

Hands-On Experiments

LIFE SCIENCE: HUMAN BODY

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A TEACHING RESOURCE FROM



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This product utilizes innovative strategies and proven methods to improve student learning. The product is based upon reliable research and effective practices that have been replicated in classrooms across the United States. Information regarding the research basis is provided on our website at www.rempub.com/research

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Introduction

In order to become active learners, students must learn to describe things, pose questions, acquire knowledge, explain phenomena of nature, test explanations in various ways, and communicate thoughts and ideas with others.

In addition to traditional lecture and textbook reading, students need to develop the skills of scientific inquiry if they are to develop true scientific literacy. The activities presented in this book are both “hands-on” and “minds-on” in that they are inquiry-oriented.

Scientific inquiry describes the various ways to study the natural world and suggest explanations based on evidence gathered during an inquiry. It includes making observations; asking questions; examining publications to discover what is already known; creating and executing investigations; casting evidence against known information; gathering, analyzing, and interpreting data; suggesting solutions, explanations, and predictions; and communicating results with others. Critical thinking, recognizing assumptions, and considering alternative solutions are also emphasized.

Although not all inquiry-based science activities include every component of inquiry, the goal is to present enough varied experience so that students will be repeatedly exposed to the full experience of inquiry over time.

Standards-based learning should integrate cumulative knowledge within a subject with other academic disciplines. The extension activities in this book are specifically designed to meet this goal by encouraging the teacher to infuse science within other subject areas hereby linking and reinforcing content areas. The activities not only measure students' ability to analyze, solve problems, and synthesize information, but also indicate their mastery of knowledge and skills.

To The Teacher

The activities included in *Life Science: Human Body* have been selected especially for use with elementary and middle grade students. The activities provide teachers and students with interesting, easy-to-do science investigations. The necessary materials are commonly found around the house and in school supply closets or resource centers. Because the materials are readily available, the activities can be conducted at home. A caution statement, suggesting adult supervision, is included on all activity sheets that require lighting a match, working near a hot plate, using dry cell batteries, etc. Health and Safety lessons, which discuss proper use of the materials, can be integrated when presenting these science demonstrations in the classroom. A form letter is provided which may be reproduced and sent home to inform parents of the science activities and encourage their participation when activities are assigned for homework.

When these activities are presented to lower elementary students at the preconceptual or awareness level, the emphasis is on the sensory-motor, observation, and communication skills. In the upper elementary and lower intermediate grades (after the students have developed readiness for a particular concept through awareness level activities), a formal classroom lesson that involves using comparison and organization skills may be presented. Upper intermediate and middle school students can be involved in the activities at the mastery and reinforcement level. This level requires them to relate the concept to new or untested experiences, hypothesize, test variables, and use other high level thinking skills.

Suggestions for Using Materials

- The activity book can be placed in the school library and made available for students to use at home.
- The materials can be placed in the Media Center and used by teachers as a resource prior to presenting activities in the classroom.
- Assign to a cooperative learning group for sharing with the rest of the class.
- Students can use some of the suggested extension activities for Science Fair projects.
- The letter to parents may be attached to selected activities and sent home. Encourage students to involve parents in setting up and conducting the experiments.

Although many of the concepts can be keyed to grade level objectives, the *Hands-On Experiments* series has been developed to be used as a supplement to the basic grade level program. It is designed to give students opportunities to perform meaningful science investigations that focus on concepts that are applicable to everyday life situations.

Special Suggestions To Teachers

AWARDS

The reproducible *Super Scientist Award* and the *Recycling Award* at the end of this book are designed for elementary teachers to use as motivational awards when appropriate.

INTRODUCING THE LESSON

The *General Information* at the top of each teacher page may be read to the class before each experiment to introduce the activity. With older students, the *General Information* portion of the teacher page could be reproduced and given to the students. Italicized words found on the teacher pages are also found in the glossary. Glossary words can be incorporated into spelling or vocabulary lessons.

THOUGHT QUESTIONS

Some activities include “Thought Questions” under the heading *Extension Activities* on the teacher page. The questions are designed for oral presentation to the students during the lesson. Some questions may be used to introduce the activity, while others work better at the close of the lesson. Encourage oral participation and creative thinking when posing “Thought Questions” to the students.

HOME PARTICIPATION

Students should be encouraged to share selected investigations with family members at home. A reproducible *Letter To Parents* is included in the book which may be used to introduce these activities to the adults at home.

Food Tasting

GENERAL INFORMATION

The sense of smell is an important factor in distinguishing tastes. Impaired *olfactory* receptor cells or blocked nasal passages can cause us to lose our ability to distinguish tastes. Food must be moist for taste to occur.

Although all taste receptor cells appear structurally the same, they connect to one of two different nerves associated with the tongue. Different characteristics of taste seem to be associated with different areas of the tongue but the actual mechanics of taste differentiation is not known. Taste impulses are sent through the *thalamus* in the brain stem to a specific area of the *cerebral cortex* where they are interpreted. Taste receptors are shed and replaced on the surface of the tongue about every 20 days.

MATERIALS

Provide enough toothpicks so that each food taster has one for each food tasted. You'll need to use one paper cup for each food tasted. Use a variety of foods as suggested on the student sheet. Instruct students to keep their eyes closed or provide a blindfold.

PROCEDURE

Choose one or more food tasters from the class. Blindfold the first taster and have him/her hold the nose closed or use a noseclip. Using a toothpick, carefully place a bit of food on the taster's tongue. Without chewing the food, have the taster identify it. Record the results on the chart. Repeat with the nostrils open, changing the order of foods sampled. Be sure to use different toothpicks each time.

ANSWERS TO QUESTIONS

1. Most will show that 'nose open' is more accurate
2. Smell (as per the test), sight – discuss the importance of aesthetically-presented food, especially in advertising and restaurants.
3. Answers will vary.
4. Blocked or 'stuffed-up' nasal passages make tasting more difficult.

EXTENSION IDEAS

Thought Questions:

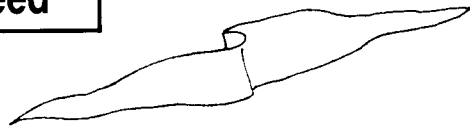
1. Q: Why do you suppose your nose is located on your face, near your eyes and mouth?
A: You are able to see what you are smelling before you eat it. If something looks and smells spoiled, you'll know not to eat it.
2. Q: If your nose were located on your arm or leg, how would this affect you?
A: Your nose would be more susceptible to injury, and you wouldn't be able to smell food before you ate it.
3. Q: A fly's taste buds are located on its feet. What value is this to the fly?
A: A fly can taste potential food simply by landing on it. If the surface landed upon is not edible, the fly continues its search for food.

Food Tasting

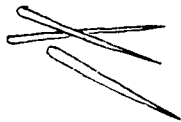
You Will Need



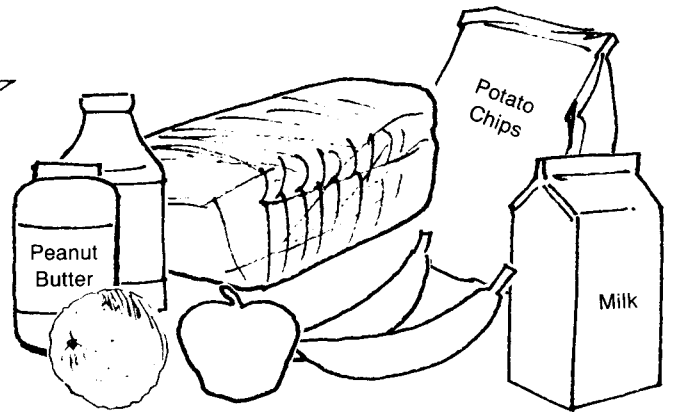
paper cups



blindfold



toothpicks



7 food samples
(cut solids into small chunks)
apple, onion, peanut butter, catsup, mustard, etc.

Here's How

1. Blindfold tester and have him/her hold the nose closed or use nose clips.
2. Using a toothpick, carefully place a bit of food on the taster's tongue and have him/her identify it. Record the results on the chart, "Y" if taster was able to identify food and "N" if not. Use a separate toothpick for each sample and for each taster. Rinse mouth after each taste.
3. Repeat with nostrils open, but change the order of foods sampled.



Questions

1. Which test produced more accurate results?
2. Which other sense, besides taste, plays a part in how foods taste to us?
3. Were any foods identified under both conditions?
4. How would having a cold affect tasting ability?

Food Tasting Data

	Food	Nose Closed	Nose Open
1			
2			
3			
4			
5			
6			
7			