

# SCIENCE FAIR CENTRAL

## MAKE. CREATE. EXPLORE.



### BUILD YOUR OWN BAT CAVE!

Difficulty: Advanced    Cost: \$\$\$

Families will work together to build a home for one of nature's misunderstood, but most helpful backyard animals - bats!

## Background

Although bats are often shown as scary or dangerous animals in popular culture, they are actually one of the most helpful and amazing animals that you can attract to your backyard! Just like the comic book hero inspired by them, bats have some amazing superpowers! Not only are bats one of the only flying mammals in the world, they can locate their prey in the air using supersonic sound waves in a process called **echolocation**. Bats send out a series of clicks producing sound waves that bounce off of their surroundings. These waves return to the bat's brain to create a picture of the environment around them and allows them to catch insects in midair, to locate water, and the find places to live.

Do you hate those pesky insects in your backyard? Believe it or not, bats just might be one of nature's greatest pest control solutions by helping to regulate insect populations. In fact, a single bat can eat up to 1,000 mosquitos in just one hour! Bats are also considered to be a **keystone species** - a species that many others depend on for survival - because they act as essential pollinators for many types of plants, ensuring the survival of important and delicious crops like bananas and peaches. While there are over 1,300 species of bats in the world, many of them are in danger due to environmental pollution and habitat loss, making it difficult for them to survive, reproduce, and continue to help their ecosystems.

## Plan

In this activity, your family can help bats in your backyard by creating a safe "bat cave" for them to call home! You may not know this, but many species of bats don't actually live in caves; instead they make their



homes in trees, buildings, bridges, and crevices in rocks. A narrow “bat cave” constructed of wood and sealed properly is just what bats are looking for and can make an excellent place for them to live and raise their young - all while they’re helping to rid your backyard of annoying insects or pollinating plants.

Don’t worry, you don’t have to be an expert builder to make an awesome “bat cave” for the species of bats that live in your area. With limited supplies, a few tools, and a little teamwork, your family can work together to create and hang your own bat house to bring bats to your backyard!

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## Create!

Before you begin building your “bat cave,” decide which member of the family will have each of the following jobs:

- **The Measurer** - this group member’s tool will include a measuring tape. They are in charge of accurately measuring and marking all of the wood or other materials that need to be cut.
- **The Cutter** - this group member’s (preferably an older child or adult) tools include either a table saw, circular saw, or hand saw. They will be in charge of following the measurer’s marks to cut all the pieces of plywood and cedar to the correct width and length.
- **The Sander** - this group member’s tools include sandpaper or a sander. They will sand down the rough edges and surfaces on wood used to build the bat cave.
- **The Painter** - this group member is responsible for staining and/or painting the inside and outside of the bat cave. They can decide if there are any special designs that they would like to add to the exterior of the bat house! (A bat symbol that might call the bats in, perhaps?)
- **The Builder** - the group member will be using the staple gun to attach the gutter guard to the inside walls of the bat cave, and will use the drill screw the pieces of the bat cave together.

### Steps for constructing your Bat Cave

1. Begin by measuring and marking the plywood. The plywood piece will serve as the back panel of your bat cave and should

## Materials

- (1) Columbia Forest Products 3/4 in. x 2 ft. x 4 ft. PureBond Red Oak Plywood Project Panel (*Free Custom Cut Available*)
- (2) 5/8 in. x 5-1/2 in. x 6 ft. Western Red Cedar Dog-Ear Fence Picket
- (1) 1”x2”x8’ Cedar Board
- Frost King Gutter Guard plastic mesh - Frost King E/O 6 in. x 20 ft. Plastic Gutter Guard
- Frost King Gutter Guard plastic mesh - Frost King E/O 6 in. x 20 ft. Plastic Gutter Guard
- Staple gun - Arrow Fastener T50 Heavy-Duty Staple Gun
- Silicone caulk - GE All Purpose Silicone I 10.1 oz. Clear Window and Door Caulk
- Exterior grade screws - Grip-Rite #8 x 1-1/4 in. Philips Bugle-Head Coarse Thread Sharp Point Polymer Coated Exterior Screw
- Wood stain (in a dark color for interior of bat house) - Minwax 8 oz. Wood Finish Ebony Oil-Based Interior Stain
- Exterior paint or stain (*for outside of the bat house*)



measure 15" x 34". Use a saw to cut the plywood to these measurements.

2. Next, measure your cedar fence slats into 15" long pieces. You will need 6-5.5x15" pieces for the front panel and roof of your bat cave. Use the saw to cut the cedar into these 6 pieces.

\*If you would like your bat cave to have a slanted roof, cut the long edge of two of the slats at a 10-degree angle.

3. Use a measuring tape to divide the 1"x 2"x 8' cedar board into 2 - 1"x 2"x 3' pieces, these will be the side pieces for the bat cave. Use a saw to make this cut. If your bat cave will have a slanted roof, cut one end of each of the side pieces at a 10-degree angle.
4. Use sandpaper or a sander to smooth out the surface and edges of each piece of wood. This will help the stain and/or paint to adhere to the surface of the wood.
5. If you want, you can use a dark-colored stain to stain one side of the plywood back panel and one side of each of the cedar front panels. Because bats like a very dark home, this will help to attract them to your bat cave.
6. When the stain has dried, use scissors and a staple gun to attach the plastic gutter guard to the stained parts of the plywood and cedar panels. This will give the bat something to grip onto as they climb into your bat cave. Make sure that you staple down all the edges, being careful not to leave any gutter guard that could catch and tear fragile bat wings!
7. Lay out the side pieces and add caulk to the edges of these pieces. As you prepare to join the front cedar panels to the side pieces and to each other, add caulk on the edges to help seal and weatherproof your bat cave. Use a drill to screw the front panels to the side pieces.

### STEP 3



### STEP 6



### STEP 7



## STEP 8



8. IMPORTANT - as you assemble the front panels onto the side pieces, leave a  $\frac{1}{8}$ " gap between the bottom two panels. This gap will allow air to circulate in your bat cave.
9. Use a saw to trim the excess off of your side pieces so that they are flush with the assembled front panel.
10. Add caulk to the exposed edge of the side pieces, and use a drill to attach the back plywood panel.
11. Add caulk to the top of the bat cave and use a drill to attach the roof.

## STEP 10



12. As an added protection for the bats and to deter other animals from getting into your bat cave, you can measure and cut a  $\frac{3}{4}$ " strip of cedar that will fit snugly into the bottom opening, leaving a  $\frac{3}{4}$ " wide opening for the bats to enter. Use caulk and a drill to attach this piece.



13. Give your bat cave another one-over with a sander or sandpaper to clean it up.
14. Now it is time to paint or stain the outside of your bat cave! It is recommended that the colder the area you live in, the darker the color your bat cave should be to help keep the bats warm. If you live in an area that is very hot, like the southwest United States, you should use a lighter color, such as a gray or light brown to make sure that your bat cave stays cool enough for bats.

## STEP 13



## STEP 14



15. Get creative with your designs on your bat cave! Make it personal for you and your family!

## Next Steps

Now it's time to hang your bat cave! Many people think that hanging it on a tree is a good idea, but surprisingly it isn't! The best places to hang your bat cave is on the side of a house, barn, or building. It needs to be hung at least 12 feet off the ground, and a height closer to 15-20 feet is even better! You should also try to find a place that gets a good amount of sunlight, which will help to keep the bat cave warm and encourage bats to want to make a home there!

What species of bats is your bat cave likely to attract? Conduct research to find out the local bat species in your area.

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## Helpful Links

1. <http://www.batcon.org/resources/getting-involved/bat-houses/build>
2. <http://www.batrescue.org/batfacts/batfacts.html>
3. [https://www.usgs.gov/faqs/why-are-bats-important?qt-news\\_science\\_products=0#qt-news\\_science\\_products](https://www.usgs.gov/faqs/why-are-bats-important?qt-news_science_products=0#qt-news_science_products)
4. <http://www.batcon.org/why-bats/bats-are/bats-are-important>

