CAD DESIGN (Middle/Jr. High and High School)

OVERVIEW

Participants will plan, draw, and produce a cardboard prototype of a school locker-organizer.

CHALLENGE

Create and produce a school locker-organizer that will store text-books, notebooks, writing utensils, cell phones, and various other items commonly found in public schools.

TIME LIMITS

The entry must be completed during the fall semester of 2009.

PROCEDURE

A. Participants check in their entries at the time and place stated in the conference program.
B. Entries are assessed by evaluators. Neither students nor advisors are present during the assessment.
C. The top 3 finalists will be announced and given trophies during the awards ceremony.

REGULATIONS

A. The CAD Drafting Challenge is an individual event. No recognition is given for a group effort.
B. The design must be plotted to an appropriate scale, saved electronically on a CD-R or DVD-R, and submitted along with a full-scale cardboard prototype at check-in.
C The following rules must be adhered to in your design:
    1. Your locker-organizer must be comprised of no more than three (3) components, with the overall dimensions of the organizer being:
        a. 30" height
        b. 11¾"width
        c. 10¾" depth
    2. The drawings for each component must contain an accurately dimensioned orthographic projection, and an isometric view of the parts.
    3. No fasteners, glue, or other types of adhesives may be used in the design. Each component must be self standing or interlock together with the other components.
    4. Prototypes must be constructed of 1/8" or smaller corrugated cardboard, cardstock, railroad board, or a like material.
H. The winning design may be used on publications and promotional items for the Razorback Technology Challenge and participating colleges. Winning entries become the property of the University of Arkansas.

EVALUATION

Designs are evaluated for creativity and effectiveness to plan, draw, and model the locker-organizer. The design will all be judged on the neatness, accuracy, and technical quality of the drawings and prototype.

DRAGSTER DESIGN (Middle/Jr. High and High School)

OVERVIEW

Participants design, produce working drawings for and build a CO_2-powered dragster.

CHALLENGE

Design and build the fastest CO_2-powered dragster.

TIME LIMITS

A. Entries must be started and completed during the fall semester of 2009.
B. The dragsters are submitted at the assigned time and place.
C. Cars must be picked up at the specified time upon the conclusion of the event.

PROCEDURE

A. Participants check in their entries at the time and place stated in the conference program.
B. Entries are reviewed by evaluators to determine, among other things, safety on the track.
C. Safe dragsters race two at a time for fastest time.
D. Following the race, participants pick up their entries from the display area at the time and place stated in the conference program.

REGULATIONS

A. The official distance between the start line and the finish line on the race track is twenty (20) meters.

B. Dragsters must have a minimum of two screw eyes per car. Screw eyes must not make contact with the race track. The track string must pass through both screw eyelets, which are located on the center line of the bottom of the car.

C. No repair or maintenance is allowed after the entries have been registered.
D. All CO_2 cartridges for the race will be provided.

*This is a no-holds-barred, head-to-head race. **There are no rules other than those specifically listed above.**

EVALUATION

The top 3 finalists will be announced and given trophies during the awards ceremony.

GRAPHIC DESIGN (Middle/Jr. High and High School)

OVERVIEW

Participants plan and lay out a graphic design
for the 2010 Razorback Technology Challenge T-shirt.

CHALLENGE

Create and produce a one (1) color graphic design that is
appropriate for the 2010 Razorback Technology Challenge T-shirt.

TIME LIMITS

The entry must be completed during the current school year.

PROCEDURE

A. Participants check in their entries at the time and place stated
in the conference program.
B. Entries are reviewed by evaluators. Neither students nor advisors
are present at this time.
C. The top 3 finalists will be announced and given trophies during the
awards ceremony.

2008 T-Shirt

2009 T-Shirt

REGULATIONS

A. Graphic Design Challenge is an individual event. No recognition is given for a group effort.
B. The design must be printed on photo or card stock and placed in a three-hole clear plastic
sheet protector when submitted at check-in.
C. The design must also be saved electronically on a CD-R or DVD-R, when submitted at check-
In. This disc will become property of the University of Arkansas.
D. The original design layout must promote the 2010 Razorback Technology Challenge. The
following information must be included:
    1. The words "Razorback Technology Challenge"
    2. Conference location "University of Arkansas"
E. The design may include the use of commercially produced or computer generated type and
public domain clip art. **Any use of copyrighted or registered artwork must be
accompanied by written permission from the original artist.** On a separate sheet of paper
(placed in the same clear page protector, behind the art) list the origin of the graphics or images, the
designers name, and the school name.

    ***Do not use the registered University of Arkansas or Razorback logos.**

F. If the design entry contains images of people, proof of consent must be attached to the back of
the entry. Minors require parental consent.
G. The winning graphic design may be used on publications and promotional items for the
Razorback Technology Challenge and participating colleges. Winning entries become the
property of the University of Arkansas.

EVALUATION

Designs are evaluated for creativity and effectiveness to communicate a message, neatness, and technical quality.

PROBLEM SOLVING (Middle/Jr. High and High School)

OVERVIEW

Participants use problem solving skills and limited materials to develop a solution to a problem given on site. Participants are required to work as a team to provide the best solution, which is measured objectively.

PURPOSE

Demonstrate skill in determining the best solution to a problem within the given parameters.

ELIGIBILITY

Teams are limited to three members.

TIME LIMITS

The allotted time for design and construction of the solution is one hour.

PROCEDURE

A. All tools and materials are provided.
B. The problem and evaluation criteria are distributed.
C. After teams receive the materials, they have one hour to design and construct a solution.
D. Each solution is tested as soon as possible after the construction phase is completed. If the solution is to be tested for repeatability, the team has thirty (30) seconds to reset the device.

REGULATIONS

A. All work must be completed in the event area during the time specified for the event.
B. All materials are provided. Only the materials issued to each team by the event coordinator may be used in the development of the solution.

EVALUATION

Each team's solution is evaluated objectively. A finite measure—such as elapsed time, horizontal or vertical distance, and/or strength—will be defined in the problem and is used to determine the best solution. Second best attempts or other objective criteria are used to break ties when possible. Only as a last resort does the event coordinator use subjective measurement, such as originality, to evaluate solutions.

STRUCTURAL DESIGN (Middle/Jr. High and High School)

OVERVIEW

Participants build a model of a structure that is destructively tested to determine design efficiency.

CHALLENGE

Participants must design and construct a beam bridge that reflects knowledge of bridge design and construction concepts using only the materials listed.

TIME LIMITS

1. The completed bridge will be submitted at the time and place stated in the conference program.
2. The bridge must be produced during the fall semester of 2009.

PROCEDURE

1. Participants report to the event area at the time and place stated in the conference program.
2. Students will check in using the registration list.
3. Bridges should be completed and ready for testing at registration.
4. Sketches will not need to be submitted for competition.
5. Testing will begin at the time designated or when all structures have been entered.
6. Be as quiet as possible when entering or leaving the testing area.
7. The structures are destructively tested and their test results are recorded. Public viewing is allowed at this time.
8. The top three finalists will be awarded trophies.

REGULATIONS

1. Materials
    a. The following may be used as structural pieces
        i. 30' of 3/32" by 3/32" basswood or balsa
        ii. One 3" x 5" note card
        iii. cyanoacrylate adhesive (CA) glue
        iv. One load platform, 3" x 3" plate of ¼" plywood with a 1/2" hole drilled in the center
    b. The structure must reach one inch beyond the abutments, plus or minus 1/8"; therefore the structure must be two inches greater than the span, plus or minus 1/4"
2. Bridge Span
    a. The span of the bridge is the opening between the abutments.
3. The span of the bridge will be set at 12".
4. The width of the structure must support the three inch square load platform.
5. The 3" x 3" load platform is centered in the length of the structure. The load platform is prepared from ¼" plywood with a ½" hole bored in the center.
6. The load platform must be glued on the top and center of the structure.

EVALUATION

An increasing load is applied to the structure until the structure fails. The failure weight is then recorded on the evaluation form. The three structures that can support the greatest load will take first, second, and third places.

TECHNOLOGY QUIZ BOWL
(Middle/Jr. High and High School)

OVERVIEW
Participants will compete in an oral question/response, head to-head team competition.

PURPOSE
Demonstrate knowledge of leadership skills and the systems of technology.

ELIGIBILITY
Entries are limited to one (1) team of up to five (5) members per school.

TIME LIMITS
Oral competition will be paired rounds of 6 questions per round single elimination.

ATTIRE
Casual business.

PROCEDURE
A. Participants report to the event area at the time and place stated in the conference program.
B. Participants follow the specific regulations and adhere to the directions provided on site by the event coordinator.

EVALUATION
A bracket will be designed based upon the number of teams entering the competition. Six (6) questions will be asked per round. This is a single-elimination event. Trophies will be awarded to the top three (3) teams in the oral competitions.