Exploring Biotechnology – Middle Grades CDE

Purpose

The Middle Grades Exploring Biotechnology CDE is designed to test middle grades FFA members' knowledge of biotechnology tools, processes, and practices. Members are tested on their ability to identify biotechnology tools, performance on a written test, and their ability to perform a lab practicum as a team.

Sponsor

The North Carolina FFA Foundation currently sponsors this event.

State Event Superintendent

The superintendent for this is Dr. Jason Davis, State FFA Coordinator, Department of Agricultural and Extension Education, NCSU, Campus Box 7654, Raleigh, NC 27695-7654. Phone: 919.515.4206
Fax: 919.513.3201
Email: jason_davis@ncsu.edu

Eligibility

This event is open to all Middle Grades FFA chapters (6th – 8th grade) and Middle Grades FFA members in good standing. Members winning a previous state event in this area are ineligible.

Teams shall consist of three or four members. Four scores will count towards the team total (A three-member team will earn a zero for the 4th score). No alternates are allowed in state events. Any alternate found participating in a state event will result in team disqualification.

The use or possession of cellular phones, Personal Digital Assistants (PDAs) or any other mobile electronic communication device is prohibited during any state-level career development event. Any violation of this rule will result in total disqualification.

Any member found cheating in any state-level career development event will result in total disqualification for that event.

The North Carolina FFA Association, in keeping with the FFA mission and purposes, does not permit the use of tobacco products at any FFA facility or at any FFA activity.

At the North Carolina Middle Grades FFA State Competition, members may participate in only one career development event with the exceptions of Middle Grades Parliamentary Procedure, Middle Grades Prepared Public Speaking and Middle Grades Parliamentary Procedure.

Dress Code

Participants are required to follow the North Carolina FFA Career Development Event Dress Code. A ten percent reduction in the total team score will be taken if a participant violates the dress code. Participants are allowed to wear long pants, an appropriate shirt with a collar or an appropriate high school or FFA t-shirt.

Procedures for Administering the Event

The event coordinator shall be responsible for setting up the event, choosing event officials, and developing materials according to the criteria listed below.

The Tools and Materials Identification Phase (40 points)

1. Twenty (20) tools will be selected from the attached official list.
2. Each tool used in the event shall be identified by a number. Participants may examine tools.
3. Participants will place the identification number of the tool in the space to the left of that tool name on the official list.
4. When two sets of tools are used, they shall include the same tools.
5. No tool will be used more than once in the identification portion of the event.
6. Each participant will be assigned a tool to begin identification.

7. Each participant will remain at each tool for one minute and then progress to the next tool. 20 minutes total will be given for the identification round.
8. No participant will be permitted to return to a tool for a second time.
9. Grading will be done by giving two (2) points for each tool correctly identified.
10. If it is observed that a participant uses the same number on his or her paper for more than one identification, neither number will be counted as correct thus resulting in a penalty for using the same number twice.
11. When teachers are involved in the grading of papers, they shall not grade any papers of their own team members.

The Tools and Materials Knowledge Test Phase (40 points)

1. A written (matching) test designed to test the knowledge of the participants regarding the proper use(s) of 20 randomly selected tools will be developed by the coordinator selecting 20 tools and 25 uses from the attached tool identification listing.
2. Participants will place the letter of the correct use in the space to the left of each tool.
3. Each participant will be given 20 minutes to complete the test. Two (2) points will be given for each tool with the correct use.
4. When teachers are involved in the grading of papers, they shall not grade papers of their own team members.

Lab Practicum (40 points)

1. Students will be evaluated on completing activities at a liquid measuring station and a weighing station.
2. Students will be given ten (10) minutes at each station, 20 minutes total to complete.
3. Students will be evaluated on using proper safety techniques, accuracy, and following instructions.
4. Grading will be done by giving twenty (20) points for each station.
5. Teams will not be permitted to return to a previous station.
6. All activities at each station will be completed as a team.
7. Equipment and supplies will be provided at each station. All equipment will require manual measurements.

Scoring

Maximum Score	*120*
Tool Identification	40
Knowledge Test	40
Lab practicum	40

The top three scores of participants from a team will be counted to determine team rankings.
In the case of a team tie, the fourth team member's score will be used to determine team ranking. If the event remains tied co-winners will be awarded.

In the case of an individual tie, the tie will be broken by comparing individual scores in the Tool Knowledge portion of the event. If the individuals remained tied compare the Tool Identification portion. If the scores remain tied co-winners will be awarded

State Awards

The awards for the state event will be presented annually at the conclusion of the NC FFA Middle School CDE Rally to include a team 1st, 2nd and 3rd place plaque.

Bibliography

Exploring Biotechnology Curriculum Guide (latest edition), available on Moodle.

Exploring Biotechnology Tools and Materials Identification List

Instructions: Tools/Materials will be numbered 1-20. The contestant is to write appropriate number in the space to the left of the tool/material.

Contestant Number: _____ Contestant Name: _____

_____ Agar
_____ Apron
_____ Balance
_____ Beaker
_____ Beaker brush
_____ Bunsen Burner
_____ Buret
_____ Centrifuge
_____ Concave microscope slide
_____ Crucible
_____ Disposable boots
_____ Distilled water
_____ Dust mask
_____ Face shield
_____ Fire extinguisher
_____ First aid Kit
_____ Flask
_____ Forceps
_____ Funnel
_____ Graduated cylinder
_____ Grafting tool
_____ Hedge shears
_____ Hot plate
_____ Hot water bath
_____ Implant gun
_____ Incubator
_____ Lab coat
_____ Liter container
_____ Medicine dropper
_____ Microscope cover slip
_____ Monocular Microscope
_____ Mortar
_____ Pestle
_____ Petri dish
_____ pH meter
_____ Pint Container
_____ Pipette Pump
_____ Pipette, Disposal
_____ Planting bar
_____ Pruning shears
_____ Quart container
_____ Respirator
_____ Rubber Gloves
_____ Rubbing alcohol
_____ Ruler
_____ Safety Glasses
_____ Safety Goggles
_____ Scalpel
_____ Soil auger
_____ Soil thermometer
_____ Stain, methylene blue
_____ Stirring rod
_____ Syringe
_____ Test tube
_____ Test tube brush
_____ Test tube rack
_____ Thermometer

Exploring Biotechnology Tools and Materials Career Development Event

Name	Proper Use of Tools, Equipment or Materials
Agar	Gelatinous extractive of a red alga used especially in culture media
Apron	A garment made of cloth, plastic, or other protective materials wrapped around the waist.
Balance	An instrument for weighing
Beaker	A deep wide mouthed thin-walled vessel usually with a lip for pouring that is used especially in science laboratories
Beaker brush	An instrument used to clean the inside of beakers
Bunsen burner	A gas burner consisting typically of a straight tube with small holes at the bottom where air enters and mixes with the gas to produce an intensely hot blue flame
Burette	A graduated glass tube with a small aperture and stopcock for delivering measured quantities of liquid
Centrifuge	A machine used for separating substances of different densities
Concave microscope slide	A cupped device to hold a small specimen
Crucible	A vessel used for melting a substance that requires a high degree of heat
Disposable boots	Safety device used to keep feet and shoes clean
Distilled water	Purified water
Dust mask	Protects the respiratory system from airborne particles
Face shield	A protective device to cover the eyes, nose and mouth
Fire extinguisher	A safety device used to put out fires.
First aid Kit	A collection of materials to treat injury
Flask	A container often somewhat narrowed toward the outlet and often fitted with a closure
Forceps	An instrument for grasping, holding firmly, or exerting traction upon objects especially for delicate operations
Funnel	A utensil that is usually a hollow cone with a tube extending from the smaller end and that is designed to catch and direct a downward flow
Graduated cylinder	A cylinder that has been divided into increments for measuring
Grafting tool	Preparing woody parts for grafting
Hedge shears	Trimming and shaping hedge
Hot plate	A simple portable appliance for heating or for cooking in limited spaces
Hot water bath	A container filled with liquid used to raise the temperature of materials
Implant gun	Injects growth hormone into animals
Incubator	An apparatus with a chamber used to provide controlled environmental conditions especially for the cultivation of microorganisms
Lab coat	A protective garment worn over the clothes

Liter container	Any container that holds 1000 milliliters
Medicine dropper	A short glass tube fitted with a rubber bulb and used to measure liquids by drops
Microscope cover slip	Thin material used to mount specimens
Monocular microscope	An instrument using radiations other than light or using vibrations for making enlarged images of minute objects
Mortar	A strong vessel in which material is pounded or rubbed with a pestle
Pestle	A usually club-shaped implement for pounding or grinding substances in a mortar
Petri dish	Small shallow dish of thin glass or plastic with a loose cover used especially for cultures in bacteriology
pH meter	An instrument used to measure the acidity and alkalinity
Pint container	Any container that holds 16 ounces
Pipette pump	Device used to accurately dispense small amount of fluids
Pipette, disposable	A small piece of apparatus which typically consists of a narrow tube into which fluid is drawn by suction (as for dispensing or measurement) and retained by closing the upper end
Planting bar	Setting out tree seedlings
Pruning shears	Cutting and shaping shrubbery
Quart container	Any container holding 32 ounces
Respirator	A device worn over the mouth or nose for protecting the respiratory tract
Rubber gloves	Protective device used to protect hands and fingers
Rubbing alcohol	A colorless flammable liquid that is used as a solvent
Ruler	A smooth-edged strip (as of wood or metal) that is usually marked off in units (as inches) and is used as a straightedge or for measuring
Safety glasses	To protect the eyes from impact of foreign objects
Safety goggles	To protect eyes from the liquids and vapors
Scalpel	A small straight thin-bladed knife used especially in surgery
Soil auger	Boring into soil to get samples
Soil thermometer	Determining soil temperature
Stain, methylene blue	A standard dye
Stirring rod	Instrument used to mix liquids
Syringe	A device used to inject fluids into or withdraw them from something
Test tube	A plain or lipped tube usually of thin glass closed at one end and used especially in chemistry and biology
Test tube brush	An instrument used to clean the inside of test tubes.
Test tube rack	A device used to hold test tubes
Thermometer	An instrument for determining temperature