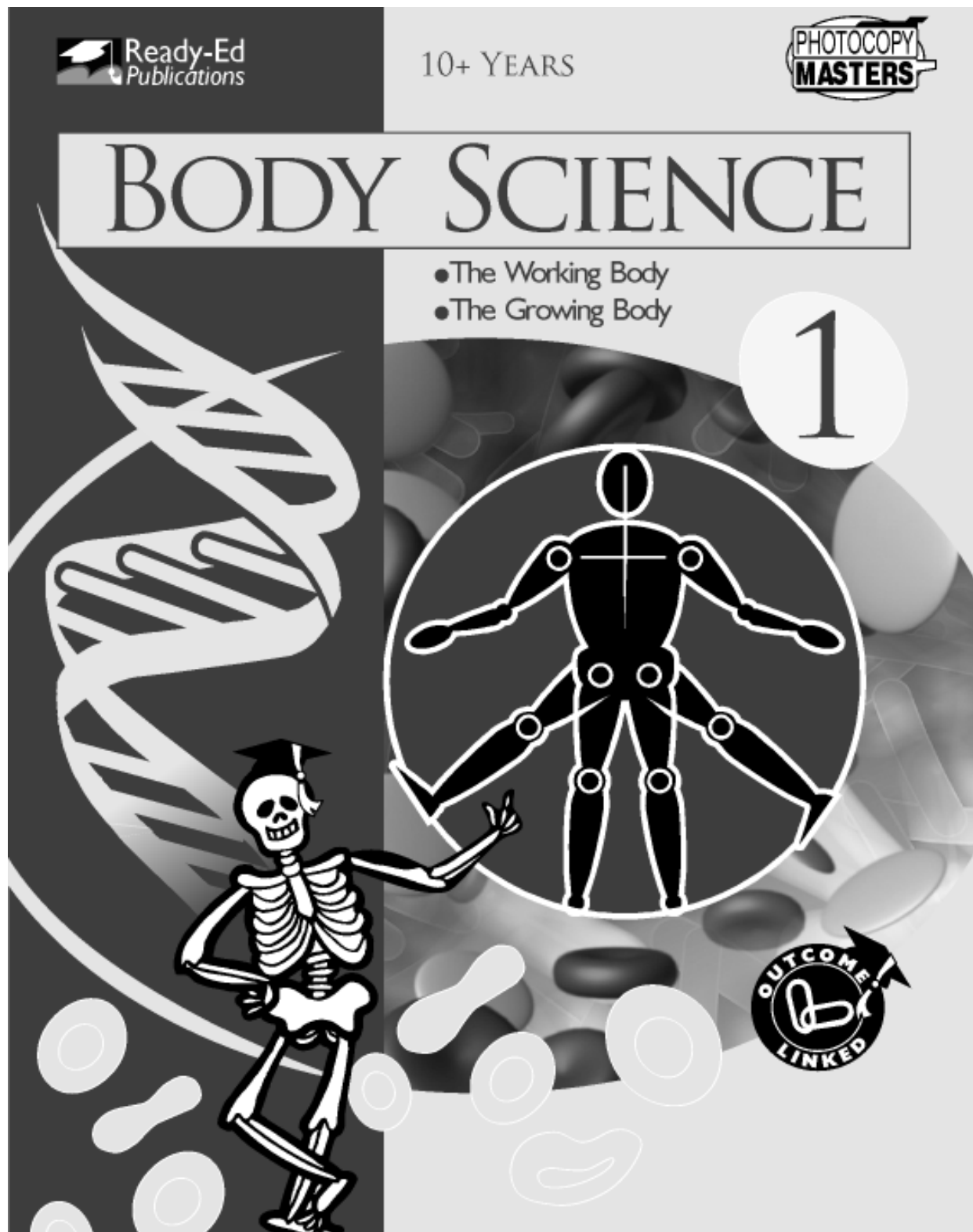


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# RATIONALE

*Body Science* was written for teachers who want lessons that are inspiring as well as being practical. For teachers, science lessons are too often associated with long lists of difficult to find equipment and experiments that do not account for the busy time schedule within a teaching day. *Body Science* provides a science experience which delivers easy to teach lessons packed with relevant, motivational information and tasks. This book covers scientific concepts as well as relevant skills and processes.

*Body Science* aims to entice students with the fascinating progress, studies and future projections that are being explored in the scientific world today.

*Body Science* is used as the title of this book as a general term, to incorporate an exploration of anatomy and physiology, historical views on the body and future directions for science in this field.

Students, like the rest of us, want to learn about the things that directly affect them. There is no better "real" learning experience than students gaining knowledge and insight into the structure and function of their own bodies. This book provides real answers to the kind of questions and topics that are interesting and relevant to students and teachers alike.

*Body Science* consists of two sections: *The Working Body* and *The Growing Body*.

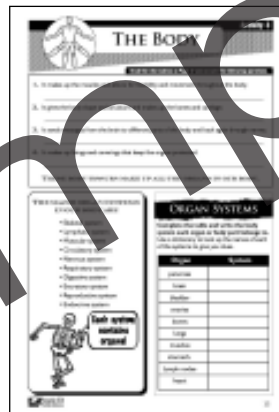
Each section explores the history of diseases, health and past views on body science in the information pages titled *Looking Back* (see Example A).



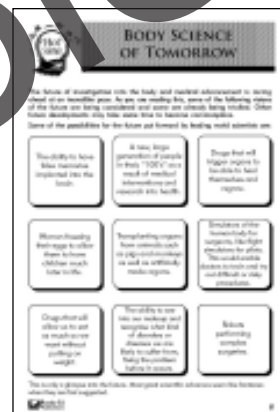
Example A



Example B



Example C



Example D

At the end of each part is a section called "Hot Science" dealing with topical issues facing science today (see Example D).

*Because of the range of information and tasks included, this book also spans the society and environment and health curriculums. As such, it is ideal for a basis of an integrated theme of work.*

*The book deals occasionally with topics that may be sensitive in your classroom. The section on puberty provides information appropriate for an upper primary level. As such, Body Science is not intended for children below this age and parents may need to be notified prior to teaching.*

*The "Hot Science" section that deals with the issue of stem cell research will also need possible consideration, dependent on the school environment. The issue itself is intended as an objective look at the facts on this issue to give students an insight into some current topical debates. As this is a potentially sensitive issue, however, teachers are advised to consult with the principal or parents before planning to teach.*

# LOOKING BACK

## BODY SCIENCE IN HISTORY

One of the ways the Ancient Chinese balanced these energies was by performing acupuncture. This involved inserting fine needles into the body at different pressure points. Acupuncture is still popular throughout the world today and is considered a form of alternative medicine.



*Woman applying leech to her forearm.*

### THE MIDDLE AGES

The period in Europe between the 5th century and the 15th century was known as the “middle ages”. This period of time began after the Roman Empire had collapsed. The money and structure of the Roman Empire had allowed discoveries and investigation of the human body to take place, but this almost stopped at the end of the Empire. Europe fell into chaos with the in-fighting and small scale battles that erupted as rivals sought to gain control over new territories. With the lack of any other direction, people focused entirely on the guidance of the church, which preached that illnesses and problems with the body were brought about through sin. It would not allow the dissection of bodies and so doctors and scientists weren’t able to study the body and make new discoveries. Whilst some knowledge of the past still existed there was little scientific research done at this time. A lot of beliefs about the body were based more on superstition than science. Illness was seen to be caused by such things as demons, sins, astrology, bad smells, and groups of minority

people in the community. The practise of blood letting was still popular as were herbal remedies and the use of astrological charts.

Operations were not done by doctors but were left to barber-surgeons. These surgeons performed operations but only on the visible outer body parts, such as the eyes or face. However there was no understanding that dirt caused infections and many patients died as a result. In general, the superstitious beliefs, strange cures and unsanitary practices meant that it was uncertain whether a patient was helped or made worse by the doctors and surgeons of the day.

### THE BEGINNING OF MODERN MEDICINE

Some of the most significant steps in the development of modern medicine are:

c.1550	Andreas Vesalius published new ideas on the anatomy of the human body that challenged previously held beliefs. His extensive research was based on his dissection of human bodies. He is among a group of scientists who had to resort to digging up and dissecting dead bodies from graves.
1620-1629	William Harvey discovers that blood circulates through the body.
1660-1669	Thomas Willis details the function of the brain and the nervous system.
c.1798	Edward Jenner invents the first vaccines against small pox.
c.1850	Louis Pasteur discovers that diseases are caused by germs.
1860-1869	Scotsman, Joseph Lister discovers antiseptics and reduces post-surgical death in a Glasgow hospital by half.
1920-1929	Alexander Fleming invents antibiotics.

# LOOKING BACK

## BODY SCIENCE IN HISTORY



Answer the following questions from the information pages on Page 8 and 9.

1. What do you think is meant by the term “alternative medicine”?  
\_\_\_\_\_
2. What did the Ancient Greeks see as being central to the health of a person?  
\_\_\_\_\_  
\_\_\_\_\_
3. In Ancient China what did “Yin” and “Yang” represent?  
\_\_\_\_\_
4. What were some of the reasons for the lack of scientific discovery and research into the human body during the Middle Ages?  
\_\_\_\_\_  
\_\_\_\_\_

### Talk About It!

## ALTERNATIVE VS CONVENTIONAL MEDICINE



The term “alternative medicine” describes a range of varied healing practices that do not use conventional drugs or medicines to heal. Alternative medicine incorporates the use of herbs, vitamin and mineral supplements, massage, essential oils, acupuncture and cupping, to name a few. In some places in the world, these practises are carried out in doctors’ surgeries and hospitals. In the west they are considered alternative and are not the main form of practised medicine.

### Discuss in a group

- ▶ Do you have any experiences of people you know using alternative medicines?
- ▶ Do you think that alternative medicines work?
- ▶ Why do you think these forms of medicine are not suggested more by doctors and used in hospitals?
- ▶ What, if any, problems can you see with alternative medicines?
- ▶ Do you think more or less people will use alternative medicines in the future?



# LOOKING BACK BODY SCIENCE IN HISTORY

## LIST OF ANCIENT SOCIETIES

- Aztecs
- Ancient Egyptians
- Incas
- Ancient Romans
- Ancient Greeks
- Aborigines (prior to 1788)
- Mediaeval Europeans.

**Choose an ancient society from the list and create a fact file about aspects of health related to the headings below.**

Illustrate a health fact from your ancient society in the centre.

Use the internet or the library as sources.

## Fact File ►

LIFESTYLE:

VIEWSONHEALTHAND  
THE BODY:

DIET:

HEALING  
PRACTICES:

MEDICINES:

HYGIENE:



# THE BODY

The human body is mapped out into organ systems of two or more organs that work together. These organ systems help us to perform basic functions.

*E.g. the stomach and intestines are organs from the digestive system that help us to digest our food.*

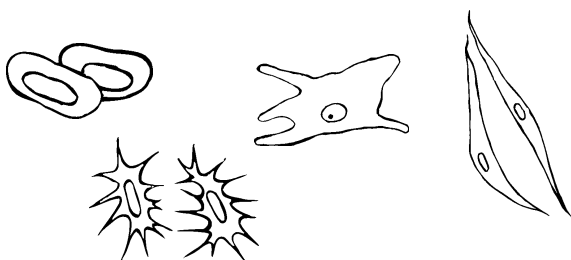


ORGANS ARE MADE UP OF TISSUE WHICH COMPRISES LOTS OF MICROSCOPIC CELLS BUNDLED TOGETHER.

## FACTS About Cells!

The cells in your body are dying and regrowing every day – in fact three hundred million cells die in a human body every minute.

How many is that in a day?



It takes 17 of your face muscles to smile but a whopping 43 to frown! Something to consider the next time you feel grumpy!

THERE ARE FOUR DIFFERENT TYPES OF TISSUES IN THE BODY.

### EPITHELIAL TISSUE

Epithelial tissue is packed tightly together. It makes up the linings or casings of the organs, keeping the organs protected and separated from one another. Your skin and the inside of your stomach are made of epithelial tissue. Put a finger inside your mouth and run it along the inside of your cheek — that's epithelial tissue as well.

### CONNECTIVE TISSUE

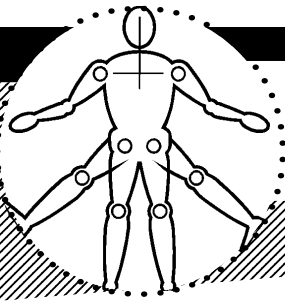
Connective tissue is the tissue that supports the body and gives it shape. If we had no connective tissue we would be all floppy and unable to support our own bodies. Can you guess where you might find connective tissue? If you said "the bones" you would be right. Our bones, ligaments, tendons, fat tissue and cartilage, as well as the inside layer of our skin is made up of connective tissue.

### MUSCLE TISSUE

Muscle tissue, you've probably guessed, makes up the muscles. It is a special type of tissue that can stretch, allowing us movement.

### NERVE TISSUE

Nerve tissue is a complex tissue that sends messages from the brain, down the spinal cord to different parts of the body and back again.



# THE BODY

Read the information on Page 12 and answer the following questions.

NAME THE TISSUES WHICH EACH SENTENCE DESCRIBES:

1. It makes up the muscles and allows for flexibility and movement throughout the body.  
\_\_\_\_\_
2. It gives the body shape and structure and makes up the bones and cartilage.  
\_\_\_\_\_
3. It sends messages from the brain to different parts of the body and back again through nerves.  
\_\_\_\_\_
4. It makes up linings and coverings that keep the organs protected.  
\_\_\_\_\_

THESE BODY TISSUES MAKE UP ALL THE ORGANS IN OUR BODY.

THE MAJOR ORGAN SYSTEMS  
IN OUR BODY ARE:

- Skeletal system
- Lymphatic system
- Muscular system
- Circulatory system
- Nervous system
- Respiratory system
- Digestive system
- Excretory system
- Reproductive system
- Endocrine system



**Each system  
contains  
organs!**

## ORGAN SYSTEMS

**Complete the table and write the body system each organ or body part belongs to.**  
To give you clues, use a dictionary to look up the names of each of the systems.

Organ	System
pancreas	
brain	
bladder	
ovaries	
bones	
lungs	
muscles	
stomach	
lymph nodes	
heart	