



CUB SCOUT BOOMERANG (SILVER) TEST 10 – DISCOVERY

Make a simple colour wheel and show when rotated how the colours blend to form a white colour

Colour Wheel

Resources

- Cardboard discs (8cm dia)
- (Strong) thread or fine string
- Paper colour wheel templates
- Coloured pencils, crayons or felt pens
- Scissors or circular cutter
- Paper glue

Instructions

1. Colour in a colour wheel template.
Two different templates are provided. One has 14 divisions, to be coloured in using the seven basic colours of the rainbow (Red, Orange, Yellow, Green, Blue, Indigo, Violet). Colour two wheel divisions (either adjacent or opposite segments) in each colour;
The second template is divided into 6 segments, and is also divided radially with 4 concentric rings. This template can be used to observe the effects of mixing different combinations of colours (*e.g.* Red + Blue, Red + Yellow, Blue + Yellow);
2. Cut out the coloured wheel, using either scissors or a circular cutter.
3. Using a small amount of paper glue, attach the coloured wheel to the cardboard disc (just a dab in the centre of the wheel is all that is required—it can then be easily changed);
4. Using a pin or the point of a compass, punch two holes, to match the two outer holes in the cardboard disc, in the coloured wheel;
5. Thread a piece of strong cotton or fine string (~1 metre) through the two outer holes (*not* the centre hole) in the colour wheel and tie the two ends of the string together;
6. With fingers through the looped ends of the string, on either side of the disc (colour wheel), wind (or have someone wind for you) the disc around several times.
7. Pull the string gently with both hands, drawing away from the colour wheel—the wheel should begin to turn. Now, here's the trick... Just as the thread becomes fully unwound, and with the colour wheel spinning, release the tension on the string just enough that the colour wheel can continue to turn and wind the string in the opposite direction. Just as the colour wheel stops spinning, pull gently again on the string, as before—the wheel should then start spinning in the opposite direction (faster than before). Again, just as the thread becomes fully unwound, release the tension on the string, and allow the colour wheel to keep spinning and winding up the thread again.

By gently pulling and then releasing the tension on the string, as described above, you should be able to make the disk spin to and fro. Watch what happens to the colours on the colour wheel as it spins.

Resource Preparation

White Card

8 SHT Pasteboard 510mm x 640mm \$1.65 The Art Shop

Cut 8 cm circles—with careful layout, 45 can be cut from 510 x 640 sheet. This requires a bit of patience using the Compass Cutter, as the cutter must be used gently, circling 10-12 times—try 5-6 times from each side of the card—to cut through the card neatly. A thinner card, which will be easier to cut, can be used, but thicker card will generally yield a disc that spins better.

With a conventional (drawing) compass, inscribe a 5 mm (radius) circle around the middle of the disc. Mark a line through the centre of the disc, and at the two points where this line intersects the 5 mm circle, use the needle point of the Compass Cutter (or something similar) to punch 2 holes. If these two holes are not punched exactly opposite each other, and the same distance from the centre of the disc, the disc will vibrate when spinning and the ultimate result will be compromised.

Compass Cutter

Art & Craft by Colby \$9.95 The Art Shop

This is the preferred means of cutting circles in the present case. The more accurately the circle is cut, the better the disc will spin. If the disc is even slightly uneven, or if the centre of the disc is not located perfectly, it will vibrate badly when spinning and it will be difficult to make the disc spin consistently.

Compass Cutter blades

Art & Craft by Colby Pkt of 12 \$4.95 The Art Shop

White bond paper (standard laser printer paper) for colour wheel templates

The templates (Colour Wheels 6.pdf and Colour Wheels 14.pdf) are printed 6 to an A4 page, then cut into individual templates. Colour the template before finally cutting out the wheel with either the Compass Cutter (preferred) or scissors.

Coloured pencils/felt pens/crayons/paints

The quality of the colour mixing results will be somewhat dependent on the 'purity' of the colours used, particularly when showing the effect of combining the elements of 'white light'. No particular items are specified here—you can experiment, and let the children see what effect is produced by different colouring media.

Paper Glue

UHU *stic* Glue Stick 6 x 8.2g \$9.99 The Art Shop

The smaller glue sticks (specified) are much easier for children to use to get a neat result than the larger items.

String or thread

Gutermann 100% Linen thread (CA02776) (50m) \$3.10 Spotlight

Strong, fine string or thread is all that is required here. The thread specified is not easily broken by an adult with bare hands, yet is fine enough to require that only small holes be punched in the disc.

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