Scratching the Surface of Sandpaper

Sandpaper is used throughout the guitar building process, not to mention many other applications. There are many types of sandpaper; it’s important for students to know how to select the appropriate type of sandpaper for each application.

**Learning Objectives:**

1. Students will be able to identify various grits of sandpaper and describe the appropriate use for each.
2. Students will be able to use appropriate terminology when referring to different types of sandpaper.
3. Students will be able to a sandpaper grit chart.
4. Students will be able to describe the tools that can most help them most effectively use sandpaper.

**Materials Required:**

* Different grits of sandpaper
* Sandpaper Grit Chart
* Orbital sander, sanding block
* Scraps of hardwood
* Microscope (optional)
* Eye protection

**Safety:**

**safetys:**

Safety glasses must be worn at all times in a lab environment.

**References:**

* Discovery / Science Channel's "How It's Made" Sandpaper episode

<https://www.youtube.com/watch?v=ZzOQ6gWgvf8>, Accessed February 1, 2016.

* Wang, Linda. "What's That Stuff?" Chemical & Engineering News Chem. Eng. News 85.30 (2007): 33. Web. 1 Feb. 2016. <https://pubs.acs.org/cen/whatstuff/85/8530sci2.html>.
* Grit Scales Chart: <http://www.seabean.com/polish/GritScales.pdf>. 1 Feb. 2016.

**Learning Process:**

1. Take pre-quiz.
2. Review the accompanying PowerPoint
3. Review the grit chart.
4. Experiment with different grit papers on scraps of wood.

(Optional activity – Explore force and friction with this associated lesson: http://scienceofeverydaylife.discoveryeducation.com/teachers/pdfs/3\_5\_FRICTION\_DontSlip.pdf)

1. Optional: Explore sandpaper of various grits, composition, and in various stages of wear under a microscope. Have students make observations, with drawings, of at least two different grits of sandpaper. Share images and associated observations, and draw conclusions related to differences observed.
2. Take the post- quiz.

**Standards:**

[CCSS.MATH.CONTENT.HSN.Q.A.1](http://www.corestandards.org/Math/Content/HSN/Q/A/1/)
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

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| HS-ETS1-2. | Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. |
| HS-PS2-6. | Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. |

**SANDPAPER SELECTION CHART**

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| --- | --- | --- | --- |
| **Grit** | **Number** | **Coating** | **Common Uses** |
| Very coarse | 3036 | G,SG,S | Rust removal on rough-finished metal. |
| Coarse | 405060 | G,SG,SG,A,S | Rough sanding of wood; paint removal. |
| Medium | 80100120 | G,A,SG,A,SG,A,S | General wood sanding; plaster smoothing; preliminary smoothing of previously painted surface. |
| Fine | 150180 | G,A,SG,A,S | Final sanding of bare wood or previously painting surface. |
| Very fine | 220240280 | G,A,SA,SA,S | Light sanding between finish coats; dry sanding. |
| Extra fine | 320360600 | A,SSS |  High finish on lacquer, varnish, or shellac; wet sanding.High-satinized finishes; wet sanding. |

 *G = garnet; A = aluminum oxide; S = silicon carbide. Silicon carbide is used dry or wet, with water or oil.*