

# **STEM Gender Gap: An Important Initiation from Cameron University for Middle School Girls**

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## **Aerospace Summer Academy** for Middle School Girls:

Twelve middle school girls are selected from all over Oklahoma



# **Activities:**

- **Day#1**:
- Women in Stem keynote
- Discussion on careers in STEM
- Hands on activities using simulation and lab equipment to cover the physics of free fall,

- The academy mainly focuses on Physics, Engineering behind the concept of aerospace dynamics and design
- We also cover the contribution of women in the area of space science
- The academy normally held in second week of June for five days
- Over the years the academy was residential but due COVID restrictions, this year it was operated as full day camp for five days
- 2021 Cameron University Aerospace Summer Academy for girls with the directors and councilors



acceleration due to gravity, and projectile motion

PHYSICS EDUCATION

## **Day#2**:

- Discussion on history behind the contribution of women in aerospace
- Use NASA's handbook on aerodynamics for kids to determine center of gravity of F 15 aircraft using cardstock
- Discuss Newton's three laws and all forces acting on an aircraft

# **Day#3**:

- Discuss Bernoulli's principle and fluid pressure using simple devices like a ball and vacuum cleaner
- Use FoilSim simulation design by NASA to understand the physics of flight
- Airplane part identification and function worksheet activities

Three female camp counselors with STEM majors are included to help the girls



Students working on measurements of acceleration due to gravity during 2021 Aerospace Summer Academy

Rocket launching in 2021 Aerospace Summer Academy



Students working on FoilSim simulation during 2021 Aerospace Summer Academy

Physics of projectile motion using a mouse trap launcher

# **Day#4**:

- Foam rocket launch
- Understanding of free fall using picket fence
- Construction of water bottle rocket

## **Day#5**:

- Construct the highflying rocket model using kit
- Launch your rocket (competition among groups)
- Quiz bowl completion based on all five days of activities

#### **Future Plans:**

#### **Learning Outcomes:**

- Students show science process skills like observing, communicating, investigating, predicting, and measuring
- Learn about mathematical standards like problem solving, reasoning, functions, and variables
- Learn about the contribution of women in the area of space science

Gain mentorship advice from the directors and counselors

**Acknowledgement:** 

- We thank Oklahoma Aeronautical Commission. For providing funding
- We thank Cameron University for providing all the logistic required for the academy

• We would like to include more areas of applied physics and engineering

• Girls will be grouped in terms of grade levels

• We would like to bring women from Oklahoma or women employed in Oklahoma based companies in the area of physics and engineering to talk about their journey in STEM career

• We would like to give importance in mentoring the selected girls till high school or college