Glassology: Where Science Meets Art

Vocabulary

Bicarbonate is a tiny particle that's found in things like baking soda and soda pop. It has a special name and formula, HCO_3, and it has a negative charge, meaning it has more electrons than protons.

Crystallizing is the process where a substance turns into crystals. Imagine when you make sugar water and let it sit for a while. Over time, the sugar will start to come together and form neat, solid shapes called crystals.

Tetraoxygens are a special way that oxygen atoms are arranged in silicon dioxide molecules. In this arrangement, each silicon atom is surrounded by four oxygen atoms, arranged in a pyramid shape. This pattern helps give silicon dioxide its strong and stable structure.

Covalent bonds are like a handshake between atoms. When two atoms want to stick together, they share some of their electrons. This sharing helps them stay connected. In covalent bonds, the atoms share electrons to be more stable and stick together better.

Amorphous means that a substance has no a clear or regular pattern when you observe it at the atomic level.

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Ionic bonds are like a game of giving and receiving. In this type of bond, one atom gives away some of its electrons to another atom. This creates two atoms with opposite charges: one becomes positively charged and the other becomes negatively charged. These opposite charges attract each other, holding the atoms together like magnets.

The refractive index tells us how much light bends when it goes through a material, like glass or water.

Viscosity is how thick or sticky a liquid is. It tells us how easily a liquid flows.

Low-emissivity glass is a special kind of glass that has a coating to help keep heat and harmful rays from the sun outside. It lets regular light through so you can still see well, but it blocks out a lot of the heat and UV rays. This helps keep your space cooler and protects your stuff from fading or getting too hot.

Aberration means something is not quite right or different from what we expect. In science, it often refers to when things don't look or act as they normally would.

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Fill In The Blanks Using These Terms:

-CRYSTALLINE -COVALENT -SILICA -CALCIUM
-4 BILLION -SOLID -JACKS -INSULATOR -LOW -ROMAN

1. _____ is a dioxide of Silicon found in quartz.
2. Soda lime glass is made of 13-17% Sodium Oxide, 5-10% _____ Oxide, and 70-75% Silicon Dioxide.
3. The Sodium replaces some of the _____ bonds between the tetrahedrons with low energy Ionic bonds.
4. Glass is categorized as an amorphous _____.
5. Glass is an _____ of electricity because its electrons are tightly bound together.
6. Melting temperature, TM (°C)≈1000; this relatively _____ melting temperature makes it easier and cheaper to make because less energy is being expend.
7. In physics the glass phase is deemed to be a special form of a solid. While the material feels hard, it lacks a regular _____ structure. Physicists still cannot explain the transition from a liquid to this special solid form.
8. Its inception in architectural applications traces back to the _____ Empire, where it was used predominantly in windows for natural light.
9. Glasses have brought the ability to use our strongest sense back to over _____ people today!
10. The _____'s most important job is to score the glass so it knows where to come off the pipe, but they can also be used to shape the glass.

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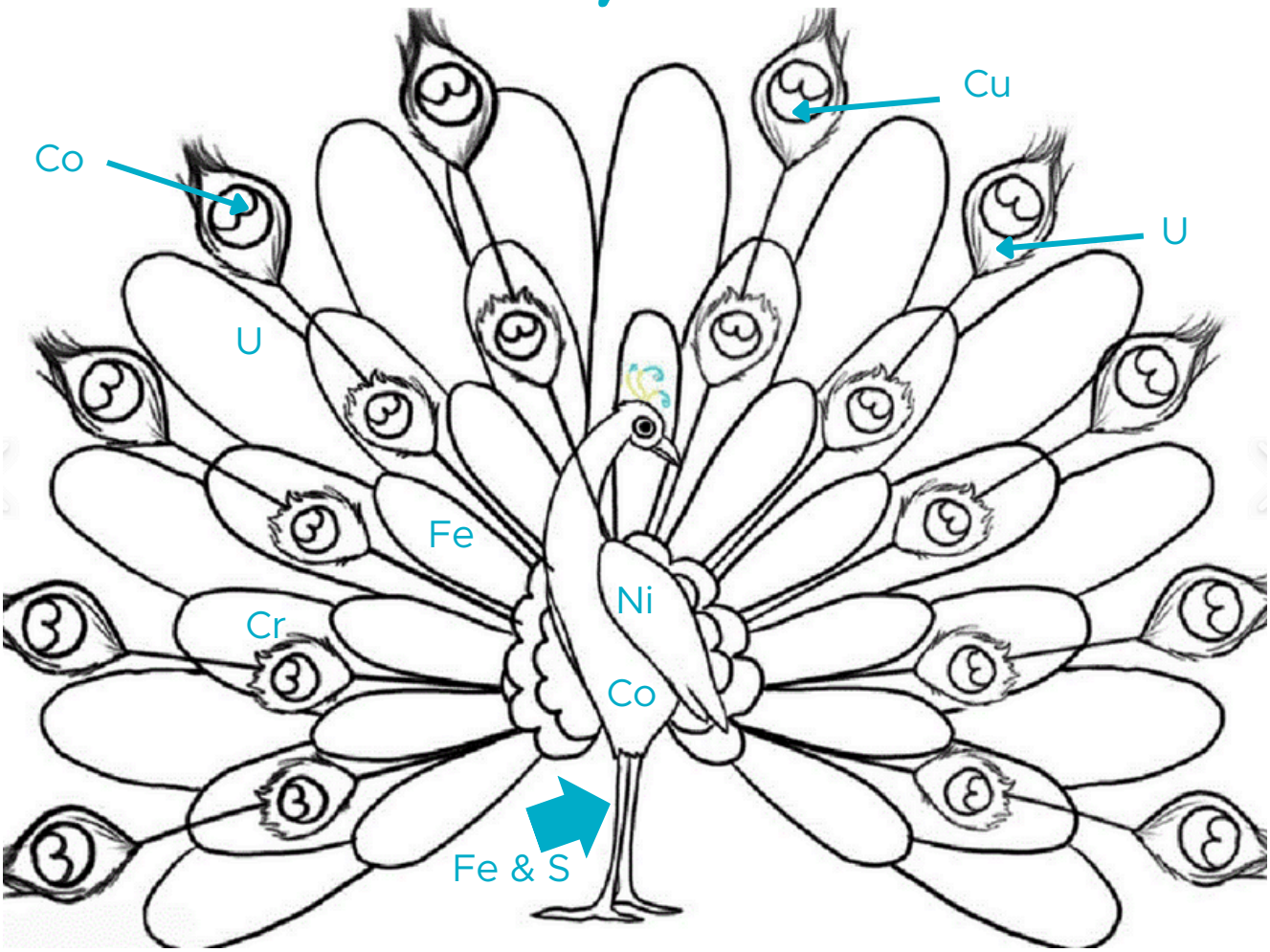
Color By Elements



IMAGINE MUSEUM

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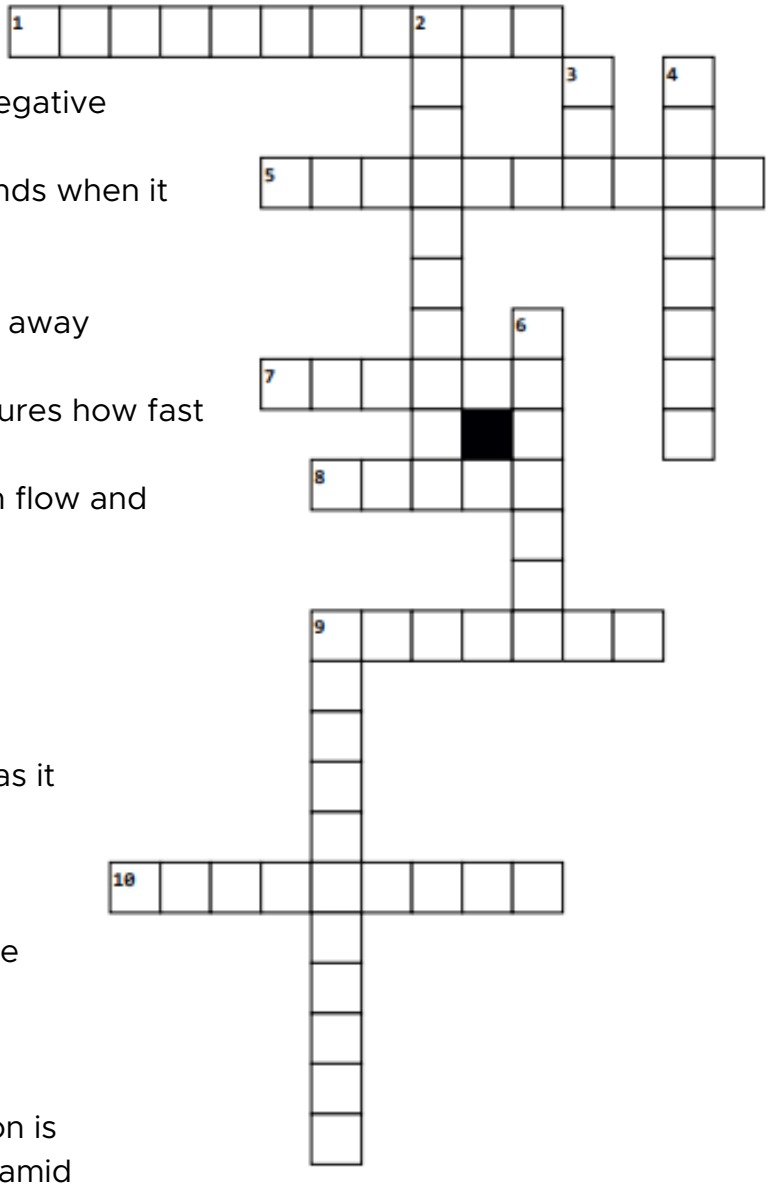
Vocabulary Crossword Puzzle

ACROSS

1. Also known as HCO3, it has a negative charge.
5. Index that tells us how light bends when it goes through a material.
7. A dioxide of Silicon.
8. Bond between atoms that give away electrons to each other.
9. This type of conductivity measures how fast a material transfers heat.
10. Tells us how easily a liquid can flow and move.



DOWN

2. When something doesn't look as it normally should.
3. The expression of human imagination.
4. Bond between atoms that share electrons to be more stable.
6. This element helps build and maintain strong bones.
9. Arrangement where each Silicon is surrounded by 4 Oxygen in a pyramid shape.

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Work Sheet Answers

ANSWERS FOR VOCABULARY CROSSWORD PUZZLE

1. Bicarbonate
2. Aberration
3. Art
4. Covalent
5. Refractive
6. Calcium
7. Silica
8. Ionic
9. Across - Thermal
   Down - Tetraoxygen
10. Viscosity

ANSWERS FOR FILL IN THE BLANK:

1. Silica
2. Calcium
3. Covalent
4. Solid
5. Insulator
6. Low
7. Crystalline
8. Roman
9. 4 Billion
10. Jacks