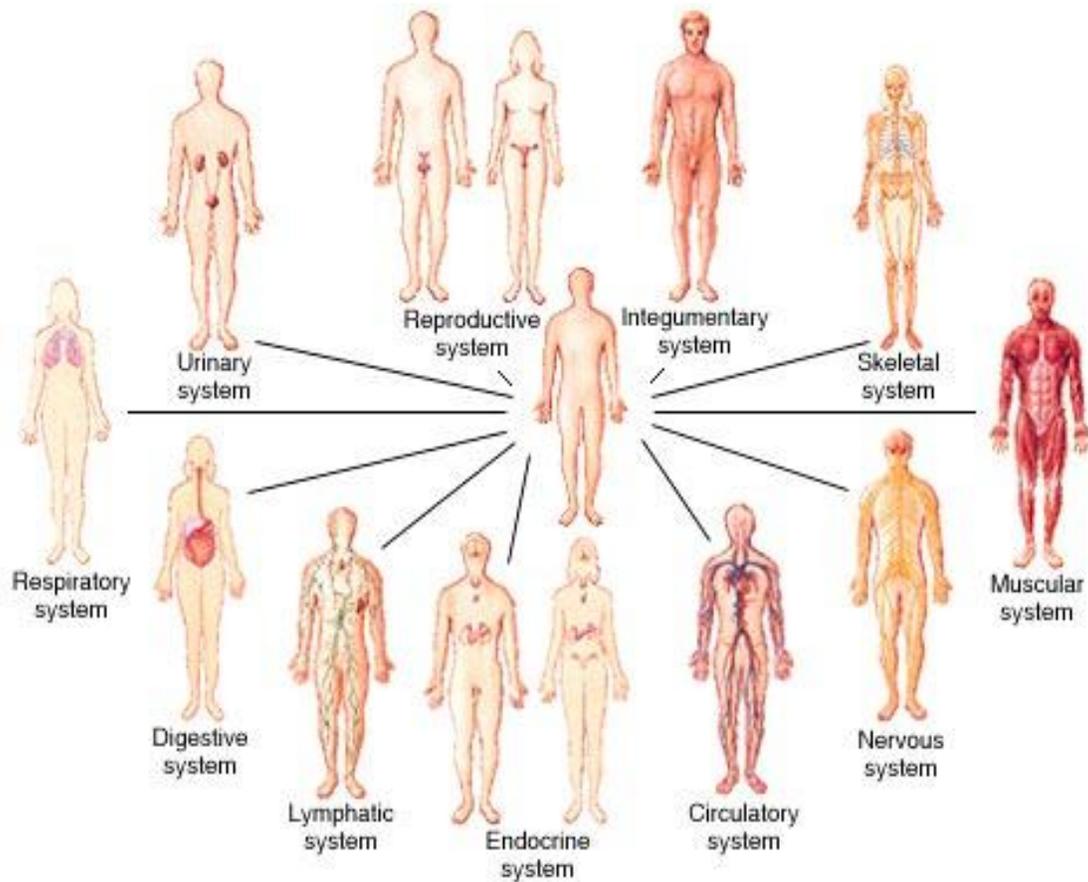


Human Body

An Integrated Science Learning Unit for Yukon Grade 5 Students



Centre for Youth, Research, Science Teaching and Learning
University of Manitoba

Social Sciences and Humanities Research Council

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Acknowledgments

In 2008, the Yukon First Nation Education Advisory Committee proposed several goals and priorities for education in the Yukon. Central priorities included the development of curriculum and resources that integrate into curricula, First Nations content, perspectives, values, knowledge *and ways of teaching and learning*. This resource provides teachers with the support for providing learning experiences that allow for learning to be grounded in the heritage of northern students including culturally preferred learning styles rather than just learning about their heritage.

The development of this resource for teachers and students in the northern Yukon has been made possible through the granting agency Social Sciences and Humanities Research Council. Their support has ensured that northern students are provided with the opportunity to learn about their heritage through means responsive to their learning style preferences, especially when they study core curriculum areas such as science. The development of this resource has also been made possible through the support of the Tr'ondëk Hwëch'in community of Dawson City. The elders and community members have given their time and knowledge to ensure that their experiences can be recorded and incorporated into learning activities valuable for their community's children.

As well, the school community of Robert Service School, especially the teachers of the Intermediate grades is thanked for its support in the development of the learning activities outlined in this resource.

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Cross-Curricular Applications

This unit is developed to reinforce learning outcomes of Science, Social Studies and English Language Arts relating to the Science unit of Simple Machines, experienced during Grade 5. These include:

Physical Sciences: Human Body Systems

It is expected that students will:

- Describe the basic structure and functions of the human respiratory, digestive, circulatory, skeletal, muscular, and nervous systems
- Explain how the different body systems are interconnected

The unit is also developed to reinforce or address the learning outcomes of the Social Studies curriculum of British Columbia (2005). These include:

Skills and Processes:

It is expected that students will:

- Use inference, imagination and pattern identification to clarify and define an issue or problem.
- Use an outline to organize information into a coherent format.
- Identify alternative interpretations and viewpoints on a selected topic (ex. Which simple machine(s) would be appropriate to complete a particular task?)
- Individually or in groups, implement a plan of action to address a problem or issue (How to bring large quantities of food up into a cache through the use of simple machines)

English Language Arts: Oral Language (Purposes, Strategies, Thinking and Features)

It is expected that students will:

- Share ideas relevant to class activities and discussions.
- Listen to classmates and others without interrupting.
- Speak respectfully and use appropriate language and tone when disagreeing.
- Speak and listen in partner, small group, and whole class discussion to accomplish a task.

- Contribute relevant responses to class/group discussions.
- Use vocabulary appropriate to topic and audience. (ex. Using the appropriate terminology when referring to the different parts of the body)
- Follow multi-step oral instructions and demonstrations (conducting and experiments to understand how the human body systems function)
- Ask questions, independently or with classmates, to explore a topic further.
- Use new vocabulary introduced in texts and class discussions.
- Build on others' ideas.
- Question and speculate on possibilities regarding the ideas and information presented (e.g., "What if...", "I wonder if...", "What would happen if...")

English Language Arts: Reading and Viewing (Purposes, Strategies, Thinking and Features)

It is expected that students will:

- Follow written procedures
- Extract accurate and important information from text and 'text features', including specific details from graphics.
- Interpret images and make some relevant inferences (e.g. construct meaning from visual texts and identify relevant detail)
- Write down and/or share what they already know about a topic or idea and ask and respond to questions related to the material read/viewed.

The emphasis in Social Studies on the validation of Aboriginal Cultures and Continuity and Change in Society are emphasized in this unit. As students are engaged in science, they will also be engaged in social studies learning. They will also be developing oral and written language and numeracy skills specific to Grade 5. Students are encouraged to explore the characteristics of the human body simple through the stories and accounts of persons from the community, hands on experiments, and questioning. By hearing these accounts and having their own first-hand experiences, students can develop a rich understanding of the functions of the human body and keeping our bodies healthy. There are obvious connections to social and environmental change and personal health and well-being. Broaden the focus by adding stories and activities of your own or from the experiential base of your community.

Conceptual Ideas and Progression

The recommended sequence for supporting student conceptual development of the human body systems is suggested below. For the most part, the activities and the conceptual and skill development embedded within the activities are sequential. Lower elementary experiences and ideas primarily focus on experiencing and communicating these experiences. Upper elementary experiences focus on understanding and investigating these experiences and appreciating applications of this understanding to their students' everyday world. It is suggested teachers address the following key ideas:

Introduction to the Human Body:

- Discussion of interconnectedness and how all human body systems work together to function optimally
- Tracing of body on large paper which will be used to represent the different systems and how they connect

Learning about the skeletal system:

- Introductory activity – our body
- Introductory activity- discovering what we know and want to know about bones through a bone observation activity.
- Investigating the importance of keeping our bones healthy
- Learning about the different types of bones
- Discovering how bones are designed for specific functions and offer clues about how that animal survived
- Local story about how bones were used to identify human remains

Learning about the muscular system

- Constructing a model to understand how muscles and bones work together.
- Students will participate in a variety of activities to discover the different types of muscles in our bodies.

- Muscle and tendon examination and questioning

Learning about the respiratory system:

- Students will participate in several activities to learn about the parts of the respiratory system
- Investigating the importance of keeping our lungs healthy and constructing a lung model

Learning about the circulatory system:

- Hands on investigation to learn about the heart- what it looks like, and the different parts
- Interactive class activity to demonstrate the route of the circulatory system, and how oxygenated and deoxygenated blood travels through the body.
- Class discussion and low organized activity to see and understand the function of veins, arteries, and capillaries in our own bodies.
- Demonstration of what our blood is made of.

Learning about the digestive system:

- Journey through the digestive system: story and role play about how food travels through our body
- Creative writing assignment describing what it would be like for a piece of food to travel through the digestive system.

Learning about the nervous system:

- Activity, discussion, and role-play to understand the many functions of the nervous system, and how it affects our whole body.
- Exploring our 5 senses
- Creative writing assignment: Brain resume

Skills Development

This unit emphasizes that the learning of science ideas is inextricably linked to the development of the processes of science. As asserted by British Columbia Science Grade 5 (2005), the legislated curriculum for Yukon schools, science experiences should provide opportunity for the development of conceptual understanding within the context of relevant investigative experiences. Although individual scientific process skills may be emphasized in specific activities, they are to be supported more holistically in teacher-facilitated or student-directed inquiry. The skills to be developed are expected to be appropriate to the level of the learner. These skills and a typical developmental sequence are outlined in detail in the Science Grade 5 (2005) guide. These skills involve coordination between cognitive and psychomotor skills. Handling and manipulating equipment require not just the physical ability to perform a task but also the intellect to know how to measure or observe accurately. It is anticipated that by the end of intermediate school, a student might be able to, with assistance, conduct a scientific investigation. This unit provides opportunities for students to work physically and cognitively towards this end. There is no universal list of scientific process skills. Those identified in this curriculum are not intended to be a linear scope and sequence; instead, they suggest multiple ways in which learning science can be explored. At each grade level, two processes are introduced and then reinforced with the curriculum content in the subsequent grades; but teachers are expected to involve all of the skills their students are capable of using. Process skills are best learned in hands-on activities where students engage in a problem-solving task while doing science. The hands-on model of learning science allows students to construct meaningful connections within the brain. In young children, process skills can be found in the natural practice of manipulating materials while asking questions and being curious. The names of the skills can be used and reinforced by teachers as students use and learn to apply these skills to science activities. The science process names will become familiar to students, enabling them to use the correct vocabulary when they explain their involvement in science and technology inquiries.

Attitudes and Beliefs Development

An explicit goal in the development of this resource and the other resources being developed in this northern Yukon project and the accompanying professional development provided for teachers is to use these as a vehicle to contribute to student 'success' in science. Although success in science is often attributed to measurable outcomes such as knowledge acquisition and development, the intent of this development project is much more encompassing. It extends this notion of success to investigate the influence of 'two-way' learning experiences on students' perceptions of success in their personal attitudes and beliefs.

What does success in science mean to northern Yukon students? It is anticipated that students will experience success in a variety of ways, beyond the border of knowledge into the domain of attitudes and beliefs. Attitudes are regarded as states of mind, behavior or conduct regarding some matter, as indicating opinion or purpose. The program of study suggested in the activities that follow will foster student curiosity and creativity, and openness to new ideas of thinking. As well students will develop confidence in their perceptions of self as students of science. Similarly they will develop confidence as evidenced in risk-taking and their effort to conduct science investigations. Their participation in the processes of science will foster their perseverance, precision and objectivity in solving scientific problems. As members of a team they will develop in their respect for and ability to work co-operatively towards purposeful goals with their peers.

Above all, it is anticipated that students will develop a more positive sense of themselves in contemporary society as they learn about the inextricable link between science and the world in which they live. It is anticipated that students will see science as part of their life trajectory both in future formal and informal settings as a result of science study that advocates 'two-way' learning

Introducing the Human Body: How Things Have Changed: A Conversation with Mary Thompson

In those days when I was young we would not have many diseases. Yes, when we were in the bush in the North Fork of the Klondike there might be accident or something. Maybe someone would cut their hand or leg with an axe or get a toothache or something or need to get glasses for their eyes or a bleeding nose. Maybe even there would be trouble with appendix. That would be serious. But we mainly stay healthy. Even in the North Fork, Joe and Annie Henry live for a long, long time.



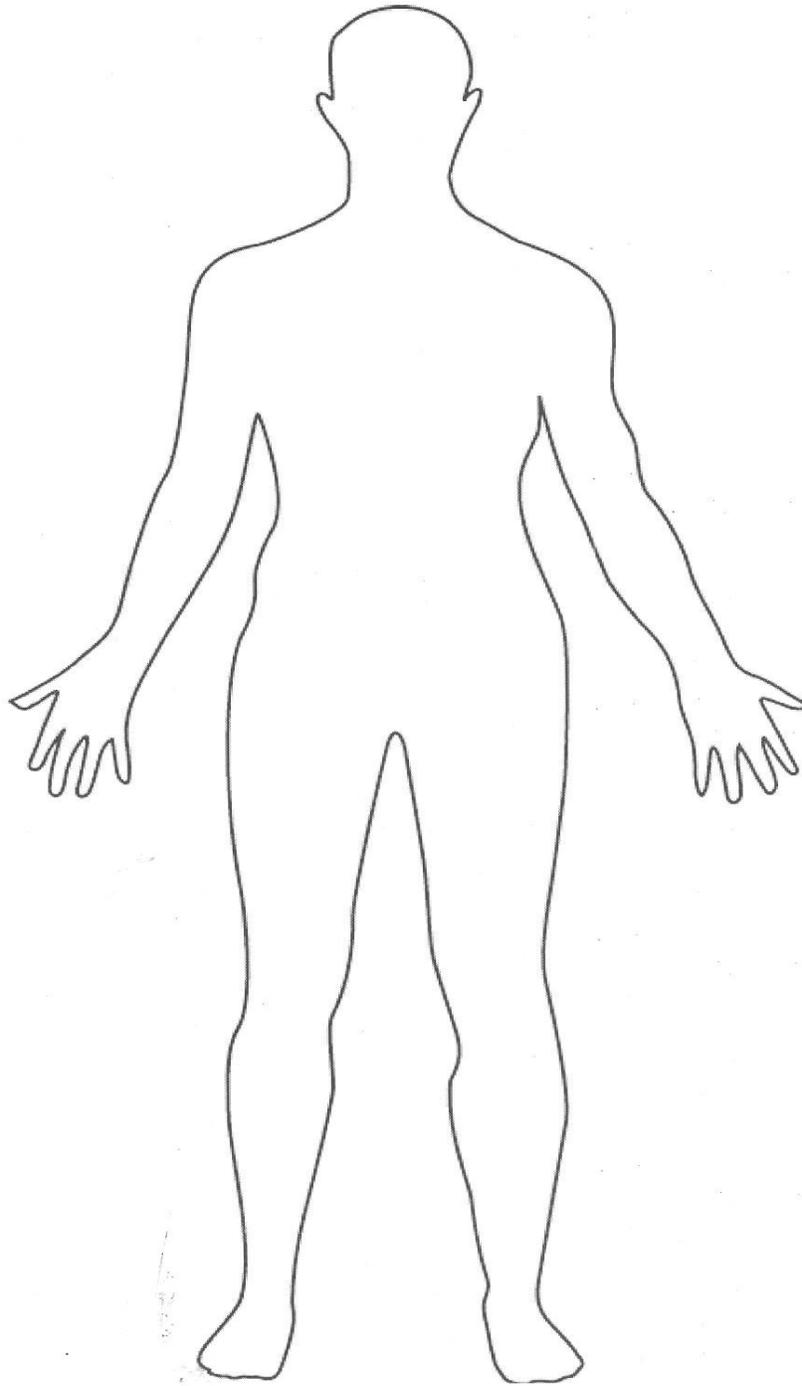
But then, we did not hear about stomach cancer or brain cancer or lung cancer. Now you hear about things like that. We never hear that much about heart problems too. Now we hear lots of people have heart problems like heart attack.

When I was still young many people got tuberculosis and pneumonia. That was in the lungs. People might cough up blood and they had to go outside for a long time to get better. Some people went for many years and even then they did not come back. That was hard on everyone because the tuberculosis was infecting to others and the person had to be kept alone and get careful treatment.

Today we wonder about why these diseases come like cancer. I remember thinking maybe it was white bread because it was not natural like bannock. It has many things in it and I think that was the problem. I knew smoking was a problem too. But now, we hear about diabetes and problems with kidneys and cancer of the colon and people say these have to do with our diet.

And we are bigger now – more fat on our body which is not good. Before we were real active and now we are less active. We have to look after our body. It's like we take care of our machines like trucks and skidoos. We look inside and make sure we are looking after them. Maybe we need to look inside our body too and look after our body too.

In the story, **underline** each body part Mary talks about. In the space below **draw** in the body parts Mary refers to. **Label** each part.



Understanding our Body: Preparing for the Unit

In this unit, we will be studying the human body. You can help in the class's learning by:

- Bringing any animal products you have from home that might be of interest to the class. Do you have ones from home or things made from animal products such as teeth, hooves, hides, skins, sinew, or any other products?
- Ask about any of your family's experiences with the body – either the human body or the body of animals. Do people have experiences that they remember with bones, muscles, tendons, ligaments, heart, blood, lungs, nerves, teeth, stomach, intestines?
- Ask people to elaborate on these stories and ask if these can be shared with the class.
- Ask if there are pictures or images about these stories that might be shared at school.
- Is there any story that is told by a person that you think the class might like to hear in person? Ask your teacher about this person coming in to speak to the class.
- Is there a website that has to do with the body that you think might be of interest to the class?
- Is there a book that you think might be of interest?
- Is there a movie or television program you think might be of interest?

Key Learning Words

Use the space below to list all the words you encounter in this unit that have to do with the human body.

Introducing Bones: Dealing with an Accident: A Conversation with Alfred Kendi

When the Dempster Highway was being built, I was on a crew of 4 men that was surveying where the new highway would go. This was the 1970s. I was about 50 years old and the oldest man on the crew. We were working in the Eagle Plains area before the Yukon-NWT border. We would get dropped off by helicopter and live in tents near Rock River, Yukon. We had food and radio in case of emergency.

One time the radio was left in the helicopter and you know what, that was the time we really needed it.

We were working near a steep ridge and I lost my footing. I fell down the ridge and knew right away I had broken my upper leg and my shoulder was dislocated. They both hurt really bad! I was in pain.

We were about 2 hours walk from camp and I could not walk. I told the other men maybe they could make a splint from small branches. They did this but I could not walk. So, we made a stretcher too and used rope and branches for me to lay down on.



The problem was I was a big man, bigger than the other three. It took a long time to get to the camp and it felt like weeks before the helicopter came.

Everyone said that I broke my leg only because I was an 'old man'.

They said I should be eating more bones, especially the marrow! That is the favorite part of the moose and caribou for me! I was just not being careful.

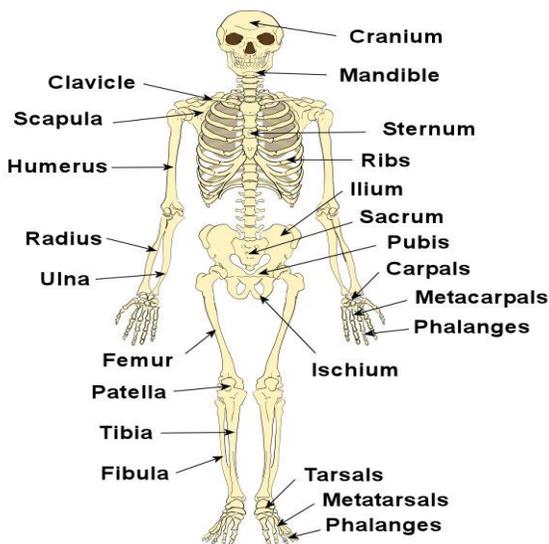
The Skeletal System

Look at the pictures below with a classmate and talk about the bones.



What comes to your mind about bones? Stories? Are there things you know about bones? Are there things you would like to know?

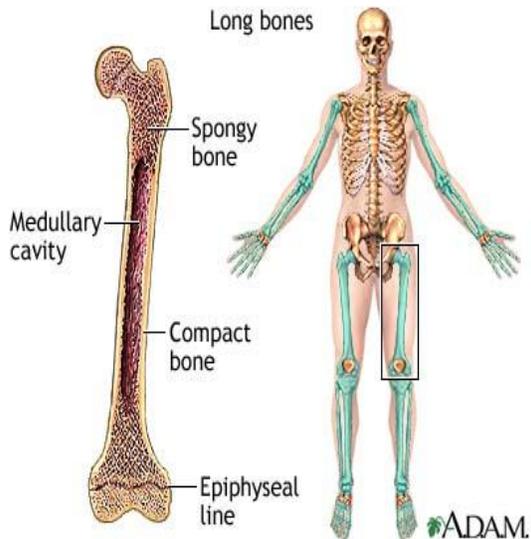
Things I Know	Things I Want to Know



Bone Observation Activity

Look at the bones on display carefully.
 Answer the first 9 questions
 Then, make up 3 questions and answer them.

What is the length of the longest & shortest bone?	Longest = Shortest =
What is the greatest & smallest width of a bone?	Greatest = Smallest =
How many bones of cartilage on the ends?	
How many bones are flexible?	
How many bones are brittle?	
How many bones are leg or arm bones?	
How many bones are from the head?	
How many bones are straight?	
How many bones are curved?	



Stories About Bones: Story and Illustration:

In the space below tell **a factual story** from your experience or someone in your family's experience about bones. Communicate your story in both written and visual form. Ensure your story has (1) a title; (2) an introduction; (3) a descriptive, logical and detailed body; and (4) closing and any other details you teacher encourages.

Bendable Bones

Our bones need to be strong and healthy so that they can (1) protect our organs, (2) provide structure to our body, and (3) help us move efficiently. It is important to drink and eat foods that contain calcium and other minerals necessary for strong bones, such as milk and vegetables.

Without minerals, your rigid bones would be soft and flexible. Try the following experiment to see how this happens, and discover the importance of keeping our bones healthy.

Steps:

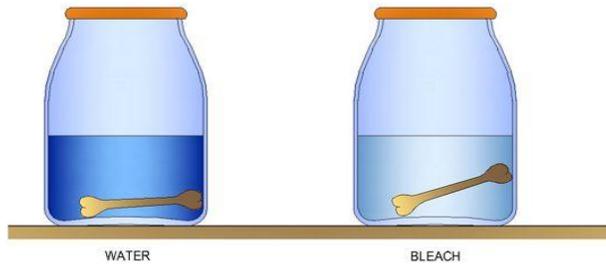
1. Take two chicken bones similar in length, clean them thoroughly. Leave no meat on the bones.



2. Record your observations of how the bones look, how soft or hard they are, and how pliable (flexible).

3. Draw a picture of what the bone looks like before the experiment.
4. Poke the bones with a pin, record how far the pin can be pushed into the bone.

5. Place one bone in a jar and cover it with milk. (Be sure to replace the milk in the jar each day so that it doesn't spoil)
6. Place the other bone in a jar and cover it with vinegar. (Note: **Vinegar is an acid which removes minerals**)



7. After five days, take both bones out of the jars and wash thoroughly.

Discussion Questions:

1. Describe the differences between the bone placed in vinegar and the bone placed in milk:

2. Draw a picture of what the two bones look like before the experiment.

3. Try to break both bones in half.

a. Which bone was easier to break?

b. Why do you think this is?

4. Poke each bone with a pin.

a. Which bone was easier to push the pin through?

b. Why do you think this is?

c. How far could you push the pin into the bone soaked in vinegar?

d. Were you able to poke the pin through the bone soaked in vinegar farther than you could before the experiment?

e. Why do you think this is?

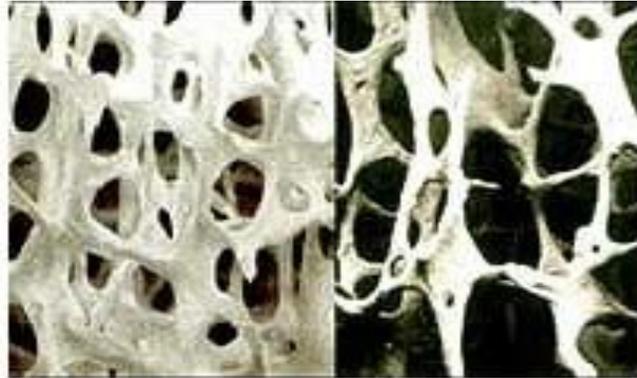
5. If we placed another type of bone (caribou, human, moose) in a jar of soda for one week what do you think would happen? Why?

6. Why is it important to have good bone health? What are some ways we can ensure good bone health?

7. Are teeth bones? Teeth decay because the bacteria in your mouth eat sugars and produce acids as wastes. You can't get rid of the bacteria, but you can stop them from getting the sugars they need. What do these acids from bacteria do to your teeth?

8. Alfred Kendi said his friends that helped him thought 'he was old' and 'should eat marrow'. What do these have to do with bone strength?

-



Healthy Bones

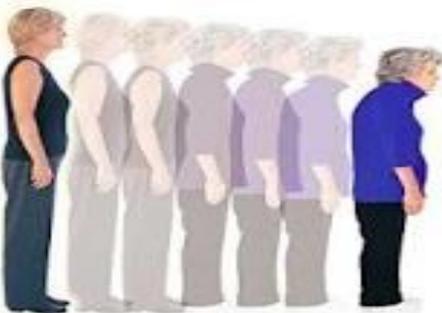
Unhealthy

9. A common disorder today, especially among the elderly, is osteoporosis. What is osteoporosis? Make reference to 'bone density'.

10. What can be done to reduce the chances of getting osteoporosis in old age?

11. Do you think osteoporosis is more common today than in the past, especially for the community's ancestors? If it wasn't more common, why was it uncommon?

-



Scraping Moose Hides: Memories of Grandmother

I remember going to visit Gramma Anderson down in North End when I was a child. I'd go with mom and they used to talk their special language. I learned to understand it, but I couldn't speak it. Because I didn't hear that language any place else growing up, I called it a special 'private language'. Now I know it was Northern Tutchone.

When we visited Gramma, she was always busy. In the winter, she would mainly be doing beadwork. In the summer she would be chopping wood, gardening or tanning moosehide. I noticed she did most of the tanning in the spring and early summer.

I didn't like it when she was tanning because of the smell. She would take off all the flesh and hair first. Then she used a fleshing bone from the shin of larger animal, like a caribou, moose or even a grizzly bear. Grandpa split the bone lengthwise. This made a sharp edge, which was then serrated by cutting small wedges out of the edge. The tool was held upright and used in a chopping scraping motion. She would do this for hours every day for maybe a week.

She would then soak the hide in a metal wash basin. Mom said the water for soaking (solution) had moose brains in it. Then she would put it on a rack to dry and then do the whole process again, again, and again. She sometimes would have the hide in the smoke from a smudge fire. Rotten wood was burned to make smoke. I liked that smell on the hide.

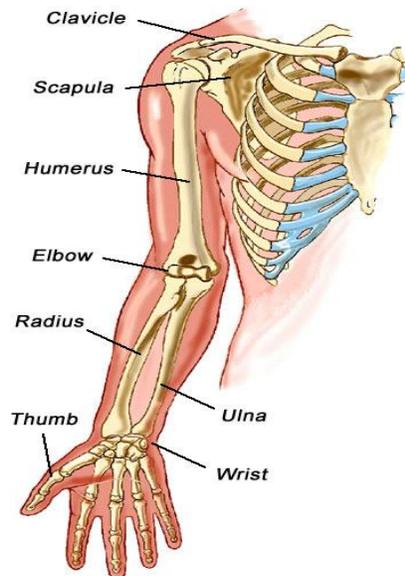


It was hard work for her. It was so smelly. Today I still have her beadwork. It is beautiful.



Using a Bone to Measure Your Height

Each bone in your body grows in proportion to the rest of your bones. In this activity you are going to measure the length of your radius. The radius is one of the two bones in your lower arm. **You can use the length of this bone to estimate your total height.**



1. Rest your elbow on a desk with your lower arm straight up at 90 degrees.
2. Measure in INCHES from your elbow to your wrist _____. This is approximately the length of your radius.



3. Calculate your estimated height using the formula below:

Boys:

**3 x radius length + 34 = your height
height**

Girls

**3 x radius length + 33 = your
height**

Example: A boy has a 9-inch radius. His estimated height will be

$$3 \times 9 + 34 = 61 \text{ inches (5 feet 1 inch)}$$

- What is your estimated height using your radius? _____
 - What is your real measured height in inches? _____
 - How many inches off were you? _____
 - What fraction of your height is your radius? _____
4. Look at the skeleton of a prehistoric skeleton found in the Yukon.

Figure out by measuring and calculating if the mammoth's radius length is the same fraction of the mammoth's height.



Skeleton Measurements



Part of Skeleton	Where do I measure?	Measurement in cm	
		Me	Someone taller or shorter
Skull	Top of head to base of head		
Circumference of Skull	Distance around the head		
Collar bones	Left shoulder to right shoulder		
Pelvis	Width across the hips		
Spinal Column	Base of skull to base of spine		
Pelvic Bone	Left hip to right hip		
Humerus	Shoulder to elbow		
Femur	Hip to knee		
Fibula / tibia	Knee to ankle		
Foot bones	Heel to big toe		
Hand bones	Wrist to middle finger		

1. What is the greatest difference in femur length in the class?
2. What is the greatest difference in skull circumference?
3. How many times larger is your femur than your hand bones?
4. Your mathematics question?

Ancient bison remains found near Whitehorse

Near-complete skeleton is the first ever found in the Yukon

[CBC News](#)

Posted: Apr 30, 2012 4:07 PM ET

Last Updated: Apr 30, 2012 5:21 PM ET



Paleontologists pore over the bison bones which were found in the Porter Creek neighbourhood of Whitehorse last week. They estimate the skeleton could be thousands of years old. (Grant Zazula)

Two very rare discoveries could shed light on the mystery of prehistoric bison in Yukon. Both a full bison skeleton and partial remains were found on two separate occasions near Whitehorse last week.

Craig Duncan was trenching a power line to a new house in the Porter Creek neighbourhood of Whitehorse when he came across something unusual.

"[Researchers] got pretty excited. It was pretty funny — they just basically all came running."

—Craig Duncan, finder of full skeleton

"I stumbled across a bone and so we decided to look further and found quite a bit," said Duncan.

The full skeleton was about six feet underground. Duncan informed the Yukon Government's paleontologists and archeologists and within hours, the digging was underway.

"They got pretty excited. It was pretty funny — they just basically all came running," said Duncan.

Also last week, a family was skiing on Fish Lake, about 15 kilometres from Whitehorse, when they came across more bison remains. The remains were sticking out of the ice on the lake.

Bones could unlock Yukon bison history

Both unusual finds have the potential to help explain what happened to bison after the ice age and before the species disappeared about 400 years ago. The bison seen in the territory today were re-introduced about 40 years ago.

Grant Zazula, a paleontologist with the Yukon government, said that during the ice age, bison were likely the most abundant large animal in the territory. But the animals weren't in southern Yukon because it was covered in ice at that time.

Zazula said questions remain as to what happened to the bison after that.

"Trying to understand their history after the ice age, understanding how they adapted to climate change, human hunting —trying to figure that out is a big question in paleontology and archeology," he said.

The bones are also unusual because they're a near-complete skeleton — something that has never before been discovered in the area.

Zazula said the ground at Duncan's house looks like an ancient lake bottom.

"We're finding little shells of snails and what not. And if I took a guess, it was probably an animal on the ice that probably fell through," he said.

It's not yet known how old the bison is, but Zazula is guessing that it is thousands of years old.

The paleontologists will do radio carbon dating on the bones to see how old it is. They will then do DNA tests to try to find out where the bison fits in with their understanding of prehistoric bison populations in Yukon.

Animal Bone Use

The community member talked about how bones were used. In the space below **write and illustrate** how different bones were used. Share your illustration in words with your classmates.

Pipe Cleaner Skeleton

Model this pipe cleaner skeleton with your kids - a quick and easy Halloween craft! You could make a whole collection of these and have them hanging in a window or sitting on a shelf or window sill to welcome guests!

You will need:

White pipe cleaners & narrow post it strips to label at least 10 bones
Wool to hang

Instructions:

Cut a pipe cleaner in half. Put one half to one side, and keep the other as the spine.

Take another pipe cleaner, and cut it so that it is roughly two thirds and one third. Bend the long piece in half, and twist the middle onto one end of the spine. Shape into the legs.

Take a third pipe cleaner, and again cut it so that it is roughly two thirds and one third. Bend the long piece in half, and twist the middle onto one the other end of the spine, shaping it to form the shoulders and arms.

To make the ribs, twist one end of a pipe cleaner onto the spine just below the arms. Shape it into a zigzag pattern and twist around the spine to finish.

For the skull, cut another pipe cleaner so that it is roughly two thirds and one third. Using the long piece, twist a small loop for the mouth. Make another loop around the outside with a pointed top for the nose. Finally twist a loop around the outside.

Twist your spine onto your skull to join the whole thing up.

If you like, tie a piece of wool to the skull so you can hang your skeleton.



Identifying Skulls

It was a beautiful fall day in the Yukon, and Jared and his family were headed up to Tombstone to enjoy a picnic and bonfire. Jared had just finished pleading with his parents to allow his best friend John to join them. They agreed and Jared, his family, and John were on their way. It had been a long time since the family had a chance to go to Tombstone and Jared and John were really looking forward to doing some exploring while they were there.

Once they arrived in Tombstone, they unpacked the truck and had a beautiful picnic enjoying the amazing scenery around them. Jared asked his father if John and he could go off for a bit of a hike. Now that they were older, and knew the area well, they were allowed to go alone. They were both really excited about their new independence.

The two boys had a great time on their hike. They saw a caribou off in the distance, and even spotted an eagle. They hiked for about an hour enjoying the sun, and making up games as they went.

While on the trail about an hour into their hike, they saw what looked like the skull of a wild animal (A). They thought it was really neat and looked at it for a while, examining all of the different parts. The boys were trying to decide which animal it came from. John was convinced it was a bear, Jared thought it looked more like a wolf. Neither boy had ever encountered either skull and found it quite fascinating.

A.



They decided to take it back and show Jared's dad so that he could tell them what it was. They started heading back to the picnic area and on the way they stumbled across another skull (B). This one was a bit more familiar to both of the boys and they agreed that it must be a caribou. They decided to bring it with them too.



The boys were very excited with their discoveries and were looking forward to showing the family their new treasures. When they got back to the picnic area, the family was sitting around a bonfire telling stories. They all thought that the skulls were really neat. Jared said to his dad “this one must be a wolf right dad, look how big the teeth are!” John interrupted and insisted again that it must be a bear.

Jared’s father examined the skull for a moment and determined that in fact one of them was right. It was either a bear or a wolf, but he wasn’t going to tell them which one until they got home. As it turns out, at home Jared’s father had the other skull. He wanted to show the boys that one first, and see if they could identify which one was which by looking for a few clues. He went on to explain that animal skulls can tell us many things about creatures and how they survived in their natural environment. A few relatively simple observations of an animal’s skull can tell us what the animal ate, whether the animal was predator or prey, and which senses were most important to the animals survival.

On the way home the boys talked animatedly about why they thought they were right when identifying the skull. They knew a lot about the two animals. They discussed how a wolf is a carnivore, and a bear is an omnivore. They know that both are predators. They were excited to see the other skull so that they would have a more clear answer.

When they got home, Jared’s father went and got the other skull. When looking at it they boys realized that they are very similar. They thought that was interesting considering both animals are so different.



Examine the three skulls. See if you can determine which animal they came from. Make a hypothesis and give a reason for why you chose that answer.

a. _____

b. _____

c. _____

2. Jared's father mentioned that you could tell what an animal ate by looking at the skull. You can tell if it is a herbivore (eats only plants) or if it is a carnivore (eats only meat) or if it is an omnivore (eats plants and meat). How do you think you would do this?

3. Use your answer from question 2 to make a hypothesis determining if each animal was an omnivore, herbivore, or carnivore.

a. _____

b. _____

c. _____

Jared's father began to explain that you could tell what an animal ate by looking at its teeth.

- Carnivores (meat eaters): have smaller teeth except for the canines (fangs), which are quite large, long, and pointed.

- Herbivores (plant eaters): have large well-developed teeth that are designed for cutting plants. They often don't have the large fang teeth that carnivorous animals have.
- Omnivores (meat and plant eaters) have a combination of carnivore and herbivore teeth. They have large teeth for cutting plant material, as well as sharp scissor like canine teeth.

4. Using the knowledge you learned about animals' teeth, check your answers from questions 3 and see if you would change your original answer.

Jared's father began talking about the nasal passage of the skulls. Certain features in the nose tell us if the animal had a particular good sense of smell. "We know that wolves have a great sense of smell. They can smell almost 2.5 Km away on a clear day! If we look at the nasal passage of the skull, the more prominent the bony structures in and around the area, the better sense of smell they have. A strong sense of smell helps an animal to stalk its prey." He said.

5. Look at all 3 of the skulls. Put them in order from **best sense of smell to worst**.

-
-
-

"So the skull of each animal gives us clues about things it needed to survive" said Jared.

"Exactly", said Jared's father. "The bones in our bodies, human and animal, are structured in a particular way to protect us, and help us survive. In humans we have bones to help us move, and protect our organs. Our skulls are also designed in a particular way so that we can adapt to our surroundings".

"I bet the eyes of these animals would tell us something about what type of hunters they are" said John.

"Your absolutely right" said Jared's father. The position and size of the eyes will give us clues to tell us if the animals were good hunters, and if they were predators (animals that hunt other animals), or prey (animals that are hunted by other animals). Most predators have eyes that are located in the front of their skull. Most prey have eyes that are located on the side of their skull. All herbivores are prey, and therefore all have their eyes located on the side of their skull".

6. Why do you think predatory animals have eyes in the front of their skull, and animals that are prey have eyes towards the side of their skull?

“Look at the first skull (A). Its eye sockets are a bit smaller than the third skull (C)”. Said John. I bet that is important to know as well.

12. What do you think the size of an animal's eye sockets tell us?

“You're absolutely right John” Said Jared's father. “An animal with a big eye socket generally indicates strong eyesight. This feature would also make them better hunters. Carnivorous animals have great eyesight because they need to stalk their prey from far distances”.

We know that wolves are carnivores, bears are omnivores, and caribou are herbivores. Each animal has specially designed teeth to help them with finding food. We also know that wolves have great eyesight, and a strong sense of smell. Caribou have decent eyesight so that they can see predators from far away. Although bears also hunt animals, they are not as good of hunters as wolves.

13. Based on the information you have learned about each animal, and what you have learned about the different characteristics of the skulls
- a. Determine which skull is from a bear, a wolf, and a caribou.
 - b. Explain how you know using words or pictures. Provide all evidence that you have to support your answer.

Century Old Coffins Found in Dawson City

In November of 2010 construction crews were working in Dawson city on 5th street, where the new Waste and Water Treatment Plant was to be built. While doing some digging to pour the foundation, four coffins were uncovered! Construction was halted immediately and the local RCMP, the City of Dawson,



Tr'ondek Hwech'in, and the Department of Highways and Public Works were contacted.

It was discovered that four men had been buried at this site. It was thought that these men were buried here during the gold rush in the late 1800's. Specialists were brought to Dawson to work with the Tr'ondek Hwech'in, the RCMP, and historians to determine how old the bodies were, how they came to be buried at the sight, and who they were.

The team was fairly certain that the bodies they had found were the remains of executed prisoners, buried alongside an old drainage slough in the 1890's. The site that the bodies were found used to be

Fort Herchmer, which was a Northwest Mounted Police Palisade. Police had been brought to the area during the Gold Rush from Fortymile to stop any lawlessness that was often seen in other Gold Rush communities. Many people were hung for breaking the law, and it was assumed that these people had been buried at this sight, after they had been executed.



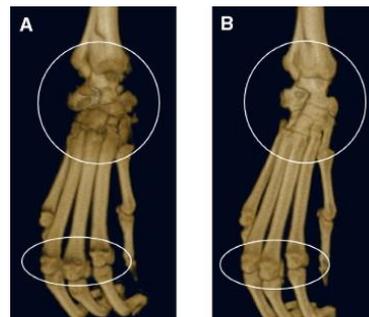
With century old bones and a list of prisoner names, researchers began work to determine the identities of the four bodies found in Dawson. Osteologists (researchers who study bones and teeth) were brought in to let the bones tell the story, and look for clues to determine whom these people once were.



The first step in this process was to determine a basic profile for burials A, B, C, and D. A and B were about the same size. One was a full adult, and the other was a youth. They could tell that one was younger because of separations in the plates of his skull. When we are growing, our skull is not fused together completely like it is as an adult. Researchers were able to tell that burial A was in his late 30's and burial B was in his early

20's.

With advanced bone arthritis, it was determined that burial D was over 50 years old when he died. Burial C was a young teenager. Researchers knew this because of separations in the plates of his skull, his size, and also his teeth.



The next step was to determine ancestry. In the Yukon, ancestry of a body is important because it determines if a body should be buried locally, or in the case of First Nations, to be returned to its ancestral community for a culturally appropriate burial.



Burial A had interesting dental work. He had a gold bridge, and dark staining on his teeth, indicating tobacco use. He had access to good dentistry and a frequent supply of tobacco, so he was probably from a city and new to the Klondike when he was executed. It was also determined that he was Caucasian by the ridge in his nose and the shape of his eye sockets.

The shape of the jaw on Burial B was an indication that he was of First Nations ancestry. Burial C was also First Nations. Researchers knew this because he had molar teeth, which had developed early. They knew he was young, and this is often a trait of First Nations people.

Burial D was a bit of a mystery. They only had bones from the waist down but that was enough to indicate that he was short (about 5 feet, 4 inches), and had powerful legs that would indicate heavy lifting. They assumed he was probably overweight.

The information given by the osteologists was enough to determine who these men were after matching it with historical execution records. The bodies had been identified!

Burial A was thought to be Edward Henderson. He had come to the Yukon from the United States to find his fortune. He arrived in the Klondike with a small group of prospectors. He had a severe bladder infection causing him to urinate frequently. He carried a small tin cup with him to fill in the nights. One night he accidentally spilled his cup on one of his fellow travellers. The man he spilled on was angry with him and started a fight. Henderson reached for his pistol and shot his companion down. He was hung for what he did and was buried at the sight on 5th street in Dawson City.



Jim and Dawson Nantuck with their brothers

Burials B and C were likely Jim and Dawson Nantuck, who were brothers from the Carcross-Tagish First Nation. They shot two prospectors on the McClintock River in Southern Yukon. The ages of the men were 13, and 20. Researchers were able to tell from the bones that these men suffered from severe illnesses. Burial C had scurvy, which was evident from severe tooth decay. Burial B showed signs of a bad infection such as tuberculosis.

Burial D was Alexander King, a very well known gold prospector. King shot a man after he repeatedly crashed their makeshift boat against the rocks of an Alaskan river. He shouted, "you've bumbuzzed this enough!" before firing his gun at the mans back. He was hanged soon after returning to the Klondike. On June 11, 2011, after being identified, the bodies were buried in the Dawson City Cemetery. Researchers worked very hard to determine whom these men were. They were able to use clues from their remains to solve the mystery. Each had unique characteristics that led to the uncovering of four separate identities and stories.

Muscle and Bone interaction

Ben and his sister Jessica were spending an afternoon in West Dawson chopping wood to prepare for the coming winter months. Ben normally prided himself on his wood chopping skills, and could normally chop much more than his sister. He noticed today though that he was having a hard time keeping up. This really bothered him, and he figured it had to do with the fact that he spent most of the past couple of months in a cast. He had recently broken his arm, but had been healed for a few weeks now so he found this frustrating.



Ben's dad Jim came out to check on them, and could see that Ben was very frustrated. He asked why, and Ben explained that he didn't understand why he couldn't chop wood as well as he could before. He had only fractured a bone, he felt like he should be back to normal by now. He wondered if it would ever be the same as it was before, and didn't understand what the problem was.

Jim had taken a lot of first aid courses, and because he spent a lot of time outside in the woods he had made a point to learn a bit about how the human body systems work so that he could be prepared if anything ever happened. Jim explained to his son that the bones, muscles, joints, tendons and ligaments in our body have to work together to function.

Ben, still frustrated, was having a hard time listening to his dad's long explanation. He didn't understand why it took so long to heal, and why his muscles weren't working the same as they were before. He only hurt one bone in his arm and the rest was fine. Jim asked his son what he knew about the skeletal system and the muscular system.

1. a) What do you know about the *function (purpose)* of the skeletal system and the muscular system? Use the chart below.

Bones	Muscles

- b) Do you notice any similarities between the two systems? Do you think one system could work effectively without the other?

Now Ben was a bit curious. How exactly do the two systems work together to produce movement? He was starting to realize that maybe his fractured bone effected more in his body than he had realized. He asked his dad Jim to explain it to him in more detail. Jim decided it would be better if his son built a model of an arm so that he could see how the muscles and bones in his arm work together to produce movement.

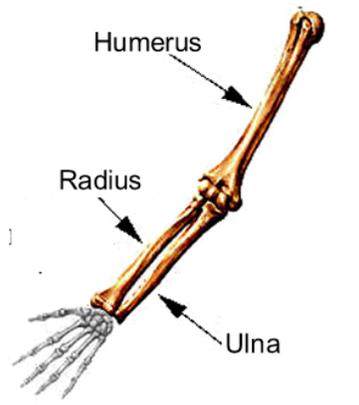
Jim went into the house and came back with some paper towel rolls, paper clips, string, and a few long balloons.



Jim told Ben that they were going to construct a working model of an arm. This model would have muscles, bones, tendons (which attach muscles to bones) and ligaments (which attach bones to other bones).

1. With a partner, collect all of the materials that are shown above. Determine which material is going to represent the following:
 - a) Bones: _____
 - b) Muscles: _____

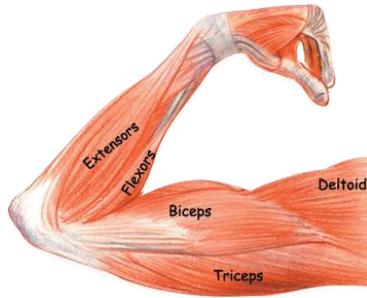
- c) Tendons (attach muscle to bone): _____
- d) Ligaments (attach bones to other bone): _____
2. Using the materials you are given, construct a model of the bones in your arm. You need to represent the humerus (bone from the shoulder to the elbow), the radius and ulna (bones from the elbow to the wrist), and the ligaments (how the bones are attached). The model should be moveable at the elbow joint.
3. Draw and label a picture of your model of what you use to represent the bones and ligaments.



Once Ben had constructed the bones and ligaments of the arm, his father told him that all of the muscles in our body are attached to muscles. In order for our bodies to move, the muscles must pull on the bones, which changes our body position.

4. Using the materials provided create and represent the following:
- a) The biceps (muscle on the top of your arm when your palm is facing up)
 - b) The triceps (muscle on the bottom of your arm when your palm is facing up)
 - c) Forearm muscles
 - d) Tendons (which attach muscles to bones)
(The tendons are represented in the picture below in white).

Then attach the muscles and tendons to the bones.



5. Draw and label a picture to show what you used to represent muscles and tendons, and how you attached them to the bones.

Jim used Ben's arm model to show him that as you move your arm (bend it at the elbow) the muscles pull on the bones lengthening and shortening to create the action. Ben now understood that human muscles and bones must work together to create movement. If one is not working properly, then the other system will not work either.

6. Explain why Ben's broken arm, which was still healing, made movement difficult when chopping wood.
7. Find on **the internet** what does a physiotherapist do? How does their work relate to bones and muscles?
8. What diseases of the muscles are you aware of? Search **the internet** to find out about muscle disease. Also find out the name and story of one person who made significant contributions despite having a muscular disease.
9. Look at animal pictures on **the internet** (cougars, bears, moose, gazelle, etc) and get an idea of why their front and back legs differ in length and musculature.

Making Pemmican: A Story by Mary McLeod

In early days there are two ways to save food: dry it or freeze it. Today we have other ways but still drying and freezing are used. We mainly use moose and caribou and salmon. The moose came from river valley. The caribou came from down river before Eagle, but now these caribou are gone and we get them up Dempster way.

For pemmican, you dry meat muscle after boiling it in water. Boiling makes the meat shred easy so it can be made into small bits. The muscle from the legs and the body are best. Maybe caribou or moose or even bear meat could be used. After boiling, the meat is pounded with moose or caribou fat and some salt. The crushed meat is mixed with fat and maybe even berries. It is best if you can't see the lumps of fat from around kidneys of moose or caribou. Then this is flattened. I hear some people then used to put this in intestine (to make like sausage). Then when you travel around, you don't need fire. You have your meat ready.



You can take fish meat too and dry it. It has to be cut in strips. Then pound it with fish eggs and stoneberries and moose fat. You use the fat from around the moose kidneys. Some people add raisins and sugar, but you don't need to do this.

You can take salmon meat and mix it with blueberries. Just stir it and because it has oil in it, you don't need to add fat.

To store food, you can put dry fish, dry meat and dry berries up high in a cache.

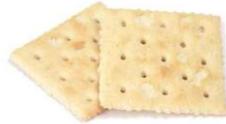
Fresh meat and berries can be put in a hole in the ground, like cellar. You put moss cover in inside cellar and it keeps things good. At Eight Mile we put cheese cloth around meat before it was covered by moss. The cellar was near permafrost, so in summer it was always cold. In winter, it was frozen.

Making Pemmican: www.youtube.com/watch?v=hGJ4l_vg4YA

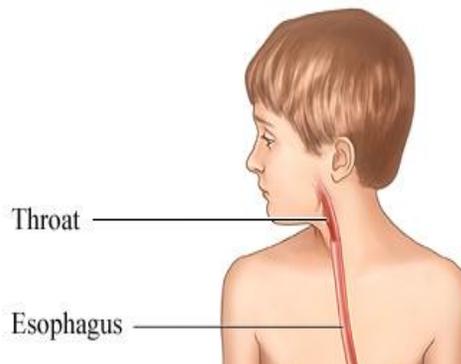
Station #1: Smooth Muscles

Directions:

1. Slowly eat 2 crackers while thinking about how it feels as the crackers move from your mouth, down your throat, and into your stomach.



2. The muscles in our stomach, esophagus and intestine are elastic and strong. We can't control this type of muscle. Describe what it feels like when the crackers move from your mouth into your stomach.



Questions:

1. What do you think this muscle is doing to move the crackers into your stomach and through the digestive system?

Station # 2: Skeletal Muscles

Directions:

1. Use the stopwatch to time and count how many times you can open and close the clothespin or your hand in 2 minutes. Record your results in the space below.



2. Take a 10 second break

3. Using the same hand, try the same task again. See how many times you can open and close the clothespin in 2 minutes. Record your results in the space

below.

Questions:

1. Could you open and the close the clothespin as many times the second time as the first?
2. Why do you think you got the result that you did?
3. What do the results of this test tell us about our muscles?
4. If you performed the task a third time, what do you think would happen? Why?

Station # 3: Cardiac Muscles

Directions:

1. Take your resting heart rate for 15 seconds _____
2. Multiply your answer by 4 to get heart rate for one minute

_____ x 4 = _____beats per minute

3. Do jumping jacks for 1 minute without stopping.
4. Record your heart rate after exercise for 15 seconds _____
5. Multiply your answer by 4 to get heart rate for one minute
 _____ X 4 = _____ beats per minute

Questions:

1. What changes do you notice in your heart rate when exercising?

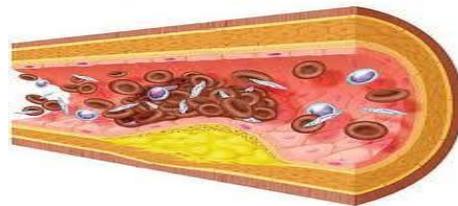
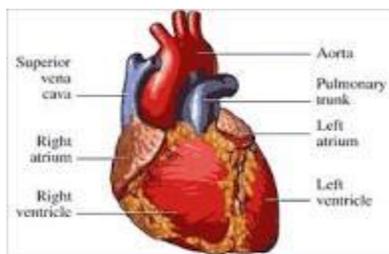
2. What do you think caused this change?

3. Carry out an investigation to find out what type of exercise causes your heartbeat to change the most after 30 seconds of exercise. In the space below, fill in the chart.

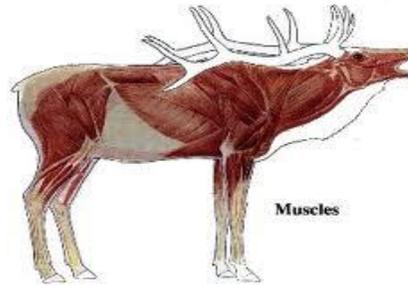
Type of Exercise	Start Heartbeat	Final Heartbeat	Change in Heartbeat

4. Stories are told of hunting caribou by skidoo and by pursuing them for a long time, their heart seizes? Do you think this is possible? Why or why not? Ask at home to see if anyone has heard of this.

5. An increasing health problem across Canada is heart disease, especially associated with arteriosclerosis. What is meant by heart disease? What is arteriosclerosis? What can cause these and how can they be reduced?



The Muscular System



Look at the samples of meat. They are numbered. The samples are made up of **muscle, fat and sinew**. Try to infer where on the body they come from

Which one is the leanest – mainly muscle?	
What part of the body does this come from?	
Which one has tendons on it?	
What part of the body does this come from?	
Which one is the fattest?	
What part of the body does this come from?	
Use the knife a tweezers to look at muscle fibre. Draw and describe it.	
Look closely at the tendon. Try to break it. Draw it and explain why it is used for things like snowshoes.	

What is the difference between muscle, ligament and tendon?

Tuberculosis as a Child

I remember a summer when we used to leave at Lousetown. I was maybe three years old. I fell in the river that summer and almost drowned.

It was that summer I remember getting a bad cough and my lungs hurting. It wasn't hurting so much in my throat, it was my lungs. I coughed and coughed and then I started to cough blood. It would even be out my nose.

I was sent by plane from Dawson to Edmonton to a tuberculosis hospital. Tuberculosis was a bad disease of the lungs. I had sisters and brothers at the same hospital. Tuberculosis was common all across the north and people had to be taken to special treatment centres in the south. Many people died for this disease. It was thought that the disease came when with the men who were on the Alaska Highway.



I stayed at this hospital – Charles Camsel Hospital - for three years. I did not get to go home and my parents were not allowed to see me. It was a difficult time.

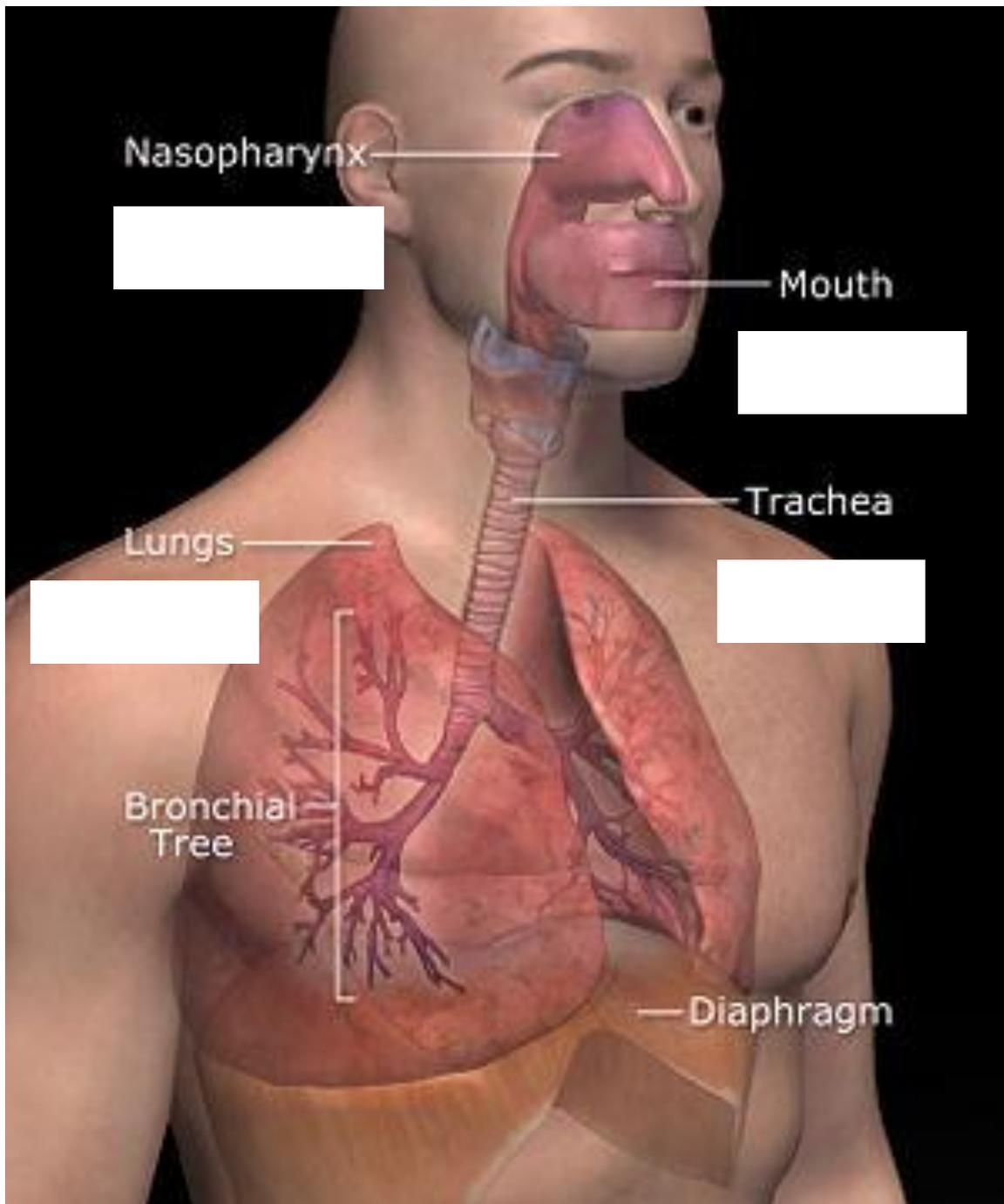
When I got better I was glad to know I would be soon going home, my brothers and sisters too although some had gone home already.

When I did get to go, I was flown to Whitehorse and in the evening taken to another place, but it was not my home. It was more like a hospital and there were many boys there. They were asleep and expected to be very quiet. I heard some boys sobbing because they were sad.

In the morning I realized I was at a school and the school was in Carcross. It was the Chutla Residential School, a school for just native people from all over the Yukon. Even one of my brothers was there. I did not see my parents for a long time. They had no say in whether I went to the hospital or whether I should go to this school.

That was the way things were then. It was a very sad time for us all.

Respiratory System



Respiratory Relay!!



Respiratory Relay!!



Respiratory Relay!!



Respiratory Relay!!

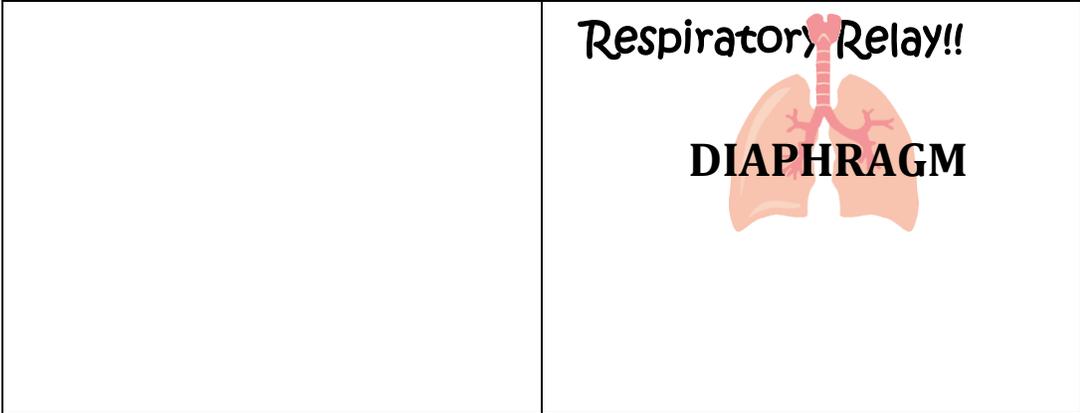


Respiratory Relay!!



Respiratory Relay!!





<p><u>The nose</u> is the uppermost part of the respiratory tract. It forms a passage that connects the nostrils to the throat. The nose filters, warms, and moistens air before it moves to other parts of the respiratory system.</p>	<p><u>The mouth</u> is where your food tube and air tube meet. The back of the mouth functions to make sure that food being swallowed is prevented from entering the air tube. This is why you can't breathe while swallowing. The mouth is also a passage for air entering the respiratory tract.</p>
<p><u>The lungs</u> lie in the chest cavity and are surrounded by the rib cage. The lungs are the main organs of the respiratory system. Their function is to supply the body with oxygen, and remove carbon dioxide from the blood.</p>	<p><u>The trachea</u>, or windpipe, is a passageway for air to get to the lungs. It is specially designed with smooth muscle, and remains open at all times and is easily moveable with the neck. The trachea also houses the larynx, which is important for producing voice.</p>
<p><u>The alveoli</u> are balloon like air sacs that are located at the end of the bronchioles. The alveoli have thin walls that have lots of blood vessels. This is where the exchange of oxygen and carbon dioxide in the blood takes place.</p>	<p><u>The bronchioles</u> produce mucus, which lubricates the lungs and clears the air passage into the lungs.</p>
	<p><u>The diaphragm</u> is the main breathing muscle that that expands the lungs when it contracts, forcing air into the lungs.</p>

Keeping Our Lungs Healthy

Jessica was headed out to walk her dog on 9th avenue trail. Her mom Judy and her friend Trish were just coming in for tea as she was leaving. She suggested that they come with her. It was a beautiful day so they agreed and left to enjoy a nice hike.

They spent about an hour or so on the trail, chatting and playing with the dog.

Towards the end of the hike Jessica noticed that her mom's friend Trish was getting very winded and had started coughing a lot. She insisted that she was fine and was just out of shape, so they continued with their walk. They arrived back at home, enjoyed their tea and Trish went home for the day.

Jessica was worried about Trish, and asked her mom if she was going to be alright. Judy smiled and her daughter and explained that she would be fine, but she has a harder time with exercise now because of her many years of smoking. She explained to Jessica that because she smokes her respiratory system, mainly her lungs, don't work they way a healthy persons do. This makes physical activity tough and signs of poor health are often seen.

Jessica had learned a little bit about the respiratory system in school but was still unsure of how exactly smoking affected the lungs. She knew that cigarettes are full of toxic chemicals, but was unable to see the connection. All she really knew about the respiratory system were the names of the parts of the system and a little bit about what they did. It all seemed very vague and she couldn't really visualize how it worked in her body.

She began asking her mom lot's of questions about it while she was making dinner. She wanted to see pictures of lungs and have her explain how it all worked. Judy decided it would be best if she could see it for herself so after dinner Judy rummaged through the house and came up with the following materials:



Together Judy and Jessica began making a lung model.

Follow along with the steps they took to make your own working lung model:

- 1.) Cut the opening of a small balloon and pull it over one end of a drinking straw. Use tape to attach the balloon to the straw.
- 2.) Using scissors carefully cut the end off of the water bottle.
- 3.) Cut the neck off of a large balloon. Have someone hold the water bottle and stretch the cut balloon over the bottom of the cut water bottle.
- 4.) Put the small balloon and straw inside the water bottle. Leave about half of the straw sticking out of the bottle.
- 5.) Secure the straw and close the top of the bottle with modeling clay.

Draw a picture of what your lung model looks like. Label the materials use:

1. What do you think will happen to the small balloon if you pull down and then push up on the large balloon?
2. Try it! What happened?
3. Why do you think this happened? What part of the respiratory system do the 2 balloons represent?
4. Based on your model, what part of your body do you think the straw represents? What does the bottle represent?
5. Using your model, explain what you think happens in your body when you breath

So now Jessica has a much clearer picture of how our lungs work, but she was still confused about why her mom's friend Trish had trouble breathing because she smokes.

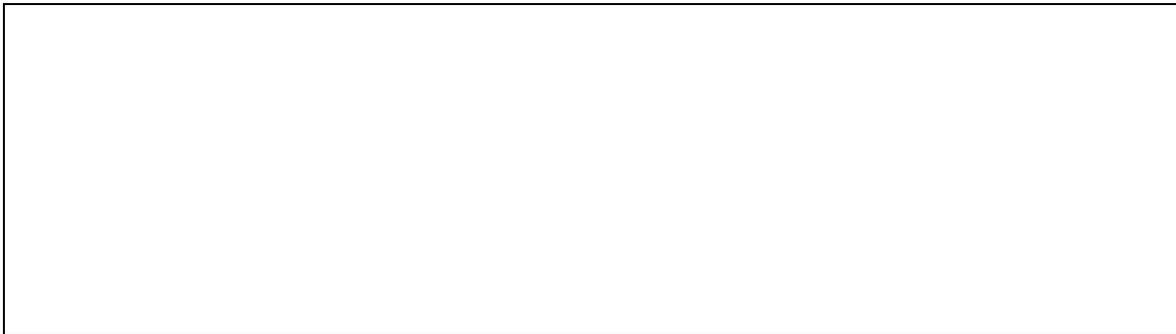
6. What part of your respiratory system do you think smoking affects? How?

Judy explained to Jessica that when you smoke you breathe in lots of harmful chemicals and poisons. These toxins attack everything that they come in contact with. When you breathe them in, your respiratory system begins to break down because of them. Our organs and soft tissue are burned and scarred from the chemicals. This makes it harder to take in air, and move air through your body. Our entire respiratory system is affected by smoking. The two parts that are most affected are our trachea (represented by the straw), and our lungs (represented by the balloon attached to the straw).

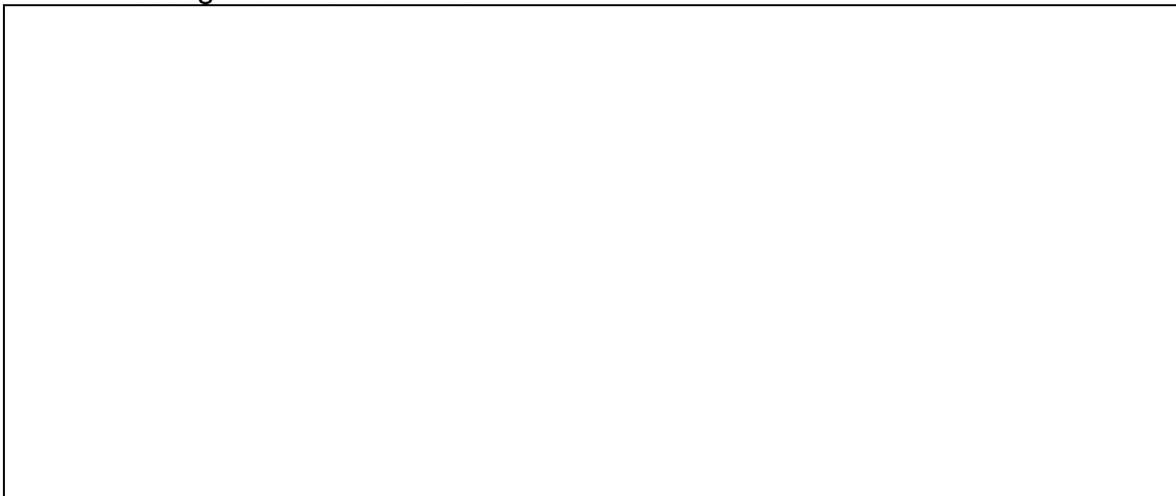
Imagine if you were trying to suck air through a straw with a hole in it. What would happen?

That's essentially the same thing that smoking does. It makes it more difficult to take in air, and move it through the respiratory system.

10. Draw a picture of your lung model labeling all of the parts, and showing how smoking effects breathing and the respiratory system.



11. Draw a poster below with a caption that draws people's attention to the hazards of smoking. Consider your target audience and an appropriate message for this audience.



Beating Fish Hearts

Growing up we had lots of time spent hunting on fishing whether we were travelling by canoe or skidoo. From an early age I would help with the gutting of the fish, moose or caribou.

I was always fascinated by the inside of the animals. Usually it was cold outside and the inside of the animal was so warm.



You learned to identify the different parts. I never ate the heart when it was raw, but my father did and most of the family. It was the prized part to eat right away.

What fascinated me was how big the heart was, whether it was in the moose, caribou or even fish. It was a strong part of the body, even though it did not bone in it.

The most curious thing was how the heart of a salmon would continue to beat even after the fish had been gutted. I would put the heart in my hand, and it would continue to beat for an hour. I think this showed just how strong it was.

Once, the moose was shot right in the neck just above the heart and when we got to it, the blood was squirting out because it was so near the heart and the blood was under pressure.

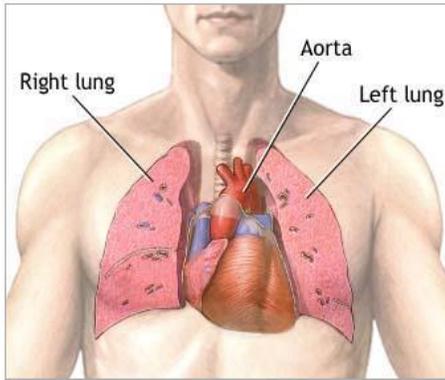
Once, my uncle shot a bear and when we gutted the bear, the heart was covered in parasite worms. They were about the size of 10 cm pieces of string and there were likely hundreds of worms in and around the heart.

This bear must have been very unhealthy. Maybe that was why it kept coming into our camp. It's teeth were rotten too.

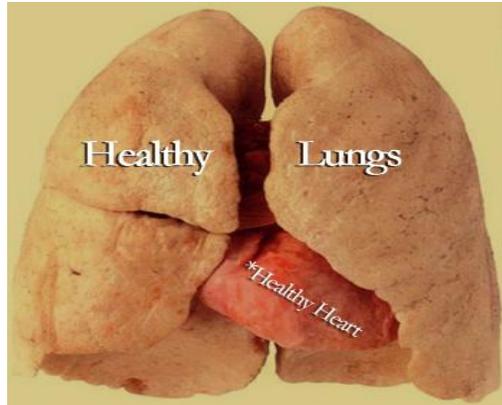
<http://www.youtube.com/watch?v=84PrHxJri9Q&feature=related>

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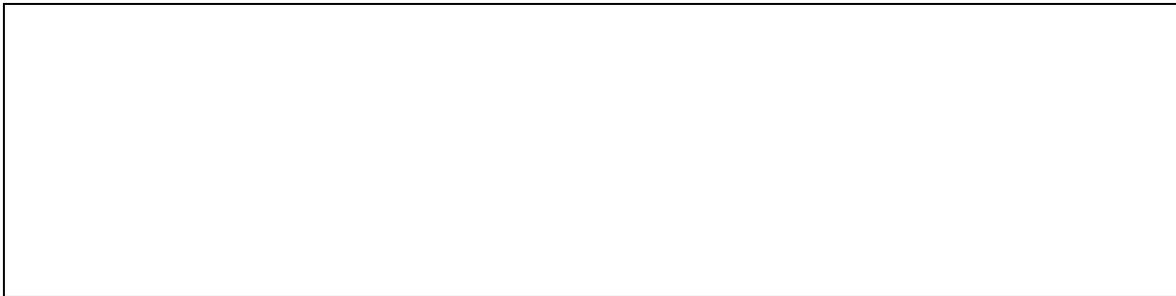
Heart and Lungs



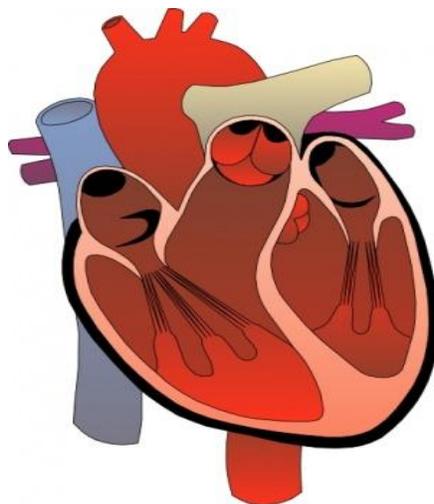
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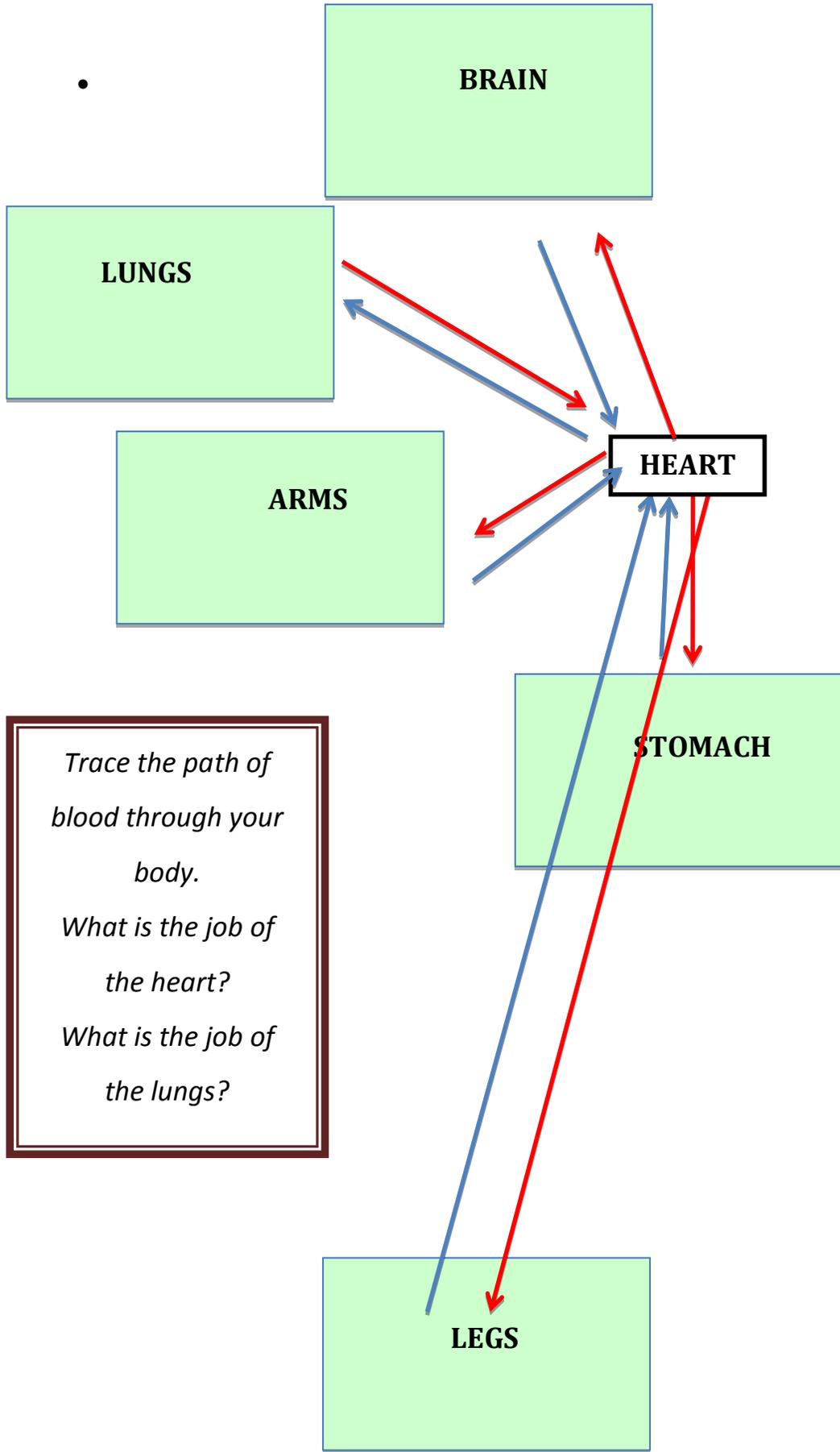


Draw and describe in words the heart on display in the space below.



Label the heart below and list beside each part its job. The parts include (1) right ventricle; (2) left ventricle; (3) right atrium; (4) left atrium; (5) aorta; (6) pulmonary artery; (7) pulmonary vein.

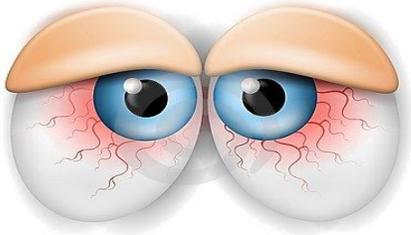




Trace the path of blood through your body.
 What is the job of the heart?
 What is the job of the lungs?

Parts of the Circulatory System

Look at the veins, arteries and capillaries in the body parts shown below. Draw pictures and describe what you see.



dreamstime.com



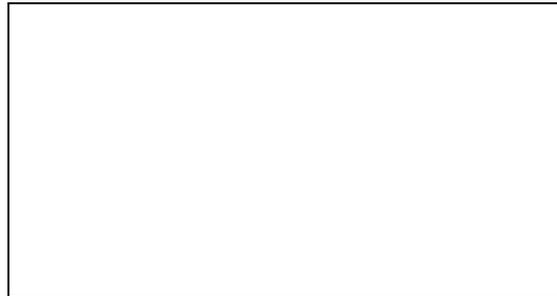
Our Blood

In this activity we will make a 'model' for blood.

You need:

- Jar
- Water with yellow food coloring
- Red food coloring
- Mini marshmallows
- Purple porcupine balls
- Cheerios
- Sugar & Salt

Mix these parts as the teacher instructs. Draw a picture of the 'blood' below.



In the chart below the rows are jumbled up. **Draw lines to connect the object we used in the model in column 1 with the blood part in column 2 and its function in column 3.** One blood part has two functions.

Object		Blood Part		Function
Cheerios		Plasma		Provide energy and essential chemicals
Water & yellow Food Colouring		Platelets		Give blood its red colour
Marshmallows		Red Blood cells		Carry Oxygen and Carbon Dioxide
Porcupine Balls		White Blood Cells		Liquid part of our blood to make it flow
Red Food Colouring		Nutrients & Minerals		Fight Disease
Salt & Sugar				Clot blood

Harvesting Caribou: From Annie Henry (1992)

In the fall time, there's lots of fat caribou. Nothing is wasted on that. Caribou is used for many things. When the caribou was killed, we look forward to fresh meat. Right away we would get fire going and cook maybe by roasting or by boiling.

The tongue was cooked. It had to be boiled. It is very tender. People are surprised when they eat it, especially when it is sliced like bologna or sausage. I find many people surprised when you tell them they are eating the tongue.

The fat around the rump of the caribou was very special too. It was the best lard and we would use it in pemmican. Some people like to whip it up and because it has little bits of meat in it, it looks like ice cream with chocolate. People call it, 'akatuk' or "Eskimo Ice Cream". I have heard some people go to a feast and don't know what it is and they eat it because they think it is ice cream but tastes like lard. I hear one white man was so embarrassed to not want to eat it, he put ketchup on it so he could eat it.

The stomach was important because often in it was berries and other things that were healthy. In some places, the whole stomach would be placed in the fire and then roasted.

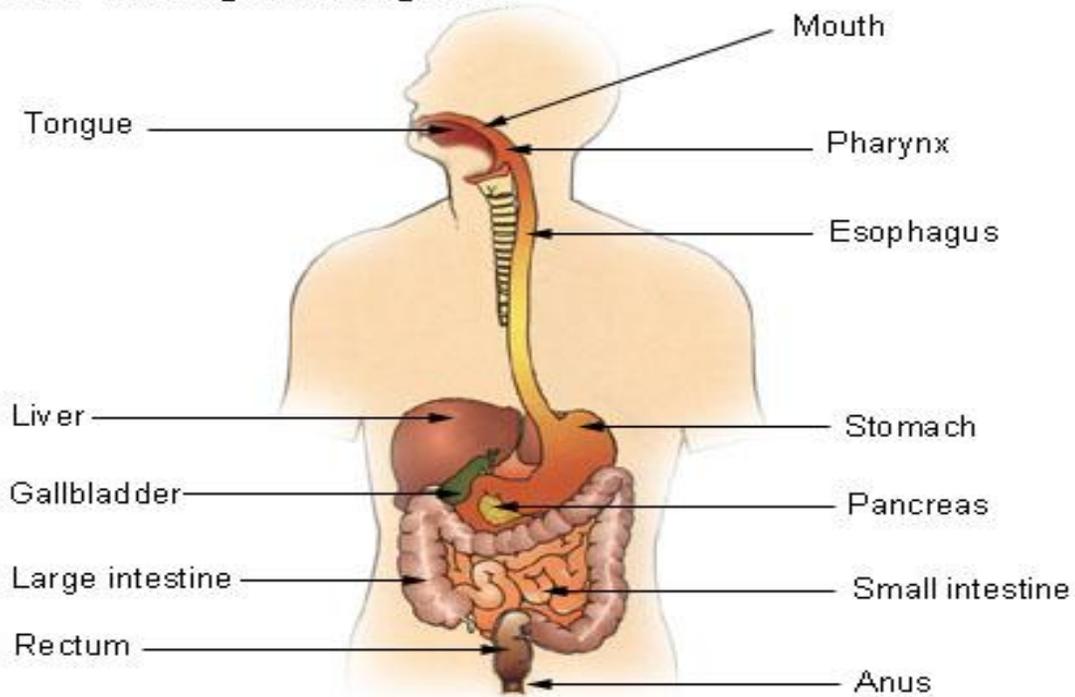
I also hear that some women take the juice from the stomach and use it to dye flowers. If you boil flowers, you get the colour of the flower in the water and can use this as a dye. If the acid from the stomach is placed in the coloured water, the dye changes colour and you can then have many colours for dyeing for artwork.

Sometimes the stomach was washed and then used as a storage for water or food. The stomach could be filled with water and left near the fire on hot stones to be heated to use for cooking. It was very strong and useful.

I really liked the marrow from the bones. This is the soft inside of the bones and it was very healthy. People would say if you eat this, then you have strong bones. I like it raw but some like it cooked. Boiling bones was important to get this from the bones. Always we did this for soup.

I like fresh kidney and liver. No one would eat the lungs though. It was just for the dogs.

Organs of the Digestive System



Story of Digestion: What Happens to a _____?

Imagine that you are a food that is being eaten and digested. Write a **creative story** about the journey of that piece of food through the digestive system. Think about how it would feel, what it would look like, what it would sound like, and what would happen at each stage. Make sure you use all of the parts of the digestive system that we have talked about in your story.

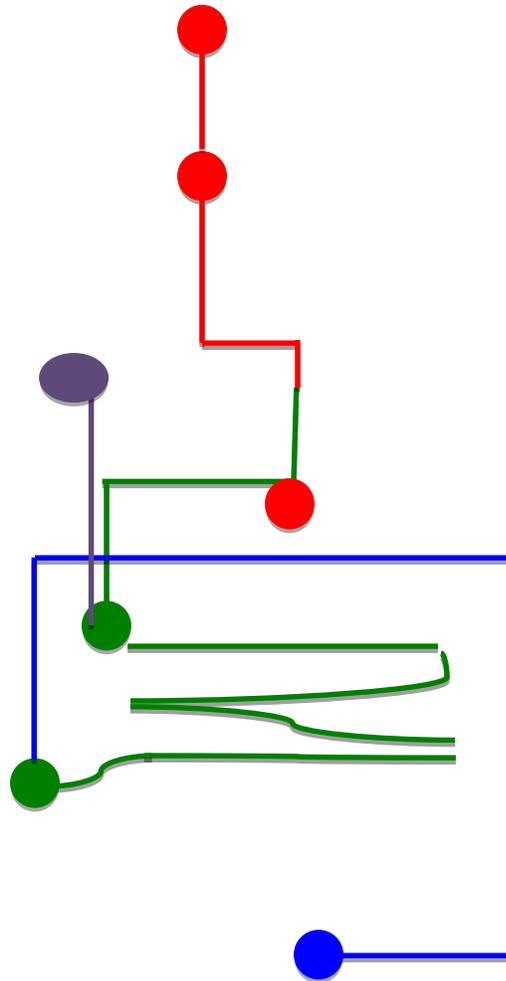
- Mouth
- Teeth
- Esophagus
- Stomach
- Small intestine
- Large intestine
- Liver
- Rectum/anus

<http://www.youtube.com/watch?v=0n0rIqf3yFk>

<http://www.youtube.com/watch?v=VmlbAk8QMxA>

http://www.youtube.com/watch?v=a4F5_t-aiWo

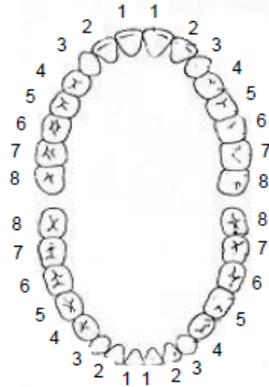
Digestive System Diagram
(to tape path on floor)



Tooth record.

You have four different types of teeth in your mouth. Colour code them using this table.

Type of tooth	Number of tooth on chart	Colour
Incisors	1 and 2	red
Canines	3	blue
Premolars	4 and 5	yellow
Molars	6 and 7	green



Record missing teeth by putting a cross on the missing tooth.



Record fillings by putting a dot on the filled tooth.



My teeth.

We counted the number of teeth we have filled or missing here are the results.

Prediction:

Which type of tooth do you think will show the most decay?

Results:

Number of teeth filled or missing			
Incisors	Canines	Premolars	Molars

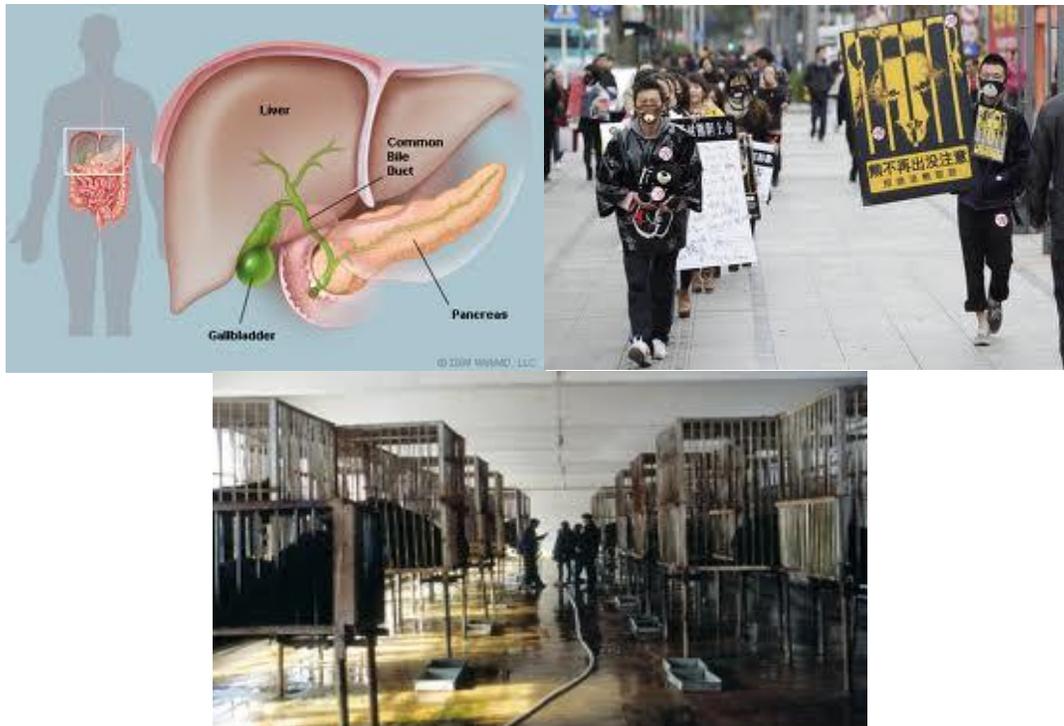
Compare this with the results of the people on your table.

Name	Number of teeth filled or missing			
	Incisors	Canines	Premolars	Molars

Bears and Bile

Animals around the world are killed each day for their body parts. In Africa, elephant tusks are a valuable source of ivory used in jewellery. Moreover, the horns of rhinoceros could command up to \$5,000 in the black market. The mothers of newborn mountain gorillas are often killed so that their young ones could be shipped to foreign countries for research or display. Tropical birds become a rarity in their native lands because they sold as pets. These are just a few examples of the maltreatment of animals globally.

In response, many nations came together to participate in a UN sponsored Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In short, CITES prohibits the international trade of species threatened with extinction. However, the trade of species that may become endangered are only regulated by a permit. While it has lessened the killing of endangered species, CITES has done little to protect others such as black bears that are threatened with endangerment. Black bears, especially in Asia, are harvested for their bile, a fluid made by our liver that is used to digest fats. It is believed by many that bile can be used to treat illness. In some counties bears are kept in cages and a tube is put in through the chest/stomach region to draw out the bile as it is produced.



This is not just a practice in Asia. In the Yukon, people still kill bears just for the bile so it can be used to 'cure' illness. This is a practice that is illegal.

Putting It All Together

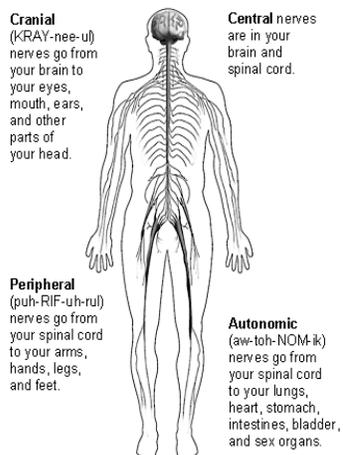
Draw a picture of the activity your friend is doing

In the chart below list everything going on in their body as they do this activity and state which body system this is.

What is going on?	System?	What is going on?	System?
1. Breathing in	Respiratory	8.	
2.		9.	
3.		10.	
4.		11.	
5.		12.	
6.		13.	
7.		14.	

Some people say that the nervous system is like the boss of an organization, like the Chief of a First Nation or the principal of a school. In what ways is this a good description of the job of the nervous system?

What are the parts of the nervous system?



Use the internet to find out about brain damage or spinal damage.

Exploring our Senses

Follow the directions for each center to discover the strange ways our nervous system works to control all 5 of our senses.

Smell

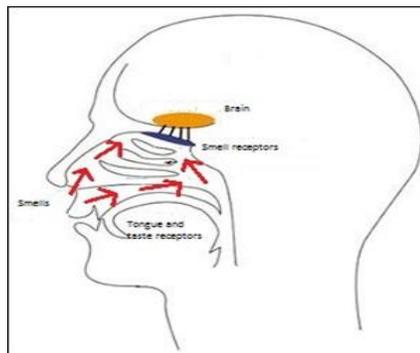
This station depicts how sensitive our sense of smell is, and how our nervous system connects our sense of smell with memory. We remember certain smells, and we also associate smells with different things in our life.



Directions:

This station has 4 containers filled with various substances.

1. Put on a blindfold
2. Smell each container
3. Try to identify what each substance is
4. In the blanks below, record what you think each substance is, rate the smell (pleasant, neutral, strong etc.), and write a memory that you associate with that smell.



Substance 1:

- What is it?
- Rate the smell:
- What does it remind you of?

Substance 2:

- What is it?
- Rate the smell:
- What does it remind you of?

Substance 3:

What is it?
Rate the smell:
What does it remind you of?

Substance 4:

What is it?
Rate the smell:
What does it remind you of?

Taste:

In order for food to have taste, chemicals from the food must first dissolve in saliva. Once dissolved, the chemicals can be detected by receptors on taste buds and the signals sent to the brain. If you have no saliva, you shouldn't be able to taste anything. Perform the steps in this experiment to see if that is true.

Directions:

1. Completely dry your tongue with a paper towel. Put a small sample of salt on your tongue.

Can you taste it? _____

2. Rinse out your mouth with water.
3. Completely dry your tongue again with paper towel. Put a small sample of sugar on your tongue.

Can you taste it? _____

4. Now try the salt and the sugar samples without drying your tongue.

Did you notice a difference when you had saliva in your mouth versus when you didn't? Explain



Touch:

Our skin is full of many sense receptors. These receptors send signals to our brain when we are touched to describe what we feel, and tell us where on our body it happened. Some parts of our body have more sense receptors, which make them more sensitive to touch.

Directions:

1. Choose a partner within your group
2. While blindfolded or with your eyes closed, have a partner touch a spot on your arm with a ballpoint pen. They should do this hard enough to leave a small pen mark where they touched your arm with the pen.
3. With your eyes still closed or blindfolded, use a different color of pen or marker and try to touch the same spot your partner did on your arm.
4. Remove the blindfold and see how close you were.
5. Switch with your partner who is blindfolded and who is making the pen mark.
6. Try this experiment on different areas of your body (hand, leg, different parts of arm, etc.).
7. Which area of your body has more sense receptors? How do you know?

Sight:

Our eyes are constantly processing images of what we see in our world. They send signals to the brain so that we can make sense of what we see and respond to it.

Directions:

1. Hold two pencils horizontally in front of you.
2. With both eyes open, touch the tips of the pencils together.
3. Now, close one eye and try to touch the tips of the pencils together.
4. Was this task easier with one eye open or both eyes open? Why do you think this is?



5. In your family or amongst your family's friends there are likely many stories that have to do with **animals and their sense of smell or sight**. Maybe someone has had experiences hunting or out in the bush and they have had an experience with bears or moose or wolves. Ask them details about the story and in the space below **illustrate this story**. It may take a few pictures to illustrate the details. Be prepared to tell this story to your classmates. The important thing is to organize the story into a storyline.

A Close Call

We were camped along the Klondike River in the fall time. There were lots of berries and in those days there were plenty of salmon in the river. We knew there were bears around but had no reason to fear for them as they had not caused trouble before.



That all changed on the fourth day we were camping. We had had salmon for dinner and cooked it on the fire. Mary was down at the river cleaning the frying pan and dishes and I went to get some more fire wood.

I came back to camp and I looked down to the river and saw the bear raised up on its hind legs and towering over Mary as she was knelt down to scrub the dishes. Because of the sound of the river, she did not know the bear was behind her.

I ran for my gun and did not know whether to yell or shoot because it had its arms up and looked like it was ready to swat her.

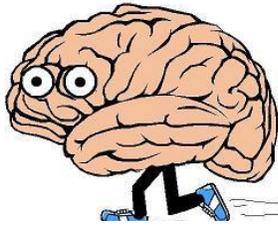
I shot towards its chest. I hit it and it staggered towards her. I shot again and it fell.

She screamed and was so surprised to see the bear fall right beside her.

We were always surprised it was interested in our salmon, considering all the salmon in the river.

Grizzly bears may not have a great sense of smell but they have a very sharp sense of smell. It could smell salmon that's for sure.

When we looked at the Grizzly close up, we could see why their swipe can be deadly.



Work Wanted!!

Your Brain is Looking for a Job!

Pretend that your brain is going on a job interview, and needs a resume to showcase what it is good at. A resume is a summary of qualifications, experience and education that people use to apply for jobs.

1. Think of a job that your brain would be good at, and would want to apply for. You can choose any profession that you want!

2. Brainstorm why your brain is best suited for that job. For example why is your brain best suited for a teacher? A Hunter? A Nurse? A Dentist? A Plumber? Why is your brain best suited to be a basketball player? What has your brain done to prepare for this job? **(Think about all the important things your brain does and how your brain works with the nervous system to control your body)**

3. Look at the samples of resumes that you have been given. Create a resume for your brain so that it can apply for the job you have chosen. Be sure to include its name, education, previous experience, and special skills!

Name:

Address:

Education:

-
-

Previous Experience:

-
-
-

Special Skills:

-
-
-

References:

-

Traditional Uses of Caribou

Caribou have been hunted for many years, especially with First Nations people. The First Nations in the Dawson area were exceptionally skilled at using different parts of the animals that they hunted for a variety of functions. No part of the animal went to waste, which made it even more valuable to hunt. For centuries northern First Nations have relied on caribou for their survival. They used parts of the Caribou that belong to the skeletal system, muscular system, digestive system, and nervous system. While you read, try to identify which system the parts of the caribou mentioned came from!



Food Source:

Caribou meat is an excellent nutritious food source. It is very high in protein and low in fat. The organs of the caribou are also eaten, and offer many nutritional benefits. The organs of the caribou were also used as dog food. Many First Nations people also ate the marrow of bones. Bone marrow (the spongy part of bone that is inside) is very high in protein, iron, calcium, and good fats. Bones and marrow can also be boiled to make soup broth.

Clothing:

Some of the warmest traditional First Nations clothing is made from caribou hide. Caribou are built to survive harsh northern winters, and this makes their fur and hide perfect for making clothing that will help humans outlast the winter as well. Coats, shirts, hats, mitts, parkas, mukluks, moccasins and much more can be made out of Caribou.



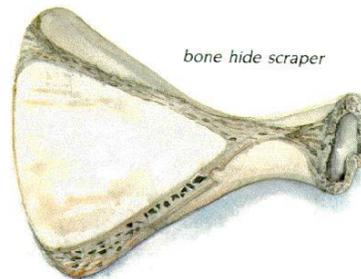
Building Materials and Tools:

Various materials to better daily life were made from different parts of the caribou.

The Tendons found in a caribou legs are very strong and were made into sinew. Sinew is a type of rope. It is very strong, and was incredibly useful for many different daily jobs. Sinew was also used as thread to sew clothing.



Bones of a caribou are very strong. They were often made into tools for scraping hides, making cutlery, fishhooks, and needles. All of these tools were necessary for daily survival in the north.



Furs and hides were important in constructing shelters. They were put over pole frameworks of houses. They acted as an insulator to keep heat in, and wind out. They would have been sewn together using sinew (made of tendons) and needles made of bone.



Transportation:

Harsh northern winters and difficult terrain made travelling challenging to First Nations people. Luckily they were very skilled at using different parts of the animals they hunted to craft various forms of transportation. For example, the antlers of the caribou were often traditionally used as the frame of boats canoes and kayaks. Antlers were also used in sleds, and for harnesses.



In the past, snowshoes were made with a wooden frame, and rawhide lacings. The lacings were often constructed from caribou hide. Snowshoes were essential for First Nations people living in the north. They were a necessary mode of transportation in the winter to hunt, trade, and trap. They made getting around much easier.



Can you think of any other traditional uses of caribou???

Summary

In this unit we have looked at the human body as well as the body of other animals like caribou and moose.

In the space below **illustrate and use words to describe something that needs to be said that relates to how we must take care of our body or other animals.** Your audience is the general public who may not be very knowledgeable about an **issue that might be a concern.**

