

What to Do with a \$20 Bill Besides Spend It

The government has established some interesting designs on our paper money that serve as anti-counterfeiting measures. Here is a great activity that develops science-thinking skills, such as observing and analyzing, while encouraging the use of science equipment, such as magnifying lenses or microscopes and UV lights (also called black lights). Use a new \$20 dollar bill to discover some of these anti-counterfeiting designs. Then look for these same designs in other denominations of bills, such as the \$5 bill.

1. The watermark is on the right-hand side of the front of the bill and can be seen when you hold the bill up to a bright light. A watermark is formed by a series of subtle depressions in the paper mold. More of the material that comprises the bill builds up in the depressions, causing a darker shadow to appear when the bill is held up to the light. The difference in the thickness of the paper in these areas cannot be felt, only seen. The water mark on the \$20 bill is a repeat of Andrew Jackson's face.
2. A color-shifting emblem can be seen as the number 20 in the lower right-hand corner of the front of the bill. As you pivot the bill in your hand, the color of the number will change from green to gold. This is created using a color-shifting foil that has been ground into a powder and then stamped into the paper.
3. Microscopic printing can be seen throughout the \$20 dollar bill. One spot to look is inside the top edge of the "0" in the number 20 on the lower left-hand corner of the front of the bill; it will read "USA." If you look along the border near there, close to Jackson's should you will see the words "United States of America 20 USA 20 USA." Another spot is the large collection of yellow number "20" in the background on the back of the bill. Notice what is written around the edges of the swirly written "TWENTY USA" phrase on the front of the bill under the Department of Treasury seal. Can you find any other microscopic writing?
4. A mylar security thread can be seen when you hold the front of the bill up to the light and look to the right of the US seal. This is a security device that is very difficult to counterfeit. Can you read what the mylar strip says? This thread will also glow green when held under a UV light (black light). Security threads on other denominations of bills will glow different colors and be located in different areas of the bill. Check it out.