Note to Educators & Parents

All of these activities support the National Science Education Standards. In particular, the activities meet the following objectives.

Content Standard A:
Science as Inquiry

Activities meet this standard when students *ask questions, conduct a simple investigation, employ simple equipment to gather data, and use data to construct a reasonable explanation.*

Content Standard B:
Physical Science

Activities meet this standard in part when students see that *common materials, such as water, can be changed from one state to another by heating or cooling and that objects have many observable properties, including size, weight, and shape.*

Content Standard C:
Life Science

Activities meet this standard in part when students learn that *organisms have basic needs. For example, animals need air, water, and food; plants require air, water, nutrients, and light. Organisms can survive only in environments in which their needs can be met.*

Content Standard D:
Earth and Space Science

Activities meet this standard in part when students learn that earth materials have *different physical and chemical properties, which make them useful in different ways, for example, as building materials, as sources of fuel, or for growing the plants we use as food.*

Content Standard F:
Science in Personal and Social Perspective

Activities meet this standard in part when students *engage in personal care–dental hygiene, cleanliness, and exercise–that will maintain and improve health.*

Content Standard G:
History and Nature of Science

Activities meet this standard in part when students realize that *science and technology have been practiced by people for a long time.*

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Visit www.fi.edu/tut for more information.

The Franklin Institute
222 North 20th Street
Philadelphia, PA 19103

Canopic Coffinette of Tutankhamun

SCIENCE ACTIVITIES FOR STUDENTS IN K-4

THINK LIKE AN EGYPTIAN

THE SCIENCE OF ANCIENT EGYPT

INSPIRED BY THE EXHIBIT *TUTANKHAMUN AND THE GOLDEN AGE OF THE PHARAOHS.*

Presented by Mellon

The Franklin Institute
Science Museum
www.fi.edu

HIEROGLYPHICS

K-4

Hieroglyphic writing first began around 5,000 years ago. Egyptians wrote in hieroglyphs up to about 400 AD. Hieroglyphs are like word pictures.

There were a few different types of hieroglyphs. Some stood for entire words, others were used for individual sounds, and still others represented groups of sounds or syllables. Egyptians also used hieroglyphs for math.

Let's look at the hieroglyphs used for individual sounds. Sometimes, the same hieroglyph was used for different letters because they sound the same.

Example:

P  P = POP

S  W = SAW

T H  = THE

The  could be a short "a" sound, a short "e" sound, or a short "o" sound.

TRY THIS!

Try these hieroglyphic puzzles. Remember! Think about how the letter sounds when you try to decode the hidden messages. Use the symbols to fill in the blanks.

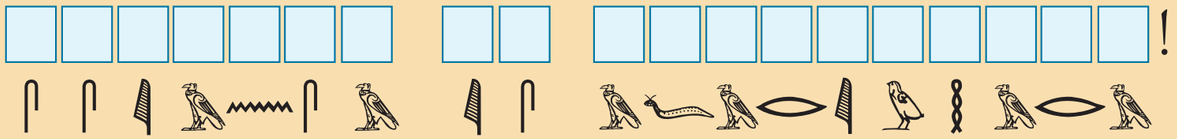
How did King Tut write his name?

Try writing "The Franklin Institute" in hieroglyphs!

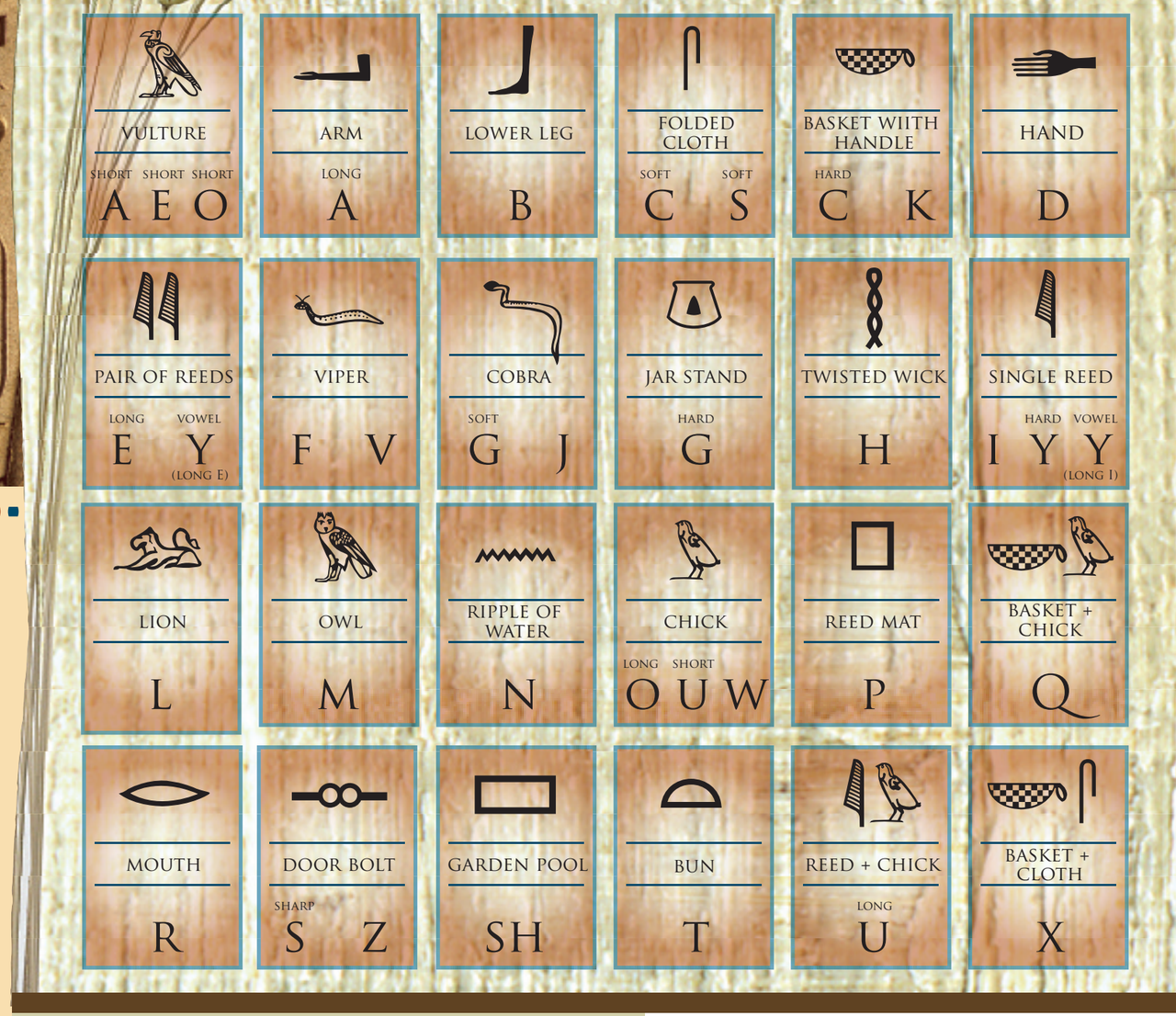
LONG SHORT SHORT SHORT
T U T A N K H A M U N

SHORT SHORT SHORT SHORT SOFT SHORT LONG SHORT
T H E F R A N K L I N I N S T I T U T E

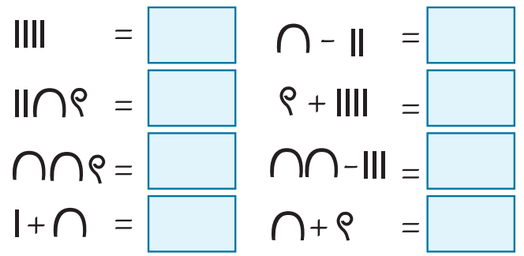
Use the hieroglyphs to decode this secret message!



Write your name in hieroglyphs! Use hieroglyphics to send a secret message to your friends!



HIEROGLYPHIC MATH



SIMPLE MACHINES

K-4

How did the Ancient Egyptians build the pyramids?

The Ancient Egyptians built pyramids using different machines. These were not machines that ran on gas or electricity. They were machines that were used to make work easier. These machines were called simple machines.

In science, work is defined as a force acting on an object to move it across a distance. Pushing, pulling, and lifting are common forms of work.

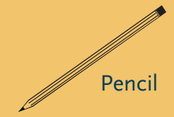
The Ancient Egyptians had to do a lot of work in order to build a pyramid! They had to push, pull, and lift tons and tons of rock.

It was slow work, but they built the pyramids using the same simple machines we use today.

TRY THIS!

It's hard to imagine that a screw is really just a kind of inclined plane. This activity will help you see what we mean!

Things you need:


Pencil

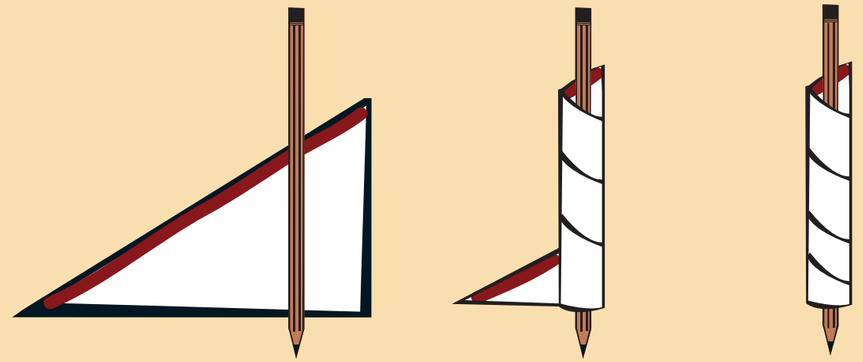

Scissors


Paper

Colored felt tip marker

Directions

1. Cut a right triangle from the paper. The dimensions should be about 5 inches, by 9 inches, by 10.3 inches.
2. Use the felt tip marker to color the longest edge (10.3 inches) of the triangle.
3. Position the shortest side (5 inches) of the triangle along the side of the pencil and then evenly wrap the paper around the pencil by rolling the pencil.



MACHINES USED BY THE ANCIENT EGYPTIANS

INCLINED PLANE

A plane is a flat surface. For example, a smooth board is a plane. Now, if the plane is lying flat on the ground, it isn't likely to help you do work. However, when that plane is inclined, or slanted, it can help you move objects across distances. And, that's work! A common inclined plane is a ramp. Lifting a heavy box onto a loading dock is much easier if you slide the box up a ramp—a simple machine.

WEDGE

Instead of using the smooth side of the inclined plane, you can also use the pointed edges to do other kinds of work. For example, you can use the edge to push things apart. Then, the inclined plane is a wedge. So, a wedge is actually a kind of inclined plane. An axeblade is a wedge. Think of the edge of the blade. It's the edge of a smooth slanted surface. That's a wedge!

SCREW

Now, take an inclined plane and wrap it around a cylinder. Its sharp edge becomes another simple tool: the screw. Put a metal screw beside a ramp and it's kind of hard to see the similarities, but the screw is actually just another kind of inclined plane. How does the screw help you do work? Every turn of a metal screw helps you move a piece of metal through a wooden space. And, that's how we build things!

LEVER

Try pulling a really stubborn weed out of the ground. You know, a deep, persistent weed that seems to have taken over your flowerbed. Using just your bare hands, it might be difficult or even painful. With a tool, like a hand shovel, however, you should win the battle. Any tool that pries something loose is a lever. A lever is an arm that "pivots" (or turns) against a "fulcrum" (or point). Think of the claw end of a hammer that you use to pry nails loose. It's a lever. It's a curved arm that rests against a point on a surface. As you rotate the curved arm, it pries the nail loose from the surface. And that's hard work!

WHEEL & AXLE

The rotation of the lever against a point pries objects loose. That rotation motion can also do other kinds of work. Another kind of lever, the wheel and axle, moves objects across distances. The wheel, the round end, turns the axle, the cylindrical post, causing movement. On a wagon, for example, the bucket rests on top of the axle. As the wheel rotates the axle, the wagon moves. Now, place your pet dog in the bucket, and you can easily move him around the yard. On a truck, for example, the cargo hold rests on top of several axles. As the wheels rotate the axles, the truck moves.

PULLEY

Instead of an axle, the wheel could also rotate a rope or cord. This variation of the wheel and axle is the pulley. In a pulley, a cord wraps around a wheel. As the wheel rotates, the cord moves in either direction. Now, attach a hook to the cord, and you can use the wheel's rotation to raise and lower objects. On a flagpole, for example, a rope is attached to a pulley. On the rope, there are usually two hooks. The cord rotates around the pulley and lowers the hooks where you can attach the flag. Then, rotate the cord and the flag raises high on the pole.

WATER

K-4

In Ancient Egypt, life depended on the Nile River, the longest river in the world. Each year, in early summer, heavy rains came and caused the Nile to overflow its banks. The flood was very good for the soil, allowing the Egyptians to plant their crops of grains, vegetables, and fruits.

Without this extra water, the Egyptians might not have been able to eat. It's no wonder that water was so important to them!

Water is important today, too. We have to use water carefully to make sure that we have enough. Here are some ways that you can help protect water.

CONSERVE WATER

- Take a shower instead of a bath.
- Leave a bottle of water in the refrigerator so you'll always have cold water to drink instead of letting the water run to get cold.
- Collect rainwater to use on plants.
- Tell your parents to water the lawn early in the morning or in the evening. In the heat of the day, water will evaporate before the ground can drink it up.
- Make sure the sprinklers are not watering the driveway or sidewalk.

STOP POLLUTION

- If you have a stream near your house, help the Earth by keeping the stream bank clean.
- When you visit the beach, make sure you don't leave any trash behind to pollute.
- Animal waste can pollute water, too. Don't let your pet leave its waste in or near a stream.

FAST FACTS

One person uses about 123 gallons of water a day!

You are about 65% water. If you weigh 60 pounds that means you are 40 pounds of water!

About 80% of the Earth is covered by oceans and seas.

About 97% of the Earth's water is in the oceans and seas.

About 2% of the Earth's water is ice (from the frozen glaciers.)

A person can live for weeks without food but can only live a few days without water.

Apples are 80% water.

Earthworms are also 80% water.

A person consumes 2 1/2 quarts of water per day from water and food to stay healthy.

If a faucet drips one drop per second, it wastes about 888 gallons of water a year.

TRY THIS!

Can you save water by turning the water off when you are brushing your teeth?

Things you need:


Toothbrush


Water


Bowl, pot or small bucket


Measuring cup

Directions:

Day 1

1. Put bowl, pot, or bucket under the faucet to collect water.
2. Turn water on.
3. Brush teeth as you usually do.
4. Use measuring cup to measure water in pot.
5. Record results in chart below.

Day 2

1. Put pot or bucket under the faucet to collect water.
2. Turn water on.
3. Wet toothbrush.
4. Turn water off.
5. Brush teeth.
6. Turn water back on to rinse toothbrush and mouth.
7. Use measuring cup to measure water in pot.
8. Record results in chart below.

How teeth are brushed	How much water did you use?	If you brush 3 times a day	How much water used per day?	If you brush 3 times every day for a year	How much water used per year?
If water is left running during teeth brushing		X 3		X 365	
If water is turned off during teeth brushing		X 365		X 365	

How much water can you save in a year by turning off the water while you brush your teeth?

Try these other quick experiments at home!

1. Turn liquid water into solid water.
2. Turn solid water into liquid water.
3. Turn liquid water into water vapor. (hint: use a tea kettle)