2016
Returning Events
Divisions B and C

SCIENCE OLYMPIAD
Eye Protection

- New classification system –
  - “A” – basic particle protection
  - “B” – impact protection
  - “C” – indirect vent chemical / splash protection

Event Parameters

- What students are allowed to bring
Event Parameters (contd)

- Safety Requirements –
  - Lab coats and aprons – students must have skin covered from the neck to wrists and toes this year.

Topic Changes

- Many events change the topic area dealt with from the previous year.
Physical Science and Chemistry

Air Trajectory B/C
Chemistry Lab C
Crave the Wave B
Crime Busters B
Forensics C
It's About Time C
Protein Modeling C
Air Trajectory (B/C)

- **Event Parameters** –
  - Impounded materials must be moveable by the members of the competing team without outside help.

- **Construction** –
  - Chambers are not required to automatically return to their original shape.
  - The launch device and all its components must fit in a cube (70.0 cm – Div C & 80.0 cm – Div B)
  - The triggering device must allow students to remain 75 cm (1.0 m last year) away from the launch area.
Chemistry Lab (C)

- General / Minor Changes only
  - Topic area change –
    - kinetics & gases
  - Eye Protection –
    - “C”
  - What students can bring –
    - Five 8.5” X 11” sheets of paper
  - Safety requirements
    - Skin covered from neck to wrists and toes
Crave the Wave (B)

- General / Minor Changes only
  - What students can bring –
    - Added protractors & rulers
Crime Busters (B)

- General / Minor Changes only
  - Eye Protection –
    - “C”
  - What students can bring –
    - Pipettes or Droppers
    - 5 pages (both sides)
  - Safety requirements –
    - Skin covered from neck to wrists and toes
Forensics (C)

- General / Minor Changes only
  - Eye Protection –
    - “C”
  - What students can bring –
    - Two instead of one non-camera calculators
  - Safety requirements –
    - Skin covered from neck to wrists and toes
It's About Time (C)

- No eye protection this year
- Event Parameters:
  - Impound only components necessary for the devices operation. Tools, clean-up supplies, reference materials, etc. need not be impounded.
  - All impounded materials must fit in 80.0 cm cube that is movable by competing team alone.
- Construction – (minor changes)
- The Competition:
  - Only 3 time trials (instead of 5 last year).
  - All time keeping devices including cell phones will be collected prior to the start of the time trials.
The Competition (contd):

- Event supervisors will conduct a short (non-scored) example of a time trial prior to the scored time trial.

Written Test:

- At least 5 questions from each of 5 areas:
  - Physics of modern timekeeping devices
  - Dynamical systems
  - Waves and frequencies
  - Historical time keeping devices
  - Time standards

Scoring: (changes due to only 3 time trials)
Protein Modeling (C)

- General / Minor Changes
  - Topic area changes –
    - Students will model proteins involved in the biosynthesis of the neurotransmitters dopamine and serotonin and the subsequent signaling by these neurotransmitters as they bind to receptor proteins on post-synaptic cells.
    - Pre Built Model – fragment of sepiapterin reductase
  - What students can bring –
    - Pencil/pen for exam and marker for marking the toobers and a metric ruler with cm marks.
Inquiry and the Nature of Science

Bottle Rocket (B)
Experimental Design (B & C)
Picture This (B)
Write It Do It (B & C)
**Bottle Rocket (B)**

- **Description**
  - Rockets will carry a Grade A Large egg that must survive the rockets return to earth.
  - Eye Protection “B”

- **Construction Parameters**
  - Rockets must not change shape or deploy any type of recovery system during launch or flight.
  - Nothing may adhere to the egg

- **The Competition**
  - Launch pressure will be between 45 and 60 psi and announced at the beginning of the competition.
Bottle Rocket (B)

- **Scoring**
  - A rocket violating 3.a-f will not be launched due to safety.
  - A rocket violating 3.g-h or that has a competition violation will receive a launch time of zero.
  - Irretrievable rockets will be scored as if the egg broke.
  - Tier 1 – 2 surviving eggs.
  - Tier 2 – 1 surviving egg.
  - Tier 3 – no surviving egg.
  - Tier 1 & 3 ties broken by longest single rocket flight.
  - Tier 2 ties broken by longest surviving egg’s rocket flight.
Experimental Design (B & C)

- General / Minor Changes only
  - Eye Protection –
    - “C”
  - Scoring:
    - Will be based on the checklist in the manual or the expanded version on the soinc.org website.
    - Graphs are only worth 10 pts instead of 12 this year.
Teams of 2 members instead of 3.

The Competition

- 4 minutes to complete 16 to 32 terms
- Each team member will take turns drawing.
- If a term is passed it is out of play and drawing rotates to the other team member.
- If the answer is multi-worded, the number of words may be represented by underlines of uniform length.
Write it, Do it (B & C)

The Competition:

- Students may use abbreviations and do not have to define them.
- Editing, punctuation or scientific symbols that fit within the context of the written description are allowed.

Scoring

- Any team that draws a subsection of the model will be ranked in tier 2.
- Drawing the entire model is a disqualification.
Earth and Space Science

Astronomy (C)
Dynamic Planet (B & C)
Fossils (B & C)
Geologic Mapping (C)
Meteorology (B)
Road Scholar (B)
Astronomy (C)

- **General / Minor Changes only**
  - Topic area change –
    - Star formation and exoplanets
  - What students can bring –
    - Two computers of any kind or two 3-ring binders …
  - The Competition:
    - color – color diagrams have been added to the information that may be used.
    - Objects to identify have all changed.
Dynamic Planet (B & C)

- General / Minor Changes only
  - The Competition:
    - several new topic areas have been added this year and one removed. The new ones are bold in your manual.
Fossils (B & C)

- NO Changes
Geologic Mapping (C)

- General / Minor Changes only
  - What students can / should bring –
    - Geologic compass
  - Representative tasks:
    - Use a geologic compass to take measurements of strike, dip, plunge and trend of planes and lines.
Meteorology (B)

- **General / Minor Changes only**
  - Topic area change –
    - Tasks or questions will be from the *everyday weather* topics listed in your manuals.
  - What students can bring –
    - One 8.5” X 11” sheet of paper
Road Scholar (B)

- NO Changes
Life, Personal and Social Science

Anatomy & Physiology (B & C)
Bio Process Lab (B)
Cell Biology (C)
Disease Detectives (B & C)
Green Generation (B & C)
Anatomy and Physiology (B & C)

• General / Minor Changes only
  • Topic area change –
    • Integumentary, Skeletal and Muscular systems.
Bio Process Lab (B)

- General / Minor Changes only
  - Eye Protection –
    - “C”
Cell Biology (C)

- General / Minor Changes only
  - Eye Protection –
    - “C”
  - The Competition:
    - Several changes to the content topics (bold letters in your manuals)
Disease Detectives (B & C)

- NO CHANGE from 2015
The Competition:

The entire focus of the event has changed. 2015 covered aquatic, air quality and climate change issues – 2016 will cover terrestrial and population growth issues.
Technology and Engineering

Building Policy
Bridge Building (B & C)
Elastic Launched Glider (B)
Wright Stuff (C)
Many of the building events have added the following paragraph to their rules:

- Students must be able to answer questions regarding the design, construction, and operation of the device per the Building Policy found on www.soinc.org

The policy has been around many years (1986)

Just a reminder that:

- “One or more of a 15-member team must have constructed all pre-built devices presented for judging.”
Building & Tools Policy
(from soinc.org)

- Includes design process, making components, and assembly.
  - Certain exceptions for safety reasons and tool access.

- Adult mentoring guidelines –

- Investigation of suspected violations –
  - ES may extensively question team members and coach must certify the device was student built.

- Sanctions –
  - Event disqualification
General / Minor Changes:

- Topic area change –
  - Bridges will be tested at an angle

Eye Protection –
- “B”

Construction Parameters:

- The Bridge must span a 35.0 cm (B) or 45.0 cm (C) “clear span”
- The bridge must rest on a single 5 cm high test support in one of the bearing zones and the low end of the bridge must rest in the opposite bearing zone.
- The height of the low end of the bridge can not exceed 2.0 cm perpendicular to the test base within the bearing zone.
- There is no maximum length, width or height.
The Competition:

Testing –

- 6 minutes to set up and test the bridge
- Team members set the test support in one of the bearing zones on one of its 2.0 cm X 5.0 cm faces.
Bridge Building (B & C) contd.

- The Competition:
  - Testing (contd)—
    - Team members must place one end of the bridge on the test support and that end of the bridge may not contact the test base.
    - The other end of the bridge must be set in the opposite bearing zone.
    - The Event Supervisor will check the height of the bridge at the clear span line of the bearing zone where the bridge directly touches the test base. If it exceeds 2.0 cm it’s a construction violation.
    - “Failure” definition has gotten more specific – read it carefully.
Elastic Launched Glider (B)

- General / Minor Changes only
  - Eye Protection –
    - “B”
  - Construction Parameters –
    - Mass of the glider 3.5 g – 10.0 g (4.0-10.0 last year)
    - Wingspan not to exceed 30.0 cm (32 last year)
- The Competition
  - Competitors must remain in contact with the floor while launching their glider with one hand holding the “apparatus”
  - 5 min to make up to 5 official flights with 1 or 2 gliders
Wright Stuff (C)

- General / Minor Changes only
  - Construction Parameters –
    - Mass of the airplane be 7.0 g or more (8.0 last year)
    - Wingspan not to exceed 40.0 cm (50 last year)
    - Wing chord 6.0 cm or less (8.0 last year)
    - Stabilizer span not to exceed 25 cm (30 last year)
    - Stabilizer chord 5.0 cm or less (6 last year)
    - Maximum motor mass 1.5 g (2.0 last year)
  - Scoring
    - Competitors may attach up to 3 US dimes to their airplane (provided by the event supervisor). 50% bonus per dime added to flight time (1 dime=1.5x; 2 dimes=2x; 3 dimes=2.5x)