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Smithsonian 49005

Smithsonian Rock Tumbler STEM Kit Instruction Manual

Model: 49005

Introduction

Welcome to the exciting world of rock tumbling with your Smithsonian Rock Tumbler STEM Kit. This kit provides a hands-on experience to transform rough stones into polished gems, fostering an understanding of geology and scientific processes. Please read this manual carefully before operating the rock tumbler to ensure safe and effective use.



Image: The Smithsonian Rock Tumbler STEM Kit, showcasing the yellow tumbler unit and various accessories for creating jewelry.

Important Safety Information

WARNING: Not suitable for children under 10 years without adult supervision. This product contains small parts and chemicals that can be harmful if misused.

- Always operate the rock tumbler on a stable, level surface.
- Keep the tumbler away from water and moisture.
- Ensure the power cord is not damaged and is plugged into a suitable electrical outlet.
- Do not touch moving parts while the tumbler is operating.
- Always unplug the tumbler before cleaning or performing any maintenance.
- Wear appropriate safety goggles when handling rough stones and grit.
- Keep all components, especially grit and polish, out of reach of young children and pets.

- Dispose of used grit and sludge responsibly, following local environmental guidelines.

Package Contents

Please check the box to ensure all items are present:

- 1 U.L. Listed Electric Tumbler
- 1 Barrel
- 2 Motor Friction Rings
- 2 Axle-Wear Plates
- 1 Rubber O Ring Gasket
- 1 Bag Rough Semi-Precious Stones (8 oz)
- 1 Bag Coarse Grit (0.63 oz)
- 1 Bag Medium Grit (1.02 oz)
- 1 Bag Polish (0.81 oz)
- 1 Pot of Glue (0.17 fl oz)
- 12 Plastic Anchors
- 2 Key Rings
- 2 Rings
- 6 Cords
- 1 Color Poster with Instructions (detailed instructions for tumbling process)

Setup

Follow these steps to set up your Smithsonian Rock Tumbler:

1. **Unpack Components:** Carefully remove all items from the packaging and verify against the "Package Contents" list.
2. **Position the Tumbler:** Place the electric tumbler unit on a flat, stable, and dry surface, away from the edge of tables or counters. Ensure there is adequate ventilation around the unit.
3. **Install Friction Rings and Axle-Wear Plates:** Locate the two motor friction rings and two axle-wear plates. These are typically placed on the motor shaft and inside the tumbler housing to reduce wear and ensure smooth operation. Refer to the included color poster for specific placement diagrams.
4. **Prepare the Barrel:** Ensure the tumbler barrel is clean and dry before its first use.
5. **Power Connection:** Plug the U.L. Listed Electric Tumbler into a standard electrical outlet. Do not turn it on yet.

Operating Instructions: Rock Tumbling Process

The rock tumbling process involves several stages, each using a different grit size to gradually smooth and polish the stones. This process can take several weeks.

General Guidelines:

- Always ensure the barrel is filled to approximately 2/3 to 3/4 capacity with stones. If you have fewer stones, add plastic pellets (not included) to achieve the correct fill level.
- Use clean water for each stage.
- Thoroughly clean the barrel and stones between each grit stage to prevent contamination.

Stage 1: Coarse Grind (Rough Grit)

1. **Load Stones:** Place the rough semi-precious stones into the tumbler barrel. Fill to 2/3 to 3/4 full.
2. **Add Coarse Grit:** Add the entire bag of Coarse Grit (0.63 oz) to the barrel.
3. **Add Water:** Add water until it just covers the top layer of stones.
4. **Seal Barrel:** Place the Rubber O Ring Gasket onto the barrel rim, then securely attach the lid. Ensure a tight seal to prevent leaks.
5. **Start Tumbling:** Place the sealed barrel onto the tumbler unit's rollers. Plug in the tumbler and turn it on.
6. **Tumbling Duration:** Allow the tumbler to run continuously for 7-10 days. Check daily for proper rotation and leaks.
7. **Inspect and Repeat:** After 7-10 days, unplug the tumbler, remove the barrel, and open it. Rinse the stones and barrel thoroughly. If the stones are still very rough, repeat Stage 1 with fresh coarse grit and water for another 5-7 days. Continue until stones are smooth and rounded.

Stage 2: Medium Grind (Medium Grit)

Once stones are smooth from Stage 1:

1. **Clean Thoroughly:** It is critical to clean the barrel, lid, and stones completely of all coarse grit residue. Any remaining coarse grit will contaminate the next stage and prevent proper polishing.
2. **Add Medium Grit:** Place the cleaned stones back into the barrel. Add the entire bag of Medium Grit (1.02 oz).
3. **Add Water:** Add water until it just covers the stones.
4. **Tumble:** Seal the barrel and tumble for 7-10 days.
5. **Inspect:** Stones should now have a dull, smooth finish.

Stage 3: Polish

For the final shine:

1. **Clean Thoroughly:** Again, meticulously clean the barrel, lid, and stones to remove all traces of medium grit. This is the most important cleaning step.
2. **Add Polish:** Place the cleaned stones back into the barrel. Add the entire bag of Polish (0.81 oz).
3. **Add Water:** Add water until it just covers the stones.
4. **Tumble:** Seal the barrel and tumble for 7-10 days.
5. **Final Rinse:** After tumbling, unplug the unit, remove the barrel, and carefully rinse the polished stones under running water. Dry them with a soft cloth.

Creating Jewelry and Keychains

Use the included accessories to turn your polished stones into wearable art:

- **Anchors:** Select a plastic anchor that fits snugly into a natural crevice or small hole in your polished stone.
- **Glue:** Apply a small amount of the included glue (0.17 fl oz) to the anchor and insert it into the stone. Allow to dry completely according to glue instructions.

- **Attachments:** Once the glue is dry, attach the key rings, rings, or cords to the loop of the plastic anchors to create custom jewelry or keychains.

Maintenance

- **Cleaning the Barrel:** After each tumbling stage, thoroughly clean the inside and outside of the barrel, the lid, and the O-ring gasket. Use a brush and running water to remove all grit residue.
- **Cleaning Stones:** Rinse stones thoroughly between stages to prevent cross-contamination of grits.
- **Tumbler Unit:** Periodically wipe down the exterior of the electric tumbler unit with a damp cloth. Ensure no water enters the motor housing.
- **Friction Rings/Axle-Wear Plates:** Inspect the motor friction rings and axle-wear plates for wear. Replace if they show significant damage to maintain optimal performance.
- **Storage:** When not in use, store the tumbler and all components in a clean, dry place, away from direct sunlight and extreme temperatures.

Troubleshooting

Problem	Possible Cause	Solution
Tumbler is not turning on.	Not plugged in; power outlet issue; damaged cord.	Check power connection. Try a different outlet. Inspect cord for damage.
Barrel is not rotating.	Barrel too heavy; friction rings worn; motor issue.	Reduce stone load. Check and replace friction rings/axle-wear plates if necessary. Ensure barrel is properly seated.
Barrel is leaking.	Lid not sealed properly; O-ring damaged or missing.	Ensure lid is tightly secured. Check O-ring for proper placement and condition; replace if damaged.
Stones are not polishing well.	Insufficient tumbling time; grit contamination; incorrect water level.	Extend tumbling time for each stage. Ensure thorough cleaning between stages. Verify water level is correct.
Excessive noise during operation.	Barrel not seated correctly; worn parts; uneven surface.	Adjust barrel position. Inspect friction rings and axle-wear plates. Ensure tumbler is on a level surface.

Specifications

- **Model Number:** 49005
- **Brand:** Smithsonian
- **Manufacturer:** NSI
- **Recommended Age:** 10 years and up
- **Material:** Plastic, Rubber
- **Item Dimensions (L x W x H):** 16 x 6 x 13 inches
- **Item Weight:** 3.7 pounds

- **Power:** U.L. Listed Electric Tumbler (specific voltage/amperage not provided, assume standard household)
- **Educational Objective:** Science
- **Theme:** Rocks/Gems
- **Batteries Required:** No

Warranty and Support

For warranty information, technical support, or to purchase replacement parts, please refer to the documentation included in your product packaging or visit the official Smithsonian or NSI manufacturer website. Contact details for customer service are typically provided there.
Note: No specific warranty details or direct support contacts were available in the provided product information.

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