SCIENCE OLYMPIAD™

Exploring the World of Science

Elementary Science Olympiad hosted by Middle Tennessee State University
April 26, 2025

Events

- A is for Anatomy
- Can Race
- Clay Boats
- Categories
- Crossword Science
- Deep Blue Sea
- Disease Detectives
- Estimania
- Food for Thought and Food for Energy
- Grab a Gram
- How Do You Spell Science
- Leaf and Tree Finder
- Magnets
- Mystery Architecture
- No Bones About It
- Paper Rockets
- Pentathlon
- Reflection Relay
- Rubber Band Catapult
- Straw Egg Drop

A IS FOR ANATOMY

Description:

This event will consist of a written test in which the contestants will view models, slides, and pictures to identify organs from the following human body systems. Both structure and function will be tested in a series of written questions.

1. Skeletal
2. Muscular
3. Digestive
4. Respiratory
5. Circulatory
6. Urinary
7. Nervous
8. Sensory
9. Endocrine

Number of Participants: 2

Approximate Time: 30 minutes

The Competition:

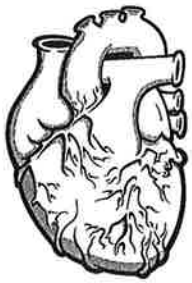
Every team will be given an answer sheet. Team members may consult with each other by writing (no talking). Only one answer for each question will be accepted. Team members will move through 20 stations answering approximately 40 questions. Questions will be at the stations or in a test booklet.

Scoring:

At the end of the testing period, the questions and answer sheet will be collected from those teams who have not turned in their responses. Time is not a factor in scoring. Correct spelling will be used as a tiebreaker.

Resources:

Fourth, Fifth and Sixth Grade Science and Health Books



CAN RACE

Description:

A team of two students will race a can against other teams in a drag race format.

Number of Participants: 2

Approximate Time: 20 minutes

The Competition:

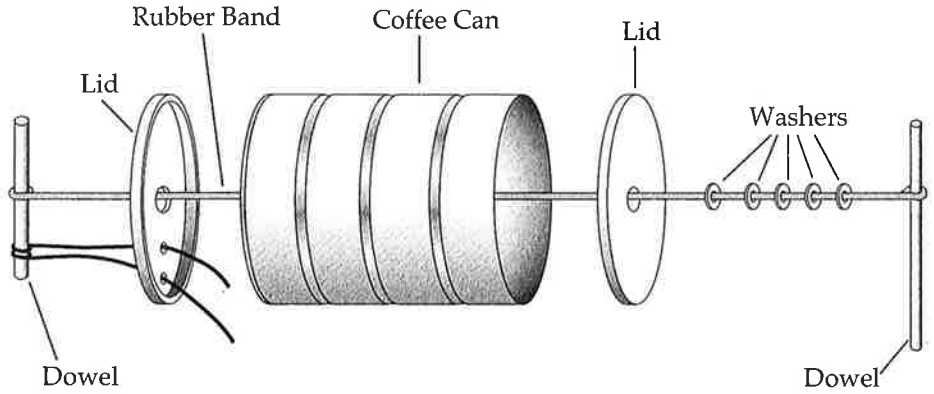
1. Students will make and bring to the contest one can racer for each team of two students.

2. The racers will be run on a course approximately three meters in length and thirty centimeters in width. The racing surface could be a gym floor, hallway, concrete or close nap carpet. Lane control will be provided by boards or other barriers along the outer edges of each lane.

3. Any can (small or large size) may be used. Racer surfaces may not be modified by addition of any substance.

4. Lollipop, Popsicle or other similar sticks may be used as the running arm. Tape and washers may be used.

5. Racers will be released by contestants without any assisting push and must not be touched by anyone until they cross the finish line. Racers stuck against lane barriers will have their "run length" measured at that point. Those jumping off of the course will be ranked after those that stay on the course.



CAN RACE CONTINUED

To Make Racer:

1. Drill holes in the precise center of the can bottom and plastic lid(s). The holes must be large enough so the rubber band will thread through them easily, and be sure the edge of the hole in the can lid is smooth so it won't cut the rubber.

2. Put the lid(s) on the can and thread the large rubber band through the hole so that the loops protrude from both ends of the can.

3. Push the shorter wooden dowel or stick through the loop of rubber band protruding from the can bottom.

4. Punch two small holes in the can bottom on either side of the stick, and tie the stick securely to the can bottom with twine, wire, or a twist tie.

5. Thread the other loop of the rubber band through the holes in several washers. (There must be sufficient number of washers to keep the longer stick, which is added in step 6, from rubbing against the edge of the can. Later, if appropriate, you can increase or decrease the number of washers.)

6. Finally, place the longer wooden dowel or stick through the loop with the washers so that one end sticks out beyond the side of the can.

7. Wind up the rubber band and release the racer.

Scoring:

1. Total distance and elapsed running time of each racer will be recorded.

2. Cans will be ranked by distance. The winner will be chosen on the basis of the greatest distance traveled.

3. In case of a tie, the shortest elapsed time will determine the winner.

CATEGORIES

Description:

The game consists of three rounds. Each team begins the round with a blank playcard on which they write their names and round number.

Number of Participants: 3

Approximate Time: 30 minutes

The Competition:

1. DRAWING CARDS. A total of six category cards are drawn from the deck by the teacher.

2. ANNOUNCING SUBJECT MATTER. From the card, the teacher selects and announces the category subject matter. As each selection is announced, all players write them in the six category blanks on their playcard. The six used cards are then set aside.

3. DRAWING LETTER TILES. The teacher draws a total of six letter tiles. Each is announced. All players write them in the Initial Letter column of their playcard. If a wild letter tile (*) is drawn, it is marked accordingly on the playcard.

4. MAKING ENTRIES. After the timer is set, each team of three players attempts to enter a word or phrase in each of the 36 blanks on their playcard. Each entry must agree with or fit the category at the top of that column and its "Key Word" must begin with the letter at the left of the row in which it is written. A specific entry may be written only once on the playcard even though it may be valid in another blank. Teams may converse quietly. Loud discussions will give away good answers to competitors!

   KEY WORDS. Generally, the "Key Word" in an entry is the first word. However, if the first word or title prefix of an entry is part of the category, the next main word is to be regarded as the Key Word (e.g., River Seine would be under S, Sir Walton would be under W and giant Panda would be under P). A person's last or surname must always be regarded as the Key Word. The articles "a", "an" and "the" are never Key Words. Common surnames given only will be disallowed as guesses unless accompanied by appropriate first names.

   Key Words in a row with a wild initial letter (*) may begin with any letter of the alphabet but need not begin with the same letter (see example below). When time is up, each player must stop writing immediately and pass his playcard to the judge. The judge will validate responses at a later time.

5. This process is repeated three times with different categories. The initial letters, however, may be the same.

6. Categories should be chosen by the teacher that reflects subject matter discussed during the school year.

7. An example chart is shown below. If only a common surname is given it will be disallowed as a guess unless accompanied by an appropriate first name.

Categories	Mammals	Trees	U.S.Rivers	Insects	Units of Measure	Scientists	Body Parts
A	apes	aspen	Allegheny	ant	amperes		artery
M	man	mangrove	Missouri	moth	meter	Mendel	muscle
F	fox	fir		fish fly		Fermi	finger
*	cat	oak	Mississippi	beetle	liter	Einstein	liver
D	dog	dogwood	Detroit	dragon fly	decigram	David Smith**	
*	horse		Snake	spider**		Watt	heart

* = Free letter
** = Incorrect Answer

Scoring:

One point will be given for each correct answer.

NOTE: In the example the student will not get credit for blank spaces and a spider is not an insect and David Smith violates rule, direction or first name beginning with a D is incorrect. We need a scientist whose last name begins with a D such as Dirac or Humphrey Davey!

CLAY BOATS

Description:

Students will construct a clay boat from a wad of clay with a total mass of 25 grams. Students will then float their clay boat in a tub of water. Plastic centimeter cubes (mass of 1 gram each or other objects of uniform weight) will be loaded in the hull of the clay boat one at a time until the boat sinks.

Number of Participants: 2

Approximate Time: 30 minutes

The Competition:

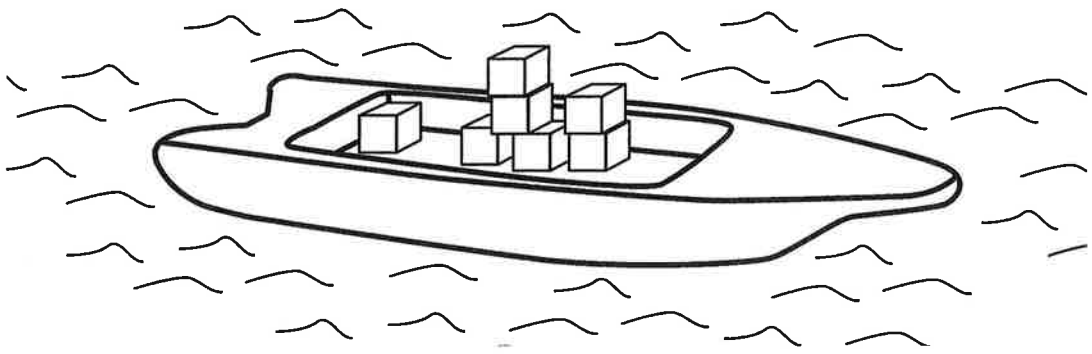
1. Clay boats must be built on site with the clay provided by the Science Olympiad officials. Each team will be given the same amount (25 grams) of unused and unworked Plasticine clay.

2. Participants may not practice filling the boat during the 10-minute building period. Teams will be timed during this period for purposes of tiebreakers. All boats must have a dry start. The plastic cubes or other objects must be dried between testing trials. All students will be given dry objects to load.

3. During the test period, team members will load their own clay boats. Loading some objects before floating the boat will be allowed; but if it sinks when launched, the team will receive a score of zero. All objects loaded after launching will be added one at a time with officials counting the objects as they are loaded. All boats must be loaded within the 10-minute test period.

Scoring:

The number of objects on board the clay boat as the boat sinks is the team's score. The highest score wins. In case of a tie, shortest elapsed time during the construction period will determine the final score.

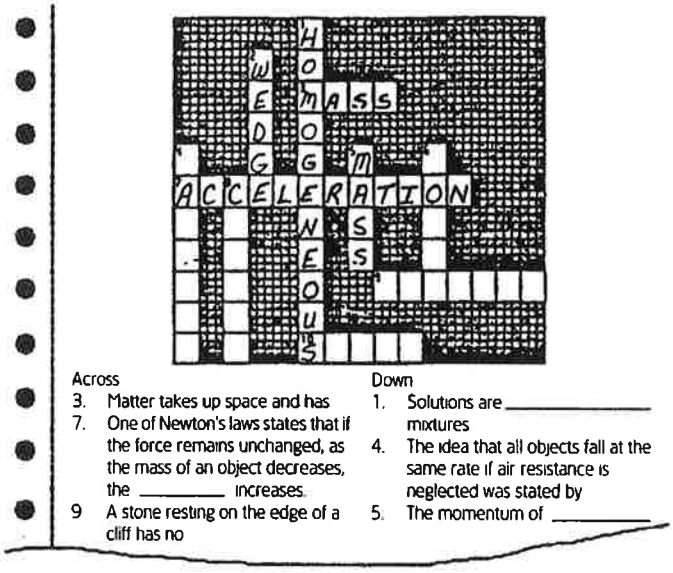


CROSSWORD SCIENCE

Description:

The purpose of this event is to test the student's knowledge of scientific terminology. Definitions of science vocabulary words will be presented to students in a crossword puzzle format as illustrated below.

Note: In this example there are fill-in-the-blank type questions. At the Science Olympiad the students will be given only definitions in the ACROSS and DOWN sections of the crossword.



Number of Participants: 2

Approximate Time: 30 minutes

The Competition:

1. Students will work in teams of two to complete a crossword puzzle of science vocabulary. Definitions of science words will be given in numbered columns marked **Across** and **Down**. (See illustration.) Students will cooperate to complete the crossword puzzle. Talking in quiet voices will be allowed.

2. Students will be timed. The start time and end time will be recorded on their answer sheet.

3. All words placed in the crossword puzzle will be taken from Elementary science textbooks.

4. Between 30 to 50 words will be placed in the crossword puzzle.

Scoring:

1. One point will be scored for each correct word placed in the puzzle.

2. The most points earned in the shortest time will determine the winners.

DEEP BLUE SEA

Description:

This event will test students' knowledge about oceanography.

Number of Participants: 2

Approximate Time: 20 minutes

The Competition:

On Part I the contestants will view pictures and/or slides and answer questions relating to identifying members of the following areas:

- Ocean flora (algae, kelp, etc.)
- Ocean fauna (mammals, mollusks, etc.)
- Ocean vessels and equipment used in exploring (diving bells, submersibles, diving gear, etc.)

On Part II the contestants will respond to a series of questions relating to the following topics:

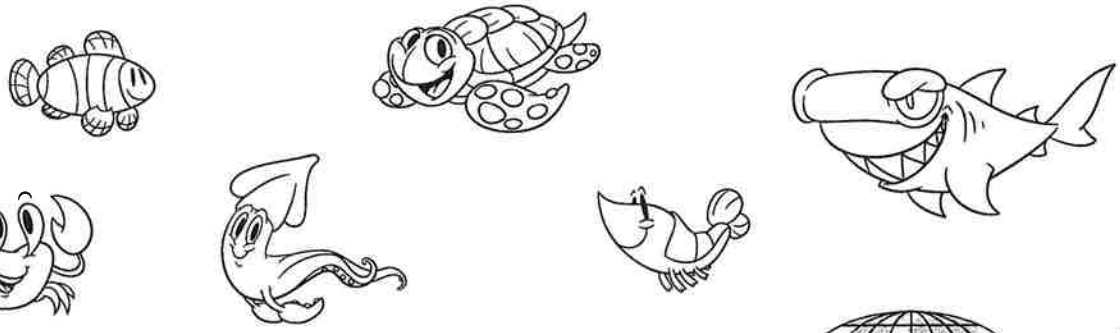
- Physical features (trenches, seamounts, etc.)
- Phenomena (tidal waves, currents, etc.)
- Geography (location and identification of oceans, seas, major bays, etc.)
- Vocabulary (relating to any of the above topics)

1. Each team will be given one test packet and one answer sheet. Team members may consult with each other by writing or whispering. Only one answer for each question will be accepted.

2. At the end of the testing period the test packet and answer sheets will be collected from those teams who have not turned in their responses.

Scoring:

The team earning the highest score will be declared the winner. Two tiebreaker questions will be included.



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DISEASE DETECTIVES

Description:

Epidemiology uses science to study disease, injury, health, and disability in communities. This study involves: reasoning skills, such as those used by "disease detectives;" comparison of risks (the chances of becoming sick or injured); and surveys to help describe different groups of people (for example, kids in school classes and people in neighborhoods). The goal of the Disease Detectives event is to have students understand connections between things they may encounter in daily life and various health problems that affect communities, risks for disease/injury, and opportunities for prevention. The event will also help students to understand general categories of causes of diseases and injuries.

Number of Participants: 1 or 2

Approximate Time: 50 minutes

The Competition:

1. The contestant or team (if 2) will move to different stations. Each station has an object, which may present a risk or prevention opportunity for disease or injury.
2. At each station, participants will perform various activities, such as:
    a. identifying and writing the disease or injury problem related to the object at the station.
    b. describing how the object might be used or modified to prevent the disease or injury problem in populations.
    c. identifying and describing routes of transmission of disease
    d. using simple calculations (e.g. addition and subtraction) to make comparisons or risk for different groups of people.
    e. interpreting a table or graph presenting data related to diseases or injuries.

Sample Problems:

Stations might include examples of an improper cooking techniques as a risk factor for food-borne infectious disease, a bicycle helmet as a preventive measure for injury, fatty foods as a risk for heart disease, a tobacco product as a risk factor for lung cancer, or a bar of hand soap representing effective prevention of person-to-person spread of infectious disease. The last station might include data for students who visit the zoo on a field trip: of 25 students who visited, 12 petted the lizard; of these, 8 became ill. Of the 13 students who did not pet the lizard, only one became ill. How would you present the risk of illness from petting the lizard? Students might compute risks (e.g. 8/12 vs. 1/13) or draw graphs to illustrate the comparison of risk.

Scoring:

Responses for each station with a commonly found item could include identification of the possible risk of use or exposure to the item and a possible means for prevention. Each identification station is worth 2 points (1 point for identification of the health problem, 1 point for description prevention). The final data station is worth 2 points (1 point for an appropriate risk comparison, 1 point for an appropriate written explanation).

ESTIMANIA

Description:

Students will be asked to estimate the answers to approximately ten questions requiring an estimate between ten and one million.

Number of Participants: 2

Approximate Time: 30 minutes

The Competition:

1. The questions will follow the following format:

   Sample Questions:

   a. How many pennies in the jar?

   b. How many two-centimeter paper clips could be laid end to end across a standard football playing field?

2. Calculators will be allowed.

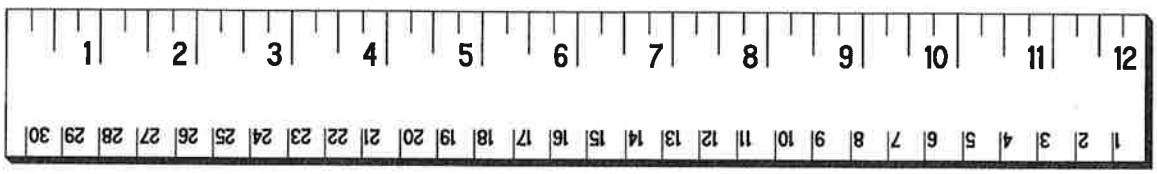
3. Students should bring a variety of equipment to help them with their estimations (rulers, cups of various sizes, spoons, etc.)

Scoring:

Points will be awarded on the following scale:

0 - 10% away from answer = 5 points
11-20% away from answer = 4 points
21-30% away from answer = 3 points
31-40% away from answer = 2 points

The team with the most points wins. In case of ties, the least amount of time needed to estimate the 10 problems will determine the winner.



FOOD FOR THOUGHT AND FOR ENERGY

Description:

This event is designed to determine a student's knowledge of the basic food groups, the food pyramid, and the three basic food types - carbohydrates, proteins and fats; their function in the body; the additives added to enhance the nutritional content of food, to prevent food from spoiling, to improve color or flavor, or to change physical characteristics; and diet analysis.

Number of Participants: 2

Approximate Time: 60 minutes

The Competition:

Part I

The contestants will move to 5 different stations and perform various activities such as:

1. Examination of labels of processed foods to determine Kilocalories.
2. Examination of packaging and label reading basics.
3. Identification of a food given the ingredients on the label.
4. Comparison of protein, fats, complex carbohydrates and simple sugar.
5. Understanding of major vitamins and minerals in human nutrition.
6. Shown pictures or specimens of food, state the food group to which each belongs, according to USDA food guide pyramid.
7. Determination of the sugar content of cereals and fast foods (using a graph) or of soft drinks (using a prepared graph and a hydrometer).
8. Diet analysis, as it relates to serving size and food groups.

Part II

The contestants will be given a paper and pencil quiz to determine their knowledge of food groups, nutrients, additives, diet analysis, and nutritional imbalance.

The students should be familiar with the terms - under nourishment, malnourishment, saturated fat, unsaturated fat, plaque, and cholesterol.

Scoring:

Highest score wins. Tiebreaker questions will be asked. Part I = 50%, Part II = 50%

GRAB A GRAM

Description:

Teams will cooperate to pick up fifty (50) grams of two different sets of material. There will be two rounds using different substances (preferably different densities) in each round.

Number of Participants: 2

Approximate Time: 60 minutes

The Competition:

Each team member must pick up some of the given material and place it in the provided container for delivery to the judges for massing. This must occur during both rounds of the competition. The material could be sand, paper clips, cereal, packing peanuts, beans, rice, etc.

Scoring:

1. The total mass of the sample (mass of the substance plus the container) from each team becomes its score if the mass is 50 or under. Samples will be massed to the nearest tenth of a gram. Those samples over fifty grams will have that amount over 50 subtracted from 50. The lowest possible score per round is "0", so if a team is more than 50+, they will not have a minus score.

2. The two team scores will be combined to determine a winner. A perfect score at the end of two rounds would be 100.

3. In the unlikely event of a tie, the team with the best single score could be declared winner.

Sample Scores:

Masses between 1-50 equal that number (e.g., 37 = 37)
Masses over 50 are subtracted from 50, so 62 = 38 (50-12)
Masses over 100 = 0 (as 102 is 52 over 50, which would equal -2, except a negative score is not allowed).

HOW DO YOU SPELL SCIENCE?

Description:

Students will be asked to spell words from the earth, life, and physical sciences and give a definition of the word spelled.

Number of Participants: 2

Approximate Time: 30-60 minutes

The Competition:

1. Words common to K-6 science books will be selected.

2. All teams will compete during one time period.

3. Words will be presented to each team in order selected by random draw of numbers by one team member.

4. The team must:
   a. Correctly spell the word (first half of time period); and
   b. Tell what the word means (in addition to spelling for teams remaining in second half of time period).

5. Judges will determine if the criteria has been met.

6. Team members may confer with one another when spelling their word. All other teams must remain silent. Teams interfering or talking aloud during spelling by another team will be disqualified.

Scoring:

1. Points will be awarded by the order of elimination. The last team standing shall be the winner provided that team correctly spells and defines its last word.

2. A team cannot be declared a winner by elimination alone. In the event that the final team cannot complete its last word, then there shall be a spell-off between the top two teams.

LEAF AND TREE FINDER

Description:

Two participants will be asked to identify various trees by using an identification key and leaf and tree part samples. Students may bring charts, keys, resource books etc., into the competition.

Number of Participants: 2

Approximate Time: 20 minutes

The Competition:

Each participant will be given a packet, or move through stations, that will include objects from trees and several guide sheets to use in the identification of trees. An answer sheet will be given and the student will be asked to identify the trees and answer questions about them.

Scoring:

Students will earn points for correctly answered questions. Tiebreaker questions will be asked. Points will be deducted for misspelled tree names.

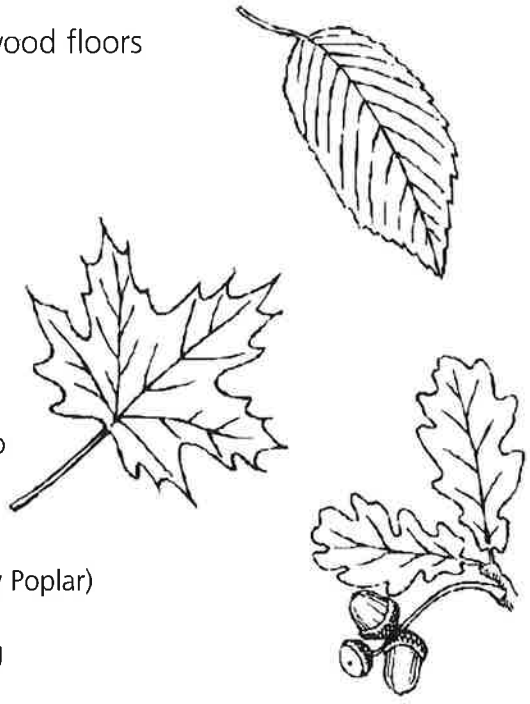
Sample Questions:

1. Show a picture (or have a real leaf and acorn) ask what tree it came from:
   A) Ash B) Apple C) Oak

2. A common use of the wood from this tree is:
   A) salad bowls B) two by fours C) wood floors

Sample tree list:

Ash, Black
Ash, White
Aspen, (Largetooth, Bigtooth)
Aspen, Quaking
Basswood
Beech, American
Birch, Paper
Boxelder
Cedar, Northern White (Arborvitae)
Cherry Black
Gingko
Hickory, Shagbark
Honeylocust
Hop-Hornbeam
Locust, Black
Maple, Red
Maple, Silver
Maple, Sugar
Mulberry, Red
Oak, Red
Oak, White
Pine, Scotch
Pine, White
Poplar, White
Sassafras
Spruce, Colorado Blue Spruce
Sycamore
Tamarack
Tuliptree, (Yellow Poplar)
Walnut, Black
Willow, Weeping
Witch-Hazel



MAGNETS

Description:

Each student will identify what objects a magnet will attract and identify materials through which a magnet can attract.

Number of Participants: 2

Approximate Time: 20 minutes

The Competition:

1. Give student a collection of various objects -- a nail, a pin, an eraser, a penny, a crayon, a paper clip, etc.

2. Ask each child to separate objects into two categories -- predict which object will be attracted to and will not be attracted to a magnet.

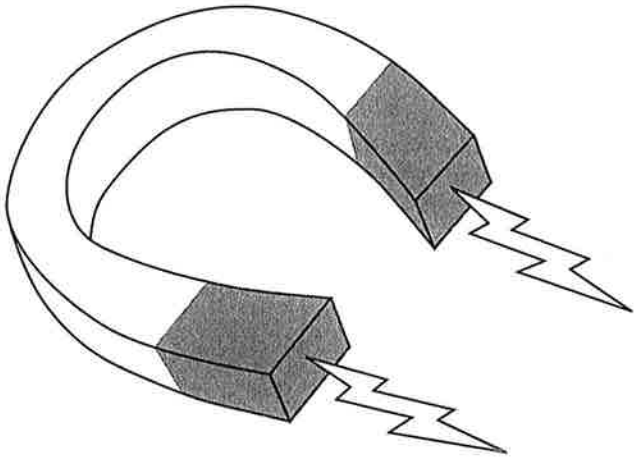
3. Give each child a magnet to test their predictions to determine which objects were attracted to the magnet. This step should be completed under judge's supervision to verify matches.

4. Show students a piece of paper, a magnet and a paper clip. Ask, "Will the magnet attract the paper clip through this paper?"

5. Repeat procedure asking students to predict and test attraction using magnet and a piece of wood, a magnet and a piece of plastic, a magnet and a glass of water, etc.

Scoring:

The greatest number of correctly predicted objects will determine the winners.



MYSTERY ARCHITECTURE

Description:

This event is designed to test the student's ability to think on their feet. They will be given a bag of materials to build a freestanding tower as high as they can. The tower should be constructed to support a tennis ball at its top.

Number of Participants: 2

Approximate Time: 30 minutes

The Competition:

1. Each team of two students will be given a bag of building materials. All teams will receive exactly the same materials. The materials might include: paper cups, drinking straws, paper clips, tape, string, paper, etc. (This list is only an example; the actual materials may be anything that the supervisors feel are appropriate).
2. Each team will have a maximum time of 20 minutes to construct a tower to support the tennis ball at its highest point. The top of the tennis ball must be higher than any part of the structure.
3. Only those materials supplied in the bag, and the bag itself, may be used to construct the tower. No other materials or adhesives may be part of the finished tower. Students may bring scissors, a ruler and a pair of pliers, which they will provide, to use as tools while building the tower. Each team may bring their own tennis ball to use while building their tower, however, all towers will be measured using the same tennis ball (regulation size and weight) provided by the event supervisor.
4. The students are to inform the judges when they finish their tower. They will place the tennis ball provided by the event supervisor on the top of their tower. The tower must remain standing long enough for the height and base to be measured.
5. The tower must be completely free standing. It cannot be attached to the tabletop, floor, wall or ceiling.
6. No coaching of the students will be allowed during the competition.

Remember, we are assessing the student's ability to think on their feet.

Scoring:

1. The height of the tower and the width of its base will be measured as precisely as possible by the judges. Since no building materials are to extend above it, the top of the tennis ball will be considered the highest point of the tower. The width of the tower will be measured at its base. The largest diameter of the base will be recorded.
2. All towers that support the tennis ball will be ranked above those that do not. The towers in each of these groups will be ranked according to their height. Tallest tower first, the shortest tower last.
3. In the event of a tie, the winner will be the tower with the smallest base measurement.

Note: supervisors should determine the acceptable measurement with the same equipment that is available to students.

NO BONES ABOUT IT

Description:

A team of two (2) students will identify bones and pictures of bones at stations throughout the room. They will also be required to answer questions found on cards at the stations pertaining to bones. Only the SCIENTIFIC NAMES of the bones will be accepted as correct!

Number of Participants: 2

Approximate Time: 30 minutes

The Competition:

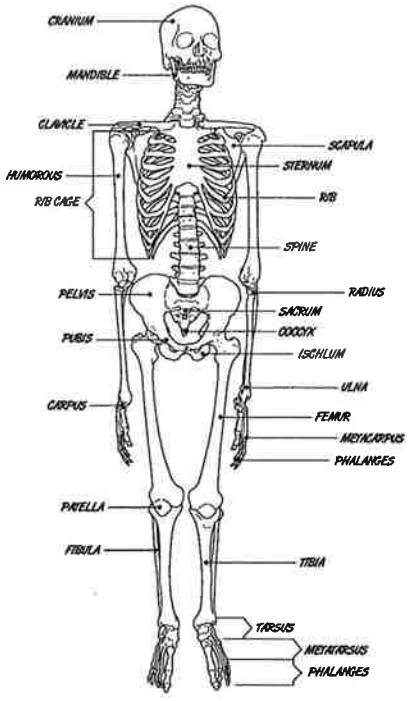
Stations will be set up in the room with provided bones and pictures of bones (HUMAN AND ANIMAL). The two participants will move from station to station with all the other teams only on the direct command of the testing official. (There will be 30 seconds at each station.) The team will be asked to record answers to the questions found at various stations on the provided answer sheet. Questions will relate to the identity of the bones or picture of the bones and also MAY include questions on orientation, articulation, number of this type in the human body, function, type of joint, range of motion, etc.

Scoring:

There will be 25 stations, with 2 questions per station. Each question will be worth 2 points, for a total of 100 points. The team with the highest point total will be the winner. In case of a tie the team with the answers spelled correctly will place ABOVE the team with the incorrect spelling.

SAMPLE QUESTIONS: (Answer in CAPS)

1. A. Identify this bone:
   TIBIA
   B. Location of this bone:
   RIGHT LOWER LEG
2. A. Identify this bone:
   MANDIBLE
   B. Function of this bone:
   ITS MOVEMENT, CHEWS & GRINDS FOOD
3. A. Identify this bone:
   SCAPULA
   B. How many of these bones are in the human body?
   TWO
4. A. Name the bone that is colored in red on this picture
   HUMERUS
   B. How tall would you estimate this animal is?
   20-40 CM
5. A. Is this skull an example of a predator or a prey?
   IF EYES ARE FACING FORWARD=PREDATOR



PAPER ROCKETS

Description:

Each team will build and fly a paper rocket using materials, which will be provided.

Number of Participants: 2

Approximate Time: 45 minutes

The Competition:

The team will have 20 minutes to build a rocket and practice launching it. This will be followed by the official launching. The winner will be the team closest to the target. The following materials will be provided:

- Large plastic soda straws (the kind used in fast food restaurants). One per student.
- Sharpened pencils (same size as straws). One per student.
- Paper (8.5 x 11). Two sheets per team.
- Cellophane tape. One roll per team.
- Scissors - one per team.
- A ruler - one per team.

1. Cut a strip of paper about 8.5 inches long and 1 to 2 inches wide.
2. Roll the paper strip around the pencil lengthwise to form a tube. Tape the paper so that the tube slides easily off the pencil but is not too loose.
3. Make several pointed cuts at one end of tube. See Figure A.
4. Slide the sharpened end of the pencil toward the pointed cuts. Fold the points around the sharpened end of the pencil and tape to form the nose cone. DO NOT TAPE THE PAPER TO THE PENCIL. See Figure B.

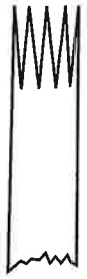


Fig. A

Fig. B

5. Cut out two sets of fins. Use the pattern in Figure C. Fold the fins on the dashed lines in the manner shown in Figure C.
6. Using two pieces of tape, fix the fins to the opposite end of the tube from the nose cone. Insert the pencil for support in taping. See Figure D.

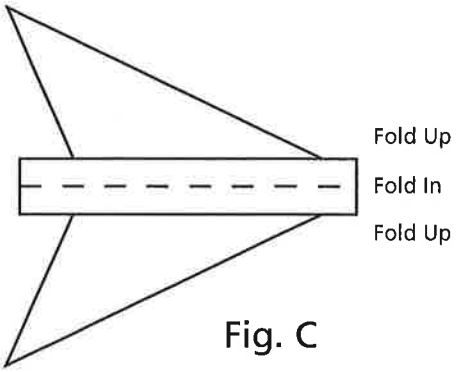
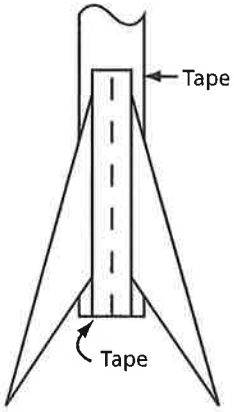


Fig. C



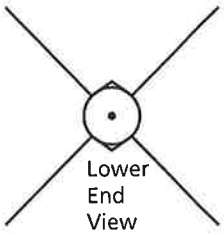


Fig. D

7. Place the rocket over the soda straw. See Figure E.

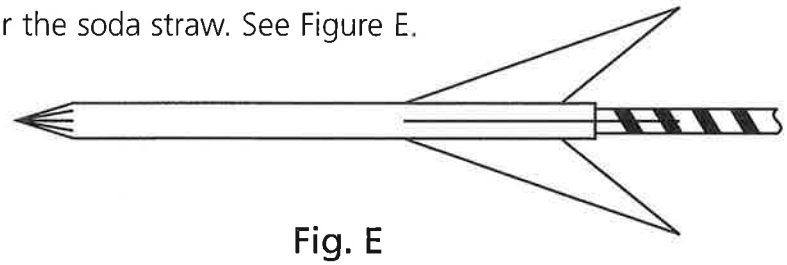


Fig. E

8. During competition students will launch the rocket from one end of the classroom toward a designated target. Each team member will launch the team's rocket one time.
9. Launch the rocket by blowing sharply on the straw. Be sure to aim rockets in the desired direction.

Scoring:

1. After each launch the distance will be measured from the center of the target to the nose of the rocket where it comes to rest. The distance from the target will become the participant's score. The target will be placed 3 to 8 meters from the launching site.
2. Each teammate will fly the rocket once. The score will be determined by measuring the distance in centimeters the rocket is from the target for each launch and adding the two scores.
3. The lowest score will be the winner.

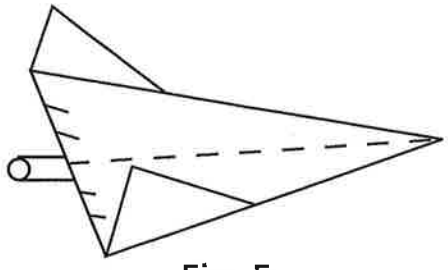


Fig. F

PENTATHLON

Description:

Five physical skills are interspersed with science questions in an obstacle course that will be run in a relay race style where each student passes the balloon to the next student. The team must be balanced with 2 to 3 boys and 2 to 3 girls.

Number of Participants: 4-5

Approximate Time: 20 minutes

The Competition:

1. Appropriate athletic attire is advised (running shoes, etc.). Change of clothing is recommended during inclement weather.

2. The physical activity will include such events as: a dash, crossing a balance beam, dribbling a basketball between a row of safety cones, running through six tires on the ground, a Frisbee throw for accuracy. All of these events must be done while carrying a fragile object (such as a water-filled balloon or a egg) without breaking it.

3. One student will be placed at each position, A-D. Students cannot pass the balloon to the next student until the question is answered. The last student completes station D & E.

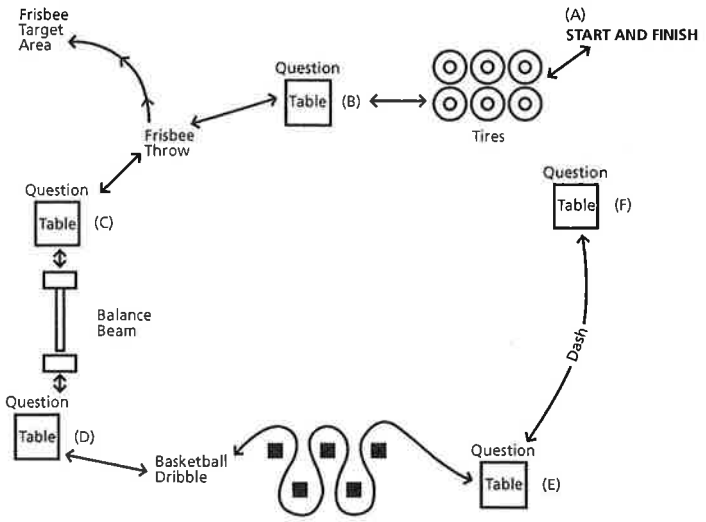
4. General science questions will be asked at tables where students stop very briefly between events. Questions should be answered as rapidly as possible to avoid loss of time.

5. Each physical obstacle and academic question must be completed correctly before proceeding to the next station. Students could be given four Frisbees and moved closer after each miss, and students should be given questions of ever-decreasing levels of difficulty so they could be successful.

Scoring:

1. The total team time to complete the event will be kept by timekeepers.

2. Penalty points are assessed for broken fragile objects (50 seconds added to team time for each broken object).



REFLECTION RELAY

Part I

Description:

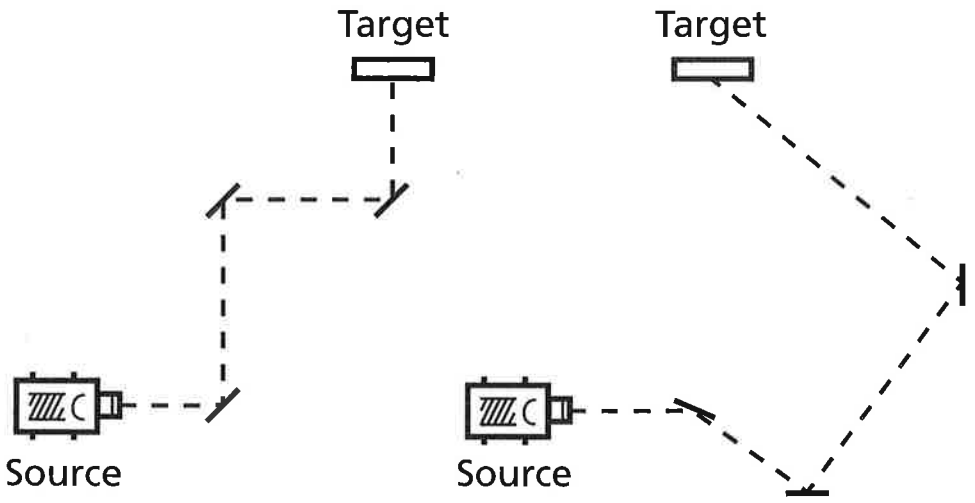
Three team members, each supplied with a pocket mirror, cooperate to bounce a light beam (from a flashlight, laser pointer, etc.) onto a predetermined target.

Number of Participants: 3

Approximate Time: 30 minutes

The Competition:

1. The light must strike each of the three mirrors before hitting the target, and there may be obstacles that the beam of light will have to be directed around (see sample diagram).



2. The three team members must cooperate to direct the beam of light on the target. They must use all three mirrors to change the light's path.

3. Each team will be given up to one minute of preparation time before the clock is started.

Scoring:

1. Each team will be timed. The objective will be to attain the lowest elapsed time in seconds. One point will be added for each second.

2. No team will be allowed to use more than two minutes to accomplish the task. Maximum score will be 120 points.

Part II

Description:

Three team members, each supplied with a mirror on a stand (mirror perpendicular to the floor), cooperate to calculate the placement of their mirrors in order to bounce a light beam onto a predetermined target. During mirror placement the light source is turned off.

The Competition:

1. Students may use a variety of supplies (string, paper, home-made protractors, etc.) brought by the student, to aid them in calculating their mirror placement (no light sources allowed).

2. The three team members must cooperate to calculate the placement of the mirrors while the beam is turned off. They must use all three mirrors to change the light's path and hit the predetermined target. There may be obstacles that the beam of light will have to be directed around (see sample diagram).

3. Each team will be given up to five minutes preparation time before the light source is turned on and the score is determined.

Scoring:

1. Each team will start with a score of 120. The objective will be to reduce this score as low as possible.

2. Once the light source is turned on, the team's score will be reduced by 30 points per mirror that is hit by the light and minus 30 for hitting the target. A perfect score of 0 will be awarded to any team that uses all three mirrors to bounce the beam of light and hit the target.

3. Scores from PART I and PART II will be totaled. Lowest total score wins.

4. In case of a tie, the team with the shortest preparation time for both parts combined will be declared the winner.

5. Scores may range from 1-240.

RUBBER BAND CATAPULT

Description:

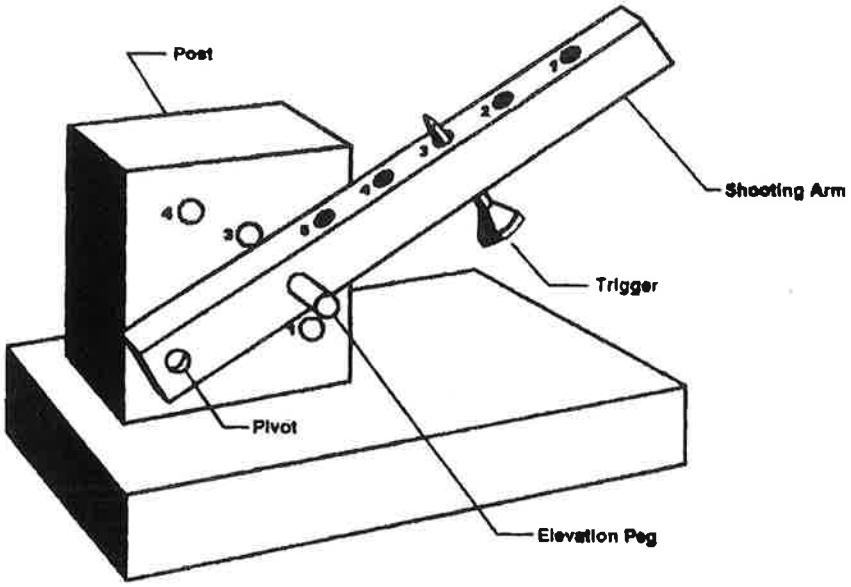
A team of two (2) students will design and construct a catapult device to shoot a rubber band at a target that is placed within a given range.

Number of Participants: 2

Approximate Time: 20 minutes

The Competition:

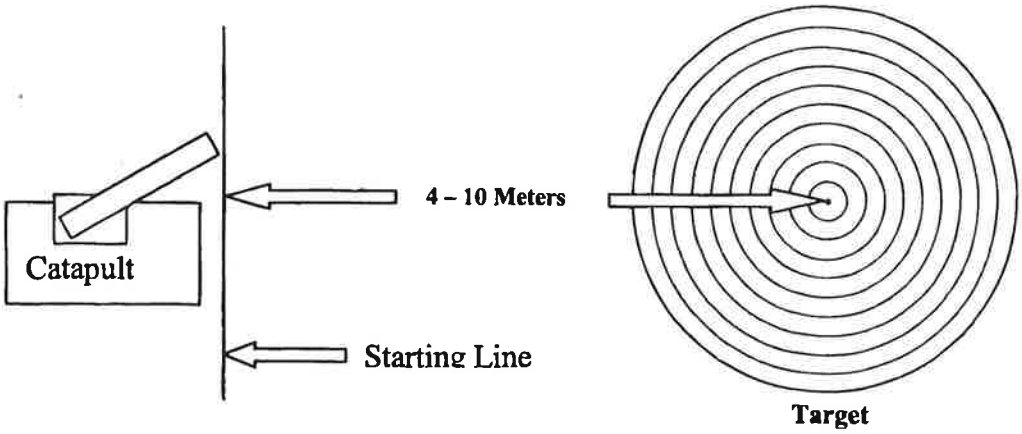
1. Students are to design, construct and bring to the tournament a catapult device similar to (but not limited to) the sample below.



2. Catapults are NOT limited to the above design and may be of any size and any material, with as few or as many shooting positions as needed to hit a target.

3. Evidence should be collected and presented on a data table which includes the base positions, shooting arm positions, and the distances traveled

4. The target consists of three to twenty concentric rings with a dot at their center. The smallest ring is approximately 8cm in diameter with approximately 5cm between rings. The center dot is approximately 2cm in diameter. The center of the target will be located between four (4) and (10) meters from the starting line.



5. No part of the catapult may extend beyond the starting line.

6. Contestants will shoot three (3) different rubber bands.

7. Rubber band maximum size limit: 22 cm. (length, not circumference) measured with the rubber band suspended freely, under only its own weight, from a nail or similar object. Rubber bands may not be knotted, linked together or attached to any other material.

Scoring:

1. The score for each shot will be determined by the smallest ring (highest number) any part of a rubber band is touching or inside of when it comes to rest. The smallest ring is worth twenty (20) points, with each successively larger ring worth 1 less point.

2. In addition to the 20 points for the smallest ring, an "X" will be awarded for all shots where any part of the rubber band is touching or within the center dot.

3. The final score will be equal to the sum of the numerical scores for all three shots.

4. The greatest number of points determines the winner.

5. Ties will be broken in favor of the team with: first, the most Xs; second, the most twenties (20), continuing with nineteen's (19) thru ones (1). Any remaining ties will be broken in the same manner comparing each shot, 1st thru 3rd, in order.

6. If ties still exist, the team with the best-prepared data table will win.

Turn in catapult, marked with team name and number, prior to the start of the tournament.

STRAW EGG DROP

Description:

Each pair of students will make a device of straws and masking tape, supplied on-site by the event supervisor, to hold a large, raw egg. The device containing the egg will be dropped from a fixed height to a target.

Number of Participants: 2

Approximate Time: 45 minutes

The Competition:

1. Each pair of students will be provided with:

a. 20 plastic non-flexible straws
b. one meter of one inch masking tape
c. scissors
d. one raw egg

2. Students will have 20 minutes to construct a device to cushion the egg and prevent it from cracking or breaking. They will have 10 minutes to drop the device from a height of 2 - 3 meters onto a target. No tape may be attached to the egg.

3. There will be ONE drop per team from the prescribed height.

4. Plumb lines will NOT be allowed during the competition.

Scoring:

1. Teams whose egg is unbroken after the drop will be ranked ahead of all teams whose egg is broken.

2. Teams whose egg is broken during the drop will be ranked after all teams whose egg is unbroken.

3. Teams whose egg is broken before the official drop will drop the empty container and be ranked after all teams whose egg is broken during the drop.

4. Teams in each of the three groups above will be ranked by the distance measured from the center of the bulls-eye to the farthest edge of the container or the farthest edge of any parts thrown from the container (not the egg).

5. The winning team will be the team whose egg does not crack or break AND is the closest to the target. In the event of a tie, construction time for building the containers will be the deciding factor.