

The Institute for Applied Tinkering **2021/2022 Annual Report**

The Institute for Applied Tinkering's mission is to develop, practice, and share educational methods that challenge and support all children to engage deeply in their learning via real interests and real tools.

At the Institute for Applied Tinkering (IAT), our impact comes from working directly with kids and educators to develop, practice, and demonstrate the efficacy of an alternative path in education, primarily through our Brightworks and Tinkering School programs.

The Institute for Applied Tinkering is now 16 years old. To date, our impact includes:

301 students have attended Brightworks since 2011, with 117 students in 2022 and 24 graduates from the high school so far

>5,000 children have participated in tinkering programs

100s of educators have developed their craft with the IAT and gone on to impact the lives of many more children

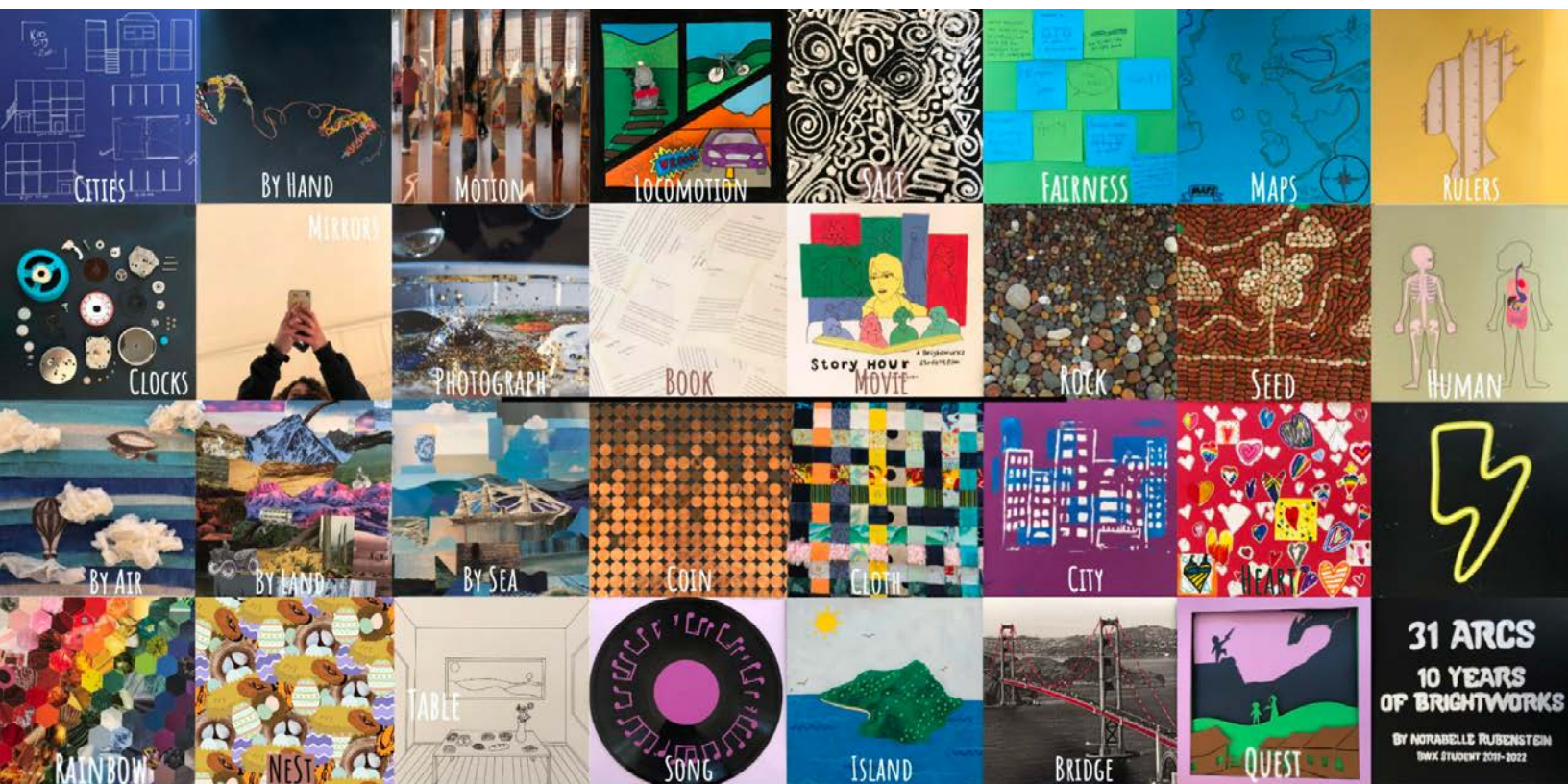


Creating Brightworks Wherever We Are

Letter from the Founder

In this, the twelfth year of Brightworks, in our fifth space, I think about the things that make us us. If you don't define yourself by location, and if no part of the pedagogy is sacred or immutable, how is it that we can look at some implementation detail or the activity of a student, and say "that's very Brightworksian"? Pressed for a simple answer recently, I suggested that we might look to see if the motivation is intrinsic or extrinsic. If there is a "Brightworks way" of getting to a learning goal, it is that we create frameworks that foster intrinsic motivation. Our emphasis is on the characteristics of learning that are not defined by place or subject, and that is why Brightworks exists and thrives no matter where we are.

The years that have gone by tell a story about who we are and all we have tried. They hint at what we yearn to become. I look at our upper school student Norabelle's visual story of her 31 arcs lived at Brightworks (image below) and can't help but smile. Unlike so many other schools, where the passage of a student through the years leaves no trace more tangible than the wake of a boat, there is evidence everywhere of our work together. You cannot pull a piece of wood from the lumber pile without becoming an anthropologist and marveling at the evidence of all that the board has been. We save little ephemeral treasures that we rescue from the floor. We make special places for great works, relishing the stories we can tell about ugly duckling projects and genius works that look like monstrosities, alongside achingly beautiful and exquisite objects born of passion and long hours. We are those ridiculous bowerbirds that collect shiny objects and arrange them, just so, to make our home inviting.



It is impossible not to love this new place we call home. This location is special, existing at the boundaries between wild and civilized, between land and sea, between real and our wildest dreams. We create Brightworks wherever we are, because it lives so fully in our imaginations, in our relationships, and in the moments that happen because we are here together doing exactly this wonderful thing that we co-create.

– Gever Tully, IAT Founder



Growing up

Letter from the Board Chair

The Institute for Applied Tinkering is now sixteen years old. When we look back at the organization's history in another sixteen years, 2022 will be seen as a huge milestone. After years of searching, we're finally in a building that meets our needs and will allow us to expand our impact as we have dreamed. After some very turbulent years, the org is stronger than ever.

So, like our students, the IAT is growing up. We're moving out of our wild startup years and becoming a more mature, confident, and capable organization. We're growing our ability to carry out our mission: to develop, practice, and share educational methods that challenge and support all children to engage deeply in their learning via real interests and real tools.

And also like our students, growing up doesn't mean we should lose any of our childlike curiosity and imagination. Long before Tinkering School or Brightworks were a gleam in anyone's eye, back when Gever and I were housemates in our Santa Cruz artists' commune, we had a motto: "Everything is Interesting." We meant that every topic, no matter how dull on the surface, has intellectual, aesthetic, ethical, scientific, and other treasures to reveal if you come at it with the open curiosity and wonder of a child.

This motto was immediately incorporated into the ethos (and T-shirts!) of the IAT. It is beautifully expressed by the Brightworks arc topics. A back-to-back pair of arcs I remember from the first years of Brightworks captures this: first Salt, then Fairness. These are two very different things. But if you explore them with curiosity, you see that they lead to many diverse but overlapping neighborhoods.

Salt: taste, ion pumps, solubility, blood, explosives, photography, salt as salary, "salted earth" in warfare, "salt of the earth," ionic bonds, neurology, geology, and on forever.

Fairness: mathematical equivalency, rules in games, social justice, political systems, standards of beauty, values and valuation, intra-group conflict, economics, color theory, forgiveness, and again, on forever.

What makes something interesting? Interested people. (By the way, this is also true in reverse: people who are interested in and curious about things are themselves interesting.)

So as the IAT moves into organizational adulthood, let's all remember that the key to our success will still be the same: approach the world with wonder, always be curious, and remember that *Everything is Interesting*.

– Matt Brocchini, *IAT Board Chair*

2021-22 Program Highlights

It was a big year for all of our programs, despite a pending move and a pandemic still in full swing. Learn more about each of our programs in 2021/2022, below.

105 Brightworks K-12 students

- 6 class of '22 graduates
- 39% BIPOC
- 34% received tuition assistance

436 participated Tinkering School programs

- 149 summer overnight campers
- 130 after school and school day program tinkerers
- 96 summer day campers at Mark Day School
- 61 weekend workshop attendees
- 55% 1st time tinkerers

73 educators developed new skills in Curious Educator programs

- 3 In-person workshops for local educators
- 4 virtual workshops
- 2 custom on-location workshops

1,000s are exploring Mars!

A new graduate from the Innovation Lab, the Tinkering School: Mars Mission took on a life of its own this year

- 170 K-8th graders explored another planet through the Mars in Classrooms pilot
- 1000s of curious minds of all ages drove rovers on Mars alongside NASA's JPL Perseverance Rover exhibit at the Exploratorium

Brightworks Programming

Exploring Foundations: Fire, Water, and Shelter

As with every year, our explorations at Brightworks are playfully inspired by an overarching theme for the year, supported by the arcs as focusing lenses. Last year, we explored “Foundations” through arcs on Fire, Water, and Shelter. All while continuing school in masks and often outdoors. Everyone was constantly stretching and rebuilding the muscles of being in community, with all the associated joys and struggles.

The Fire Arc came to a beautiful culmination with the burning of a literal phoenix at Ocean Beach. After great debate within the band about whether to actually burn what they’d invested so much in creating, lighting the match unleashed hopeful energy and excitement for all the possibilities ahead. It was a powerful visual symbol to mark the rebirth of our in-person community, and to rekindle the spark of togetherness. Below is a short pictographic journey of precious moments in a great year:



Celebrating the rebirth of community after a long COVID year



Other celebrations this year included Black lives and culture, Holi, and Pride.



High School documentary project



Safe builder training with Rob

Evolving Approach to Littles

Our youngest community members remained in the Park at the outset of the year, and the shift back to days in the building mid-way through the year afforded an opportunity to see the benefits of both environments in clear contrast. Being initially in nature all day provided a way to start strong: by practicing what it's like to be in community in different environments; leaning into agency and self-direction; and interacting with the broader community in authentic contexts that aren't contrived. Returning to the building facilitated a focus on basic



“Student understanding of their ability to learn from their play and exploration was stronger in the park than it would have been in a building. Starting in the park allowed them to establish that mindset and bring it into the building and have it overcome the conditioning that a building setting can trigger, in terms of how learning happens and who is in charge.”

– Melissa Nocero
Lead Collaborator for Early Elementary

academic skill-building with less distraction and more consistency, an ability to dive deeper into projects, and an opportunity to transfer the habits and mindsets from the creative, nature-infused, literal sky's-the-limit world of the park to new environments and expanded community. A long-term learning from this experience is the importance of recognizing strengths and abilities through play. We will continue to frontload that in the year with nature as a key element.

Diversity, Equity, and Inclusion

The Institute for Applied Tinkering is a white-dominated space, and this has been true for its entire existence. While one could argue our intentions have been good with our mission-driven work to “provide access,” we recognize that intentions are not even close to enough, that “access” is not equity, and that we are miles away from a truly inclusive and equitable space – one that is not only welcoming to Black, Indigenous, and People of Color (BIPOC), but is representative of the diversity of the Bay Area, and built with BIPOC voices and needs at the core of what we do, not as an add-on.

We recognize here that BIPOC have been historically – and are currently – intentionally and systematically disadvantaged, and that, especially in our role as an educational institution, we must intentionally and structurally work to counter that reality. To move beyond intentions and access, during the 2020/21 school year we implemented a number of measures that built on smaller steps taken during the 2019/20 pandemic year. We:

- Expanded the board to include two new BIPOC members
- Expanded the budget for DEI work to gain dedicated time and expertise, in consultation with the wonderful Sergio Suarez. They worked with the leadership team to, among other things, develop a BWX DEI Strategic Plan, provide affinity spaces for BIPOC community members, provide monthly professional development for staff, develop Social Justice Standards, form a Power and Privilege Committee, and strengthen community connections
- Maintained our commitment to high levels of tuition assistance, despite extremely tight budgets (with over \$800,000 awarded for the 2021-22 school year)
- Inspired by the work of Dr. Darlene Hall and the focus on DEI through a lens of Power and Privilege, early in the 2021/22 school year we established the Power & Privilege Committee to implement ongoing planning and accountability measures for the school. The group meets on a bi-weekly basis and is continuously working towards becoming a central aspect of the school organization and culture
- Continued our budgetary commitment to this work by carving out the funds to hire a half-time Director of DEI on staff for 2022-23 (with Sergio filling this role), and providing a budget for use by the Director to bring in additional resources. This more than doubled the fiscal dedication to DEI year-over-year. The Director of DEI will be engaged in strategic planning, adult learning, curriculum, recruiting, network, hiring, admissions,

and student and family culture, among other areas going forward. As a school organization, we are well aware that the success of this role and position is reliant on the continued support and urgency of the school community.

The commitment towards DEI is paramount to Brightworks and the IAT more broadly. We fully understand and recognize that this commitment is not yet in full alignment with our financial and structural reality. This being said, our work and efforts towards systemic change and social justice is ongoing and continuously evolving.



As an Award-Winning Community Organizer and Leader, Sergio Suarez has committed his life work to both uplift and nurture Bay Area young voices and identities of color. Since 2004 he has created and fought for equitable reform within education while creating platforms and spaces for youth to express and heal. Centering his work in honoring the students cultural kinesthetics and heritages, he has positively impacted the lives of thousands of youths in the Bay Area and across the globe.

Admissions

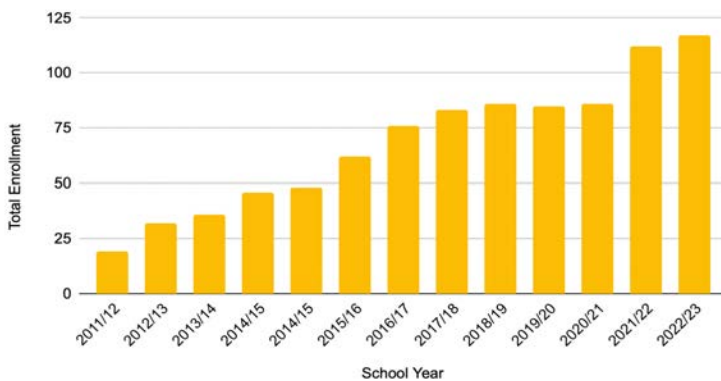
The pandemic continued to make 2021-22 admissions extraordinarily challenging, but overall successful. Shifting restrictions and ever-changing virus variants meant that the majority of the admissions experience for the year remained online. We were able to host virtual events, meet families over Zoom, and finally by February we got to know prospective students in person in nearby parks. All the while, we were hoping for but didn't know for sure until April that we would be moving to the Presidio. A huge thanks to all the prospective families who had to use a lot of imagination about what this year would bring!

Despite these challenges, 26 new students made plans to join us during the admissions season, with another 11 joining through rolling admissions. We now have 117 amazing students at Brightworks! We have increased our overall racial and ethnic diversity from 39% to 44% (and still have a long way to go to fully represent the makeup of San Francisco). We continue to maintain a slightly larger population of male students, although correcting the gender imbalance is a continued focus in the admission process.

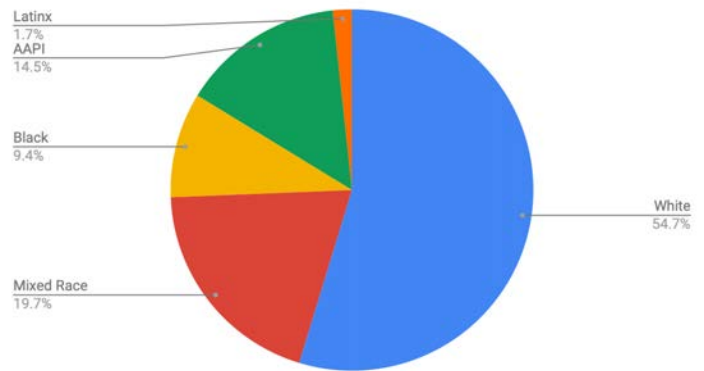


Justine Macauley, Director of Admissions and Transitions

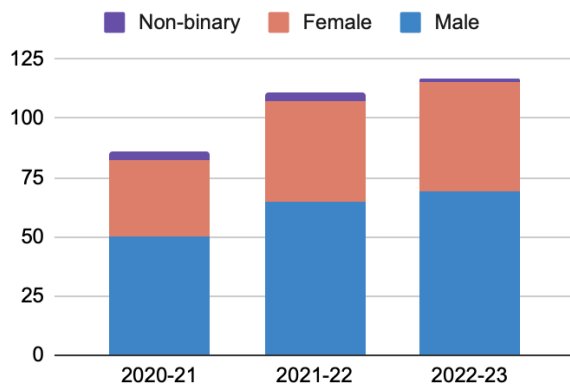
Enrollment Growth



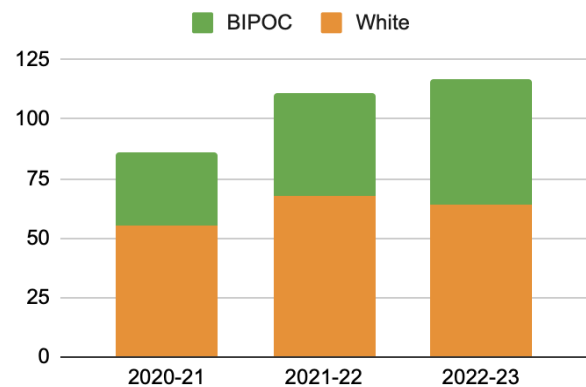
Racial Diversity



Holding ground on gender balance



Focusing on diversity



With plans to grow to 123 students in Fall 2023, we continue to focus on admitting students who will thrive at and enrich the Brightworks community, while also building a diverse and inclusive student and family body with the supports in place to help students flourish in this environment. We also continue to improve on how we share our story, including more age-specific admissions marketing material, presentations and in-person tours, and clarification of how the Brightworks model works at the elementary, middle, and high school levels.

Tinkering School

Tinkering School returned to overnight camps this year, serving 149 campers over 8 weeks of programming. This was our third summer since the COVID pandemic. The first year, our amazing team pivoted on a dime to offer online camps all summer to kids overjoyed to connect and create with others.



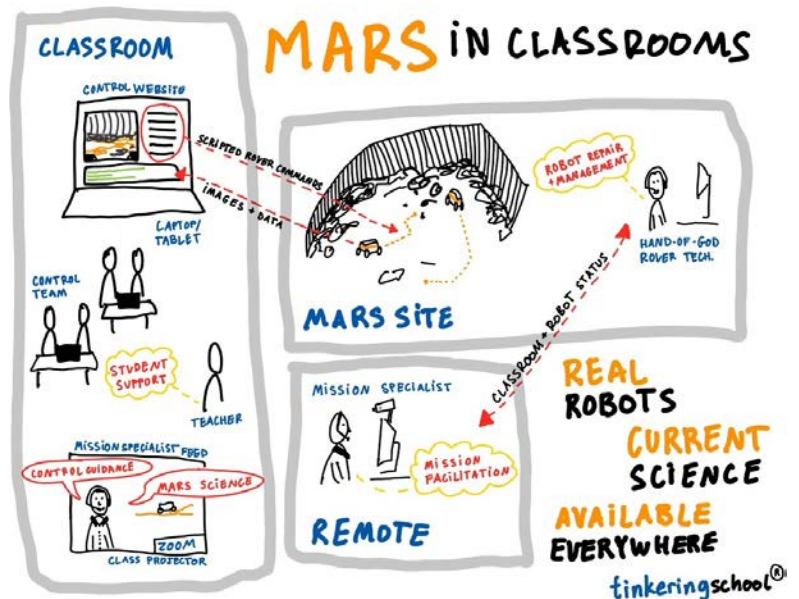
Overnight campers back designing and building again

In year two, we focused all of our energies on providing in-person day camps, especially making room for San Francisco Unified School District students who had been so impacted by disruptions to their lives and learning. This year, we returned to our original format, diving deep into the immersive and transformative experience of living and building together, surrounded by nature, with no distractions.

Tinkering School: Mars Mission

The Tinkering School Mars Mission (TSM) is creating immersive learning experiences built on robots and inspired by planetary science missions, for all students, particularly those with limited STEM opportunities.

What started as an internet-based summer camp in 2020 has now expanded into museums and classrooms. At the Exploratorium, we installed a Mars rover drive experience alongside NASA JPL's



**REAL ROBOTS
CURRENT SCIENCE
AVAILABLE EVERYWHERE**
tinkering-school®

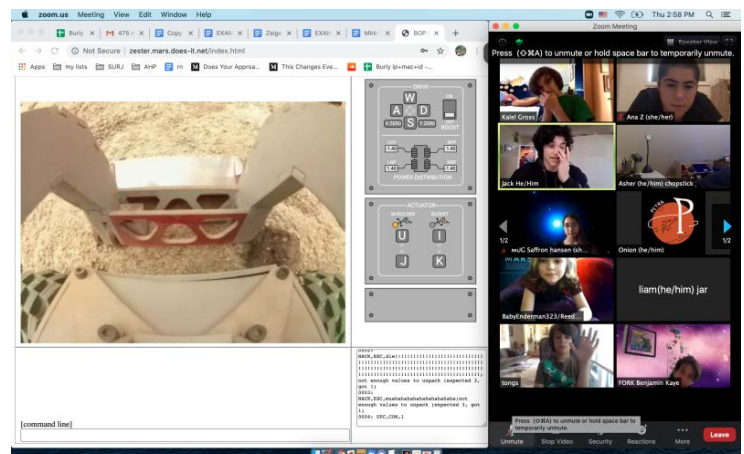


Perseverance Rover. The reception was phenomenal! Museum staff remarked on the near-constant attention our exhibit received – more than JPL’s static model – and its durability through thousands of interactions. Experts at JPL were impressed by how accurately our rover drive simulation captured their protocols.

From speaking to visitors, we learned that our cardboard prototypes inspired a new way of thinking about robotics education, one based on accessible iteration, not expensive parts. We held several rover-based workshops at both the Exploratorium and the Chabot Space and Science Center. These sessions brought hundreds of visitors into casual exploration of the real challenges faced by NASA engineers.

In 2022-23, we also expanded into schools with a pilot of Mars in Classrooms with 150 San Francisco Unified School District students and 20 Three Rivers Charter School students across K-8th grades. Facilitated over Zoom, students collaborated on laptops to program rovers over the internet as part of their science class. The NGSS-aligned Mars in Classrooms programs will serve as a jumping-off-point for math and science topics in late elementary to early high school. Our goal is to make it impossible for teachers to say “no” to inviting students to collaborate with each other and autonomously explore by offering the program on a sliding scale.

The Mars programs are developed by a group of young people from Brightworks and beyond, alongside adults from the Institute for Applied Tinkering and our newly-formed Mars Advisory Council. The Council advises the programs on how to maintain relevance in conventional classroom environments and accuracy to current robot-based planetary research. Our proximity to Brightworks invites students across ages into the complex problem space and productive teamwork environment we have developed. Meanwhile, team members continue to grow as communicators and collaborators while developing competencies in CAD tools, programming, electronics, and product design.



Online campers collaborating “on Mars”

Mars Advisory Council

Dr. Alicia Allbaugh

Mars Science Laboratory Integrated Planning and Execution Deputy Team Chief at the Jet Propulsion Laboratory (JPL)

Diana Liu

Middle school science teacher, San Francisco Unified School District

Dr. Kevin Cannon

Assistant Professor, Colorado School of Mines, Department of Geology and Geological Engineering, and the Space Resources Program

Dr. Kirsten Siebach

Assistant professor in the Rice University Department of Earth, Environmental and Planetary Sciences

Maureen Krauth

Organizer of the Marble Machine X project associated with Wintergatan and former Dreamworks project manager

Rana Adams

Student Programs Specialist at Three Rivers Charter School in Mendocino County, former coach and judge for 17 years in Junior Olympic gymnastics

Sawyer Brooks

Robotic Manipulation and Sampling Group at JPL, responsible for arm software for the Mars 2020 Rover and for the Mars Sample Return campaign. He also led the development of Limbi, a self-mobile robotic limb for in-space assembly.

Curious Educators

Sharing our educational practices is an explicitly stated and important element of the mission of the Institute for Applied Tinkering. This is partly to transform education around the globe (and help build a better world!), and partly to get feedback we can use to inform our own practices. It's a virtuous cycle.

We have been carefully tending the glowing ember of this effort through several in-person and online workshops and training sessions this year. These included in-person

workshops with Bay Area educators, professional development sessions with the entire staff of Katherine Michiels School, and online group workshops with educators ranging from Spokane, Washington to India, Nigeria, and Australia.

We have plans in place to expand our impact in this area significantly over the next several years. Look for the Summer Institute to return in June 2023, and steady growth in impact from there forward.



Local educators engage with Making and Math: Weaving them together without breaking either one



A New Home for the Institute

Letter from the Leaders of Brightworks

We ended the 2021-22 school year with great anticipation for the move to our new home. We'd been on the hunt for the right space for a long time, and this year, we began school happily basking in the kindest of new homes at 682 Schofield Road in the historic Presidio National Park. This beautiful historic building, nestled among the cypress trees and a stone's throw from the Bay, is the stuff of dreams for a school that asks so much of its environment.

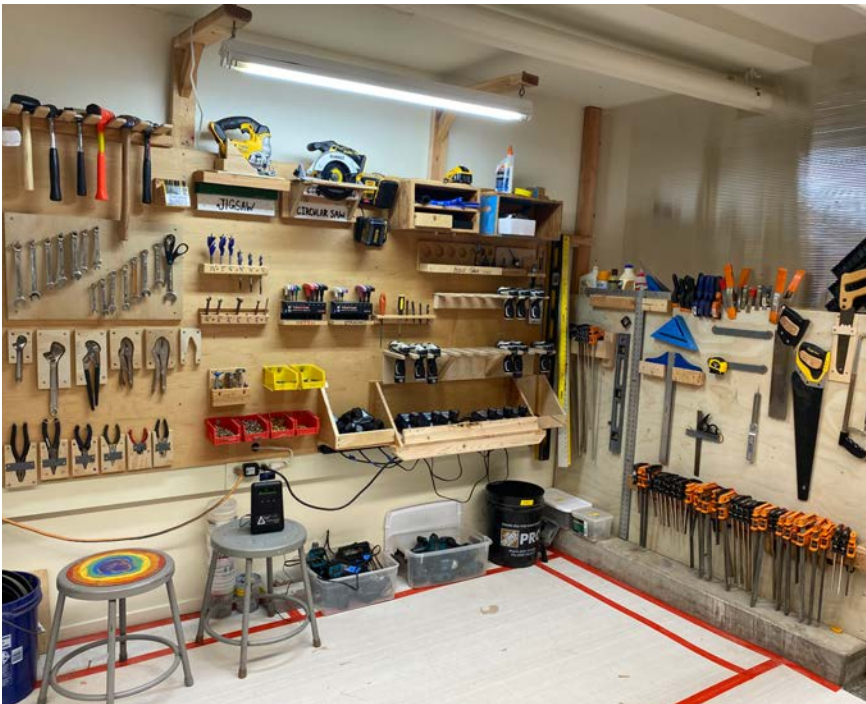
Now, after eleven years of testing and iterating, we have landed in a new home that plays and flows seamlessly from communal work spaces and quiet focus nooks to places to run and play free, all with the feel of a perfect cozy autumn living room that invites us all in and keeps us warm. All of us, big and small, are feeling the ease and awe of discovering new balance and joy in such a rich canvas to work with. The fog rolls through and then the clearest of blue shimmering skies shines on our massive back porch where we break bread together, build tree forts, and stare at the horses grazing in the stables below. Projects are taking on new dimensions as the abundance of space allows us to dream bigger in our builds. Relationships are being built with any number of living things as Rich (our lower school science collaborator) and his merry band of explorers hit the side paths to honor and understand all that lives and breathes around us. All the while, cross-age collaboration on Monster movies and other explorations are happening everywhere as our new open communal spaces make everyone a collaborator with one another.





The smiles on all of our faces are so genuine and momentous. This place we landed on is really the third teacher, the mother and the engine that is nourishing us and making all of our dreams begin to take shapes we never could have imagined. Something so sweet has begun, and we are excited to see where this will lead us all.

– Mackenzie and Anthony, *Fearless Leaders of Brightworks*



2021-22 Financials

Covid continued to put pressure on operations throughout 2021-22. We saw increased expenses for Brightworks, offset by growing enrollment and associated tuition revenue as well as continued generous donations from the community. Conversely, for the second year in a row, Tinkering School revenues were down significantly due to COVID-related disruptions, though these were mostly offset by federal Payroll Protection Program (PPP) loans that have since been forgiven.

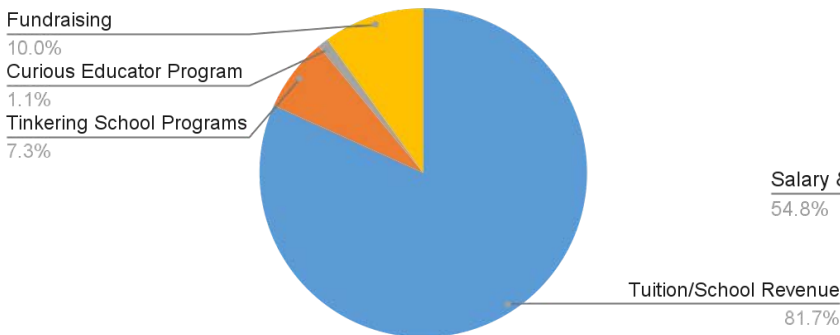
The IAT's total 2021-22 fiscal year operating revenue was \$4,678,059 with expenses of \$4,368,573 resulting in a net of \$309,486. The net operating revenue from 2021-22 was carried over to the 2022-23 fiscal year to offset projected operating deficits due to increased tenancy costs in our new home.

Category percentages (see charts below) are all nearly identical to those of the previous fiscal year in terms of their makeup of total income and expenses. However, given our move into the Presidio in summer of 2022, facilities costs will increase significantly in the 2022-23 fiscal year, with enrollment increases over the next two years (to a projected total of 132 students) targeted to offset those expenses.

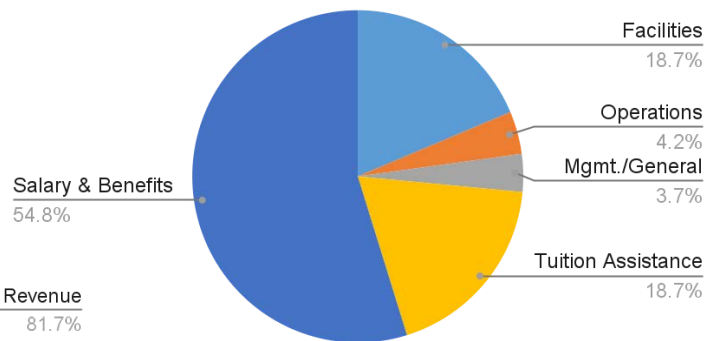


Adrian Skaj, Finance Manager

Funding Sources



Use of Funds



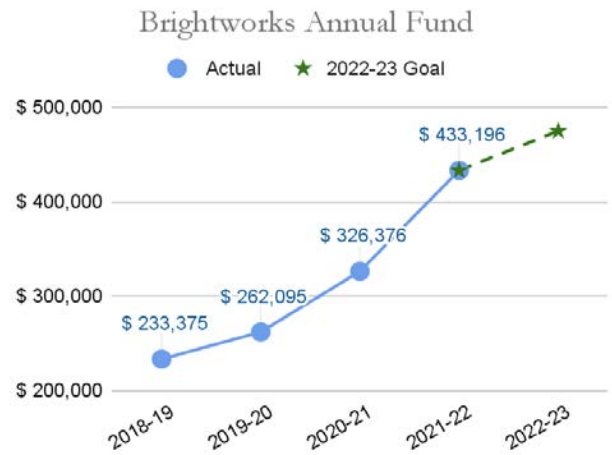
2021-22 Brightworks Annual Fund

Our last Brightworks Annual Fund, Together Again, was a wonderful success, with 97% of families participating to raise \$433,196. This was well over our goal of \$350,000. This strong support from all corners of our community helped Brightworks truly thrive in this unusual year, providing much needed funds for collaborator support, financial assistance, and helping the school with some exceptional activities and growth opportunities, including:

- Moving into our new home in the Presidio! This required significant extra summer work hours as well as other move-in expenses, including furniture, security system setup, etc.

- Expanded Diversity, Equity and Inclusion, and Power and Privilege work, and paving the way for hiring Sergio Suarez on staff as our DEI Director for 2022/23.

Fundraising participation is an indicator of the strength of a community’s commitment. We continued our trend of 100% participation in the Annual Fund by our Board of Directors and saw 97% of our Brightworks Families and 88% of our Staff contribute as well. We don’t name individual donors, but are filled with the deepest gratitude to everyone in our community, not only for your generosity in making personally meaningful contributions for your family to the school, but also for all that you do to keep us strong and for how you support each other.



A New Foundation

Letter from the Executive Director

The period covered in this Annual Report marks an inflection point in the history of the IAT. We started the year online, in the park, in a state of uncertainty – of where we would land at the end of the year, or even what the world would be like at the time we needed to move. And yet here we are!

We have an amazing new home. Brightworks is growing. Tinkering School is alive with the energy of the emerging Mars program, and with envisioning the magnificent creations of campers next summer in our beautiful surroundings. Visitors from around the world are again making pilgrimage to learn from our practices and our passion.

We do have a list of concrete organizational achievements this past year that we are very proud of. We:

- Resumed in-person community and learning
- Secured or new home and completed move-in
- Expanded membership and increased the diversity of our Board of Directors, along with staff additions to grow our capacity for effective impact
- Continued our steady growth in enrollment and fundraising

But most importantly, the incredible creativity, hard work, and love of this community – all those elements of the magic fairy dust that enabled those achievements – shone through every day in myriad and beautiful ways. In the wide eyes of excited learners; in the hearts of

humans of all ages feeling heard, seen, and kindly challenged; in the care of a community navigating challenges small and great.

I titled this note “A New Foundation” because I dearly hope, and strongly believe, that we’ve reached a stage in our organizational evolution where we can again work towards our future together on solid footing. Where our steps feel less like scrambling and more like striding. But as I think about it more, I realize this moment is something more alive than a foundation in a building sense. I see roots. I see growing towards the sun together with bright foliage unfolding and reaching. I see a place to rest and commune under the shade. A place from which to gaze into the branches and envision our next playful climb.

Thank you for a great year, dear community.

– Aaron Eden, *IAT Executive Director*

Get Involved

If you’re as fired up as we are about the mission to challenge and support all children to engage deeply in their learning via real interests and real tools, and the work to do it, we welcome you to join us! There are many ways you can get involved:

- Donate to the Institute for Applied Tinkering or a specific program by check or Paypal
- Shop online for good with the IAT as your beneficiary on [Amazon Smile](#)
- Join FamilyWorks or The Annual Fund Committee
- Come work with the [Tinkering School Team](#)
- [Buy Mars gear](#) or Tinkering School sessions for the space explorers in your life
- Send [Tinkering Labs kits](#) to all your favorite kids – a percent of proceeds go to the IAT
- Volunteer in any capacity that fits your time and strengths – whether it’s painting the building, writing grants, fundraising, building play structures, or lending a hand, you can reach out to anyone on staff to discuss

Stay in touch:



The Institute for Applied Tinkering (IAT) is a 501(c)(3) nonprofit organization
682 Schofield Road, San Francisco, CA 94129

People of the Institute for Applied Tinkering, 2021/2022

IAT

Staff

Gever Tulley, Founder

Aaron Eden, Executive Director

Libby Catzalco, HR and Curious Educator Coordinator

Freya Suarez, Operations Manager

Shayne Regalado, Business Manager

Adrian Skaj, Finance Manager

Board

Alison Lee, Secretary

Elijah Selby

Kate Schox

Kathryn Grantham, Treasurer

Michael Gough

Matt Brocchini, Chair

Monique Brinson

Olivia Teich

Patrik Lundh

BRIGHTWORKS

Leadership Team

Mackenzie Price, Head of School

Anthony Consilio, Director of Community

Justine Macauley, Director of Admissions & Transitions

Sergio Suarez, Director of DEI

Collaborators

Phillip Filastre, Asst. Dir. for Middle/Upper, Opal

Melissa Nocero, Asst. Dir. for Early Elem., Garnet

Shirvan Mahto, Quartz

Michele Brock, Diamond

Emily Furnival, Lapis

Rich Perenyi, Citrine

Sam Phillips, Amethyst

Daphne Morgen, Pearl

Michlene Cotter, Obsidian

Aili Osteraas-Constable, Obsidian

Evan Barnes, Upper School Math and Science

Nathan Savoy, Lower Elementary Support

Rob Aiman, Little Gems / Lower School Assistant

Daniel Bigler, Aftercare

Ruby Harrison-Clay, Lower School Support and Aftercare

Grace Leary, Middle School Support and Aftercare

Amina Aineb, Auxiliary

TINKERING SCHOOL

Leadership Team

Ana Zeigler, Tinkering School Collaborator

Jack Meadow*, Program Manager

Karen "KDM" Dwyer-Meadow, Tinkering School Wrangler of Details

Collaborators

Aidan Krempez

Audrey Gallagher^

Clarity Samas^

Cory Greenwald*^

Daniel Bigler*

Felix Bryan^

John Mellet*^

Julian Grossman^

Katherine Byunn-Rieder

Liam Brennan*

Liliah Parker^

Madelyn Hardee^

Owen Hoyt*

Savan Newman^

Sylvia Hoyt

Yasmin Andrews

* *Brightworks students, alumni, staff*

^ *summer staff*

