



SUPER POWER: Mixtures!

CODE REVEALING PEN

LAB NOTES...

TO MAKE YOUR CODE REVEALING PEN...

BUILD TIME
20
MINS

SECRET MESSAGES

Crayons and candles are made from wax, which is a type of solid oil. Oil and water don't mix and this experiment shows how that can be useful by the wax creating a waterproof coating on the paper. As the tea stained the rest of the paper, the wax coated part stayed dry, revealing your message.

The properties of wax means that it is great for waterproofing materials to keep them dry in the rain! If you haven't seen how water and oil don't mix, try adding a drop of cooking oil to a glass of water.

1. Watch the video of Nanogirl making her invisible ink swab pen!
2. Ask an adult to help you make some tea, black tea works best for this but you can use green tea too.
3. On your thicker card, measure, draw and cut out a 7x4cm and a 7x9cm rectangle.
4. If your card is corrugated use scissors to score the card to make it easier to bend into a tube.
5. Bend and tape each rectangle so the short edges align to make a tube.
6. Check the smaller tube fits inside the larger tube and adjust if needed.
7. Draw around the end of each tube on card, cut out and tape the circles on the end of each tube.
8. On thinner card draw and cut out a circle slightly bigger than your largest tube.
9. Fold the circle in half and cut along the fold to make two semicircles.
10. Take one semicircle, bend and tape the ends into a cone shape. Cut a small hole in the tip of the cone.
11. Cut 4 cm from your skewer and place a small blob of blue tack on the end. Cover with cotton wool or a strip of paper towel.
12. Slide the opposite end of the covered skewer through the hole in your cone so the absorbent materials sticks out of the tip of the cone.
13. Tape the cone onto the open end of your smaller tube. This is your secret code-revealing pen! The larger tube will be it's holder.
14. If you like, you can decorate and disguise your pen so that you can carry it with you on a secret mission and no-one will be able to tell what it is!
15. Write your secret message in white crayon or white wax on white paper.
16. To reveal the secret message, dip the cotton ball nib into the cold tea and gently wash it over the paper with the secret message. The message should reveal itself!

YOU WILL NEED

- A white wax crayon.....○
- or birthday candle
- Paper.....○
- Thin and thick card.....○
- Scissors.....○
- Blue tack.....○
- Ruler.....○
- Tape.....○
- Wooden skewer.....○
- Pencil.....○
- Cotton wool ball.....○
- OR paper towels
- Tea bag.....○
- Hot water.....○
- (Optional) Colouring.....○
- and decorating supplies

Tea works well for this because it has a dark colour. What other water-based mixtures can you think of which might also work well?

Try stirring a small amount of oil and water together - can you get them to stay mixed?

Can you think of other ways that invisible secret messages can be made and revealed?

Is it easy or difficult to draw in white crayon on white paper - can you see what you're drawing?