

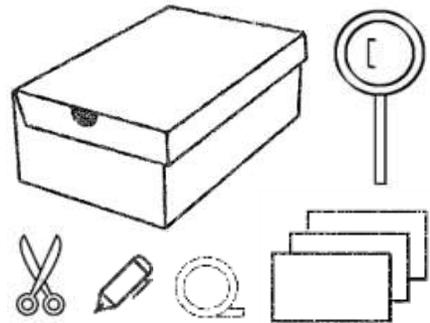


## BUILD YOUR OWN HOME PROJECTOR

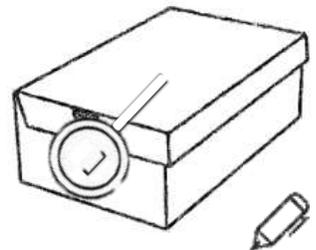
In this activity, you will learn how to build a projector for a mobile phone using materials that you can find lying around the house. The image/video from the screen will be projected from the phone onto a wall, creating your own home cinema experience!

### You will need:

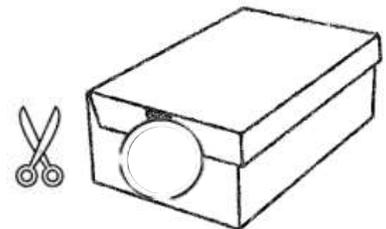
- A mobile phone
- A shoe box or similar cardboard box
- Extra cardboard pieces
- Scissors
- Tape
- Pen
- Magnifying glass (this can be removed afterwards, don't worry!)



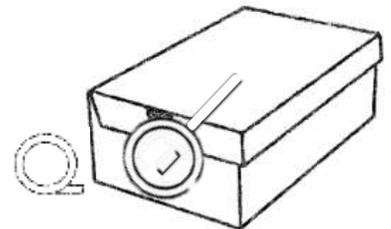
**Step 1:** Place the magnifying glass in the middle of one of thinner sides of the shoe box. Using a pen, draw round the outer circular part of the magnifying glass. You may also need to draw on the lid of the shoebox to ensure that you have a full circle.



**Step 2:** Remove the magnifying glass and cut out the circle that you have just drawn on the shoe box with your scissors.



**Step 3:** Place the magnifying glass into the hole that you have just cut out. Secure the magnifying glass into the shoebox by taping around it. The circular part of the magnifying glass can also be held in place using blue tack. Remember, you still need to be able to open the lid!



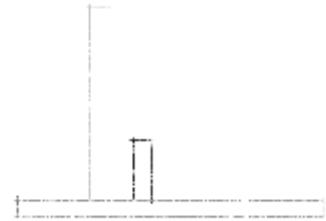


**Step 4:** We now need to make the moveable phone holder. To do this, we will use the sections of cardboard. One section of cardboard will lay flat in the shoebox, the other two will stand upright, holding the phone in place in-between them.

Lay the first section of cardboard flat on the table. Cut the second section of cardboard roughly 7 inches wide and 4 inches tall, then secure this a third of way along the flat piece of cardboard in the upright position using tape on both sides.

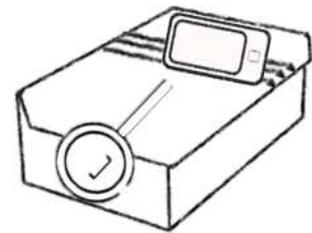
Cut the third section of cardboard roughly 7 inches wide, but only 1.5 inches tall (this can be adjusted according to your phone model). This is so that your phone camera can still project and isn't obscured.

Place your phone in between the two upright pieces of cardboard, then secure the second upright piece with tape once you are happy that your phone is secure between the two pieces and the camera is not obstructed.



**Step 5:** Put your phone holder inside the shoe box and place your phone inside of it.

The purpose of making the phone holder moveable is so that the projector can be calibrated. You can do this by adjusting the distance of the phone screen to the magnifying glass. This will affect both the size of the projected image and the image focus.



**Step 6:** Turn your phone onto its highest brightness setting, then play a video on your phone and put the phone into the holder upside down. (making sure that phone is locked in the landscape position).

#### **Why does the phone have to be upside down?**

The lens inverts the image that will be projected on the wall, making it appear upside down!

Put the lid of the box back on. The video will then play from your phone, project through the magnifying glass and onto the wall! You may need to play with the phone holder inside of the box to let the image focus on the wall.

You could even connect your phone to a bluetooth speaker or soundbar to get the ultimate home cinema experience!

