New Mexico
Governor’s STEM Challenge

STEM CHALLENGE
THE NUTS & BOLTS

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OVERVIEW

- Criteria refresher
- Challenge question & subtopics
- Proposal submission components
- Grading & evaluation
- Statewide showcase
- Resources
WHERE ARE YOU FROM?

Welcome!
CRITERIA: A QUICK REFRESHER

1) Select
   10-person student teams

2) Design
   & build model solution

3) Submit
   proposal packet

4) Present
   at Statewide Showcase
How would you use technology to make the world a safer place?
TOPIC #1: PROTECTING FROM NATURAL & MAN-MADE DISASTERS

- Illicit materials tracking
- Nuclear operations monitoring
- Asteroids impact prediction
- Natural disaster impact prediction and monitoring
- Earthquake prediction
TOPIC #2: CONSERVING THE ENVIRONMENT

- Contamination mitigation and monitoring
- Environmental resource monitoring
- Modeling wildfire behavior
TOPIC #3: SECURING INFORMATION & DATA

- Cybersecurity
- Computer network encryption
- Quantum computing
TOPIC #4: IMPROVING HEALTH

• Disease outbreaks and organisms monitoring
• Personalized medicine and treatment
• Bioinformatics and biotechnology
TOPIC #5: SAFEGUARDING FOOD, ENERGY, & WATER

- Agriculture technology
- New energy source development
- Infrastructure modeling
- Resilient energy distribution
- Water availability
ANATOMY OF THE PROPOSAL PACKET

1) Executive summary
   - One-page “elevator pitch”
   - Skillset demonstrated: conciseness and focus

2) Written plan
   - 10 pages maximum
   - Skillset demonstrated: science writing

3) Slide deck/pitch stack
   - Designed to be around ~10 minutes
   - Could include photos, diagrams, graphs, etc.
   - Skillset demonstrated: visual engagement
EXECUTIVE SUMMARY

1. **Show** the problem in a way that captures attention

2. **Explain** solution and basic findings/results

3. **Anticipate** contradictions/challenges

4. **Compel** reader with future possibilities
SLIDE DECK/PITCH STACK

1. Cover
   o Grab attention

2. Problem
   o No debatable arguments

3. Solution
   o Your prototype model!

4. Demo
   o Video, graphs, sketches, data, etc.

5. Effect/Influence
   o Positive and negative effects if implemented on a large scale

6. Feasibility/Constraints
   o Is this practical? Any unintended effects?

7. Team
   o What does your team contribute?

8. Future Plans
   o Go big!
WRITTEN PLAN

Identify the Problem
• Demonstrate research/background of the problem, including work done by others
• Discuss and clarify constraints
• What was the main goal/mission?

Brainstorming
• Discuss the creative and decision-making processes
• Show the various ideas considered to solve the problem
• Explain why selected approach was taken and why other ideas were not chosen

Model or Prototype
• Describe in detail, paint a picture; list materials used (including cost)
• Present compelling plan for the prototype would function and be used
• Identify how safety and protocol was observed and followed

Test Model and Evaluate
• Discuss troubleshooting, testing, and redesigning through all iterations
• Discuss strengths and weaknesses of design
• Discuss modifications/refinements made to improve/adjust the design
• Share test results, explain if/how design effectively addresses the problem

Collaboration
• Discuss how the team worked on the project
• Communicate how each member contributed
PROTOTYPE CONSIDERATIONS

• Rough model of your solution
  • Smaller in size = better (needs to be transported)
  • Think about presentation: space, power, safety, noise, etc.

• Can be made from reused and repurposed items
  • Cardboard, household supplies, recycling bin items, etc.
  • Resource usage and reusability considerations

• Can be made in a fab-lab or makerspace
  • Great idea, but not a requirement

• If it’s not functional…
  • Students need to explain how it could work
  • And explain why they were unable to make it work

• If your prototype is fully functioning, even better!
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DUE: NOVEMBER 22
Two-fold weighted process:

• 50% proposal packet
  • Evaluated before Showcase

• 50% prototype demonstration
  • Evaluated in person at Statewide Showcase
STATEWIDE SHOWCASE

UPDATE: all teams invited to present

DECEMBER 7
LOS LUNAS HIGH SCHOOL

- Morning: Prototype demonstration, in-person evaluations
- Lunch: Judge deliberations
- Early Afternoon: Award ceremony
INDUSTRY EMPLOYER SPONSORS (AKA JUDGES)
RESOURCES (WE GOT YOU)!

- Mentor network
  - Request through website
- Materials
  - Reimbursement application process
- Challenge document
  - Live & updated with industry info
QUESTIONS?

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