



## 2019 NJ TSA MIDDLE SCHOOL DESIGN PROBLEMS

### **CAD Foundations**

Design an illuminated, handheld magnifier to assist with reading text or examining small objects. It should be attractive and designed to fit in a pocket or purse. It will be sold as a fundraiser item to raise money for your school's TSA chapter.

Use CAD to prepare an isometric drawing and the required 2D views. Show only the exterior of the product.

Submit the drawings on maximum paper size of 24' x 36" or smaller sheets mounted on a 24" x 36" sheet with no overlapping papers.

Your drawings will be evaluated using the Official Rating Form, page 43 of the Competitive Events Guide.

### **Coding**

Many middle schools hold an orientation before school actually starts. These sessions are helpful, not only because you learn your way around the building, and get to meet some of your teachers, but you also get to meet fellow students. That way, when you show up on your first day of school, you may already recognize a few familiar faces. But, as you will probably recall, it was hard to remember everything you learned during orientation.

#### **APP DESIGN CHALLENGE**

Design an app that provides some of the most important information that a new student needs to know about your school. Please follow these guidelines:

- **PLATFORM:** The app can be on any platform (web app, desktop/PC app, a web browser extension, robot, Ruby on Rails, mobile, etc).
- **PROGRAMMING LANGUAGE:** Use any programming language: c/C++, Objective C, C#, Java, JavaScript, Python, Ruby, Swift, "block code", etc.
- **FUNCTIONALITY:** The app must have some degree of functionality.
- **CONTENT SUITABILITY:** All content must be in good taste and observe all school rules.
- **ORIGINALITY:** The app must be original in design and content.
- **VIDEO:** Create a 1-3 minute video that contains the following information:

- First name of each team member
- The name of the app
- Clearly explain the purpose of the app
- The tools and coding language used to create the app
- Show how the app works
- **SUBMIT THE VIDEO** through YouTube
- **IN ADDITION** submit a document that includes the following information:
  - Your ID number(s)
  - Title of the app
  - Explain the app in ONE sentence.
  - What is your app trying to accomplish? (200 characters max.)
  - What technical /coding difficulty did you face in programming your app, and how did you address this technical challenge? (500 characters max.)
  - With what you've learned, what improvements would you make to version 2.0 of your app? (500 characters max.)

## EVALUATION

- **VIDEO** (50 points)
  - The purpose of the app is explained (10 points)
  - Tools and coding language are explained (10 points)
  - At least 3 features of the app are demonstrated and explained (30 points)
- **DOCUMENTATION** (50 points)
  - Written description of the app's purpose (10 points)
  - Technical difficulty and solution are explained (20 points)
  - Improvements that should be included in version 2.0 are explained (20 points)

## SUBMISSION INSTRUCTIONS

- The URL for the video (posted on YouTube) should be emailed to [tsachall@tcnj.edu](mailto:tsachall@tcnj.edu) by March 21, 2019. Required documentation must be submitted as a PDF attachment to the email.
- Include ID number(s) and "Middle School Coding" in subject line of email.

## System Control Technology

Elon Musk is known for his interest in revolutionizing transportation on the road, in space, and underground. Your challenge is to research his work and then construct a working model that illustrates one of the projects that he is currently focusing on.