

PRODUCE

Revised 6/27/18

PURPOSE

To stimulate the study of and interest in the science of growing, harvesting, storing, processing, and marketing of fruits, nuts, and vegetables through Agricultural Education curriculum.

OBJECTIVES

- To develop an understanding of the economic importance of the horticulture industry in the United States.
- Help develop an awareness of job opportunities for students who may be interested in careers in Olericulture and Pomology.
- Introduces quality standards and conditions for produce.
- Develops critical thinking skills and analytical skills through identification and judging quality of fruits and vegetables.
- Develop an understanding of cultural growing requirements for individual products and practices.
- Develop consumer awareness in purchasing produce.

COMMON CORE REFERENCES

7-8th Grade

MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*

9-10th Grade

CCSS.ELA-Literacy.RST.9-10.9 Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

11-12th Grade

CCSS.ELA-Literacy.SL.11-12.1d Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

EVENT FORMAT

A. Classes

There will be six classes of vegetables, fruits and nuts. Each class will have four plates of the vegetable, fruit or nut to be placed on quality and condition. The varieties to be judged will be selected from the identification list. One class will be designated as the oral reasons class by contest officials. Notes may not be used during oral reason presentations at State. Hand written notes may be used during oral reasons at invitational contests only.

NOTE: Samples will not be handled or touched.

B. Math Assessment and Solution

There will be 15 math assessment and solution questions. Each question will be worth 10 points. Suggested materials are not limited.

All About Vegetables West Edition

May be purchased at bookstores, a local nursery, or wherever Ortho Products are sold.

NMSU Circular # 483 - *Growing Grapes in New Mexico*

NMSU Circular # 461 - *Growing Pecans in New Mexico*

Sunset Western Garden Book, Latest Edition

Available at most bookstores.

NMSU Circular #457 Home Vegetable Gardening in New Mexico

http://aces.nmsu.edu/pubs/_circulars/CR457/

Delmar publishers "Mathematical applications in Agriculture"

http://www.delmarlearning.com/browse_product_detail.aspx?catID=12346&ISBN=140183549X

NCCER Applied Construction Math (A Novel Approach)

Garden Math

<http://gardenmath.blogspot.com/>

Garden Math Useful Equivalents

<http://pss.uvm.edu/pss123/equivtab.htm>

C. Identification

The identification test will consist of two sets of 30 specimens from the identification list. Only marketable specimens will be used in the identification test. An identification sheet without variety names will be provided for each contestant. ID answers are to be placed on Form 14. Invitationals can do 1 of 30.

TEAMS

One team may enter per school. Each team will pay entry fees and all teams and individuals are eligible for awards.

TEAM MEMBERS

There may be four members to a team with the three highest individual total scores making the total for the team.

EVENT SECTIONS AND POINTS POSSIBLE

Oral Reasons	50 points
Math Assessment	150 points
Identification	600 points
Judging	300 points
<i>Total</i>	1100 points

Horticulture Produce Identification List

Vegetables and Herbs

1 Alfalfa Sprouts	53 Muskmelon (Cantaloupe)
2 Anise	54 Nopales (cactus)
3 Artichoke (Globe)	55 Okra
4 Asparagus	56 Onion (any color)
5 Basil	57 Oregano
6 Bay Leaf	58 Parsley
7 Bean (Black)	59 Parsnip
8 Bean (Kidney)	60 Peas (Green)
9 Bean (Lima)	61 Pepper (Floral Gem)
10 Bean (Navy)	62 Pepper (Habenero)
11 Bean (Pinto)	63 Pepper (Jalepeno)
12 Bean (Red)	64 Pepper (Long Green Chile)
13 Bean (Snap)	65 Pepper (Pimento)
14 Bean Garbanzo	66 Pepper (Poblano)
15 Bean Sprouts	67 Pepper (Serrano)
16 Beet	68 Popcorn
17 Bell Pepper	69 Potato (Finger)
18 Black-eyed Pea	70 Potato (Purple)
19 Bok Choy	71 Potato (Red)
20 Broccoli	72 Potato (Yukon gold)
21 Broccoli Flower	73 Potatoe(Russett)
22 Brussell Sprouts	74 Pumpkin
23 Cabbage	75 Radicchio
24 Carrot	76 Radish
25 Cauliflower	77 Radish (Daikon)
26 Celeriac	78 Rhubarb
27 Celery	79 Rosemary
28 Chayote	80 Rutabaga
29 Chinese Cabbage	81 Sage
30 Chives	82 Scallions
31 Cilantro	83 Shallots
32 Collards	84 Spinach
33 Cucumber	85 Squash (Acorn)
34 Dill	86 Squash (Butternut)
35 Eggplant	87 Squash (Mexicon Gray Calabicit)
36 Endive (Regular or French)	88 Squash (Spaghetti)
37 Garlic	89 Squash (Yellow Crook-neck)
38 Ginger Root	90 Squash (Zucchini)
39 Honeydew Melon	91 Sugar Cane
40 Horseradish	92 Sweet Corn(Yellow)
41 Jicama	93 Sweet Potato
42 Kale	94 Swiss Chard (any color)
43 Kohlrabi	95 Tarragon
44 Leek	96 Thyme
45 Lettuce (Bibb)	97 Tomatillo
46 Lettuce (Head)	98 Tomato (Cherry)
47 Lettuce (Leaf)	99 Tomato (Grape)
48 Lettuce (Romaine)	100 Tomato (Italian-Roma)
49 Mint	101 Tomato (Salad)
50 Mushroom (Crimini)	102 Tomato (Yellow)
51 Mushroom (Portabella)	103 Turnip
52 Mushroom (White)	104 Yucca Root

Fruits and Nuts

105 Almond
106 Apple (Gala)
107 Apple (Golden Delicious)
108 Apple (Granny Smith)
109 Apple (Red Delicious)
110 Apricot
111 Avocado
112 Banana
113 Blackberry
114 Blueberry
115 Brazil Nut
116 Cashew
117 Cherry (any variety)
118 Chestnut
119 Coconut
120 Craisin
121 Cranberry
122 Date
123 Fig
124 Filbert
125 Grape(any color)
126 Grapefruit
127 Guava
128 Kiwi Fruit
129 Kumquat
130 Lemon
131 Lime
132 Macadamia Nut
133 Mandarin
134 Mango
135 Nectarine
136 Olive (any variety)
137 Orange (Naval)
138 Orange(Blood)
139 Papaya
140 Peach (any variety)
141 Peanut
142 Pear (any variety)
143 Pear(Asian)
144 Pecan
145 Pineapple
146 Pinon Nut
147 Pistachio
148 Plantain
149 Plum (any variety)
150 Pomegranate
151 Prune
152 Pumpkin Seeds
153 Raisin (any color)
154 Raspberry
155 Star Fruit
156 Strawberry
157 Sunflower Seed
158 Tangelo
159 Walnut
160 Watermelon

Sample Horticulture Produce Math Problems

1. Your anticipated Jalapeno yield is 10 tons per acre. Assuming you will have a 2 % harvest/processing loss how many pounds of jalapenos would be marketed from a 3.5 acre farm?
2. Rhubarb crowns are planted at 2.5 feet intervals. How many crowns would you need for one garden row that is 96 feet long?
3. Beets require .21 inches of water per day. How many inches of water would be needed for the month of July?
4. Joe Greenhand harvested 1200 pounds of watermelons for the farmers market. A watermelon is 92 % water. How many pounds of plant product is Joe actually transporting?
5. If there are 3,000 radish seeds to an ounce. How many seeds would be found in one pound?
6. Crucifer crops require pH above 6.8 . You need to raise the pH of your 50 acre field. How many pounds of hydrated lime need to be applied. (application rate is 1500 lbs. per acre)
7. Commercial peas are grown at a rate of 400,000 plants per acre. How many plants could be grown on 4.25 acres?
8. Your 1 acre tomato patch requires 1.5 lbs. of seed. There are 9,000 seeds to the ounce. Assuming a 90 % germination rate, how many plants can you expect.
9. Baby corn will yield 8,000 unhusked pounds per acre. Ninety percent of the weight is husks, silk etc., that will be removed. How many pounds of husked marketable product remain?

PRODUCE JUDGING STANDARDS

Judging is a matter of opinion should be on certain facts and standards. The standards of excellence should be adhered to in judging: it will lower the quality of products at a show or in the market.

In judging fruits and vegetables for show, remember three main parts:

1. Uniformity of size
2. Uniformity of shape
3. Uniformity of color

Size - Choose exhibits that are all the same size; they should be medium in size and not too large. They should be typical for the variety. Size is usually what the public would prefer to buy at the market.

Shape - Choose exhibits having the same shape and being typical for the variety.

Color: The specimens should have the same color or color markings, i.e., peaches with a red blush or the fruit should all have the same blush.

The materials to be judged should be:

1. True to type
2. Of good quality
3. In good condition - free of bruises, cuts, discoloration, etc.
4. At proper stage of maturity for eating
5. An example of cultural perfection
6. Free from pest damage
7. Clean

Special Points to Consider in Selecting and Judging Vegetables:

Beans, green and wax

Merits: Fresh color
Uniform in length coloring and maturity
Good shape for variety - generally straight but some varieties curve on
Pod brittle, not wilted
Fleshy and well filled with pulp from one end to other, but without beans being prominent
Beans one-half mature
Free from defects
Can be shown with or without stems, but should be uniform

Preparation: Leave stems attached to pod

Faults: Tough
Wilted
Pale and discolored
Evidence of insect and disease
Knife marks on the pod

Beets

Merits: Uniform in size, color and shape
Size from one and one-half to three and one-half inches in diameter
Generally dark red with little russetting on crowns
No cracks, new varieties including gold colored beet

Preparation: Cut off tops to approximately one inch

Faults: Color not within uniform, light streaks visible, damaged, cracked, pithy, wilted, too large and tough for eating

Broccoli

Merits: Fresh green color
Right stage of maturity for eating
Flowers tightly budded without yellow showing, crisp
Free from worms and aphids
Stems should be under six inches long

Preparation: A few lower leaves may be trimmed off leaving no stubs

Faults: Small, loosely closed sprouts; yellowish color, wilted

Cabbage

Merits: Heads solid and firm; salad types 5-8 inches in diameter
Kraut types -8 inches in diameter
Tender, crisp good weight for size
Free from insect damage or disease
Type is important as varieties differ in shape
Shape may include: round, flat, pointed, red and savoy

Preparation: Outer leaves should be removed, leaving only the last few that curl at the tips (wrapper leaves)
Cut stem one-fourth inch below lowest leaf

Faults: Poor color, loosely formed, wilted
Disease or insect damage
Incorrect size or shape

Carrots

Merits: Type very important: Short (3-4"); Half Long (5-7"), and Long (8" and
Diameter depending on variety
Smooth, straight
Pale to deep orange, depending on variety; each carrot same size and

Preparation: Cut tops off at approximately one inch

Faults: Off-colored, wilted, rough, cracked, insect damage, crooked or branched

Cauliflower

Merits:	Solid heads, good white color Smooth fine grained texture Crisp
Preparation	Outer leaves trimmed evenly about one to two inches above center of head. Cut stem one-fourth inch below lowest leaf.
Faults:	Wilted Yellow to brown color Rough, grainy texture (ricey)

Cucumbers

(Listed under various classifications): Picking - one to three inches long; Slicing - six to eight inches long; and Gherkins (West India) - small pickling cucumbers that have burr-like fruit two to three inches long, one to one and one-half inches thick. Bright green skin with fleshy prickles.

Merits:	Should be even in size, crisp
Preparation:	Leave one-fourth to one-half inch of stem attached
Faults:	Light in color Not uniform in color and size Over mature Misshapen fruit

Eggplant

Merits:	Symmetrical and true to type 3-5 inches in diameter Firm, mature and uniform in color
Preparation:	Stems trimmed one to one and one-half inches Do not wash, but wipe with a damp cloth
Faults:	Wilted, misshapen Poor color, streaks in color of either green or white bruised spots

Herbs

Merits:	Fresh, uniform Clean leaves and stems
Faults:	Dirty, diseased, insect damage, discolored, shriveled

Kohlrabi

Merits:	One and one-half inches to three inches in size; tender; even color
Preparation:	Trim leaves to about one inch of vegetable; trim off long roots

Faults: Oversized, wilted, hard and pithy

Lettuce (Head)
Merits: Firm, crisp, fresh
Head in good condition

Preparation: Leave most of wrapper leaves in tact
Best to remove few outer leaves after you get to show, as they protect the head
Cut stem or butt with knife leaving one-fourth to one-half inch

Faults: Wilted, dry
Shriveled, loose or bolting heads

Muskmelons or Cantaloupe

Merits: Clean, firm
Free from soft spots, scratches, decay
Netting should be deeply ridged over entire melon
Even, good color
Determine ripeness by the "full slip" - vine should detach clean at attachment to melon

Faults: Over or under ripe
Coarse netting
Poor color, blemishes
Too much yellow indicated over ripeness

Okra

Merits: Uniform in size, shape, color and maturity
Typical of variety
Pods should be harvested when half grown, two to four inches long

Preparation: Trim stems one-half to one inch

Faults: Pods woody and fibrous

Onion

Merits: **Green Onions** - one-half to one inch in diameter, showing no bulge
Clear white color, dark green tops
About six inches long, roots trimmed to one-half inch
Dry Onions - Uniform in size, then neck
Good color and shape for variety

Preparation: Cut tops leaving one to two inches on bulb; remove rootlets. Outer scale can be carefully removed, but if damage occurs in inner scales, it is scored down heavily.

Faults: Too many layers of skin removed, thick, soft neck, sunburned.

Cracked scales, damaged.

Pepper, Bell

Merits: Uniform, true to variety, firm, heavy, smooth, free from blemishes
Stems should be attached; all specimens should have the same number of lobes or sections, varying from one to four, solid green color.

Faults: Dull, rough texture
Off color, sunscald

Pepper, Chile

Merits: Uniform in size and shape
Good color, firm
Free from blossom-end rot
Straight
Stems attached

Faults: Discoloration
Shriveling
Immature
Skin blemishes

Potato

Merits: Medium size (8 to 10 ounces), 3-6" long for Russet, 2-4" long plump, firm, smooth diameter for Red

Faults: Immature, blemishes
Rough in shape, dirty
Select for good uniformity, size and color
Free from green color, sprouting and shriveling

Pumpkins & Squash

Pumpkins and squash are difficult to describe because of the great variations available on the market. The items for judging should be representative of the variety; all should have 1/2 to 3" stems to prevent leaking.

Pumpkins

Merits: Mature, smooth
Evenly colored surface (green color indicates immaturity)
Fruits may vary from round to oblong
Surface is grooved

Preparation: Cut from stalk, leaving two to three inches of stem attached

Faults: Misshapen, immature fruit

Summer Squash

Merits: Fruits small and tender enough to mark with fingernail; ideal length is six to eight inches, 1-2" in diameter

Preparation: Trim stems to one inch by cutting from vine

Faults: Fruits large and over-mature

Scallop Squash

Merits: Fruits small, three to six inches in diameter, with or without stems

Winter Squash

Merit: Uniform color
Free from blemishes, insect and disease damage
Fruit typical in shape and variety
Fruits should be mature and the rind hard, not easily marked with

Preparation: Trim stem to one inch

Faults: Immature
Insect and mechanical damage

Sweet Corn

Merits: Uniform in length, size and color according to variety, kernels full grown and in the milk stage

Preparation: Cut stems neatly below the point where the husks are attached
If cut high, husks will fall and ruin appearance. Frequently silk is removed to tip of ear by pulling

Faults: Immature, unfilled grains, over-ripe and hard, uneven rows.
Not filled to tips of ears, worm damage.

Tomato

Merits: Medium size, firm
Color clear and typical of variety
Clean, no growth cracks

Preparation: All with stems closely trimmed or all stems removed. Remove blossoms attached.

Faults: Coarse, over or under-ripe, bruised, soft cracks or corrugation
Scarring

Watermelon

Merits:	Good weight for size Medium to large in size Bright intense green color or even striping over melon. Yellow rather than white spot where melon rested on the ground. Form even and regular without bulges or furrows.
Preparation:	Trim stem to one inch
Faults:	Light in weight, uneven shape or color, blemishes Ground spot white

Special Points to Consider in Selection and Judging Fruits:

Apples

Merits:	Specimens should be typical of the variety, uniform in size, color and maturity Free from insect, disease and mechanical damage Size medium to large, but size is not important factor.
Preparation:	Stems should be left attached; remove leaves and spurs
Faults:	Not uniform, blemishes

Grapes

Merits:	Typical of variety Berries should be uniform in size, color and maturity
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Pears

Merits:	Uniform in shape, size, color and maturity, typical of variety
Preparation:	Leave stems attached

Peaches

Merits:	Uniform in every respect with the ground color of the fruit yellow
Preparation:	Stems of peaches need not be present, but should be uniform with or without stem Care in handling to prevent bruising is a must

Plums

Merits:	Uniform and typical of variety, fresh, plump and full color, free from damage
Preparation:	Stems attached; do not remove natural bloom