



NUWA'S STONES

Reflect & Refract a Rainbow

“Pinmei knew, of all the wonders she had seen on her journey, this rainbow by the light of the moon was the loveliest of them all. Amah looked at her, eyes glistening. ‘Nuwa is smiling at us,’ she whispered.”

—WHEN THE SEA TURNED TO SILVER

The five colored stones that the goddess Nuwa placed in the sky to stop the Starry River from flooding the mortal world appear to Pinmei and Amah as a rainbow in the sky. Can you cast a reflection of Nuwa's gift on this very paper?

What to Gather:

- Water
- Small Mirror (5" x 7" is ideal)
- Shallow pan
- Flashlight or sunlight
- White piece of paper

What to Do:

- 1) Fill the pan about halfway with water.
- 2) Lay the back of the mirror against one of the shorter edges of the pan. Place the mirror at an angle so at least a third of the mirror is under the water.
- 3) If you are using a flashlight, shine the light into the water at the underwater portion of the mirror. If you are using sunlight, bring the pan and mirror outside so the sun can shine on the mirror underwater.
- 4) Hold this paper above the mirror. Adjust the angle until you see a rainbow appear!

Is it Nuwa or is it Science?

Nuwa is just a story, but early in our world history, stories were our way of explaining what we saw. We now understand that rainbows are the result of refraction and reflection.

Refraction is how light bends when it passes through a different medium. In this experiment, water is the medium. When you shine the white light of your flashlight (or the white light coming from the sun) into the water, the light bends.

But here is the amazing thing. White light isn't just one color. It's a combination of all the visible colors. So when white light bends, all of its parts (red, orange, yellow, green, blue, indigo, and violet light) also bend. Each of these colors bends at a different angle because each color travels at a different speed inside water or glass.

When you reflect the light back out of the water using the mirror, you're reflecting the white light that has been broken up (from refraction) into the full rainbow of colors. Now that is an experiment worthy of a goddess!

Our thanks to www.physicscentral.com for the experiment and explanation!

Early Science in China

The Chinese had wonderful stories about the weather and seasons, but they were also astounding science innovators. King Yingda (574-648) who lived in the early part of the Tang Dynasty, observed that rainbows were created by the sun shining on water drops.

Source: Encyclopaedia of the History of Science, Technology and Medicine in Non-Western Cultures (Springer)