

JUDGING STANDARDS FOR APIARY PRODUCTS

I. Terms Beekeepers Use When Talking About Honey and Beeswax

Judging Rules & Requirements – Always obtain a current copy of the judging rules and requirements for the contest you are entering. Items such as number of jars per entry, container size, labeling requirements, and required additional information (in the proper format) are only a few of requirements that may vary from show to show.

Beeswax - A natural wax secreted by bee glands located on their abdomen. Beeswax can come in different degrees of color and cleanliness. Beeswax can be judged as blocks, or as novelty items that include artisan articles and candles (rolled, dipped, or molded).

Blended Honey - A homogeneous mixture of two or more honeys differing in floral source, color, flavor, density, or geographic origin.

Chunk Honey - Cut Comb Honey placed in a jar which is then filled with Extracted Honey.

Comb Honey - Honey comb that has been built in a container by the bees. This is the most natural form of honey available. Containers can be round or square plastic, or square boxes made of basswood. The foundation used is 100 % beeswax with no metal wire supports in it.

Cut Comb Honey - Honey comb cut from a honey comb frame by the beekeeper. Usually placed into some kind of container for display.

Definition of Honey - Honey is the substance made when the nectar and sweet deposits from plants are gathered, modified, and stored in the honeycomb by honey bees. The definition of honey stipulates a pure product that does not allow for the addition of any other substance. This includes, but is not limited to, water or other sweeteners.

Extracted Honey - Also known as strained honey, is liquid honey that has been separated from the comb by centrifugal force, gravity, straining, or other means. This honey is packaged in a bottle or larger container.

Floral - Indicates the primary flowers from which bees gathered nectar to produce the honey.

Non-Floral - Indicates primary sources other than flowers such as extra-floral nectaries and honeydew.

Geographic Origin - The name of an area of production (state, region) may be included, provided the honey has been produced entirely within that area. Blends containing honey of foreign origin must be labeled to indicate their origin(s), in accordance with the Code of Federal Regulations (CFR).

Liquid honey - Liquid honey is honey that is free from visible crystals.

Raw Honey - Honey as it exists in the beehive or as obtained by extraction, settling, or straining without adding heat.

Weight to volume conversions

16 oz. Queenline-style jar = 1 lb. liquid honey

12 oz. jar = 1 lb. creamed honey

16 oz. jar = 8 oz. pollen

Award Point Ranges

First Place (Blue Ribbon) 96 - 100

Second Place (Red Ribbon) 90 - 95

Third Place (White Ribbon) 85 - 94

Containers

Queenline-Style can be obtained in 8 oz., 16 oz., and 32 oz. size clear glass jars.

Classic-Style (including mayo style) clear glass jars can be obtained in 8 oz., 16 oz., 32 oz., and 36 oz. jars. These are the standard sizes carried by most distributors. Also available are 1 lb. round chunk honey jars or straight cylinder glass jars. Wide mouth jars are better for use with a chunk honey entry.

Never use jars that have embossed patterns or brand names (*i.e.*, Mason) in the glass. Also, jars should be inspected for either bubbles or impurities in the glass itself, and only jars without these problems should be used in an entry for a honey show. Additionally, jars should be cleaned of blemishes on the inside or outside of the glass, and all dust or fibers need to be cleaned from a jar before honey is added.

II. Judging Class Description

1. Extracted Honey:

Also known as strained honey that has been separated from the comb by centrifugal force, gravity, straining, or other means. Entries consist of 3 glass Queenline type jars (or Classic-style glass jars) with plain metal or plastic lids. Honey will be graded and judged on density, absence of crystals, cleanliness, flavor, aroma, fill, color, and container appearance.

USDA Color Standards Color Range (Pfund scale limits are given for all 7 ranges)

Water WhiteHoney that is Water White or lighter in color (Pfund scale 8 or less).

Extra WhiteHoney that is darker than Water White, but not darker than Extra White in color (over 8 to and including 17).

White Honey that is darker than Extra White but not darker than White in color (over 17 to and including 34).

Extra Light AmberHoney that is darker than White, but not darker than Extra light Amber in color (over 34 to and including 50).

Light Amber Honey that is darker than Extra Light Amber, but not darker than light Amber in color (over 50 to and including 85).

Amber.....Honey that is darker than light Amber, but not darker than Amber in color (over 85 to and including 114)

Dark Amber.....Honey that is darker than Amber in color (over 114).

Show judging at times will combine the seven USDA colors into fewer judging classes. Our judging color classes are as follows:

Class: Light - Includes Water White, Extra White, White, Extra Light Amber, & Light Amber (Pfund scale range is 8 to 85).

Class: Dark - Includes Amber, Dark Amber through Black- a person cannot see through it (Pfund scale range is greater than 85).

Exhibitors may have assistance in selecting the appropriate color class for the extracted honey entries.

2. Comb & Cut Comb Honey:

This entry comes in square, rectangular, or round comb and should be displayed in containers that will allow judges to examine and taste one side while the other side can be kept intact for exhibit. Each entry consists of three "cassettes" (clear lids both sides, no pressure sensitive label), or "basswood sections" (cardboard carton with window, no producer's name, or address). The foundation used is 100 % beeswax with no metal wire supports in it.

- Comb Sections

Honey contained in the cells of the comb in which it is produced. Sections may be square or round. Square sections may be exhibited in white section show cases or in commercial cardboard containers.

Round sections should have clear covers on both sides and no band; either type must be easily removed from the container for inspection by the judge. All sections should be well filled, with the comb attached firmly around the entire perimeter of the cassette and with an absence of 'pop-holes'. All the criteria for comb honey apply. Before exhibiting, the sections should be thoroughly cleaned of any dirt or propolis. A Stanley knife blade, used with care, makes a good scraper. When a class requires more than one section, the rule of uniformity applies, and both or all sections must match. One square entry and one round entry, however good individually, will not qualify as an official entry. Both sections must contain the same type of honey and have similar cappings, and preferably, they were produced in the same section rack or super. They must also both be displayed the correct way up (*i.e.*, the way it hangs in the hive).

- Cut Comb Sections

This is bulk comb honey cut into pieces, edges drained, and suitably wrapped or packaged for marketing. An entry consists of three pieces, each placed in commercial plastic comb honey boxes (4 inch × 4 inch). The comb should be cut to exactly fit the container, use a template and a sharp knife, not a commercial comb cutter, and should be well drained on a rack (a cake cooling rack is suitable) before insertion. There should be no loose honey in the container when judging takes place.

Never be tempted to 'make up the weight' with liquid honey, or indeed with another, thin piece of comb underneath, the latter would result in instant disqualification. The judge will remove the comb from the container to inspect the capping on both sides and if this is not possible due to loose honey in the container, the exhibit will be severely penalized. When two or more pieces of cut comb are required for a class, the rule of uniformity applies, and they should match in every respect. They should preferably be cut from the same comb, or at least from combs taken from the same super, and must be cut in the same direction. Two pieces of comb cut at right angles to one another will be severely penalized, however good they might be individually.

3. Chunk Honey: Entries shall consist of 1 strip of cut comb (full length of the jar) placed into each of three 1.5 lb. (pint) wide mouth glass jars (never in Queenline jars). This is the most difficult type of comb honey exhibit to produce, but the end product is well worth the effort. It is important to remember that the rule of uniformity still applies, and all jars in the exhibit must match in every respect. (Use of wide mouth jars is strongly encouraged, however use of classic-style jars will not disqualify an entry.)

Normally the liquid honey and the comb will be of the same color. Dark honey does not look attractive in the jar, so it is better to use lighter colors of honey. It is especially important to choose honeys that do not granulate readily. When cutting the piece(s) of comb, the same criteria should be observed as for the cut comb classes; it should be cut with a sharp knife, using a suitable template. The cut comb should be well drained before placing in the container.

The cut comb should reach from the base of the jar almost to the top. The liquid honey should be warmed slightly so that it runs easily and then poured gently down the inside of the jar until level with the top of the jar. A lid should now be screwed on tightly, and the jar gently turned upside down and slowly on to one side to allow trapped air bubbles to escape on to the side of the jar. The jar can now be rotated slowly to allow more air bubbles to escape before standing it upright. This process may have to be repeated several times before all the air bubbles have been able to escape. When you are satisfied that the exhibit is free of air bubbles, remove the lid and gently pour in more honey if needed, skim the surface to remove any air bubbles, scum, or wax flakes, and screw on a clean lid. The finished exhibit should be free of granulation (in both the liquid and the comb honey), trapped air bubbles, and wax flakes.

4. Beeswax Blocks: Beeswax is an important part of the beekeeping industry. Not only is it used to provide the beekeeper with foundation for building up good strong combs, but it is also attractive when used in candles and art. It is extremely important that the person receiving the beeswax exhibit does not handle it with bare hands or even touch the wax surfaces. Fingerprints and worn areas on beeswax will decrease its quality. The weight and thickness should be according to the show schedule, and the color is between pale primrose and orange, preferably the former.

Purity and uniformity of preparing the wax exhibit should be checked, no wavy or uneven surface should be evident. The exhibit should be translucent when light is shone through. There should be good plasticity and texture. Any signs of chemical adulteration or bleaching are to be disqualified. Each exhibit should be shown in a transparent cover to eliminate dust. It is recommended that saran wrap be used. The wax may be polished or unpolished. Entries are made in a 1 lb. block, geometric shape, not decorative. The top and bottom surfaces of the block should be smooth.

5. Beeswax Articles (Novelty Wax Display)

Beeswax Artisan Articles: Three (3) entries of original design must be 100% beeswax; may be cast in mold or carved. No non-beeswax enhancement allowed.

Beeswax Candles: Three (3) candles each molded, hand rolled, or dipped. No non-beeswax enhancement is allowed, except wick. Molded candles may be from the same mold or two different molds. One candle from each entry will be burned during judging to evaluate utility.

6. Educational Display of Honey: An educational exhibit shall serve to educate the public in some aspects of honey bees or beekeeping. Exhibitors must be aged **14 years old or younger**. Materials from any source may be used. The display must be the soul work of the exhibitor. Constraints on dimensions may be imposed by the Show Chairperson if space is limited.

III. Judging Standards

(All attribute points add up to 100 for entry that is judged)

1. Judging Standards For: Extracted Honey

Liquid honey is put into a specified class simply by its color. The color of honey is dependent on the nectar gathered by the bees. Some flower nectar results in a very light honey that is almost as clear as water. Other nectar gives a very dark honey, and some honeys are so dark that one cannot see through it. Since this difference is a natural occurrence in nature, the judge does not take off points for color even if he prefers one color over the next. Color is the only criteria used to categorize samples into classes of honey. As liquid honey exhibits are entered, the judges compare them to the colors on a color grader disk to determine the class. Queenline-style or Classic-style clear glass jars of liquid honey are accepted; any other container cannot be used. Clear glass Queenline jars work best for polariscope examination during judging.

Classes of Liquid Honey:

We will use the following two color classes for show entries:

Class: Light - Includes Water White, Extra White, White, Extra Light Amber, & Light Amber (Pfund scale range is 8 to 85).

Class: Dark - Includes Amber, Dark Amber through Black- a person cannot see through it (Pfund scale range is greater than 85).

Exhibitors may have assistance in selecting the appropriate color class for the extracted honey entries.

Entry requirements – Three (3) Queenline-style or Classic-style clear glass jars, all the same size. Your choice of one (1) to two (2) pound jars.

ATTRIBUTE POINTS (100 total)

Degree of Density; maximum points.....20

Each sample of honey is checked for moisture content using a refractometer. This device measures the specific gravity (or the total solids content) of the honey using a metered prism. A drop of honey is placed on the refractometer prism, and after providing enough light the percentage of water in the honey can be read off a scale that is seen through the eyepiece. The full 20 points will be awarded to honey whose density is from 13.0 to 18.5. A honey sample containing more than 18.6% water content is disqualified. Honey containing the amount of water will ferment over a period of time. Honey content that is less than 13.0, will be checked carefully.

Freedom from crystals; maximum points.....10

The honey is placed in a special light box called a polariscope. The polariscope has two polarizing filters arranged at a 90-degree angle across the light path. This arrangement causes the light which is polarized by the first filter to be completely cancelled by polarization as it passes through the second filter. The honey is placed in the light path between the two filters. If the honey is free of impurities, the cancellation of the polarization by the two filters will give the honey a clean and homogenous appearance when viewed through the end of the light path.

However, if there are bubbles, crystals, pollen, dust, dirt, or fibers in the honey, the light passing through the first filter will be diffracted by impurities before passing into the second filter. The result is that the polarized light is no longer perfectly cancelled. The result is the debris glows with a halo of light around it. Thus, the polariscope allows the judge to see very clearly every particle, fiber, crystal, and air bubble in the honey (as well as anything else that might contaminate the honey). This is why a glass Queenline jar is used. These jars allow a clear view of the contents. Sometimes entries which do not look crystallized when viewing with the naked eye can still be shown to have crystals when viewed through a polariscope. These entries may contain fine crystals caused from sitting too long or from wild swings in room temperature. Points are taken off if crystals are seen through a polariscope.

Absence of bubbles or foam; maximum points.....10

Some small bubbles which are not visible to the naked eyes can be seen through the polariscope. Foam sometimes settles at the top of the honey and must be removed by the beekeeper prior to entry. Usually, a judge can tell when a honey sample has been just bottled for judging because the beekeeper did not give the honey time to settle out the bubbles and foam.

Cleanliness; maximum points.....20

The honey must also be clean. An entry can be compromised if there are pollen granules, wax particles, dirt, lint, bee parts or anything objectionable present in the honey. Never use cheese cloth (or similar material) to strain extracted honey through. It can/will impart lint fibers into the extracted honey.

Containers - cleanliness and neatness; maximum points.....10

The containers must be glass Queenline-style or Classic-style clear glass jars. They must be clean, neat, and uniform. Points are taken off if there are fingerprints, dirt, or anything objectionable on the outside of the containers. Those receiving the exhibits are incredibly careful not to touch the glass jars with their fingers. Exhibits will be carefully handled and only when necessary, doing so by touching only the lids. Avoid using jars with air bubbles in the glass, and jars should never be embossed with patterns or brand names.

Uniformity of entry and accuracy of filling; maximum points.....10

Uniformity of appearance of the honey is important. Sometimes a beekeeper will fill his or her 3 jars of honey from different batches of honey. Or they will start filling the jars from one batch and finish using another batch. Sometimes this causes one part of the honey to look darker or lighter or different in some way within the same jar or between the 3 jars.

Flavor and Aroma; maximum points.....20

Flavor and aroma reflect the degree of taste excellence and aroma for the predominant floral source. Points will not be deducted if one honey tastes different from another honey. Honey naturally takes on its flavor from the flower the nectar is gathered from, so different honeys in the same class will not always taste the same.

What the judge looks for is any burnt or objectionable taste derived from the processing of honey or managing of the bees. These objectionable flavors can be due to overheating the honey from which a burnt taste may be present. Other objectionable tastes can be detected from the overuse of substances which are absorbed by the honey, such as pesticides or the use of naphthalene instead of para-dichlorobenzene when storing supers. Para-dichlorobenzene is legal for use because it is not absorbed into the wax during storage of supers, whereas naphthalene is absorbed. Naphthalene is illegal and beekeepers should not use. Sometimes the judge can pick up an unknown taste that he or she is fairly sure from experience does not naturally occur in honey. Menthol and other organic compound flavors will also be incorporated into the honey if applied to the hives when honey supers are present.

2. Judging Standards For: Comb & Cut-Comb Honey

Comb honey is the most natural form of honey. When the bees make honey, they store it in beautiful, fresh, white wax which is built inside square or round plastic containers provided by the beekeeper in the hive. Comb honey is harvested just the way the bees have made it. No one has touched, filtered, melted, extracted, or processed the honey. Cut comb honey is similar in that it is also honey in the comb that has been cut out by the beekeeper in square, rectangles, or round pieces. These pieces are then placed in appropriate containers. The foundation used is 100 % bees wax with no metal wire supports in it.

Classes of Comb Honey:

1. Comb Honey Box
2. Comb Honey Round
3. Cut Comb Honey

Entry requirements – Three sections of comb/cut comb honey in the appropriate containers.

ATTRIBUTE POINTS (100 total)

Uniformity of appearance of honey and wax; maximum points.....20

Does the honey and wax look uniformly distributed? This can be discerned by looking at the cappings closely. Are there any ridges or raised areas? Points are taken off for areas of non-uniformity.

Absence of uncapped cells; maximum points.....20

Comb honey should not contain any uncapped cells; it should be completely filled from top to bottom and side to side. There should be an absence of uncapped cells. Points are taken off for open cells.

Uniformity of color of cappings; maximum points.....15

Comb honey should have pure white cappings, and there should be uniformity in color. If there are some that have yellow travel stains, points will be deducted.

Absence of watery cappings; maximum points.....10

Sometimes the bees bring in nectar so fast that the honey does not have enough time to cure in the cell. In other words, the bees seal the honey in the cells before enough water has been desiccated from the honey. This results in watery cappings. The beekeeper needs to check the comb honey to make sure there are not any of these watery cappings present in his or her exhibit. The judge can sometimes see these as little drops of honey seeping from some of the cells.

**Cleanliness of the section of frame, or
Uniformity of cut for 4 parallel-sides: maximum points.....15**

When the beekeeper removes comb honey from the hive, it should be cleaned. Some of the travel stains around the outside of the plastic containers as well as the frames can be removed before presentation. Points will be taken off for any unremoved spots or discolorations. For cut comb, neatness and uniformity of cut are evaluated. The judge will downgrade for crushed comb.

Absence of pollen and granulation; maximum points.....10

Bees also deposit pollen in honey comb; however, they usually do not deposit it in frames which are primarily used for honey since these frames are usually above and away from the brood chamber. However, there may be some bees who wish to deposit pollen even in honey supers. Also, sometimes honey will crystallize in the cells over a period of time and when temperature changes occur to promote this. The beekeeper should inspect his or her comb honey for both pollen and crystals in the cells. Comb honey should not contain any pollen or granulation due to crystallization.

Uniformity in weight; maximum points.....10

The weight of the comb honey must be uniform. One side of the comb cannot be filled with more honey than the other side. Also, if one side contains more uncured honey than the other side, this will cause a weight difference that can be felt by the judge.

3. Judging Standards For: Chunk Honey

Chunk honey is a unique type of honey which is prized by many people throughout the world. It is simply cut comb honey put into a wide mouth jar, and the jar is subsequently filled with extracted liquid honey. It is usually best to use a lighter class of honey for this in order to be able to see the comb honey better (but using lighter honeys is not a strict requirement). In judging this class of honey, some criteria for liquid honey and some from comb honey are incorporated. The cut comb should extend from the bottom of the jar to the liquid fill line.

Entry requirements – Three 1.5 lb. (pint) or (2 lbs. or less) wide mouth smooth clear glass jars, never in Queenline-style jars. (Use of classic-style jars will not disqualify an entry.)

ATTRIBUTE POINTS (100 totals)

Uniformity of appearance & weight; maximum points.....20

Just as for comb honey, the cut comb used in chunk honey must have uniformity of appearance. The comb must not be filled more on one side than the other, and the cappings must all be the same. Does the honey and wax look uniformly distributed? Are there any ridges or raised areas?

Neatness of cut; maximum points.....10

The first criterion is neatness of cut of the comb honey. It takes a very sharp knife and much care in cutting comb without destroying parts of it in the process. Is the chunk a perfectly cut strip (free hand or from a template) of cut comb, and are they sharp cuts not having ragged edges? The chunk should reach from the base of the jar to the liquid fill line.

Absence of watery cappings and unfilled cells; maximum points.....20

If the judge sees any watery cappings or unfilled cells in the comb honey, he/she will deduct points. Just as in the comb honey subcategory, the absence of watery cappings and unfilled cells is essential in a good quality chunk honey exhibit.

Cleanliness of comb and honey; maximum points.....20

There should be no travel stains on the comb honey and no bubbles, wax, crystals, or other particles in the liquid honey.

Uniformity of entry and accuracy of filling; maximum points.....10

Uniformity of appearance of the honey is important. Sometimes a beekeeper will fill his or her 3 jars of honey from different batches of honey. This typically leads to a lack in uniformity among the jars of an entry. The chunks of comb should also come from the same batch to insure uniformity of appearance within the entry jars.

Correct density, flavor, and aroma of liquid honey; maximum points.....10

Using a refractometer, the judge will check the density or water content of the honey and determine that it contains less than 18.6% water. The judge will taste the honey and determine if there are any objectionable flavors or aromas in the honey such as a burnt or other non-natural taste. The taste test may also reveal fermentation that has already occurred in very wet honey.

Containers - cleanliness and neatness; maximum points.....10

The containers must also be wide mouth glass jars; however, the use of classic-style jars will not disqualify an entry. They must be clean, neat, and uniform. Points are taken off if there are fingerprints, dirt, or anything objectionable on the outside of the containers. Those receiving the exhibits are incredibly careful not to touch the glass jars with their fingers. Exhibits will be carefully handled and only when necessary, doing so by touching only the lids.

4. Judging Standards For: Beeswax Blocks

The weight and thickness should be according to the show schedule and the color is between pale primrose and orange, preferably the former. Purity and uniformity of preparing the wax exhibit should be checked. No wavy or uneven surfaces should be evident. The exhibit should be translucent when light is shone through. There should be good plasticity and texture. Any signs of chemical adulteration or bleaching are to be disqualified. Each exhibit should be shown in its natural state. The wax may be polished or unpolished.

Entry requirements – One (1) block of pure beeswax [not less than one (1) pound]

ATTRIBUTE POINTS (100 total)

Cleanliness; maximum points.....35

The most important thing to consider when judging beeswax is how clean it is. The color of beeswax is important in determining how the beeswax was processed and how much care was put into producing a clean product. Bleaching of the wax is disallowed in most beeswax shows. Other deductions depend on whether the beeswax is discolored due to honey, propolis or pollen. When bees travel over combs over a period of time the beeswax darkens. Usually, the cappings obtained during honey extraction provide the cleanest and lightest beeswax.

Color and aroma; maximum points.....30

The color of beeswax is also an important consideration. If the beeswax is too dark, it likely contains substances other than beeswax. The colors of straw, canary, yellow or lemon yellow are the most desirable.

Uniformity of appearance; maximum points.....20

Before beeswax is solidified while making a block, it must be uniform in color. If one part of the item is darker than another part, points must be subtracted. Also, if an exhibit is not shaped properly or appears worn from handling, it is of less quality.

Freedom from cracking, shrinking, and blemishes; maximum points.....15

During the cooling and solidification process, beeswax changes in volume. The beekeeper must take this under consideration in the making of molded items. Cracking may occur as a result of this process.

5. Judging Standards For: Beeswax Artisan Articles and Beeswax Candles

Beeswax is an important part of the beekeeping industry. Not only is it used to provide the beekeeper with foundation for building up good strong combs, but it is also attractive when used in candles and art. It is extremely important that the person receiving the beeswax exhibit does not handle it with bare hands or even touch the wax surfaces. Fingerprints and worn areas on beeswax will decrease its quality. Each item must be handled carefully to prevent its quality from being decreased before, during and after judging.

During the cooling and solidification process, beeswax changes in volume. The beekeeper must take this under consideration in the making of molded items. Cracking may occur as a result of this process. If part of the item is darker than a major part of an item, points must be subtracted. Also, if an exhibit is not shaped properly or appears worn from handling, it is of less quality.

Entry requirements -

Beeswax Artisan Articles, three (3) entries, molded or original design, 100% beeswax with no enhancements

Beeswax Candles, three (3) entries each (rolled, dipped, or molded)

ATTRIBUTE POINTS (100 total)

Cleanliness, color, quality of wax (some parts may contain wax colored to highlight or emphasize artistic embellishments); maximum points.....25

Freedom from cracking, shrinking & blemishes; maximum points.....25

Candles – Uniformity of Appearance & Shape; maximum points.....25

OR

Artisan Articles – Novelty of mold or sculpture; maximum points.....25

Candles – Finishing details; maximum points.....25

- a. For molded: flat, finished bottom, wicks trimmed to ½“, & seams removed
- b. For dipped: last dip left on, wicks left joined
- c. One candle from each entry will be burned during judging to evaluate utility

OR

Artisan Articles – Finishing & Neatness details of workmanship; maximum points.....25

6. Judging Standards for Educational Display about Apiculture or Bee Biology

All exhibitors must be **aged 14 years old or less**. The purpose for the Apiculture Exhibit is for students to present information on either the (1) importance of pollination by honey bees to U.S. agriculture and natural plant systems, (2) various aspects of basic biology and/or ecology of honey bees, or (3) various aspects of the culturing of honey bees (or beekeeping). This latter topic can include all aspects of managing honey bees for honey and wax production, producing queens and honey bees that are sold as starter colonies for other beekeepers, diseases and pests of honey bees, or any issues related to the maintenance of beehives. The goal is to offer a concise and interesting exhibit about an interesting aspect of honey bees to inform the public about these important insects.

Use the same protocol for creating displays that might be used in presenting a project at a school science fair (see **Figure**). However, students will not be stating specific scientific hypotheses being tested, and they will not be analyzing and interpreting data from experiments. Regardless, the overall structure of a science fair display board can be followed. The following description of the display focuses on a specific topic to serve as an example, *but any aspect of honey bee biology or beekeeping could be molded into this format*.

There should be an overall **Project Title** that clearly defines what aspects of bee biology or beekeeping is being featured in the display. For example, a project could focus on the mating biology of queen honey bees. I will use this example to illustrate how section titles could be used for the topic. Of course, this is only an example, and students are encouraged to make presentations on many interesting aspects of bee biology or beekeeping. If the presentation focused on reproduction in honey bees, the title could be ***“Reproduction and Mating Behavior of Queen Honey Bees.”***

The **Introduction or Statement of Purpose** will be used to explain why a particular aspect of bee biology is being discussed and why it is important. For example, reproduction is important for all animals in nature to propagate the species. In beekeeping, the value of a queen bee is diminished if she is mated poorly. Poorly mated queens do not lay as many eggs, and they often have issues with poor egg-laying patterns that reduce the size and vitality of their colonies. A good introduction would state what some of these issues may be.

The subsequent **Background and Literature Review** would begin with a couple of paragraphs that detail how and why poorly mated queens produce colonies that do not make as much honey as other colonies. The review could begin with a description of queens and drones, how each one of these types of bees develops in a colony, how and where they mate, and how many drones are needed to produce a well-mated queen. The review could also highlight things that could cause a queen not to properly mate (*e.g.*, bad weather during periods when she needs to take her mating flight) or other reasons that a queen or drone could be inferior (diseases affecting both sexes, chemical poisoning, etc.).

It is extended portions of the Literature Review that will take the place of the **Statement of Hypothesis** and **Materials and Methods** and **Conclusions** sections of a typical science fair display. Create section headings for each major topic to be discussed in the Literature Review. For example, the first section of a review after the introductory paragraphs could be a topic on ***“Caste Development of Honey Bees.”***

The development from eggs to adult bees would be outlined and described for both queens and drones in detail. The second major heading could be *“Mating Biology of Honey Bees.”* The entire mating flight behavior of queens and drones would be described here. Differences in how far the two sexes will fly to mate could be described, as well as differences in age at which the two sexes will actually attempt to mate. A third section could be *“Reasons for Poor Mating in Queens.”* This section will describe why it is that some queens do not properly mate. Some reasons are related to the queens; others are related to the drones. A final section could be *“How to Recognize a Poor Mated Queen.”* For each one of these headings, the student will summarize the available information on each specific topic. Photos, figures, and tables can be used to enhance your explanations of ideas.

The **Interpretation of Data** and **Further Reading** sections that typify a science fair project would be combined and renamed something different for this display. This final section is a summary of the entire written account. It would be a concluding statement in paragraph form. It could be labeled **Concluding Discussion**, and it should be used to reiterate the key points of the entire presentation. Additionally, students could use this section to speculate on new ideas that might help fix a particular issue or problem in beekeeping or provide new ways of thinking about honey bees to solve problems with their husbandry, etc.

Students are encouraged to speak directly to an experienced beekeeper as a supplement to reading about bee biology. Beekeeping is such an intricate hobby that insight from experienced beekeepers can be valuable to developing a fuller understanding of problems or issues that cause beekeepers to lose income from reduced honey production or other problems. If a beekeeper is interviewed, please remember to cite them in the reference section at the end of the display. A “personal contact” or interview with a beekeeper will be scored on the judging sheet.

EXHIBIT SIZE

Not to exceed 15 inches (38 cm) deep, front to back; 48 inches (122 cm) wide, side to side; and 5 ft (150 cm) high above the tabletop.

Display materials must fit on the table in front of your board. This space is approx. 15" x 24".

Display boards of 3-4 ft height (vs 5 ft) are recommended for readability by the judges.

TEXT

Use size 24-point or larger font. Position your main points at eye level.

NAMES

Student name(s) should not appear on the display board; they will be printed on the poster location label.

REFERENCES

References (Bibliography) are required on the display board. If the bibliography is exceedingly long, include “Selected References” on the board and have available copies of the complete reference list.

Material Normally Included on a Typical Project Display Board

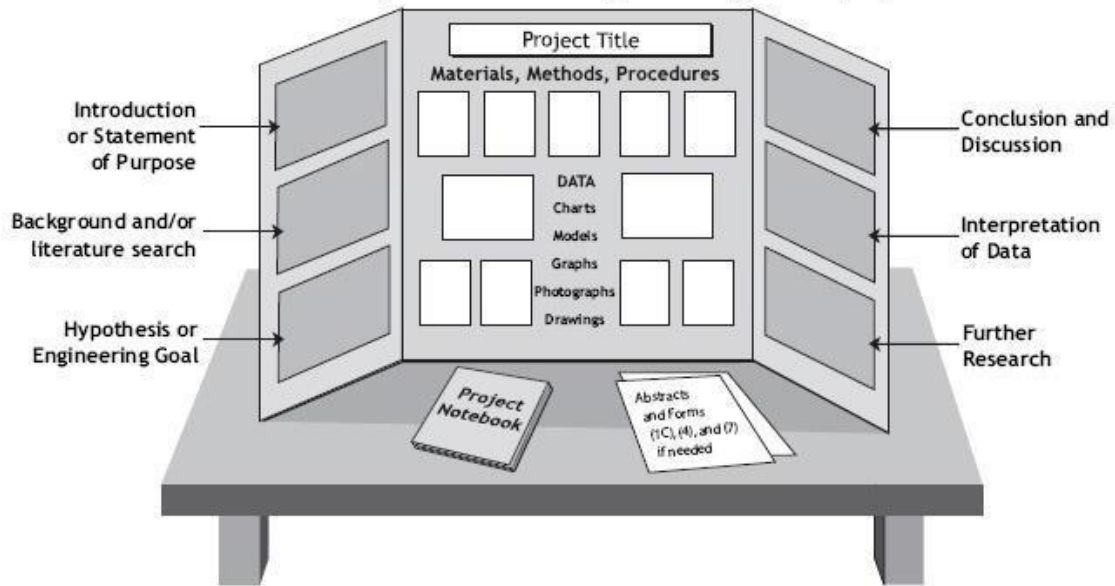


Figure – Display format typical of a science fair project will be adopted for the apiculture exhibit. Some major differences are that students in the apiculture exhibit are not expected to present a scientific hypothesis or engineering goal that was tested in an experiment. Similarly, the student will not be interpreting data or suggesting further research.

HONEY JUDGING SHEET

Class: _____
(Light or Dark Honey)

Entry # _____

<u>LIQUID HONEY</u>	<u>POSSIBLE POINTS</u>	<u>JUDGING POINTS</u>
1. APPEARANCE AND UNIFORMITY OF CONTAINERS; CLEANLINESS -----	10	_____
2. UNIFORMITY OF HONEY -----	10	_____
3. FREEDOM FROM CRYSTALS -----	10	_____
4. FREEDOM FROM FOREIGN MATERIAL -----	20	_____
5. FREEDOM FROM AIR BUBBLES EITHER IN SUSPENSION OR AS FROTH -----	10	_____
6. FLAVOUR AND AROMA -----	20	_____
7. DENSITY -----	20	_____

HONEY JUDGING SHEET

Entry # _____

<u>CUT COMB OR SECTION COMB</u>	<u>POSSIBLE POINTS</u>	<u>JUDGING POINTS</u>
1. QUALITY AND UNIFORMITY OF HONEY AND WAX -----	20	_____
2. CLEANLINESS OF SECTIONS -----	15	_____
3. COMPLETENESS OF FILL -----	20	_____
4. UNIFORMITY AND APPEARANCE OF CAPPINGS -----	15	_____
5. NO WATERY CAPPINGS -----	10	_____
6. NO POLLEN OR GRANULATION -----	10	_____
7. UNIFORMITY OF SECTION WEIGHT -----	10	_____

HONEY JUDGING SHEET

Entry # _____

<u>CHUNK HONEY</u>	<u>POSSIBLE POINTS</u>	<u>JUDGING POINTS</u>
1. CLEANLINESS OF COMB AND HONEY -----	20	_____
2. CLEANLINESS OF CONTAINERS -----	10	_____
3. UNIFORMITY AND NEATNESS OF CUT EDGES OF COMB -----	10	_____
4. COMPLETENESS OF CAPPINGS; NO WATERY CAPPINGS -----	20	_____
5. DENSITY; QUALITY AND FLAVOUR -----	10	_____
6. UNIFORMITY OF FILLING -----	10	_____
7. UNIFORMITY OF COMB AND WEIGHT -----	20	_____

BEESWAX BLOCK JUDGING SHEET

Entry # _____

**JUDGING
POINTS**

1. COLOR OF WAX AND AROMA-----	30	_____
2. CLEANLINESS (Free from impurities) -----	35	_____
3. UNIFORMITY OF APPEARANCE -----	20	_____
4. NO CRACKING, SHRINKING OR BLEMISHES -----	15	_____

BEESWAX ARTISAN ARTICLES OR BEESWAX CANDLES JUDGING SHEET

Class: _____
(Articles or Candles)

Entry # _____

**JUDGING
POINTS**

1.	CLEANLINESS, COLOR, QUALITY OF WAX-----	25	_____
2.	NO CRACKING, SHRINKING OR BLEMISHES-----	25	_____
3.	UNIFORMITY (CANDLES) OR ORIGINALITY (ARTICLES) -----	25	_____
4.	FINISHING DETAILS; CANDLES OR ARTICLES -----	25	_____

Originality is based on the complexity of the mold and probability of encountering faults or discounts on scoring from using a complex mold. Cleanliness is based mostly on the amount of debris settled on or stuck to the bottom of the entry. Uniformity of appearance and color is based on the consistency of the color throughout the molded artifact and the darker the wax the more it is discounted. Freedom from cracking/smoothness is judged on the presence/absence of cracks and disfigurements caused by shrinkage and being cooled too quickly. Smoothness, especially around the edges of corners will affect this score. Freedom from air bubbles is based on the number of deformities caused by the presence of air bubbles in the artifact.

EDUCATIONAL EXHIBIT JUDGING SHEET

ENTRY# NAME: _____

ATTRACTIVENESS (50 points)

Text typed or stenciled (up to 25 points) _____

Or:

Text hand printed (up to 20 points) _____

Photos/computer diagrams (up to 25 points) _____

Or:

Hand drawn diagrams/graphs (up to 20 points) _____

TOTAL FOR ATTRACTIVENESS (not over 50 points) _____

TIME SPENT (20 points)

List of references (up to 10 points) _____

Personal contact (5 points) _____

Difficultness of information to obtain (up to 5 points) _____

TOTAL FOR TIME SPENT (not over 20 points) _____

CORRECTNESS (20 points)

Spelling (minus 1 point for each misspelled word) _____

Factual (minus 5 points for each wrong statement or fact) _____

TOTAL FOR CORRECTNESS (not over 20 points) _____

NEATNESS (10 points)

Erases (minus 1 point for each one) _____

Whiteouts (minus 1 point for each one) _____

Ink smudges (minus 2 points for each one) _____

TOTAL FOR OVERALL NEATNESS (not over 10 points) _____

TOTAL SCORE (add totals in outer columns) _____