ANNUAL REPORT: TABLE OF CONTENTS

Letter from the Executive Director ................................................................. 3

Our Work

• What We Do .................................................................................................. 4
• Impact ............................................................................................................. 6
• Strategic Initiatives ...................................................................................... 10
• R&D Programs ............................................................................................. 12
• Resources ...................................................................................................... 16

Financials .......................................................................................................... 21

Funding Sources ............................................................................................. 23

Donors .............................................................................................................. 25

Board of Directors .......................................................................................... 26

BSCS Leadership ............................................................................................. 27
Dear Friends,

It is an exciting time to be part of BSCS Science Learning. In 2018, the BSCS staff and board of directors celebrated our organization’s 60th anniversary, while laying the groundwork for a promising future.

This milestone illustrates how far BSCS has advanced over the course of our history. From our origin as a single curriculum development project called the Biological Sciences Curriculum Study, we have grown into an independent nonprofit that is providing national leadership in research, teacher professional learning, leadership development, and instructional materials development.

We have had a significant impact on science education over our history. By diversifying our sources of funding and our collaborators, as we have in the past several years, we are making sure that our impact will continue to grow in the years to come. Historically, we have relied on federal agencies to support our research and development. But in 2018 we more than doubled our foundation funding to 29% of our total revenue. This additional funding is enabling us to introduce new resources and programs and reach a broader audience of educators and learners.

As much as BSCS has grown over six decades, we remain firmly rooted in our origin as a developer of transformational instructional materials. At the same time that we were reveling in nostalgia during our anniversary—sharing longtime friends’ stories about BSCS’s original high school biology programs—we were also launching a new instructional materials development initiative for our time (OpenSciEd, pg. 12).

It is a true honor to lead such a storied organization. On behalf of BSCS’s staff and board of directors, I invite you to read about our current endeavors and their impact in this report. And I invite you to support our mission to transform science teaching and learning as we enter the next chapter of our story.

Sincerely,

Daniel C. Edelson, PhD
OUR WORK

WHAT WE DO

Transforming science education means working for impact that is both systemic and sustainable. Over the last 60 years, our scope of work has expanded across four areas:

- Developing instructional materials
- Designing and delivering professional learning programs for teachers
- Providing leadership development programs for schools and districts
- Conducting research on science teaching and learning
The First Versions of BSCS’s high school biology programs (Yellow, Blue, and Green) were published in 1963.

By the mid-1970s, half of all US school districts were using a BSCS high school biology program and 75% of incoming college freshmen had studied from one.

In today’s world, BSCS focuses on developing highly interactive materials that are designed for next generation science and meet the needs of increasingly diverse student populations.

The 5E Instructional Model
BSCS developed the 5E Instructional Model in 1987, which became the global standard for science curriculum development.

The first versions of BSCS’s high school biology programs (Yellow, Blue, and Green) were published in 1963.

BSCS has reached over 20 million students across the United States and around the world with inquiry-based science instructional materials.
STeLLA: Science Teachers Learning from Lesson Analysis

**THE STeLLA HYPOTHESIS:**
Professional development on high-leverage teaching strategies through video-based lesson analysis can transform teaching and student learning.

**RESULTS:**
STeLLA has demonstrated impacts on both teacher and student learning above and beyond any impacts from a traditional science professional development program.

**IMPLEMENTED ACROSS CONTEXTS:**
Elementary and secondary schools with in-person and online delivery.

**TESTED:**
10 research studies across the United States.

**BSCS HAS GENERATED $43.25 MILLION+ IN RESEARCH GRANTS OVER THE LAST 10 YEARS.**
With the turn of the century, our scope of work expanded with an increased focus on science education research and teacher professional learning.
This map reflects the geographic distribution of 600+ educators (including inservice teachers, preservice teachers, teacher-leaders, and university educators of preservice teachers) directly impacted by STeLLA. Darker shades indicate more participation.
Over the last five years, BSCS has directly supported 350+ educators in navigating Next Generation Science.

Next Generation Science Impact

This map reflects the geographic distribution of 350+ participants (including teachers, teacher-leaders, PD providers, and administrators) at BSCS-hosted, 3-5-day institutes designed to support educators with next generation science. Darker shades indicate more participation.
OUR WORK

STRATEGIC INITIATIVES

As BSCS celebrates our storied history, we are also looking ahead to the future—which includes three long-term, strategic initiatives.

21st Century High School Biology

We are launching an effort to reconceive high school biology to meet the needs of our students and society throughout the 21st century. As we convene scientists, educators, curriculum writers, community members, and advisors, we are exploring foundational questions, beginning with this one: What knowledge and skills in the life sciences will all students need for their lives and careers in the next 10–20 years?

“VIP” Professional Learning for 21st Century Teaching

We are committed to bringing our transformative Video-based Inquiry-into-Practice (VIP) professional learning model to a broad audience of K-12 science teachers. Through more than a decade of research and development on our STeLLA (Science Teachers Learning from Lesson Analysis) professional learning program, we have documented the power of VIP professional learning to change teacher practice and improve student outcomes. We are exploring implementation and business models for nationwide dissemination.

Equity & Social Justice

We are striving to break historical and institutional barriers to science for marginalized students and teachers. Our vision is that one day, all educators and learners will have access to a high quality science education, feel confident applying science effectively in their lives, and be prepared to understand and redress social and environmental injustices. We are exploring opportunities to pursue this initiative across our instructional materials development, teacher professional learning, leadership development, and educational research.

These strategic initiatives are currently being supported by major gifts from individuals.
OUR WORK

R&D PROGRAMS

Throughout BSCS’s 60th anniversary, we have celebrated milestone achievements across many research and development programs. Three ongoing programs are highlighted here.

OpenSciEd

*BSCS Focus: Instructional Materials Development*

The release of the Next Generation Science Standards (NGSS) in 2013 created a need for high quality instructional materials that enable students and teachers to meet the standards and are practical for broad implementation. BSCS is helping to meet this need as the lead institution in the OpenSciEd project’s consortium of developers.

OpenSciEd was launched by the Carnegie Corporation of New York to produce open source instructional materials for the Next Generation Science Standards. The first phase is focusing on middle school. The work is a collaboration among 10 partner states, the Developers Consortium, a network of science education leaders, and a funding collaborative. The Developers Consortium is responsible for the development of instructional materials, professional learning resources, and the implementation of a field test across all 10 partner states. The middle school phase will culminate with the release of a complete program for grades 6–8 by December 2021.

**2018 MILESTONE**

The Developers Consortium created a middle school scope and sequence and design specifications for science instructional materials, under the direction of the state steering committee, and worked closely with educators to begin developing and field testing the first three instructional materials units.

Learn more: bscs.org/our-work/rd-programs/openscied-developers-consortium

OpenSciEd is funded by the Carnegie Corporation of New York, Bill and Melinda Gates Foundation, Charles and Lynn Schusterman Foundation, and the William and Flora Hewlett Foundation. Danny Edelson is the project director. Audrey Mohan is the associate project director.
Sound Waves

How can a sound make something move?

OpenSciEd
MIDDLE SCHOOL SCIENCE

Metabolic Reactions
How do things inside our bodies work together to make us feel the way we do?

Thermal Energy
How can containers keep stuff from warming up or cooling down?

Sound Waves
How can a sound make something move?
OUR WORK

Towards a More Humane Genetics

_BSCS Focus: Research_

People often portray science as a socially neutral endeavor. But it isn’t. The work of BSCS Research Scientist Brian Donovan and his team reminds us of that. Our Towards a More Humane Genetics research project shows that genetics education can affect adolescents’ racial biases.

In three randomized controlled trials (RCTs), we demonstrated that when genetics education draws students’ attention to genetic variation between racial groups in the course of teaching fundamental genetics concepts, it can increase racial bias. More recently, we conducted three additional RCTs that reveal the reverse effect. We found that genetics education can decrease racial bias by helping students understand that there is more genetic variation within racial groups than there is between them. Ultimately, our research is starting to suggest that genetics education can create humane or inhumane outcomes depending on how it addresses human differences.

**2018 MILESTONE**

BSCS produced a paper revealing how genetics education can reduce the development of racial biases among adolescents. The paper is now published in *Science Education* and led to a feature story in *The New York Times*.

Learn more: bscs.org/humane-genetics

Towards a More Humane Genetics is funded by the National Science Foundation.

Brian Donovan is the principal investigator.
OUR WORK

R&D PROGRAMS

STeLLA

*BSCS Focus: Teacher Professional Learning, Leadership Development, and Research*

Research shows that high quality teacher professional learning is essential to high quality science instruction. And high quality science instruction can enhance student success. However, until recently, research on professional learning has only been able to show impact on participating teachers; it has not been able to document subsequent effects on student outcomes. STeLLA, BSCS’s signature Video Inquiry-into-Practice (VIP) professional learning program, demonstrates impact on both teacher and student outcomes.

STeLLA helps teachers learn when and how to use high-leverage teaching strategies through video-based lesson analysis. And over the last 15 years, BSCS has successfully implemented and evaluated STeLLA across a variety of contexts—including in teacher preparation (preservice) and continuing education (inservice) programs; in district-wide programs and in programs enrolling individual teachers; in programs for elementary, middle, and high school teachers; and in programs facilitated in person and online. STeLLA’s reach and impact continue to grow annually.

**2018 MILESTONES**

- BSCS secured a grant to develop a version of the STeLLA program to be conducted entirely online and to research its effectiveness.
- BSCS launched a multiyear partnership with three Colorado universities to deliver the first version of STeLLA for preservice science teachers at the secondary level.
- BSCS extended its partnership with Jefferson County Public Schools (JCPS) in Louisville, KY, to expand STeLLA’s reach from one-third of JCPS’s biology teachers to all of JCPS’s biology teachers via a leadership development program.

Learn more: bscs.org/STeLLA

STeLLA is largely funded by the National Science Foundation. Jody Bintz, Connie Hvidsten, Sue Kowalski, Betty Stennett, and Chris Wilson are principal investigators across STeLLA work.
BSCS has produced countless classroom and professional learning resources over the last 60 years—including three programs that currently support educators and leaders in navigating next generation science.

NextGen TIME

A resource for: school districts preparing to implement next generation science.

One of the most important decisions a district makes for instruction is the selection of instructional materials. Not only is it a costly investment, but instructional materials can either support or inhibit improvements in teaching and learning. At BSCS, we also recognize the decision-making process as an opportunity for leadership development and capacity building. BSCS, in collaboration with the K-12 Alliance at WestEd and Achieve, have developed the NextGen TIME program to support districts in making good adoption decisions, planning for implementation of the programs they adopt, and most important, learning and building internal capacity through the process. BSCS distributes the resources that support the NextGen TIME as an Open Educational Resource, which means it is available free of charge and users are free to adapt it however they choose.

Learn more: nextgentime.org

NextGen TIME has been funded by the Carnegie Corporation of New York. Jody Bintz is the project director.
Five Tools and Processes

A resource for: educators seeking support in navigating new and more challenging science standards.

A district’s decision to introduce new science standards can be highly rewarding for teachers and students, especially when supported by an intentional process for planning and implementation. BSCS, in partnership with the American Museum of Natural History and the K-12 Alliance at WestEd, developed the Five Tools and Processes to help professional development leaders work with teachers on curriculum, instruction, and assessment to achieve the vision of NGSS. The freely available resource ultimately supports educators in translating science concepts, practices, and performance expectations into a plan for next generation science–aligned units of instruction.

Learn more: bscs.org/fivetools

Five Tools and Processes was funded by the Carnegie Corporation of New York. Jody Bintz is the project director.
A Medical Mystery

A resource for: middle school science teachers looking for a curriculum unit designed for NGSS with an accompanying professional learning program.

Middle school educators across the United States are being asked to implement next generation science. However, high quality materials and professional learning opportunities that implement NGSS are scarce. That’s why BSCS’s new middle school science program--A Medical Mystery--is valuable. It supports teachers in the effective instruction of an NGSS-aligned, EQuIP-reviewed body systems curriculum unit. Students using this program are immersed in an online environment that challenges them to solve the medical mystery: “What’s Wrong with M’Kenna?” Over the course of several lessons, students engage with a series of interactive experiences, simulations, and animations to investigate how and why M’Kenna is constantly sick. Students leverage inquiry-based practices of scientists to construct their own understanding of complex phenomena and ultimately solve the medical mystery. This resource was developed in partnership with Oregon Public Broadcasting and includes the complete middle school science curriculum unit, a teacher’s guide, and an online professional learning course. The curriculum received a high rating of E/I on the EQuIP rubric, prior to final revisions.

Learn more: bscs.org/resources/educator-resource-center/a-medical-mystery

3-D Middle School Science was funded by the National Science Foundation. Sue Kowalski is the principal investigator.
## Financials

### Contributions and Public Support

<table>
<thead>
<tr>
<th>Source</th>
<th>Unrestricted</th>
<th>Donor Restricted</th>
<th>Fiscal Year 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal and State</td>
<td>4,158,072</td>
<td>4,158,072</td>
<td></td>
</tr>
<tr>
<td>Foundation</td>
<td>1,901,972</td>
<td>1,901,972</td>
<td></td>
</tr>
<tr>
<td>Schools/Universities</td>
<td>241,769</td>
<td>241,769</td>
<td></td>
</tr>
<tr>
<td>Other Contracts</td>
<td>121,486</td>
<td>121,486</td>
<td></td>
</tr>
<tr>
<td>Royalties/Sales/Participant Fees</td>
<td>89,182</td>
<td>89,182</td>
<td></td>
</tr>
<tr>
<td><strong>Total Nonoperational Income</strong></td>
<td><strong>62,616</strong></td>
<td><strong>(63,729)</strong></td>
<td><strong>(1,113)</strong></td>
</tr>
</tbody>
</table>

### Program Services

<table>
<thead>
<tr>
<th>Category</th>
<th>Unrestricted</th>
<th>Donor Restricted</th>
<th>Fiscal Year 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Services</td>
<td>6,427,436</td>
<td>6,427,436</td>
<td></td>
</tr>
<tr>
<td>General and Administrative</td>
<td>258,660</td>
<td>258,660</td>
<td></td>
</tr>
<tr>
<td>Marketing and Development</td>
<td>24,162</td>
<td>24,162</td>
<td></td>
</tr>
<tr>
<td><strong>Total Operating Expenses</strong></td>
<td><strong>6,710,258</strong></td>
<td><strong>6,710,258</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Operational Revenue Less Expenses</strong></td>
<td><strong>(197,777)</strong></td>
<td><strong>(197,777)</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Nonoperational Income

<table>
<thead>
<tr>
<th>Source</th>
<th>Unrestricted</th>
<th>Donor Restricted</th>
<th>Fiscal Year 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributions and Public Support</td>
<td>6,900</td>
<td>62,797</td>
<td>69,697</td>
</tr>
<tr>
<td>Investment income - net</td>
<td>(19,534)</td>
<td>(51,276)</td>
<td>(70,810)</td>
</tr>
<tr>
<td>Satisfied Program Restrictions</td>
<td>75,250</td>
<td>75,250</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Nonoperational Income</strong></td>
<td><strong>62,616</strong></td>
<td><strong>(63,729)</strong></td>
<td><strong>(1,113)</strong></td>
</tr>
</tbody>
</table>

### Net Assets

<table>
<thead>
<tr>
<th>Category</th>
<th>Unrestricted</th>
<th>Donor Restricted</th>
<th>Fiscal Year 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in Net Assets</td>
<td>135,161</td>
<td>(63,729)</td>
<td>(198,890)</td>
</tr>
<tr>
<td>Net Assets Beginning of Year</td>
<td>2,128,860</td>
<td>911,462</td>
<td>3,040,322</td>
</tr>
<tr>
<td>Net Assets End of Year</td>
<td>1,993,699</td>
<td>847,733</td>
<td>2,841,432</td>
</tr>
</tbody>
</table>
FINANCIALS

- Federal Agencies: 64%
- Foundations/Businesses/Nonprofits: 29%
- Schools/Universities/States: 4%
- Other Contracts: 2%
- Royalties/Sales/Participant Fees: 1%

22
FUNDING SOURCES

FEDERAL AGENCIES
National Institutes of Health
National Science Foundation
U.S. Department of Education

FOUNDATIONS/BUSINESSES/NONPROFITS
Carnegie Corporation
Fermilab Friends of Science Education
George Lucas Educational Foundation
Gordon and Betty Moore Foundation
Howard Hughes Medical Institute
Kendall Hunt Publishing Company
Monterey Bay Aquarium
National Association of Biology Teachers
National Center for Civic Innovation
Novim
Pisces Foundation

SCHOOLS/UNIVERSITIES/STATES
Friends Academy, New York
New Mexico Northwest Regional Education Cooperative
Shelby County Schools, Tennessee
San Francisco Unified School District, California
Wyoming Department of Education

ADDITIONAL FUNDING FROM ROYALTIES/SALES/PARTICIPANT FEES
HEROES

15 or more years of giving
* Jeff and Jody Bintz
* Mark Bloom
* Janet Carlson
* Jack and Martha Carter
  Henry Drexler
* April Gardner
* Timothy and Mary Helen Goldsmith
* Bruce Hurd and Pamela Van Scotter
* Joseph Loomer and Nancy Landes
* Stacey Luce
  James Manhart
† Carlo and Ellen Parravano
* Thomas Sager and Eugenie Scott
* Betty L. Stennett
* Jared and Molly Stuhlsatz
* Anne L. Westbrook

SUPPORTERS

1 or more years of giving
* Randall and Kathrine Backe
† Hilda Borko
* John and Carmen Edelson
† Alexandra Fuentes
* Cynthia J. Gay
  Frank and Karen Girolami
† Larry Gold and
  Hope Morrissett
* Emily Harris
  Michael Lach
* Valerie and Anthony Maltese
* Aran Miller
  Megan Mistler
* Lindsey Mohan
  Lynn Nixon
* Lauren Novo
† Nathan Root
* Jeffrey and Lindsay Snowden
  Cathie Stimac
  Herman and Joan Suit
  Dan and Barbara Suratt
  Michael Thiel
  David and Susan Udin
* William Wengert

STEADFAST SUPPORTERS

5 or more years of giving
† Bruce and Betty Alberts
  James and Dorothy Barufaldi
† Kurt Bausback and Mary Kiely
  Michael Borowitz and Barbara Crain
† Zoe Buck Bracey
† Richard and Amy Cardullo
  Stewart Chun and Diane Sakumoto
† Charles and Diana Coble
  Jan and Lynn Dash
  Maxine and M. L. Denniston
  Samuel Dunlap
* Daniel and Vivian Edelson
* Robert Foulk
  Nicole Gillespie
* Louis and Kim Gomez
* Mike Gorman and Brooke
  Bourdelat-Parks Gorman
  James Hook and Wen Chyi Shyu
* Constance J. Hvidsten
* Jane Butler Kahle
  Steven and Margaret Krings
* Rebecca Kruse
* Theodore Lamb and Michelle Slattery
* Douglas Lundberg
  Thomas and Carol Marlowe
  William Mitchell Masters and
  Anne Moffat
* Joseph and Margie McInerney
  David Morgan
* Paul and Amy Numedahl
† Roger Olstad
† James Pellegrino and Susan Goldman
* Harold and Norby Pratt
† Manuel Rendon and Susan Kowalski
† Dennis Schatz and Leila Wilke
† Sheldon and Ellen Schwartz
  Thomas and Catherine Seaver
* Richard and Patti Shavelson
  Brenda L. Speer
  James and Christine Stolzenbach
  John and Sheila Suarez
* Marti Torres
* David and Katherine Renee Touchette
† Stephen Traphagen and Julie Minbiole
  Thomas and Valerie Wheeler
* Christopher D. Wilson

* Current or past employee
† Current or past board member
BOARD OF DIRECTORS

Richard J. Shavelson, PhD, Chair
Margaret Jacks Professor of Education (Emeritus), Stanford University

Richard A. Cardullo, PhD, Vice Chair
Howard H Hays Jr. Chair, Faculty Director of University Honors, Associate Vice Provost, Undergraduate Education, Professor, Department of Biology, University of California, Riverside

Bruce Alberts, PhD
Chancellor’s Leadership Chair in Biochemistry and Biophysics for Science and Education, University of California, San Francisco

Hilda Borko, PhD
Professor, Graduate School of Education, Stanford University

Alexandra Y. Fuentes, MEd
Program Manager STEAM Integration, Fairfax County Public Schools

Nicole Gillespie, PhD
Executive Director, Knowles Science Teaching Foundation

Larry Gold, PhD
Professor, University of Colorado Boulder

Louis M. Gomez, PhD
Professor, University of California, Los Angeles, Urban Schooling Division

Mary L. Kiely, PhD
Senior Academic and Research Program Officer (retired), Stanford University

James W. Pellegrino, PhD
Liberal Arts and Sciences Distinguished Professor and Distinguished Professor of Education, University of Illinois

Nathan Root, MS
Vice President-Market Development Executive, Capgemini

Dennis Schatz, MS
Senior Vice President for Strategic Programs, Pacific Science Center

Stephen Traphagen, MEd
Biology, AP Biology, Chemistry Teacher, Rolling Meadows High School
BSCS LEADERSHIP

Management Team

Daniel Edelson
Executive Director

Jody Bintz
Director of Professional Learning

Robert Foulk
Director of Operations

Susan Kowalski
Director of Research

Audrey Mohan
Assistant Director

Paul Numedahl
Director of Professional Learning

Aleigh Raffelson
Executive Office Coordinator

Chris Wilson
Director of Research

Corporate Officers

Daniel Edelson
President

Robert Foulk
Secretary and Treasurer

Susan Kowalski
Vice President

Paul Numedahl
Vice President
STAY CONNECTED

🌐 www.bscs.org
👍 Facebook.com/bscsorg
🐦 Twitter.com/bscsorg
✉️ info@bscs.org
📞 719-531-5550

5415 Mark Dabling Blvd., Colorado Springs, CO 80918