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LIGHT INSIDE A RAINDROP

AFTER THE RAIN

The RAIN stops. The CLOUDS break in the west, and low afternoon sun spills across a wet yard. Turn your back to that light, look toward the fading shower, and a curved band of color hangs in the air, red along the outside and violet along the inside. Nothing is up there but falling water. Each drop works like a PRISM, a clear object that bends light and spreads it into a SPECTRUM, the full set of colors hidden inside plain white sunlight.

SPELL Spell: CLOUDS

CLOUDS

SPELL Spell: RAIN

RAIN

KNOWN What is the name for a clear object that bends light and spreads it into colors?

PRISM

KNOWN What is the name for the full set of colors hidden inside plain white sunlight?

SPECTRUM

OPEN When you notice a band of color in the sky, which color do you look for first?

Open response - use practitioner judgment

MATH A rainbow is usually named with 7 colors. Red sits at the outside edge and violet at the inside edge. How many colors lie between those two edges?

5

INSIDE A RAINDROP

Sunlight looks white, but it is really a mixture of colors traveling together. When a beam enters a raindrop, it slows down and bends. That bending is called REFRACTION. The beam crosses the drop, strikes the curved back WALL, and bounces off in a REFLECTION. Then it bends again on the way out. Red light bends the least and violet bends the most, so the colors leave the drop at slightly different ANGLES. That is why one drop can send your eye a single pure color.

SPELL Spell: WALL

WALL

SPELL Spell: ANGLES

ANGLES

KNOWN When a beam of light enters a raindrop, it slows down and bends. What is that bending called?

REFRACTION

KNOWN Inside the drop, the light hits the curved back wall and bounces off. What is that bouncing called?

REFLECTION

OPEN If a single raindrop could send you just one pure color, which color would you want it to send?

Open response - use practitioner judgment

MATH Red light leaves a raindrop at about 42 degrees, and violet light leaves at about 40 degrees. How many degrees apart are they?

2

DROPS, NOT RAIN

Rain is not really what a rainbow needs. Drops are. Spray from a waterfall, a garden HOSE, or ocean surf can lift the same COLORS into the air on a sunny day. In fog the droplets are so tiny that the colors smear together and the arc turns pale and washed out. That ghostly white band is a fogbow. On a clear night with a bright full MOON, faint light passing through falling rain can build a moonbow, so dim that most eyes read it as gray.

SPELL Spell: HOSE

HOSE

SPELL Spell: MOON

MOON

SPELL Spell: COLORS

COLORS

OPEN A moonbow is so faint that most eyes read it as gray. What do you imagine it would feel like to spot one?

Open response - use practitioner judgment

YOUR OWN RAINBOW

So you cannot walk up to a rainbow or stand underneath it. It is a direction, not a place. The arc is always centered on the antisolar POINT, the SPOT directly opposite the sun, straight out past the shadow of your own head. The colored band sits about 42 degrees away from that CENTER. Step sideways and the arc slides with you, rebuilt from new drops. Your friend beside you catches light from different drops, so you never share the same rainbow.

SPELL Spell: SPOT

SPOT

SPELL Spell: CENTER

CENTER

KNOWN The place directly opposite the sun, straight out past the shadow of your own head, is the antisolar what?

POINT

OPEN Your friend beside you is seeing a rainbow built from different drops than yours. How would you describe yours to them?

Open response - use practitioner judgment

MATH

A rainbow's colored band sits about 42 degrees out from its center in every direction. How many degrees is that all the way across, from one edge, through the center, to the other edge?

84