New Event Summaries

Physical Science and Chemistry

Storm the Castle (B)

- Description
  - teams design, construct, and calibrate a device that uses only the energy of a falling counterweight to launch a projectile as far and accurately as possible
- Eye Protection #5
- Impound Event

Storm the Castle (B)

- Competition
  - Target box -- 20cm by 20cm by 20cm
  - Team announce position of target in whole meters
  - 5 min to make 3 shots
  - May request target moved if they hit it
  - Must submit 5 calibration graphs
- Scoring – high score wins

Sounds of Music (C)

- Description
  - Teams build one wind instrument and one percussion instrument based on a 12 tone tempered scale
  - prepare to describe the principles behind their instrument's operation
  - be able to perform a major scale, a required melody and a chosen melody with

Sounds of Music (C)

- Competition
  - Each member play required scale
  - Play duet of required piece with melody and harmony
  - Play duet of their choosing which best displays capabilities of instruments
  - Instruments evaluated on creativity, originality, variety, etc.

Sounds of Music (C)

- Scoring
  - Rubric in rules

Protein Modeling (C)

- Description
  - Students will construct physical models of proteins.
  - For the 2011 competitions, students will model proteins involved in reprogramming adult cells to become stem cells, also known as induced pleuripotent stem cells (IPS).
- Impound event

Protein Modeling (C)

- Resources
  - 5 - 8½ by 11 double sided pages
- Competition
  - Pre-build K1f4 protein model (40%)
  - Build on-site model (30%)
  - On-site written exam (30%)

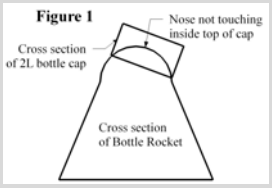
Technology and Engineering

Bottle Rocket (B)

- Description
  - Prior to the tournament, teams construct up to 2 rockets designed to stay aloft for the greatest amount of time
- No Impound
- Eye Protection #5

Bottle Rocket (B)

- Construction
  - Fins attached by silicone or polyurethane-base glues
  - Must have blunt nose (no part or nose can touch interior of bottle cap)
  - No recovery system



Bottle Rocket (B)

- Competition
  - 1 launch per rocket
  - Pressurized to 75psi
- Scoring

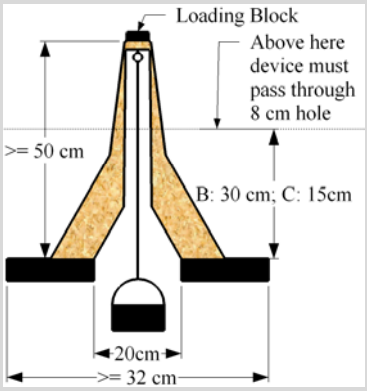
a. Ranking within each tier is determined by the greatest time aloft of any single rocket.
b. Tiers:
   i. Tier 1: Any launch without Construction or Competition violations.
   ii. Tier 2: Any launch with rocket parts separating during launch or flight (4.e.).
   iii. Tier 3: Any launch with Construction or Competition violations other than 4.e.
c. Ties are broken by the better score of each tied team's other rocket.
d. Teams unable to launch their rockets due to Safety or Construction violations receive participation points.

Towers (B & C)

- Description
  - design and build the most efficient tower
- No Impound
- Eye Protection #2

Towers (B & C)

- Construction



Towers (B & C)

- Competition
  - Support 15 kg of sand
- Scoring
  - Score = (Load supported)^2/(Mass of Tower)
  - Scored in tiers
    - Meet construction parameters
    - Not meeting construction parameters
    - Unable to be loaded

Helicopters (C)

- Description
  - construct and test free flight rubber-powered helicopters prior to the tournament to achieve maximum flight times
- Impound -- motors only at check-in

Helicopters (C)

- Construction
  - Functional components – no rigid plastic
  - Rotors
    - Up to 3 fixed pitched rotors
    - Maximum diameter – 40cm
    - No limit on number of blades

Helicopters (C)

- Competition
  - Must supply flight logs
  - 8 minute flight time
  - Maximum of 2 flights

Helicopters (C)

- Scoring
  - Longest flight wins
  - Incomplete flight log: -10% of flight time
  - No flight log: -30% of flight time

Inquiry and the Nature of Science

Awesome Aquifers (B)

- Description
  - Students will construct an aquifer and answer questions about groundwater concepts.

Awesome Aquifers (B)

- Construction
  - Materials listed in manual

Awesome Aquifers (B)

- Competition
  - Station 1 -- written test on groundwater
  - Station 2 -- written test utilizing provided resources (maps, charts, graphs, etc.)
  - Station 3 -- Build Aquifer to explain and demonstrate concepts chosen by E.S.
  - Station 4 -- Use built aquifer to explain and demonstrate concepts

Awesome Aquifers (B)

- Scoring
  - Station 1 -- 25%
  - Station 2 -- 25%
  - Station 3 -- 0%
  - Station 4 -- 50%
  - High Score wins

Sumo Bot (C)

- Description
  - Students will design and construct a robot (bot) that will attempt to move an opponent's robot from a ring.
- Impound Event

Sumo Bot (C)

- Construction
  - Requirements listed in manual
  - Powered by electricity (batteries)
  - No sharp objects, projectiles, flames, magnets, etc.
  - Must be radio controled
    - 3 frequencies minimum

Sumo Bot (C)

- Competition
  - Double elimination tournament
  - Ring is 5 foot square
  - 2 minutes to force opponent completely out of the ring
  - If no winner; lighter bot declared the winner
  - Stalling penalty if move back continually for 15 sec.
  - See manual for other parameters

Sumo Bot (C)

- Scoring
  - 1st -- tournament winner
  - 2nd -- championship looser
  - Other places determined by number of wins
  - Ties broken by
    - Total losing times / bot mass (high wins)
    - Robot mass (low wins)
  - Unsafe robots will be disqualified

Life, Personal, and Social Science

Microbe Mission (B & C)

- Description
  - Students will answer questions, solve problems, and analyze data pertaining to microbes
- Eye protection #4
- Resources
  - 1 - 8½ by 11 two-sided page of notes
  - Non-programmable, non-graphing calculator

Microbe Mission (B & C)

- Competition ("test" or stations)
  - Microscopes; parts and function
  - Differences among prions, viruses, bacteria, etc.
  - Roles of microbes in food production, spoilage, etc.
  - Beneficial vs. dangerous microbes
  - Interpret growth curves, etc.
  - See manual for other parameters

Microbe Mission (B & C)

- Scoring
  - High score wins

Break Time