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«Ступинский авиационно-металлургический техникум

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«METALS. METALLURGY.
METALS AND ALLOYS USED IN STUPINO AREA INDUSTRY».
ПЛАНИРОВАНИЕ ИНТЕГРИРОВАННОГО УРОКА

Тема		Металловедение. Металлы и сплавы применяемые в металлургической промышленности г. Ступино (английский+материалловедение
Цель	Предметная	Дать определение металлам и сплавам, познакомить с видами металлов и сплавов и их применением. Дать понятие металлургии. Познакомить с историей металлургии.
	Языковая	Совершенствовать коммуникативные умения в различных видах речевой деятельности.
Задачи	Предметные	Провести анализ продукции выпускаемой металлургическими предприятиями города и определить наиболее применяемые сплавы при их производстве. Обсудить применение этих сплавов в других видах производства.
	Языковые	Развитие: умений монологического высказывания с элементами рассуждения, изучающего чтения; грамматических навыков. Расширение словарного запаса за счет овладения лексических средств, обслуживающими новую тему и отработка ранее изученных лексических единиц.
Содержание	Предметное	Теоретические знания: названия металлов и сплавов, отрасли применения, некоторые виды обработки . Фактологические знания: названия предприятий города и виды выпускаемой продукции.
	Языковое	Лексика по предмету: , metals, alloys, ore, metallurgy, steel, aluminium, gold, nickel. Конструкции выражения мнения: I think, I feel, for all I know , in my view, in my opinion, from my point of view. Грамматическая конструкция: Passive Voice.
Форма организации урока		Языковая разминка, дискуссия, презентация

Warm up

Teacher: No substance has been as important as metal in the story of man's control of his environment. Advances in agriculture, warfare, transport, even cookery are impossible without metal.

The world metal isn't new to you. You met with this material studying other subjects.

What are these subject concerning metals?

Students own answers:

Possible answer: physics, chemistry, geography.

Can you give some names of metals?

Students own answers:

Possible answer: gold, silver, nickel, aluminum, copper, iron, zink.

Teacher: Who can give the meaning of the term. "metal"

Students answers:

Answer: Metal is an element, compound, or alloy that is a good conductor of both electricity and heat. Metals are usually shiny, malleable and ductile

Reading:

Read the text and answer the question:

What are the task of metallurgy?

Answer: Metallurgy deals with making metals and alloys into forms suitable for practical use.

Text

Metal is any of a class of substances characterized by high electrical and thermal conductivity as well as by malleability, ductility, and high reflectivity of light.

Some metals are found in their "native" or free elemental form (eg, platinum, gold, silver, copper and a limited number can be produced from seawater, notably magnesium. However, most metals are extracted from ores (naturally occurring mineral compounds) found at or near the earth's surface.

Manganese ore

Science and technology of metals and their alloys is **metallurgy**.

Metallurgy is a domain of materials science that studies the physical and chemical behavior of metallic elements, their intermetallic compounds, and their mixtures, which are called alloys. It is also the technology of metals: the way in which science is applied to their practical use. Metallurgy is distinguished from the craft of metalworking.(Columbia encyclopedia).

The field of modern metallurgy may be divided into process metallurgy (production metallurgy, extractive metallurgy) and physical metallurgy.

Extractive metallurgy is the practice of removing valuable metals from an ore and refining the extracted raw metals into a purer form.

In production engineering, metallurgy is concerned with the production of metallic components for use in consumer or engineering products. This involves the production of alloys, the shaping, the heat treatment and the surface treatment of the product.

Physical metallurgy is a branch of metallurgy that deals with the physical properties and structure of metals and alloys

Almost all metals are used as alloys.

Alloy is a mixture of several elements. Alloys have properties superior to pure metals. Alloying is done for many reasons, typically to increase strength, increase corrosion resistance, or reduce costs.

Common engineering metals include **aluminium, chromium, copper, iron, magnesium, nickel, titanium and zinc**. They are most often used as alloys.

Much effort has been placed on understanding the **iron-carbon alloy system**, which includes steels and

cast irons. Plain carbon steels that contain essentially only carbon as an alloying element are used in low cost, high strength applications where weight and corrosion are not a problem.

Stainless steel or galvanized steel are used where resistance to corrosion is important.

Aluminium alloys and magnesium alloys are used for applications where strength and lightness are required.

Copper-nickel alloys (such as Monel) are used in highly corrosive environments and for non-magnetic applications.

Nickel-based superalloys like Inconel are used in high temperature applications such as turbochargers, pressure vessel, and heat exchangers. For extremely high temperatures, single crystal alloys are used to minimize creep.

General understanding

Answer the questions:

1. What are characteristic of the metal?
2. In what state do metals occur in nature?
3. What is the art of metals and alloys?
4. Does extractive metallurgy study the properties of metals?
5. What does metallurgy in producing engineering deal with?
6. What is an alloy?
7. Why are alloys done?
8. What are the most used alloyed metals?
9. When are plain carbon steels used?
10. What is the application of Monel?
11. Iron-carbon alloy system deals with.

Vocabulary

Fill in the gaps with missing words from the text.

1. _____ is art and science of extracting metals from their ores and modifying the metals for use.
2. _____ is metallic substance composed of two or more elements.
3. _____ is any of a category of electropositive elements that usually have a shiny surface, are generally good conductors of heat and electricity
4. _____ a mineral or an aggregate of minerals from which a valuable constituent, especially a metal, can be profitably mined or extracted.
5. When the application of strong and light materials are required, alloys where the predominant metal is _____are used.
6. In applications working at high temperatures _____ alloys are used.
7. In very bad environmental conditions _____ alloys are used.
8. _____ steel is used when application is strong but isn't very expensive and doesn't work in severe conditions.
9. _____ steel is used when application must resist corrosion.

Materials

1. http://en.wikipedia.org/wiki/Columbia_Encyclopedia - Columbia Encyclopedia
2. http://www.britannica.com/ - Britanica Encyclopedia
3. http://wiki.answers.com/Q/Microsoft_encarta_encyclopedia_deluxe_2003_descargar - Microsoft Encarta Encyclopedia