

中小學生科學普及讀物系列

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趣味科普英語 學習指導



前 言

本书是与《趣味科普英语》配套的学习指导用书,具有如下几个特点:

1. 寓科技知识、语言技能训练和创新精神培养于一体,让广大青少年在学习科普知识的同时,也受到扎实的英语基本功的训练和创新思维的培养。

2. 集英语教学与科普百科之长,既能让青少年依循英语学习的规律,贯彻以听为主、听说并重、创意为先的原则,又能让青少年学生在英语学习中汲取必备的科普知识,为以后的科技创新培养应有的创新意识。

3. 在强调语言学习与科普知识的同时,本书还试图契合青少年的学习特点,从内容设计上进行了创新:图文并茂以提高文本阅读趣味性的同时,还力求内容精干实用,通过创意思考题培养学生的创新意识及批判性思维,以弥补当今课堂教育之不足。

4. 本书还附赠原版录音,让广大青少年读者在扩大知识面的同时,可进一步提高英语听力的水平。

5. 本辅导书也可单独使用,作为老师与家长辅导学生及孩子科普英语的课外读物或作为学生的第二课堂课本使用。

编者

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Unit One Human Beings

Lesson 1

Body Structure and Function

内容提要: 本课概述人体的主要组成部分。

Supplemental facts and information



1. The human body is a single structure but it is made up of billions of smaller structures of four major kinds: cells(细胞), tissues(组织), organs(器官), and systems(系统).
2. An organ is an organization of several different kinds of tissues. These different kinds of tissues are so arranged that they can perform a special function together.
3. A system is an organization of varying numbers and kinds of organs. These organs are so arranged that together they can perform complex functions for the body.
4. Ten major systems include the skeletal(骨骼系统), muscular(肌肉系统), nervous(神经系统), endocrine(内分泌系统), circulatory or cardiovascular(循环系统), lymphatic(淋巴系统), respiratory(呼吸系统), digestive(消化系统), urinary(泌尿系统), and the reproductive system(生殖系统).
5. Each system has many component parts; for instance, the circulatory system includes the heart, arteries(动脉), veins(静脉), and many smaller vessels(血管).
6. Body functions are the physiological(生理的) or psychological(心理的) functions of body systems. Survival of the body depends on the body's maintaining or restoring homeostasis(体内平衡), a state of relative constancy, of its internal environment.



7. Human life process(生命过程/进程) includes organization(有机体), metabolism(新陈代谢), responsiveness(身体反应), movements(运动), reproduction(繁衍), growth(成长), differentiation(变异), respiration(呼吸), digestion(消化), and excretion(排泄或分泌). All these processes work together, in fine-tuned(细致入微的) balance, for the well-being of the individual and to maintain(维持/保持) life.
8. Life depends on certain physical factors(物理要素) from the environment, which include water, oxygen, nutrients(养分), heat, and pressure.

Hints to Creative Thinking



1. Are all fingerprints different? What are the possible uses of fingerprints in our daily life?

世界上没有两个人的指印是相同的,即使孪生子也不例外。因此,指印可以广泛应用于诸如个人保安、公共安全、金融保险以及警察办案等各个领域。

As far as we know today, no two fingerprints are identical, and even identical twins are no exceptions. There are basically six types of fingerprints:

- a. loop; b. double loop; c. central pocket loop; d. whorl; e. plain arch; f. tented arch.



Loop



Double loop



Central pocket loop



Whorl



Plain arch



Tented arch

The distinctiveness of each person's fingerprints makes it a good form of identification in various circumstances: accidents, personal security, murders, financial security and insurance. As a matter of fact, fingerprints have already been employed in many of the above fields and have yielded good results. In the United States, with the aid of a computer, a fingerprint can be



traced to 1 of 300,000,000 individuals within 5 seconds. This is more than the population of the United States.

2. How does our skin help us? List as many ways as possible our skin protects us.

皮肤是人体最大的器官。它可以保护人体不受外来细菌的侵犯,帮助人体排出废物,让人体体温保持恒定,通过指印与足印提供身份鉴定,保护人体不受来自诸如太阳、雨水等外部的伤害。

The skin is the largest body organ. It can protect us in various ways:

- a. protects us from sun, rain and other weather conditions;
- b. keeps us in contact with the world;
- c. keeps our body temperature constant;
- d. protects us from bacteria;
- e. protects our inner organs from injuries;
- f. provides us means of identification (fingerprints, footprints);
- g. eliminates wastes from our body.

Other functions our skin performs include keeping us cool through sweat glands, holding our inner organs inside and giving us various senses of feeling by sensory preceptors.

3. How does our hair help us? Give some concrete examples or draw pictures to illustrate the way our hair helps us.

头发对人类的帮助很大,比如帮助人类散热,保护人的大脑皮层不受直接伤害等。

For group discussion. Hair is very useful to human beings. It can help us in many ways such as keeping us cool and protecting us from direct injuries from outside forces.

课文翻译 (Text Translation)



第1单元 人

第一课 身体结构和功能

问:人体有多少个组成部分?

答:人体主要有四个部分组成:头、颈、躯干和四肢。每一部分有更小的部分——器



官组成。比如,头就包括头发、脸、眼睛、鼻子、耳朵和舌头等器官组成。

问:我们有多少块骨头和关节?

答:我们人体有 206 块不同的骨头,主要有以下四组:

A. 胸; B. 头; C. 胳膊和腿; D. 手指和脚趾。

测试:

1. 人的心脏一分钟跳动多少次?
A. 100—200 次。 B. 60—80 次。 C. 35—50 次。
2. 一个成人有多少牙齿?
A. 11—12 颗。 B. 28—30 颗。 C. 18—20 颗。
3. 一般来说,吃面包时,你首先使用的是哪颗牙齿?
A. 门牙。 B. 犬牙。 C. 磨牙(白齿)。
4. 你的鼻子不能做什么?
A. 帮你呼吸和闻味。
B. 帮你清洁进入体内的空气。
C. 冬天帮你温暖进入体内的空气。
D. 帮你嚼口香糖。
5. 你的舌头能帮你做什么?
A. 你需要用舌头来感觉。
B. 舌头能辨别不同的味觉。
C. 你可用舌头抓住食物。
D. 你可用舌头降温。

创意题:

1. 所有的指纹都不同吗?指印有什么用途?
2. 我们的皮肤起什么作用?请尽可能地列举出皮肤帮助我们的方式。
3. 我们的头发起什么作用?试举具体例子或画图说明头发如何帮助我们。





Lesson 2 Senses

内容提要: 本课概括介绍人体的主要感觉器官及其特点。

Supplemental facts and information



1. Sense organs(感官) send signals to the brain via(通过) nerves. The brain interprets these signals and the body acts accordingly.
2. The following instructions may be helpful in saving our eyes: a. Have proper light when you read; b. Don't read fine print for a long period of time; c. Don't look directly at the sun; d. Wear protective glasses if necessary; d. Never read in bright sunlight.
3. The primary colors of light(光的原色) are slightly different from paints(颜料). They are red, blue and green.
4. Learn the sequence of colors of light by the name of a hypothetical man, Roy G. BIV (red, orange, yellow, green, blue, indigo, and violet).
5. White light consists of all colors and can be separated into its component colors by passing it through a prism(棱镜).
6. If white light strikes an object of one color, the object absorbs that color but our eyes perceive its complementary color(补色). If we perceive a green object, the object is actually orange, its complementary color.
7. For unknown reasons, color blindness(色盲) affects more men than women.
8. When we say an object is blue, it is not actually blue.
9. Each image our eyes receive lasts for a short length of time beyond the actual scene. This produces the effect of mixing colors.
10. Vision persists for a short time in the eye after the object is gone from view. This phenomenon is called "visual persistency(视觉暂留)". This attribute(特点) is widely used in motion pictures and television.



Hints to Creative Thinking



1. Do you like vinegar(醋)? What is the sensation caused by vinegar? Draw a picture to illustrate your sensation.

For class discussion.

2. Do you, or any of your friends or family members, wear glasses, contact lenses(隐形眼镜), or a hearing aid? How do these help change your or their life?

戴眼镜除了可以帮助近视眼看清物体外,还可以帮助眼睛抵御风沙及其他外来的伤害。另外,在炎热的夏季,即使健康的人也需要戴太阳镜以防止太阳强光伤害眼睛。对于有听力障碍的人来说,助听器的出现也大大改善了他们的生活。

Eyes are organs that can receive millions of unrelated pieces of information about the outside world almost instantaneously. For those people who are near-sighted or far-sighted, wearing glasses or contact lenses will be a great help in their life. Even for those who do not suffer near-sightedness or farsightedness, in hot summers, they also need to wear sunglasses to protect their eyes from possible injuries by the Sun. However, wearing non-prescription sunglasses for long periods of time can be harmful.

3. What is the real color of a red dress?

For class discussion.

课文翻译(Text Translation)



第二课 感觉

问:我们有几种感觉?

答:我们有五种主要感觉。触觉是由皮肤中的特殊的神经末梢组成。感官通过神经把信号送到大脑。大脑对这些信号进行解读,于是身体就照(大脑的)指令行动。我们有五种主要的感官:a. 皮肤; b. 鼻子; c. 耳朵; d. 眼睛; e. 舌头。

问:我们的眼球为何会改变大小?

答:眼球在光线暗时就放大,而在光亮接近眼睛时就会收缩。任何一眼受到光线刺激时双眼都会有反应。眼球收缩保护眼睛不受多余光线的伤害。眼球放大



则在光线不足时让更多的光进来。

问:我们的感觉多于5种吗?

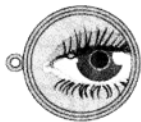
答:人们常说有五种主要的感觉,但实际上我们还有更多的感觉。比如说,我们有一种平衡的“感觉”,它使人能保持挺直的姿势。还有一种“动觉”,人可以(通过它)知道胳膊、腿及头的位置等。

测试:

1. 橙汁引起的是一种什么样的感觉?
A. 触觉。 B. 视觉。 C. 听觉。 D. 味觉。 E. 嗅觉。
2. 鼓声引起的感觉是什么?
A. 触觉。 B. 视觉。 C. 听觉。 D. 味觉。 E. 嗅觉。
3. 使人能够站直的感觉是什么?
A. 触觉。 B. 平衡的感觉。 C. 动觉。 D. 视觉。
4. 我们在看电视时,瞳孔变_____。
A. 大 B. 小 C. 正常

创意题:

1. 你喜欢醋吗?醋引起什么样的感觉?画图展示你的这种感觉。
2. 你的朋友或家庭成员或你自己戴隐形眼镜或助听器吗?这些东西是如何帮助你们改变生活的?
3. 红色衣服的真正颜色是什么?





Lesson 3

Nutrition

内容提要: 本课概述人类日常生活所需要的食物构成及相关科学知识。

Supplemental facts and information



1. Everyone must eat enough of the right kinds of food every day in order to have a healthy body.
2. The right kinds of food include those which provide for energy, for body repair and growth, and for the proper functioning of body organs.
3. The average Chinese consumes about 35 metric tons of food in a lifetime.
4. The following "Food Pyramid" was designed by the U. S. Department of Agriculture to
 - a. increase the amount of fiber;
 - b. reduce saturated fats;
 - c. comply with the latest medical findings on health and nutrition;
 - d. vary the proportions of the main basic food types.

The Food Pyramid



5. The four levels shown in the above "Food Pyramid" are:



- a. Lower Level, which contains grains [rice, cereals(谷物), bread, pasta(面团类食物), etc.] ;
 - b. Second Level, which contains (1) vegetables [carrots, broccoli(花椰菜), lettuce(莴苣), etc.] ; and (2) fruits (oranges, apples, bananas, pineapples, etc.) ;
 - c. Third Level, which contains (1) dairy [milk, yogurt(酸乳酪), cheese, etc.] and (2) meats and proteins (beef, chicken, fish, eggs, beans, etc.) ;
 - d. Top Level, which contains (1) fats and oils [salad oil, salad dressing(沙拉调味品) etc.] and (2) sugars [candy, jams(果酱), jellies(果冻), etc.] .
6. The “Food Pyramid” places “fats” on top of the pyramid. It means that “fats” should be eaten very sparingly.
 7. Nutritionists and medical scientists suggest that we should eat foods in the lower and second levels of the “Food Pyramid” more than those in the third and top levels.
 8. Foods in the lower level of the “Food Pyramid” are rich in carbohydrates(碳水化合物). Carbohydrates are starches(淀粉) and sugars which are themselves excellent sources of heat, energy and calories.
 9. Some foods contain much fat and others contain very little. A diet with high fats leads to high cholesterol(胆固醇). It can in turn cause intestinal(肠道的), heart, and circulatory(循环系统的) problems.
 10. Fats are found in various forms such as butter, margarine(人造黄油), shortening(起酥脆作用的油脂), meat trimmings(肉沫) in solid form and cooking and salad oil in liquid form and in a variety of foods such as the foods of animal origin(来自动物的食物如鸡、鱼、猪肉等)
 11. Fats are classified as “fatty acids”(脂肪酸) in two categories: “saturated”(饱和的) and “unsaturated”(非饱和的). Saturated fats tend to raise your cholesterol level.

Hints to Creative Thinking



1. Do you like fast food? What is your favorite fast food? Do you think it is good for your health?





西式快餐含有一些营养成分,但在成分搭配上存在许多问题。少食无妨,多食则有害。

Western fast foods do have some nutritional value, but it also reduces quantities of some valuable basic ingredients at the same time. Fast foods also contain some ingredients that are not good for optimum health. Eating fast foods once in a while is ok, but if you live on fast foods, you will surely lose your health sooner or later.

2. Do you like to eat candies(糖果)? Do you know what is the chief ingredient of candy?

For class discussion.

3. What do you usually eat for breakfast? Draw pictures if necessary to show your breakfast food.

For group discussion.

课文翻译 (Text Translation)



第三课 营养

问:我们身体需要哪种食物?

答:我们身体需要碳水化合物、脂肪、蛋白质、维生素和水。我们必须正确饮食以保证健康和合适的躯体。

问:日常食物能为我们做些什么?

答:谷物、面包以及土豆都是燃料食物。它们为我们工作和玩耍提供能量,并让我们身体暖和。瘦肉、鸡蛋和大豆为身体的修补和成长提供养料。西红柿、牛奶、胡萝卜含有维生素和矿物质让我们的身体处于良好的工作状态。

问:“快餐”对我们健康好吗?

答:快餐有营养价值,但大量地削减了一些基本成分。而且,快餐中还含有一些对健康不利的成分:

- a. 高卡路里;b. 高脂肪;c. 纤维含量低;d. 缺乏铁元素;e. 脂肪含量很高;f. 盐分含量很高;g. 缺乏维生素 A、C 及几种维生素 B。

测试:

1. 如果人吃多了,身体会_____

A. 消耗掉多余的脂肪。



- B. 多余的东西转化成脂肪储存起来。
C. 排泄出多余的物质。
2. 西红柿没有下列哪种营养?
A. 维生素。 B. 矿物质。 C. 水。 D. 脂肪。
3. 瘦肉含有什么营养?
A. 脂肪。 B. 水。 C. 蛋白质。 D. 矿物质。
4. 下面那些食物含糖成分丰富?
A. 土豆。 B. 火腿。 C. 面粉。 D. 胡萝卜。

创意题:

1. 你喜欢“快餐”吗? 你最喜欢的“快餐”是什么? 你认为“快餐”对你的健康有益吗?
2. 你喜欢吃糖果吗? 你知道糖果的主要成分是什么吗?
3. 你早餐一般吃什么? 如有必要可以画图展示你的早餐。





Lesson 4 Health

内容提要:本课简单讨论了有关人体健康的主要问题及保护方法。

Supplemental facts and information



1. Our hearing is very important because it enables us to detect sounds and provides us with a sense of balance.
2. Deafness or impaired hearing (听力损害) is sometimes hereditary; but it may also be caused by external conditions such as continual playing of loud music.
3. Wearing hearing aids(助听器) does help those people of impaired hearing a lot. But hearing aids cannot replace normal hearing. They can magnify sounds, but tone and quality cannot be replaced.
4. Good clothing is very important to our health. In our daily life, cotton is one of the most important textiles(纺织品) because of its durability(耐用性), ease of dyeing and laundering(易于染色和洗涤).
5. Most synthetic fibers(合成纤维) are made from petrochemicals(化工原料). Fibers are spun into yarn(纤维织成纱), and yarn is woven into fabrics(纱纺成布料).
6. We should wear proper clothing in proper climate first for self-protection, then for attention, and last but not least, for self-satisfaction.
7. Teeth are vital organs for they enable us to chew our food properly to make digestion easier. If properly cared for, they can be cosmetically attractive.
8. The most common teeth problem is decay(龋齿). Decay originates when bacteria react on food particles(食物残渣) between the teeth and form an acid that destroys the tooth enamel(牙齿的釉质) and causes cavities(空洞).
9. Plaque(斑) is the primary cause of tooth decay. It is composed of mucous(黏液质的) food particles and bacteria that build up around the gums(牙床) and on the teeth.
10. 95% (ninety-five percent) of people over 5 years of age have tooth decay.