MESA DAY CONTEST RULES 2026-2027

(FINAL)

AI for Social Good

LEVEL: Middle School

DIVISION(S): Grades 6-8 (combined)

COMPOSITION OF TEAM: 2-3 students per team

NUMBER OF TEAMS: Preliminary – Determined by your local MESA center
Regional – # of teams per division at the discretion of each region (Northern, Central, LA/Central Coast, and Southern)

SPONSORS: University of California Davis MESA College Prep
University of California San Francisco MESA College Prep

OVERVIEW: Changes, if any, from "DRAFT" rules are highlighted in "yellow." **AI For Social Good** invites middle school students to explore artificial intelligence through a hands-on activity by training and testing a Google's Teachable Machine. In preparation, students will complete a CodeHS course covering AI, AI use in community contexts, and the impact of AI and data centers. **Participation logistics, limits, and competition facilities may vary by host site. Advisors and students are responsible for verifying this information with their local MESA center.**

PROMPT: Teams will train an image classification model to identify the primary macronutrient - carbohydrate, protein, or fat - in different foods. After submitting their model, it will be tested by classifying a set of mystery items, and teams will present at MESA Day on the relationships between image classification and our communities. This challenge promotes critical thinking about nutrition, environmentalism, data bias, and the real-world applications of AI for social good.

RESOURCES:
What is the Google Teachable Machine?
How to Train Your Teachable Machine Model (Short Tutorial)
How to Train and Export Your Teachable Machine Model (Long Tutorial)
Sample Images

MATERIALS: Teams will require the following prior to competition day:

- Computer with internet access
- Google Chrome or other modern web browser
- Access to Teachable Machine website

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- Submitted Teachable Machine model and image files of items (collected by students for training AI model) in advance by the deadline as determined by the Host Center
- Submitted digital slide presentation by the deadline as determined by the Host Center

The Host Center will provide the following:

- Internet enabled computer suitable for presentations and access to online materials
- Projector and screen or television compatible with standard presentation formats
- Connection cables including HDMI, USB, VGA, and any required adaptors. Teams must confirm compatibility with the Host Center.
- 12 standardized mystery items (digital)

GENERAL RULES:

1. Teams must consist of 2-3 students. Teams consisting of 1 (one) student will not be allowed to compete.
2. **ALL team members** must complete at least 60% of the assignments in the specified CodeHS pre-course **one week** prior to the contest date (see "Enrollment Links" attachment/ appendix). Failure to meet this requirement will result in the team not being able to compete in the competition.
3. Teams **train an AI model using ONLY Google Teachable Machine** by:
    a. Creating categories of food items by their primary macronutrient: 1) mainly Protein, 2) mainly Carbohydrates, or 3) mainly Fats.
        i. The primary macronutrient of any food product will be determined by whichever macronutrient has the largest daily value percentage (DV%) on the majority of food labels for the product. For protein, the daily value percentage will be 2x the number of grams.
    b. Providing/uploading images of **prepared dishes** to the Teachable Machine.
        i. Each primary macronutrient category must include a minimum of 8 images per above classifications. Students that do not meet category minimums **WILL NOT BE** eligible to compete.
        ii. **A prepared dish** is any food item that is ready for safe consumption without requiring further cooking, heating, or handling. This includes foods that are naturally edible in their raw state (e.g., fruits, vegetables, etc.) and those that have been cooked, cured, or otherwise made safe to eat (e.g., grilled chicken, baked salmon, sautéed tofu. etc.).
    c. Testing their model using Teachable Machine's preview tool.
        i. Teams are encouraged to spend approximately 10–15 hours on training and testing their model.
4. Submit the trained AI model as a ".tm" file by the designated deadline as determined by the Host Center. Teams that do not submit the model in this format will **NOT BE** eligible to compete.
    a. In the model training website, click the ☰ menu in the upper-left corner of the screen. Select "Download project as file." This creates and downloads a ".tm" project file to your computer.

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b. The submitted file must be renamed in the following format **MESACenter_School_TeamMember'sNames.tm**. A **10% penalty** on the model prediction score will be assessed for failure to label the file in this format.

Ex: UCDavis_Smythe_EvaWorkel_DannyNolson.tm

c. Teams are **NOT PERMITTED** to edit their Teachable Machine after submission.

5. Each team must create a **5-minute presentation slideshow** (e.g., Google Slides, PowerPoint Presentation, etc.) to explore the relationships between image classification and our communities. Failure to meet this requirement will result in the team not being able to compete in the competition. The presentation slides must be submitted by the date specified by the Host Center.
   a. Presentation slides must be clearly labeled with the team members' names, grade levels, school, and MESA center. A **10% penalty** on the presentation score will be assessed for failure to include this information.
   b. Must address **ALL** of the following content questions directly in any order:
      i. Examine the positive and negative consequences of using image classification models for science (e.g., may be nutritional, medical, etc.).
      ii. Examine the impact of the three macronutrients on the overall health of the human body (e.g., How do these macronutrients contribute to bodily functions? What happens when these macronutrients are not present in the diet or consumed in excess?)
      iii. What rights should communities have on where data centers are placed?
   c. AI may be used to assist with research, but all ideas and presentations must be generated by the team. Any use of AI for research must be disclosed in the presentation.
6. Models and presentation slides must be the original work of the students. Judges may ask questions to confirm authenticity.

JUDGING:

1) Each team's AI model will be tested <u>prior to the day of the competition</u>.
   a) The model will be loaded onto a device at a testing station and evaluated for accuracy.
   b) Models will be tested on a standardized set of 12 mystery items: 4 carbohydrates, 4 proteins, and 4 fat foods.
   c) For each item, the team's model will be used to predict whether it is primarily a carbohydrate, protein, or fat.
2) <u>On the day of the competition</u>, each team will have **5 minutes** to present to a panel of judges.
   a) Judges will determine team order by random selection and will post the team order prior to the start of competition.
   b) The team must be ready to present when called or forfeit the competition.
   c) Only judges, MESA staff, and competing teams will be allowed in the competition room.
   d) Presentation may not exceed 5 minutes. Once 5 minutes has elapsed, teams will be stopped and prevented from speaking beyond the 5 minute mark.
   e) Judges will provide time signals at the following intervals: one (1) minute, thirty (30) seconds, and five (5) seconds remaining.
3) Judges' decisions are final.

SCORING:

1) Teams will earn **4 points per mystery item for each correct classification**. (Maximum of 48 points)
   a) To receive points for any given item, the model's prediction must meet a minimum confidence threshold of **70% or higher** for that classification.

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2) The presentation is worth a maximum of 100 points.
3) **TIEBREAKER:** In the event of a tie, teams will be ranked by **efficiency score**, calculated as:
    a) **Efficiency Score = Number of Correct Predictions ÷ Total Quantity of Images Used to Train the Model**
    b) The team with the higher efficiency score will be ranked above the other tied team(s).

AWARDS:

- Medals will be awarded for 1st, 2nd, and 3rd place based on the highest Final Team Score.
- Please check with your MESA center to determine the number of teams that advance to Regional MESA Day.

ATTACHMENTS/APPENDIX:

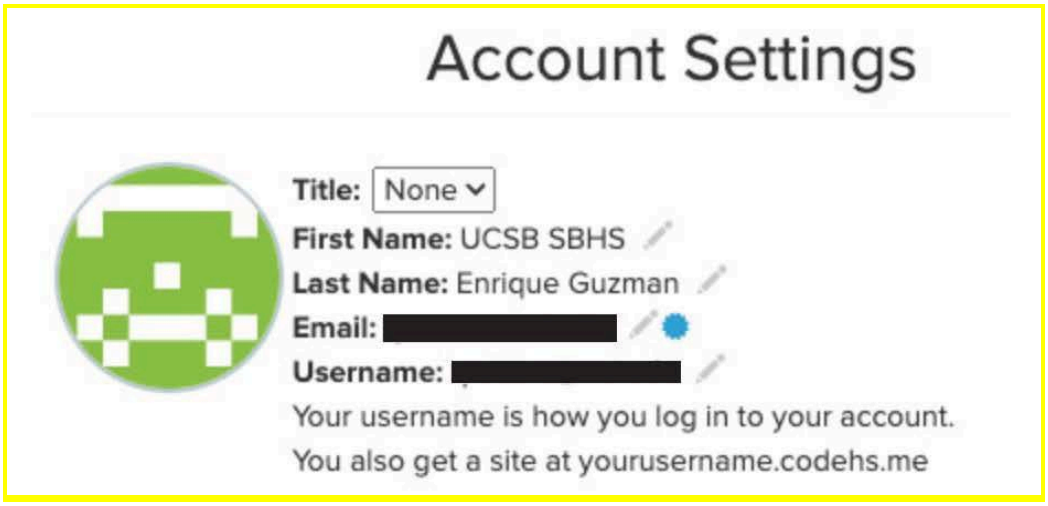
- AI for Social Good course in CodeHS
- Scoring Rubric

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AI for Social Good CodeHS Course

Enrolling Instructions: When enrolling in CodeHS, EACH team member **MUST** include their **MESA CENTER and SCHOOL** in their registration. See below for example:

- **First name field:** Abbreviated MESA center and School Name
- **Last name field:** Student's First and Last Name



Course Links: Courses have been created to match the MESA region your host center is affiliated with. Please register for your appropriate course:

Northern California: For students affiliated with CSU East Bay, RISE, UC Davis, UCSF, Ukiah
Northern Region: https://codehs.com/go/C8C72
Enrollment Code: C8C72

Central California: For students affiliated with Fresno State, San Jose State, UCSC, University of the Pacific
Central Region: https://codehs.com/go/5027E
Enrollment Code: 5027E

Los Angeles / Central Coast: For students affiliated with CSULA, CSULB, UCLA, UCSB, USC
LA/Central Coast Region: https://codehs.com/go/69F3B
Enrollment Code: 69F3B

Southern California: For students affiliated with Imperial Valley, San Diego State, UCI, UCR
Southern Region: https://codehs.com/go/3238C
Enrollment Code: 3238C

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SCORE SHEET FOR AI For SOCIAL GOOD

Middle School – Grades 6-8

Copies of this score sheet will be provided by the MESA Day Host Center.

Student Names: _____ MESA Center: _____

School: _____

Required Elements	YES	NO
Team consist of 2-3 students		Unable to compete
Digital slide presentation present		Unable to compete
Image recognition model submitted		Unable to compete
Presentation addresses all 3 content questions from the official rules		Unable to place
Image recognition model is trained on at least 8 images in each macronutrient category		Unable to place

Teachable Machine Model Scoring				
TEST ITEM	CONFIDENCE ≥ 70%?		POINTS AWARDED	
1.	□ Yes	□ No	□ 1	□ 0
2.	□ Yes	□ No	□ 1	□ 0
3.	□ Yes	□ No	□ 1	□ 0
4.	□ Yes	□ No	□ 1	□ 0
5.	□ Yes	□ No	□ 1	□ 0
6.	□ Yes	□ No	□ 1	□ 0
7.	□ Yes	□ No	□ 1	□ 0
8.	□ Yes	□ No	□ 1	□ 0
9.	□ Yes	□ No	□ 1	□ 0
10.	□ Yes	□ No	□ 1	□ 0
11.	□ Yes	□ No	□ 1	□ 0
12.	□ Yes	□ No	□ 1	□ 0
TOTAL CORRECT PREDICTIONS: *(DO NOT AWARD POINTS FOR ANY PREDICTIONS BELOW 70%)*		/12	x 4	/48
TOTAL IMAGE COUNT (TIEBREAKER INPUT)_____	**Tiebreaker: Correct Predictions_____÷ Image Count_____=_____** *(Efficiency Score = Correct Predictions ÷ Number of Images Used to Train Model.)*			

FINAL TEAM SCORE

Presentation Score		Total Correct Prediction Score		**Final Team Score**
Presentation Label (names, grade level, school, center) Penalty (10%)	-	Model File Label (names, grade level, school, center) Penalty (10%)	-	
Final Presentation Score	/100	**Final Correct Prediction Score**	/48	/148

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Presentation Score					
Content	**Excellent (5 points)**	**Very Good (4 points)**	**Good (3 points)**	**Satisfactory (2 points)**	**Needs Improvement (1 point)**
Organization/Structure: Clearly organized with distinct and relevant introduction, body, & conclusion. (2x points)	10	8	6	4	2
Logical Flow/Reasoning: On topic, deliberate progression of information, smooth transitions.	5	4	3	2	1
Content Question 1: Examine the consequences (positive and negative) of using image classification models for science (nutritional, medical, etc.).	**Excellent (5 points)**	**Very Good (4 points)**	**Good (3 points)**	**Satisfactory (2 points)**	**Needs Improvement (1 point)**
Knowledge/Understanding of Topic: Comprehensive understanding and explanation of the topic.	10	8	6	4	2
Evidence/Examples: Provides relevant supporting materials and real world examples.	5	4	3	2	1
Content Question 2: Examine the impact of the three macronutrients on the overall health of the human body.	**Excellent (5 points)**	**Very Good (4 points)**	**Good (3 points)**	**Satisfactory (2 points)**	**Needs Improvement (1 point)**
Knowledge/Understanding of Topic: Comprehensive understanding and explanation of the topic.	10	8	6	4	2
Evidence/Examples: Provides relevant supporting materials and real world examples.	5	4	3	2	1
Content Question 3: What rights should communities have on where data centers are placed?	**Excellent (5 points)**	**Very Good (4 points)**	**Good (3 points)**	**Satisfactory (2 points)**	**Needs Improvement (1 point)**
Knowledge/Understanding of Topic: Comprehensive understanding and explanation of the topic.	10	8	6	4	2
Evidence/Examples: Provides relevant supporting materials & real world examples.	5	4	3	2	1
Presentation	**Excellent (5 points)**	**Very Good (4 points)**	**Good (3 points)**	**Satisfactory (2 points)**	**Needs Improvement (1 point)**
Team Introduction: Creative introduction of team members that includes names, grades, MESA center.	5	4	3	2	1
Body Language: Confident, relaxed personable demeanor; fluid movements enhance presentation.	5	4	3	2	1
Pace/Flow/Vocal Control: Appropriate timing moves the audience smoothly from point-point. Voice clear & projects; clear pronunciation & enunciation.	5	4	3	2	1
Effective Use of Language: Clever, concise, and appropriate word choice; use of meaningful antidotes, statistics, or quotes.	5	4	3	2	1
Audience Engagement & Impact/Overall Presentation: Direct eye contact; effective use of gestures & facial expressions. Broad appeal and stimulates audience interest.	5	4	3	2	1
Digital Slide Presentation: Supports & enhances audience understanding of topic; creative; integrated seamlessly into presentation. (2x points)	10	8	6	4	2
Team Participation: All team members participate meaningfully in the presentation.	5	4	3	2	1
COLUMN TOTALS:					
PRESENTATION SCORE:					**/100**

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