那节课，我们把彩虹捉进了教室

讲光的色散那周，天气预报连着三天阴。我盯着教案发愁：这个实验最漂亮的部分是阳光穿过三棱镜、白墙上映出光谱那一幕，没有太阳，戏就唱不响。第四天早上，云还是厚的。我咬咬牙，决定改用手电筒和水槽，把彩虹硬捉进教室。

课堂演示开始得有点寒酸。我拉上窗帘，教室暗下来，一只手电筒立在讲台上，白光柱打在端于水槽边的镜子上，镜子斜插进脸盆的水里。我慢慢转镜子，白墙上来回找——忽然，一道窄窄的彩虹从水面上立起来，红橙黄绿蓝，虚虚地挂在墙上。教室里响起一片不敢置信的吸气声。拉窗帘的男孩举着布条不肯松手，喊：别开灯！让它多待一会儿！

分组实验立刻铺开。八个小组各领一只脸盆、一片小镜子、一支手电筒，在各自的墙角布阵。教室一下子成了八个小型彩虹工坊。有的组怎么转都只有一团模糊的白光，急得直挠头；有的组歪打正着，镜子角度刚好，半道彩虹趴在墙上，全组像捉住了什么活物，屏着气挪位置，想把它补全。靠窗那组最幸运，云缝里漏进一小片真阳光，他们的彩虹比别人的亮出一个档次，其余各组排队前来参观，脸上写满羡慕。

实验后的讨论，我原本只备了两个问题，结果孩子们交上来十几个。彩虹为什么总是红的在外边？为什么镜子要斜着插进水里？阴天就没有彩虹了吗，那雨后的彩虹是谁把阳光掰开的？我们一个一个问题过，翻到光的折射和色散，翻到水珠就是天空的三棱镜。有个女孩最后问：老师，我们把它捉进教室的彩虹，跟天上的彩虹，是同一道吗？我想了半天，答不上来，就说：这个问题，值得你写进周记。

下课，窗帘拉开，教室重新亮堂。黑板上还留着各组画的水滴光路图，歪歪扭扭，却条条都通向那道彩虹。我在教学日志里写：这三天阴天没有毁掉这节课，反倒逼出了手电筒和水槽的版本。实验的意义从来不在器材多贵，而在有没有让四十个孩子相信，光里藏着颜色，而他们亲手把颜色放了出来。

The Day We Caught a Rainbow into the Classroom

The week I was to teach dispersion of light, the forecast showed overcast skies for three days running. I stared at the lesson plan in despair: the most beautiful part of this experiment is sunlight passing through a prism and a spectrum blooming on a white wall. Without the sun, the show cannot open. On the fourth morning the clouds were still thick. Gritting my teeth, I decided to switch to flashlights and water troughs and catch a rainbow into the classroom by force.

The demonstration began a little shabbily. I drew the curtains; the room went dim. A flashlight stood on the podium, its white beam striking a mirror held at the edge of the water basin, the mirror slanting into the water. I turned the mirror slowly, hunting back and forth on the white wall - and suddenly a narrow rainbow rose up from the water surface, red orange yellow green blue, hanging faintly on the wall. The class let out a collective disbelieving gasp. The boy who had drawn the curtains

held the fabric fast and shouted: don't open them! Let it stay a while longer!

Group work rolled out at once. Eight groups each received a basin, a small mirror, and a flashlight, and set up at their own corners of the room. The classroom became eight little rainbow workshops in a blink. One group turned its mirror every way and got only a blur of white light, scratching its heads in frustration; another stumbled onto the right angle, and half a rainbow lay on the wall - the whole group froze as if holding a live creature, shifting positions breath by breath, trying to complete it. The group by the window was luckiest: a sliver of true sunlight leaked through the clouds, and their rainbow outshone everyone else's by a class. The other groups queued up to visit, faces full of envy.

For the discussion afterward I had prepared only two questions; the children handed back more than a dozen. Why is red always on the outside of the rainbow? Why must the mirror slant into the water? Is there no rainbow on cloudy days - so who breaks open the sunlight for the rainbow after rain? We worked through question after question, reaching refraction and dispersion, reaching the fact that a raindrop is the sky's own prism. At the end a girl asked: Teacher, is the rainbow we caught into this classroom the same one as the rainbow in the sky? I thought a long time, could not answer, and said: that question is worth writing into your weekly journal.

At dismissal the curtains opened and the classroom brightened again. On the blackboard remained the water-drop light-path diagrams each group had drawn, crooked and wobbly, yet every one of them leading to that rainbow. In my teaching journal I wrote: three days of overcast weather did not ruin this lesson; instead it forced out the flashlight-and-basin version. The meaning of an experiment was never in how fine the equipment is, but in whether forty children come to believe that colors hide inside light - and that they themselves let the colors out.