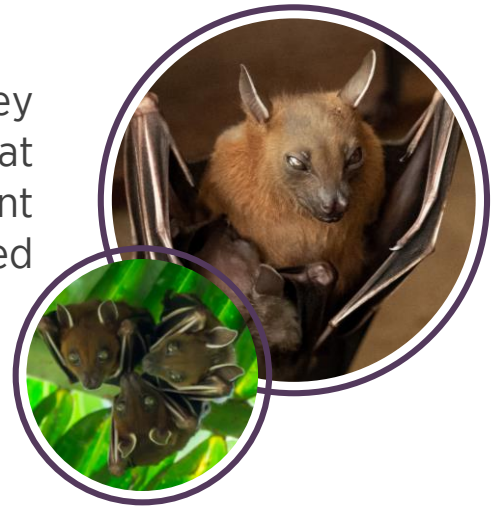


Explore The Animal Kingdom

Bats- Using Sound to See

Bats are nocturnal animals, meaning that they sleep during the day and wake up to hunt at night. Even though bats have excellent eyesight, they use a technique called echolocation to 'see' and hunt in the dark.

Which means that bats can see with both their ears and their eyes!



But what is Echolocation?

We usually hear echoes when we are in an empty room or in one of the caves found around our islands.

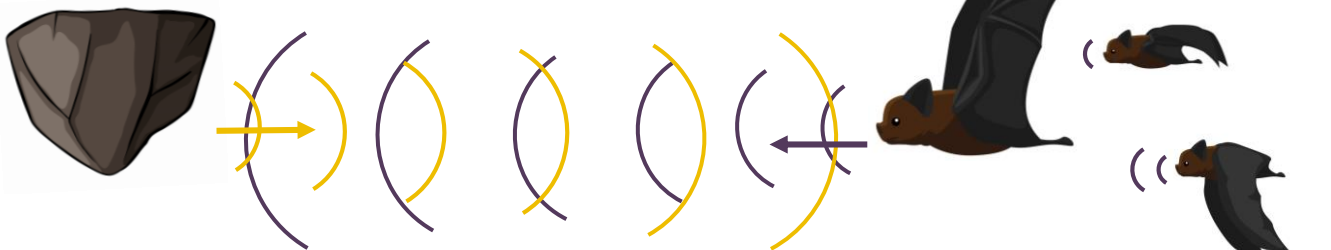


An echo is the reflection of sound

An echo is made by sound waves that travel through air and bounce back off a hard surface back to the listener.

It's similar to how a ball will bounce back if you throw it against a hard surface like a wall or the floor.

Bats make high pitched sounds, too high for our ears to hear, with their mouths as they fly from one place to another. When they make this sound, it travels through the air and bounces back when it hits an object.



And then bats listen very carefully to the sound that comes back...

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Bats- Using Sound to See

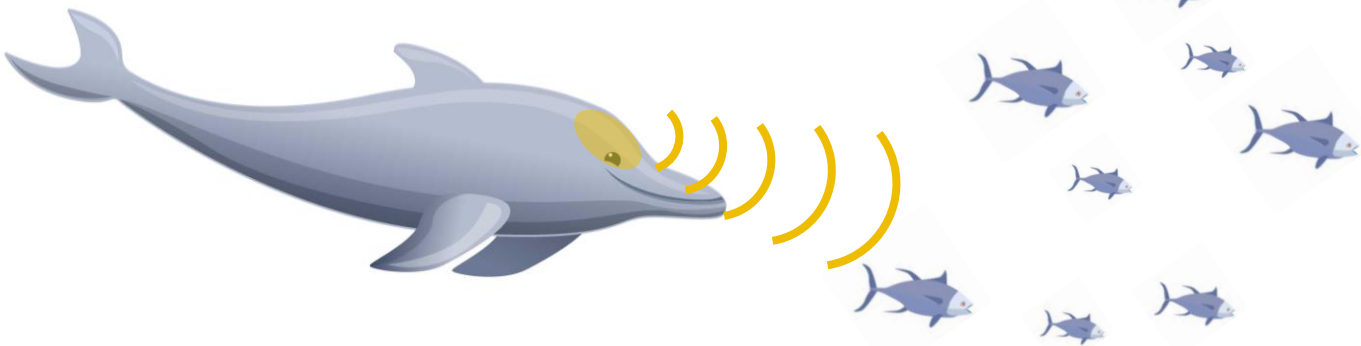
...By listening to how long it takes for the echo to reach them, which ear it reaches first, and how much of the sound comes back, bats are able to figure out how far away the object is, as well as in which direction it is and how big it is.



If you want to learn about Maltese Bats, check out Greenhouse's project Akustika @GreenHouseNGO on facebook!

This is why bats have such large and sensitive ears!

Animals such as whales, dolphins and some birds also use echolocation to find food and to find their way around. Submarines use it to 'see' in the dark ocean.



Did you know?

Dolphins use their nasal passages to make clicking sounds. They then send these sound waves into the water by using an organ in their forehead called a melon!



Some blind people have also trained their ears to use echolocation.

By making clicking sounds they are able to 'see' what is around them.

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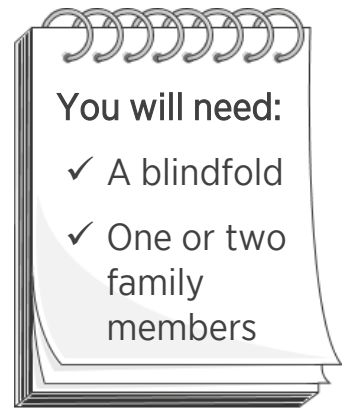
Explore The Animal Kingdom

Bats- Using Sound to See

Now let us explore how sensitive *your* ears are! Most people depend a lot on their sense of sight to see what's around them. But if you concentrate and listen, you will realise how much information you can gather by using your sense of hearing instead.

Activity 1: Where is the sound coming from?


For the first hearing activity, you will need the help of one or more family members. The participant who will be listening will need to be blindfolded, and will need to either sit in a chair or stand in one place.



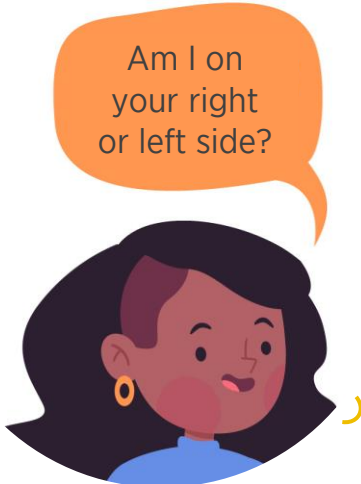
The other participants will be the ones making sound. Make different sounds from different areas around the room. You can also walk around the blindfolded participant as you're talking – ask them to notice the difference in sound.

Ask the blindfolded person:

1. Which **direction** is the sound coming from?
2. How **close/far away** is the sound?



How far away am I?



Am I on your right or left side?

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Bats- Using Sound to See

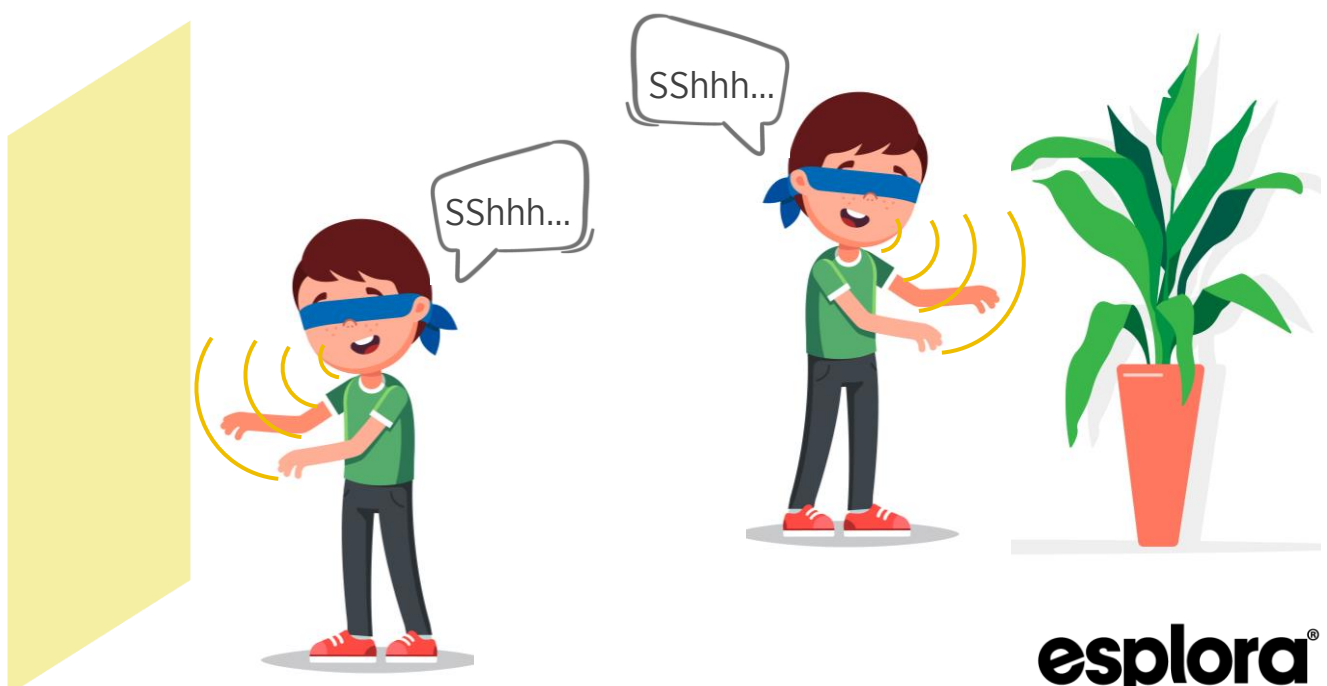
Human echolocation is a skill which you can practice. It allows you to find objects without seeing them with your eyes. This activity will make you slightly more aware of your surroundings.

Activity 2: Finding your Way

- Choose a room and make sure that there's nothing on the floor which can trip you.
- Face a window, wall or large object in the room.
- Use a blindfold to cover your eyes.
- Make a continuous sound with your mouth such as 'shhh'.

Move slowly towards the object in front of you whilst making the sound and listen closely.

1. Do you notice a difference in the sound?
2. What happened as you got closer to the object?
3. Try and guess how far away you are from the object with your eyes still closed.
4. Test different surfaces – is there a change in the sound?



For this activity we suggest adult supervision. Ask a family member to keep watch to make sure that you do not get hurt.

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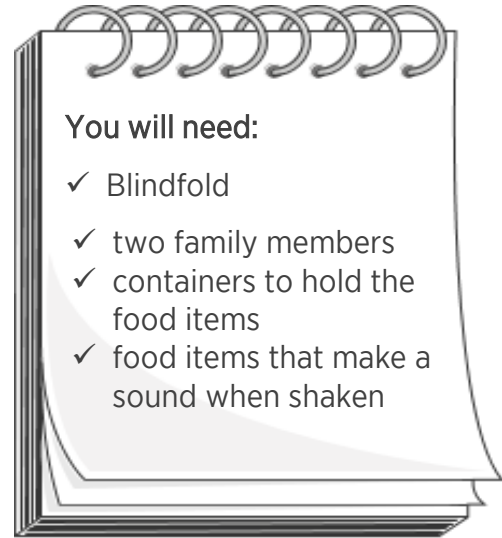
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Bats- Using Sound to See

Activity 3: Guess the Object

The aim of this activity is for a blindfolded person to **guess the object** making the sound by using only **their sense of hearing**.

Depending on the age of the participant, you can make it more challenging by asking the blindfolded person to guess the **type and material of the container** being used, and how much **volume** is taken up by the food inside.



Examples of food items:

Choose items which the blindfolded person is familiar with.

- dried beans
- cereal
- different kinds of pasta
- rice
- quinoa
- couscous
- lentils
- sweets
- nuts



Examples of containers:

- metal bowl
- plastic bowl
- glass bowl
- plastic container with lid
- metal can
- metal bottle



Shake the container with the food inside and ask the blindfolded person to **listen carefully and to:**

- Describe the food item
 - Describe the container
 - Provide you with any other information
- Example: volume of container filled with food item (Full/half full/almost empty)

Discuss the reasoning behind their answer. Example of questions which you can ask:

- “Why do you think it’s that particular object?”
- “Why do you think it’s rice and not pasta?”
- “Why do you think the container is half full?”
- “Why do you think it’s an open bowl and not a closed container?”

This game can be played with any item that makes sounds and not necessarily food items. Example of objects which can be used include pens, pencils, staples, Velcro, wooden and metal utensils...

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