or littleBits activity for your online learners — all while your in-class students take turns performing the activity in a socially distanced space. Then, when your students alternate their learning environments throughout the week, they can also alternate activities.

Another idea to extend the reach of the robots and STEM kits you have available is to **create a checkout or lending program**. Similar to a library book checkout system, clearly label your bots and kits for inventory purposes, create a Google Form or a similar solution to track who borrows what and for how long, and communicate with parents how to properly clean, care for, and return the Sphero and littleBits products afterward. You can find additional recommendations on a Sphero and littleBits checkout or loaner system in our **socially distanced learning guide**.

Additional Resources

Sphero, littleBits, and are our community of STEAM enthusiasts are constantly developing new activities for learners all across the world.

Make sure to check out the **Sphero Edu app**, **littleBits Fuse app** and **littleBits Classroom** regularly, as well as the **Sphero Community Forum** and the **littleBits Community Forum**, to learn about new and exciting play-based activities for your in-person or remote learners. Additionally, Sphero is committed to helping teachers adapt to new ways of teaching.

For more information on how to make the best out of socially distanced learning environments, don't hesitate to check out our **COVID-19 resource guide**.

Conclusion Help the Creators of Tomorrow Play More Today

Adapting to societal changes during the pandemic has been tough, especially when it comes to ensuring students get the education they need to flourish in the 21st century.

At Sphero, we hope to take some weight off the shoulders of educators and parents everywhere during this unusual school year. With our programmable robots, modular circuits, and play-based STEAM activities, we can provide your in-person and remote students with fundamental lessons that help them become the creators and inventors of tomorrow.