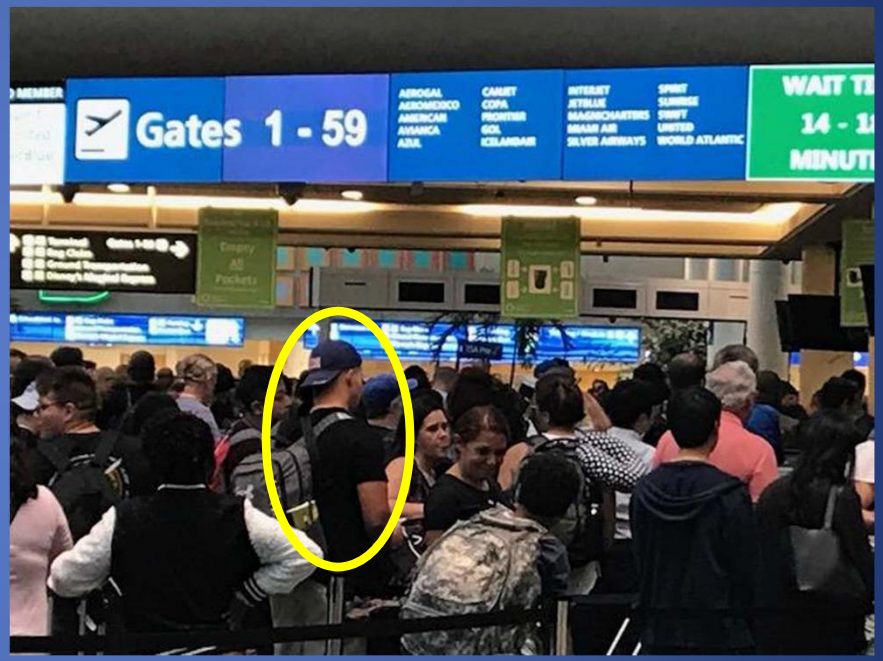
2018 SAME Engineering and Construction Camp at USAFA

"Build then Design"

Teddy Brunger
June 26 – July 2

On my way…

- Nervous and Excited
- Reviewed Homework
- Layover in Denver
- Met at Colorado Springs baggage claim
- Arrival at USAFA

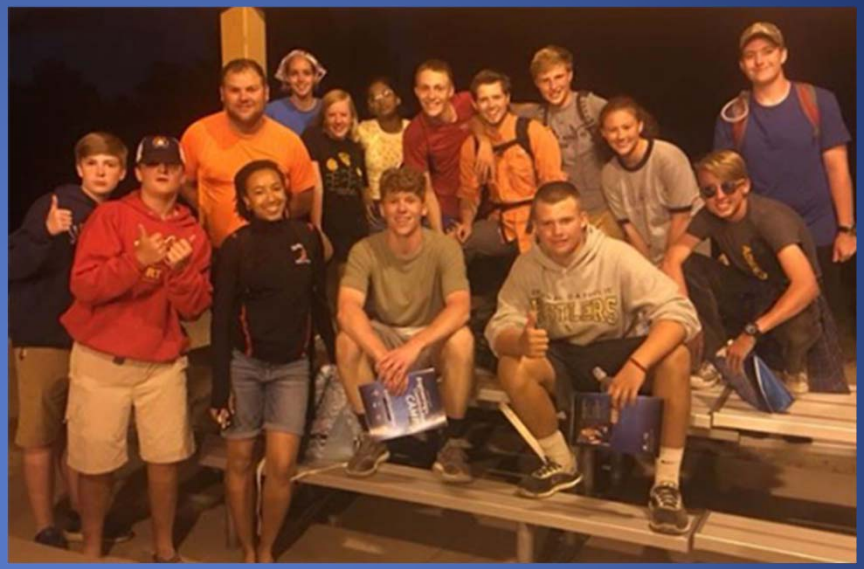


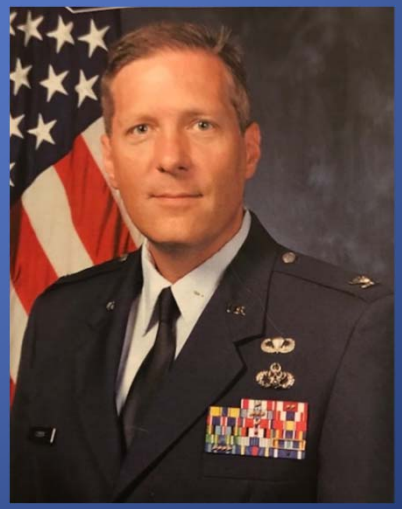
Day 1

- Orientation/Flight Assignments
  - Foxtrot
- What we learned
  - Colonel J. Christ

Served 22yrs in USAF and Head of Dept of Civil Engineering USAFA

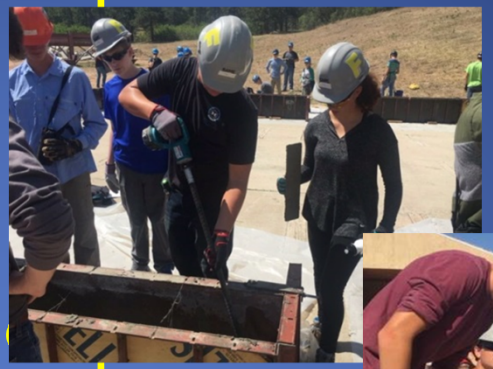
- Real life application
  - Full group cooperation and collaboration

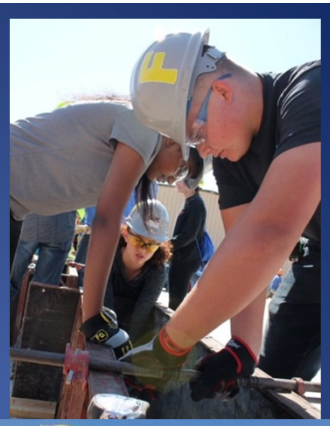


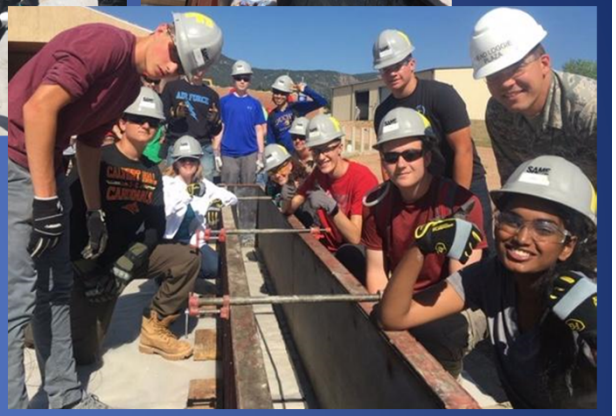


Day 2

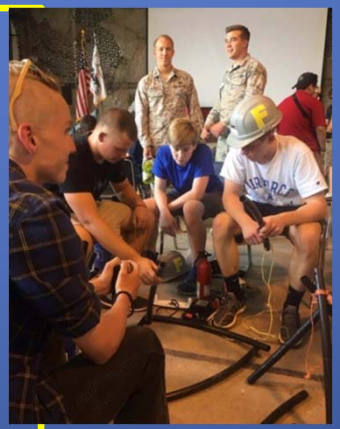
- **Concrete Beam Construction**
- What we learned
  - Concrete = compression
  - Rebar = tension
- Real life application
  - The strongest beam is dependent placement of the rebar and the W/L/H of the beam

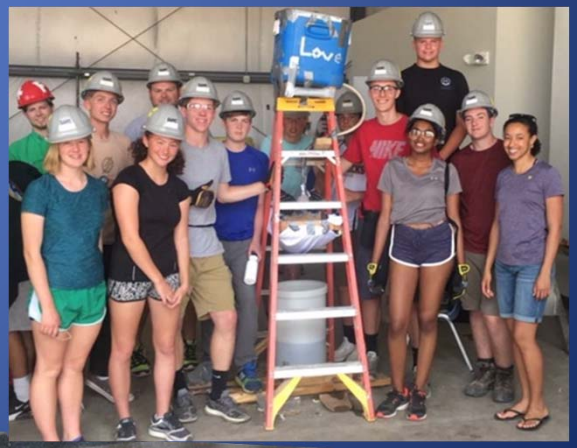






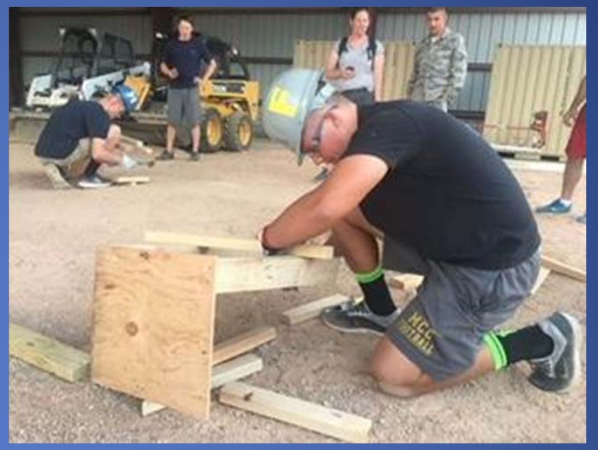
- **Water Treatment**
- What we learned
  - Sand = filter
  - Charcoal = pigment remover
- Real life application
  - Water purification can be done using very limited materials.

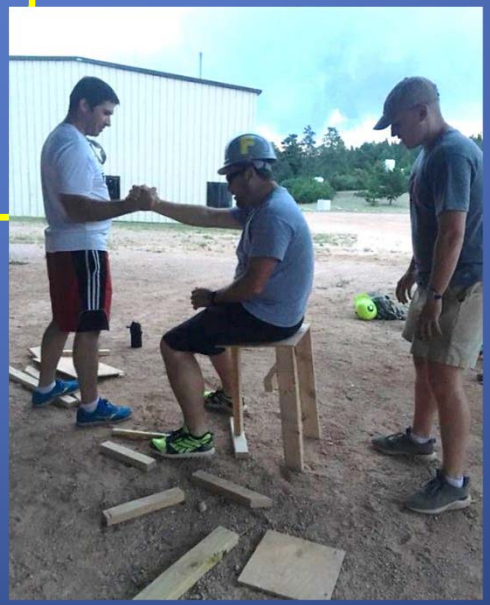


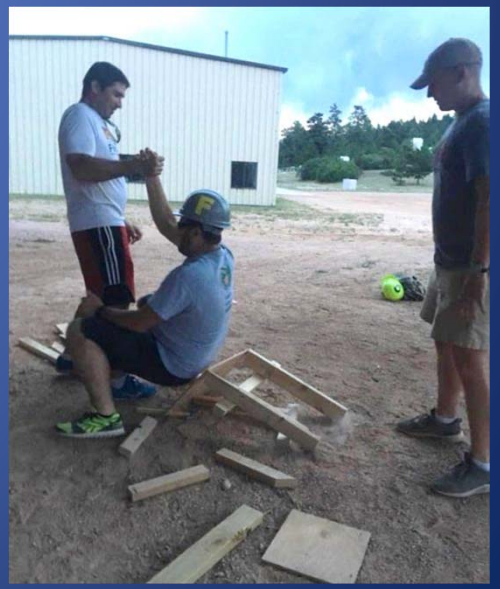


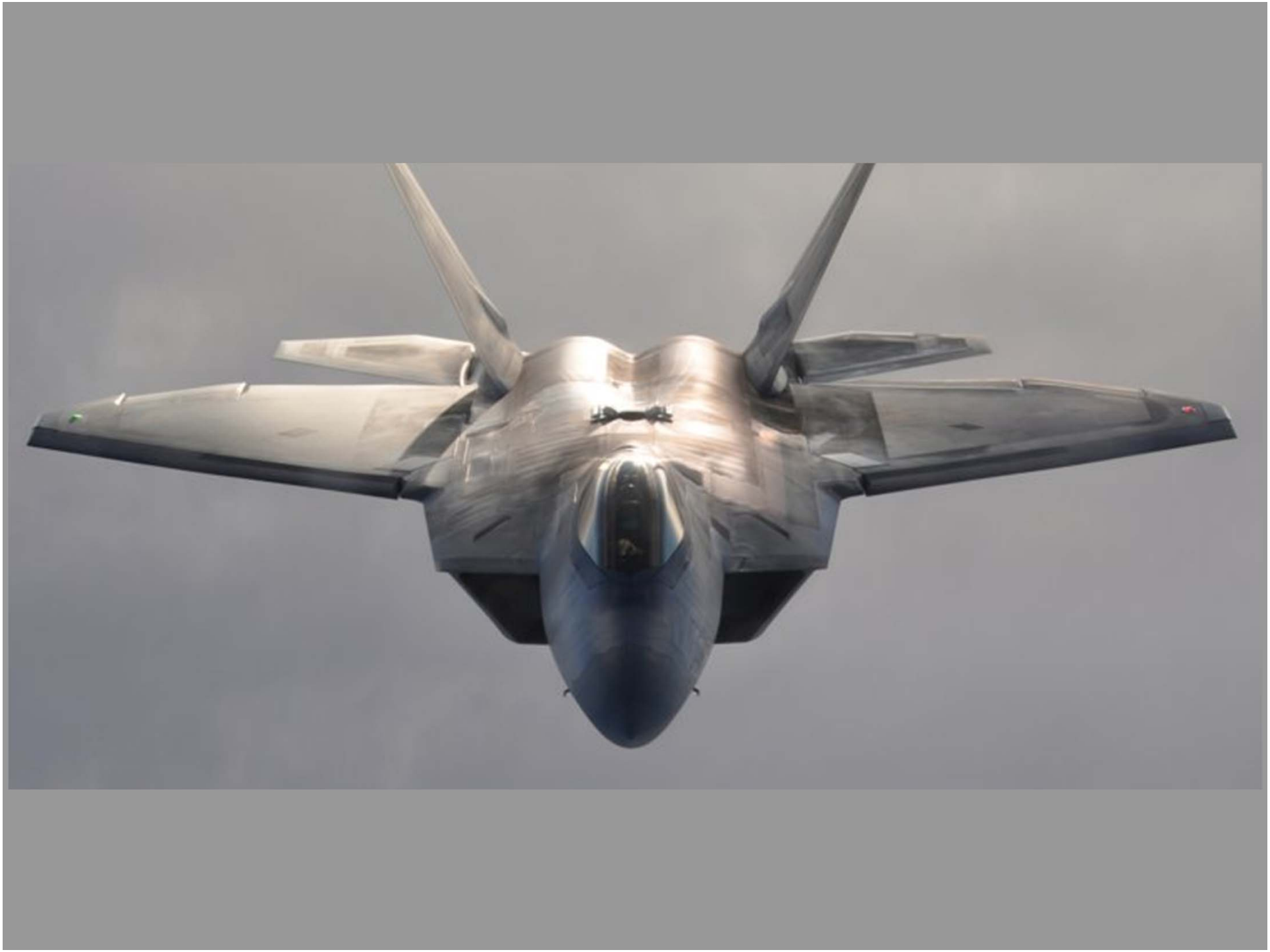
Day 2 (continued)

- **3-Legged Chair**
- What we learned
  - Strongest chair = strongest base
- Real life application
  - Integrity of a structure relies on its base



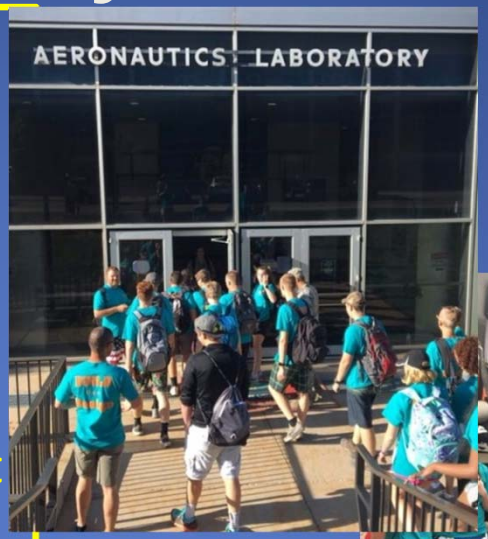


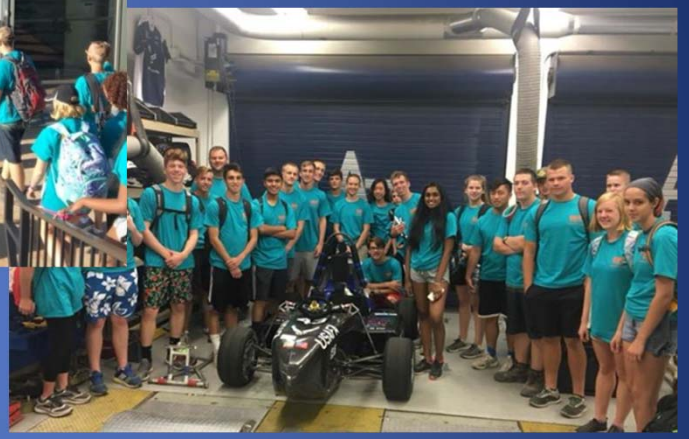




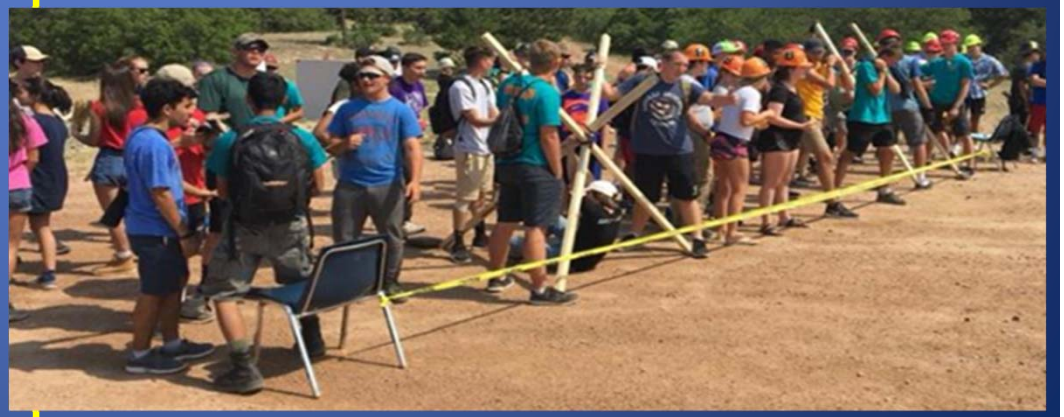
Day 3

- **USAFA Laboratories Tour**
- What we learned
  - Mach 6 Ludwieg Tube
- Real life application
  - Evaluate reaction of aircraft at high speeds





- **Catapult**
- What we learned
  - 45 degree angle is optimal
  - Weight of pouch of balloon affects distance travelled
- Real life application
  - Survival



Day 3 (continued)

- **Cardboard canoe**
- What we learned
  - Flat bottom more stable than v-shaped
- Real life application
  - V-shaped = speed
  - Flat = stability
  - Balance of both gave best results

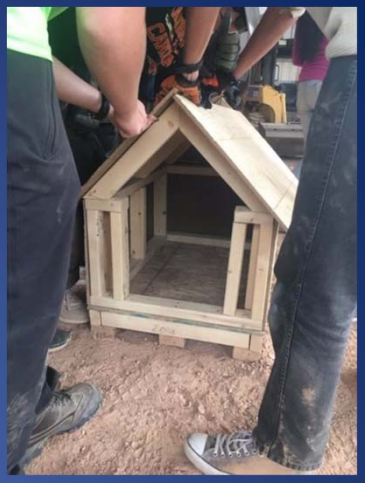
Day 4

- **Engineering Firm Tours**
- What we learned
  - Design then build
- Real life application
  - Different 3-D models of same project help plan the optimal design

- **Engineer Reaction Course**
- What we learned
  - Deadlines must be met
- Real life application
  - Build fast but not in a hurry *(fastest pace without risking integrity of the structure)*

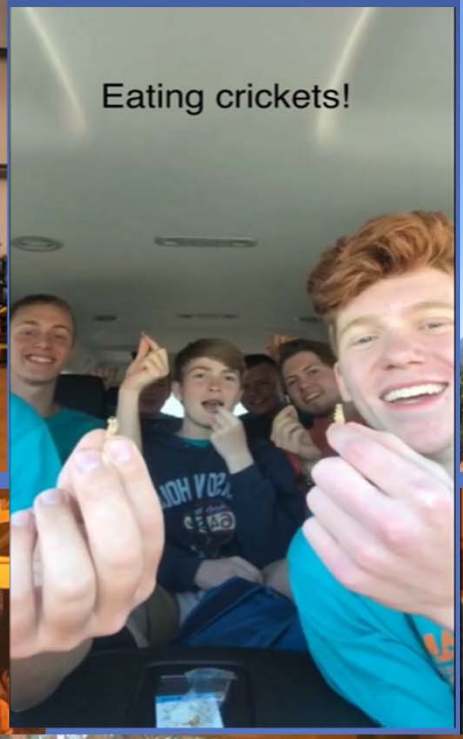
Day 5

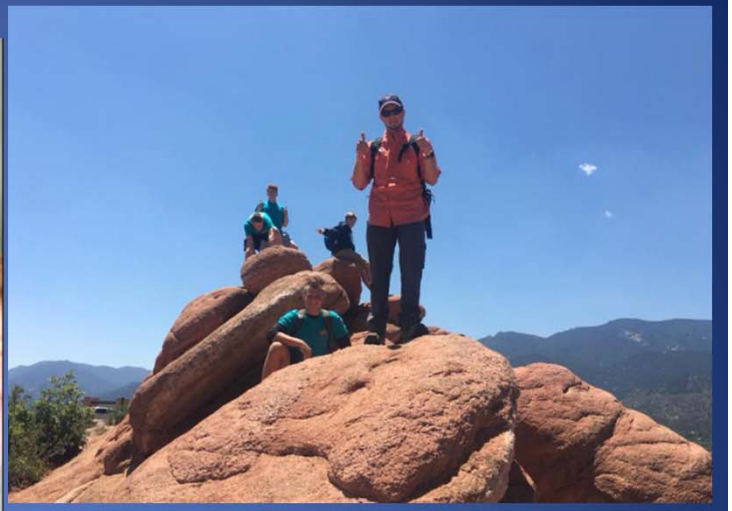
- **Dog Kennel Construction**
  for CS Humane Society
- What we learned
  - Elevated structures can help protect against natural forces
- Real life application
  - Only dog house that will not get wet inside during rain storm

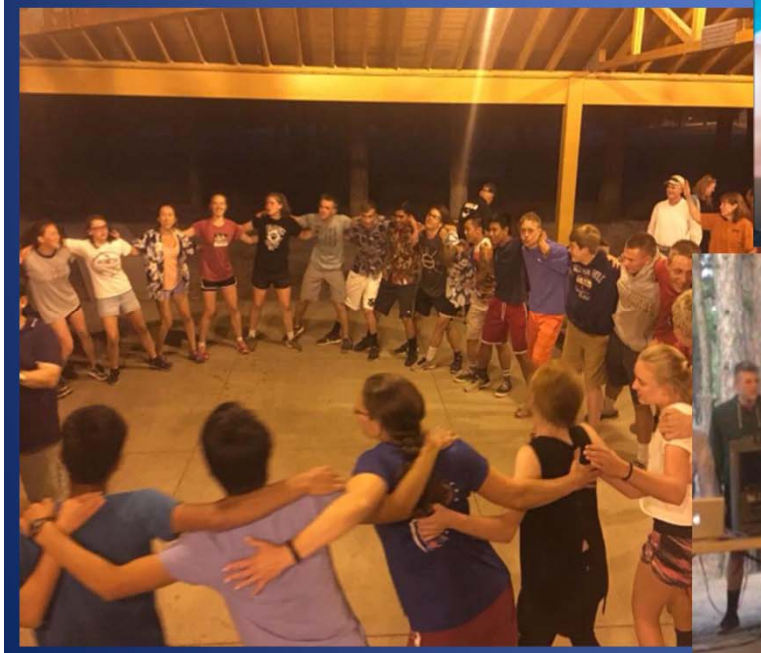


- **Sprinkler System**
- What we learned
  - More sprinkler heads = less pressure throughout system
- Real life application
  - Quantity ≠ Best Quality

And even had time for more fun…

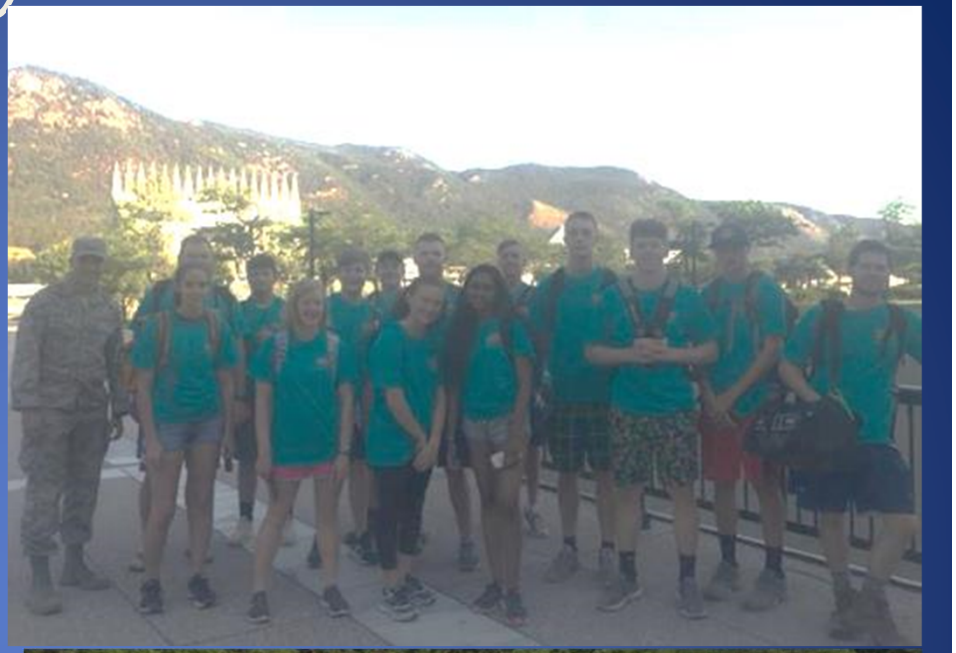






Day 6

- **USAFA Admissions Tour**
- What we learned
  - What I have to do to apply to the USAFA
- Real life application
  - I will continue to work hard to exceed the requirements

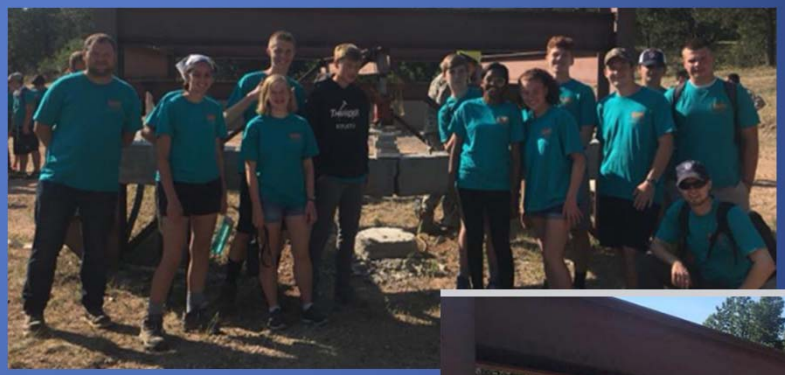


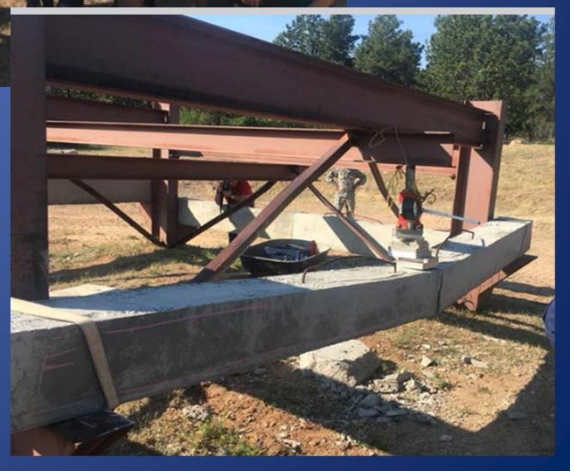
- **Water Balloon Launch**
- What we learned
  - Did our catapult work optimally?
- Real life application
  - Catapult angle and balloon pouch weight = travelled further than any other team

Day 7

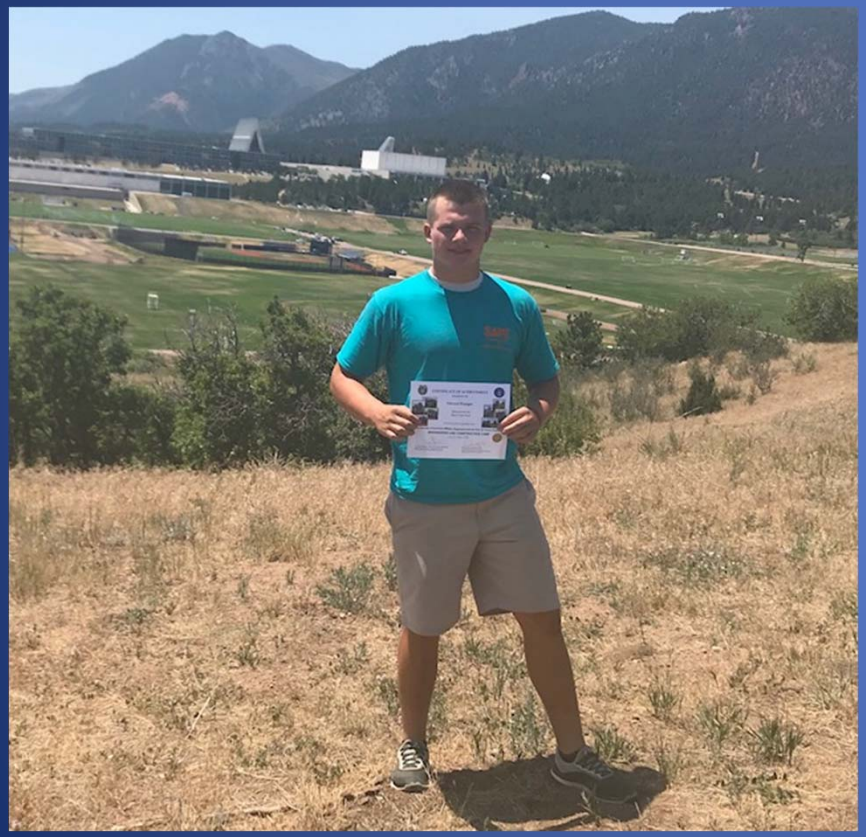
- **0600 PT**
  - 100+ Push ups
  - 12x 50 meter sprints
  - 1 mi run
  - Core exercises
  - Formation practice

- **Concrete Beam Destruction**
- What we learned
  - Did we have a strong beam?
- Real life application
  - Rebar needs to be strategically placed diagonally through out the length of the beam for best outcome





Going home…



- Reflecting
  - "Civil Engineering" has new meaning to me
  - Motivated to pursue an education and career in engineering

THANK YOU

★Space Coast SAME★

for an UNFORGETTABLE experience!