



Egg Drop Contest (Group A: Grade 4, 5)

How the Contest Works

Students are asked to build a device (e.g., egg holder/container) that will keep a raw, uncooked egg from breaking when it is dropped from a height onto a target on the ground. The height of the dropping point will be about 18 feet above the ground. During the contest, a limited amount of materials (for example, straws, wood sticks, rubber bands, etc) will be provided for each student to build a device made only from the provided materials to support an egg when dropped from a given height.


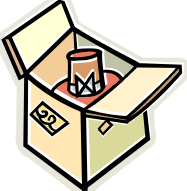
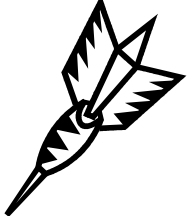

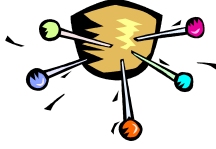
How to Score Your Project

We will be scoring your final project according to the following:

- Unbroken egg: 50 points
- Creativity of design: maximum of 30 points
- Description of your project’s design and concept: maximum of 20 points

Examples of egg holder/container devices

There are several types of devices that can be designed. Examples include:

				
CUSHION	BOX	DART	PARACHUTE	UFO

Who Sank My Battle Ship! (Group B: Grade 6, 7)

This contest will review and test the student's knowledge of Buoyancy, Density, Hydrophilicity and Hydrophobicity. You will have to select a paper boat design that will keep afloat a cargo of 12 pennies the longest. This boat can be augmented with tape, tape with wooden support and with butter or not at all! You decide. The boat design that keeps the cargo afloat the longest will enter the finals. The winner will be chosen by judges; who will determine which finalist had the best theory on why their boat out lasted the others.



Chemical Separation (Group C: Grade 8, 9)

Separation of mixture is one of the major techniques in science. For example, often, developing a new cancer curing medicine begins with the separation of a key ingredient from a rare tree bark or the skin of a frog. Even finding DNA of a criminal from the blood sample at the crime scene is another good example.

This year, the task is to isolate the key ingredient of a popular drug that you and your family members use frequently. In order to isolate the active ingredient, you must understand basic concepts of chemistry and know how to conduct some essential isolation and purification techniques. The detailed information will be given in the lab on the test date, but it will be helpful if you study the following information prior to the day.

Essential experimental methods and concepts:

Density, magnetism, states of matters, solution, heterogeneous mixture, dissolution (solubility), filtration, extraction, chromatography, pH (acid/base), neutralization (chemical reaction between common acids and bases).

Helpful Links

Density

- <http://www.elmhurst.edu/~chm/vchembook/120Adensity.html>
- <http://www.youtube.com/watch?v=VDSYXmvjg6M>
- <http://www.youtube.com/watch?v=B3kodeQnQvU>

Magnetism

- <http://www-istp.gsfc.nasa.gov/Education/Imagnet.html>
- <http://vimeo.com/1613352>

States of matters

- <http://www.chem.purdue.edu/gchelp/atoms/states.html>
- <http://www.youtube.com/watch?v=s-KvoVzukHo>
- <http://www.youtube.com/watch?v=vNG3TQrjgYU&feature=fvw>

Solution

- http://www.chem4kids.com/files/matter_solution.html
- <http://www.youtube.com/watch?v=hydUVGUbyvU>

Heterogeneous mixture

- http://www.chem4kids.com/files/matter_mixture.html
- <http://antoine.frostburg.edu/chem/senese/101/matter/faq/what-is-heterogeneous.shtml>
- <http://www.youtube.com/watch?v=n3Usa6mOkhM>
- <http://www.youtube.com/watch?v=tphIt6G29pA&feature=related>
- <http://www.youtube.com/watch?v=1k9Td7tjOkU&feature=related>
- <http://www.youtube.com/watch?v=cme6GimHeq0&feature=related>

Dissolution



Korean-American Scientists and Engineers Association, New York Metro Chapter
KSEA NY Metro Math & Science Olympiad (KMSO 2011)

- a. <http://www.youtube.com/watch?v=EBfGcTAJF4o&feature=related>
- b. http://www.youtube.com/watch?feature=iv&annotation_id=annotation_159084&v=dr4sFNzUVzI
- c. <http://www.youtube.com/watch?v=ek6CVVJk4OQ&feature=related>

Filtration

- a. http://www.wiredchemist.com/chemistry/instructional/chem_lab_filter.html
- b. <http://www.youtube.com/watch?v=QEEx788j-yk&feature=related>

Extraction

- a. <http://www.files.chem.vt.edu/chem-ed/sep/extract/extract.html>
- b. <http://www.youtube.com/watch?v=vcwfhDhLiQU>

Chromatography

- a. <http://www.rpi.edu/dept/chem-eng/Biotech-Environ/CHROMO/chromintro.html>
- b. http://www.youtube.com/watch?v=Z54ec_G12QE&feature=related
- c. <http://www.youtube.com/watch?v=nCqwZuE4boY&feature=related>

pH (acid/base), Neutralization

- a. http://www.chem4kids.com/files/react_acidbase.html
- b. http://www.youtube.com/watch?v=6Y4Y-__ME60
- c. <http://www.youtube.com/watch?v=cqWeFDMRiRk&feature=related>
- d. <http://www.youtube.com/watch?v=8IRI5gPR5EY&feature=related>

Science Written Test (Group D: Grade 10, 11)

Science written test is not to evaluate student's fundamental knowledge in biology, chemistry, and physics. This Olympiad questions demand deep understanding of those basic concepts and ask students to go further to connect different aspects. The test consists of 40 multiple choice questions and 4 open-end questions. The questions are made for 10th and 11th grade high school students. Students are asked to finish within 100 minutes. For the open-end questions, not only the answers but also the works to get the answers must be shown.

Research poster presentation (Group E: Grade 10, 11, 12)

High school students in 10th-12th grades will give a presentation on their own research projects in a poster format. Students are expected to prepare research posters in which introduction, methods, results and discussion should be presented appropriately. Students will also need to give a verbal presentation in front of judges. During presentation, judges may ask students questions relevant to their research projects. Evaluation will be based on creativity of research projects, preparation of posters, execution of projects, presentation skills and students' responses to questions.