

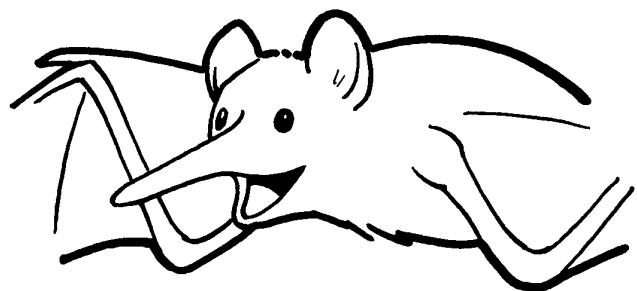
# Echolocation

Echolocation is the method that some bats use to catch insects and other moving creatures. They are able to use sound waves to determine where the insect is. When a bat is hunting it makes a series of high-pitched sounds. The sound waves travel through the air and bounce off of objects. When the sound waves return to the bat it can tell the bat where the object is. A bat can use sound waves to tell the difference between objects that are stationary or moving. For example, a bat uses sound waves to avoid hitting a tree and immediately afterwards uses sound waves to catch a mosquito. Bats probably have the best techniques for echolocation of any animal on earth. The sounds they make are often much higher than the human ear can hear.

How do sound waves travel back to a bat? It is similar to how a mirror reflects light. If you hold a small mirror in your hand and maneuver it in the sunlight you can see the light reflecting off of the mirror and onto other objects. This is similar to how sound waves are reflected. The bat emits a high-frequency sound. The sound waves hit an object and are then reflected back to the bat. This high-tech system allows bats to fly in total darkness. They not only “see” where they are going, but can also catch their prey. When you look at pictures of bats you can see that many have large ears and interesting nose shapes. Some bats use their ears to catch sound waves and other bats use their odd-shaped noses to direct sound waves.

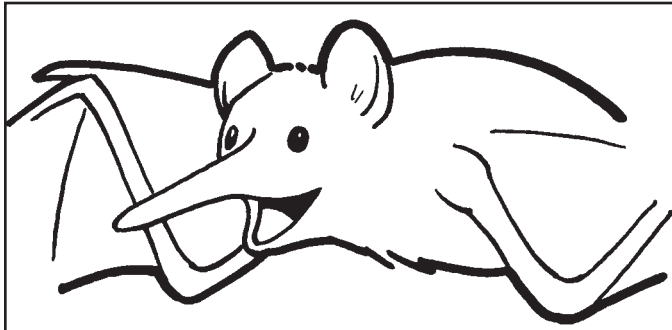
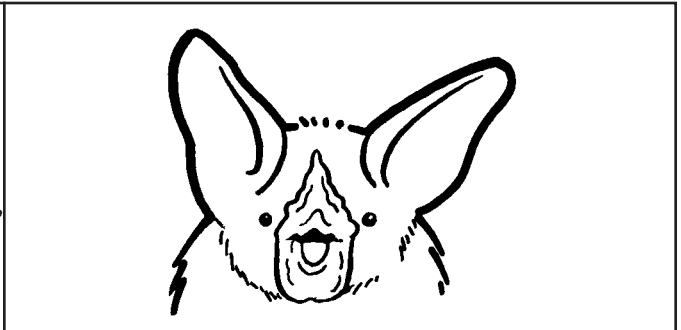
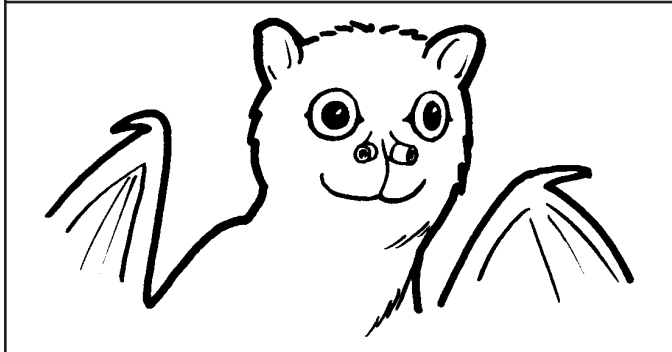
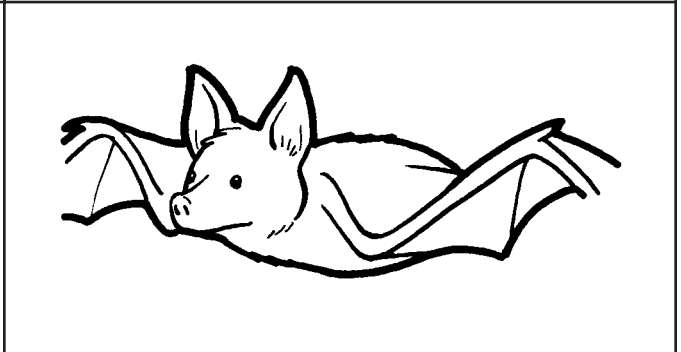
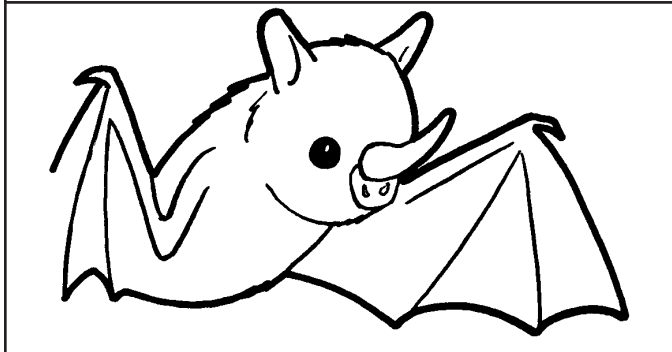
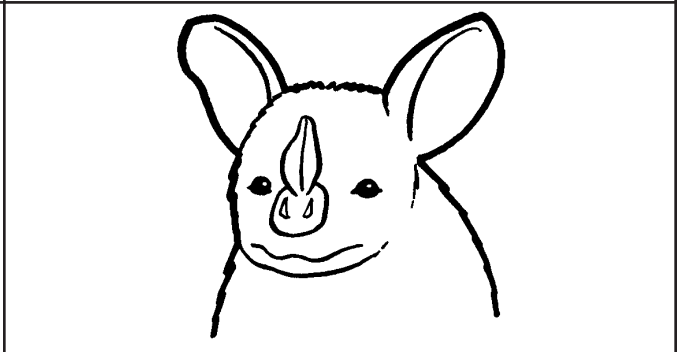
## Activities

1. Provide your children with hand mirrors and take them outside on a sunny day. Ask each child to reflect the sunlight off of the mirror and onto the sidewalk, side of a wall, or the school building. Ask the child to think about how the mirror is reflecting the light. Explain that bats reflect sound waves off of objects in much the same way. (**Note:** Warn the children to not reflect the light directly back towards their open eyes.)
2. Gather the children around you and ask them to look at the size of their classmates’ ears in comparison to their bodies. Show pictures of bats with large ears and ask the children to compare the size of the ears to the bats’ bodies. Remind the children that megabats have small ears and microbats have large ears (page 36). Are humans more like megabats or microbats? Have the children cup their hands around their ears. Continue talking to the children and ask if they notice a difference in the loudness of your voice. Ask them to tell why they think the sound is louder. Provide each child with a large circle (with approximately a 12" [30cm] diameter) that has been cut in half. Ask the children to cup one half-circle paper around each ear to form a pair of larger ears. Talk to the children for a few minutes with their larger ears in place. Be certain to not talk louder than when the children initially listened to your voice. Ask them to share how you sounded to them this time. Did your voice sound louder? Explain to children that their enlarged ears were able to collect more sound waves which improves their hearing.



# What a Nose!

Many bats have noses that look odd. Cut out the bat names and glue the names in the correct boxes.

 <p>1 <input data-bbox="272 720 719 804" type="text"/></p>	 <p>2 <input data-bbox="940 720 1386 804" type="text"/></p>
 <p>3 <input data-bbox="272 1159 719 1243" type="text"/></p>	 <p>4 <input data-bbox="940 1159 1386 1243" type="text"/></p>
 <p>5 <input data-bbox="272 1598 719 1682" type="text"/></p>	 <p>6 <input data-bbox="940 1598 1386 1682" type="text"/></p>

horseshoe bat

sword-nosed bat

leaf-nosed bat

long-nosed bat

tube-nosed fruit bat

hog-nosed bat

# Answer Key

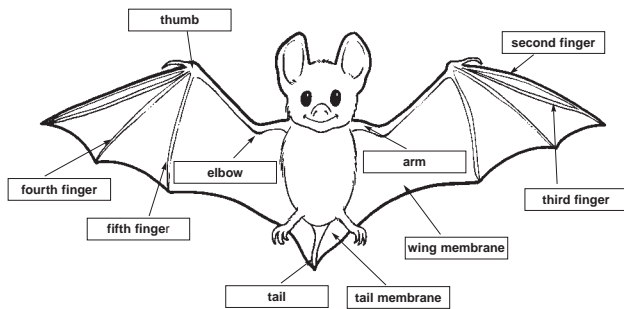
## Page 9

1. Mother and Stellauna were attacked by an owl.
2. Stellaluna fell into a bird nest.
3. Mother bird fed Stellaluna.
4. Stellaluna and the baby birds learned to fly.
5. Stellaluna found her mother.
6. Stellaluna protected and saved her bird friends.

## Page 17

1. they eat them
2. they eat the bugs
3. grasshoppers, beetles, and moths
4. 600 mosquitoes or 150 bugs
5. accept any reasonable answer

## Page 19



## Page 26

### Across

1. predator
6. nocturnal
8. hibernate
9. maneuver
10. colony
12. insectivorous

### Down

2. roost
3. membrane
4. mammal
5. sonar
7. prey
11. echolocation

**Bonus:** Stellaluna

## Page 27

1. false (bats are not blind)
2. true
3. true or false (some rocks are not hard)
4. true
5. true or false (some candy is sour)
6. true
7. true
8. true
9. true or false (some buttons may not appear cute)
10. false (a drink is not a living thing, therefore it is not capable of emotion)
11. true
12. true
13. true or false (some trees are not tall)
14. true or false (sheets are not always white)

## Page 28

1. fact
2. opinion
3. fact
4. fact
5. opinion
6. opinion
7. opinion
8. fact
9. opinion
10. fact
11. fact
12. opinion
13. opinion
14. fact

## Page 35

1. 600 bats; 1,500 bats
2. 3 bats
3. 10 fingers; 80 fingers
4. 22 degrees F; 12 degrees C
5. 300 insects
6. 200 megabats
7. 14 babies
8. 4 inches; 18 centimeters
9. 180 miles
10. 15 years

## Page 41

1. long-nosed bat
2. horseshoe bat
3. tube-nosed bat
4. hog-nosed bat
5. sword-nosed bat
6. leaf-nosed bat