Name: _____ School: _____

WHOSE EARS HEAR BETTER?

Do animals hear differently than humans? Why do you think that is? Do some animals hear better than others? Do you think ear shape or size has anything to do with how well an animal can hear? What animals do you think hear the best? How do you know what animal hears the best?

MATERIALS:

- Paper
- Scissors
- Tape

TIME:

- 20-30 minutes

INTRODUCTION QUESTIONS:

How might ear size make a difference in hearing?

How might ear shape make a difference in hearing?

PROCEDURE:

1. Check out the pictures of **animal ears on the next page** and select <u>3-5 ear types</u> that you'd like to make with <u>paper and tape</u>, and <u>test with a family member</u>.
2. Test each pair of ears by standing across a room from a family member (the same distance for each pair of ears tested) and have him/her whisper the following (the same volume for each pair of ears tested):
   - ➤ "Hello, I'm happy to see an animal in this house."
   - ➤ "Wow, what beautiful ears you have."
   - ➤ "I'll bet your ears are perfect for your habitat"
3. Do the same test twice for each animal (two trials).
4. Record data from each test on the chart on the next page.

DEER, PIG, ZEBRA, SIAMESE CAT, RACOON, BAT, RABBIT, PANDA, HORSE, DEER MOUSE, GOAT, GERMAN SHEPHERD, CHIMPANZEE, ELEPHANT, CHIHUAHUA, COW

Test each pair of ears by standing across a room from a family member (the same distance for each pair of ears tested) and have him/her whisper to you, using the Whispering Script below.

Record data in the chart: Under "Trial 1" and "Trial 2", rate how well you can hear the whispering on a **scale of 1-10 (1=not at all, 10=can hear perfectly).**

ANIMAL	TRIAL 1	TRIAL 2
1-		
2-		
3-		
4-		
5-		

WHISPERING SCRIPT:

"Hello, I'm happy to see an animal in this house."

"Wow, what beautiful ears you have."

"I'll bet your ears are perfect for your habitat"

REFLECTION QUESTIONS:

1. Which of your animals received the best score? Did the animal-shaped ears change your hearing?

2. Does ear size make a difference in hearing? Does ear shape make a difference in hearing? Could you predict how well an animal can hear by looking at its ears? Why or why not?

3. Would you recommend someone who has a hearing disability use an artificial ear like the ones you designed? Why or why not?

4. Different breeds of goats have floppy ears, some have upright ears and some have almost no ears at all. Does this affect their ability to hear? Why would different animals evolve with different sizes and shapes of ears?

More info - Excerpt from: https://www.scientificamerican.com/article/ears-do-their-design-size-and-shape-matter/

Have you ever been puzzled by a faint noise nearby, trying to discover what it is? Maybe you turned your head or cupped your hand behind your ear, hoping to hear the sound better. What if we could make this cup huge? Some animals know the answer. Many animals with exceptional hearing have big ears. A Serval (a type of African wildcat), for example, can hear a mouse wiggling its way underground. And bats, which rely on sound to help navigate in the dark, have notoriously large ears on their small heads. Unlike humans, many animals can deliberately move their ears (beyond a wiggle, that is). Some (such as horses) can even move each ear independently. They point the cupped ear, as needed, to enhance a sound and localize the source.

(optional) Take it further-interesting websites:
Amazing Animal Senses, from Neuroscience for Kids
Here's How Birds Make Do without External Ears, from The Huffington Post

Shut the Box: a dice game

A classic dice game of Northern French origin, and several centuries old. It is said to have been especially popular among sailors. For 2–6 players. In addition to the two dice you will need nine coins (or another item), and paper and pencil.

Aim of the game: To "shut" as many "boxes" as possible, and thereby be the player with the lowest minus score.

How to play: First draw nine "boxes" in a row, as shown, and number them from 1 to 9. Decide who starts; the turn order then proceeds clockwise. In your turn, you try to roll the dice several times in a row, shutting one or two boxes with each roll.

Shutting a box is done by placing a coin on it. If you shut one box in your turn, the number of the box must correspond to the sum on the dice; and if you shut two boxes, their numbers must correspond to the two numbers on the respective dice. When you cannot shut one or two boxes corresponding to your entire roll your turn is over, and you receive as many minus points as the sum of the boxes which are still 'open".

If you manage to shut the boxes 7, 8 and 9, you may from then on choose to roll one die only in your turn. If you however choose to roll both dice, you must shut two boxes for the roll to count as valid! Example: Your first roll shows 5-3, and you choose to shut box number 8 by placing a coin on it. Your next roll shows 6-5, and you have no choice but to shut boxes 6 and 5 (since there is no box with the number 11). Your third roll shows 2-6, which ends your turn – box 8 is already shut, and of the boxes 2 and 6, number 6 has already been shut. Since you cannot shut boxes with both dice, your turn is over. You score 1+2+3+4+7+9=26 minus points, which is noted on the score sheet.

Pass the dice to the next player. The player scoring the fewest minus points is of course the winner. Note that if you are unlucky enough to roll 5-5 or 6-6 on your first roll, your turn is immediately over and you score the maximum possible 45 minus points!

Variation: If you cannot use your entire throw as per the rules above, you may use it as far as possible before ending your turn. In the example above you would have been allowed to shut box number 2, scoring minus 24 points instead.


BOSQUE SCHOOL

Challenging Education

A) The long edge of this paper is 8.5 inches long. You can use that as a ruler to estimate the lengths of things.

- Try measuring across the middle of a circular dinner plate. Now write down your answer. The distance across a circle through its center is called the **diameter**.
- Curve the paper around the edge of the plate to measure the distance around the outside. Write down that answer as well. The distance around the edge of a circle is called the **circumference**.
- Find another circle; maybe a jar lid or a cup, that is a different size. Measure and record the diameter and circumference.
- Now divide the circumference of the plate by the diameter of the plate as precisely as you can. Do the same for the other circle. Write those numbers down as well. What do you notice? Are the numbers close to being the same?
- The ratio of a circle's circumference to its diameter is what we call **pi (π)**, which is a Greek letter that stands for 3.1415926….. (it goes on forever!). If you got close to three, nice work! Any circle of any size always has the same ratio.

CIRCUMFERENCE

DIAMETER
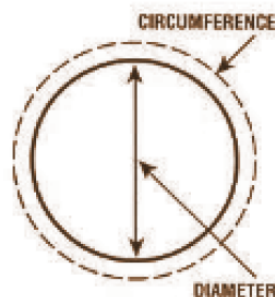
B) Emma has 4 more quarters than nickels. The total value of her quarters and nickels is $3.10. In all, what is the total number of nickels that Emma has?

C) Five students sit around a circular table.Their chairs are numbered in order from 1 through 5. Alejandro sits next to both Ben and Chan. Daria sits next to both Ben and Sarah. The numbers on Alejandro's and Chan's chairs add up to 6. Who sits in chair number 3?

D) Mark a spot on the ground (you can use a rock, a pencil, tape, etc.). Take five regular steps from the mark, and mark the spot you stop. Measure the distance between your marks, and divide that by five. Now you have your stride length. Use your stride length to measure the width and length of a room in your home. Draw a diagram of the room from above, using ¼ inch for each foot that you measured using your stride length. This is a scale drawing using the scale of ¼ inch per foot. Now you can add other rooms to create a scale diagram of your entire home, or create your own imaginary home or building.

BOSQUE SCHOOL

Challenging education

A) La longitud de esta hoja es de 8.5 pulgadas. Puedes usarla como una regla para calcular la longitud de otros objetos.

- Intenta medir por el centro un plato circular. A continuación, escribe tu respuesta. La línea recta que pasa por el centro de un círculo se llama diámetro.
- Dobla la hoja sobre el filo del plato para medir la distancia de todo el círculo. Escribe esta respuesta también. La distancia alrededor del filo de un círculo se llama circunferencia.
- Busca otro círculo; tal vez la tapa de un frasco o una taza, pero de otra medida. Mide y escribe el diámetro y la circunferencia.
- Ahora, divide la circunferencia del plato por el diámetro del plato, lo más preciso que puedas. Haz lo mismo con el otro círculo. Escribe estos números también. ¿Qué observas? ¿Son parecidos los números?
- El ratio de la circunferencia de un círculo a su diámetro se llama pi (π), lo cual es una letra griega que representa 3.1415926….. (¡sigue hasta el infinito!). Si tu respuesta es tres, más o menos, ¡buen trabajo! Los círculos siempre tienen el mismo ratio, no importa su tamaño.

CIRCUMFERENCE

DIAMETER
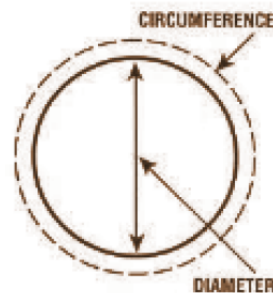
B) Emma tiene 4 quarters más que nickels. El valor total de sus quarters y nickels es $3.10. En total, ¿cuántos nickels tiene Emma?

C) Cinco estudiantes se sientan alrededor de una mesa circular. Las sillas llevan los números del 1 al 5, en orden. Alejandro se sienta entre Ben y Chan. Daria se sienta entre Ben y Sarah. Los números en las sillas de Alejandro y Chan suman 6. ¿Quién se sienta en la silla número 3?

D) Marca un lugar en la tierra o el suelo (puedes usar una piedra, un lápiz, cinta adhesiva, etc.) Da 5 pasos normales desde la marca y marca dónde estás. Mide la distancia entre tus marcas y divide la suma por cinco. Ahora tienes la longitud de tu paso. Usa esta medida para medir la anchura y la longitud de un cuarto en tu casa. Ahora dibújalo representando cada pie como ¼ de una pulgada. Este dibujo es una escala de ¼ pulgada por pie. Ahora puedes añadir otros cuartos para dibujar toda tu casa o crear una casa o edificio imaginario.
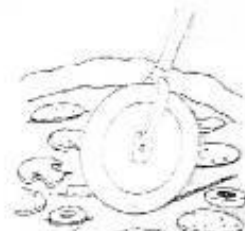
Simple Machines

A simple machine is a machine with few or no moving parts. Simple machines make our work easier.
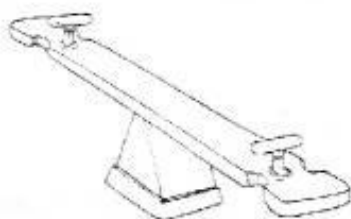
a lever

A lever is a bar that moves on a turning point. The bar can be straight or curved. This simple machine helps us move things by pushing, pulling, or lifting. You could use a lever to pry a nail out of a board.

a wheel and axle

A wheel and axle moves objects across a distance. This simple machine is a wheel (round part) that turns the axle. The axle (a smaller cylinder) is fastened to the wheel so they turn together.
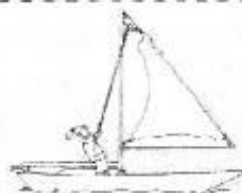
a pulley

This simple machine uses wheels and a rope to move objects up, down, and across a long distance. Instead of an axle, the wheel is used to turn a rope or cord. The cord wraps around a wheel. As the wheel turns, the cord moves. Attach a hook to the cord and you can raise and lower objects.
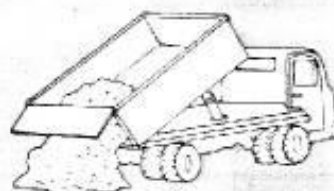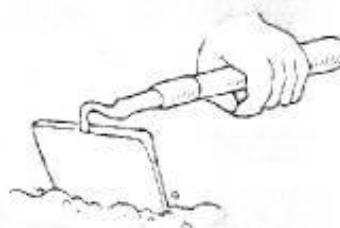
an inclined plane

A plane is a flat surface. If one end of the plane surface is raised higher than the other, you have a simple machine called an inclined plane. It makes the work of moving things up and down easier.

a screw

A screw is a special type of inclined plane. The inclined plane in a screw curves around a pole. The inclined plane allows the screw to move itself or to move an object surrounding it. It can be used to raise and lower things. It is also used to hold things together.

a wedge

A wedge is also a type of inclined plane. In fact, it is two inclined planes working together. It is wide at one end and tapers to a point at the other end. It is used to separate things by cutting, piercing, or splitting.

Name _____

Simple Machines Quiz
Job 2—Part 1

Name the simple machine.

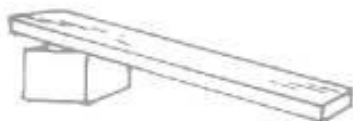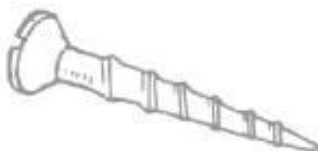_____   _____   _____

_____   _____   _____

Give an example of each simple machine.

1. A _____ is an example of a pulley.

2. A _____ is an example of a wedge.

3. A _____ is an example of an inclined plane.

4. A _____ is an example of a lever.

5. A _____ is an example of a wheel and axle.

6. A _____ is an example of a screw.

Time to play OUTSIDE SPRINGTIME BINGO!

*Play with another family member (second bingo card on the next page), or even by yourself. The goal is to find as many signs of spring as possible. Circle each **sign of spring** that you find. <u>Have fun!</u>*

WORM	GREEN LEAF	FLUFFY CLOUD	FLY	SPIDERWEB
FLY	LIZARD	BIRD	TREE	BIRD NEST
FLOWER	BEE	**FREE**	SPIDER	BUTTERFLY
LADYBUG	ANT	ROCK	RABBIT	PINE NEEDLE
HUMMINGBIRD	ROLY POLY	CACTUS	GRASS	BEETLE

WORM	GREEN LEAF	FLUFFY CLOUD	FLY	SPIDERWEB
FLY	LIZARD	BIRD	TREE	BIRD NEST
FLOWER	BEE	FREE	SPIDER	BUTTERFLY
LADYBUG	ANT	ROCK	RABBIT	PINE NEEDLE
HUMMINGBIRD	ROLY POLY	CACTUS	GRASS	BEETLE