Title: Inherited/Acquired Traits

Just imagine you have received a call from a lawyer. He calls you into his office and you find out that a long lost and very wealthy great-great uncle has suddenly passed away. He had worked hard all his life and had invested his money wisely. He had also invented several very small, but extremely important, computer parts which he had patents on. He has left you all his money and the rights to his patents. Sounds great right?

The above story illustrates two ideas in life. Your uncle worked hard and by his industry had acquired his wealth. You on the other hand have inherited your wealth. Animals and plants have traits that they either inherit or acquire.

Traits

Traits are qualities, features or other things that distinguish the organism. They can include things like hair color, tooth shape, beak shape, bone size, or muscle structure. Traits come in two varieties: acquired and inherited.

Acquired Traits

Just like your uncle, animals can acquire useful abilities. These acquired traits cannot be passed on genetically. You can't inherit your uncle's knowledge, skills, ideas or memories and it doesn't work that way with other organisms either. Acquired traits include things such as calluses on fingers, larger muscle size from exercise or from avoiding predators. Behaviors that help an organism survive would also be considered acquired characteristics most of the time. Things like where to hide, what animals to hide from and other behaviors. For plants, acquired characteristics might include bending because of wind or growths resulting from insect bites.

Inherited Traits

Like our story, some things can be inherited. In organisms, inherited traits must come from a parent or other ancestor. A trait may seem to skip a generation or even two or three, but if a trait shows up it must have been present in an ancestor. Mutations are the exception to this rule. Inherited traits include things such as hair color, eye color, muscle structure, bone structure, and even features like the shape of a nose. Inheritable traits are traits that get passed down from generation to the next generation. This might include things like passing red hair down in a family. For animals it may include things like the stripes on a tiger, a skunk's ability to spray, or the flavor of fruit from different apple trees. All organisms that reproduce pass on traits to their offspring.

Student Name: _____

MY FAMILY TRAITS WORKSHEET

Instructions: Interview members of your family to see what inherited traits you may share. Fill in your answers on the chart below.

	You	Mom	Dad	Sibling	Sibling	Sibling	Other Relative	Other Relative
Dimples? Yes or No								
Hitchhiker's Thumb or Regular Thumb? H or R								
Can Curl Tongue? Y or N								
Short or Long Second Toe? S or L								
Right or Left Thumbed? R or L								
Attached or Unattached Earlobes? A or U								
Can make a Vulcan hand sign? Y or N								

Do you share any other inherited traits with your family members? Take a good look at each other! Use the blank rows above or the back of this paper to list additional traits.

Name: _____

Date: _____

Period: _____

Inherited vs. Acquired Traits

You need to read each trait that is listed and decided on whether or not it is an inherited or an acquired trait. Place a check mark in which box it fits in, then in the why box justify your answer.

Trait	Inherited	Acquired	Why? Justify your answer
Being Tall			
Playing basket ball well			
Doing a front hand spring			
Being able to hold your breath for more than a minute (large lung capacity)			
Having blue eyes			
Having webbed feet			
Short legs			
Playing the piano			
Writing left handed			
Being able to throw the perfect spiral football			
Having curly hair			
Type of music you like			
Hunting well			
Shape of your nose			
Having lots of body hair			
Going bald			
Ability to sink a three pointer			
Ability to hit a home run			
Size shoe you wear			
Ability to roll your tongue			

1. List 5 traits that you have inherited.

2. List 5 traits that you have acquired.

3. List 5 traits that are inherited in plants.

4. Can plants acquire traits? If so, list all that you can think of.

5. List 5 traits that are inherited in animals.

6. List 3 traits that are acquired in animals.

Answer the following questions

1. What traits have you inherited?

2. What traits have you acquired?

3. List five traits which are inherited in animals?.

4. List at least three traits that are acquired in animals. Remember that you are an animal.

Trait	Circle One	
1. Flower petal Color:	Inherited	Acquired
2. Tree Height	Inherited	Acquired
3. Professional athletic ability	Inherited	Acquired
4. The ability of a mouse to learn a maze	Inherited	Acquired
5. The color blindness of a person	Inherited	Acquired
6. The scars on a person's face	Inherited	Acquired
7. Your eye color	Inherited	Acquired
8. The music ability of a piano player	Inherited	Acquired
9. A widow's peak on a person's forehead	Inherited	Acquired
10. Your knowledge about your science class	Inherited	Acquired

Summary:

1. Heredity plays a major role in our lives and how it shapes our actions and personalities.

2. An inherited trait is something that can be passed through the genes, such as hair color, features, or skin tones.

3. An acquired trait is something that can be learned and is taught to you by your significant others.

And the simplest way by which we can understand this is if we look at a

List of Inherited Traits in Humans

Traits are passed on from parent to child through genes and chromosomes which are made up of DNA.

Here is a list of inherited traits in humans. Use this list to see which category you fall under!

Earlobes

There are two kinds of earlobes. The attached earlobes and the detached earlobes. Attached earlobes are those in which the lobes are joined to the side of the head. They appear to be one complete structure. Whereas detached earlobes are those in which the lobe seems as if it is detached. They appear hanging from the ear.

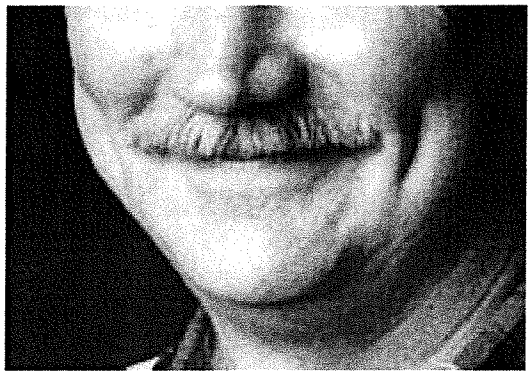
Dimples

Notice how some people have dimples while others don't? That's because a dimple is caused due to a dominant gene which carries the 'dimple' trait. People who do not have dimples carry a recessive gene of the 'dimple' trait and therefore they do not have dimples.

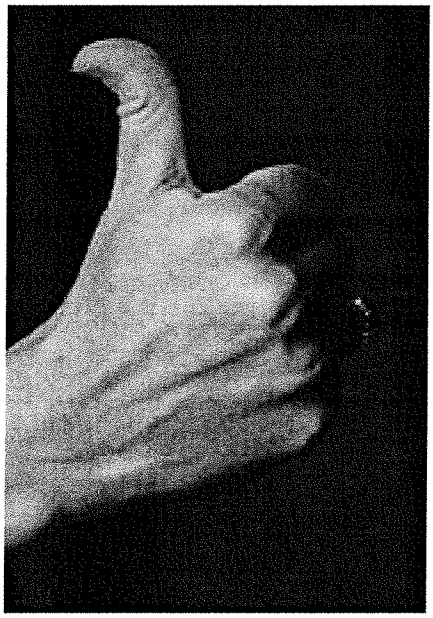
EXAMPLES OF INHERITED TRAITS

Some people have a genetic trait that creates indentations on their cheeks called dimples

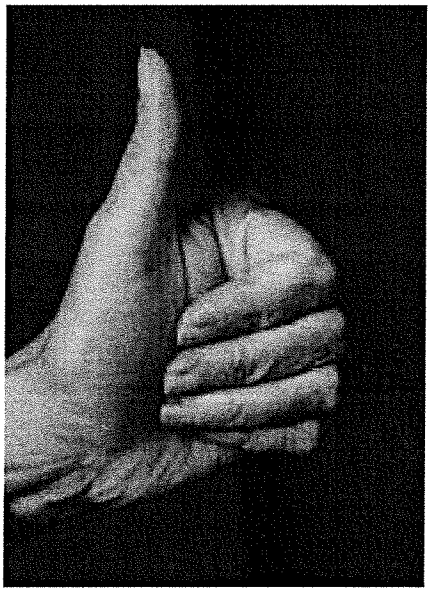
Dimples



These two images show the difference between a regular thumb and a "Hitchhiker's thumb" which, because of a genetic difference, can bend farther backwards.



Hitchhiker's Thumb



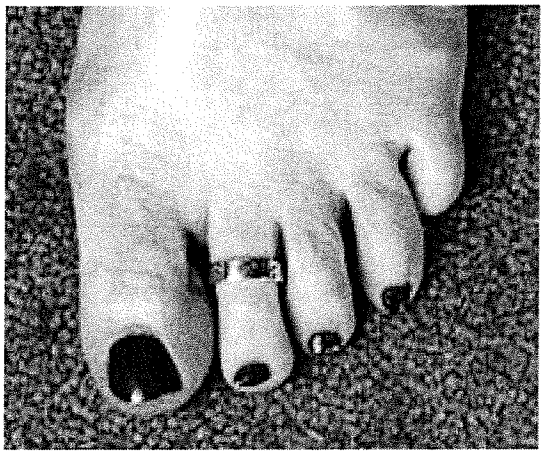
Regular Thumb

Tongue rolling is a genetic trait certain people have that allows them to curl their tongue.

Curled Tongue

Photo Credits: "The Amazing Picture Machine"
http://www.ncrtec.org/picture.htm
North Central Regional Technology in Education Consortium

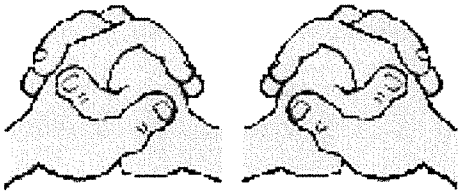
Some people have toes that decrease (get smaller) in size from the big toe to the small one while other people have a second toe that is longer than their big toe.



Short Second Toe

Long Second Toe

Are you right or left thumbed? Put your hands together, interlocking your fingers. Which thumb is on top?



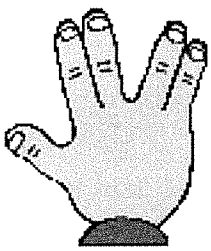
Left Thumbed Right Thumbed

Attached Earlobe

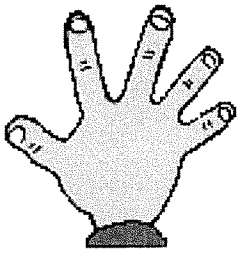
Unattached Earlobe

Are your earlobes attached or unattached? A person with attached ear lobes will have the lowest point of the ear lobe attached to the face. A person with unattached ear lobes will not have the lowest point of the ear lobe attached to the face.

Can you make a Vulcan hand sign like Mr. Spock does on "Star Trek"? Try to spread your fingers into a "v". Some people can do this easily and some people can't!



Vulcan



Earthling

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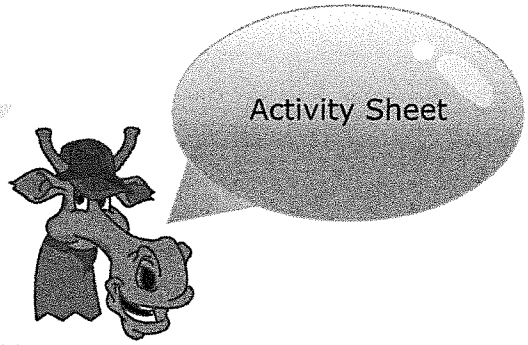
Worksheet: What do we learn from fossils?

Intermediate Phase
Grade 4 – 6
Learning area: Natural Sciences
Strand: Life and living
Theme: Biodiversity, change and continuity
Specific Aim 1: Acquiring knowledge of natural sciences



Activity 1: Reading and comprehension

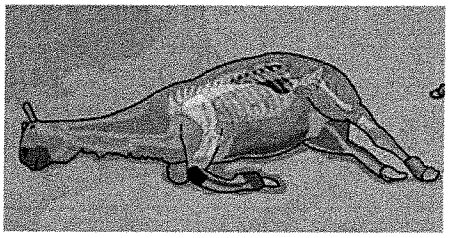
Read the article, "Every fossil tells a story" and answer the questions that follow.

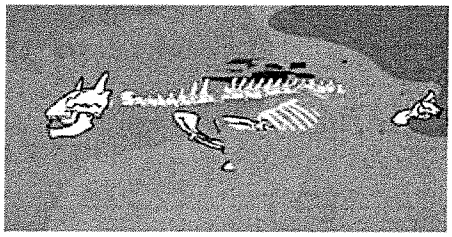
Every fossil tells a story

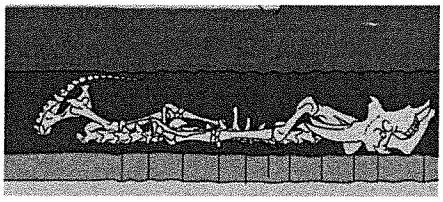
Source: *Based on an article written by Pippa Haarhoff*

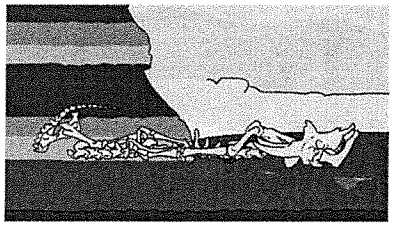
Fossils are the remains or evidence of dead pre-historic animals and plants that have been preserved in rock. Most often the hard, duarble parts such as bones, teeth or shells are preserved. However, sometimes wood, animal faeces (called coprolites), animal tracks or the casts of soft body parts may fossilize.

How are fossils made?
Special conditions are needed for a skeleton to fossilize. Once the living animal dies, the body must become buried under protective layers of mud or sand. As the bone slowly decays, water containing minerals seeps into the bone and replaces the chemicals in the bone with rock-like minerals. The process results in a perfect replica of the original object, called a fossil. The fossil has the same shape as the original object, but is chemically more like a rock!


Living animal dies.


Body must become buried under layers of mud or sand.


As the bone slowly decays, water containing minerals seeps into the bone and replaces the chemicals in the bone with rock-like minerals.


Erosion exposes the fossil.

HOW FOSSILS FORM

Fossils of hard mineral parts (like bones and teeth) were formed as follows:

- Some animals  were quickly buried after their death (by sinking in mud, being buried in a sand storm, etc.).
- Over time, more and more sediment covered the remains.
- The parts of the animals that didn't rot (usually the harder parts likes bones and teeth) were encased in the newly-formed sediment.
- In the right circumstances (no scavengers, quick burial, not much weathering), parts of the animal turned into fossils over time.
- After a long time, the chemicals in the buried animals' bodies underwent a series of changes. As the bone slowly decayed, water infused with minerals seeped into the bone and replaced the chemicals in the bone with rock-like minerals. The process of fossilization involves the dissolving and replacement of the original minerals in the object with other minerals (and/or per mineralization, the filling up of spaces in fossils with minerals, and/or re crystallization in which a mineral crystal changes its form).
- This process results in a heavy, rock-like copy of the original object - a fossil. The fossil has the same shape as the original object, but is chemically more like a rock! Some of the original hydroxyl-apatite (a major bone constituent) remains, although it is saturated with silica (rock).

Why are Fossils Rock-Colored?

Because they ARE rocks! A fossilized object is just a rocky model of an ancient object. A fossil is composed of different materials than the original object was. During the fossilization process, the original atoms are replaced by new minerals, so a fossil doesn't have the same color (or chemical composition) as the original object. Fossils come in many colors and are made of many different types of minerals, depending on what the surrounding rock matrix was composed of.