



PUBLIC OUTREACH & THE DELAWARE BRIDGE DESIGN COMPETITION

HOW IT ALL STARTED – S.T.E.M.

- PUBLIC OUTREACH TO DELAWARE SCHOOLS
 - STARTED ~10 YEARS AGO
 - FIRST FIVE YEARS:
 - ~500 STUDENTS PER YEAR
 - LAST FIVE YEARS:
 - 40-50 PRESENTATIONS PER YEAR
 - CLASSROOM PRESENTATIONS
 - CAREER FAIRS/EXPOS
 - STATE FAIR EXHIBITS
 - ~2,500 STUDENTS PER YEAR



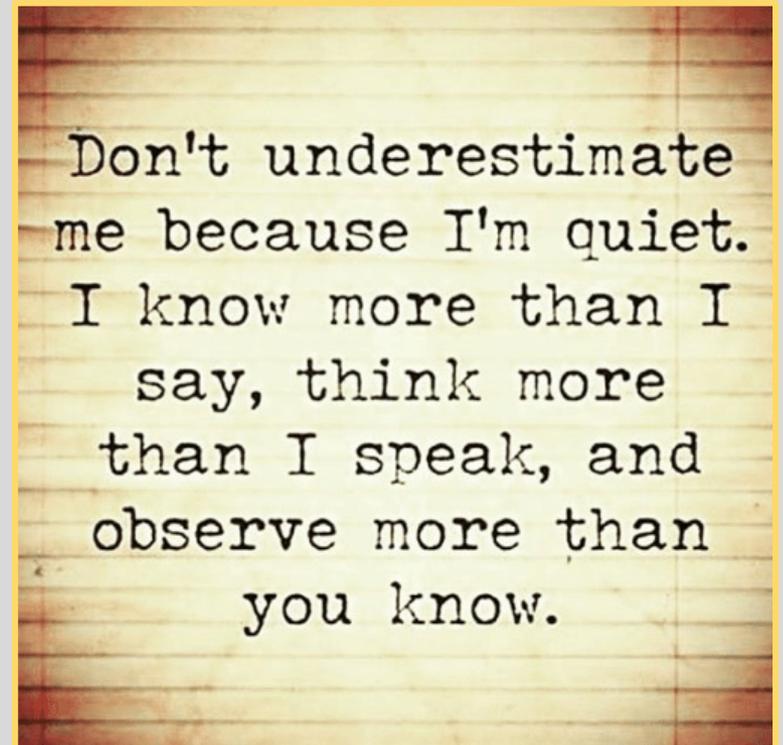
OUR GOAL – WHY DO WE DO THIS?

- “GRASSROOTS” CAMPAIGN
 - GENERATE POSITIVE PUBLICITY FOR DELDOT
 - RECRUIT POTENTIAL DELAWARE NATIVES TO WORK FOR DELDOT



OUR GOAL – WHY DO WE DO THIS?

- INTRODUCE STUDENTS TO ENGINEERING
 - ELEMENTARY SCHOOLS, MIDDLE SCHOOLS, HIGH SCHOOLS
- REACH STUDENTS OTHERS BELIEVE TO BE...
 - ...TOO LAZY
 - ...TOO STUPID
 - ...TOO MUCH OF A PROBLEM
- ENCOURAGE STUDENTS TO PURSUE CAREERS IN ENGINEERING
- DIVERSIFY THE ENGINEERING INDUSTRY



DELAWARE BRIDGE DESIGN COMPETITION

- DESIGN & CONSTRUCT A SPECIFIED BRIDGE TYPE
- EXPOSE STUDENTS TO REAL-WORLD ENGINEERING & DESIGN ISSUES
 - INTEGRATION OF MATH & SCIENCE
 - INTRODUCTION TO 3-D MODELING & DRAFTING SOFTWARE
 - PROMOTE COLLABORATION AMONG STUDENTS
- MATERIALS & SOFTWARE FREE TO PARTICIPATING SCHOOLS & STUDENTS

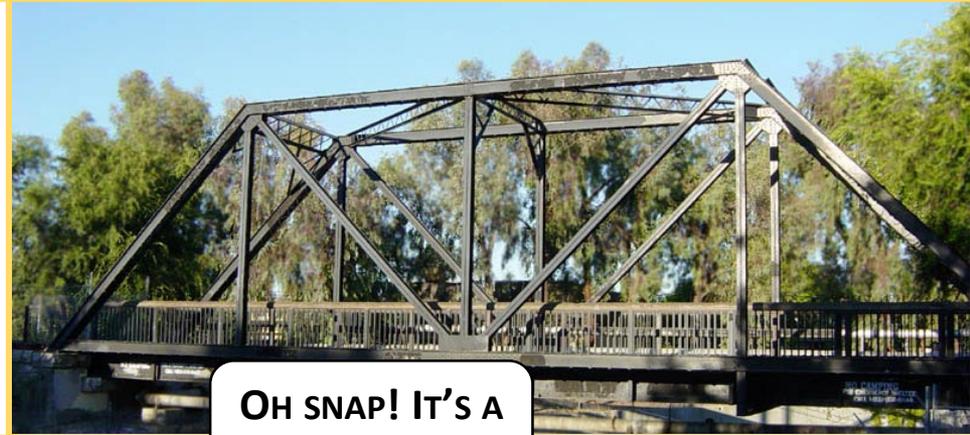
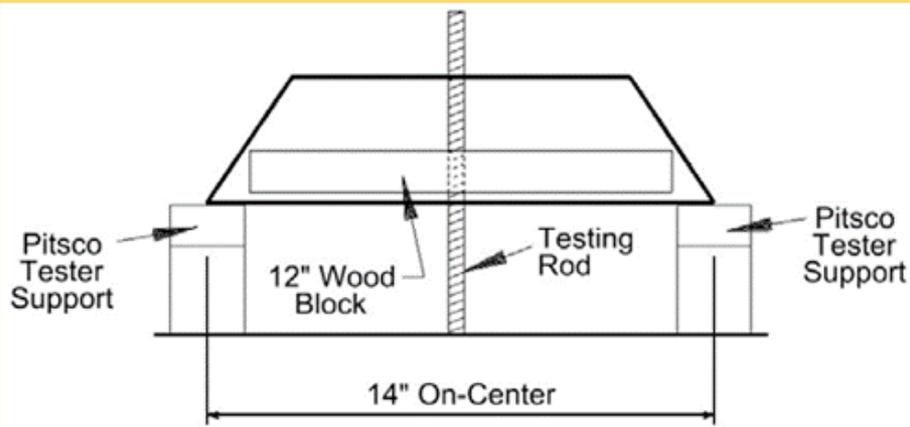


WHO CAN PARTICIPATE?



- SCHOOLS THROUGHOUT DELAWARE
- COMPETITION IS SPLIT BETWEEN 3 DIFFERENT GRADE GROUPS
 - 7TH – 8TH : TRUSS BRIDGE
 - 9TH – 10TH : TIED-ARCH BRIDGE
 - 11TH – 12TH : DECK ARCH TRUSS BRIDGE
- TEAMS WILL CONSIST OF 3 MEMBERS
- NO LIMIT TO THE NUMBER OF TEAMS

7TH TO 8TH GRADE BRIDGES

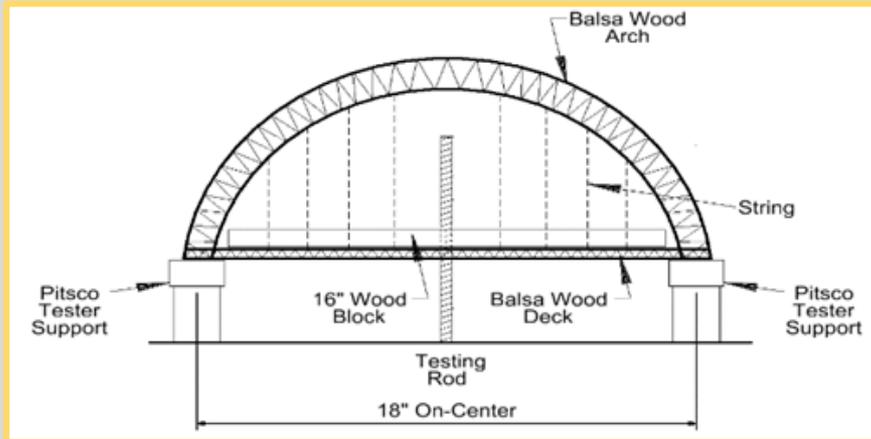


OH SNAP! IT'S A
PRATT TRUSS!

TRUSS BRIDGE

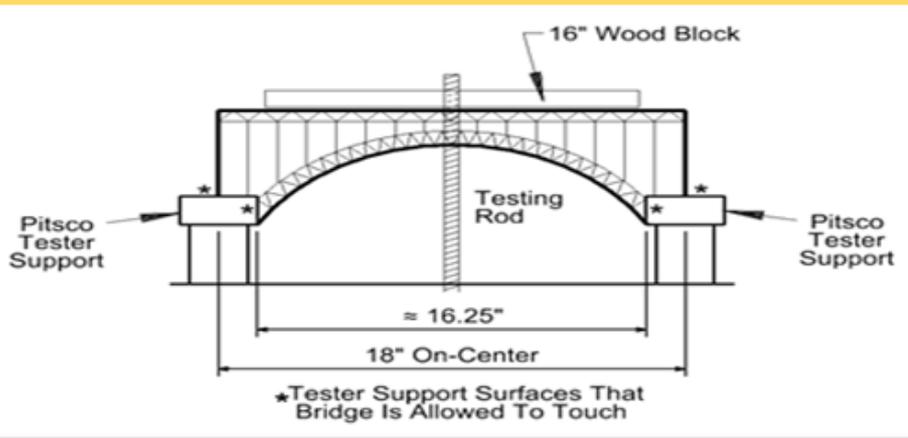


9TH TO 10TH GRADE BRIDGES



TIED-ARCH (BOWSTRING) BRIDGE

11TH TO 12TH GRADE BRIDGES



DECK ARCH TRUSS BRIDGE

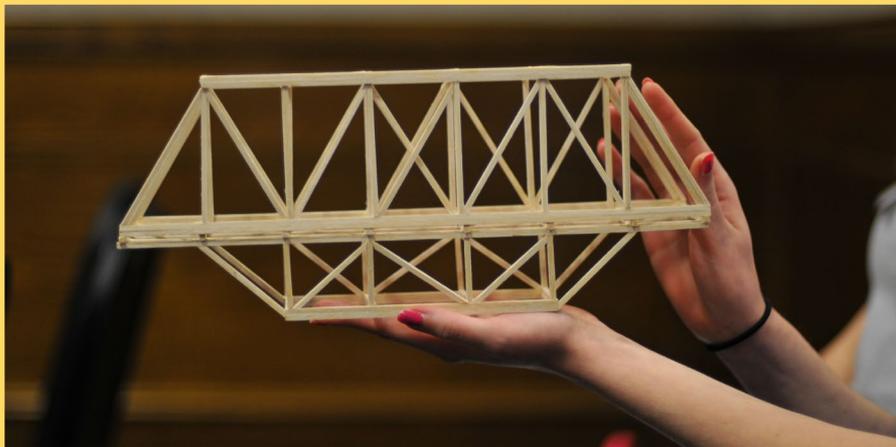
HOW DOES THE COMPETITION WORK?

- 3-PART SCORING SYSTEM
 - DESIGN PROPOSAL – 30%
 - 10-MINUTE ORAL PRESENTATION W/ Q&A SESSION – 20%
 - BRIDGE PERFORMANCE – 50%

2018 Delaware Bridge Design Competition

Truss Bridge Design

Team: Overwatch





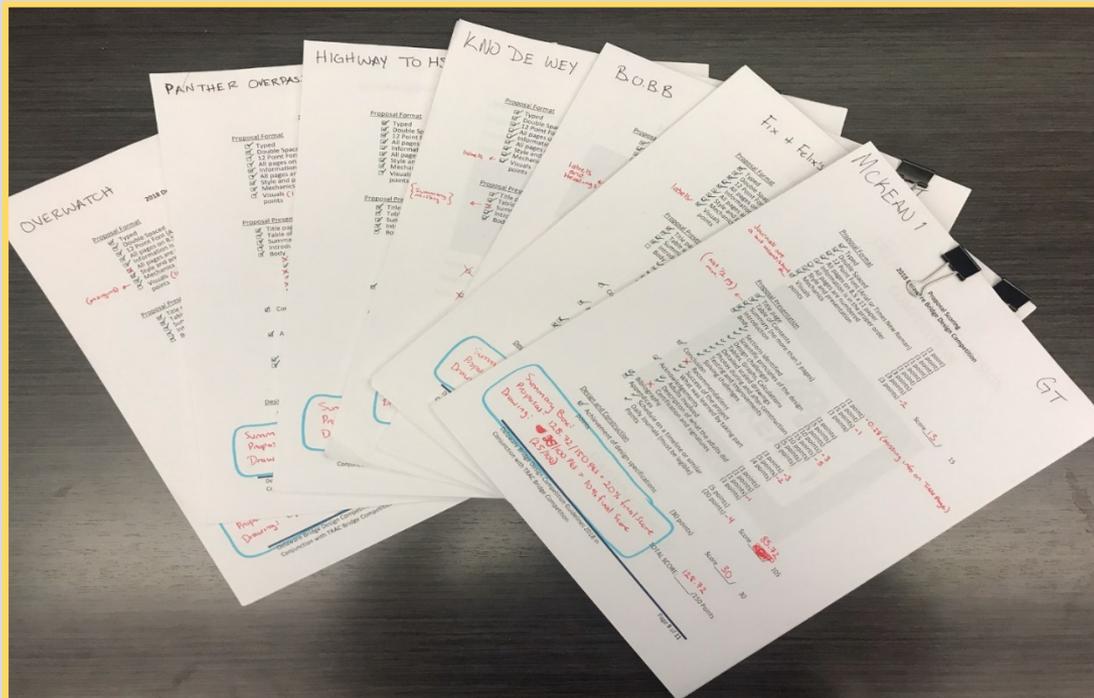
Caesar Rodney High School

Brady Phillips, Jacob Stant, Reign Stevens

Christopher Harris

DESIGN PROPOSALS

- DISCUSS THOUGHT-PROCESS, DECISION-MAKING, CHALLENGES, ETC.
- DESIGN CALCULATIONS, TESTS, & DRAWINGS



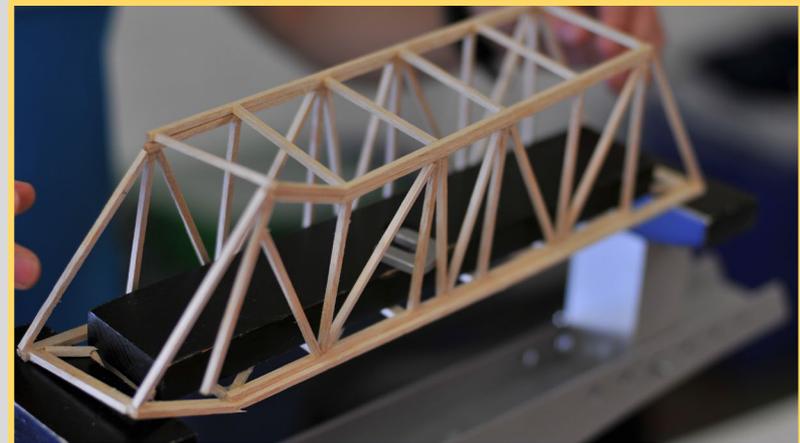
ORAL PRESENTATION

- STUDENTS SHOWCASE WORK AND CREATIVITY
- 10 MINUTE PRESENTATION
- 5 MINUTE QUESTION & ANSWER SESSION



BRIDGE TESTING

- STUDENTS PROVIDED WITH ENOUGH MATERIAL TO BUILD MULTIPLE TEST BRIDGES
 - IMPROVE ON WEAKNESSES
 - LEARN FROM MISTAKES
- FINAL BRIDGES TESTED ON COMPETITION DAY
 - LOADED TO FAILURE
- PERFORMANCE BASED ON STRENGTH-TO-WEIGHT RATIO
 - $\text{RATIO} = \text{WEIGHT HELD} / \text{WEIGHT OF STRUCTURE}$
 - MAXIMUM SCORE: 50 POINTS
 - $\text{SCORING} = (\text{RATIO}_i / \text{RATIO}_{\text{Highest}}) * 50 \text{ POINTS}$



BRACE YOURSELF!





COMPETITION DAY

- ALL-DAY EVENT
- “SWAG” BAGS & AWARDS
- SHOW ENGINEERING CAN BE FUN!



SWAG FOR PARTICIPANTS

- ASSORTED DELDOT GIVEAWAYS
- PARTICIPATION MEDALS
- T-SHIRTS
- METAL EARTH BRIDGE MODELS



AWARDS FOR WINNERS

- TROPHIES FOR SCHOOLS
- WALLY'S FOR STUDENTS
 - BRONZE
 - SILVER
 - GOLD
- BIG CHECKS!!!
 - 3RD PLACE: \$600
 - 2ND PLACE: \$750
 - 1ST PLACE: \$900



FUN FOR ALL!!!



It's a blast...
"Truss" Me!

FUN FOR ALL!!!



HOW DID WE ACCOMPLISH THIS?

- DELDOT CONTRIBUTORS
 - CIVIL RIGHTS DEPARTMENT
 - BRIDGE DESIGN SECTION
- SPONSORS
 - DELAWARE CONTRACTORS' ASSOCIATION
 - AMERICAN COUNCIL OF ENGINEERING COMPANIES
 - AMERICAN SOCIETY OF CIVIL ENGINEERS
 - AMERICAN SOCIETY OF HIGHWAY ENGINEERS



2019 BRIDGE DESIGN COMPETITION

- BIGGER & HOPEFULLY BETTER
 - ~7X LARGER THAN 2018
- 27 SCHOOLS THROUGHOUT DELAWARE
 - 8 MIDDLE SCHOOLS
 - 19 HIGH SCHOOLS
- 74 TEAMS TO-DATE
 - 7TH & 8TH GRADE TEAMS: 13
 - 9TH & 10TH GRADE TEAMS: 31
 - 11TH & 12TH GRADE TEAMS: 30
 - ❖ ANTICIPATING 80-90 TEAMS

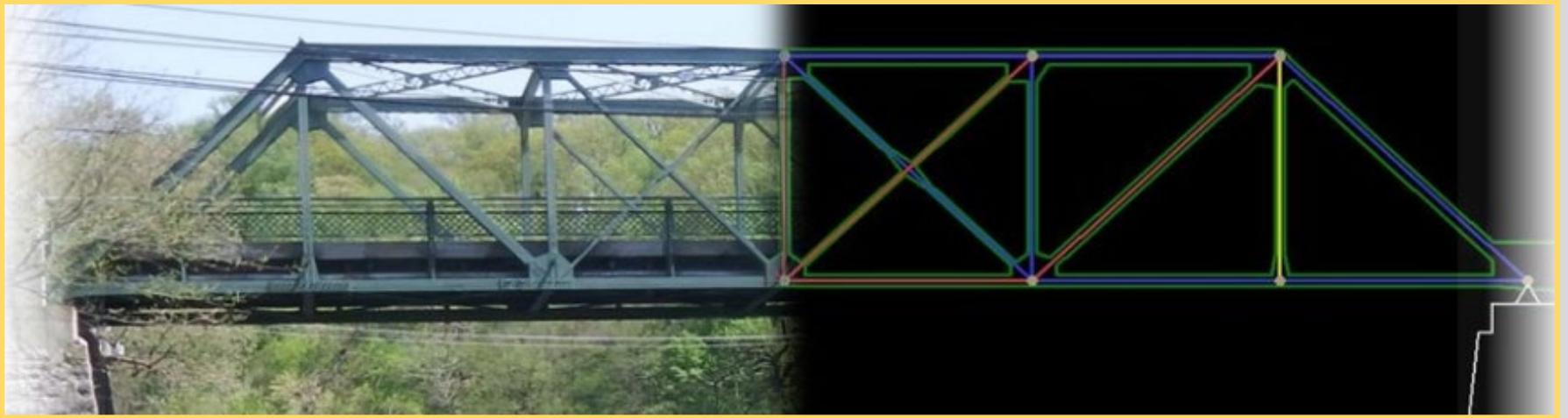


WHAT WE NEED THIS YEAR

- MENTORS
 - VISIT PARTICIPATING SCHOOLS
 - WORK DIRECTLY WITH STUDENTS
- JUDGES
 - GRADE PROPOSALS (PRIOR TO COMPETITION)
 - JUDGE PRESENTATIONS (DAY OF COMPETITION)
- SPONSORSHIPS
 - BRONZE
 - SILVER
 - GOLD



QUESTIONS?



- WEBSITE: [HTTPS://DELDOT.GOV/PROGRAMS/BRIDGEDESIGNCOMP/INDEX.SHTML](https://delDOT.gov/PROGRAMS/BRIDGEDESIGNCOMP/INDEX.SHTML)
- CONTACT: NICHOLAS DEAN
 - NICHOLAS.DEAN@STATE.DE.US
 - 302-760-2318