

# Digital Adventure 360 Experience - Bats

## Lesson Summary

Through [360° images](#), students will inquire about bats, specifically related to their characteristics, habitat/niche and human impact including climate change.

## Learning Objectives

Discuss to what extent human behavior impacts bats.

### NGSS:

MS-LS2-4 Ecosystems: Interactions, Energy, and Dynamics

Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

MS-LS2-5 Ecosystems: Interactions, Energy, and Dynamics

Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

HS-LS2-6 Ecosystems: Interactions, Energy, and Dynamics

Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7 Ecosystems: Interactions, Energy, and Dynamics

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS-LS4-5 Biological Evolution: Unity and Diversity

Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

HS-LS4-6 Biological Evolution: Unity and Diversity

Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

## Learning Activities

### ***Pre-activity -***

Choose what works for you and have students complete a see-think-wonder.

1. Watch video on why bats are important: (“We need bats and bats need us”), approx. 3 min.
  - a. "<https://www.youtube.com/watch?v=L8CkElz6rdc>"
2. Using the internet have students research different local species of bats in groups or pairs, approx 10-15 min ([http://www.michigan.gov/dnr/0,4570,7-153-10370\\_12145\\_12205-70016--,00.html](http://www.michigan.gov/dnr/0,4570,7-153-10370_12145_12205-70016--,00.html))
  - a. Little Brown Bat
  - b. Northern Long-eared Bat
  - c. Evening Bat
  - d. Hoary Bat
  - e. Big Brown Bat
  - f. Tri-colored Bat
  - g. Indiana Bat
  - h. Silver-haired Bat
  - i. Red Bat
3. Bat Detective: Identify the bat by sound, 5-10 min: <http://go.galegroup.com/ps/i.do?p=MSIC&sw=w&u=gale&v=2.1&it=r&id=GALE%7CA509163057&asid=5087b64f3c79d8da2e9f9da461509198> (MLA Citation: Nugent, Jill. "Be a bat detective!" Science Scope, Oct. 2017, p. 12+. Research in Context, go.galegroup.com/ps/i.do?p=MSIC&sw=w&u=gale&v=2.1&it=r&id=GALE%7CA509163057&asid=5087b64f3c79d8da2e9f9da461509198.)

### **Core Activity -**

In pairs, have students investigate the [Thinglink 360° images on bats](#) for 20-30 minutes. Students are to choose 2 hotspots and complete a [I used to think, now I think](#) on each.

1. Fun facts about bats - <https://www.youtube.com/watch?v=b3w9ZbRQlek>
2. Bat Killings by wind turbines - <https://www.scientificamerican.com/article/bat-killings-by-wind-energy-turbines-continue/>
3. Be a Bat Detective - <https://www.batdetective.org/#!/classify>
4. Climate Change - Wildlife and Wildland (Video) - <https://www.youtube.com/watch?v=drINEQFXbPY&feature=plcp>
5. White-nose Syndrome Interactive Map - <https://www.whitenosesyndrome.org/maps/>
6. White-Nose Syndrome: A Scourge In The Bat Caves (Audio) - <https://www.npr.org/2012/04/05/150000682/white-nose-syndrome-a-scourge-in-the-bat-caves>
7. *What is the “Bat Zone”?* - <https://www.youtube.com/watch?v=3RCufMJJVik>

8. How is the Bat Zone a refuge? - <https://www.youtube.com/watch?v=P7aN9BNhPP0>
9. What bat species are in Michigan? - <https://www.youtube.com/watch?v=XVx2cPzlrXo>
10. What can you expect at the Bat Zone? - <https://www.youtube.com/watch?v=jGBVrUzpugc>
11. Are bats endangered? - <https://www.youtube.com/watch?v=YdUJPSM2zpU>
12. What happens when bats first arrive at the Bat zone? - <https://www.youtube.com/watch?v=RjVKw5wS3aI>
13. What do bats eat?? - <https://www.youtube.com/watch?v=PEy3EzxpU8Y>
14. What are some of the biggest misconceptions about bats? - <https://www.youtube.com/watch?v=TdM8P4BmeNQ>
15. I wish people knew... - [https://www.youtube.com/watch?v=cg3V\\_qo2q8Q](https://www.youtube.com/watch?v=cg3V_qo2q8Q)
16. What do bats do everyday?? - <https://www.youtube.com/watch?v=jx5Krk8Y0V0>
17. How do Vampire Bats help each other? - [https://www.youtube.com/watch?v=7Dgtqtpe\\_14](https://www.youtube.com/watch?v=7Dgtqtpe_14)
18. Are humans safe around bats?? - <https://www.youtube.com/watch?v=IWFiZXdlCsA>
19. What are the environmental and human threats to bats? - <https://www.youtube.com/watch?v=Divp1U7XwKA>
20. Bats help plant the rainforests - <https://youtu.be/OpjYRfUmxxc>
21. White-Noise Syndrome | Minute Updates | Great Lakes Now - <https://www.youtube.com/watch?v=Jn3dCKJUe-c>
22. LIVE Fruit Bat Cam - <https://www.youtube.com/watch?v=sdlo9sm33CQ&feature=youtu.be>

## ***Culminating Activities***

***Extension*** - Choose any or all

1. DPTV Digital Adventure Badge <https://batconservation.org/learn/earn-digital-badges/>
2. Build A Bat House: <https://www.nwf.org/Home/Garden-for-Wildlife/Cover/Build-a-Bat-House>
3. Build a Bat Garden: <https://batconservation.org/help/bat-gardens/#section-Bat-House>
4. Further research can be done through the Michigan eLibrary (<http://mel.org/>). Recommended databases (<http://mel.org/databases>) by grade level are as follows:

## Additional Resources

Grade Level	Database Name	Weblink (for all Michigan residents)
PreK - 3	Scholastic BookFLIX	<a href="http://galesupport.com/migeoipcheck/migeoipcheck-scholastic.php">http://galesupport.com/migeoipcheck/migeoipcheck-scholastic.php</a>
K - 4	Britannica Elementary	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-brit.php?database=BRELEM">http://www.galesupport.com/migeoipcheck/migeoipcheck-brit.php?database=BRELEM</a>
5 - 7	Britannica Middle	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-brit.php?database=BRMDDL">http://www.galesupport.com/migeoipcheck/migeoipcheck-brit.php?database=BRMDDL</a>
8 +	Britannica High	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-brit.php?database=BRHIGH">http://www.galesupport.com/migeoipcheck/migeoipcheck-brit.php?database=BRHIGH</a>
PreK - 2	Early World of Learning	<a href="http://worldbookonline.com/ewol/home?subacct=O610">http://worldbookonline.com/ewol/home?subacct=O610</a>
K - 8	eBooks K-8 Collection	<a href="http://galesupport.com/migeoipcheck/migeoipcheck-ebSCO.php?database=EBK8">http://galesupport.com/migeoipcheck/migeoipcheck-ebSCO.php?database=EBK8</a>
K - 5	Kids InfoBits	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=ITKE">http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=ITKE</a>
K - 8	NoveList K8+ (to identify books to read and create reading lists)	<a href="http://galesupport.com/migeoipcheck/migeoipcheck-ebSCO.php?database=NOVEL">http://galesupport.com/migeoipcheck/migeoipcheck-ebSCO.php?database=NOVEL</a>
K - 5	World Book for Kids	<a href="http://www.worldbookonline.com/kids/home?subacct=O6106">http://www.worldbookonline.com/kids/home?subacct=O6106</a>
6 +	Gale Virtual Reference Library (Reference books including <i>Grzimek's Animal Life</i> )	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=GVRL">http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=GVRL</a>
6 +	General Reference Center Gold	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=GRGM">http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=GRGM</a>
6 +	InfoTrac Student Edition	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=STOM">http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=STOM</a>
6 +	Opposing Viewpoints in Context	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=OVIC">http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=OVIC</a>
6 - 8 +	Research in Context	<a href="http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=MSIC">http://www.galesupport.com/migeoipcheck/migeoipcheck-gale.php?database=MSIC</a>
K-12	PBS Learning Media	<a href="https://dptv.pbslearningmedia.org/">https://dptv.pbslearningmedia.org/</a>