Middle School Themes and Problems

Audio Podcasting

Theme: Breaking News from the Future

Students create an audio podcast reporting on a fictional future event, discovery, invention, or crisis as if it is happening live.

Biotechnology

Theme: Biotechnology in Food
Biotechnology can be used to improve crops, make food last longer, or create new types of food. Explain how biotechnology is used in food production and describe one way it could help farmers or consumers.

Career Prep

Theme: Choose a career from the Career Clusters Digital Technology category within one of the following subclusters:

- Data Science & Artificial Intelligence
- Information Technology (IT) Support & Services
- Network Systems & Cybersecurity
- Software Solutions
- Unmanned Vehicle Technology

Challenging Technology Issues

Topics:

- The Use of AI to Write News Articles
- Requiring Coding as a Core Subject in Middle School
- Virtual Reality Replacing Physical Labs in High School Science Classes
- Medical Tourism as a Means of Accessible Treatment Options
- Robots in Elderly & Child Care

Children's Stories

Theme: Create a book that tells a story about the weather. You must include at least five tactile elements.

Coding

To prepare for MS Coding competition, teams should have knowledge of concepts (software development, computer science, and coding topics) that will be on the Coding written test. They also should be familiar and comfortable with using the Scratch programming language.

Scratch is a free visual programming language available from the MIT Media Lab (https://scratch.mit.edu/download). An offline version of the Scratch tool should be downloaded and available on each team's laptop.

Teams that advance to the semifinalist level, based on written test performance, will perform a challenge using the Scratch programming language. Semifinalist teams will receive the challenge on site and will have two hours to complete it. (PLEASE NOTE: Semifinalist teams MUST have a version of this program available for offline use, as there will be no Internet access available during the semifinalist level of the competition.)

Examples of the types of challenges students may be asked to complete can be found at this link: https://scratch.mit.edu/starter-projects

Construction Challenge

Theme: Your team has been tasked to design an urban community greenhouse and garden appropriate for a densely populated city neighborhood. The facility must fit entirely within a narrow 25 ft by 100 ft footprint and safely accommodate 20-30 community members simultaneously. The design must leverage at least two sustainable architectural or engineering practices. Describe the specific practices and design choices made to build the greenhouse within these constraints.

Cybersecurity

Problem Statement: FinStream Technologies is a fast-growing financial technology startup. During a routine audit, the security team notices anomalies in the network logs. A senior software engineer who recently submitted their two-week notice has been downloading unusually large volumes of proprietary source code and client financial data from the cloud repository to a local workstation and subsequently transferring it to an unencrypted external USB drive. Analyze the immediate actions required to secure the data, investigate the scope of the exfiltration, and recommend policy changes.

Data Science and Analytics

Data Set – Yellowstone_Wildlife.csv

Topic: Explore how wildlife populations and their migration behaviors have shifted in Yellowstone National Park over the last 50 years. Look at the key ecological, environmental, and human characteristics provided in the dataset. Based on your analysis, create a set of data-driven criteria that can help Yellowstone National Park with their planning for wildlife conservation. Support your predictive criteria with clear evidence from the data.

Digital Photography

Theme: Create a digital photo series consisting of seven color photographs. Each photo should emphasize one of the colors in the ROY G. BIV sequence:

1. Red
2. Orange
3. Yellow
4. Green
5. Blue
6. Indigo
7. Violet

The seven photos must all be connected by a single theme, story, location, subject, or idea. While each image should prominently feature its assigned color, the entire collection should feel like one cohesive series rather than seven unrelated photographs.

Dragster

No theme for 2027, see official rules for specifications

Drone Challenge (UAV)

Theme and Topic

Humanitarian Aid and Rescue

Forensic Technology

Skills

1. Forensic Biology-Genetics
2. Toxicology
3. Forensic Psychology

Mass Production

Theme: Automata Box

Mechanical Engineering

Problem Statement

Medical Technology

Theme: Pulmonological Conditions & Modern Technologies to Address them: teams will select a respiratory-related condition and outline it in the display. Then, teams will select a modern medical technology that will be highlighted by the informational pamphlet and multimedia video.

Microcontroller Design

Theme: Wearable Technology

Off the Grid

Design Brief: Resilient Housing Unit in Cabo San Lucas

Overview:
A family of six lives in an informal settlement, or *colonia*, on the outskirts of Cabo San Lucas, Mexico. The family consists of two parents, one grandparent and three children.

Their current home is self-built using salvaged materials such as scrap wood, corrugated metal, pallets, and tarps. The home is single-level and crowded, with limited privacy between generations. The family does not have reliable access to running water, sewage, electricity, drainage, or waste collection. Water is delivered by truck and stored in a small cistern, while electricity and sanitation systems are often improvised.

The region's arid desert climate creates year-round challenges, including extreme heat, strong seasonal winds, and persistent dust. In addition, many informal settlements are located near arroyos, flood zones, or unstable terrain, placing families at serious risk during hurricanes and flash floods.

Challenge:
The family needs a safe, affordable, and resilient single-level housing unit that can support multi-generational living in an informal settlement in Cabo San Lucas. Your task is to design a housing solution that improves comfort, safety, dignity, and long-term livability while responding to the region's climate, limited infrastructure, and economic realities.

Requirements:
• The housing unit must be single-level and designed for a multi-generational family.
• The design should include passive cooling, natural ventilation, and strategies to reduce heat and dust inside the home.
• The structure must be more resilient to hurricanes, strong winds, flash flooding, and unstable ground conditions.
• The home should include solutions for water collection, water storage, and water conservation.
• The design must address sanitation, drainage, and waste management in areas without reliable public infrastructure.
• The proposal should use affordable, durable, and locally available materials when possible.
• The home should be simple to build, repair, and maintain using realistic construction methods.
• The design should allow for incremental or phased construction so the family can improve the home over time.
• The layout should include flexible spaces for privacy, family gathering, sleeping, cooking, and daily activities.
• The design should be scalable so it could potentially be adapted for other families in similar communities.

Budget:
Your team has a limited budget equivalent to the income of a working family in Cabo San Lucas. The design should prioritize affordability, durability, and realistic implementation. The budget must account for building materials, water storage, basic sanitation, ventilation, and flood protection.

Prepared Speech

2027 National TSA Conference Theme: "Forward to Fifty"

Promotional Marketing

Theme: You have been asked to develop a promotional marketing campaign for Discover TSA: Open House & Recruitment Night. The purpose of the event is to introduce prospective members and their families to the opportunities available through the Technology Student Association. The event will feature student demonstrations, interactive STEM activities, competitive event displays, and opportunities to meet current TSA members.

Use the following information when creating your promotional materials:

Event Name: Discover TSA: Open House & Recruitment Night
School: Edison Middle School
School Mascot: Emus

School Colors: Green and White
Date: Friday, August 1, 2027
Time: 6:00 p.m. – 8:30 p.m.
Location: Edison Middle School
Address: 1840 Innovation Parkway, Orlando, FL 32819

Printable Design
A promotional graphic suitable for both print and social media advertising that promotes the event.

Wearable Design
A collectible lapel pin for the Edison TSA chapter.

Digital Design
An auto-advancing digital welcome presentation highlighting event activities, chapter accomplishments, and opportunities available through TSA

Robotics

Theme

Solar Racer

A model solar track on top of carpet will be the floor surface at the 2027 National TSA Conference

STEM Animation

Theme: Think. Design. Create. An animation centered on the engineering design process.

Structural Engineering

Design Brief

Verification Form

Website Design

Design Brief: Design and develop an informational website dedicated to a fictitious space exploration program. Your website should educate and inspire a general public audience — particularly students your age — about the mission's goals, crew, technology, and significance for the future of human space exploration.