

4

Grade Lesson Package



heart healthy kids™
volume 2

Jeunes cœurs en santé^{MC}



volume 2

OVERVIEW OF LESSON PACKAGE FOR GRADE 4

General Information

STRUCTURE OF THE UNIT

This unit consists of an introduction and five student lessons (BLM 1-5).

CONTENTS OF THIS PACKAGE

- Teacher Guide Pages, including Tips and Answers
- Photocopiable Student Lessons, BLM 1-BLM 5
- Photocopiable Circulation Game, BLM 6
- Photocopiable Heart Talk Glossary, BLM 7
- Photocopiable Heart Fact Page, BLM 8

STRUCTURE OF STUDENT LESSONS

1. Each Student Lesson is provided in Black Line Master (BLM) format.
2. Each lesson is organized around the following headings:
 - Warm-up
 - Are you Ready?
 - Get Set
 - Go!
 - Cross the Finish Line
3. Each Go! section involves the student in an activity or in making something: a model, a picture, a chart. In most cases, what students make can be taken home to share with their families.
4. The unit is are very much self-contained. Students should be able to progress through each lesson with minimal teacher guidance. It is suggested that a class discussion follow each lesson to wrap up any student questions.

YOU DON'T NEED TO BE AN EXPERT

All the information you and your students really need is either in this package or in the box. There's no need for the teacher to do extra research. At the same time, there is plenty of opportunity for students to do extra research.

YOU DON'T NEED SPECIAL MATERIALS

You won't have to prepare or scrounge for materials. Most activities don't require anything more than pens, pencils, paper and tape. Everything else you'd need at school is in the box. And there are numerous opportunities for children to share activities with family by taking the lesson page home and interacting with adults.

YOU DECIDE HOW MUCH CLASS TIME TO USE

Children need not do the entire unit to benefit. It's well worth while to do, say, the introduction and one or two of the lessons you think your students would most enjoy. If you choose to do all five lessons, you might decide to do one a day for a week, or one a week for a month.

The time required will depend on your objectives. Each lesson can stand on its own, if necessary. Or, the unit can be enhanced to become the theme of a multidisciplinary study.

YOU DON'T NEED A LOT OF PREPARATION TIME

We've tried to keep this teacher guideline as concise and concrete as possible, so you won't have to wade through page after page to get to the heart of the matter. We've avoided jargon, and chosen the simplest possible language and the tightest possible format. The same is true of the Student Lessons. Note that Tips and Answers are provided. To save space, the answers are written as simply as possible. You may want your students to answer in full sentences.

THE LESSONS ARE MEANT FOR INDEPENDENT WORK

The five lessons are designed to help students learn how to learn from reference materials, from reading, from working together to answer questions, from connecting the learning that takes place from one lesson to the next.

INTRODUCING THE UNIT

See page 3 of this Teacher Guide for a suggested introduction.



OVERVIEW OF LESSON PACKAGE FOR GRADE 4

Contents at a Glance

	<i>Topic</i>	<i>Teacher Guide</i>
Overview of Grade 4 Lesson Package	General Information	page 1
Contents at a Glance	Contents	page 2
What you don't know about your Heart	Introduction to Lessons	page 3

<i>Student Lesson</i>	<i>BLM</i>	<i>Title</i>	<i>Topic</i>
Lesson 1	BLM 1	<i>Circulation Game: Rules</i>	Structure and Function of the heart
Lesson 2	BLM 2	<i>Rule 1: Eat Good Food</i>	Nutrition for a healthy heart
Lesson 3	BLM 3	<i>Rule 2: Breathe Clean Air</i>	Air (oxygen) for a healthy heart
Lesson 4	BLM 4	<i>Rule 3: Move Your Body</i>	Exercise/fitness for a healthy heart
Lesson 5	BLM 5	<i>Emergency! Help for an Unhealthy Heart</i>	Using the 911 Emergency Service
	BLM 6	<i>Circulation Game: Picture B</i>	Goes with Lesson 1
	BLM 7	<i>Heart Talk Glossary</i>	Goes with all Lessons
	BLM 8	<i>Handy Heart Facts</i>	Goes with all Lessons

Curriculum Expectations

Students will:

LESSON 3.

- identify the major harmful substances found in tobacco (H & PE -- Healthy Living)
- describe the short and long-term effects of first and second-hand smoke, and identify the advantages of being smoke-free (H & PE -- Healthy Living)

LESSON 4.

- recognize that the health of the heart and lungs is improved by physical activity (H & PE -- Active Participation)
- monitor their pulse rates before and after physical activity (H & PE -- Active Participation)

LESSON 5.

- identify people and community agencies that can assist with emergency situations (H & PE -- Healthy Living)

NOTE: Based on the Province of Ontario's Curriculum Expectations
 H & PE: Health and Physical Education, The Ontario Curriculum Grades 1-8
 Sc & Tech: Science and Technology, The Ontario Curriculum Grades 1-8

Teacher’s Guideline – Grade 4

INTRODUCTION *What You Don’t Know About Your Heart Now Could Hurt You Later*

Teacher Preparation: Make copies of BLM 7 and BLM 8 – one each per student. These are helpful for the introduction, and will be needed for all five lessons.

Do or Say	Ask	Elicit
Pull the stethoscope out of the box	Does anybody recognize this?	It’s a stethoscope
Swing it	What’s it for?	Listening to the heart
Choose a student “volunteer”	Show me how to use it	Get student to place earpieces in your ears, disc on own chest
Have student place stethoscope disc their chest	What’s that sound?	Heartbeat
Say: Yes, I hear it. Gee, it’s noisy!	How does the heart make all that noise?	From pumping blood (from pushing blood around)
It sounds as if you people already know a few things about the heart	Where is your heart? What does it do? Where does the blood go? What does the blood do?	It’s in your chest It pumps your blood Everywhere It keeps you alive

In this unit, you’ll learn some of what you don’t already know about the heart.

- In Lesson 1, you’ll play a game to learn the rules that control the movement of blood everywhere in the body. To help out, you’ll get a copy of a Heart Glossary. [Pass out the photocopies now, during the introduction.] That’s like a minidictionary of heart talk. You’ll also get a page of Handy Heart Facts. [pass out the photocopies now.] The great thing is, you don’t have to learn everything at once. And when you have a glossary and fact sheet handy, you don’t have to memorize a lot of stuff. There are also lots of posters with helpful information.
- In Lessons 2-4, you’ll learn about the “Big Three” rules for heart health. The rules themselves couldn’t be simpler: 1. Eat, 2. Breathe, 3. Move. But you need to learn what they mean.

- In Lesson 5, you’ll learn how to help people whose hearts got hurt by what they didn’t know, and make a Personal Emergency Chart for your home.

You’ll be working in groups of three. [ASSIGN THE GROUPS IN YOUR USUAL MANNER. WE RECOMMEND ONE HIGH ACHIEVER, ONE LOW ACHIEVER, AND ONE FROM THE MIDDLE OF THE PACK.] Get together now with the rest of your group, and spend a little time looking at the materials that are available to help you with this unit. GIVE OUT PHOTOCOPIES, SHOW THEM WHERE POSTERS ARE. We’ll start on Lesson 1 [IN TEN MINUTES, AFTER RECESS, AFTER LUNCH, TOMORROW, MONDAY]

Teacher's Guideline – Grade 4

LESSON 1 *The Circulation Game*

The purpose of this game is to give students a concrete sense of the way blood circulates in the body; and to help them appreciate the complexity of the circulatory system without involving them in a lot of memorization.

As teacher, you will play the role of “game official.” That is, you will read the instructions out loud so students can have two free hands to take part in the game. Follow-up materials are provided in photocopiable form. Pass them out after the game.

TEACHER PREPARATION

Photocopy:

- Class sets of BLM 1, Heart Glossary, Heart Facts
- One copy of “Picture B” for yourself

Collect Materials:

- large piece of paper (e.g., newsprint) masking tape
- 3 crayons (black, red, blue), small toy truck (or red checker)

Make Arrangements

- to use the hall, the gym, or a space in the classroom

READ is your cue to read aloud from the text that follows.

TEACHER is your cue to DO without reading out loud.

INTRODUCTION

READ There’s a miracle liquid inside your body! It’s your blood, and it keeps you alive, but not all by itself. To discover which body parts help the blood out, you’ll set up a pretend “emergency room” with a “body,” and “medical” teams.

WARM-UP

TEACHER Decide who will play each role below.

Art Director must have a steady hand.

Volunteer “Body” must lie perfectly still.

Blood Team at least five members.

Heart Team, Lung Team, Stomach Team

ARE YOU READY?

TEACHER Give students the materials listed above. You need a copy of (1) this page (2) Glossary (3) Picture B

GET SET

1. *READ:* It’s time to set up the emergency room.

Art Director Tape the paper to the floor.

Volunteer Body Lie on the paper, face up, arms at

right angles, feet as far apart as possible.

Art Director Trace around the Volunteer with black crayon. Keep it at least 2-3 cm away from the volunteer’s clothes.

TEACHER: When drawing is complete,

- tell Volunteer and Director to get up and join a team.
- Place picture B on the floor where students can see it.

2. *READ:* Get ready to draw body parts with the black crayon.

Lung Team Draw lungs on the body. Lungs are hollow, thin-walled pouches. They bring air into your chest and let it out again. Blood-filled tubes in the walls absorb oxygen from air.

Heart Team Draw a heart. The heart is a strong muscle with four hollow compartments. Soon you’ll find out what the compartments are for, and why the heart is called a pump.

Stomach Team Draw a stomach. The stomach is part of a body system that breaks food into bits small enough for blood to carry.

3. *READ:* The blood’s job is to deliver useful materials and take away waste materials, something like a truck. I’m going to colour a short piece of masking tape red and stick it on the toy truck. From now on, the truck stands for a single red blood cell. Red blood cells are tiny saucer-shaped objects that pick up oxygen at the lungs and deliver it all over the body. [NB: This model ignores the fact that blood cells don’t pick up food.]

Blood Team Kneel outside the body at head, feet, and hands.

Other Teams Kneel outside as close as you can to your organ.

GO!

4. *READ:* [ALLOW TIME FOR EACH TEAM TO DO ITS JOB.] As you work, don’t lift the “cell” off the body or outside it.

Lung team Place the blood cell inside the lungs. Roll the cell from the lungs into the heart’s top right compartment.

Heart team Roll the cell into the heart’s bottom right compartment. Now push it out through the bottom right corner.

Blood team Move it to the nearest hand; back to the armpit.

Stomach team Roll the blood cell alongside the stomach but not inside it. Then roll it down the nearest leg to the foot.

Blood team Roll the blood cell up one leg and down the other.

5. *READ* What did the blood pick up at the lungs? (ELICIT: Oxygen.) Near the stomach? (ELICIT: Food.) But now the blood has travelled nearly halfway around the body. So it has given up half of its oxygen and food. And it has picked up waste. So the cell is not the same as it was at the start. To show this, I'm putting a blue-coloured piece of masking tape on top.

6. *TEACHER* ALLOW TIME FOR EACH TEAM TO DO ITS JOB.

READ: Now keep the blood cell circulating.

Blood Team Move the cell: Up the leg and the empty side of the body. Out the empty arm to the hand. Back to the neck, and around the head. Back to the top left corner of the heart.

Heart Team Move the cell: Into the heart's top left compartment. Down into the bottom left compartment. Out the heart's bottom left corner. Then "pump" it up to the lungs.

7. *READ:* The cell is back where it started – the lungs. The lungs inhale air from outside. Air contains oxygen. So the blood cell can pick up fresh oxygen, and circulate again. This time, you will trace its path with a red crayon.

TEACHER: ALLOW TIME TO SWITCH TO RED CRAYON
READ: See if you can remember where the blood goes. If you need help, I can read the instructions again.

- Don't lift the red crayon until you get to the first foot.
- Switch to the blue crayon. Trace the path back to the lungs.
- Tape the finished body to a wall, or a door.

Lung team Make a label that says what the lungs do and how they help the blood do its job. Tape your label to the body.

Heart team Make a label that says what the heart does and how it helps the blood do its job. Tape your label to the body.

Blood team Get together and decide what body part carries the blood around. Make a label that names the body part(s) and says what they do. Tape your label to the body.

TEACHER: Now you can pass out BLM 1. Its tasks and questions should allow kids to internalize what they have learned. An answer key for BLM 1 is provided separately.

Answers to Questions for Grade 4 Lesson 1

The Circulation Game

You played this game to discover how blood keeps you alive. Let's see what you found out.

WARM UP

What role did you play in the game?

Answers will vary

ARE YOU READY?

What piece of equipment was most important?

Discuss to show range of opinion

GET SET

1. Why did you have to keep the crayon 2-3 cm away from the Volunteer?

keep clothes clean

2. While you drew body parts, your teacher read from the Glossary. What do you recall about:*

- The lungs?

they give oxygen to blood

- The heart?

it's a pump

- The stomach?

breaks food into small bits

3. What do you recall about red blood cells?

they pick up oxygen

What did you use as a pretend red blood cell?

a toy truck because it picks up and delivers

GO!

4. Where did your pretend blood cell start out?

at the lungs

What body parts did it visit before it got back?

heart, arm, stomach, one leg, other leg, other arm, neck, head, (neck again), heart

5. What did the blood cell pick up: At the lungs?

oxygen

Near the stomach?

food (bits) ***

6. What did your teacher do when the blood got about halfway around the body?

put blue tape on top of red tape on "blood cell" (truck)

What was your teacher's reason?

to show that cell had changed by dropping off food and oxygen; picking up wastes

7. The heart has 4 compartments: Which ones did your pretend blood cell visit?

- On its trip away from the lungs?

Top Right and Bottom Right

- On its trip back toward the lungs?

Top Left and Bottom Left

- Where did it go in between?

All around the body

8 Look at the red and blue lines on the paper body.

Circle the best word for this pattern:

network map puzzle highway

CROSS THE FINISH LINE

Use your Glossary and your Heart Facts page to find the following information:

- What do the red and blue lines stand for?

blood vessels (tubes)

- What is a circulatory system? List its parts.

heart plus blood vessels

- Circulate means travel around again and again. What do you think will happen to the blood that just got back to the lungs?

It will return to the heart and circulate through the body again

- Will it follow exactly the same path as before?

Same path, no. Most of same places, yes.

- What's the only body part that actually pumps the blood (gives it a push)?

the heart

- How far does the blood go on one push? (Hint: there are two possible answers.)

(i) out to the lungs and back (short trip)

(ii) out to the rest of the body and back

- How does blood keep you alive?

Blood brings food (fuel) and oxygen to "burn" it (extract its energy) to every part of the body. [and brings it 24 hours a day]**

- On the back of this page, draw a body with all the parts that help the blood do its job. Be sure to label the parts.

*Emphasis is on what they recall – it may not be everything!

**Help them say it in their own words.

***Model is simplified. Food bits actually dissolve in plasma.

STUDENT WORKSHEET GRADE 4 LESSON 1

The Circulation Game

You played this game to discover how blood keeps you alive. Let's see what you found out.

WARMUP

What role did you play in the game?

ARE YOU READY?

What piece of equipment was most important?

GET SET

1. Why did you have to keep the crayon 2-3 cm away from the Volunteer? _____

2. While you drew body parts, your teacher read from the Glossary. What do you recall about:

- The lungs? _____
- The heart? _____
- The stomach? _____

3. What do you recall about red blood cells?

- What did you use as a pretend red blood cell?

GO!

4. Where did your pretend blood cell start out?

- What body parts did it visit before it got back?

5. What did the blood cell pick up

- At the lungs? _____
- Near the stomach? _____

6. What did your teacher do when the blood got about halfway around the body?

- What was your teacher's reason?

7. The heart has ____ compartments: Which ones did your pretend blood cell visit:

- On its trip away from the lungs? _____
- On its trip back toward the lungs? _____
- Where did it go in between? _____

8. Look at the red and blue lines on the paper body. Circle the best word for this pattern:

network map puzzle highway

CROSS THE FINISH LINE

Use your Glossary and your Heart Facts page to find the following information:.

- What do the red and blue lines stand for?

- What is a circulatory system? List its parts.

- Circulate means travel around again and again. What do you think will happen to the blood that just got back to the lungs?

- Will it follow exactly the same path as before?

- What's the only body part that actually pumps the blood (gives it a push)?

- How far does the blood go on one push? (Hint: there are two possible answers.)

- How does blood keep you alive?

- On the back of this page, draw a body with all the parts that help the blood do its job. Be sure to label the parts.

Answers to Questions for Grade 4 Lesson 2

Eat a Variety of Foods

WARM UP

Work individually and write down everything that you ate yesterday. Don't forget to include all of your snacks.

For this activity you will need:

- A copy of Canada's Food Guide to Healthy Eating
- Your own piece of blank paper

ARE YOU READY?

Canada's Food Guide to Healthy Eating helps you make food choices for healthier eating every day. Review the Food Guide so that you are ready to complete this worksheet. Review the back of the Food Guide that lists the number of servings and serving sizes for foods within each food group that you need to eat every day.

Canada's Food Guide to Healthy Eating shows you what and how much you should be eating. A range of servings provides the number of servings needed from each food group. The number of servings you need each day from the four food groups and Other Foods depends on your age, body size, activity level, whether you are male or female and if you are pregnant or breast-feeding.

GET SET

1. Using the chart below, classify the foods that you ate yesterday into the four food groups and Other Foods category.

<i>Grain Products</i>	<i>Vegetables & Fruit</i>	<i>Milk Products</i>	<i>Meat & Alternatives</i>	<i>Other Foods</i>

CROSS THE FINISH LINE

5. Total the number of servings of food that you have in each food group. Using Canada's Food Guide to Healthy Eating compare this number with the recommended number of servings that are needed from each food group. Do you have enough servings from each of the four food groups? How many servings of food are 'everyday foods' and how many are 'sometimes foods'?

The recommended number of servings/day from each food group is:

Grain Products: 5-12 servings, Vegetables and Fruit: 5-10 servings, Milk Products: 2-4 servings, Meat and Alternatives: 2-3 servings. Other Foods can provide taste and enjoyment. However, some of these foods are higher in fat or Calories and should be used in moderation.

All foods fit into a total diet. However, you want to look at balance, variety and moderation when assessing your eating pattern.

2. Review the definitions of 'everyday foods' and 'sometimes foods' in your Glossary.

Everyday Foods: a variety of nutrient-dense foods from each food group and the Other Foods category. At least the minimum number of servings as listed in Canada's Food Guide to Healthy Eating should be 'everyday foods'.

Sometimes Foods: foods from the food groups and/or Other Foods which are high in energy and not very nutrient-dense. Examples include: cookies, cakes, potato chips, cream cheese, fruit leathers, pop, etc.

GO!

3. Using Canada's Food Guide to Healthy Eating as a tool, calculate the number of servings you ate from each food group. If you ate more than one serving of a particular food, list the number of servings beside the food. Underline the 'everyday foods' and circle the 'sometimes foods'.
4. Review your list of foods you eat occasionally. Think about how often you are eating those foods.

6. If you do not have enough servings from all of the four food groups, use Canada's Food Guide to Healthy Eating to assist you in selecting additional foods to increase your number of servings from each of the four food groups. Concentrate on including more 'everyday foods'.

Encourage the students to choose a good selection of vegetables and fruit and grain products.

7. Make a list of foods that you are going to try to eat more often. Remember that one of the key messages in the Food Guide is variety. Experiment with new foods more often.

Use this opportunity to ask the students to introduce some foods that they may eat at home that might not be familiar to the other students in the class.



STUDENT WORKSHEET GRADE 4 LESSON 2

Eat a Variety of Foods

WARMUP

Work individually and write down everything that you ate yesterday. Don't forget to include all of your snacks.

For this activity you will need:

- A copy of Canada's Food Guide to Healthy Eating
- Your own piece of blank paper

ARE YOU READY?

Canada's Food Guide to Healthy Eating helps you make food choices for healthier eating every day. Review the Food Guide so that you are ready to complete this worksheet. Review the back of the Food Guide that lists the recommended number of servings and serving sizes for foods within each food group.

GET SET

1. Using the chart below, classify the foods that you ate yesterday into the four food groups and Other Foods category.
2. Review the definitions of 'everyday foods' and 'sometimes foods' in your Glossary.

GO!

3. Using Canada's Food Guide to Healthy Eating as a tool, calculate the number of servings you ate from each food group. If you ate more than one serving of a particular food, list the number of servings beside the food.

Underline the 'everyday foods' and circle the 'sometimes foods'.
4. Review your list of foods you eat occasionally. Think about how often you are eating those foods.

<i>Grain Products</i>	<i>Vegetables & Fruit</i>	<i>Milk Products</i>	<i>Meat & Alternatives</i>	<i>Other Foods</i>

CROSS THE FINISH LINE

5. Total the number of servings of food that you have in each food group. Using Canada's Food Guide to Healthy Eating compare this number with the recommended number of servings that are needed from each food group. Do you have enough servings from each of the four food groups? How many servings of food are 'everyday foods' and how many are 'sometimes foods'?

6. If you do not have enough servings from all of the four food groups, use Canada's Food Guide to Healthy Eating to assist you in selecting additional foods to increase your number of servings from each of the four food groups. Concentrate on including more 'everyday foods'.
7. Make a list of foods that you are going to try to eat more often. Remember that one of the key messages in the Food Guide is variety. Experiment with new foods more often.

Answers to Questions for Grade 4 Lesson 3
Three Big Rules for Heart Health. Rule 2: Breathe Clean Air

WARM UP

Show the Smoking poster from the box. Ask how students can share it so each group has a turn.

GET SET

1. You've breathed air all your life. What does it mean to you?

Answers will vary.

2. According to the glossary, what is oxygen?

It's a material found in air. The cells need it to extract energy from their "fuel" by "burning" blood sugar. [Similarly, Candle flames need it to keep burning.]

GO!

3. No special tips.

4. Use the instructions in the box below to construct a simple model of a human lung.

How to Build a Model of a Human Lung

- Fold as many times as possible. More than 5 difficult.
- Unfold ... count ... or multiply

5 folds gives 32 compartments
 (2x2x2x2x2) or 2 times itself 5 times.

What do parts of the model mean? No tips here.

How to Operate a Model of a Human Lung

Expand and contract your model lung again. How many compartments will let oxygen through?

Half or 16 in a 32-compartment model lung.

How many can't?

The other half.

CROSS THE FINISH LINE

5. Search the Glossary to fill in this chart.

	<i>Fresh Blood</i>	<i>Used Blood</i>
How much oxygen?	lots	not much
How much waste?	not much	lots
What colour?	bright red	dark red

6. Search the Glossary to fill in this chart.

How are they alike?	hidden fat	second hand smoke
	bad for heart	bad for heart
different?	hard to detect	easy to detect

7. Smokers can't smoke everywhere. Sometimes their lungs inhale completely clean smoke-free air. But even then, the blood can't pick up a full load of oxygen. Use what you learned from your paper lung to explain why.

Half the compartments are blocked with tar. So the lung can only get half as much oxygen from a lung full of air.

[Only long term smokers would actually have half of lung blocked. This is a model.]

8. A change in breathing patterns can help a smoker get more oxygen by taking in more air.

a) How would breathing more deeply help?

The lung would take in more air and therefore more oxygen. [Kids this age won't likely recognize that there would also be more surface area for gas exchange.]

b) How would breathing faster help?

The smoker could get more lungfuls of air each minute.

c) Why might smoking eventually cause a heart attack?

The heart has to work harder to get enough oxygen.

9. Look at Picture B. What would happen if:

a) Your feet don't get enough oxygen?

They'll get tired faster because the cells can't get enough energy out of their food.

b) Your heart doesn't get enough oxygen?

It will get tired faster because the muscle can't get enough energy out of its food.

c) Your feet get smoke filled materials from second hand smoke along with the oxygen?

The smoke filled air could harm the blood vessels.

[This question and the next may lead to some imaginative answers. The worst product from smoke is nicotine (poisonous and addictive) and carbon monoxide (merely poisonous).]

d) Your heart gets smoke filled air along with the oxygen?

STUDENT WORKSHEET GRADE 4 LESSON 3

Three Big Rules for Heart Health. Rule 2: Breathe Clean Air

WARM UP

Keep working in your group of three. You will need: a piece of paper, a red pen, an ordinary pencil, your Game Page, your Glossary Page, and the Smoking poster. (Note: If a word's in bold print you can look it up in the Glossary.)

GET SET

There are three "big rules" for heart health. Breathing clean air is important because:

- breathing brings air into your **lungs**
- air contains **oxygen**.
- cells need oxygen to get **energy** out of power food.

GET SET

- You've breathed air all your life. What does clean air mean to you?
- According to the glossary, what is oxygen?

GO!

- Take turns inhaling and exhaling deeply to expand and contract your lungs. Can you:
 - Feel your own lungs expand and contract?
 - See expansion and contraction in others?
- Use the instructions in the box below to make a pretend lung.

How to Build a Pretend Lung

- Place a piece of paper flat on your desk.
- Scribble red lines on one side.
- Fold the paper in half, as many times as possible.
- Unfold the paper, and count the compartments.

What are the Parts Pretending to Be?

- The unfolded paper is something like a lung. But a lung has millions of tiny compartments.
- The paper stands for the lung's thin walls.
- The clean side stands for inside of the lung. That's where the lung compartments trap clean air.
- The paper has red scribbles on the back. Lung compartments have blood vessels on the back.

How to Operate the Pretend Lung

- Grip the paper by its ends, clean side facing you.
- Push the ends in to contract the model lung.
- Pull them out to expand the model lung. Listen.
- When a real lung expands, air presses the walls.
- Air is pressing the paper lung right now – air that contains oxygen. Imagine oxygen pushing through.
- Imagine oxygen pushing right into the red scribbles on the back of the paper. Can you see it in your mind?
- That's how your lungs work. Oxygen pushes right through the thin wall and into the blood vessels.

How to Build a Smoker's Lung

- Draw a pencil X in every second compartment. X stands for tar from tobacco smoke.

Operate the Smoker's Lung

- Count or calculate: How many compartments can let oxygen through? How many can't?

CROSS THE FINISH LINE

5. Search the Glossary to fill in this chart.

	<i>Fresh Blood</i>	<i>Used Blood</i>
How much oxygen?		
How much waste?		
What colour?		

6. Search the Glossary to fill in this chart.

How are they alike?	Hidden fat	Second hand smoke
different?		

- Smokers can't smoke all the time and everywhere. Sometimes their lungs inhale completely clean smoke-free air. But even then, the blood can't pick up a full load of oxygen. Use what you learned from your paper lung to explain why.
- Look at Picture B. What could happen if:
 - Your feet don't get enough oxygen?
 - Your heart doesn't get enough oxygen?
 - Your feet get smoke filled materials from second hand smoke along with the oxygen?
 - Your heart gets smoke filled air along with the oxygen?

Answers to Questions for Grade 4 Lesson 4

Move Your Body

WARM UP

Show the Physical Activity poster from the box. Ask how students can share it so each group has a turn.

GET SET

1. You've been moving your body all your life. What does physical activity mean to you?

Answers will vary.

2. According to the glossary, what is fitness?

The glossary splits physical fitness into two parts: fitness and cardiovascular fitness. Together, they mean joints that bend freely, strong muscles that can work a long time, plus heart lung and blood vessels that can deliver oxygen-rich blood to muscles at a fast rate for a long time.

GO!

3. Use the instructions in the box to investigate your own heartbeat and pulse.

How to Use a Stethoscope

A Substitute Stethoscope for Home Use

If you suspect that some of your female students are uneasy about having another student hold the stethoscope disc on their chests, you may wish to turn the entire lesson into an at-home activity. Or you may wish to ask students to bring towel tubes from home. They are amazingly effective, and the user's hand need not touch the subject's body.

How to Take Your Own Pulse

Taking a wrist pulse involves a long learning curve. Turn palm up, place 2 fingers (not thumb) on wrist. Press gently.

My Heartbeat Chart

Beats per minute with stethoscope _____

Pulse when I wake up in the morning _____

Pulse when I'm sitting in school _____

Pulse before I start walking _____

Pulse after walking briskly for 5 min _____

Pulse after resting for 5 min _____

Pulse after running for 1 min _____

Pulse after resting for 5 min _____

Pulse before I start watching TV _____

Pulse after watching TV for 30 min _____

Pulse range for my age group _____

Am I inside the range? _____

CROSS THE FINISH LINE

4. Do you have to tell your heart to beat faster when you run?

No

Explain why or why not.

The heart has a pacemaker that controls the heart-beat automatically.

5. What will likely happen to your heartbeat as you get older?

It will likely get slower. The heart facts page show that teenage hearts beat slower than baby hearts. Adult hearts beat slower still.

6. Running around makes your heart beat faster and work harder. How can that be good for you?

The heart is made of muscle, and muscle gets stronger when it works harder.

7. a) What is your favourite physical activity?

Answers will vary.

b) Estimate how much time you spend on it.

They'll have to estimate because they probably don't measure that time nearly as closely as they measure TV time. Hardly any parent complains because a

child is getting too much exercise.

c) How much time do you spend watching TV?

They'll likely know almost exactly because the TV guide sets the time out in half-hour blocks, and because how much may be an issue with their parents.

8. a) Couch potatoes have poor cardiovascular fitness. Explain why they do.

Their hearts don't have to do much work while they sit in front of the TV, so the heart muscle gets flabby and weak.

b) Explain why cardiovascular fitness matters.

It lets your heart deliver blood quickly so you can keep going.

9. From the poster, list the advantages of being physically fit.

i) more blood to your muscles; ii) you have more energy; iii) heart muscle gets stronger with exercise; you have more fun; you feel good about yourself; you sleep better; you will have a healthy body weight.

Did you know about all of them?

Probably not.

STUDENT WORKSHEET GRADE 4 LESSON 4

Three Big Rules for Heart Health. Rule 3: Move Your Body

WARM UP

Keep working in your group of three. You will need: a watch or clock with a second hand, alcohol swabs, stethoscope, your Heart Facts page, your Game Page, your Glossary Page, and a Physical Activity poster. (Note: If a word's in **bold print** you can look it up in the Glossary.)

ARE YOU READY?

The third "big rule" for heart health is one word: Move!

Muscles get strong when you work them hard. Strong muscles are essential for **fitness**. **Fitness** is essential for a healthy heart. Your heart gets stronger when you make it work. Measuring your heartbeat is a good way to evaluate fitness.

GET SET

1. You've been moving your body all your life. What does physical activity mean to you?
2. According to the glossary, what is fitness?

GO!

3. Use the instructions in the box to investigate your own heartbeat and pulse. Others can help with the timing, but you should listen to your own heartbeat and take your own pulse.. (Note: People your age are at different stages of growth. There is a lot of difference from one person to another. This is natural and normal.)

How to Use a Stethoscope

- If there is only one stethoscope for the class, plan how you will share it so everyone gets a turn.
- Use the alcohol swabs to clean the earpieces.
- Press the metal disc firmly against your chest. You'll probably hear your heart right away.
- Move the disc around until the sound is loudest. Do you hear the lubDUB? Count lubDUBs for one minute. Write the number in the heartbeat chart.

A Substitute Stethoscope for Home Use

- Use a paper towel tube to listen to your family's heartbeats. Then let them listen to yours.

How to Take Your Own Pulse

- Your pulse tells you how fast your heart is beating without a stethoscope. Turn your palm face up on your wrist. Press gently until you feel a throbbing. Count the number of beats in a minute.
- Over the few days, fill in the chart on the right.

My Heartbeat Chart

Beats per minute with stethoscope _____

Pulse when I wake up in the morning _____

Pulse when I'm sitting in school _____

Pulse before I start walking _____

Pulse after walking briskly for 5 min _____

Pulse after resting for 5 min _____

Pulse after running for 1 min _____

Pulse after resting for 5 min _____

Pulse before I start watching TV _____

Pulse after watching TV for 30 min _____

Pulse range for my age group _____

Am I inside the range? _____

CROSS THE FINISH LINE

Use the Heart Fact Sheet and Poster.

4. Do you have to tell your heart to beat faster when you run? Explain why or why not.
5. What will likely happen to your heartbeat as you get older. (Heart facts page.)
6. Running around makes your heart beat faster and work harder. How can that be good for you?

7. a) What is your favourite physical activity?
b) Estimate how much time you spend on it.
c) How much time do you spend watching TV?
8. a) Couch potatoes have poor cardiovascular fitness. Explain why they do.
b) Explain why cardiovascular fitness matters.
9. From the poster, list the advantages of being physically fit. Did you know about all of them?

Answers to Questions for Grade 4 Lesson 5

Call 911

WARM UP

Show students the phone book. How will they share it so every group gets a turn?

GET SET

1. According to the glossary, what is a heart attack?

Death or damage to muscle so heart can't pump blood to rest of body; caused when clogged arteries block oxygen-rich blood from reaching heart.

2. According to the glossary, what is a stroke?

Death or damage to brain cells so brain can't send orders to rest of body; caused when clogged arteries block oxygen-rich blood from the brain.

GO!

3. a) If your community does not have a 911 service, discuss how students can get help otherwise.

b) Can students think of any other likely questions?

c) What do students think a Personal Emergency Chart should be made of?

<i>What the Operator Might Ask</i>	<i>How Would You Answer?</i>
What is your name? etc.	Kids are often kept surprisingly ignorant of family health matters. Good observation skills can't replace facts on a chart posted beside the telephone.

CROSS THE FINISH LINE

Discuss these questions as a class.

This suggestion is made because a group of three may not have sufficient collective experience to make good suggestions. In an entire class, at least a few students are likely to have had some family experience with heart attacks or strokes, or other medical emergencies such as asthma.

4. One of the first symptoms of a stroke may be a sudden, extremely severe headache.

a) Explain why the head would be affected.

A stroke affects the brain. If the blood vessels to the head are blocked, then the brain would not get enough food and oxygen.

b) Is a headache always a sign of a stroke?

No. Some people (including kids) get migraines, which are very painful, but not the sign of a stroke.

c) Would someone having a stroke be able to tell you how he or she was feeling?

Maybe, maybe not. Often, a stroke affects the part of the brain that controls speech.

d) How could you guess from a person's behaviour that a stroke might be happening?

The person's face might look surprised, or puzzled. The eyes might look as if they can't focus. An arm or a leg might suddenly go limp. The person might fall as a result.

5. a) You might expect chest pain to be the first sign of a heart attack. Why?

The heart is in the chest, so that is the first place where damage occurs.

b) In many cases, the first sign is actually a puzzling

pain in the arm or shoulder. Often the person with the pain won't admit this kind of pain could be the start of a heart attack. How could you tell an adult like this why it is NOT a good idea to "wait a while and see"?

The term "puzzling" is used because the pain cannot be traced to an injury. In fact, the onset of a heart attack often inspires a great sense of i) fearfulness in the patient ii) denial that this may be "the big one". And it stands to reason that a heart which is not pumping properly is not sending enough blood to the brain, so it's not surprising that the person is not thinking clearly. Students may wonder why a heart attack may cause a pain in the arm. Tell them to ask a nurse or doctor.

6. a) Normally, you would not give personal information to a stranger over the phone. Why is it okay to give it to a 911 operator?

You have to trust somebody in an emergency, and your community has provided a service that works hand in hand with police, fire service and hospitals. If you can't trust 911...who can you trust?

b) What would you do if the operator asked you to unlock the front door, or leave the house?

You should always do what the operator says. The paramedics can't get in easily if the door is locked. If the operator thinks there is a gas leak in the house, anyone who can still move should get out promptly. But don't ever hang up the phone until the operator tells you to. The operator may want you to keep reporting on the patient's condition.

7. At first, the adults you live with might not want to give you the information you need for your Personal Emergency Chart. a) Explain why not.

Some adults have been brought up to think of their age as a kind of secret. Elderly folks especially think of some illnesses as shameful or embarrassing.

b) Explain why they should.

Because every responsible family member should be able to help all the others. Adults like to think they'll always be in control, but they are more likely to have a heart attack or stroke than kids are.

c) Explain how you could convince them.

Make them watch an episode of '911' on TV or discuss as a family.

8. Sick or injured people who appear unconscious may still be able to hear. But they won't be able to let you know that they hear you. Why is it important for you keep talking to the person until help arrives?

The sick person is probably frightened. In fact, a sense of doom is a common symptom of an oncoming heart attack. The sound of a familiar voice that says help is coming can keep the sick person from panicking.

STUDENT WORKSHEET GRADE 4 LESSON 5

Emergency! Help an Unhealthy Heart – Call 911

WARM UP

Work in your group of three to help each other make Personal Emergency Plans. You will need a phone book and your thinking caps.

ARE YOU READY?

You may not be expecting a heart emergency at your home. But that's the way of emergencies – no one expects them. And kids often wind up in charge. What if that happened to you? Would you know what to do? Could you keep your cool? A pre-decided plan can help you do that. And a plan that works for a heart emergency will work for any emergency. The front pages of the phone book give lots of good ideas.

GET SET

1. According to the glossary, what is a heart attack?

2. According to the glossary, what is a stroke?

GO!

3. a) Find out if your community has a 911 emergency service. (How?)
b) Read down the left side of the box below. It shows questions a 911 operator might ask.
c) Use the right side to design a Personal Emergency Chart to keep by the phone at home.

<i>What 911 Might Ask</i>	<i>How Would You Answer?</i>
What is your name? (First and last).	Your name:
What is the street address?	My street address:
The nearest large intersection?	The nearest major intersection:
Who is sick or hurt? (First and last name.)	Do you know the last names of all adults at your home?
How old is the sick or hurt person?	Do you know how old everyone is?
Is the person awake? Collapsed? Breathing?	Can you tell if a collapsed person is breathing?
How long has he or she been sick or hurt?	What if you weren't there at the start?
What was he/she doing just before?	What do you say if you weren't there at the start?
Has anything like this happened before?	Do your adults have any health problems?
Does the person take any kind of medicine?	How can you find out if your adults need medicine?

CROSS THE FINISH LINE

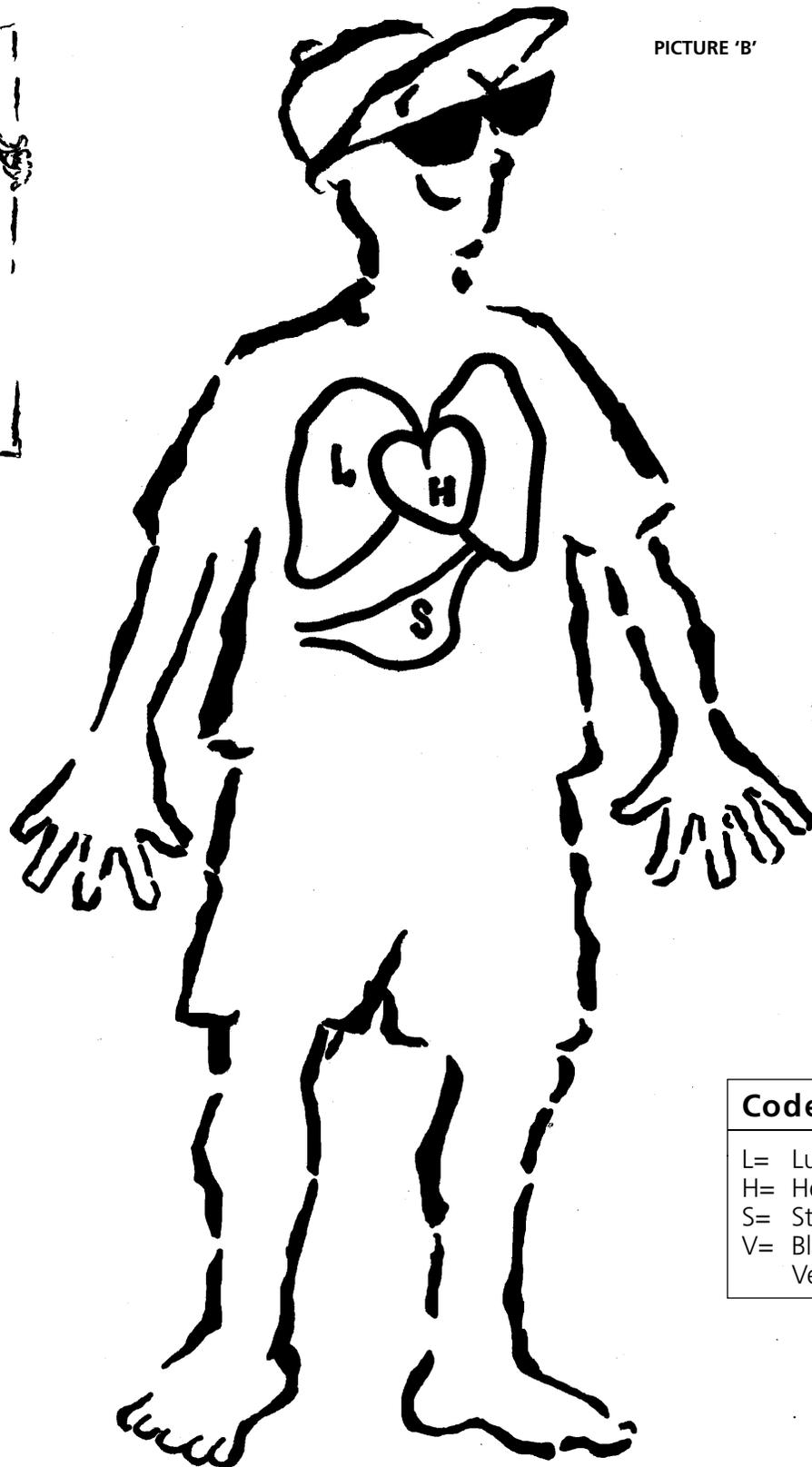
Discuss these questions as a class. Use the Glossary, Heart Facts Page, and phone book.

4. One of the symptoms of a stroke may be a sudden, extremely severe headache.
 - a) Explain why the head might hurt.
 - b) Is a headache always a sign of a stroke?
 - c) Would someone having a stroke be able to tell you how he or she was feeling?
 - d) How could you guess from someone's behaviour that a stroke might be happening?
5. a) You might expect chest pain to be the first sign of a heart attack. Why?
b) In many cases, the first sign is actually a puzzling pain in the arm or shoulder. Often the person won't admit that this kind of pain could be the start of a heart attack. How could you tell an adult like this why is it is NOT a good idea to "wait awhile and see"?
6. a) Normally, you would not give personal information to a stranger over the phone. Why is it okay to give it to a 911 operator?
b) What would you do if the operator asked you to unlock the front door, or leave the house?
7. At first, the adults you live with might not want to give you the information you need for your Personal Emergency Chart.
 - a) Explain why not.
 - b) Explain why they should.
 - c) Explain how you could convince them.
8. Sick or injured people who appear unconscious may still be able to hear. But they won't be able to let you know that they hear you. Why is it important for you to keep talking to the person until help arrives?

CIRCULATION GAME PICTURE



PICTURE 'A'



PICTURE 'B'

Code Box

L= Lungs
H= Heart
S= Stomach
V= Blood
Vessels

GRADE 4 HANDY HEART FACTS

How much blood?

An adult's body holds about five liters (5 L) of blood.

Length of blood vessels

If stretched out – 96,000 km – enough to go around the world nearly four times!

Sample heart rates:

- mouse – 850 beats per minute
- newborn human – 140 beats per minute
- average for your age group – 70 - 100 beats per minute
- average adult – 60 - 100 beats per minute
- athletes as low as 40
- elephant – 35 beats per minute

How many red blood cells?

About 25 trillion (2,500,000,000,000) in an adult's body.

Size of red blood cells

This line is about 1 cm long: ___ 1250 red blood cells could fit along its length.

Smallest blood vessels

The smallest capillaries are so thin that red blood cells have to fold up to pass through.

Biggest blood vessel

That's your aorta. It is the main tube from your heart to the rest of your body. Use your forefinger and thumb to form a circle that's 2.5 cm across on the inside. That's the size of the opening inside an adult's aorta.

Size and shape of heart

To make a simple model of your heart, make a fist with your left hand. Cup your right hand around it. That's about the size and shape of your heart, no matter how big or small you happen to be.

Your heart has two sides

Each side of your heart has two hollow compartments, with walls made of muscle. The muscle pushes your blood through these compartments by squeezing repeatedly.

Your heart has four compartments

If you could look inside your chest at your own heart, you would see four compartments. Pause now to look at the simplified picture in BLM 9. The top compartments are both weak. They only have to push blood into the bottom compartments. The bottom left compartment is the strongest. It has to push blood out to the farthest parts of your body. The bottom right compartment is not as strong. It only has to push blood out to the lungs, not nearly as far away from the heart.

Why are the LEFT-hand compartments on the RIGHT side of the picture?

Looking at a picture of a heart is like looking at the front of another person's body. To test this idea, get a partner to stand facing you with both hands held up in the air. Now, clap your partner's left hand. Which of your hands was easiest to clap with? Now clap your partner's right hand. Which hand was easiest to use this time?

Why the heart goes lub DUB

If you listen to a heartbeat, you hear lub DUB, lub DUB. The lub sound is longer but softer. The DUB sound is shorter but louder. Both sounds are caused by the shutting of flaps that let blood in and out of the heart. The lub sound is made when both bottom compartments squeeze at the same time, and the IN-flaps slap shut. This prevents the blood from flowing backward. The DUB sound is made when both bottom compartments relax or let go at the same time, and the OUT-flaps slam shut. Again, this prevents the blood from flowing backward.

How many lub DUBs?

About 100 000 a day, on average.

GRADE 4 HEART TALK

A Glossary for Heart Healthy Kids

active play: Any game, activity, or exercise that makes your body take in extra air.

blood vessels: Tubes that carry blood around body.

blood: Liquid containing red blood cells.

brain attack: See stroke.

cardiovascular fitness: Heart, lungs, and blood vessels are able to deliver oxygen-rich blood to muscles at a fast rate for a long time.

cells: Tiny building blocks that make up all body parts: skin, bones, lungs, heart, and other muscles.

compartment: Room-like hollow in heart, with two door-like openings to let blood in and out.

circulatory system: Includes a heart to pump blood and a network of tubes called blood vessels.

energy: Provides body heat or makes things move.

everyday foods: a variety of nutrient-dense foods from each food group and the Other Foods Category. At least the minimum number of servings as listed in Canada's Food Guide to Healthy Eating should be 'everyday foods'.

fat: Has many functions including providing energy, protecting and insulating the body and organs, transporting some vitamins, slowing the digestion of a meal and helping in the formation of some hormones. Fat is needed for good health but too much can harm health.

fitness: Joints bend freely; muscles are strong and can work a long time (see cardiovascular fitness).

food: Edible materials that the body can use.

fresh blood: Blood fresh from lungs is high in oxygen, low in wastes, and bright red in colour.

hidden fat: Foods with fat that is one of the ingredients but not visible to the eye, usually high in harmful fat (e.g. ice cream, potato chips).

heart: Muscular pump with four hollow compartments; upper compartments let blood in, lower compartments push blood out forcefully.

heart attack: Clogged blood vessels block oxygen-fresh blood from reaching heart muscle, damaging the muscle which then can't pump blood to rest of body.

heartbeat: Repeated pumping action of heart; or sound made by that action, or the beats per minute.

lungs: Hollow, thin-walled pouches inside chest; lined with blood vessels that absorb oxygen from air.

muscle: Body part that exerts force by contracting (getting shorter and thicker) and lets go by relaxing.

nicotine: Active ingredient in tobacco.

oxygen: Material found in air, cells use it to get energy by "burning" their food (fuel).

pacemaker: Small area in heart; it creates electric signals to control heartbeat automatically.

plaque: Mix of dead cells and fat; sticks to arteries (like tooth plaque on teeth); blocks blood.

pulse: Rhythm of heartbeat felt in wrist or throat.

red blood cells: Tiny saucer-shaped objects, that pick up oxygen at lungs, and deliver it all over body.

second-hand smoke: Mix of tobacco smoke exhaled by smoker plus smoke given off from the ends of burning cigarettes, cigars, or pipes.

sometimes foods: foods from the food groups and/or Other Foods which are high in energy and not very nutrient-dense. Examples include: cookies, cakes, potato chips, cream cheese, fruit leathers, pop, etc.

stomach: Part of the body system that breaks food into bits small enough for blood to carry.

stroke: Clogged arteries block oxygen-rich blood from reaching the brain, which then can't send orders to rest of body (also called brain attack).

tar: Given off in hot tobacco smoke; gathers into sticky brown blobs when it cools in lungs.

tobacco: Plant with nicotine-containing leaves that users smoke, chew, or sniff.

used blood: Blood on its way back to lungs is low in oxygen, high in wastes, and dark red in colour.

HOW THE HUMAN HEART WORKS

In real life, the human heart has many parts. But you do not need to memorize all the parts to understand how the heart works. Just check out this simplified picture as you read the Handy Heart Facts on BLM 7.

SIMPLE MODEL OF THE HEART

