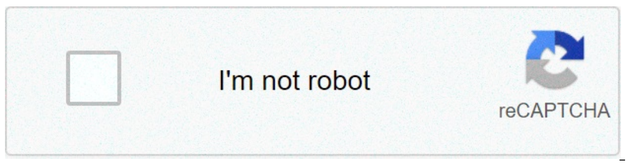

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Ir periodic table

Tractors and laptops get old, just like their owners. U.S. tax law recognizes that equipment used for a business — farm machinery, computers, trucks and tools — has a limited "useful life." Depreciation lets business owners deduct a percentage of the original cost of an item over its lifetime, rewarding investment and covering some of costs of maintaining older equipment.Depreciation can be a huge tax advantage for small business owners, if — and that's a big if — you can make sense of the IRS depreciation tables. The depreciation tables spell out exactly how much you can deduct each year for different classes of business property. At first glance, the tables make about as much sense as the box score of a cricket match. But it all becomes clear after you understand some important tax terminology.For each piece of business property you want to depreciate, you need to answer the following questions in order to use the depreciation tables:Which depreciation system applies?What is the property class?When was the item placed in service?What is the basis amount (cost)?What is the recovery period?Which depreciation convention applies?Which depreciation method applies?Depreciation SystemThe entire depreciation process is ruled by the Modified Accelerated Cost Recovery System (MACRS). MACRS itself is divided into two separate systems of depreciation: the General Depreciation System (GDS) and the Alternative Depreciation System (ADS). In all but a few rare cases — equipment used outside of the country, for example — GDS is the depreciation system that applies.Property ClassThe IRS has divided every imaginable type of business property — from race horses to tugboats — into nine classes. Each class is named for its useful lifetime. Here are the nine classes and examples of the types of property they cover:3-year property – race horses, rent-to-own property5-year property – automobiles, computers7-year property – office furniture, agricultural machinery10-year property – boats, fruit trees15-year property – restaurants, gas stations20-year property – farm buildings, municipal sewers25-year property – water treatment facilitiesResidential rental property – rental apartments or homesNonresidential real property – office buildings or storesIf you want to look up the property class of just about any business property, browse through "Appendix B" of IRS Publication 946: How to Depreciate Property.Keep reading for further instructions on how to decipher the IRS depreciation tables. It's human nature to organize things. Cooks painstakingly organize their spices into various groupings, whether alphabetically or according to how often they're used. Kids dump out their piggy banks and sort their riches into piles of pennies, nickels, dimes and quarters. Even the items in a grocery store are grouped a certain way. Head down the international aisle, and you'll find packages of Chinese egg noodles sitting next to boxes of taco shells.Chemists, as it turns out, are organizational junkies, too. They look for similar physical and chemical properties among the elements, the basic forms of matter, and then try to fit them into similar groups.Scientists began attempting to organize the elements in the late 1800s when they knew of about 60. Their efforts, however, were premature since they were missing a key piece of information: the structure of the atom. While initial efforts failed, one attempt by a Russian chemist named Dmitry Mendeleyev showed much promise. Although Mendeleyev wasn't 100 percent correct, his approach laid the groundwork for what is now the modern periodic table of the elements.Today, the periodic table organizes 112 named elements and acknowledges several more unnamed ones. It has become one of the most useful tools in chemistry, not only for students, but for working chemists as well. It classifies the elements according to their atomic number (more on that soon), tells us about the nuclear composition of any given element, describes how electrons are arranged around a given element and allows us to predict how one element will react with another.So, exactly what is this feat of organization? Keep reading as we examine the history, organization and uses of this most handy chemical tool. Keep up with the latest daily buzz with the BuzzFeed Daily newsletter! The horizontal rows on the periodic table of the elements are called periods. Every element in a period has the same number of atomic orbitals. For instance, hydrogen and helium are in the first period, so they both have electrons in one orbital. The columns on the table divide the elements into groups with the same number of electrons in their outer shells. These electrons, called valence electrons, cause them to share chemical properties. For example, noble gases have full valence shells, so they are unreactive, and halogens, such as fluorine and chlorine, react vigorously with alkali metals, such as sodium and potassium. The periodic table organizes the elements according to recurring trends in their properties. Lawrence Lawry / Getty Images You may be asked to use the phrase "periodic table" in a sentence to show you understand what one is and what it's used for. The periodic table organizes chemical elements according to trends in their physical and chemical properties. The periodic table lists elements in order of increasing atomic number. There are 118 elements listed in the periodic table, although a few elements await verification of their discovery. Mendeleev's periodic table ordered elements by increasing atomic weight. The periodic table is ordered according to periods and groups. Hydrogen is the first element of the periodic table. Most of the elements of the periodic table are metals. One of the halogens on the periodic table is the element chlorine. People have known about elements like carbon and gold since ancient time. The elements couldn't be changed using any chemical method. Each element has a unique number of protons. If you examine samples of iron and silver, you can't tell how many protons the atoms have. However, you can tell the elements apart because they have different properties. You might notice there are more similarities between iron and silver than between iron and oxygen. Could there be a way to organize the elements so you could tell at a glance which ones had similar properties? Dmitri Mendeleev was the first scientist to create a periodic table of the elements similar to the one we use today. You can see Mendeleev's original table (1869). This table showed that when the elements were ordered by increasing atomic weight, a pattern appeared where properties of the elements repeated periodically. This periodic table is a chart that groups the elements according to their similar properties. Why do you think Mendeleev made a periodic table? Many elements remained to be discovered in Mendeleev's time. The periodic table helped predict the properties of new elements. Compare the modern periodic table with Mendeleev's table. What do you notice? Mendeleev's table didn't have very many elements, did it? He had question marks and spaces between elements, where he predicted undiscovered elements would fit. Remember changing the number of protons changes the atomic number, which is the number of the element. When you look at the modern periodic table, do you see any skipped atomic numbers that would be undiscovered elements? New elements today aren't discovered. They are made. You can still use the periodic table to predict the properties of these new elements. The periodic table helps predict some properties of the elements compared to each other. Atom size decreases as you move from left to right across the table and increases as you move down a column. The energy required to remove an electron from an atom increases as you move from left to right and decreases as you move down a column. The ability to form a chemical bond increases as you move from left to right and decreases as you move down a column. The most important difference between Mendeleev's table and today's table is the modern table is organized by increasing atomic number, not increasing atomic weight. Why was the table changed? In 1914, Henry Moseley learned you could experimentally determine the atomic numbers of elements. Before that, atomic numbers were just the order of elements based on increasing atomic weight. Once atomic numbers had significance, the periodic table was reorganized. Introduction | Periods & Groups | More about Groups | Review Questions | Quiz Elements in the periodic table are arranged in periods (rows) and groups (columns). Atomic number increases as you move across a row or period. Periods Rows of elements are called periods. The period number of an element signifies the highest unexcited energy level for an electron in that element. The number of elements in a period increases as you move down the periodic table because there are more sublevels per level as the energy level of the atom increases. Groups Columns of elements help define element groups. Elements within a group share several common properties. Groups are elements have the same outer electron arrangement. The outer electrons are called valence electrons. Because they have the same number of valence electrons, elements in a group share similar chemical properties. The Roman numerals listed above each group are the usual number of valence electrons. For example, a group VA element will have 5 valence electrons. There are two sets of groups. The group A elements are called the representative elements. The group B elements are the nonrepresentative elements. Each square on the periodic table gives information about an element. On many printed periodic tables you can find an element's symbol, atomic number, and atomic weight. Introduction | Periods & Groups | More about Groups | Review Questions | Quiz Elements are classified according to their properties. The major categories of elements are the metals, nonmetals, and metalloids. Metals You see metals every day. Aluminum foil is a metal. Gold and silver are metals. If someone asks you whether an element is a metal, metalloid, or non-metal and you don't know the answer, guess that it's a metal. What are Properties of Metals? Metals share some common properties. They are lustrous (shiny), malleable (can be hammered), and are good conductors of heat and electricity. These properties result from the ability to easily move the electrons in the outer shells of metal atoms. What are the Metals? Most elements are metals. There are so many metals, they are divided into groups: alkali metals, alkaline earth metals, and transition metals. The transition metals can be divided into smaller groups, such as the lanthanides and actinides. Group 1: Alkali Metals The alkali metals are located in Group IA (first column) of the periodic table. Sodium and potassium are examples of these elements. Alkali metals form salts and many other compounds. These elements are less dense than other metals, form ions with a +1 charge, and have the largest atom sizes of elements in their periods. The alkali metals are highly reactive. Group 2: Alkaline Earth Metals The alkaline earths are located in Group IIA (second column) of the periodic table. Calcium and magnesium are examples of alkaline earths. These metals form many compounds. They have ions with a +2 charge. Their atoms are smaller than those of the alkali metals. Groups 3-12: Transition Metals The transition elements are located in groups IB to VIIIB. Iron and gold are examples of transition metals. These elements are very hard, with high melting points and boiling points. The transition metals are good electrical conductors and are very malleable. They form positively charged ions. The transition metals include most of the elements, so they can be categorized into smaller groups. The lanthanides and actinides are classes of transition elements. Another way to group transition metals is into triads, which are metals with very similar properties, usually found together. Metal Triads The iron triad consists of iron, cobalt, and nickel. Just under iron, cobalt, and nickel is the palladium triad of ruthenium, rhodium, and palladium, while under them is the platinum triad of osmium, iridium, and platinum. Lanthanides When you look at the periodic table, you'll see there is a block of two rows of elements below the main body of the chart. The top row has atomic numbers following lanthanum. These elements are called the lanthanides. The lanthanides are silvery metals that tarnish easily. They are relatively soft metals, with high melting and boiling points. The lanthanides react to form many different compounds. These elements are used in lamps, magnets, lasers, and to improve the properties of other metals. Actinides The actinides are in the row below the lanthanides. Their atomic numbers follow actinium. All of the actinides are radioactive, with positively charged ions. They are reactive metals that form compounds with most nonmetals. The actinides are used in medicines and nuclear devices. Groups 13-15: Not all Metals Groups 13-15 include some metals, some metalloids, and some nonmetals. Why are these groups mixed? The transition from metal to nonmetal is gradual. Even though these elements aren't similar enough to have groups contained within single columns, they share some common properties. You can predict how many electrons are needed to complete an electron shell. The metals in these groups are called basic metals. Nonmetals & Metalloids Elements that don't have the properties of metals are called nonmetals. Some elements have some, but not all of the properties of the metals. These elements are called metalloids. What are Properties of Nonmetals? The nonmetals are poor conductors of heat and electricity. Solid nonmetals are brittle and lack metallic luster. Most nonmetals gain electrons easily. The nonmetals are located on the upper right side of the periodic table, separated from metals by a line that cuts diagonally through the periodic table. The nonmetals can be divided into classes of elements that have similar properties. The halogens and the noble gases are two groups of nonmetals. Group 17: Halogens The halogens are located in Group VIIA of the periodic table. Examples of halogens are chlorine and iodine. You find these elements in bleaches, disinfectants, and salts. These nonmetals form ions with a -1 charge. The physical properties of the halogens vary. The halogens are highly reactive. Group 18: Noble Gases The noble gases are located in Group VIII of the periodic table. Helium and neon are examples of noble gases. These elements are used to make lighted signs, refrigerants, and lasers. The noble gases are not reactive. This is because they have little tendency to gain or lose electrons. Hydrogen Hydrogen has a single positive charge, like the alkali metals, but at room temperature, it is a gas that doesn't act like a metal. Therefore, hydrogen usually is labeled as a nonmetal. What are the Properties of the Metalloids? Elements that have some properties of metals and some properties of nonmetals are called metalloids. Silicon and germanium are examples of metalloids. The boiling points, melting points, and densities of the metalloids vary. The metalloids make good semiconductors. The metalloids are located along the diagonal line between the metals and nonmetals in the periodic table. Remember that even in mixed groups of elements, the trends in the periodic table still hold true. Atom size, ease of removing electrons, and ability to form bonds can be predicted as you move across and down the table. Introduction | Periods & Groups | More about Groups | Review Questions | Quiz Test your comprehension of this periodic table lesson by seeing if you can answer the following questions: Review Questions The modern periodic table isn't the only way to categorize the elements. What are some other ways you could list and organize the elements? List the properties of the metals, metalloids, and nonmetals. Name an example of each type of element. Where in their group would you expect to find elements with the largest atoms? (top, center, bottom) Compare and contrast the halogens and noble gases. What properties can you use to tell the alkali, alkaline earth, and transition metals apart?