



Student Activities
Conferences 2022

Branching Out With STEM

David Trussell, UIL Director of STEM Activities

Before We Get Started...



Session
Number:
142



Attendance



Online Handouts



Session Evaluations

UIL STEM Contests - High School

The Core Four:

- ▶ Calculator Applications
- ▶ Mathematics
- ▶ Number Sense
- ▶ Science

Plus

- ▶ Computer Science
- ▶ Robotics

UIL STEM Contests - A+ Academics

- ▶ Calculator Applications
 - ▶ Grades 6-8
- ▶ Mathematics
 - ▶ Grades 6-8
- ▶ Number Sense
 - ▶ Grades 4-8
- ▶ Science
 - ▶ Grades 6-8

Math Contests - Number Sense

- ▶ Mental math
- ▶ 10-minute test with 80 questions
- ▶ Covers concepts from all high school mathematics courses
- ▶ [Sequence chart](#)
- ▶ State contest director - Larry White

Math Contests - Mathematics

- ▶ 40 minute, 60 question multiple choice exam
- ▶ Covers concepts from Algebra I, Geometry, Algebra II, Pre-calculus, AP Calculus (BC) and AP Statistics
 - ▶ Students do not have to take all these courses to be successful
- ▶ Calculators are permitted
- ▶ State contest director - Cliff McCurdy

Math Contests - Calculator Applications

- ▶ 30 minute test with 70 problems
 - ▶ 35 numerical
 - ▶ 21 stated
 - ▶ 14 geometry
- ▶ Any standard handheld calculator may be used
 - ▶ Most contestants use an HP or TI graphing calculator
 - ▶ Calculators used for testing (AP, STAAR) are fine
- ▶ State contest director – Dr. Dave Bourell

Science Contest

- ▶ Three contests in one
 - ▶ Two hour test with 60 questions divided into three sections
 - ▶ Students can place and advance in overall individual and team standings, as well as top scorers in each of the three subject areas
- ▶ Biology
 - ▶ State contest director - Dr. Michelle McGehee
- ▶ Chemistry
 - ▶ State contest director - Dr. Brian Anderson
- ▶ Physics
 - ▶ State contest director - Dr. David Bixler

Math and Science Resources

- ▶ [UIL Online Store - Test Archive](#)
- ▶ [UIL Conferences YouTube Channel](#)
- ▶ [Invitational Meets](#)
- ▶ [Texas Math and Science Coaches Association](#)
- ▶ [Independent Vendors](#)

Computer Science Contest

- ▶ 45 minute 40 question multiple choice exam

PLUS

- ▶ 2 hour hands-on programming contest for teams
- ▶ The same students participate in both components
- ▶ Challenges students to apply programming concepts and skills, as well as their knowledge of the Java programming language
- ▶ Parallels the AP Computer Science curriculum
- ▶ [Detailed topic list on UIL website](#)

Computer Science Resources

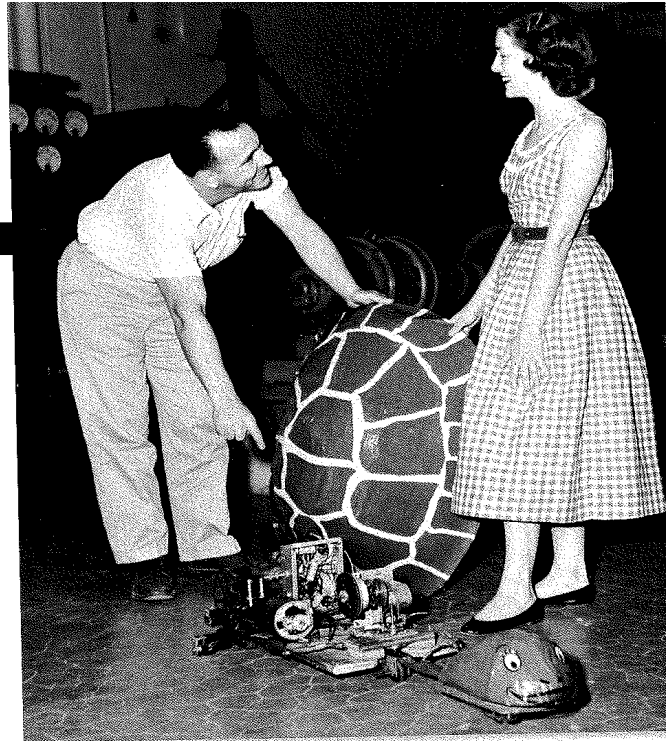
- ▶ [UIL Online Store - Test Archive](#)
- ▶ [UIL Conferences YouTube Channel](#)
- ▶ [Invitational Meets](#)
- ▶ [Independent Vendors](#)
- ▶ [Computer Science Resource Page](#)
 - ▶ Java Tutorials
 - ▶ Software Information
 - ▶ Online Programming Practice Resources

Computer Science Resources for Teachers

- ▶ [Code.org](#)
 - ▶ Curriculum, study and practice resources for all grade levels
- ▶ [WeTeach_CS](#)
 - ▶ Professional development opportunities
 - ▶ Incentives for CS certification
 - ▶ Previous Computer Science background not required

Robotics

The Early Years?



Turtle Power

THERE'S NO EVIDENCE TO SUGGEST THAT THE INHABITANTS OF Turtle Pond ever met Tessie, a giant mechanical Franken-turtle built at UT in 1954, but at roughly 4 feet long and 3 feet wide, Tessie was surely big enough to fill UT's flesh-and-bone reptile populace with Vader-esque feelings of dread.

Perhaps Tessie's friendly eyes and generous smile painted atop her papier-mâché head would have been enough to dispel any foreboding. If not, a quick glance underneath the hood—or shell—would reveal her to be little more than a mass of wires and motors.

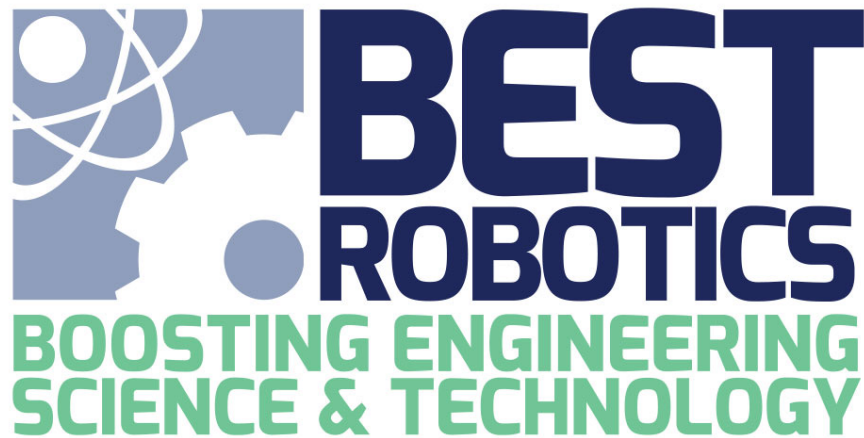
Though the reasoning behind the turtle's construction is lost to history, Tessie was built by

Arthur W. Ivy, BS'54, and displayed at the University Interscholastic League's 45th All-University Exposition and Power Show. Among the creations accompanying Tessie at the annual exhibit of future scientific feats was an electronic tic-tac-toe player named George, constructed out of disused pinball machines. —Ben Wright

CREDIT: University Interscholastic League Records, Briscoe Center, UT-Austin

Program Structure

- ▶ UIL Robotics is a collaboration
- ▶ Two partner organizations since 2016



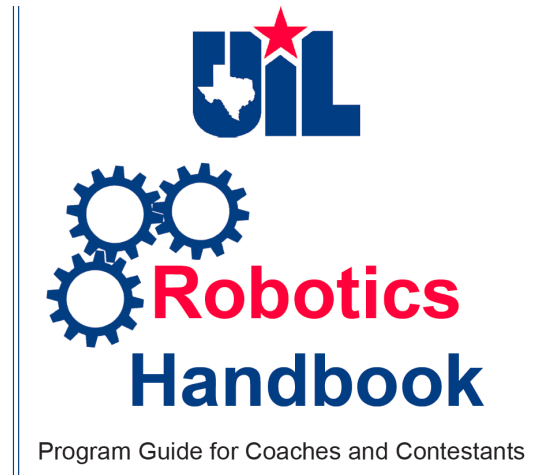
New for 2022-2023 - VEX Robotics Pilot

- ▶ RECF - VEX Division
 - ▶ Pilot Program
 - ▶ VEX competition programs are administered by the Robotics Education & Competition Foundation (RECF)



Who Makes the Rules?

- ▶ UIL rules determine team eligibility to compete for UIL Championships and specify championship criteria
- ▶ UIL Robotics Handbook
 - ▶ Updated edition will be posted this month
- ▶ BEST, FIRST and VEX rules determine how the contests are run - contest specifications, qualifier structure, judging, scoring, etc.



Participation in Robotics

- ▶ Which competition is the right fit for my school community?
- ▶ Your school can compete in any or all UIL divisions
- ▶ More schools are including multiple competition platforms in their robotics programs
 - ▶ Your school can participate in any combination of robotics competition platforms
- ▶ Participation can change over time

Which Program to Choose?

Some Factors to Consider...

- ▶ Scheduling
 - ▶ BEST - compact fall season
 - ▶ FRC - compact spring season
 - ▶ FTC - spread out season (UIL championship in April)
 - ▶ VRC - spread out season (UIL championship in February)
- ▶ Cost and available resources
 - ▶ BEST, FTC and VRC are comparable in cost, FRC costs more
 - ▶ Lots of variables - available facilities/equipment, travel considerations, etc.
- ▶ Personnel
 - ▶ What is the best fit for the educator(s) who will be working with the robotics program at my school?

Which Program to Choose?

Some Factors to Consider...

- ▶ Educational focus
 - ▶ In general, BEST and FRC will include a heavier engineering component, while FTC and VEX incorporate more programming
 - ▶ BEST - build from raw materials
 - ▶ FRC - build with higher-end machining
 - ▶ FTC and VRC - build from prefabricated parts
- ▶ Additional competition elements
 - ▶ Presentations, engineering notebooks, etc.

Robotics Resources

- ▶ BEST, FIRST, RECF - VEX
 - ▶ www.bestrobotics.org
 - ▶ www.firstinspires.org
 - ▶ www.roboticseducation.org
- ▶ Texas affiliates will help you get started and connect with local contacts
 - ▶ www.bestoftexasrobotics.org
 - ▶ www.firstintexas.org
 - ▶ [RECF Texas contacts](https://www.robotevents.com/support) (https://www.robotevents.com/support)

STEM - Strength in Numbers

- ▶ **UIL STEM Activities**
 - ▶ Provide numerous participation options for students
 - ▶ Promote college and career readiness for in-demand STEM fields
 - ▶ Offer multiple pathways to TILF scholarship eligibility
 - ▶ Build and reinforce one another
 - ▶ Offer many ways to earn points to your school

Keys to STEM Success

- ▶ School community buy-in
 - ▶ Administrators, teachers, students and parents
- ▶ Start in the younger grades
 - ▶ UIL A+ math and science contests
 - ▶ Opportunities in Coding and Robotics for younger students
- ▶ Build a culture

Questions

