# Discovery

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# DISCOVETY CELEBRATING DAVID KOCH'S LIFE AND LEGACY



The passing of my brother David on Aug. 23 prompted quite an outpouring of comments from employees and friends around the world. I thank you for those heartfelt messages of condolence and for thinking of our family during this time.

David, like our father, had an insatiable thirst for knowledge, and was an excellent engineer. He was always on the lookout for technologies that would enable us to create value for our customers.

It makes me very happy to watch the group he led for so long (and has transformed itself so many times) undergo still another transformation. You can read the story of that exciting new journey beginning on page 3.

On page 11 you will be introduced to a community of uncommon philanthropists and social entrepreneurs that is dedicated to helping millions transform their lives. Stand Together's success is based on the same principles as Koch Industries': helping people create virtuous cycles of mutual benefit.

Because it is an election year here in the U.S., 2020 is likely to be filled with more noise than progress. As Koch company employees, I believe each of us can play an effective role in public debate by setting a good example.

We do so by showing that the best path to success and fulfillment comes from finding what we do well, developing those gifts, and then using them to help others in a spirit of mutual benefit.

To have a society that works for everybody, we must all strive to bring people together, rather than drive them apart.

Charles Koch, chairman and CEO

Koch Industries, Inc.

# **ENGINEERING A TRANSFORMATION**

# More than just the name is changing for Koch's chemical technology businesses BY DAVE DOTSON



Have you heard? Koch Engineered Solutions is the new name for one of Koch's oldest businesses: Koch Chemical Technology Group.

We are proud of our heritage, which dates back to the formation of Koch Engineering in 1945. What used to be contained in a small shop and office in downtown Wichita has, over the course of 75 years and multiple acquisitions, grown into a multi-billion-dollar business with world-renowned brands and capabilities. As Charles Koch noted on the previous page, much of that phenomenal growth was thanks to the entrepreneurship and passion of the late David Koch.

Our customers know they can rely on us to create superior value for them by providing the best technology, services and talent in the business. This has enabled us to become the preferred supplier for many customers, have great brands and be consistently profitable. This is reinforced by our industry–leading R&D centers and one of the strongest



parent companies in the world. So why, if we're so wellestablished and successful, would we even want to think about transforming our group?

Because — to put it simply — we have no choice.

# AN HONEST SELF-ASSESSMENT

Our world is being disrupted daily by new technologies. Robotics, automation, data and connectivity are rapidly changing the way our competitors pursue opportunities. Meanwhile, the customers we are competing for are looking for new and better ways to optimize and improve their operations. They are also looking for preferred partners who can find problems and offer solutions before they even know the problem or solution exists.

For several years, what is now KES has consisted of nine different companies, each of which had great things to offer but when combined approached their customers (often the same ones) with nine different sales teams and nine different strategies. Because of this and a too-conservative approach toward risk, we developed a reputation of being difficult to work with. For years, we've tended to be too transactional. We take an order and supply our product or service, then wait for the next phone call. Although we have large market shares in North America, we have been less successful than our competitors in high-growth markets and other regions. Yet, we have the capabilities, talent and technology to be the preferred partner globally for many more customers. So, we have a sense of urgency to do something about it before we waste our advantages.

### IT ALL STARTS WITH VISION

We started what we call our revisioning process by thinking about the future. How will a competitor enter one of our businesses five or 10 years from now? What will that look like?

It's not going to be clipboards and spreadsheets and people on the ground in refineries, chemical plants and other facilities. Instead, they'll likely connect to our customers



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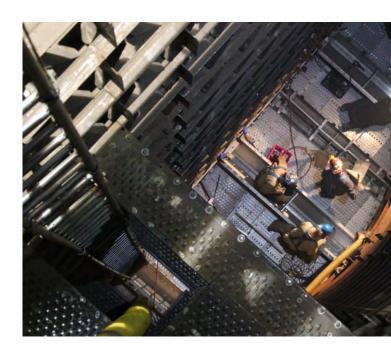




Coen, a John Zink Hamworthy Combustion product line, is the market leader for providing boiler burner technology. Acquired in 2007, its customers include power providers as well as industrial steam users.

instantly from anywhere in the world. They'll be able to use real-time data, computational models and predictive analytics to solve problems on the spot. When new products are needed, engineering and manufacturing will start at the push of a button. And customers will be able to track the entire production and delivery process.

We have historically thought of ourselves as equipment providers with some unique and specialized services. But when we applied the KII Vision, we started to think about ourselves as a set of highly specialized engineering and service *capabilities* that can do much more than just



supply equipment. That was the moment when our vision of ourselves and how we can create value changed.

We now recognize we have unique engineering capabilities that we can use to solve problems for our customers. When we combine them with our service capabilities and apply modern connected technology, we can greatly expand the breadth of services we provide and bring innovative, integrated solutions to our customers. We can do a much better job of helping them design, install, operate, optimize and improve their processes.

# WHAT WE MUST DO

To implement this new vision, we must change how we think of ourselves and how we approach and create value for our customers. We need to add capabilities and continue to grow our domain expertise. To that end, KES must become a preferred partner for many more and different customers.

In the primary markets we focus on, we often have advantaged and unique technology and equipment. But even so, feedback from our customers has told us we aren't always preferred because of the perception (or reality) that we are hard to work with. So we are changing how we interact with our customers. We will become a true partner

of choice by, in part, integrating the capabilities of *all* our companies to provide customers with higher-value solutions.

We will expand our capabilities and apply new technologies to better bring our domain expertise to our customers — helping them optimize and improve their performance. This will require building new businesses and customer–service models.

We will do a better job of partnering with our KII sister companies to create more value in their businesses and improve the quality of our offerings and our speed to market. We will use the breadth and capabilities within Koch Industries (the Koch Lab concept) to be the fastest to market with new products and services. KII's vision of long-term value creation has created industry-leading R&D and test centers. We will more fully use these innovations and capabilities to capture new markets and new opportunities, using new technology to change how we deploy our unique expertise.

We will also enable employees to discover and develop their gifts and apply them in roles in which they can make the greatest contribution. We will help them self-actualize and reach their full potential. We will be an enterprise that is highly sought after — by our customers and by talented, entrepreneurial employees.



Left: New six-pass SUPERFRAC® XT trays made by Koch-Glitsch were recently installed at FHR's Houston chemical facility. As part of this project, Koch Specialty Plant Services designed and built a special elevator that enabled the removal and replacement of old equipment in a faster, safer way.

Right: Delta Robots, like this one from Genesis Robotics and Motion Technologies, are often used in the packaging industry for "pick and place" applications. This model uses GRMT's LiveDrive® Direct-Drive motor technology. It eliminates the need for bulky motors and gears while increasing line capacity and productivity.



# Discovery KES

#### WHAT HAVE YOU DONE FOR ME LATELY?

Although this vision sounds lofty and may seem like an abstract theory, I can assure you we already have many exciting things underway.

Even before we changed our vision, we were changing how we thought of our group and where our business model can be applied.

When we purchased Genesis Robotics and Motion Technologies in 2018, we knew it had special technology that could disrupt the robotics industry. We took that a step further, applying our engineered-to-order business model to help Genesis enable industrial robotics manufacturers to design custom-built actuators to use in specific robotics applications. This process of working with the customer to understand their needs and the application, then designing and providing a specific solution, is the same model we use to supply mass transfer solutions via Koch-Glitsch or emissions control solutions from John Zink Hamworthy Combustion.

Both of these companies are partnering with Flint Hills Resources to help monitor and improve the performance of FHR's plants. Koch–Glitsch is working with Pine Bend Refinery to monitor two distillation towers in real time as an experiment to determine if we can add value by applying our expertise in mass transfer.

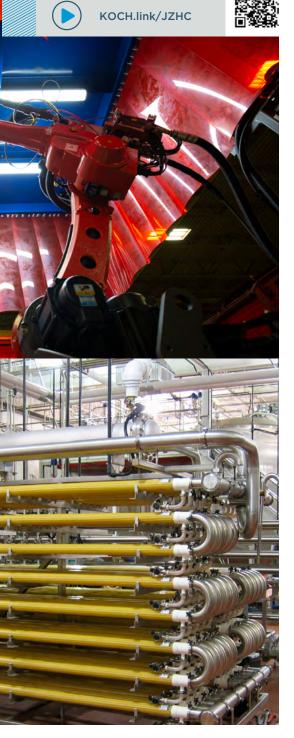
Similarly, John Zink Hamworthy Combustion is monitoring the burner performance of nine heaters at current and former FHR locations. By monitoring the real-time process and atmospheric conditions of the burners and comparing those data to our physics-based model, we have been able to help operators make adjustments that bring the furnace much closer to optimal operating conditions. This helps increase fuel efficiency, reduces emissions and improves the safety and reliability of both the burners and the heaters.

In order to increase the speed of the experiment, we partnered with EFT (Koch's advanced data analytics company), reducing development time by many hours. The experiment was so successful, EFT became a part of KES on November 1.





The XP Flare Tip (above) is John Zink Hamworthy Combustion's most recent innovation in flaring. It combines the benefits of improved smokeless capacity with lower steam consumption and noise levels.



This will further improve our integration and help KES better develop its connected products platform.

Koch-Glitsch recently completed its acquisition of Germany's Julius-Montz GmbH — a leading chemical and pharmaceutical process equipment and technology supplier. This expands Koch-Glitsch's product portfolio and provides access to the German refining and petrochemical markets. At the same time, Montz can now use Koch-Glitsch's global sales capabilities to market its technologies more broadly. This is mutual benefit in action.

There are many other examples of transformation as well.

We now have a partnership with INVISTA Performance Technologies to develop innovative solutions for improving its process technology offerings, giving it an extra advantage in the marketplace. For the last several years, Optimized Process Designs has been expanding its scope to include larger and more complex petrochemical facilities. Koch Separation Solutions, which was emphasizing municipal water systems, has refocused its vision on a number of niche applications. KSS has had tremendous success designing separation solutions for unique food and beverage applications. (So unique that they can't be made public!)

All our companies are working to improve their manufacturing and services through optimization and automation efforts. We've even started a new business called Koch Project Solutions. It offers full project management and general contracting capabilities for customers who have large capital projects but might not have the "owner" resources to effectively manage a large engineering and construction effort. Our transformation will make it possible for us to provide a full, turnkey solution for the first time — even for an entire plant.

## **MORE TO DO**

These examples are just snapshots of the many things we have already launched. The next step in our journey is to make sure we are organized and have the culture and talent necessary to fully advance this vision. As I have heard INVISTA's CEO, Jeff Gentry, say many times, "we will be limited only by our culture and our capability." That is true of KES as well.

The opportunities before us are incredible and exciting. Our ability to create value for others and ourselves as we pursue them will be determined by our ability to attract, retain and motivate creative, self-actualizing entrepreneurs and organize around our biggest opportunities.

My goal is to unleash this team to go capture!

Dave Dotson, president Koch Engineered Solutions



# STAND TOGETHER BY BRIAN HOOKS

Can the same principles that drive success at Koch Industries also create solutions for society's biggest challenges?

Charles Koch certainly thinks so — so much so that he is investing his personal fortune to spark virtuous cycles of mutual benefit through his philanthropy.

Charles has also made a point of seeking partners who are capable of helping people transform their lives. Together, this group is guided by the same North Star: a society where people from all walks of life knock down barriers so everyone can realize their unique potential and contribute to the lives of others.

## **STARTING POINT**

The beginning of this vital approach to philanthropy dates back more than 50 years. In the 1960s, Charles Koch began offering scholarships to students and supporting scholars looking to offer new ideas for addressing problems in society. Along the way, he found partners — including other business leaders and philanthropists — willing to help build new capabilities, unlock opportunities and drive continual transformation.

Today, that philanthropic community is called Stand Together. We help social entrepreneurs supercharge their efforts to help people improve their lives by connecting them with passionate partners and the resources necessary to make a greater difference. Our community includes more than 700 of America's most effective business and philanthropic

leaders, the people leading more than 150 community organizations fighting poverty, more than 1,000 professors at 350 universities, tens of thousands of K-12 teachers and millions of grassroots activists nationwide.

Through that philanthropic community, Stand Together tackles some of the nation's biggest challenges so that every person has the opportunity to realize his or her potential.

"The progress we're making," says Charles Koch with a smile, "is one of the reasons I get up in the morning charged up every day."

# **HELPING EVERY PERSON RISE**

Although we live in a period of unprecedented progress — economic, social, technological — many people are being left behind. The way our society chooses to address this represents the greatest challenge of our time.

The alarm bells are all around us: A decline in economic mobility that once defined the American dream. A criminal justice system that gives better deals to the rich and guilty than to the poor and innocent. A drop in U.S. life expectancy for the first time in more than 100 years.

Why is this happening? The biggest problem is that the key institutions of society that can make or break a person's ability to succeed — education, business, communities and government — have become dominated by a top-down approach based on power and control rather than working to empower people.



Our education system teaches to test rather than help students identify their unique gifts and succeed by creating value for others. In business, cronyism and protectionism protect special interests rather than empower innovators and employees. In communities, the War on Poverty has made poverty easier to endure but harder to escape, failing to help people gain the skills and support to succeed. In government, the choices being presented today are too often variations of socialism and nationalism — two paths that lead to the same place: control and dependency rather than empowerment and success.

Such top-down ideas are a reaction to the pace of change and innovation that are causing disruption in people's lives. However, these ideas have failed every time they've been tried. But in tough times, people will settle for bad ideas if that's all that's being offered.

Stand Together offers an alternative approach that people across the country have been searching for. Rather than top down, Stand Together's approach is bottom up — based on a deep belief in people and an understanding that with the right mindset and support, all of us can improve our lives and meaningfully contribute to the lives of others. Stand Together is uniting with *anyone* to do right and to spark movements that can transform the key institutions of society from the bottom up.

### **VIRTUOUS CYCLES**

In the August 2018 issue of *Discovery*, Charles Koch described how virtuous cycles of mutual benefit have propelled KII's exceptional growth: "The cycle begins when we develop capabilities that enable us to create value for others. As we improve and add to our capabilities, new opportunities open, which point to the need for additional capabilities, and so on, in never-ending cycles of improvement and growth."

KOCH.link/DiscoveryAug2018





- Charles Koch and Brian Hooks at the most recent
  - Stand Together Summit this summer in Colorado Springs.



Building on this momentum, Stand Together recently launched its biggest initiative yet: Stand Together to Help Every Person Rise. There's no single solution. But Stand Together is investing more than ever before to support the social entrepreneurs who are developing effective solutions from the bottom up — and in the process, transforming the key institutions so they empower people to tackle our country's biggest problems. Here are five examples of the kinds of things our country must do.

# Empowering everyone to find fulfilling work

Shaun Alexander — former NFL MVP with the Seattle Seahawks — came to his first Stand Together Summit in January wanting to make a greater difference with his philanthropy.

At that Summit, he met Chad Houser, founder of Café Momentum — a top-ranked restaurant in Dallas that's staffed by an unusual workforce: kids who are exiting the juvenile justice system. Houser told Alexander that, on average, nearly 50% of kids leaving

Shaun Alexander, Chad Houser, Judge Sheila Calloway and Café Momentum interns and supporters at the Nashville "pop-up" restaurant.

juvenile detention return within a year. But for young people who go through a 12-month, paid internship with Café Momentum, 85% never return to jail. Young people are using these internships — and the confidence and skills that come with them — as a springboard to more fulfilling lives.

Shaun was fired up. He began working with the team at the Stand Together Foundation to think about ways to transform and extend the concept. What if they took the restaurant to Nashville, home of the 2019 NFL Draft? It wasn't long before Café Momentum had launched a temporary "pop-up" restaurant in Nashville. A group of kids from the local juvenile detention center got a crash course in restaurant service for an event that included Stand Together philanthropists, NFL players and the mayor of Nashville.

After the event, one young participant said, "Having these people come in ... coming to tell me I've got potential, that I can do things, and showing me I could — that really had a great effect on me."

Now Shaun's goal is to help expand Café Momentum to all 32 NFL cities. He recruited several current and former NFL players to get involved as well, propelling a virtuous cycle that will not only help young people nationwide transform their lives but also change how society thinks about the potential of bottomup solutions like Café Momentum that can empower people to find fulfilling work.

## Helping neighbors beat poverty and addiction

For years Scott Strode struggled with drugs and alcohol. But then he discovered that physical fitness could help him overcome his addiction. In 2006, he launched The Phoenix to help others do the same.

The Phoenix takes an innovative approach with a CrossFit-style training program that helps people recovering from addiction stay sober through both fitness and a supportive community. Its results have been impressive. Eight out of 10 active members have remained sober for six months — a success rate more than twice the best clinics in America. When CNN aired a story about Scott's accomplishments as part of its "Heroes" series, more virtuous cycles were created.

Dana Smith watched that CNN special while sitting in a jail cell, feeling hopeless about her future. But after learning about The Phoenix, Dana realized there were others who not only shared her struggle with addiction but who had found a realistic path to rebuild their lives. She dedicated herself to becoming a model



inmate and after her release moved to Colorado to join The Phoenix. Today, she has not only stayed sober, she has found her calling as regional director for The Phoenix's flagship operation in Denver.

Now, in partnership with the Stand Together community, The Phoenix is scaling its efforts. It has expanded from seven to 45 locations, helping more than 10,000 people annually. Through new partnerships and promotions — like the one it announced with the Boston Red Sox this spring — it plans to reach hundreds of thousands more with its message of hope for those who have fallen behind.



Top: Scott Strode, founder of The Phoenix, throws out the opening pitch at Fenway Park.

Bottom: People beating addiction through fitness and community with The Phoenix.

# DISCOVERY STAND TOGETHER

## Ensure an excellent education for every person

The most common answers to problems in our education system are to double down on the current approach: an excessive focus on standardized tests and a one–size–fits–all approach to learning. Transforming education requires flipping that approach on its head: personalizing education to focus on how to empower all kids to unlock their unique potential.

Youth Entrepreneurs, a program Koch Industries has supported for decades, is a great example. It approaches learning as an experience, with the teachers serving as guides that help students identify their skills and then learn to apply them in the real world. What if we could accelerate the growth of many more innovative programs like YE?

Matt Candler founded an organization called 4.0 to do just that. 4.0 invests in early-stage social entrepreneurs focused on education in a person's formative years. It also helps them network with one another so they can continuously learn and evolve.

In its first eight years, 4.0 has helped launch 228 educational programs serving students in all types of schools. For example:

- **unCommon Construction** teaches students practical skills by building homes as part of an interdisciplinary high school experience.
- **Electric Girls** focuses on helping girls get hands-on experience with engineering projects.

Now Stand Together is helping 4.0 dramatically scale its efforts. In a groundbreaking new partnership with the Walton Family Foundation, the Stand Together community is investing \$10 million to fund 500 more social entrepreneurs in education over the next few years.



As educators have greater opportunities to experiment, innovate and create a diversity of options for students, they drive virtuous cycles — continually discovering new and better ways to create educational opportunities. In doing so, they transform education from the bottom up, to empower students to realize their potential.



Top: Students with unCommon Construction learn technical skills. Left: Students with Electric Girls learn about engineering.

## **STAND TOGETHER | VOLUME 25 | NUMBER 4**



Building a strong economy that works for all

Helping every person rise is not just about helping those who have fallen on hard times. It's also about unleashing the growth and innovations that can transform our quality of life for the better.

Sal Churi knows firsthand that there are many economic barriers holding people back from a brighter future. With support from Stand Together partners, he founded Trust Ventures — a venture capital fund that invests in transformative technology companies in highly regulated industries.

- **Oklo** is a pioneer in advanced nuclear technology. Its model is to create safe, scalable, portable energy that could dramatically reduce costs and expand access. In remote areas of the country, it could lower energy costs by 80%.
- **Visibly** is a telemedicine start-up connecting patients with doctors over the internet to expand access to affordable eye care. This is an especially big deal for people in the 25% of American counties without an eye doctor in their area.

ICON is building houses — that's right, houses
 — with 3D printers. Think about the benefits
 when you can build the core structure of a home for a fraction of the usual cost.

The biggest challenge facing these companies is not how to make their technology work, but whether they'll be allowed to operate at all. That's because each of these examples faces policy barriers. ICON is a typical example. In most major cities, zoning and permitting regulations have been in place for decades — long before anyone ever imagined a 3D printer. Those rules were never designed to account for something as transformative as ICON.

That's why, in addition to investing in startups, Trust Ventures uses its legal and policy expertise to help them navigate and remove needless barriers. This doesn't just benefit Trust Ventures — it helps level the playing field for many more principled entrepreneurs, transforming the role business can play in solving problems in society by opening up innovation and opportunity.



America's first 3D-printed house in Austin, Texas, made with ICON's innovative technology.

# DISCOVERY STAND TOGETHER

### Bridging divides and building respect

Some of the biggest barriers to progress are the polarization and divisiveness gripping our country. Left unchecked, they not only lead to stagnation, frustration and lack of opportunity, they hinder self-transformation.

Fortunately, social entrepreneurs supported by Stand Together have shown that even these obstacles can be overcome. They've provided powerful examples of how to bridge divides and build mutual respect — even in the hotly contested arena of public policy.

Consider the story of Matt and Caitlin Bellina. When he was 30 years old, Matt was diagnosed with ALS, or Lou Gehrig's disease. At the time, he was a Navy fighter pilot and father to three young boys. There is no cure for ALS and 80% of patients die within five years. In 2018, Matt was in year four.

Matt and Caitlin had been advocating for years to reform a law that prohibited terminally ill people from trying experimental treatments that could save their lives. Lawmakers from both parties supported this reform — as did nearly 85% of Americans. But for years, it was stuck in partisan stalemate. Neither party wanted to give the other a win. It was partisanship at its worst.

The Stand Together community set out to change that. Through Americans for Prosperity, they focused on building a nonpartisan coalition of lawmakers who wanted to do the right thing. The group launched a major media effort, including a national TV ad that thanked policymakers from both parties who were putting people over politics, while calling on their colleagues to act. And they upped the pressure on key lawmakers who were sticking to their old partisan ways, with grassroots activists making so many phone calls to Capitol Hill that one lawmaker finally called and said, "Enough, you've made your point — we're trying to get this done."

A few weeks later, Congress passed the legislation and sent it to the president's desk — a major victory, proving that even in one of the most divisive periods of our country's history, we can still bridge divides and move the country forward.

As for Matt? Thanks to his courageous leadership, Congress named the legislation after him and other



Matt and Caitlin Bellina at the Right-to-Try bill signing.

KOCH.link/Bellina

terminally ill patients who advocated for its passage. And a few weeks later, Matt and Caitlin got incredible news: Matt had been granted access to a new experimental treatment. It had been two years since he'd taken his last step. But just one month after he began treatment, Matt posted a video on Facebook showing the progress he'd already made.





This is just one of many advances the Stand Together community led over the past two years, including historic criminal justice reform and health care reform for veterans, and dozens of reforms at the state level with support from policymakers of both parties.

These examples show how virtuous cycles of mutual benefit can transform how public policy is made in this country. We can work together on areas of common ground — regardless of political party — which unlocks more opportunities for progress than is otherwise possible.

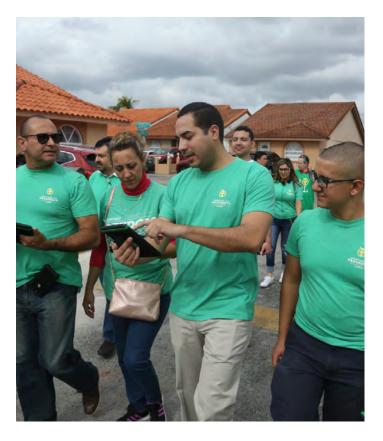
# **SOCIETAL TRANSFORMATION**

These five examples represent experiences typical of the thousands of social entrepreneurs who partner with Stand Together. As people benefit from these efforts, they go on to help others, creating and extending virtuous cycles that spark a ripple effect of positive change nationwide.

By applying this approach to America's biggest challenges, we aim to inspire movements of millions that can transform the key institutions of society — education, business, communities and government — from top-down control to bottom-up empowerment so everyone can rise and realize their American dream.

With the discourse in our country becoming more and more contentious, it's easy to get discouraged. As Charles mentioned on page 2, next year will probably be among the most divisive in recent memory. But that doesn't need to be what defines 2020 or the future of our country. The





Grassroots activists with Americans for Prosperity go door to door in their Florida neighborhood.

initiatives we've described here, along with hundreds of others underway, demonstrate that this country is full of good people who want to make a difference and will do the right thing if given the chance. Through these efforts, we're helping show there's a better way and that there can be a brighter future ahead.

As Charles put it recently: "We have made more progress in the past five years than in the previous 50. And in just the last 18 months, we have made more progress than in the previous five years. Yes, the challenges we face are great. But our ability to overcome them is far greater — if we stay true to these principles and stand together."

Brian Hooks, chairman and CEO Stand Together









Koch partners with Invention Convention Worldwide — an invention education program that has reached more than 100,000 students in seven countries — to support young inventors. At ICW's national convention in May, Koch awarded four inventors the Young Visioneer Award and invited these students to visit Koch research and development facilities, where they worked alongside our industry experts and discovered new ways to improve their prototypes while also experiencing the innovation process firsthand.

Top: Florian and Aanya test propellers with an SRG Global employee. Bottom left: Danny presents his car seat invention to a panel of Molex leaders. Bottom right: Morgan conceptualizes new prototypes at Phillips-Medisize.



Read and watch more about their experiences at koch.link/YoungVisioneers

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