

1.	Tinkercad Basics. A simple 3D Design tool	Tinkercad is a great free 3D design program with a quick learning curve that allows teachers to quickly teach students to create their own designs for 3D printing. In this workshop you will learn Tinkercad basics and some techniques that help students to quickly create some amazing designs.
2.	Teachers in Industry: The Ultimate Teacher Externship	Would immersing educators in industry help them understand the skills necessary for student success in the workforce? We think, yes! Learn how Frederick County Public Schools and American Woodmark Corporation team up to provide a unique experience to guide educator practice in preparing students for jobs of today and tomorrow.
3.	Using the CTE Resource Center Website and Canvas to Access Virginia's Technology Education Curriculum	The CTE Resource Center, your source for Virginia's CTE curricula, will guide you in accessing your courses through the Center's new website and through Canvas/Virtual Virginia. You will learn how to access the content from the Canvas Commons, pull it down into your Canvas course, and see different ways to integrate your current lessons and resources with the course competencies.
4.	Sustainability in Action: Planters and Pallets Project	This project focuses on multiple sustainability initiatives such as on interiorscaping, urban gardening, air quality, horticultural therapy, upcycling, etc. It also provides real-world experiences for the students involved. The MHS design classes converted used pallets into usable wood planter boxes after the creation of digital designs, the planing of the rough wood pallet pieces, fabrication of the boxes, and the exterior painting prior to installation. Students in the Environmental Science (MHS) classes, Design (MHS) classes, the Village Program (MEHMS), and the Sustainable Design, Engineering, and Energy (MEH/MHS) classes all worked to set up planters and place them throughout the schools.
5.	Sea, Air and Land Challenge – an accessible project based introduction to engineering	The Sea Air and Land Challenge introduces students to engineering through the use of robotics. Over one semester, teams work in classes or after school groups to design and develop submersibles, drones or land rovers. On Challenge Day, teams come together to learn about careers and compete. Optional curriculum available.
6.	Electric Vehicle Grand Prix in the Valley	This session will explain how Sherando High School Technology Education Department

		started a team to build an electric vehicle. Sponsored by Shenandoah Valley Electric Cooperative (SVEC), students loved the project. TSA members and students enrolled in Engineering Explorations made the effort to build and race a 3- wheeled vehicle.
7.	Taking Engineering to the next level	Come learn about the valuable resource published by American Society for Engineering education that enhances the STEL and provides depth to engineering practices and knowledge.
8.	How to Make Toast and Other Wicked Problem Solving Solutions	The value of teamwork and each team member's contribution to a complex problem will be demonstrated through an interactive activity titled "How to Make Toast". Part of the T/E design process is drawing representations of designs. To draw out participants' creative ideas, they are led through an activity in which design ideas are enhanced through team member's individual contributions through sketches of a "simple" design process. The concept of synergy is developed, and the importance of collaboration among team members is reinforced.
9.	VA STEM Board: Engineering Solutions for STEM	Where is Virginia STEM? What counts as a STEM occupation? Learn about the Virginia STEM Advisory Board and what we are doing to help engineer and manufacture solutions for a more unified approach to STEM education in Virginia.
10.	Changes in Middle School Curriculum Frameworks	Join 2 middle school teacher to find out what the changes are in the middle school courses Introduction to Technology, Inventions and Innovations, and Technological Systems. These courses align with the Standards for Technological and Engineering Literacy. There are options for being creative!
11.	Preparing to teach Virginia's new Energy courses	VDOE, Energy industry representatives, and Virginia educators designed eight new high school energy courses. This session will guide you through the process to be thoroughly prepared to teach these HS courses (or MS modules), and seek course approval with your CTE Director from your school board.
12.	EbD for Introduction to Technology	Learn how to use the Engineering byDesign curriculum from ITEEA to teach Introduction Technology in Virginia.

13.	EbD for Inventions and Innovations	Learn how to use the Engineering byDesign curriculum from ITEEA to teach Inventions and Innovations in Virginia.
14.	Manufacturing: The Future	The future of manufacturing is in our classrooms. How can we get these learners excited about career opportunities in the industry? Learn how a WBL coordinator and local manufacturer teamed up to offer tours and job shadowing, that has led to classroom connections and student employment.
15.	Next Generation Methods for Teaching Robotics and Preparing the Future STEM Workforce	From coding to manufacturing applications, robotics in the classroom is constantly evolving to better prepare students for future STEM careers. Join us and see firsthand how to reinforce math and science concepts and teach industry credentials using robots. Get hands-on experience with several different robot kits and robotics AR/VR systems.
16.	Renewable Energy Classroom Kit Lending Library - Broadening Our Reach	In this session, participants learn about the Center for the Advancement of Sustainable Energy at JMU and its renewable energy classroom kit lending library. Educators will have a chance to work through many of the kits available and learn about how CASE is partnering with the 4H community to expand the reach of the lending library and increase access to counties not able to benefit from the library in the past.
17.	EbD for Technological Systems	Learn how to use the Engineering by Design curriculum from ITEEA to teach Technological Systems in Virginia.
18.	Integrated STEM - Linking STEM activities to science SOLs	Participants will learn how to create STEM design challenges that integrate science SOLs. Design briefs currently being used with connections to physical science and life science will be shared.
19.	Engineering For US All: NSF sponsored Curriculum	Engineering for US All (e4usa) is a NSF funded high school engineering program that opens engineering to a new generation of students and educators. The e4usa mission focuses on the nationwide expansion of student and teacher access to engineering, with intentional efforts to reach populations traditionally underrepresented in the field.
20.	Using micro:bit microcontrollers in Elementary and Middle School curricula	New micro:bit microcontrollers were introduced just 5 years ago, and were adopted by many several countries for all 6th-7th graders, and there are new , similar initiatives here in the United States. These microcontrollers have

		multiple built-in sensors, 25 LED's, multiple input options, radio communication, microphone and speaker, breadboarding capacity, and are programmable in Microsoft MakeCode, Python, Javascript, C++, and Scratch. The online interface and fully functional simulator accommodates 21 different human languages.
21.	Changes in High School Courses for 2022-23	Four High School courses were reviewed and revised for the coming school year: Communication Systems, Graphic Communication Systems, Construction Technology, and Sustainable and Renewable Technologies. Come here about the changes that impact these courses.
22.	Virtual Robotics with VEX VR	The presenter will focus on how virtual robotics can empower students to be successful with physical robots. <i>Bring a device and come program!</i>
23.	Lit Pop Up Cards	Engineer Pop Up Cards with your students and add LED's to make them Light!
24.	Exploring Offshore Wind Energy	Participants will engage in a few of NEED's newest offshore wind energy hands-on lessons. This curriculum was developed by The NEED Project in partnership with The Dominion Energy Charitable Foundation. The activities and information introduce students to wind, wind generation, and offshore wind technologies, as well as the Coastal Virginia Offshore Wind Project. Great for students all over the country and beyond to learn more about offshore wind in the U.S. Through hands-on inquiry investigations, nonfiction text, and critical thinking activities, participants will learn about the physics of wind, and how we harness wind's energy today both offshore and onshore, just as their students would in the classroom. Activities include measuring wind speed by building an anemometer, learning how wind can do work using supplies to engineer a windmill that lifts paperclips, and a circuit activity to build a simple, parallel, and series circuits.
25.	Excellent Energy Engineering Presenters doing 2 sessions	Participants partake in hands-on energy challenges that demonstrate just how seamlessly you can incorporate engineering and design into your science content lessons. The activities are intended for students to develop the skills necessary to problem-solve and design solutions to well-defined challenges, but that will also only take a class period or two to complete. Each activity includes an introduction, suggested design and testing

		parameters, and “Teachers’ Cheats”, along with additional extension and enrichment opportunities for participants to take back to their classroom. We’ll also share insights into the job market as the energy industry number of jobs and opportunities is only expected to grow and change as our energy needs change. Session participants will be constructing a solar oven, investigations with the electrical output of a PV panel and emerging solar technologies, and a challenge focusing on wind energy to do physical work by lifting paper clips.
26.	National Board Certification for T&E Teachers	You go to conferences, you read the latest articles, take classes, but what else is out there to further your teaching prowess? Becoming a board certified teacher allows you to prove your effectiveness in the classroom. It demonstrates a commitment to excellence, students will learn more, and you as an educator will improve your practice.
27.	What’s Missing From the Engineering Design Process?	The engineering design process is a comprehensive tool to develop creative problem solving in students however, one crucial element is often overlooked, empathy. This session will give educators practical applications to develop empathy within the engineering design process.
28.	Digital Engineering Design Notebook	Coming to you live from Georgia Tech via Zoom learn how to use a digital engineering notebook that has been funded by NSF to organize student engineering projects. This resources is in the beta version and needs your input.
29.	Rapid prototyped 3D maze cube	This project is a way to teach multiple types of rapid prototyping as students design and manufacture a 3D maze. The presentation gives an overview of how to design the maze in CAD then split into sides to laser cut, 3D print, and or CNC mill parts that are assembled.
30.	Introduction to TSA	Not sure about the Technology Student Association? Come learn about what great opportunities await your students!
31.	TSA Co Curricular Chapters	How to use TSA activity in your classroom
32.	Learning by manufacturing - manufacture your own JellyBOX 3D printer	The unique way --- how to learn skills: laser cutting, soldering, crimping, 3D printing and much more. Result is a the JellyBOX 3D printer made from RAW materials. The most unique way, how to learn skills important for any production.

33.	Safety in STEM Education: Recommendations Informed by Virginians' Responses to the National Safety Survey	This presentation will be based off of the national safety survey findings from ITEEA's newest safety book "Safer Engineering Education and CTE Instruction: A National STEM Education Imperative" to be released in May 2022 (co-published with ASEE and NSELA). Like the book, this presentation will provide results from each segment of the survey directly followed by recommendations and resources to help educators address those issues (ex. class occupancy). The book describes the crossover between CTE, science, and T&E which the data also support. Given the increase in makerspaces and engineering practices taught by educators with limited to no safety training, this is a critical topic. It directly aligns with ACTE's facilities and safety recommendations for quality programs. This presentation will provide a unique twist in that it will look at the responses specifically from Virginia teachers and see how Virginia compared to the national averages across the various safety categories. This provides implications for administrators, teachers, librarians, and others who are overseeing STEM/CTE/T&E/elementary engineering education to be aware of safer practices and also advocate for safer facilities and policies in their school.
34.	Your Role in Serving in VTEEA	Everyone knows that VTEEA is a voluntary duty that is shared by a few. Talk with Ron Vickers, a long time serving member about what you can do to help in whatever capacity that fits you.
35.	Cardboard Engineering / Mechanisms	From middle school students or up, cardboard engineering is an activity that can be an excellent way to have students learn about mechanisms. In this workshop you will make a working model using cardstock and glue. All materials will be provided for this low cost project. I have used these for many years and will freely share my materials. Also lots of examples will be present to examine. Hint: Look up <a href="http://www.robives.com">www.robives.com</a> before you come!
36.	Computer Programming: Just Another Tool in the Toolbox	Programming is a useful tool for everyone! We will examine the creation and use of custom programs to use in the classroom. Programs can be in anything from a Google Sheet to traditional programming languages. Programs can be for grading, organizing, project calculations, etc. Make life easier with custom programs!
37.	Sling-Shot Egg Crash Cars	This presentation covers the design process, testing, and demonstration of egg crash and smash vehicles with the use of recycled

		materials (limited resources). The vehicles are designed to protect the driver (raw egg) from injury, (cracked) or death (decapitation) in a head on and a side impact collision.
38.		