



Agates are the easiest to polish.



Tumbling sodalite can be tricky because it chips easily, but it is beautiful when shiney!



Moss agates are simple to polish and the shine is amazing!

NOTES:



Rock Tumbling for the Beginner

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Materials for Your First Tumble:

- Rocks to tumble (AGATES or all one kind or of same MOH – 7 or above)
- 60/90 grit
- 120/220 grit
- 500 grit (or Pre-polish or Tripoli)
- Polish (start with Tin Oxide)
- Tumbling media – I use plastic beads, the ones I get are used to fill dolls
- Paper Towels
- Water
- Sponge – one for each grit level (4-5)
- Strainers (4-5)
- Machine oil

Tools needed:

- Rotary tumbler
- 1 Barrel for each level (4-5)
- Scale (I have an inexpensive digital scale)

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***Children should always be supervised by a responsible adult.**

Whew! Got it all? Agree to the terms? Then please, read on, be safe and have FUN!

If you have questions, please do not hesitate to contact me.



Agates from the Queen Charlotte Islands. This is a good group to tumble. Minor pits, no huge crevices or evident cracks. Each rock is 1 inch in diameter or less.

Step 1: SELECT YOUR ROCK

The first and most important step involves picking your “rough”, or the rock you want to tumble. The most rewarding to begin with are agates – especially Montana spotted agates! I know amethysts and rubies are beautiful, but they’re not the best first choices for tumble polishing; quartz stones, like amethyst, tend to crackle and fracture easily and rubies take FOREVER to get a decent shape and polish (to find out why check out where they are on the MOH scale)!

You can find your own stones in the “wild” on lake shores, riverbanks, ocean beaches, in the middle of a prairie, your driveway, at a park, farm or mine, or you can go to a rock hobby supplier, some folks even visit pet stores that sell aquarium stone!



This is a Montana spotted agate – notice how lovely the shine is!

HONESTLY – GET AGATES for your first batch, second and third...then experiment! Trust me on this one.

The agate to the left is a Montana Spotted Agate and they are wonderful to tumble because they are amongst the easiest to shine and thus the most satisfying to learn with.

Choose stones with a MOHS of between 5 & 7. Softer stones may never polish in a tumbler or they might require special treatment. Harder stones will take a very, very, very long time and a lot of grit!



The agates to the left aren’t great tumbling stock. They have deep holes and grooves in them. By the time the holes and grooves have been worn away, there won’t be any agate left to put into polish!

If you purchase “tumbling rough” you are likely to get a mix of everything. You will probably get crushed or broken stones. Remember that stones with big fractures, pits or deep-Vs are less likely to be successful.



Crystals & Vugs

Watch out for Crystals and vugs. They are beautiful, but they don’t belong in a tumbler.

The grit can get caught in the crystals, destroying them, only to work their way out in the polish cycle and ruin the finish on your other stones.

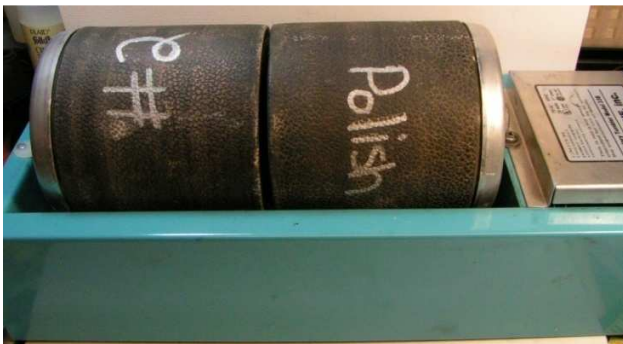
In the agate (top left), you can see a bit of crystal formation. In all likelihood, the agate had an empty pocket and a solution





leaked in and began to slowly grow. The thin layer of agate will probably erode away, exposing the crystal to grit. Save this type of stone for hand-grinding and polishing so that you may preserve their beauty.

Alternatively you may use a solution, such as Opticron, an epoxy, to fill the area and then tumble the stone. This frequently works well in sealing closed vugs and fractures. There are other options as well, though some can be quite complicated!



Lortone 33B (7lb capacity)

I like this particular style of tumbler because it has two barrels and I can run relatively small batches in each and can hold be different stone types.

If you will be tumbling large batches of stones, you can purchase larger tumblers. Remember – larger tumblers use more rocks AND more grit and polish.



Thumler A-R12 Model 130 (12lb.)



Step 2: CHOOSE YOUR WEAPON

There are all kinds of tumblers out there and some are sold to tumble jewelry ONLY, some shouldn't tumble anything more than air (red plastic barreled tumblers sold in science stores) and then there are REAL MACHINES!

I prefer Lortone or Thumler brands. I'm not usually a brand loyal kind of gal, but I've learned the hard way and want to save you some angst.

These tumblers have thick rubber barrels, that won't last forever, but for long enough that you'll be amazed.

When you purchase your tumbler, pick up extra barrels as well (at least one for each stage – with the Lortone 33B I picked up two for each stage). I was told to do this soon after I began tumbling. I was having trouble getting the rocks to shine; having the extra barrels has saved me a lot of frustration ever since.

This is the somewhat less than glamorous interior of my motor compartment.

As you can see it needs to be cleaned. This can be accomplished with a clean cloth – never use water or sprays! Working with rocks like this can be a dirty business!

Of interest in this tutorial is the rubber belt on the left hand side of the photo. This is the part that will eventually need to be replaced. Check it occasionally to ensure it's not cracked, doesn't have chunks whacked out of it and that it is securely on both wheels. It doesn't need to be super tight, but if it is loose, it won't turn the wheel effectively and the motor will work harder than necessary, wearing it down prematurely.



I'm using the Lortone 33B throughout this tutorial, but the care and use are similar for many rotary tumblers on the market today. You can even build your own tumbler if you're mechanically minded!

This is what my tumbler looks like underneath the barrels. These are the rollers. The steel roller bar has a little plastic cover that helps it grip the rubber barrel. Only one is turned by the motor – in this case, it's the one at the bottom of the picture.

As you can see, mine needs to be cleaned. ☺

The roller is turned by the motor inside the motor case of your tumbler. In the case of the 33b, that is located underneath the silver cover, which we are going to take off!

Explore it now, while your machine is new so you know how things are supposed to look. Plus, some tumblers get shook up in travel and you may need to tighten a belt or something.

Tumblers are relatively simple machines, as long as it is turned off and unplugged before you start exploring it, you'll be fine. DO NOT take the motor apart unless you are really, really good at working with motors. They are hard to put back together and taking them apart voids your warranty.

If the belt is cracked or has chunks missing, replace it. AND if it looks chewed up, find out why. It might be loose and will need to be tightened.

Check with your manufacturer about the process for changing and tightening the belt in your tumbler.

Now, put the cover back on and we'll move on to the next step.

I use sewing machine oil on my tumbler, as is recommended by Lortone. Check the manufacturer's directions for your tumbler. The manufacturer may have a special oil or designated viscosity they prefer you use for maximum performance. I like the container because it delivers a nice little dot of oil, which is all that is needed.

I add a drop to each end of each roller, every time I change grits. You should do this at least once a month if your tumbler is running continuously, as mine does. Avoid using excess oil. Once again, check with your owner's manual or the manufacturer!



**TIPS:**

- If your tumbler has lids like the one mine uses, there is a bolt end on the bottom side. Place an adhesive bandage over the nut end and then put the rubber membrane back on. This will help prevent the nut from wearing through the rubber membrane as the rocks tumble against it.
- If you have different barrels for each stage – label them NOW! Before you do anything else. I used acrylic silver paint pens on the barrels and permanent markers on the lids. Label every single part that will come into contact with the stones.

The containers and lids vary by manufacturer. Always be sure to take the containers completely apart and clean them thoroughly between batches.

STEP 3: GET ROLLIN'!

Add rocks to the *Coarse/Stage 1* barrel. I always rinse new rocks to ensure there isn't foreign debris.

At step one, especially with a coarse 65/70 grit, contaminants really can't do much damage, but they might further on down the line.



Keep your scale nearby!!!

STEP 4: JUST ADD WATER

Next add water to the stones - it should be about 1/2 to 2/3 full for best effect.

Note: Keep in mind the maximum weight/load the tumbler manufacturer recommends for the machine.

Theoretically, I can have 3.5 lbs per barrel OR 7lbs of rock in TOTAL. I always try to have a little less weight to ensure I don't wear out the motor!

Some rocks are simply heavier than others. If you happen to be tumbling heavy rocks, you may not be able to have a barrel 2/3 full, but rather, half full. Maybe you'll end up running only one barrel (assuming you have two as I do in this tutorial).





STEP 5: TO BEAD OR NOT TO BEAD

Usually beads, or other tumbling agents, are added to improve the delivery of grit throughout the water/grit/stone mixture *or* to cushion the stones *or* to fill the barrel.

If I am working with temperamental stones, such as the quartz family, which likes to crackle and crunch as they bump into each other, I put beads in at the very first, or COARSE, stage and in every single stage thereafter. (Yes, fresh beads designated for each stage).

If you have wisely chosen to use agates in your first tumble, you don't need to waste the beads because the agates will be just fine. You can save your beads for the POLISH!



STEP 6: DOWN TO THE NITTY GRITTY

Silicon carbide (Remember *Carborundum* from the MOH scale?) is the standard "grit" used in breaking down stones in the tumbling process. Silicon Carbide is a man-made mix of silica sand and carbon at temperature between 1600 °C and 2500 °C. It rings in at 9.5 on the MOH and every time it breaks, it creates sharp, uneven corners and edges – all the better to wear your rock down with!!!

The way the system works is that water carries the grit onto the rock surfaces. As the tumbler turns the rocks are carried up the sides – this is one reason the rubber is a good material, because it catches the rocks. As rock material is worn off it mixes in with the grit and water, creating slurry. Slurry acts as a nice thick scrubber because it carries the grit throughout your barrel. If you have saved slurry for this stage, add it and a little bit of water.

Keep the slurry from each stage. You can add it into the next batch of stones, at that stage. The creamy slurry will help cushion the stones and more efficiently carry the grit into crevices.

ALERT: *If your barrel suddenly gets quiet or is making a "thunking" sound, your barrel may have a case of the bogs (one of the reasons I check on mine every day). This may have happened because too much slurry has been created and all of your rocks are cemented to the bottom of the barrel. No worries, add water and tumble, you'll soon hear the rocks work loose. You may want to determine if you had stones that were too soft, too little water, too much stone...any of those "issues" can create sludge cement. Never use a sharp instrument to loosen the stones because you risk injuring yourself and as well as a relatively expensive barrel!*

TIPS:

- Have a mixture of stones with different shapes and sizes, avoiding anything over two inches in diameter or larger.
- If you don't have enough rocks to fill your barrel up to 2/3, use plastic beads to take up that space.



OR you may choose to use 65/70 if your rocks are rough

Stage 1 – Rough Grit

Smooths out the rough edges of stones. If you are starting with “tumbling rough” from a rock shop, then begin with 65/70 grit. I start with 120 most of the time because I tend to work with stones I’ve pre-shaped, or in the case of many of my agates, have already been shaped by the river or ocean.

If your rocks aren’t shaped up by the time they come out of this grit, they won’t improve their shape in the next stages. This is the stage we all try to rush through, but it is probably one of the most important! Make sure your stone surfaces are smooth, without pits, cracks or gashes. If they are present at this stage they will remain throughout the other stages.



Add grit to the rock/water/bead mixture in the barrel according to the manufacturer’s recommendations, which tend to be somewhere in the vicinity of the following:

| Barrel Size | Stage 1: | Stage 2: | Stage 3: Fine | Stage 4: |
|-------------|----------|----------|---------------|----------|
| 1.5 | 2-4 | 2-4 | 2-4 | 5-6 |
| 3 | 4 | 4 | 6 | 6 |
| 4.5 | 7-8 | 7-8 | 7-8 | 9-10 |
| 6 | 8-10 | 8-10 | 8-10 | 11-12 |
| 12 | 17-20 | 17-20 | 17-20 | 25 |

Note: 16 Tablespoons in a cup

Stages & Length of Each Stage

| | |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stage 1: Coarse (65/70 grit or 120 grit) | ~14-28 days, the higher the MOHS of the rock, the rougher the shape, the longer this stage will take; keep in this stage until stones are in the shape you want and there are no cracks or pits, fine scratches may be okay |
| Stage 2: Medium (120 grit) | ~10—14 days – keep in this stage until there are no visible scratches |
| Stage 3: Fine | ~10-14 days |
| Stage 4: Super Fine or Pre-Polish | ~10-14 days |
| Stage 5: Polish | ~10-14 days or until the polish you want has been achieved |



STEP 7: CLEAN THE RIM TO WIN

In order to avoid leaking barrels, it is critical that you clean the rim of any grit, water, rock particle or bead with a paper towel. Now, reassemble and close the barrel.

ALERT: *If you use cloth towels to clean up your gritty workspace – hand wash and hang them to dry. Do not put in the washing machine. You never want this grit to get into contact with any piece of moving machinery. The machinery will be destroyed by the silicon carbide grit – and it takes very little grit to cause a HUGE problem.*



STEP 8: GET ROLLING

Now the fun starts. You should hear the rocks clacking into each other. This isn't a process you want to do in your bedroom!

Check on them daily to see if they sound like everything is moving along.



STEP 9: CHARGE!

Once every 5-7 days open up your barrels and check them. If there is a lot of foam, remove some water or add some rocks. If the slurry looks like oatmeal, add a wee bit of water. The slurry should look like a thick gravy or melted ice cream.

If the slurry feels quite gritty, add a tablespoon of grit, reassemble everything and put the barrel back on the rollers. If the slurry feels smooth, add two tablespoons of grit. This is called "charging the load". Be sure to clean the rim to ensure a tight, waterproof seal.

NOTES:



I am thrifty (cheap) and use cat litter containers for my buckets. I also use old, stained plasticware or food containers to store the slurry.



Notice, this batch doesn't have beads. Agates usually don't but it doesn't hurt to add them in during the polish stage.



Before moving to the next stage, carefully clean the barrel with a sponge. I have a sponge for each stage of grit (they are each a different colour and have trays with their grit level written on them. I do this to avoid cross-contamination with the grit.

STEP 10: CHECK, CLEAN, LOAD

After approximately two weeks, check your rocks thoroughly. Set up a rock cleaning station near a water source. Use a bucket, place a container to catch the slurry in and a strainer at the top of the bucket. You will need a strainer for each stage, to ensure there is no cross-contamination of grits – it's a good idea to label them.

ALERT! NEVER, NEVER, NEVER, EVER dump your slurry down a sink drain. If you do, the slurry will solidify into nasty cement and at some point in your very expensive future you will end up having to replace pipes.

If your stones are in the shape you desire, we will move onto the next step. If they have pits, cracks and bumps, think about repeating this stage (re-use your slurry and give it a full, fresh charge of grit.)



Nice slurry gravy. If you label the container and keep it tightly covered, it should only need a little water and a re-charge of grit for your next tumble at this stage. I keep slurries for each of the grits. If polishes are successful, and I know there isn't any grit or stone remaining in it -I also save my polish slurry.

STEP 11: WASH ROCKS

Once the barrel is clean, place the rinsed rocks back in it. Fill with water, 1-3 Tablespoons of Borax and allow to tumble over night.

STEP 12: RINSE WELL AND REPEAT

The next day, empty the rocks into the next level's strainer, rinse and remove any rocks with rough or broken edges or pieces smaller than about ¼ inch and then place them into the next level's barrel.

Now, repeat steps 3-11 with each grit, pre-polish and polish that remains.



Stage 2 – Medium Grit

This stage of grit removes scratches and begins to smooth the surface of the stone.

No shaping will occur in this stage.



FINE or Stage 3

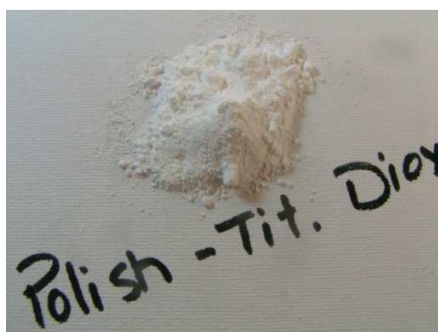
This level of grit refines the surface even further. Some folks use 500 grit, and then 1,000 grit and then polish. Others use 500 grit, then Tripoli, THEN Polish.

Try out each way and do what you prefer.

You may use 500 grit, 1,000 grit or Tripoli - it is up to you.

When I get to this level, I almost always add tumbling media, such as plastic beads. This will help cushion the rocks, add extra polishing surface and even make the tumble a wee bit quieter!

I've begun using 500 grit and Tripoli, essentially adding a 5th step into the mix.



STEP 17: GET A SHINE ON

Polish or Stage 4

This is the fun stage – because you know you're getting close to the end and pretty, shiny stones!

Add a little Borax, about 2Tbsp. to the mix. This helps reduce surface tension on the stones and increases the polish.



Polishes are many and you will probably try them all if you get addicted to tumbling rocks. Tin oxide seems to be the standard. Pictured at left, I am adding cerium oxide, which is said to be really messy, but honestly, it works well on stones that nothing else seemed to do. It's best on feldspars such as labradorite.

POLISH & ROCK COMBINATIONS

TIP: *the polishes can come in different measurements – either microns or “grits”. Here is a short list of polishes and rock combinations. Experiment and take notes!*

Agate: Tin Oxide, Aluminum Oxide

Amber: Tin Oxide

Apatite: Chrome Oxide

Aventurine: Tin Oxide, Aluminum Oxide

Beryl: Tin Oxide, Diamond

Celestite: Aluminum Oxide, Chrome Oxide

Epidote: Tin Oxide

Feldspar: Cerium Oxide, Tin Oxide, Aluminum oxide



*Above: is green aventurine that was pre-shaped and successfully tumbled
below: milky quartz successfully tumbled;*



Above: example of a poor hematite tumble. These stones should not have left the First or Coarse stage!

Hematite: Chrome Oxide

Garnet – everything seems to work

Jadeite: Cerium Oxide, Chrome Oxide, Tin Oxide, Diamond

Jasper: usually all of them work

Labradorite: Cerium Oxide, Tin Oxide, Aluminum Oxide, Diamond

Lapis Lazuli: Diamond, Tin Oxide, Chrome Oxide

Malachite: Diamond, Tin Oxide, Chrome Oxide

Moonstone: Tin Oxide, Aluminum Oxide, Diamond

Rhodocrosite: Diamond, Aluminum Oxide, Tin Oxide

Some Final Tips:

- Agates and Jaspers are usually the easiest to get to a high shine.
- Explore other types of medium for cushioning, such as corn cob, nut shells, etc. and figure out something you like.
- Plastic beads can be re-used over and over again – in the same level they were initially used. Rinse them thoroughly after each use, allow the beads dry thoroughly, and keep them in a container marked with the grit level they were used with.
- Hand wash towels that have been in contact with grit in a tub outside. Never put them in the washing machine. Avoid dumping grit water anywhere children may play or pets may dig.
- Never wash empty grit containers in the dishwasher. (THAT was an expensive lesson that grit is evil when it gets into machinery. It only takes a few crystals!)
- Some people like to use Ivory soap shavings instead of borax. Different soaps can react differently with the barrels made by different manufacturers.
- There are less expensive ways to tumble rocks. You can make your own tumbler – instructions are available on the internet, just do a search. You can start with Coarse or 65/70 grit and leave the stones alone for several months (depending on the stone type). I've heard some people have success with that. I've also heard of people using silica sand or no grit at all and just allowing the mechanical tumbling to do the work.
- Be patient, very, very patient.

And most importantly... **Have fun!!!**

Check out: <http://rocktumblinghobby.com> and be sure to visit the discussion board. There are wonderful people, of all ages, eager to share their knowledge and experience, who will also “ooh” and “aaah” over your work or give advice that will help you improve!