COMPUTER SCIENCE FOUNDATIONS
by sphero

A STANDARDS-ALIGNED, SUPPLEMENTAL CURRICULUM

Computer Science Foundations (CSF) features:

- Printed Educator Guide for step-by-step instructional support
- Student-ready lessons, pre-loaded in the Sphero Edu app
- 72 scaffolded lessons across nine themes
- 45–60 minutes per lesson with handouts
- Optional extensions that allow lessons to augment additional class time
- Two to three students per Sphero robot and device
- Compatible with Windows, Mac, iOS, Android, Chrome, and Kindle Fire

sphero edu

Sphero Edu provides a toolset that is unbounded in its potential. Our program goes beyond code by incorporating robotics and technology with collaborative STEAM activities, nurturing students' imaginations in ways no other education program can.

Educators learn, students learn

Rather than be experts themselves, educators learn to code alongside students while fostering healthy class culture and modeling growth mindsets.

Bring coding into content classrooms

CSF enhances core content areas by enabling non-computer science teachers to make curricular connections and explore computer science with their students, from foreign language to science to PE.

Elevate community through SEL

CSF allows learners to grow vital social and emotional learning skills (SEL) as well as 21st century skills, such as creativity, collaboration, critical thinking, communication, and responsible decision-making.

All ages, all abilities

Whether a 3rd grader brand-new to coding or a high school senior who's a seasoned programmer, CSF is an entry point into problem-solving through programming.

Device compatibility

CSF is designed around the pair-programming technique, where two students share one device and one Sphero robot. The program's compatibility across devices allows ease of implementation, accommodating any device restriction.

Standards-aligned

Computer Science Foundations is built on the K12 Computer Science Framework Principles and is aligned to various national and international standards, including the Computer Science Teachers Association (CSTA) standards and Next Generation Science Standards (NGSS)

Ask your Sphero Edu sales rep for a sample lesson

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Suitable for your school's needs

Supports your level of readiness

Perhaps your school desires an entry point for coding and robotics. Or, maybe you have some experience and would like to grow. Or, perhaps you need a creative approach to fostering community. Whatever your unique situation, Sphero CSF can meet you where you are.

Flexible implementation

- School-wide initiatives (STEAM, Computer Science Education, Technology and Robotics)
- Single teacher or team-taught
- Subject-area teams or grade-level teams
- Extracurricular or core content

Flexible device support

- Shared devices (classroom cart)
- 1:1—a device for every student
- BYOD
- Stationary devices in Library Media Center or Learning Lab

Flexible timing

- Weekly in the classroom or monthly in the Library Media Center/Makerspace
- Short "sprints" with a given theme or a year-long marathon
- Build deeper skills or broaden application

Ready to roll *(out)*

YEAR 1

Purchase CSF

and

Buy a Power Pack to put in your library or makerspace

or

Buy your most enthusiastic tech educators a Power Pack to pilot CSF in their classroom

or

Enroll an educator in Sphero Fundamentals to get familiar with the Sphero Edu platform

YEAR 2

Add a Power Pack to share between three STEM educators in the same building and a copy of CSF for each to use

or

Buy additional licenses of CSF for educators to gradually incorporate activities with the guidance of year-one educators

or

Enroll a cadre of first-time Sphero educators in Sphero Fundamentals, and buy a Power Pack for them to share

YEAR 3

Buy additional licenses of CSF and another Power Pack to rotate between last year's cadre of Sphero educators

or

Expand to an entire grade level, with additional sets of CSF and Power Packs

or

Enroll in a Sphero Virtual Training session for the whole school

Contact your Sphero Edu sales rep to tailor a roll-out that meets your needs

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Make CS and robots approachable in all content areas

Scaffolded across three courses and 72 lessons, teachers and students build Draw, Block, and Text coding skills. They then integrate these concepts into curricular content: everything from polygons and poetry to logic-puzzlers and compliment-givers.

See Standards Alignment: https://bit.ly/3vosuHR

PROGRAMMING LEVELS

DRAW
Manual Movement, Distance, Direction, Speed, and Color

ADVANCED BLOCK
Functions, Variables, Complex Controls (If Then), and Comparators

BEGINNING BLOCK
Roll, Delay, Sound, Speak, and Main LED

BLOCK-TEXT TRANSITION
JavaScript Syntax, Punctuation, and Asynchronous Programming

INTERMEDIATE BLOCK
Simple Controls (Loops), Sensors, and Comments

BEGINNING TEXT
JavaScript Movements, Lights, and Sounds

THEMES & LESSONS

Course 1	Course 2	Course 3
"A" in STEAM	Empathy	Brain Breakers
x2 x3 x3	x1 x3 x3 x1	x3 x3 x2
Shapes & Numbers	Storytelling	Missions
x2 x3 x3	x1 x3 x3 x1	x3 x3 x2
Nature	Game Design	Navigation
x2 x3 x3	x1 x3 x3 x1	x3 x3 x2

72 Total Lessons

Ask your Sphero Edu sales rep for a sample lesson

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Featured Themes

Course 1

“A” in STEAM

You guessed it, we’re talking about the Arts. Using Sphero robots, students will use the Draw and Block Canvas to paint, write poetry, compose music, and dance.

Shapes & Numbers

As students progress to programming with blocks, they’ll learn how to connect numbers in equations, play dice games, design guessing games, and create their own figure skating routines.

Nature

In this theme, students will use their polycarbonate robotic ball to understand the natural world by mimicking the movement of animals, programming a school of fish, and modeling sleep patterns.

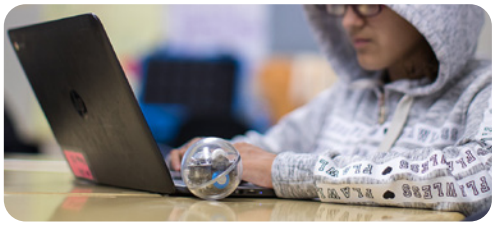
Course 2

Empathy

With their robots and Block programming skills, students will learn to communicate clearly with their partners, offer praise and encouragement, and grow their classroom community.

Storytelling

In this series of Block lessons, students will use their Sphero robots to represent the elements of a story, develop dialogue, retell historical events, and even overcome writer’s block.



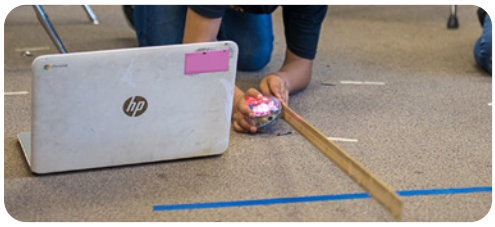
Game Design

Bring out your inner gamer through a series of lessons designed to develop your Block programming skills—play Bingo, search for hidden treasure and build your own set of dice.

Course 3

Missions

In this series of lessons, students will become critical thinkers and problem-solvers as they puzzle through obstacle courses, lockboxes, secret codes, and more.



Navigation

From exploring how animals migrate to planning a road trip, this series of lessons brings the world of navigation to life for students through hands-on programming with their Sphero robots.

Brain Breakers

In this theme, students develop their problem-solving and collaboration skills while creating secret codes, solving riddles and cracking a bank robbery.

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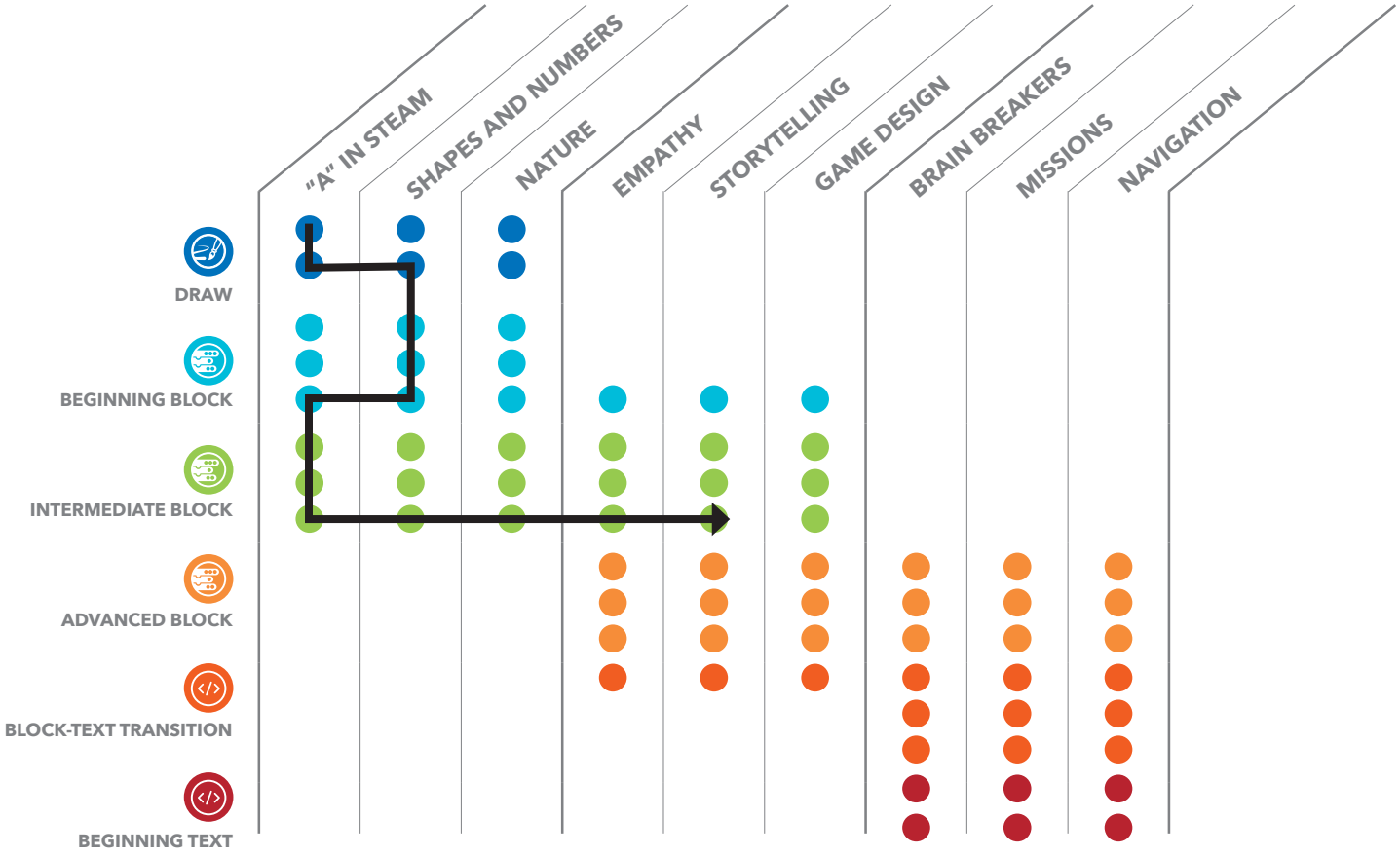
FLEXIBLE LEARNING PATHWAYS

Elementary School Educator

"This year in my third grade class, I'll teach one lesson a week with our shared iPad cart and Power Pack. We can progress through a theme to take on new challenges, but when I sense students need more practice, we will use a different theme to review and master coding concepts."

Skip around content themes and programming levels

An individual educator chooses a theme to start the class. Students can build conceptually by continuing lessons in that theme or reinforce their practice of a given concept by exploring in a different theme.



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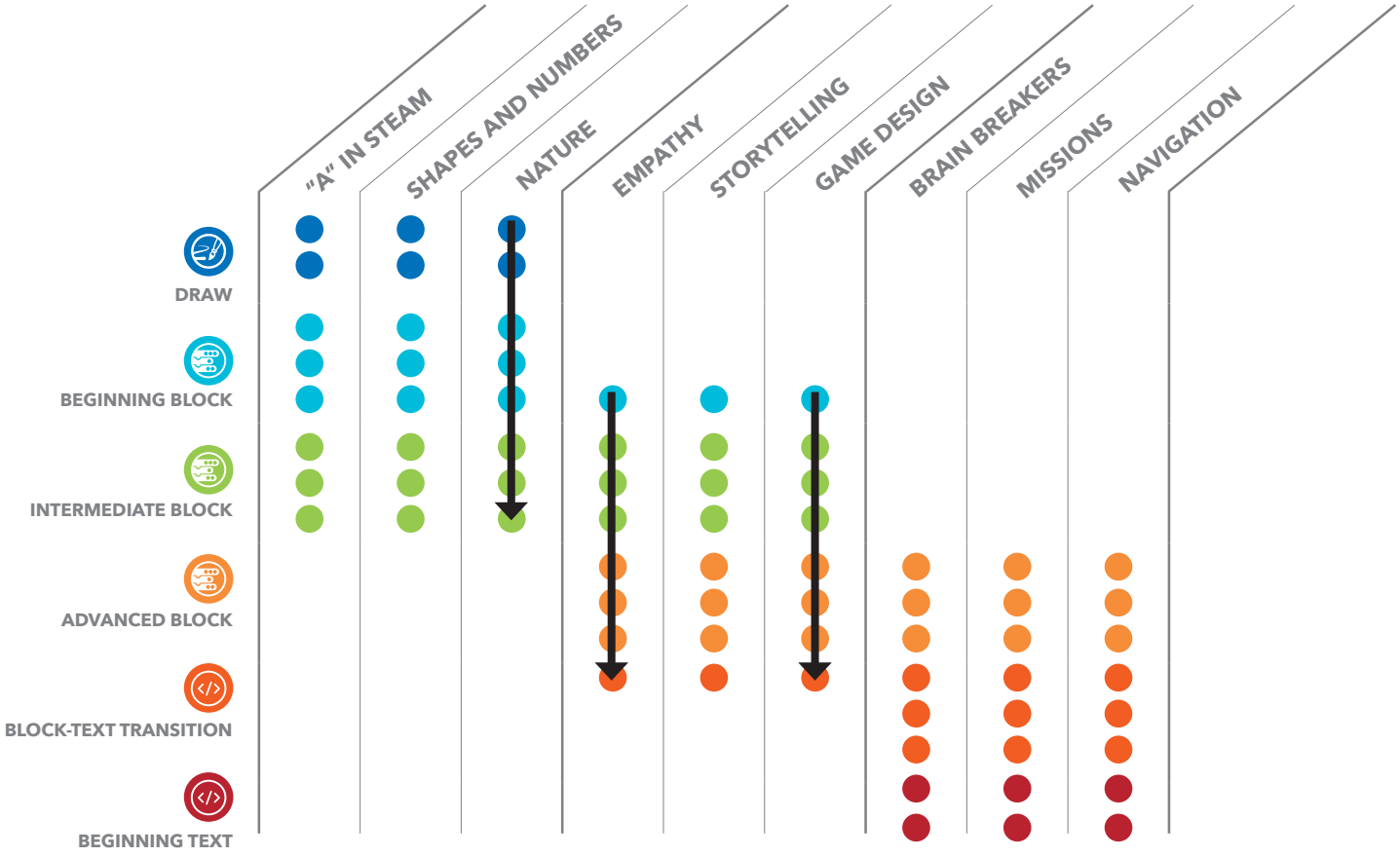
FLEXIBLE LEARNING PATHWAYS

Middle School Educator

"I look forward to working alongside my colleagues as we tag-team three themes with our students. Across the semester, we will teach collaboratively and—as it suits our content—grow not only our coding abilities, but also our culture as a team."

A grade-level team covers a different theme in each class

Students work through a given theme with a content-area teacher, with each teacher devoting a portion of their year to incorporating coding in their content area. Teachers learn programming alongside their students, and together apply their new knowledge to enhance their own curriculum.



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FLEXIBLE LEARNING PATHWAYS

Library Media Specialist

"In our Library Media Center/Makerspace, grades 6, 7, and 8 schedule quarterly visits to work on engineering-related challenges. Students bring their own devices, and I can easily pull out two Power Packs and assign a lesson for students to tackle. We cover all three courses amongst the grades."

Different grades follow various themes and programming levels

Grade-level students can journey through the supplemental curriculum over the course of multiple years, progressing across the themes and deepening understanding. Newer students can visit previous lessons, while students who need a challenge can choose more advanced concepts.