

PROLOGUE

This 8th teacher/parent manual in the Spiritual Syllabus Series, for use in Rudolf Steiner's Art of Education, deals with the manifest world – *Science*. The subject is taught in 3 main lessons per year; one each of Physics, Biology and Anthropology – or physical, life and human sciences, to use the gentler terms.

As well, there are 3 middle lessons; these share the 'Discovery' stream with Social Studies. Discovery is one of the 4 middle lesson streams, each with three, 3-week units per years. Each in turn has 3 strands; those of Discovery are: Physical World; Living World; Human World. In Class 3 and 4, social studies and science share 3 discovery strands each; science in Class 3 has one, and in Class 4, two. Of course one would not program a science main lesson in the same 3-week time bracket as a science middle. (Nor would one normally place any two like subjects so close.) the curriculum is like a menu, from which one orders a balanced meal. It is this *balance* between subjects which is striven for. A timetabling example might be: a main lesson on maths, then a science middle, with say a painting afternoon block – all in the same 3-week bracket.

These syllabus suggestions are just that, suggestions; new initiatives, as long as they're of value, should continually arise in the creative breast of the teacher.

Science awakens the physical body forces of the child – the inner world of pattern and structure. A rich science program from Class 1 to 12 will help this consciousness path, so... Child Awake!

See *Logios* for full Class 3 and 4 curriculum.

SCIENCE - HEAD

SCIENCE - PHYSICAL BODY

CLASS 3

MAIN LESSONS

CLASS 4

BODY	SOUL	SPIRIT	BODY	SOUL	SPIRIT
PHYSICS	BIOLOGY	ANTHROPOLOGY	PHYSICS	BIOLOGY	ANTHROPOLOGY
LIGHT & COLOUR Page 1	STORIES OF AGRICULTURE Page 11	THE TWELVE SENSES Page 23	SOUND STORIES AND STUDIES Page 39	PLANT AND EARTH Page 47	MAN AND ANIMAL Page 61

DISCOVERY - CHEST

MIDDLE LESSONS

WILL	FEELING	THINKING	WILL	FEELING	THINKING
PHYSICAL WORLD	LIVING WORLD	HUMAN WORLD	PHYSICAL WORLD	LIVING WORLD	HUMAN WORLD
AIR AND WIND STORIES Page 32			FIRE STORIES AND STUDIES Page 71	TORRID ZONE ECOLOGY Page 82	

Full Primary Curriculum in: *La Pleroma*.

Full High School Curriculum in: *A Steiner High School?*

Full Programming details in: *A Steiner Homeschool?*

The children should also have demonstrated to them the principle of color perspective; you know, how the mountains fade away into the distance. They can best experience this in painting, which should be an ever-present strand of this 3-week unit. Both painting and drawing can feature in this main lesson to great advantage, bringing to life so many of the handiworks of the Lord of the Spectrum. Now there's a good character for a story."

"And for the more didactic part of the lesson" added Teacher "I might tell the class that it's the Lord of the Spectrum who performs the color tricks of, say, demonstrations of complementary colors. You know, say a blue circle on orange ground. Stare at it for a while, then look at a white piece of paper next to it. One sees quite clearly the 'negative' orange circle on blue ground.

And not only that; one can see the behavior of various colors as these have been portrayed in story. For instance, a green circle on white ground will, when stared at for some time, stretch out in a horizontal band – the very same gesture one takes in eurythmy for green – or indeed one sees when (Occult) Venus rises with the sun and momentarily creates the little-seen but well-documented lateral 'green flash'."

"Yes, I've see the green flash – what a wonderful induction into the color world this is for children, the intrinsic behavior of the different hues. I love the one where you see a blue circle on white; the blue begins to pale in the center, and concentrates around the edge of the circle, just like the iris of the eye – yellow does the opposite. There always seems to be a 'magical' component to this *movement in stillness*, to use an oxymoron – the deeds of the Lord of the Spectrum yes?"

"Yes, I suppose we should actually draw the color circle in our main lesson books." Said the Teacher.

It would also be a good idea to teach both the Light and Pigment Primaries; in a simplified form 9-year-olds could understand this. As any stage-lighting expert knows, focusing red, green and blue spotlights on one place will create a stage flooded with ... *white* light! These 3 are called the 'sun' primaries.

The 'earth' primaries, red, blue and yellow, mixed as pigments, create the color of the earth, indigo. That is why the 7-color sun spectrum contains, in order of the sun's children, the planets: violet-Moon, yellow-Mercury, green-Venus, *white*-Sun, red-Mars, orange-Jupiter, blue-Saturn. This is so different from the Newtonian 'earth' spectrum of red, orange, yellow, green, blue, *Indigo*, and violet – you can see indigo has replaced white."

"I don't know why you come to me for advice at all !" complained Teacher's Teacher "I feel more irrelevant by the moment. Are there any more biscuits? Anyway, it might be a good idea in this Color Physics main lesson to actually qualify, in an imaginative way of course, the Nine Colored Lights' that is, the way color reaches us. The closer to the source of light we see the color, the closer it is to its suprasensible origins. Take the green flame of copper burning; that is pure Venus energy. The sensitive person can't look at it without feeling a sacrificial kind of yearning – a longing to enter its loving ambience.

So difference this is from that medium furthest from the source, color reflected off an opaque, matt surface, one of the densest materialism. Poster paint would be in this category – very earthy! The other 7 range variously between these extremes, and can be demonstrated with great effect:

Metallic color, as seen in a beetle's back; iridescent, in a peacock's feathers; color through a transparent substance, like stained glass; translucent – color, through say oiled rice paper; color through transparent white paper reflection – as seen in watercolor painting." Teacher's Teacher paused to dispatch a biscuit.

"I suppose there could be a lot of general discussion about how color expresses in the world, as in food for instance. The color of curry is the same as that which it so effectively suppresses, the trots! This is like-to-like color healing ... hey, did you hear that?! A Golden Whistler. His trilling song is a combination of his gold breast, and sharply defined black and white throat. It is actually the color that commits the sound to the ether."

Teacher's Teacher had finished eating, so got back to work "That's a good observation – in a play, you might be able to suggest where the various colors live in the human being, as taught to teachers in their eurythmy lessons. Indeed one should harness the support of the eurythmy teacher in bringing some color into her/his lessons – this truly is integrative education.

From squeezed out black, with clenched fists at our sides, to the fending-off gesture of grey – right up to the open-fingered movement for white, high above our heads, eurythmy expresses eternal color verities. Here the children are unconsciously absorbing the mysteries of color – the language of the Lord of the Spectrum himself!"

"Oh, that reminds me," chirped Teacher "I mustn't forget to touch the vocabulary of color, through spelling lists and what-not. There are many names for red, each slightly qualifying the blanket concept; in other words, what kind of red? There's ... let's see, rouge, rufous, ruddy, rust, rose, and ruby. Isn't that funny? They all start with the letter 'r' – I wonder why?" Teacher looked at the pink waterlily in the pond, it was now fully open, a flamingo gift to the day; she continued "The r sound is the only 'air' sound in English, connected as it is to the sign of Taurus – with its Quality of Will! Will is red. I guess I could show the reality as it expresses through the vernacular, like a 'red-blooded boy' – that is a 'will' statement. Of course there are lots more, like green with envy, browned off – and grey with hatred!"

"Yes, color vocabulary can be fun; and what about foreign color words? Yellow is jaune, gelb and Amarillo in French, German and Spanish respectively. Children love these language comparisons (these are great for the eurythmy class too). The word jaune has even moved across the English, as in 'jaundice'. You'll also note the soul use of that word – 'a jaundiced view'!" Teacher scribbled notes so as not to forget these little many colored gems.

"How ab out color illusions?" continued Teacher's Teacher "9-year-old children love those, with that blossoming 'pictorial aspect' of theirs. A good text from the local library can be helpful here. It's too time-consuming to think of these 'color tricks' yourself – it might detract from the more important element of lesson preparation, that which one can't get from a book, The Story.

Take two yellow triangles, put one on a white ground, and one on black. The children will be certain that the triangle on white is much larger than the one on the black – magic again yes? Indeed behind every one of these so-called illusions is a soul reality of a kind. Black does have the tendency to swallow (as in 'Black Hole') or engulf, white to liberate, in this case expanding the yellow triangle."

“I know one,” sang Teacher happily “if you place equal pink squares on a blue and yellow ground, the surrounding colors change the hues of the pinks dramatically. The pink on yellow appears much stronger than the one on the blue – and then there’s another one I remember with stripes...”

The warm sun invoked the two women to silence; they rested back in their comfortable chairs. The Teacher gazed lovingly at the now-large pink waterlily; the perfumed heart was sparkling gold. The flower lifted the dreaming soul of The Teacher in its loving embrace, and took her on a journey of neither time nor space. She arrived in a world of unspeakable blazonry, becoming a shimmering complexion in a host of color phantoms. These moved and weaved, fluctuate and coruscated in green, gold and violet – all around the center of a Perfect Light. This Light, the very essence of which charged each flowing Color Being with vitality, found its strength in a limitless whirl of kaleidoscopic hues. The Light, or Lord of the Spectrum as it really was, whispered wordlessly into the gleaming soul of The Teacher. This was the most sublime initiation of all.

“... and to teach color you have to love color,” murmured Teacher’s Teacher, who had apparently been going on in this vein for some time “this is your opportunity to teach good *taste* in color. Hold up some garish, meretricious color combinations – then compare these with examples of harmonious tones.”

“What!?” Oh I’m sorry, I must have dozed off.”

“Never mind, it wasn’t really important. You can fill some of your knowledge gaps with this, especially on some of the supersensible aspects of color theory.” She handed The Teacher a small book, *Choirs of Colors* by little known educational author, Alan Whitehead. With that Teacher’s Teacher girded her loins in her filmy shift, and turned to leave, smiling enigmatically.

“Oh, I haven’t offended have I? It’s just that one minute I’m staring at the waterlily, the next .. ah, never mind, it’s hard to explain.”

“Nothing to apologize for – or explain, I’ve been on the waterlily color tourn myself you know. Well I’ll be going, to give you time to write a color song for your class.”

“Color song? What about?” At that moment a black and yellow wasp began circling a St. Andrew’s Cross Spider “Um, it’s okay, I feel a song coming on already...”

COLOR, COLOR

Color, color – Color One is dancing,
With the blossom, high up in the tree.
Summer's child; she's living in her fancy,
Upward, outward – as far as you can see.

Hunter in yellow and black,
Alert for speedy attack.
Nothing can turn him back
When he sees the Dark One creeping;
Stealthy, back-bent, shadowed and silent *Caught!*
More silent still in a tomb up in the tree.

Hunter Hunter, Hunter now is leaving;
He can tell that Autumn's almost here.
"Won't you stay? Good times can last forever!
Our song's unsung – cold winter's nowhere near"

Hunter has gone in the night,
Bark One lurks out of sight.
Silver chain deadly and bright,
Waits for the Color One passing –
Lightly, flightly; singing and sprightly
Caught!
Wingless, afraid; carried off
And lost from sight.

Now if you can listen very closely,
You may hear her singing underground.
Dark One creeping, blossom softly sleeping;
Shroud of silver chain around it wound.

Hunter will come again,
Dark One now will reign,
Color One bound in chain
Sings for her silent master.
One day, she may, follow a sun ray
Free !
Grow wings again,
Fly up high among the flowers.

Full music notation in my book *33 Sun Songs*.