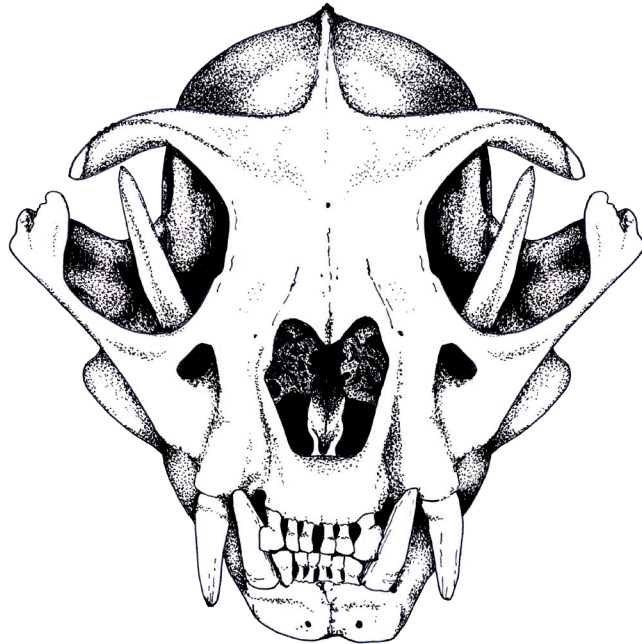


CALIFORNIA
ACADEMY OF
SCIENCES

skulls

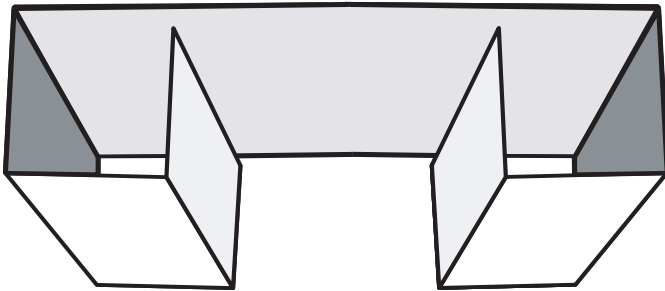


skulls and vision

Developed by
Pipsqueak Productions, LLC © 2002
www.pipsqueak.com

Things to Make

Paper Binoculars



Use a 3" x 11" strip of stiff paper and make three bends at each end. Roll the bends up to make binoculars. They'll help isolate the view from each eye.

Marks on a Rope



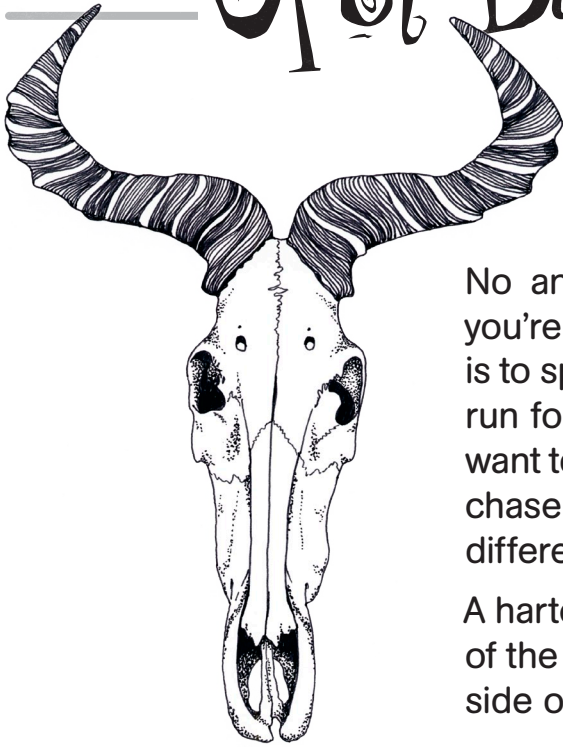
Mark a 36-foot rope either every 12 inches or every 36 inches. The difference? The first marks every 10° on a circle. The second marks every hour on a clock face.

Mirrors on Sticks



Tape mirrors to popsicle sticks. Make two. Nothing should be sharp—these go near your eyes!

Spot Danger, Track Prey

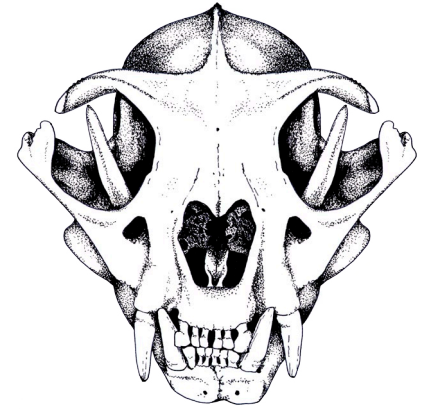


Hartebeest
Herbivore/Prey

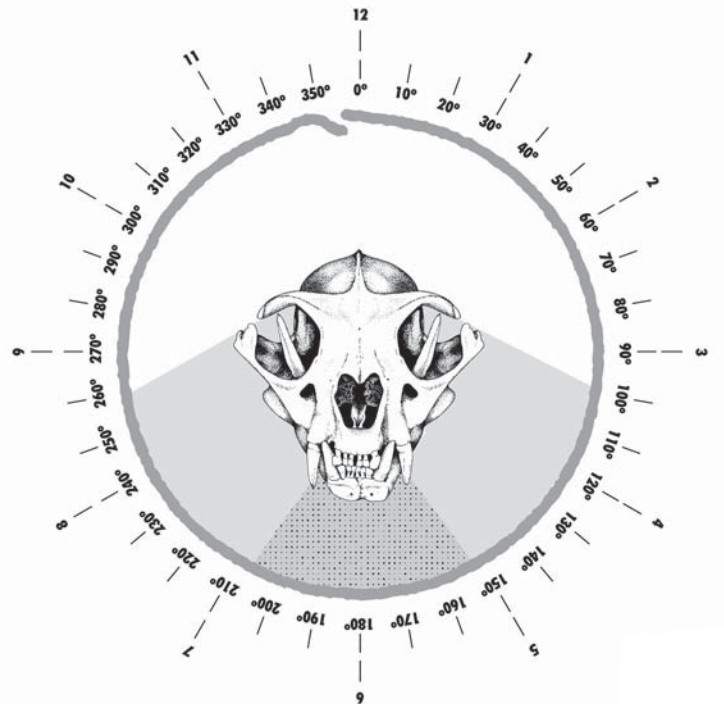
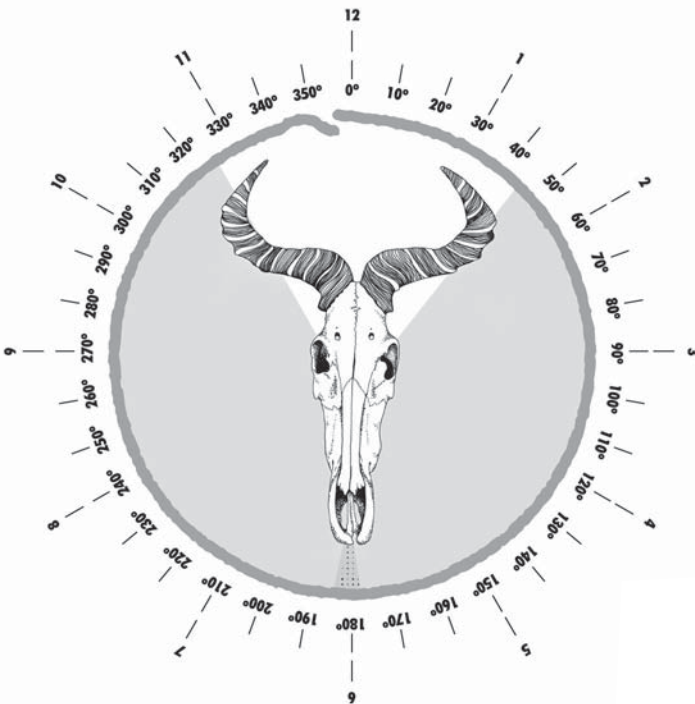
No animal wants to be eaten. If you're a hartebeest, your strategy is to spot danger and then make a run for it. If you're an ocelot, you want to track your fleeing prey and chase it down. Each animal has different needs from its vision.

A hartebeest has eyes on the side of the skull. This allows for greater side or peripheral vision.

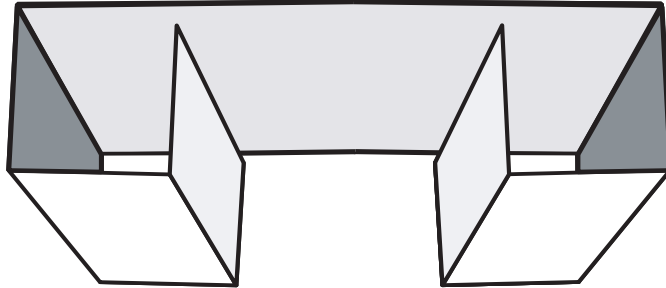
An ocelot has eyes which face towards the front and has a larger area of overlap between the left and right eye. This allows for greater 3D or binocular vision.



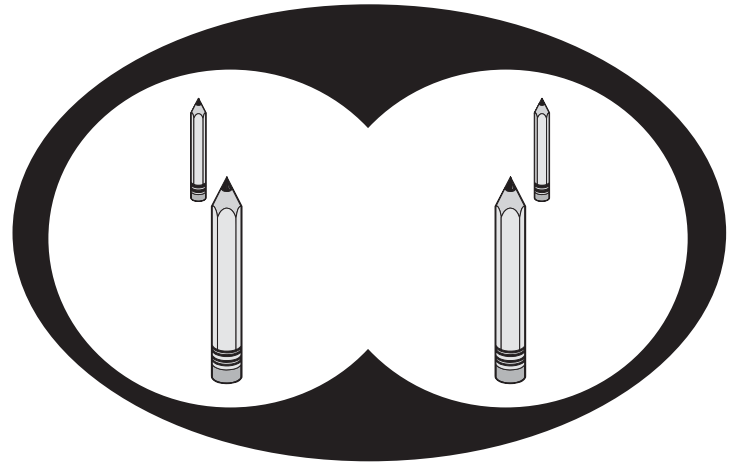
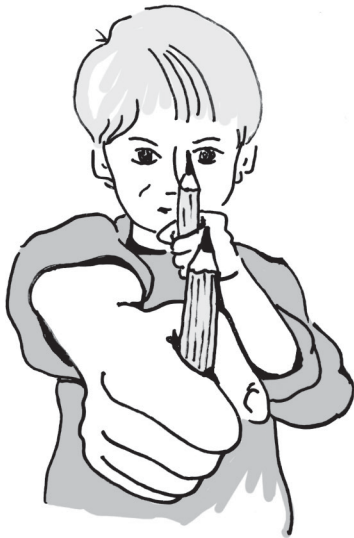
Ocelot
Carnivore/Predator



≡≡ 2 Eyes are Better than 1 ≡≡



Look around using the binoculars. Try covering one eye and then the other. Things that are closer will seem to shift positions more than things that are farther away.



Each eye sees an object from a slightly different perspective. This difference allows the brain to merge the two images and form a single three-dimensional image.

≡ Double Vision, Double Fun ≡



Ever go to a 3D movie? The trick is to get a different image into each eye and the brain does the rest. Here, you cross your eyes a bit to merge the skulls.



Keep head straight. Hold up your finger in the middle of the skulls and half the distance from the image to your eyes.

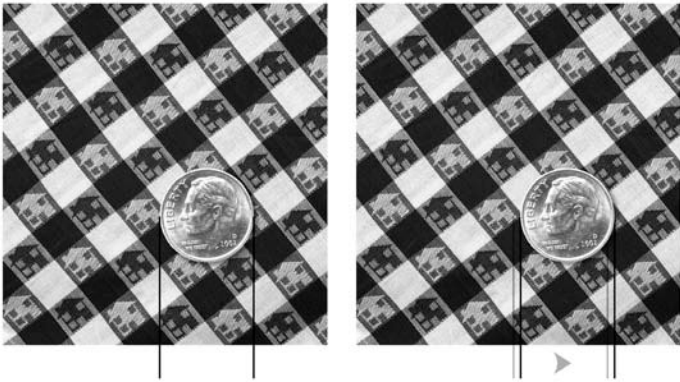
Focus on the tip of your finger—what's behind your finger will double so you'll see four skulls. Move your finger near and far until the two middle skulls fuse into one.

Look past the tip of your finger at the middle skull while keeping your eyes fixed. This can take some practice, but when you get it, the middle skull will look 3D.

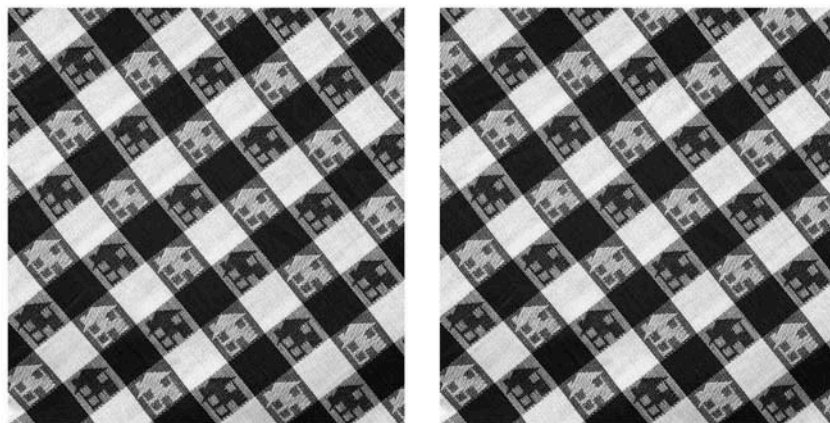
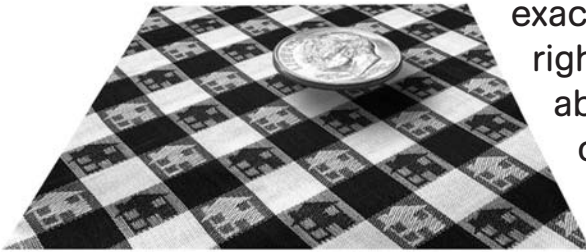
skulls and vision

CALIFORNIA
ACADEMY OF
SCIENCES

≡ Float the Dime ≡



Get two dimes that look almost the same. Put one on each of the empty napkins below. Place them in almost exactly the same position, except move the one on the right square over to the right just a little bit, as shown above. Then use the crossed eye trick to make just one napkin with a dime floating over it. Move the dime around to see where it floats the best. Can you make the dime look like it's under the napkin?



Plot Your Vision!



This activity is designed to measure the limits of the field of vision for each eye.

Mark a 36-foot rope every 12 inches (for degrees) or every 3 feet (for a clock face). Lay the marked rope out in a circle. **Subject A** stands at the middle of the circle facing away from the ends of the rope. **Spotter B** should stand directly in front of **A** and make sure that **A** stares fixedly at **B** the entire time. **A** should cover the left eye with the back of the mirror stick. **Spotter C** should move around the circle away from **B** until **A** can no longer see **C**. **Spotter D** should move around the circle away from **B** until **A** can no longer see **D**. Record the positions of **C** and **D** on the included data sheet for the right eye. **A** should cover the right eye and then repeat. Record the new data for the left eye.

Spotters C and **D** should go to the limits of **A**'s peripheral vision for each eye, as shown below. **Subject A** should take the mirror sticks and hold each angled in towards his or her nose. Can **A** now see **C** and **D**? How far towards the rope ends do **C** and **D** have to move so that **A** can't see them?

