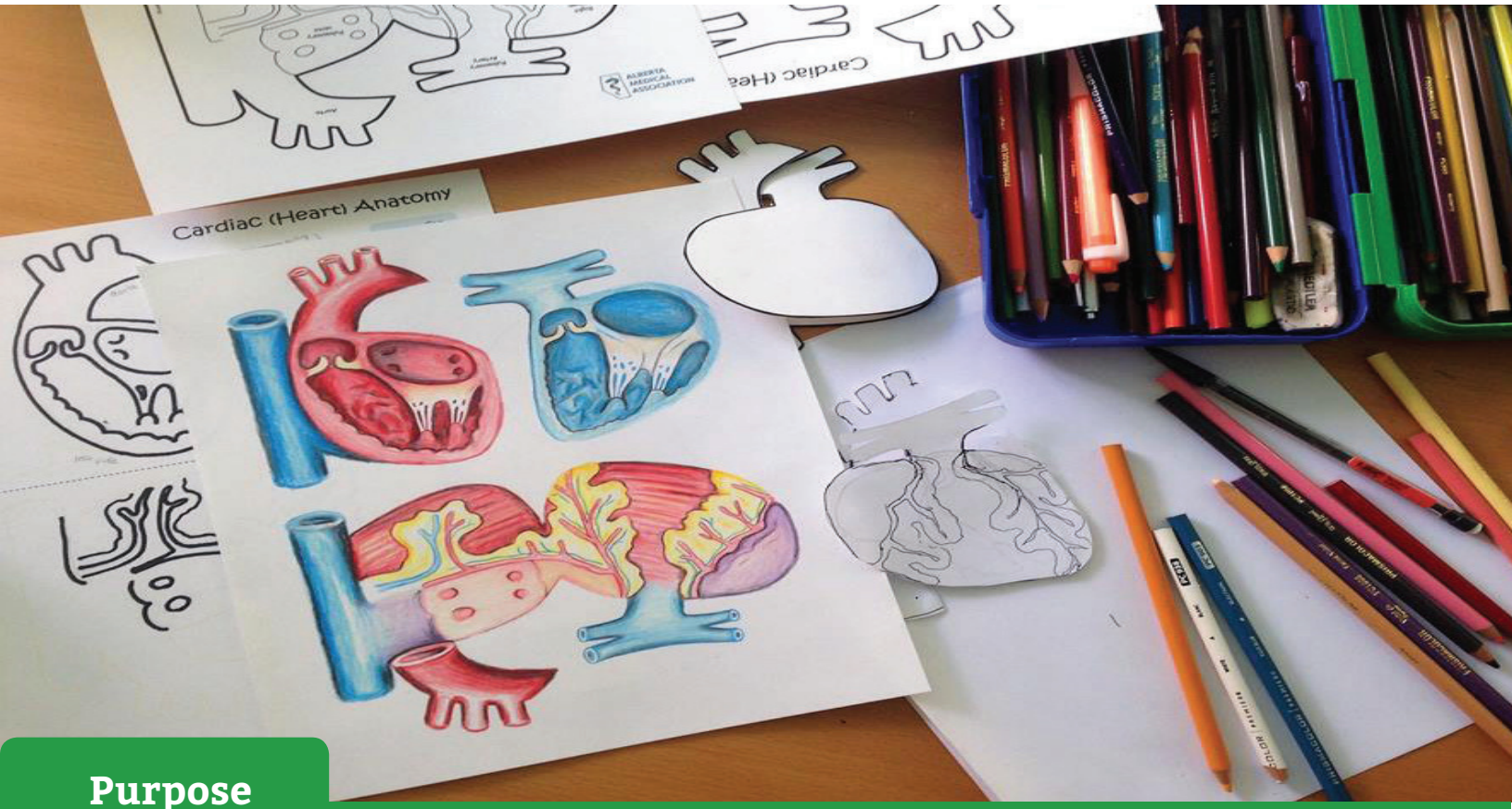
Design for Health: Class Challenge

Grade 5-9 | Career and Technology Foundations



Purpose

In this challenge, students will design a product to help a non-profit organization communicate key health messages to children living in a rural, low-income setting in a developing country. Taking inspiration from Dr. Michiko Maruyama, students will explore the occupational clusters of Communications and Human Services while completing this CTF Challenge.

This challenge is based on the story, *Design and Medicine Intersect: Michiko Maruyama's Love of Learning*, Together: Alberta's Notebook on the Global Goals, Melissa Bui, Alberta Council for Global Cooperation, 2017

The original story can be found at: together.acgc.ca

Support Materials

- Story: Design and Medicine Intersect
- Heart and Lungs Doodle
- Sternotomy Doll and Accessories
- Lesson PowerPoint Available

Estimated Time Required

12 hours

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More about

Dr. Michiko Maruyama

Dr. Michiko Maruyama graduated from the University of British Columbia Northern Medical Program in 2015 and she was accepted into the Cardiac Surgery Residency Program at the University of Alberta. Prior to starting medical school, Michiko completed an Industrial Design degree (Engineering Route) at the University of Alberta.

While completing a cardiac surgery residency in Edmonton, she is concurrently working towards a Master of Industrial Design degree.

Michiko continues to actively explore and integrate medicine, art and design.

See Dr. Maruyama's work at **www.artoflearning.ca**

Outcomes: Alberta Program of Studies

Career and Technology Foundations: Clusters and Skills

Cluster: Communications

Communication Technology (COM): Discover and develop skills related to technologies used to design, construct and relay a message for the purpose of connecting, informing, entertaining or selling products.

- using appropriate tools and methods for communicating messages
- critique or assess compositions created by yourself or others

Design Studies (DES): Learn about the creative process from conception through to development in architecture, industrial design, engineering, interior design and landscaping.

- applying the principles and elements of design
- using appropriate scale when drawing and creating models
- employing sketches, drawings and models
- understanding the needs of the client

Cluster: Human Services

Human and Social Services (HSS): Learn about occupations related to wellness, human development, family support and professional standards and ethics

- understanding the basic anatomy of human body systems
- articulating health promotion and disease prevention messages

Outcomes

This challenge supports the development of all 14 learning outcomes as outlined in Alberta Education CTF Program of Studies. The outcomes support students in:

- Exploring interests, passions and skills while making personal connections to career possibiltiies
- Planning, creating, appraising and communicating in response to challenges
- Working independently and with others while exploring careers and technology

Competencies

This challenge supports student growth in the following competencies:

- **Problem solving:** evaluating the impact of possible solutions to carry out the most viable option
- **Creativity**: exploring or playing with ideas, materials or processes to create something
- **Global Citizenship:** valuing equity and diversity and beliving in the capacity to make a difference
- **Communication:** clarifying the purpose or intention of a message in relation to audience, context, or culture

Introduction

Read: *Design and Medicine Intersect: Michiko Maruyama's Love of Learning*.

Watch: *Alberta Story: Dr. Michiko Maruyama*. CTV Alberta Primetime. Wednesday, May 16, 2018 https://alberta.ctvnews.ca/dr-michiko-maruyama-1.3933016

Discuss:

- Why did Dr. Maruyama become interested in medicine?
- How does Dr. Maruyama combine her interests in medicine and design?
- What things has Dr. Maryuama designed in order to help her patients?
- Why is Dr. Maryuama's unique approach innovative? How does it benefit patients, especially children?
- From what you have read/heard, what is cardiac surgery? What is industrial design? Brainstorm ways industrial design impacts medicine.
- How is Dr. Maruyama working towards the UN Sustainable Development Goals?

Create: Colour Dr. Maryuama's doole or create her Sterostomy Doll as inspiration for your own project

The Challenge

Challenge Question:

How can you design a simple product, tool, or campaign to effectively communicate a health message to children living in a rural, low income setting?

Challenge Description:

Students plan and design a product, tool or health promotion campaign for a non-profit organization working to address health issues in a developing country. Students may work with the organization to understand key health issues and the local context, including cultural understandings. Students research common health issues in the location, as well as treatments and prevention methods. In groups, students develop a simple tool or product that would help a health care worker visually explain the health issue to children. This tool is tested with children for its effectiveness in communicating the health issue.

Scenario:

An Alberta non-governmental organization (NGO) is supporting a health program in a small hospital clinic in a developing country [students may pick!]. The area where the clinic is located does not have access to the internet, and has limited electricity. The need for basic health information is huge, but access to information is difficult. Your job is to develop a product, tool, or health promotion campaign to effectively communicate important health messages to children, while respecting local cultural understandings.

Keywords and Vocabulary

Industrial Design: creative design that improves the appearance and funtion of goods and services.

Ostomy surgury: a procedure that allows bodily waste to pass through an opening in the body.

Cardiac Surgeon: a surgeon whom operates on on the heart or great vessels

Design Thinking: a process for creative problem solving used by designers. Through this approach the designer focuses on researching and involving users in the design process.

Developing countries: countries with a lower national income, and lower Human Development Index than average.

United Nations Sustainable Development Goals (SDGs)

17 Goals that 192 countries, including Canada, agreed upon in September 2015, to elimate poverty, reduce inequality, and tackle climate change by 2030.

To learn more about the SDGs:

- See ACGC lessons and resources
- Read other stories from Together: Alberta's Notebook for the Global Goals

Sample Activities

Using the CTF learning process, students will *plan, create, appraise,* and *communicate* about their proposed solution to the challenge.

Plan

1. **Define your issue:** In groups or as a class, decide on a global health issue you would like to address. Listed are examples of health issues Canadian organizations address in developing countries.
   - Dental Care in Latin America: www.changeforchildren.org
   - Malaria prevention in Sub-Sarhran Africa: www.plancanada.ca
   - Chagas disease in Latin America: www.mcccanada.org
   - Water/Sanitation issues and disease prevention: www.cawst.org
   - Jiggers in East-Africa: www.canadiannursesforafrica.ca
   - HIV Prevention in South Africa: www.keiskammacanada.com
   - Low vision in India: www.operationeyesight.org
2. **Understand the problem:** Conduct research, speak to experts, and ask critical questions to understand the nature of the health issue in relation to the local context. What is the problem? How is it prevented? How is it treated? What specific health information do children need in order to stay healthy? What local beliefs, customs, understandings and/or circumstances need to be considered?

Create

3. **Generate Ideas:** Generate various ideas on how to address the health issue through health education. What tools, products or visual can you create to communicate the prevention or treatment of the health issue?
4. **Evaluate and Choose Your Idea:** Evaluate your ideas and choose the best way forward. Which idea do you think is most appropriate for the people and the location? Consider criteria you could use to test the idea.
5. **Develop the Idea:** Design, engineer, and protype your idea using appropriate materials, software, or technologies available.

Appraise

6. **Test the Idea:** Test your product with others. Make necessary changes so you communicate your message more clearly.

Communicate

7. **Implement your Idea:** Complete a final prototype of your product or concept and present it to others.

Invite ACGC to visit your school and see your solutions!
Contact projects@acgc.ca

Suggested Tools and Technology

Some possible software and technology students may use for this challenge include:

- Adobe Creative Cloud (Illustrator, InDesign, Photoshop)
- Canva
- 3D Printing
- AutoCAD

Interdisciplinary Learning Opportunities

Links to Alberta Program of Studies Outcomes

Fine Arts: This challenge encourages students to demonstrate competencies in Fine Arts, specifically focusing on components of composition and concept development.

Science: Grade 8 This challenge aligns with outcomes found in Unit B: Cells and Systems, related to human body systems.

Additional Resources

Alberta's Notebook for the Global Goals
www.together.acgc.ca

Art of Learning: Michiko Maruyama
www.artoflearning.ca

Career and Technology Foundations Program of Studies: Alberta Education
https://education.alberta.ca/career-and-technology-foundations/program- of-studies

Alberta CTF Resources
http://albertactf.ca/

Health Topics: World Health Organizatoin
www.who.int/health-topics/

The Global Goals: Goal 3: Good Health and Well-Being
www.globalgoals.org/3-good-health-and-well-being

How the Body Works: Kids Health
www.kidshealth.org/en/kids/center/htbw-main-page.html

Human Centered Design in International Development
www.designkit.org / ideo.org

**All images are used with permission from Michiko Maryuama. To use her images and doodles, please contact her via her website www.artoflearning.ca*

Assessment for Student Learning

Use Alberta Education's Interactive CTF Asseseement Tool to assess how students *acquired, applied, and adapted* each of the learning outcomes at each stage in the design process.

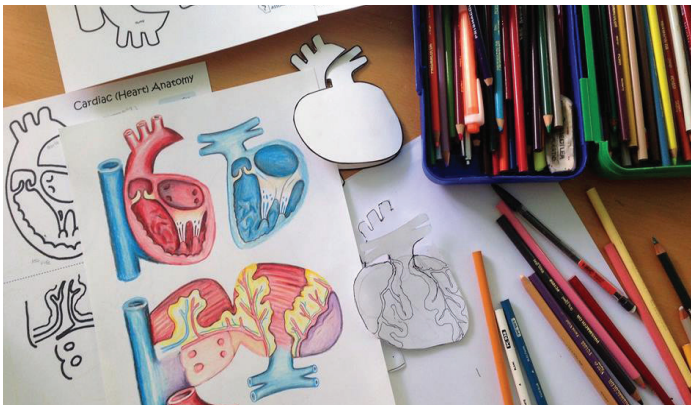
https://education.alberta.ca/media/3272934/ctf-classroom-assessment-tool-interactive.docx

Design and Medine Intersect: Michiko Maruyama's Love of Learning

Melissa Bui, Alberta Council for Global Cooperation

When I mention that I study Industrial Design, it's often met with a "what does that entail?" kind of question. As I enter my final year at the University of Alberta, I'm starting to see how multifaceted a career in design can be. Recently, I met with fellow designer Michiko Maruyama over coffee. She shared with me her inspiring story of taking design to new places.

I was humbled to learn that while studying for her undergraduate degree in Industrial Design, Michiko was diagnosed with a rare disease — one requiring surgery, radiation, and chemotherapy. Her experience as a patient motivated her to direct her studies towards medicine. Despite her new path, however, Michiko was not ready to leave behind her talents as a designer and an artist.



Michiko explained how she designed a comic book as part of her application to medical school, and how throughout her studies she created paintings and children's books to support various causes. On her personal website, she publishes "*Daily Doodles*," colorful sketches she uses to teach herself and her peers components of the medical curriculum. Over time, her love of design—medicine—and eventually, the heart—came together. Today, Michiko is a cardiac surgeon resident at the University of Alberta and a master's student in Design.

By merging her passion for creativity and her dedication to health and well-being, Michiko (now Dr. Maruyama) is currently developing a series of innovative educational tools and children's toys.

Her designs include the Ostomy Doll — a teddy bear designed to teach children how to take care of themselves during and after surgery. As a part of her master's research, she is designing what she calls **"organami"**— anatomically accurate paper models of the heart that children and medical students alike can both use as educational tools.

Michiko's work is exemplary of the kind of synergies that can emerge through the intersection of different disciplines and passions. Michiko recently received a grant from Alberta Medical Association Emerging Leaders in Health Promotion. Her innovative and exploratory approach models a commitment to promoting quality education, and improving good health and well-being within her community.

Check out Michiko's artwork at artoflearning.ca.

Keywords and Vocabulary

Industrial Design:
Creative design that improves the appearance and funtion of goods and services.

Ostomy:
Ostomy surgery is a procedure that allows bodily waste to pass through an opening in the body.

Cardiac Surgeon:
A surgeon whom operates on the heart.

Anatomically Accurate:
Representing the body of a person in a correct, accurate manner.

Sternotomy

Zeddy needs open heart surgery through a midline sternotomy.
Cut, fold and glue the pieces together.
You will need scissors and glue.

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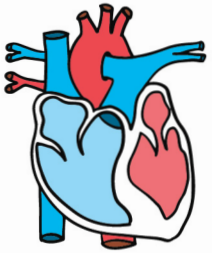
Cut

Fold

glue

Designed by:
Michiko Maruyama

The Mini Book on Hearts



The heart is an organ that pumps blood to the rest of your body.

It is located inside your chest between your lungs.

If you listen with a stethoscope, the heart makes a "lub-dub" sound. This is the sound of the valves opening.

In order to fix the heart, the surgeon will need to open the chest.

This is called a **sternotomy**.

Michiko Maruyama
www.artoflearning.ca

Sternotomy

Here are some accessories for Zeddy! A hospital gown, bandages, medicine, balloons and some healthy food!

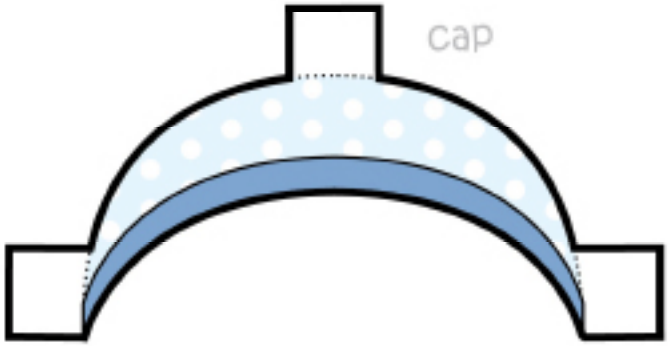
Cut, fold and glue the pieces together. You will need scissors and glue.

Designed by:
Michiko Maruyama

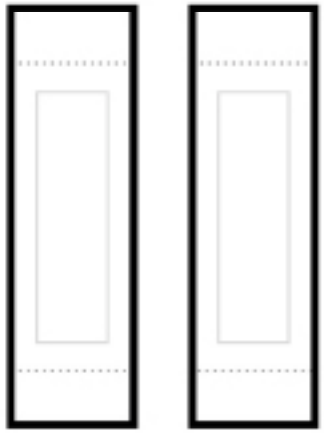
Cut

Fold

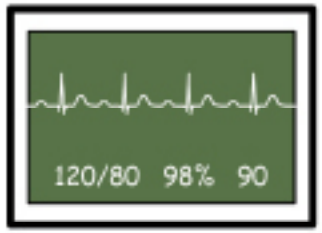
cap



bandages



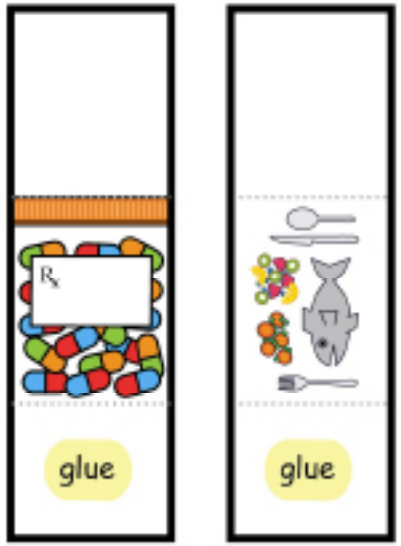
Gown



heart monitor (ECG)

heart pillow

Food



medicine

balloons

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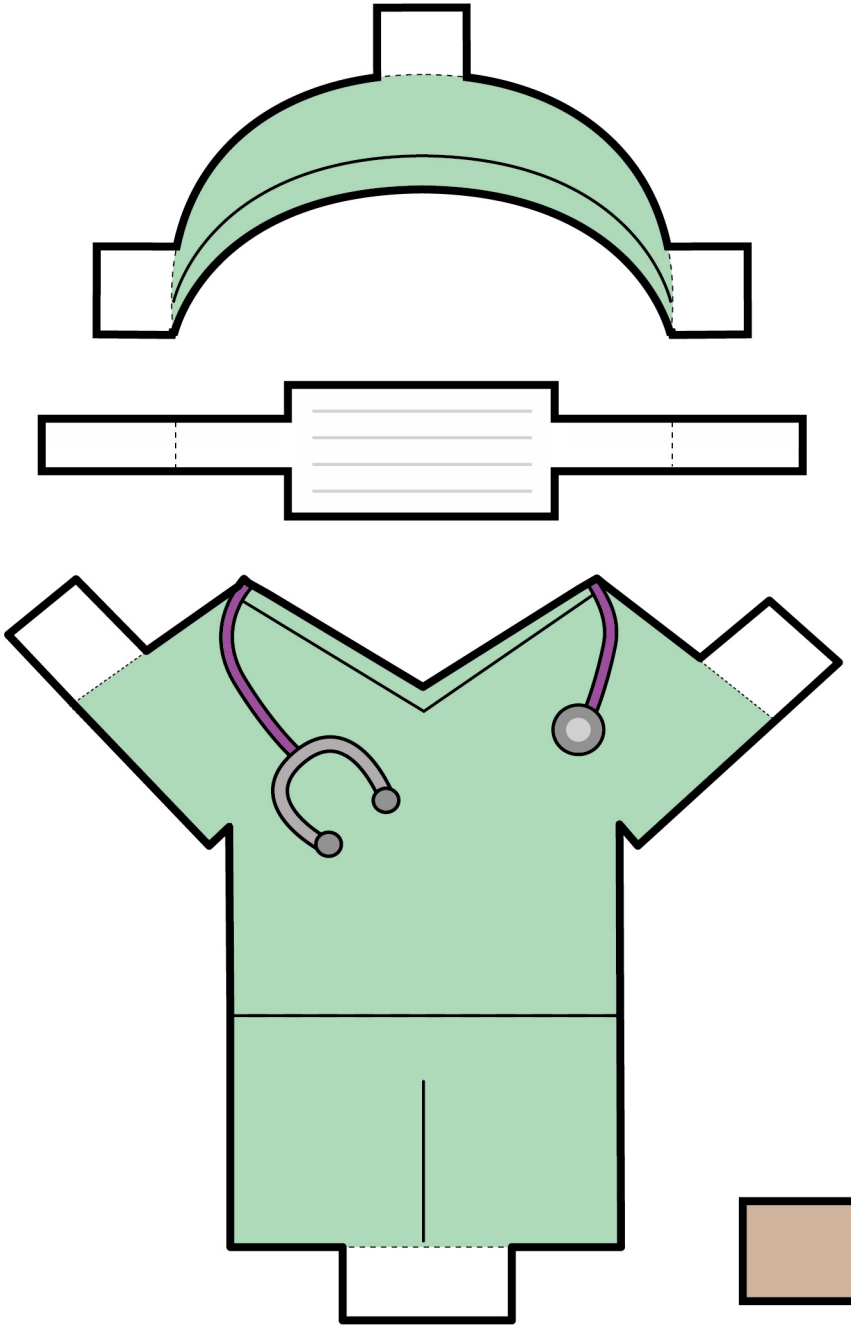
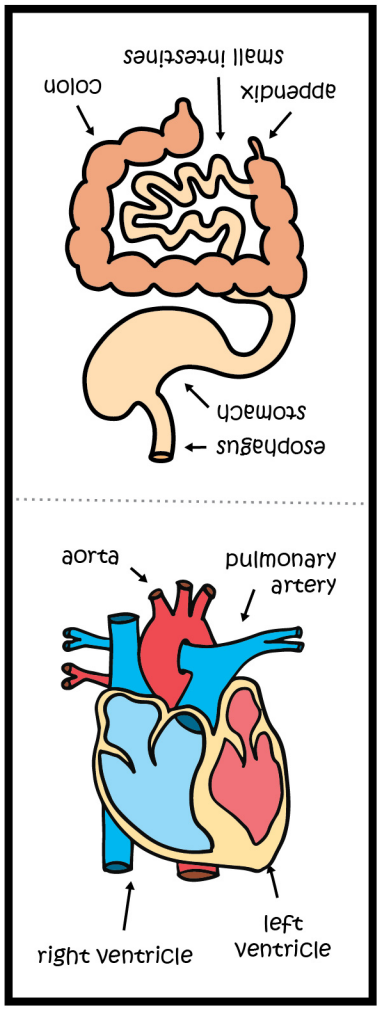
Cardiac Surgeon

Dr. Zeddy is a cardiac surgeon.

Cut, fold and glue the pieces together.
You will need scissors and glue.

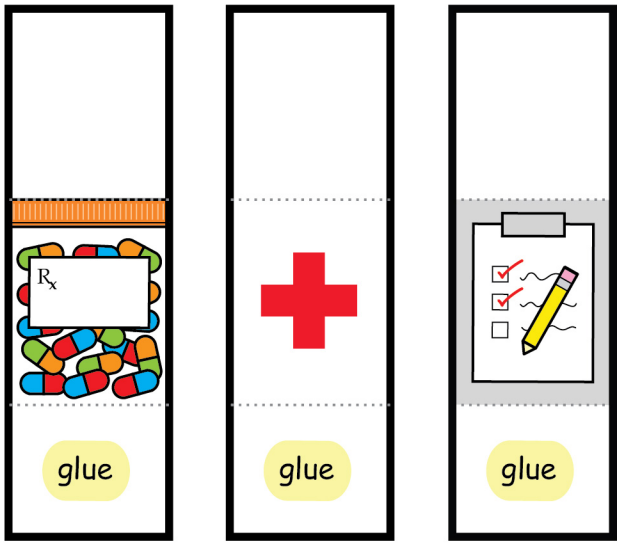


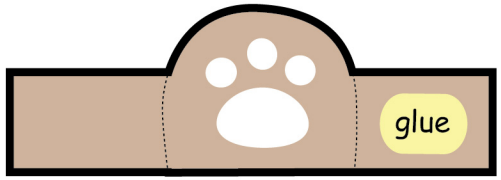


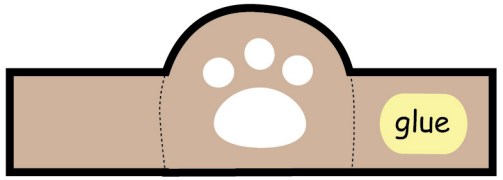
Cut

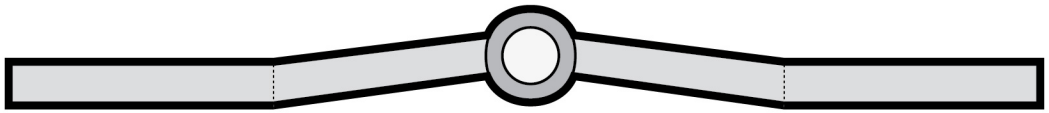
Fold

ALBERTA MEDICAL ASSOCIATION









Designed by:
Michiko Maruyama

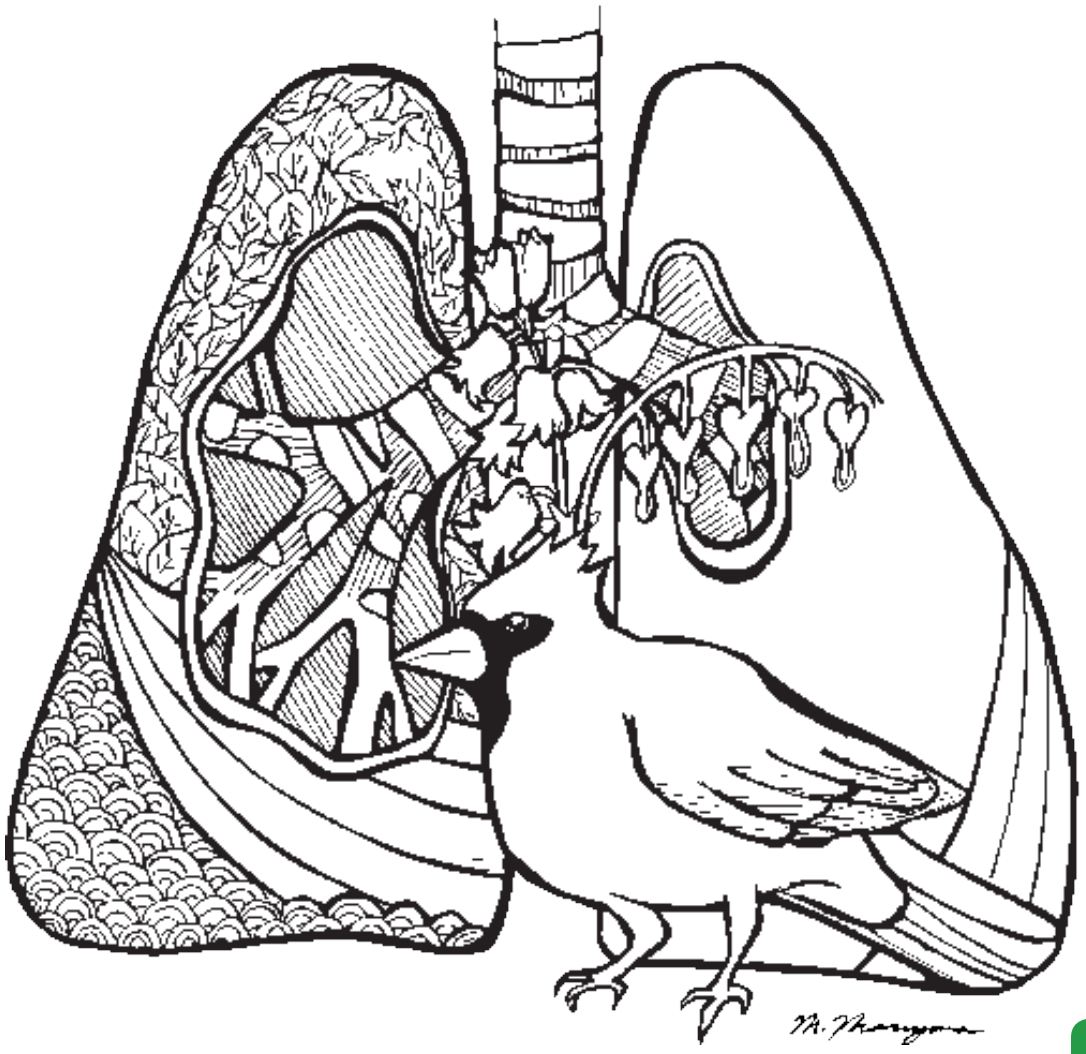
Design for Health: Class Challenge

Name: _____

Class: _____

Colouring Page

Colour this 'Doodle' by Dr. Maruyama as inspiration for your own project!



Heart and Lungs Doodle
Colouring Book
Pen and Ink, Adobe Illustrator

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