

Welcome to Judging Geology

So you have been asked to judge the Geology exhibits at the County Fair. Judging a 4-H Geology Exhibit is no more difficult than being a Geology Leader. Just take it easy and don't panic, because with some preparation, time, and effort, you can be ready to venture into the arena.

The following material will provide you with a review of the philosophy of 4-H judging, some guidance in judging different types of exhibits, and some reference materials may make the process less daunting. Remember, philosophy can be defined as "the serene wisdom that comes from calm contemplation of life and the universe."

The Geology project, like all projects in the 4-H program, should be designed to develop youth through the 4-H Life Skills. Judging should be a part of the process of development. The 4-H Life Skills are:

- A positive self-concept.
- An inquiring mind.
- A concern for the community.
- Healthy interpersonal relationships.
- Sound decision making.

Your comments and criticisms should be stated in such a way that the 4-H'ers can grow from them.

A MESSAGE TO THE 4-H JUDGE

An exhibit is not an end in itself, nor does it measure the entire learning taking place in a 4-H project. However, the exhibit does display what the 4-H'er is capable of doing and what they have accomplished.

1. Help the 4-H'er have a positive learning experience from the judging process.
2. To be a positive learning experience, the "why" of the placing award is more important than the actual placing itself.
3. Remember the feelings and attitudes of the 4-H'er are most important. Judge the exhibit, not the individual.
4. Self-recognition, self-satisfaction, and the learning derived from the project are more important than the ribbon placing.
5. Assume the exhibit is honest and the 4-H member did his or her own work, with some possible resource assistance.
6. Evaluate the efforts of the 4-H'er by recognizing stronger points as well as weaker points in judging the exhibit. You may do this verbally where conference judging is used, or in written form.
7. Help the 4-H'er to be more aware of the practicality of the exhibit as a learning experience.

8. Judge according to the age level and experience of the individual exhibitor.
9. Be familiar with several methods of accomplishing the desired result. Don't be locked into doing things only one way.
10. Be objective without stating personal preference.
11. Be familiar with the guidelines or criteria of the 4-H project being judged. If there are specific county guidelines, follow them. If they are different from the guidelines used at the State Fair, comment on the differences for exhibits going on.
12. Use established standards and determine whether the exhibit meets the standards.
13. Judge exhibits by a combination of educational methods, such as:
 - a. A standard scorecard
 - b. Written comments
 - c. Conference judging, where appropriate

PERSONAL CONFERENCE JUDGING IN GEOLOGY

Personal conference judging has worked well in the judging of 4-H clothing, foods, electric, and similar projects. It is equally adaptable to the 4-H geology project since the judge must examine each specimen carefully for identification and condition. Also, the judging, if done correctly, compares the member's exhibit against a scorecard and not competitively against other entries in the same class. If the judging is on the county level, the judge should decide which of the exhibits in the various classes should be certified for exhibiting at the State Fair.

There are several ways in which the personal conference judging can be accomplished.

1. The judge could come to the county a few days before the fair and do the personal conference judging. Knowing how 4-H'ers always struggle to meet fair deadlines, this might pose problems. It would, however, provide a more relaxing situation for both the judge and the project members.
2. The judge, if desired, could have the members and leaders sit with him while doing the judging the day of the fair. The disadvantage of this is judges don't always know how long it will take them to judge an exhibit. So a youngster might have quite a wait before his or her turn came up to meet the judge. It would also be quite a problem for the agent if an attempt was made to make up an interview schedule in advance.
3. The judge, if desired, could do all the judging the day of the county fair and then go over the exhibits with the members, explaining the weak and strong points of the exhibits. The judge could also make suggestions for improvement for those certified for the State Fair.

Whatever system we use, personal conference judging or otherwise, we must keep in mind the learning experience, not the competition, is what we are attempting to bring about.

A copy of the publication "Personal Conference Judging" follows this. Please study it carefully. (from Geology Leader's Notes)

PERSONAL CONFERENCE JUDGING

4-H has always put forth the idea the people development is more important than the objects made. Yet we frequently judge inanimate objects to determine the personal growth progress of a child. Each child's efforts are judged against a given standard. Sometimes, unfortunately, the efforts are judged against the work of other individuals without much consideration of age, experience, interest, need, or the degree of improvement made by each child.

Personal conference judging, on the other hand, focuses directly on the personal development of the individual 4-H'er. It involves a consultation between the boys and girls and adults.

Together you evaluate the project or part of a project, basing the evaluation both on a predetermined standard or criteria and on the goals of the member in doing the project.

Parents, leaders, Extension agents, and judges are just a few of the people who help youngsters evaluate their choices. Personal evaluation can be used to help determine such matters as project selection, project progress, participation in the club, and others.

Personal Evaluation

With personal evaluation, each individual has the opportunity to determine his own starting point, take note of the progress he feels he has made, and set the direction of his future growth. He also has the advantage of relating more closely to an adult in a warm, supporting relationship.

Frequently we ask ourselves:

- Are we generating salable skills in 4-H for the present or the future?
- Are we really involving people in practices which help them develop a feeling of self-worth and competence?
- Do we allow youth to work out their own problems with help from adults?
- Do we provide opportunities for youth to be articulate while working with adults?

Today's young people desire help in working out their problems. To do this, they need adults who are understanding, empathetic, supportive, and willing to listen, as well as involve themselves in dialogue with a young person.

It is with these questions in mind and these needs to be met that we turn to the personal conference manner of judging.

Conducting the Conference

We must consider several details in conference type judging if the method is to prove a success.

The first important element essential to the success of the conference involves the ability of the adult or judge to relate to the 4-H'er. This individual must be open minded, willing and able to listen to the 4-H'er, have a knowledge of what was being taught, and be able to recognize his ability level. The project leader probably is the best qualified to do this evaluation with the 4-H'er, although many leaders – and sometimes 4-H'ers – feel this needs to be an outsider.

Also of great importance to the success of the conference is the way it gets started. Care must be taken that the 4-H'er is put at ease before he is expected to relate meaningfully to the adult. A sincere compliment about the project to be evaluated can do this. In some cases, it may take a bit of conversation about a topic not related to the project.

Always begin the conference on a good note. Talk first about the good qualities of the article. Give the 4-H'er the opportunity to express his feeling of satisfaction about the work done.

Then ask a leading question that will give the 4-H'er a chance to talk about his problems. Usually he's well aware of them. The role of the adult is to listen and help the member explore possible solutions to these problems. Consider those things which can be done to improve the article under discussion; then, if needed, make suggestions for avoiding the problems in the future. Help the 4-H'er make his plans for a future course of action.

If the parent or leader is present at the conference, this is the time he should be involved. Be careful not to let the parent dominate the interview.

The evaluation may take from three to fifteen minutes, depending upon the scope of the project. In most cases, a schedule of five minutes per person per project will be adequate.

We all want to provide maximum learning experiences at every level for the youth of Kansas. Whether the learning situation involves fairs, style revues, demonstration events, project meetings, or whatever, our belief is that it's what happens to people that really counts!

"Creating A Positive Experience for 4-H Youth at the County Fair" follows.

GUIDELINES FOR GEOLOGY PROJECT JUDGES

1. As a judge, you will need to review the rules, classes, and scorecards ahead of time. Use standard scorecards, if available.
2. You need to determine whether the contest has conference judging, and if so, what type (see "Personal Conference Judging in Geology").
3. Placing (Modified Danish System)
 - a. Use standard percentage points for placing. **Never judge one exhibit against another.**
 - b. Always comment on what has been done well, as well as what can be improved. This will help the 4-H'er keep remain interested in the project and encourage him to continue to improve.
 - c. Ribbon placing, by percentage points, should be given to you by the show superintendent.

Recommendations:

<u>County:</u>	Kansas State Fair
100-90 Purple	100-95 Purple
89-80 Blue	94-90 Blue
79-70 Red	89-85 Red
69 or less White	84 or less White

- d. There should be no limits on the number of each ribbon placing given. If required, determine the top placing in Purple or Blue.
4. Tools needed for judging geology exhibits:
 - Hand lens
 - Streak plate
 - Glass plate
 - Knife, nail, or file
 - Magnet
 - Dilute acid
 - References (rock, mineral, and fossil, as needed)
5. Always use the standard scorecard when judging geology exhibits, or have available for reference.
 - a. Rock, Mineral, and Fossil
 - b. Educational Exhibits
 - c. Lapidary Exhibits
 - i. Point deductions are shown on the scorecards. Always give the reason for each point deduction.
 - ii. If the same error occurs more than once, note it, but do not take points off for every occurrence. If the same error is made multiple times, consideration should be given to lowering one ribbon place.
Examples:
 1. County or specimen name spelled incorrectly on several labels.
 2. Specimens not numbered or numbered in a sequence within box or boxes. (This indicates specimens were not numbered when collected.) Different numbering systems are

acceptable, such as those including letter or year in numbering system.

- iii. If a geology division or class rule is not followed, deduct one ribbon placing. For example:
 - 1. Specimens lack rock type (sedimentary, metamorphic, or igneous) where required.
 - 2. Fossils not identified at phylum level
 - 3. Fossils not identified at genus level where required
 - 4. Display not within size limit or number of boxes for class.
 - 5. Boxes with sliding Plexiglas tops must slide out the top of the box. (Boxes at the State Fair are displayed at an angle upright, and otherwise the Plexiglas will fall out.)
 - iv. Specimen labels should be typed (using a computer or word processor) or neatly hand-written.
 - v. Some counties may have special classes for younger members who are not able to go on to the State Fair. Check for requirements and special scoring in these classes, if appropriate.
 - vi. Not everyone will have the same references to work with. If identification is correct according to the reference used by the exhibitor, but the identification has changed in more recent publications, indicate the new identification and where it can be found. Discuss what should be done with the person in charge, ahead of time.
6. Minimum number of specimens
- a. When counting minimum number of specimens, be sure to look for fall-collected specimens. Current year specimens before after previous state fair.
7. Show Hints
- a. Plan to arrive in time to visit with the person in charge. Get acquainted with the facilities and relax.
 - b. When judging exhibits, be sure to take time to examine each one, even if your first glance indicates the exhibit may be in the bottom of the class.
 - c. Be sure the clerk understands your procedure.
 - d. Give general comments and criticisms as general remarks for all to hear. Give individual criticisms quietly to the member only, so they will not be embarrassed.
 - e. Be friendly and courteous with all participants, but not overly familiar with any of them or their parents, or give help to any individuals you do not offer to all of them.
 - f. Be careful what you say to your clerk. They live in the community and know many people. It may be hard for them not to share some “off the record” remarks.

TIPS FOR JUDGING KANSAS ROCKS

Exhibits should contain only one of each rock (ex: limestone, shale, granite, quartzite, etc) unless a formation, member, or qualifying name is included in the description (ex: Ft. Riley limestone, algal limestone, etc.. See also Feb 2012 labeling discussion). If the name of the member is on the label, the name of the formation is not also required.

Encourage exhibitors to have a fresh surface shown to help in identification.

Test limestone with acid.

Discourage the use of sediment size term for rock name (ex: clay, sand, etc.)

Discourage use of local names; use proper rock names. (See "Some Rocks Found in Kansas")

When judging, if the local leader has misidentified a specimen, be very careful in making the correct identification and make sure both the leader and the exhibitor understand why it is not correct.

Salt and chert, while sometimes deposited in massive beds, should be displayed as minerals. Rock gypsum should be displayed as a rock, although the crystal varieties (satin spar and selenite) should be displayed as minerals. Remember, a rock is made up of several minerals, not just one, with few exceptions.

REMEMBER: The 45 and 60 specimen classes should be identified with the rock type (sedimentary, igneous, or metamorphic). A key is acceptable if it is easily understood.

Sedimentary structures are masses of inorganic material which were deposited in sedimentary rocks; later weathering has released them from their parent rocks. They are not true rocks, but can be exhibited as a mineral, if the proper mineral is named (ex: barite rose, calcite-lined geode, etc.)

A partial list of Sedimentary Structures:

Concretion (several minerals)

Septarian concretion (calcite or barite, most commonly)

Geode (calcite or quartz)

Salt casts (casts of halite crystals)

Cone-in-cone (calcite)

Ripple marks (sandstone or siltstone)

SOME ROCKS FOUND IN KANSAS

Sedimentary:

	(Any may contain formation or member name)
Sandstone	sand-size sediments; feels like sandpaper
Siltstone	silt-size sediments; feels like emery paper
Claystone	clay-size sediments; surface feels slick
Shale	contains mostly clay-size sediments
Conglomerate	contains rounded gravel size sediments
Breccia	contains angular gravel size sediments or fragments
Dolostone	rock dolomite
Ironstone	assorted oxidized hydrated iron minerals with some clays and may be highly siliceous
Limestone	1. chalk 2. coquina 3. (any qualifying term) limestone a. ex: fossiliferous, oolitic, algal, etc. 4. (formation or member) limestone
Coal	Bituminous Coal is more common than lignite coal
Lignite Coal	plant parts still present
Jasperoid*	regional term for chert breccia in black chert (Tri-State Mining Area only)
Catlinite*	pipe stone found in glacial material in NE Kansas

Metamorphic:

Quartzite	glacial material (Sioux), river gravels, Silver City Dome in Woodson County (calcite-cemented sandstone from Kanopolis Lake is not true quartzite)
Gneiss	glacial material, river gravels
Schist	glacial material, river gravels
Marble	glacial material
Hornfels	Rose Dome in Woodson County
Slate	Silver City Dome in Woodson County
Jasperoid and Catlinite	* see above

Igneous:

Granite	coarse grained; river gravel, Rose Dome, glacial material
Basalt	fine grained; river gravels
Gabbro	coarse grained; river gravels
Kimberlite	locations in Riley County; <u>was</u> called peridotite
Lamproite	Silver City Dome in Woodson County
Volcanic Ash	mostly western Kansas; some found in eastern Kansas
Granodiorite	medium-to-coarse-grained; glacial material
Obsidian	river gravels

*Indicates a slightly metamorphosed sedimentary rock – either sedimentary or metamorphic type of rock is acceptable, but sedimentary is preferred.

TIPS FOR JUDGING KANSAS MINERALS

Samples of minerals do not have to be composed of only one mineral. If the labeled mineral is in or on a rock or another mineral, it should have some indication of where it is located. If you cannot find the labeled mineral, indicate on the scorecard and discuss with exhibitor.

Use physical properties of the minerals and the tools listed on the first page of the Guidelines to confirm the identification of minerals by the exhibitor. If the minerals are not included in the list of minerals often found in Kansas exhibits (given below), use a more complete list from reference materials. The list "Some Kansas Minerals" can help you decide if the mineral is described as being found in Kansas and how common or rare it is. If a mineral doesn't pass a particular physical property test, test the mineral for its other physical properties before counting it wrong.

USEFUL PHYSICAL PROPERTIES FOR QUICK IDENTIFICATION IN EXHIBITS

Hardness	Streak	Acid reaction
Luster	Cleavage	Crystal form
Color	Fracture	

MINERALS OFTEN FOUND IN KANSAS EXHIBITS:

1. Hardness test
 - a. Quartz – harder than a knife blade; scratches glass
 - b. Calcite – penny will scratch
 - c. Gypsum – softer than your fingernail
2. Acid reaction (always test the following minerals with acid)
 - a. Calcite – reaction
 - b. Dolomite – weak reaction
 - c. Halite – no reaction
 - d. Barite – no reaction
 - e. Opal – no reaction
3. Streak test

Galena – black	Hematite – red
Magnetite – black	Limonite – yellow
Marcasite – dark gray	
Pyrite – greenish-black or brownish-black	
Chalcopyrite – greenish or brownish-black	
4. Minerals with cleavage

Calcite	Halite	Galena
Gypsum	Celestite	Mica
Feldspar	Pyrite	
5. Minerals with fracture

Quartz	Opal	Chert
Pyrite	Garnet	

SOME KANSAS MINERALS

COMMON

Calcite
Celestite
Chalcedony (quartz variety)
Chert (quartz variety)
Dolomite
Feldspar (in river gravels – try to identify type)
Flint (quartz variety)
Gypsum
Halite
Hematite
Jasper (quartz variety)
Limonite
Marcasite
Pyrite
Quartz
Satin Spar (gypsum variety)
Selenite (gypsum variety)
Sphalerite

UNCOMMON

Agate (quartz variety) (in river gravels and glacial materials)
Anhydrite
Alabaster (gypsum variety)
Aragonite
Barite
Biotite (black mica)
Chalcopyrite
Galena
Goethite
Jarosite
Melanterite (decomposition product of marcasite)
Mica (try to identify type)
Montmorillonite (clay mineral)
Muscovite (white mica)
Orthoclase feldspar
Opal – mineraloid
Phlogopite (brown mica)
Plagioclase feldspar
Siderite
Smoky Quartz (quartz variety)

RARE

Anglesite SEKS
Allophane SEKS
Almandine (garnet variety)
Amethyst (quartz variety)
Ankerite SEKS
Apatite
Aurichalcite SEKS
Caledonite SEKS
Cerussite SEKS
Chalcanthite SEKS
Chrysocolla SEKS
Copiapite SEKS
Covellite SEKS
Cuprite SEKS
Enargite SEKS
Garnet
Goslarite SEKS
Greenockite SEKS
Hemimorphite SEKS
Ilmenite (Riley Co)
Kaolinite (clay mineral)
Leadhillite SEKS
Linarite SEKS
Magnetite
Malachite
Microcline feldspar
Polyhalite
Psilomelane
Pyrolusite
Pyromorphite SEKS
Smithsonite SEKS
Spinel (Riley Co)
Sulfur
Wurtzite SEKS

Designations based on statewide applicability. Something may be Uncommon to Common in a small area of a given county, but rare everywhere else in Kansas.

SEKS = Minerals found only in the Tri-State region of southeastern Kansas.

(compiled by Will Gilliland for 1995 “Judging Made Easy” workshop)

TIPS FOR JUDGING LAPIDARY

It helps to have some background in lapidary work. However, if you do not have the experience, consider the following points:

1. Read the minimum requirements for the class and stick with them.
2. If you do not have identification references of your own, check with a local library.
3. Tumble polished specimens:
 - i. Are they well rounded and smooth?
 - ii. Are they free of cracks and flaws?
 - iii. Is the finish polish smooth and uniform?
4. Condition of finished specimens:
 - i. Is the shape of the finished specimen uniform and/or symmetrical?
 - (1) If not, determine if deliberately cut free form
 - ii. Is specimen free of cracks and flaws?
 - iii. Is the polish uniform across specimen?
 - (1) It may help to hold specimen up to a frosted light bulb and look at its reflection on the surface of the specimen.
 - (2) Should be free of scratches under 10x lens
5. Faceted Specimens
 - a. Is girdle even around stone?
 - b. Is table flat and parallel to the girdle?
 - c. Are facets even in placement around specimen?
 - d. Are equivalent facets uniform in size and shape?
 - i. i.e., all pavilion, all crown, etc.
 - e. Does the surface have a coating? (in place of a final polish)
 - f. Should be free of scratches under 10x lens
 - g. Facets should meet in a common point where three or more come together
6. Cabochons
 - a. Does the cut and polished unfaceted stone have a domed or convex form?
 - b. Is the finish polish smooth and uniform?
 - c. Is the specimen free of cracks and flaws?
 - d. No flat areas on top above girdle unless they have beveled sides
 - i. Bevel angle and width should be constant on all sides
7. If specimen mounted:
 - a. Is specimen properly set in mount?
 - b. Is specimen securely mounted?
 - c. If held by an adhesive, is it appropriate and out of sight?
 - d. Is mount finished in an appropriate manner?

Judging Lapidary Exhibits by Larry Skelton

Lapidary work is the working or shaping of precious or more commonly semi-precious stones for aesthetic reasons. Other than for carving, most stones such as granite and other igneous rocks (as opposed to minerals) are usually excluded.

Types of lapidary work

There are four broad categories of lapidary work:

1. tumbled stones
2. cabachon cuts
3. faceted cuts
4. carving

A possible fifth category is some combination of the above three; i.e., cabachon and faceted, tumbled and faceted, etc.

Tumbled stones: May be any natural or prepared shape. Usually non-symmetrical.

Cabachon cuts: Have a rounded surface usually on one side but may be rounded on two (top and bottom) sides. May be symmetrically shaped or be freeform.

Faceted cuts: Faceted stones are usually of transparent material. Must have plane, polished surfaces; usually on top and bottom sides of stone. However, one side may be cut en cabachon or a tumbled stone may be deliberately faceted before or after tumbling. Faceted cut usually are symmetrical but may be freeform.

Carved stones: Figures or shapes carved in the round or engraved (intaglio) or raised (cameo). Carvings may range from semi-precious stones (agates, etc) to limestone, marble, alabaster (gypsum), or various igneous rocks such as granite or basalt

Judging Criteria

Tumbled stones should be polished on all surfaces with no imposed scratches visible. Grinding and polishing compounds should be removed from natural grooves and pits to maximum extent possible without marring the polished surface. (Removal may be done with a water jet.)

Cabachon cut stones should display no flats (flat areas) on the surface to be displayed (top and bottom in case of stones cut on both sides). Flats may be observed by “rolling” the stone in directed light. The girdle (edge) of the stone should be very slightly and evenly beveled to prevent chipping if set in a piece of jewelry. The display surface of the stone must be uniformly and highly polished with no visible scratches when examined by a 10x lens. If not freeform, the cut must be symmetrical.

Faceted cut stones: Equivalent facets (crown facets for example) must be even placed around the stone and must be uniform in size and shape. Facet edges must about adjacent facets in straight, sharp line. Facet corners must meet at a point with no gap or “mini-facet between them. The girdle should be a constant thickness and must be parallel to the top facet (crown facet) and culet (small bottom facet) if culet is present. All faceted surfaces must be highly polished with no visible scratches when examined by a 10x lens. Quality of the faceted stone must be considered; i.e., no interior fractures, clouds, distracting inclusions. The stone must be cut to proper dimensions/angles to maximize its appearance and to avoid “fisheyes” (dull or dead-looking reflections in the table facet caused by improper width/depth dimensions or improperly placed pavilion facets. Modern facet cutters have devised means to cut concave facets for special effects; such stones should not be penalized for lack of flat facets. Other criteria remain unchanged. The overall objective of faceting is to maximize light refracted and/or reflected from the stone. The cut of the stone should be identified (round brilliant, marquise, emerald cut, etc).

Carved stones. Carvings may be freeform or shaped. If shaped, does it resemble what the carver intended; e.g.; an animal or other living or inanimate thing (or part thereof)? Are polished surfaces free of scratches, rounded surfaces free of flats? Are unpolished surfaces present by accident or purposely left for visual effect. Difficulty of carving due to type of stone should be considered. For example, in the case of two equally well done and complicated carvings, one of granite and the other of gypsum, the granite carving would be more difficult to make because of the natural properties of the stone.

Mounted stones. Mountings may be of a metal or non-metal such as plastic, wood, etc. Mountings may be commercially procured or hand made and should compliment the stone. They should fit the stone set in them; that is, not be too large with gaps between the bezel of the mounting and edge or girdle of the stone. The edge of the bezel should be evenly burnished or crimped over the girdle. Glue or cement, if used to secure the stone in the mounting, must not be visible to the eye. Both, prong and bezel mounted stones must be solidly set and not rattle if the mounting is shaken. The mounting should be identified as to whether it is commercial or hand made by the displayer. The metal or material from which it is made (pewter, copper, sterling silver, etc) and identification of the mounted stone must both be stated.

TIPS FOR JUDGING FOSSILS

To learn the proper identification of fossils, it is necessary to learn the modern biological classification of organisms. This classification allows the user to divide organisms into groups which have common general characteristics. The first groups are very general and the last groups are very specific. The following is a list of the groups from the general to the more specific.

Kingdom	
Phylum	
Class	
Order	
Family	
Genus	
species	

When writing the name of the Kingdom, Phylum, Class, Order, or Genus of a living creature, it is always capitalized (first letter only). Additionally, the Genus and species names are underlined or *italicized* (but not both). The species name is not capitalized. Genus name on pre-printed labels should be italicized or double-underlined. The words Phylum, Class, and Genus are to be spelled out on labels.

In the 4-H geology project, the members should learn to identify Kingdom, Phylum, Class, and Genus (when possible), as this information is required in State Fair exhibits.

The four Kingdoms which 4-H'ers should learn are:

<u>Kingdom</u>	<u>Organism</u>
Monera	blue-green algae
Protista	foraminifers
Plantae	plants
Animalia	animals

The following listing is a basic outline of the more common fossils found in Kansas. It is only a guide to help you get started. There are numerous additional fossils in Kansas which you will need to research to identify. Confirm the identified fossil can occur in rocks of the age from which it was collected.

Kingdom	Monera	
Phylum	Cyanophora	ID at this level

Kingdom	Protista	
Phylum	Protozoa	
Class	Sarcodina	ID at this level
Order	Foraminifera	
Genera	<u>Triticites, Fusulina, Schwagerina</u>	
	(do not use genus unless locale ID is documented)	

Kingdom	Plantae
Phylum	Tracheophyta (vascular plants)
Class	Lycopsida (club mosses)
Genus	<u>Lepidodendron, Sigillaria</u>
Phylum	Tracheophyta
Class	Sphenopsida (horse tails)
Genera	<u>Calamites, Annularia, Sphenophyllum</u>
Phylum	Tracheophyta
Class	Filicopsida (true ferns)
Genus	<u>Pecopteris</u>
Phylum	Tracheophyta
Class	Gymnospermopsida (spore producing)
Genera	<u>Alethopteris, Neuropteris, Cordaites, Ginkgo</u>
Phylum	Tracheophyta
Class	Angiospermopsida (flowering plants)
Genera	<u>Ficus, Sassafras, Aralia, Cinnamomum, Persoonia</u>

NOTE: Petrified wood that cannot be identified to the class and/or genus should be labeled: Kingdom: Plantae
Petrified Wood **OR** Fossilized Wood

Some references use the term Division instead of Phylum for classification of plant fossils. Either is acceptable, as long as the labels in the display are consistent. The following is some of the alternate terminology.

Division	Lycopodiophyta (or Lycopodophyta)
Class	Isoetopsida
Genus	<u>Lepidodendron, Sigillaria</u>
Division	Equisetophyta (or Sphenophyta)
Class	Equisetopsida
Genera	<u>Calamites, Annularia</u>
Division	Ginkgophyta
Class	Ginkgoopsida
Genus	<u>Ginkgo</u>
Division	Angiospermophyta
Class	Dicotyledonae (oaks and maples)
Genera	<u>Cinnamomum, Ficus</u>

Division Angiospermophyta
Class Monocotyledonae (cattails and palms)

Kingdom **Animalia**

Phylum Porifera
Class Demospongia
Genera Heliospongia, Amblysiphonella, Girtyocoelia, Chaetetes

Phylum Cnidaria (formerly Coelenterata)
Class Anthozoa (corals)
Order Zoantharia
Genera Lophophyllidium, Lophophyllum, Caninia

Phylum Cnidaria
Class Anthozoa
Order Aulopordia
Genera Aulopora (attaches to surfaces)
Syringopora (chain coral)

Phylum Cnidaria
Class Scphyozoa
Genus Conularia

Phylum Bryozoa (moss animals)
Class Stenolaemata
Order Trepostomata
Genus Tabulipora

Phylum Bryozoa
Class Stenolaemata
Order Cystoporata
Genus Fistulipora (moss-like)

Phylum Bryozoa
Class Stenolaemata
Order Cryptostomata
Genera Fenestrellina, Fenestella (lace-like)
Archimedes (corkscrew)
Rhombopora (twig-like)

Phylum	Brachiopoda (two unequal valves)
Class	Inarticulata (no teeth or sockets)
Genera	<u>Lingula, Crania, Orbiculoidea</u>
Phylum	Brachiopoda
Class	Articulata (teeth or sockets)
Order	Orthida (hinge line shorter than width) (both valves are convex)
Genera	<u>Enteletes, Rhipidomella, Schizophoria</u>
Phylum	Brachiopoda
Class	Articulata
Order	Strophomenida (shell is wider than long) (hinge line goes the full width) (one valve concave, one valve convex)
Genera	<u>Derbyia, Juresania, Meekella, Mesolobus, Reticulatia, Linoproductus, Echinaria, Chonetinella, Neochonetes</u>
Phylum	Brachiopoda
Class	Articulata
Order	Spiriferida (valves are convex) (hinge line width varies)
Genera	<u>Neospirifer, Punctospirifer, Hustedia, Composita</u>
Phylum	Brachiopoda
Class	Articulata
Order	Terebratulida (valves are convex; teardrop shape)
Genus	<u>Beecheria</u>

Phylum	Mollusca
Class	Gastropoda (snails)
Genera	<u>Knightites, Bellerophon, Euphemites, Trepospira, Pharkidonotus, Worthenia, Straparolus, Amphiscapha, Turritella, Meekospira</u>
Phylum	Mollusca
Class	Bivalvia (formerly Pelecypoda)
Order	Nuculoidea (two equal valves)
Genus	<u>Nuculopsis</u>
Phylum	Mollusca
Class	Bivalvia
Order	Pterioda (valves are not equal)
Genera	<u>Inoceramus, Mytiloides, Myalina, Aviculopecten, Septimyalina, Orthomyalina</u>

Phylum Mollusca
Class Bivalvia
Order Osterina (oysters)
Genera Gryphaea, Pseudoperna, Ostrea

Phylum Mollusca
Class Bivalvia
Order Rudista (conical with a “lid”)
Genus Durania maxima

Phylum Mollusca
Class Cephalopoda (octopus and squid)
Order Nautiloidea (simple sutures)
Genus Bactrites

Phylum Mollusca
Class Cephalopoda
Order Ammonoidea (fluted sutures)
Genera Scaphites, Baculites

Phylum Echinodermata
Class Blastoidea

Phylum Echinodermata
Class Crinoidea part names allowed

Phylum Echinodermata
Class Echinoidea part names allowed

Phylum Arthropoda
Class Trilobita (trilobites – if not complete, ID parts:
cephalon, thorax, pygidium)

Phylum Arthropoda
Class Insecta

Phylum Chordata (having spinal cord)
Class Chondrichthyes (sharks – identify genus if possible)
Parts other than teeth only rarely found.

Phylum Chordata
Class Osteichthyes (fish – seldom found intact. ID parts:

		vertebrae, teeth, fins)
Phylum	Chordata	
Class	Reptilia	(turtles, mosasaurs, plesiosaurs)
Phylum	Chordata	
Class	Mammalia	(horse, camel, bison, mammoth, mastodon)
Phylum	Chordata	
Class	Amphibia	

References:

Cooper, JC, Miller, RH, Patterson, J, A Trip Through Time, 2nd Ed, Merrill Publishing Co, 1990.

Thompson, I, The Audubon Society Field Guide to North American Fossils, A Chanticleer Press Edition.

Williams, RB, Ancient Life Found in Kansas Rocks, Kansas University Printing Service.

Plant classification from Geology Curriculum, June 2007.

Labeling Discussion February 20, 2010

MINERALS

- "Calcite cone-in-cone" should be labeled as "Calcite: cone-in-cone structure".
Formation required if more than one calcite in display.
Educational, even if not scientific.
- "Garnet var. pyrope" should be labeled as "Garnet".
Variety not required unless 4-H'er is fortunate enough to collect more than one variety of garnet (rare).
- Quartz: multiple colors allowed (rose quartz, smoky quartz, milky quartz), depending on years in project. Can address in showmanship portion of points.
Multiple quartzes allowed on all levels if collected from different formations.
- Rose quartz: pinkish-red and color comes from within, not external staining. Generally found in mountain outwash.
- Sphalerite: discourage the use of the word "zinc". Could display all 3 of the following:
"Sphalerite (ruby red)" is red crystals
"Sphalerite (blackjack)" is black crystals
"Sphalerite" is the massive form
- Feldspar: identify type if more than one feldspar in display
"Orthoclase feldspar" is pinkish and found in river gravels
"Plagioclase feldspar"
"Microcline feldspar" or "Amazonite" found in mountain outwash
"Labradorite"
- Barite roses or barite walnuts
Label as "barite" or "barite rose" or "barite walnut"
Formation required if more than one barite in display
- "Moss Opal" and "Opal" are both found in the Ogallala Formation.
Use one or the other.
Can use "Pyrolusite in moss opal" with arrow to the mineral
- Halite, chert, and dolomite should be displayed as minerals, not rocks

ROCKS

- Rock dolomite should be labeled "Dolostone", a sedimentary rock
- Coal: allow all of the following:
Lignite Coal
Bituminous Coal
Bituminous Coal (Cannel)
Note: some of what was called "jet" in western Kansas is actually Cannel
- "Champion Limestone" is not a recognized term in KGS stratigraphy.
The "Champion Shell Bed" is a recognized, largely unconsolidated shell bed at the base of the Kiowa Formation
Limestone from Champion Draw should be labeled "Limestone from the Kiowa Formation"
Advisory only thru the 2011 KSF and then disallow/deduct points
- Members and formations on labels: If the name of the member is on the label, the name of the formation is not also required.
- Ironstone is oxidized hydrated assorted clays, some highly siliceous
- "Peridotite" should not be used. Use "Kimberlite" and "Lamproite".
Advisory thru the 2011 KSF, then disallowed.

- Jasperoid: Sedimentary rock from the TriState Mining Area only.
- “Quartzite” at Kanopolis is actually calcite-cemented sandstone.
True quartzite collected in Kansas is metamorphic
- Catlinite: prefer that it be listed as sedimentary rather than metamorphic

FOSSILS

- Encourage use of class Bivalvia instead of class Pelecypoda.
No point deduction as long as consistent within the display
Leaders should use Bivalvia in field guides.
KGS is using “Bivalvia” in their publications.
- Fossilized wood: Kingdom: Plantae
Phylum: Tracheophyta
Accept either “Fossilized wood” or “Petrified wood”
- Class Calcispongea is obsolete. Proper class is Demospongea.
- Genus Chaetetes is now recognized as a sponge.
Advisory (no point deduction) through 2011 KSF
- Crinoids: allow separate parts if labeled correctly OR multiple parts on a card
- Plant fossils: allow use of either “Division” or “Phylum” as long as it’s consistent within the display.
Scientific community has not agreed on which classification terminology to use.
- The words phylum, class, and genus are to be spelled out on labels. This rule will be in the 2010 KSF book.
- Mammothus is mis-spelled in several old field guides and needs to be corrected.
- Obsolete but correct fossil names: advise a couple of times, then count off.
- Genus name on preprinted labels needs to be italicized or double-underlined.

MISC

- “County” vs. “Co.”: Either is acceptable, as long as it’s consistent in the display.
- If discrepancy in literature, use what the KGS and National Geological Survey are using. We commonly use KGS literature. These are the standards the curriculum committee used.
- Specimens identified correctly, but from the wrong locale: deduct 1 point
- Current year specimens include anything collected after the previous year’s state fair. When counting minimum number of specimens, be sure to check for fall-collected specimens.
- Note to leaders preparing field guides: Be sure to spell out things like:
Quartz var jasper (instead of “jasper”)

Orthoclase feldspar (instead of “orthoclase” or “feldspar varieties”)

Gypsum var selenite (instead of “selenite”)

Kingdom: Plantae
Phylum: Tracheophyta (instead of “petrified wood”)
Fossilized Wood

Phylum: Mollusca
Class: Bivalvia (instead of “Inoceramus”)
Genus: Inoceramus

Labeling Discussion February 18, 2012

Multiples of a rock are allowed without formation name IF the source is clearly and distinctly labeled. Some specific examples include granite and quartzite.

Examples of acceptable wording for multiple granite specimens would include:

Granite from the Rose Dome

Granite (glacial outwash)

Granite (Rocky Mountain outwash)

Examples of acceptable wording for multiple quartzites would include:

Ireland Quartzite OR Quartzite from the Silver Dome

Quartzite (glacial outwash) OR Sioux Quartzite

Quartzite (Rocky Mountain outwash)

Pseudomorphs – following is some of the preferred wording:

- Quartz pseudomorph after halite (eliminates the word “variety”)
- Calcite pseudomorph after satin spar (word “gypsum” not required)
- Goethite pseudomorph after pyrite
- Limonite pseudomorph after pyrite (must streak yellow)