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## Basic cabochonning: A self-paced training module

Robert Kawka

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BASIC CABOCHONNING: A SELF-PACED TRAINING MODULE

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A Project  
Presented to the  
Faculty of  
California State  
University, San Bernardino

---

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts  
with  
Special Major

---

by  
Robert Kawka  
May 1984

BASIC CABOCHONNING: A SELF-PACED TRAINING MODULE

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Approved by:

  
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California State College

San Bernardino

BASIC CABOCHONNING:  
A SELF-PACED TRAINING MODULE

A Project Submitted to  
The Faculty of the School of Education  
In Fulfillment of the Requirements of the Degree of

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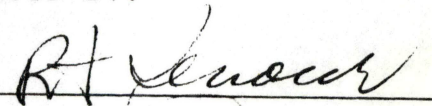
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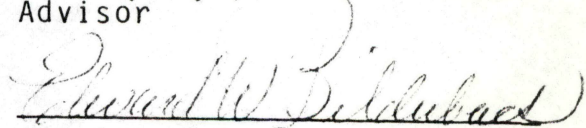
Robert T. Kawka, M.A.

San Bernardino, California

1983

APPROVED BY:

  
\_\_\_\_\_  
Advisor

  
\_\_\_\_\_  
Committee Member

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## INTRODUCTION

Lapidary is a hobby enjoyed by over 300,000 people (Leiper and Kraus, p. 2). For many, it is both a vocation and an avocation. There are no age or sex barriers. It is an activity that encourages one, including those with physical handicaps, to participate to the best of his or her ability.

As a vocation, lapidary offers many advantages--the freedom to set your own hours of work and the freedom to be as creative as you wish by choosing how much of the lapidary process with which you wish to become involved.

Lapidary has many facets--collecting materials in the field, collecting and cataloging of the minerals (Monsell, p. 78), cutting, carving and/or faceting of stones, metal work, and other related crafts. Each of these activities is a part of the field of lapidary (Zeitner, p. 575).

Lapidary does not have to be a solitary activity, for at last count there were over 600 amateur gem clubs in North America (Leiper and Kraus, p. 1). As another alternative to do-it-yourself, in recent years there have been a number of schools, both private and public, offering an impressive array of lapidary courses. While most of the courses appear to be jewelry making or geology courses, more programs are starting to offer rock cutting courses. What is

impressive about the list is that every state in the union has courses within reach of the population. These listings do not include the vast numbers of adult education courses offered by local school districts. Furthermore, many rock shops offer various levels of instruction from handing you the instruction manual and telling you how to set up your newly purchased equipment to full-fledged formal courses in cabochonning and other lapidary skills. With all these activities, how does one begin? Many novices to the field start out with simple gemstone cutting, or cabochonning, which consists of eight stages:

1. Sawing the rock into slabs, or precut slabs may be purchased.
2. Making an outline of the shape you desire to cut on a slab.
3. Trimming the marked stone to the rough shape.
4. Dopping or affixing a handle.
5. Grinding to final shape.
6. Removing by sanding the scratches from the grinding operation.
7. Polishing the gemstone.
8. Mounting into a piece of jewelry if desired. (Leiper and Kraus, p. 2)

This paper will address itself to the teaching of cabochonning, or basic gemstone cutting.

## STATEMENT OF THE PROBLEM

For the novice trying to learn cabochonning, he or she will encounter literature that is generally confusing and oftentimes insufficient to meet the needs of a beginning student. In a formal class the beginning student must often wait until an instructor is available or another more advanced student is willing to help one get started.

There is a need for a self-paced, instructional training package utilizing the principles of educational technology to produce an attractive, educationally sound instructional module teaching cabochonning which will allow the student to set his own time schedule and his own pace.

## DEFINITION OF TERMS

- Cabochon: A gem cut with a rounded or domed top. It has no facets and the outline may be circular, oval, or elliptical.
- Dopping: Fixing a short handle to a stone or gem with wax or other adhesives for easier manipulation during the grinding, sanding and/or polishing processes.
- Enabling objectives: Those skills which support the learning of performance objectives either because they are essential prerequisite skills required to learn the target objectives or because they facilitate such learning. (Gagne', p. 137)
- Lapidary: A person working with gems or stones. The art of cutting, polishing, or engraving gems or stones.
- Slabs: Rocks that have been cut into slices.



## REVIEW OF THE LITERATURE

In the review of the literature, initially it appeared that there is a wealth of information on cabochonning, with articles ranging from "Where to Write for Everything" and "Shop Safety," on through "Cabochon Cutting, A Guide for the Beginner." Entire books were devoted to "Techniques of Gem Cutting," Yet, from the viewpoint of an educator, a great majority of the books reviewed exhibited a severe lack of the application of educational principles while purporting to teach cabochonning. Lack of organization was common with examples such as those found in Dr. Dake's book, The Art of Gem Cutting, in which he discusses "Polishing the Gems," (p. 31), "A Slow Speed Polishing Technic"(sic), and finally, "The Theory of Polishing," (p.37). From the content of "The Theory of Polishing," one would normally anticipate this chapter to be placed before the others or the other two chapters to be incorporated into "The Theory of Polishing." Dr. Dake then discusses "Cabochon Bezel Angles" (p. 41) after polishing. The problem here is that the cabochon must first be cut to the angles Dr. Dake describes and then polished. This progression could mislead the novice into making a rather drastic mistake. What should be noted is that this is the seventh edition of this book!

Dr. Dake's book is not an isolated example of an

educationally unsound tutorial. In one of the standards of lapidary, Cabochon Cutting, by Jack R. Cox, Mr. Cox discusses "Grinding Gemstones" by first describing "The Grinding Unit," "The Steps in Grinding" (p. 17), "The Wheel Care" (p. 21), "Other Grinding Equipment" (p. 21), "Grinding Techniques" (p. 22), and "Hints" (p. 23). The student can become confused by the material between the "Steps in Grinding" and "Grinding Techniques." Mr. Cox talks about making templates and trimming the slab on page 12 but does not discuss using a trim saw to trim the slab for grinding until after grinding and polishing. Since the next step after the outline on the rock slab is to trim the excess material from the slab, the student is led through an illogical sequence without further explanation. Examples of illogical sequencing are prevalent in many of the texts on the teaching of cabochonning.

A number of the books place emphasis in other areas, i.e. jewelry making or tumbling, but still attempt to teach cabochonning almost as an afterthought. An example of how this can cause confusion for the novice is found in Dinwiddie and Macfall's book, The Complete Book of Rocks, Minerals, Gems, and Fossils. The authors discuss cabochonning on page 148 and in one paragraph on page 149. Many important steps are omitted, such as telling the novice to wash with soap and water before going on to the next

wheel or sanding belt. An oversight such as this can ruin some very expensive polishing wheels. Mr. Jack Cox, in So You Want to Cut Gem Stones!, third edition, sixth printing, devotes three-fourths of a page to cabbing. Janet Barber, in Pebbles as a Hobby, devotes almost a page to cabochonning from a flat stone. The problem appears to be one of very knowledgeable authors expecting others to be able to work from very minimal data. They appear to have not encountered the concept of formative evaluations which can provide "data on the basis of which to revise and improve the materials" (Gagne' p. 37) or the characteristics of the population for which they are writing.

Another category into which the literature grouped was characterized by confusing directions, such as Frank Long in Creative Lapidary. He makes statements such as, "Some stones with high crowns are not cut with a girdle; the steep slope of the sides furnishes the angle against which the bezel is burnished" (p. 54). What is the goal of this statement? The picture to which he references is six pages prior to this description, plus there is confusion as to what is meant by 3-3:1, as there is no picture designated with that number. Nance and Ron Perry, in Practical Gem Cutting, use directions such as, "Grind a small bevel around the back corner of the blank." The only question is where is the "back corner" on an oval? The Perrys and Mr. Long are

not alone in confusing statements. Mr. Girsoff, in Working With Gemstones, uses terms such as "strict abrasive hygiene is obviously a must" (p. 97). To the neophyte nothing is obvious, and yet nowhere does the author explain "abrasive hygiene."

While the above books all purport to teach cabochonning, most are not well designed from the educational viewpoint. The overall impression is that many authors are more interested in showing off what knowledge they have accumulated over the years rather than teaching a student cabochonning. Few appear to have defined their populations for which they are writing. Most of the authors appear to have trouble developing clear cut enabling objectives.

Examples of having overlooked the prerequisites or the enabling objectives are found in Scarf's book, Techniques of Gem Cutting: A Lapidary Manual, and Gem Cutting Shop Helps, by Leier and Kaus, in which both authors fail to emphasize the washing of the stone with soap and water between steps. The significance of this missing operation is that if the stone is not washed between steps, a single piece of coarse grit can become embedded in the next finer wheel or sanding cloth and then scratch every stone worked on that equipment.

While some authors place comments in their books

addressed to the novice, the overall content of the book, as exemplified by greater detail and extensive use of technical terms, tends to overwhelm the beginner. John Sinkankas' book, Gem Cutting, is a tremendous volume but is a little too overwhelming in that he has provided the beginner with 54 pages of information on grinding and sanding. There is too much detail about exceptions and specific problems encountered when working specialized stones, most of which the novice will not encounter until later on in his career as a gem cutter.

While many of the books and articles do not appear to be written for the novice, there are books that do appear to be oriented toward the novice. Martin Walker's book, Gem Cutting is Easy, appears to have been well thought out and guides the novice throughout the various steps in a logical fashion. Geldart, in Hand Lapidary Craft, presents a well structured approach for the novice. And while Mr. Geldart generally prefers to work only with non-electric tools, the processes involved are directly applicable to learning to cabochon on power equipment. Hutton, in Practical Gemstone Craft, makes excellent use of visuals in teaching basic cabochonning. For the advanced student, John Sinkankas produced a unique compilation of references in his Gemstone and Mineral Data Book, which can be extremely useful to the intermediate or advanced student. Jack Cox, in both Advanced

Cabochon Cutting and Specialized Gem Cutting, has provided good resources for the experienced cabochonner.

This review has served to further emphasize the need for better written instructional programs for training the novice in basic cabochonning. However, the problem in teaching cabochonning appears to be the same as Sperisen reported (p. vii). "It is a singular fact that although the art of lapidary has been practiced since the earliest recorded times, little is known of the techniques used by the skilled artisans." Long states, "Since there are no practitioners in the lapidary field academically qualified to teach on the college level, it is not surprising that lapidary classes are not offered at any major art schools or universities in the country" (p. 7). These two quotes indicate the current lapidary dilemma--the need for better instructional materials and greater involvement of the professional educator.

## STATEMENT OF OBJECTIVE

The objective of this media project is to produce a self paced training module to teach cabochonning.

## DESIGN OF THE PROJECT

The project has been designed as a slide-tape program.

The program takes approximately 25 minutes to view without stopping for the various operations. It is expected that the student can produce his or her first cabochon in 1 1/2 hours to 2 hours. The next 2 cabochons should not take more than one hour a piece.

It is suggested that only one cabochon be cut per day.

To successfully complete this project, the student will either need to gain access to or purchase equipment and supplies which are similar to those shown in the module. A list of manufacturers is included in the reference section. The student is provided with a materials packet containing a 40 X 30 oval tracing, three rock slabs, and a set of grinding patterns.

The suggested program is for the student to view the program in its entirety then to go through the program stopping and completing the various operations where indicated.

For large group or class orientation, it is recommended that the instructor review the program prior to its showing. This preview will allow the instructor to



collect materials such as the alcohol lamp, wax, and other pieces of equipment explained in the program.

It is also suggested that the instructor note where the various pieces of apparatus used in his particular class differ from those shown in the module and explain the differences at the conclusion of the presentation. As with all motorized equipment, it is recommended that the instructor review the safety rules with the students before allowing them access to the equipment.

## RESULTS

The first version of the training module, Basic Cabochonning, was tested using 4 boys and 1 girl who were classified as sixth graders and by an adult female.

Several problem areas appeared. The first was that of length of the program. Since there were no clearly defined stopping places, the students tended to listen to the program far beyond a logical stopping point for a particular operation. This resulted in confusion on the part of the student. This problem was corrected by the insertion of various forms of the command "stop the tape and complete the operation." There was some confusion on handling certain items of equipment such as the scribe. Areas where there was confusion regarding the description of a process or the handling of a piece of equipment were corrected, usually by expanding the instruction.

The revised version of Basic Cabochonning was tested on 3 more sixth graders, 1 girl and 2 boys, ages 11-12. During this run, the only item noted was that the students tended to check with the teacher, primarily for reassurance and then only on an average of three times during the presentation.

## Conclusion

Therefore, the conclusion is that the training module Basic Cabochonning meets the objectives of teaching basic cabochonning to the students tested.

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## APPENDIXES



## DIRECTIONS TO THE STUDENT

To view this program, a slide projector and tape recorder capable of accepting an inaudible sync signal of 1000 Hz. is required. A screen or blank wall must be available. Room lighting should be at a low enough level to offer comfortable viewing.

Adjust the sound level on the tape recorder to a comfortable level, set the slide tray on the projector with the number "0" showing, and turn on both the slide projector and the tape recorder. If you are simply reviewing this module, no further preparations will be needed.

### IF YOU PLAN TO CABOCHON OR CUT ROCK:

1. You will need to either purchase or gain access to: A combination lapidary outfit, such as a Lortone BEA82 or a Lortone BEA84 or equivalent, and wet sanding belts of 100, 220, 400, and 600 grit, or a Diamond Pacific "Genie" or equivalent.
2. Dopping equipment using either the Happy Dop system or 3/4" to 1" dowels and dopping wax with an alcohol lamp and fluid.
3. A trim saw such as the Lortone FS66-C or equivalent, or a rock scriber such as the Quik-Trim or its equivalent, and a pair of pliers.

4. An aluminum pen that can be made by cutting off a 6" long piece of common clothes line wire and sharpening one end with a file or wheel.

5. Safety glasses and an apron.

#### DIRECTIONS FOR VIEWING

It is suggested that you first view the complete program without stopping. The second time through, stop and perform the operations where indicated.

You have three rock slabs in your materials packet. You are expected to finish all three slabs. Follow the slide tape program while cutting each slab. This step is important to insure that you will become familiar with the acceptable techniques of cabochonning. Upon completion of your third slab, if you are interested in additional information, a starting point would be the selected references on the next page. They should be available from your library, local rock shop, or the listed publishers.

GOOD LUCK AND WELCOME TO THE EXCITING WORLD OF LAPIDARY!

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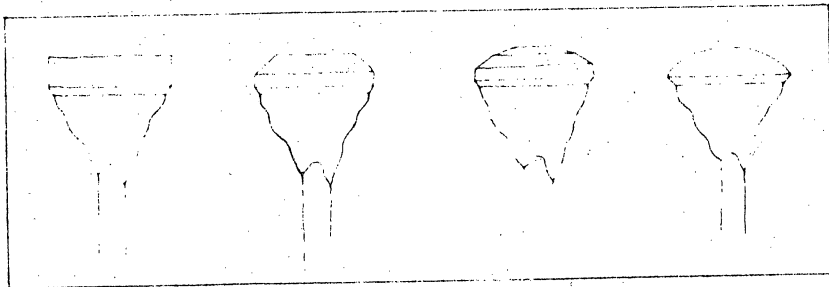
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#### EQUIPMENT SUPPLIERS

- Beacon Engineering, P.O. Box 307, Rothsay, MN 566579 (Slab and trim saws)
- Covington Engineering, P.O. Box 35, Redlands, CA 92373 (Drills, polishers, grinders, etc.)
- Dalmar Mfg. Company, 2904 W. 95th Street, Chicago, IL 62311 (Cabochoon equipment)
- Diamond Pacific Tool Company, 25647 W. Main Street, Barstow, CA 92311 (Cabochoon equipment)
- Gryphon Corp, 101 E. Santa Anita Avenue, Burbank, CA 91502 (Saw, saw blades and cabochoon equipment)
- Jenkin's Lapidary, 6226 SE 71st Ave., Portland, OR 97206 (Slab saws)
- Lortone, Inc., 28566 NW Market Street, Seattle, WA 98107 (Cabochoon equipment)
- Reytech Industries, P.O. Box 6, Stafford Springs, CT 060766 (Cabochoon equipment)



Grinding Patterns

S C R I P T

F O R

S L I D E / T A P E P R O G R A M

Title slide:  
 Basic Cabochonning  
 1

1. Music and title slide

Credit slide:  
 Presented by  
 Bob Kawka, M.A.  
 2

2. Credit slide and music

(Fade out music)

Man and woman  
 3

3. Hello. I want to welcome you to the exciting world of rock cutting.

Man  
 4

4. During the time you are with us you will learn the basic steps for rock cutting, which is called

"cabochonning"

Sun bather

5

5. This fun hobby can be both relaxing

Dollar (\$) sign

6

6. and profitable.

Timer

7

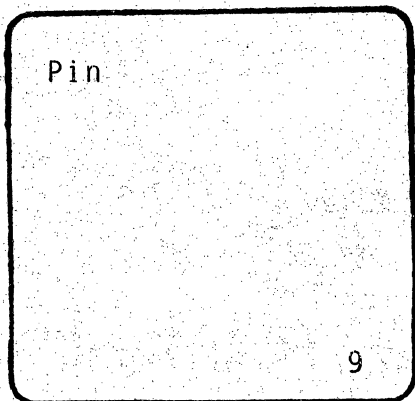
7. Most stones can be cut and polished in less than half an hour, so you can quickly see success.

Belt buckles and necklaces

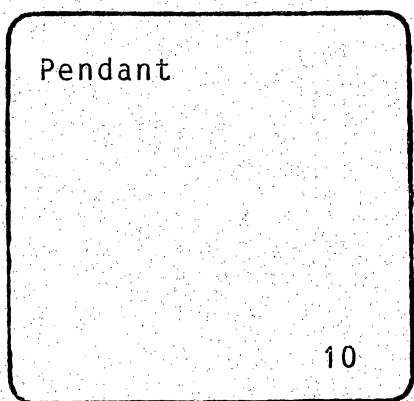
8

8. Then your stones can be mounted into readily available mounts like these belt buckles and necklaces, or

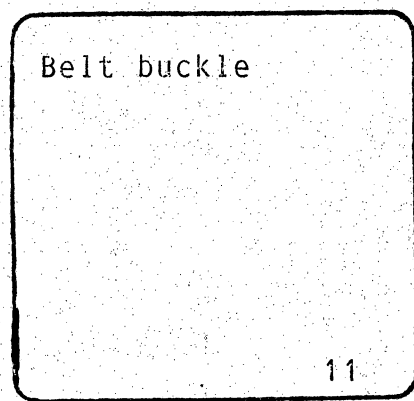




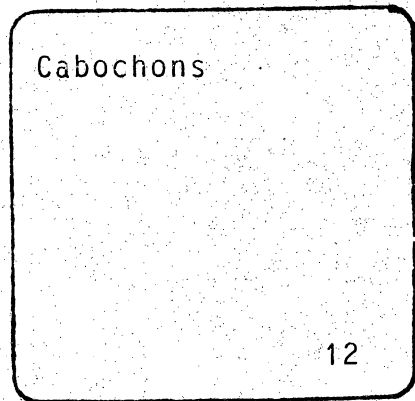
9. you can design your own mounts such as these custom-made mounts, like this pin



10. or this pendant



11. or this beautiful belt buckle.



12. You may even prefer to just build your own collection of cabochons from rocks you have collected in the field. These cabs shown here were collected from many places in the southwestern United States.

Title slide:  
How Do I Start?

13

13. To start, you will need to know about the equipment you will use for cutting, grinding, and polishing your cabochons.

Templates

14

14. First, you will need a template. As shown here, there are many types and many shapes.

40 x 30 mm oval

15

15. For this course, you will be working with the 40 x 30 millimeter size. The 40 x 30 is popular and many mountings are available for this size. We have included a 40 x 30 paper template in your materials packet to help you get started.

One template

16

16. Later on, you will want to obtain a metal template.

Two metal pencils

17

17. For tracing the outline of your template, you will need an aluminum or copper wire pencil.

Pencils and wire

18

18. These can be made from any stiff piece of heavy gauge wire. We use aluminum or copper because they will not wash off easily during the grinding processes.

Sharpening the wire pencil

19

19. To make a pencil, first cut off a piece of heavy gauge wire about six inches long and sharpen it with a file or on your grinder.

Trim saw

20

20. For the next step, you will need access to a trim saw,

Nippers

21. rock nippers,

21

Scriber and pliers

22. or scribing outfit.

22

Title slide:

Rock Saws

23. Rock saws are generally classified into either slab saws or trim saws.

23

6" Trim saw

24. Trim saws are usually six inches in diameter or smaller. They are called trim saws because they are used to trim off excess material prior to grinding.

24

8" Trim saw

25

25. The larger saws, which are usually eight inches or larger, are used to cut the raw material into slabs.

Literature

26

26. As with all rock equipment, be sure to read and follow the manufacturer's recommendations for operation and safety.

Woman with safety glasses

27

27. A good rule of thumb is to always wear safety glasses when grinding or cutting rocks.

Woman and apron

28

28. An apron is also useful when grinding.

Two grinding  
wheels

29

29. In cabochonning, all of the shaping is done on the grinding wheels. Here is one type of grinding outfit.

One grinding  
wheel

30

30. This unit uses a single silica carbide grinding wheel for shaping,

One sanding wheel

31

31. and for the polishing steps it uses a wet sanding wheel.

Polishing LAP

32

32. The round plate at the end is called a polishing lap.

Six diamond wheels

33

33. This second type of grinder uses all diamonds for cutting and polishing.

Three diamond  
wheels: 80, 220,  
280 grit

34

34. Here we have both an 80-grit coarse and a 220-grit fine grinding wheel. But instead of sandpaper, the four additional

Three diamond  
wheels: 1200  
1500  
14000 grit

35

35. diamond wheels are used for the polishing.

Man with rock

36

36. Now that you have seen the equipment, let's get started. To begin, you will need to select material to cut.

Three slabs

37

37. We have included in your materials packet three rock slabs. Later you may wish to obtain additional material at your local rock shop, rock shows.

Mountain

38

38. or you can go find material in the field.

Three dry slabs

39

39. To judge how a slab will look when polished, wet it. This is a before

Three wet slabs

40

40. and after comparison of the same slabs.



Two slabs in hands

41

41. For your first cab, I suggest you pick the slab you like the least and put the other two aside for later. Please stop the tape and select your stone. Otherwise, the tape will begin again in 5 seconds.

Slab behind template

42

42. Once you have selected your material, then use the template to outline the area you want to cab.

Tracing the oval

43

43. Hold the pencil tilted as shown, press down hard

Oval drawn on slab

44

44. and trace the outline several times to insure that you have a good clear mark. Please stop the tape and draw the 40 x 30 outline on your stone. Otherwise, the tape will continue in 5 seconds.

Trim saw

45

45. Now you are ready to trim off excess material with the trim saw or the scribe. Try to trim to within  $\frac{1}{8}$  of an inch from the outside of your cabochon.

Water supply for  
the trim saw

46

46. If you choose to saw, please remember to check the fluid level of your saw. Diamond saw blades cannot be run dry.

Worn and safety  
glasses

47

47. Be sure you are wearing safety glasses

Worn and apron

48

48. and your apron.

Trimming a slab

49

49. When sawing, push equally on both sides of the rock. Push gently as the saw will only cut so fast, no matter how hard you push. This slow, equal pressure will also help prevent bending or warping of the blade.

Blade guard up on trim saw

50

50. In this second picture, the guard is up only to show the position of the blade and rock. Do not operate the saw with the guard in this position. Please stop the tape to complete your sawing. Otherwise the tape will start in 5 seconds.

Scribing a slab

51

51. The second technique to remove excess material is called scribing. To scribe, lay the rock on a flat surface and draw a line with the scribe, pressing down very hard, with your thumb on top. Be sure to draw the line all the way across the rock. You may have to scribe over the same line several times to get the mark deep enough for the next step. Remember to work with only one line at a time. Please stop the tape and scribe the line on your stone. Remember to press down very hard with the scribe. This tape will resume in 5 seconds.

Breaking pieces  
from the slab

52

52. Then break off the piece you scribed with nippers or a set of flat pliers. Then scribe the next line. Remember that the more excess material you remove here, the less time you will have to spend on the grinding wheels. Stop the tape and break off the rock with the nippers or pliers. The tape will continue in 5 seconds.

A trimmed slab

53

53. Now that you have trimmed off the excess material, you are ready to begin grinding.

Grinding a slab

54

54. Start with the coarse wheel. In this picture we are using the 80-grit diamond wheel. In grinding the material around the outline, hold the stone so that the wheel cuts from the bottom to the top of the stone. As a reminder, use moderate pressure and move the stone from side to side across the face of the wheel.

Hand rest for  
grinding

55

55. Some prefer to use a rest which positions the rock at the correct angle as shown here. Do not grind completely to the outline you drew. Try to leave about  $1/16$  of an inch for later fine grinding and sanding.

Measuring slab  
size behind  
template

56

56. You will want to keep checking the size of your stone against the template or mounting as you cut. Stop the tape and grind your stone. The tape will continue in 5 seconds.

Washing the stone

57

57. Since the next two steps are to be completed using the fine wheel, please wash your stone and hands with detergent before continuing. Please stop the tape and wash your stone now. The tape will begin in 5 seconds.

Grinding the stone

58

58. To avoid leaving a sharp edge around the base of the stone, chamfer the bottom edge of your cab on the 220 grinding wheel. Cut a 45-degree angle all the way around the bottom of your stone. Please stop the tape and cut the chamfer around the bottom edge of your stone. The tape will begin in 5 seconds.

Grinding stone with  
80 grit

59

59. Now finish grinding your stone around the outside edge almost to the outline leaving just a little material, about 1/32 of an inch, or about the thickness of your thumb nail. Stop the tape and finish grinding the edge of your stone. The tape will resume in 5 seconds.

Measuring slab  
behind template

60

60. Again check for size with the template of the actual mounting you will set the finished stone in. Stop and check for size.

Washing stone

61

61. Then wash and dry your stone very carefully with soap and water. This tape will begin in 5 seconds.

Title slide:  
Dopping

62

62. Dopping is the process of affixing a handle to a stone so that the stone may be worked more easily. There is no set rule as to when you should dop. Many people dop before grinding. Others dop after completing the grinding process. Some never dop. As you gain experience, you will decide on what works best for you.

Dowel sizes

63

63. For the dop handle, doweling in various size diameters as shown here is available at your local hardware stores. Other items that can be used for dopsticks are clothespins, nails, and commercially-made spun aluminum dops called Happy Dops. It is a good idea to have an assortment of sticks of varying diameters to take care of all sizes of stones.

Alcohol lamp

64

64. The materials you will need for dopping will include an alcohol lamp, which uses denatured alcohol, to produce a flame that doesn't leave carbon.

Items used for dopping

65

65. Here are the four elements used in traditional dopping: the wax, the alcohol lamp, a dish of cool water, and your dopstick.

Melting the dop wax

66

66. The first step is to heat the wax over the alcohol lamp until the wax just starts to drip.

Putting wax on dopstick

67

67. Then transfer the hot wax onto your dopstick. Repeat this operation until you have built up a pyramid of wax on the tip of your dopstick. If you choose to use this dopping method, then stop the tape and build up the wax on your dopstick. The tape will resume in 5 seconds.

Drying stone over  
lamp

68.

68. Dry the bottom of your stone very carefully with the alcohol burner. Hold the stone with your fingers. This technique will prevent you from overheating the stone. It should never be too hot to touch. Stop the tape and dry your stone. The tape will resume in 5 seconds.

Softening wax on  
the dopstick

69

69. Place the stone, bottom side up, on a flat surface. Then reheat the wax on your dopstick. Be careful that wax does not run and drip on the counter. Also, be patient when heating large masses of wax to let the heat penetrate completely through the wax.

Pressing dopstick  
onto stone

70

70. When the wax is very soft and just starting to run, invert the stick and push down on your stone being careful that no wax spills over the side of your stone. If this occurs, dip your fingers in the cool water and peel the wax away from the sides of your stone.

Pushing wax onto  
bottom of stone

71

71. Then push up the wax around the underside of your stone being careful not to get any wax on the top and sides of your stone. Set aside your dopped stone and let it cool slowly to room temperature. Stop the tape and complete this operation now.



Wax pot

72

72. This device is a wax pot, which uses a light bulb to heat up the wax rather than using an open flame.

Twirling dopstick  
in wax pot

73

73. To use the wax pot, simply twirl the end of your dopstick in the molten wax until you have enough wax on the end of your stick.

The Happy Dop

74

74. A second dopping technique uses the materials shown here. Before starting you will need to clean the top of the metal plate and the bottom of your rock with alcohol. Stop this tape and clean your rock and the metal plate with denatured alcohol.

Cutting tape to fit  
the Happy Dop

75

75. Next, trim the double-sided tape to fit the top of the metal plate. We suggest that you use the double-sided mirror tape rather than double-sided tape that doesn't have the sponge material in the middle.

Placing tape on  
back of stone

76

76. Now press the white or sticky part of the tape firmly against the bottom center of your rock. Trim and stick the tape to your stone now. The tape will resume in 5 seconds.

Pressing Happy Dop  
onto stone

77

77. Peel off the protective cover from the other side of the tape and press the metal top of your Happy Dop firmly against the tape. Please peel off the protective cover on the tape and stick your happy dop to the tape now. The program will resume in 5 seconds.

Four cabochons

78

78. You are ready to begin shaping your stone. These are the steps you will use in shaping your stone. There is a copy of this diagram in your materials packet. The picture on the left shows the stone mounted on the dopstick. The second picture shows your first cut around the edge of your stone. The third picture shows the next cut, which further grinds away the top edge of your stone. The final picture shows the traditional cabochon shape. Notice that there is no flat spot on top and the sides are symmetrical or even all the way around. There is also an edge all the way around the stone.

Grinding stone  
using 80 grit

First cut

79

79. Let's practice cutting our stone following the diagrams. Our first step is to cut the top edge off the stone all the way around as we are doing here. Remember to move your rock back and forth across the face of the wheel and use moderate pressure. Please note: When holding the dopstick, place your hands as close to the stone as possible. My hands are back for the purpose of demonstration only. Stop the tape and make your first cut around the top of your stone now.

Grinding stone  
Second cut

80

80. Here we are making the next cut. Stop the tape and make your next cut around the top edge where the first cut stopped.

Final shaping cut

81

81. In this final shaping cut you will work on smoothing out the other cuts. Try to produce the rounded shape shown here. Stop the tape and finish rough shaping your stone.

Washing stone

82

82. After you have rough shaped your stone, wash and dry it well. Normally, you will be washing and drying your stone a number of times for each operation. Also, a very dry stone is the only way to check on the progress of your grinding and polishing. You will also be washing your stone every time you change wheels or sanding belts. This prevents large grit from being carried to smaller grit wheels which could result in the scratching of your stone. Stop the tape, wash, and check your stone for uneven spots or spots not covered with scratches and correct if necessary.

Grinding stone  
220 grit

83

83. Now that you have completed your rough shaping operations, move to the next wheel where you will again regrind the entire surface of the stone. Here you will finish shaping the stone and replace the large scratches made by the first wheel with finer scratches.

Sanding stone

84

84. If you are using a sanding belt for your next step, then work your stone back and forth across the sanding belt just as you did on the grinding wheel. Stop the tape and grind your stone on the second wheel or coarse sanding paper. The tape will resume in 5 seconds.

Examining stone  
under magnifying  
glass

85

85. At this point, check your stone with a magnifying glass to see if there are any areas that need to be reworked. You should see the whole surface of your stone covered with fine scratches. Stop and check your stone. Regrind any area that has coarse scratches. The tape will resume in 5 seconds.

Changing sanding  
belt

86

86. If you are finished using that grade of sanding paper, stop the machine and remove that sanding belt to replace it with the next finer grade of sanding paper.

Profile of  
cabochon

87

87. Let's review what you have done to this point. You first mounted your stone onto a dopstick with wax or tape. Then you made your first cut around the top edge of the stone at a 45-degree angle. Your second and third grinding passes rounded the stone and completed the shaping process. You then made your smoothing cuts on the second wheel.

Six cabochons

88

88. Looking at your stone from the side, it should look like figure "a." If it looks like figure "b," the sides are too steep for a standard bezel setting. In figure "c" there is a flat spot on top which usually results in a dull appearance in that area. Figure "d" has an unpolished, wavy edge. This was caused by excessive wax buildup on the sides. Figure "e" is an asymmetrical shape, which is caused by mounting the stone crookedly on the dopstick. Figure "f" is the most common error among novices. It is too shallow, and there will be a tendency for those sharp edges to break off in the mounting.

Grinding on 280  
grit

89

89. Are you ready for the polishing steps? They will go very fast. The next wheels

Sanding

90

90. or sanding belts will not cut your stone any further but will only polish it. In this picture you simply work the entire surface of your stone using moderate pressure. The total time you should spend on this wheel or belt is about 30 seconds to one minute. Stop the tape and polish your stone. Otherwise, the tape will continue in 5 seconds.

Inspecting stone  
under magnifying  
glass

91

91. Inspect your stone with a magnifying glass. If the surface of the stone is the same all over, then wash it,

Changing sanding  
belt

92

92. change to the next finer grade sanding belt,

Polishing on 1200  
grit

93

93. or go to the next wheel. Repeat the procedure of working the surface of your stone back and forth across the wheel, inspecting your stone with a magnifying glass to be sure you haven't missed any areas, wash the stone,

Polishing on 1600  
grit

94

94. and go to the next wheel. Inspect, rework if necessary, wash,

Polishing on 14000  
grit

95

95. and go to the next wheel. Stop the tape and complete polishing your stone, remembering to wash between steps.

Washing stone

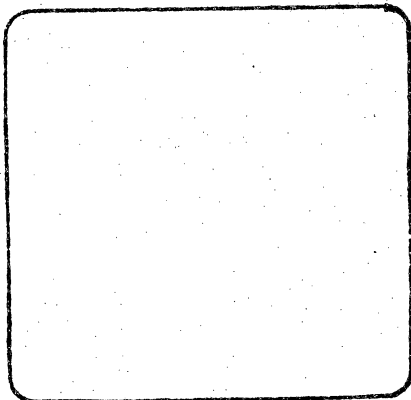
96

96. After you have polished with your highest grade of sandpaper or polishing wheel, again wash,

A dry stone

97

97. then dry,





Examining stone  
under magnifying  
glass

98

98. and inspect your stone. If the stone's surface is not of uniform appearance, it will be necessary to go back to your fine grade grinding wheel or your coarse sanding belt. Do not go to any polishing wheel. Then rework your stone through the various steps of grinding, inspection, wash, and polish until you have corrected the problem. Stop and inspect your stone now and take any corrective steps necessary. The tape will resume in 5 seconds. If the stone passes inspection for shape and uniformity of surface and you like the gloss, then you can stop here.

Polishing stone on  
polishing lap

99

99. However, some stones need the final polishing using the polishing lap shown here. To use this polishing lap, first be sure your lap is charged with the suggested polish, be it 50,000 grit diamond or tin oxide, then press the top of the stone against the outer third of the polishing lap using medium pressure.

Polishing stone on  
polishing lap  
(wiping stone  
upwards)

100

100. Wipe the stone upwards. Rotate the stone, and do it all again until the entire stone has been polished. Again, the total time for this final polish shouldn't take more than one minute. Stop the tape and complete your inspection and final polishing. The tape will continue in 5 seconds.

Removing stone from Happy Dop 101.

To remove the stone from the Happy Dop, carefully pry off the stone. If your stone is dopped with wax, place it in the freezer or a bowl of ice and water for 30 minutes to an hour. When the wax contracts from the cold, the stone should pop off.

101

Examining dry stone 102.

Wash the stone again, dry it, and admire your cabochon. Stop the tape and remove your stone from the dopstick. The tape will continue in 5 seconds.

102

Stone in mounting 103.

Here's what we did with our cabochon. What will you do with yours?

103

Two slabs

104. To quickly review cabochon production, first select your rock.

104

Tracing oval

105

105. Trace the design of the template on your rock slab.

Trimming slab

106

106. Trim the excess material.

Shaping stone

107

107. Shape your stone on the coarse wheel.

Dopstick

108

108. Wash and dop, using either the Happy Dop

Materials used in  
dopping

109

109. or the dopping wax.

Grinding stone

110

110. Grind to cabochon shape on the  
first wheel.

Grinding on 220  
grit wheel

111

111. Wash, inspect, and smooth grind on

Sanding wheel

112

112. the next wheel

Sanding on 280 grit  
wheel

113

113. or sanding belt; and repeat the  
wash, inspect,

Polishing on 1600  
grit

114

114. polish procedures until you complete  
your stone on

Polishing lap

115

115. the final polishing lap.

A case of cabochons

116

116. Remember, we asked what will you do  
with your cabochon? Here are some  
examples of what others have done  
with their cabs. Some people like  
to display their work in cases like  
this.

Pendant

117

117. Others like to create their own mountings. Whatever way you choose to show off your cabochon is up to you.

Man and woman  
by machine

118

118. Now that you have been through the complete course, if there are any areas that you feel need to be reviewed, please do so now. Also, if you want to learn more about any of the techniques used here, please check the selected bibliography included in your materials packet. However, the best way to learn is by doing--so if you are ready, let's begin.

Please rewind this tape and reset the slide tray to the start slot or 0.

Fading music.