



Sun education at school

WHY EDUCATE SCHOOLCHILDREN ABOUT THE SUN?

The emergence of a major public health crisis

Converging phenomena conspired to shove people into frequent, sporadic sun exposures: the urbanization, the development of travel and leisure industries and the vacationers' growing tastes for open-air recreations, combined with longer vacations split up over time. As a result, tanned skin has become a symbol of good health and social rise. Tanning salons have sprouted all over cities, spreading ultraviolet rays to people who knew little about their risks.

It has taken several decades to recognize that repeated and prolonged sun exposures constitute a real public health issue. Melanoma, the most dangerous kind of skin cancer, is now one of the leading cause of death by cancer among young adults. As the most aggressive type of cancer, it now tops the priority list of numerous national initiatives against cancer (E.G. France¹), while cataract, another sun-related disease, is the first cause of blindness in the world. In France, since the late 90's, the crystalline lens replacement has become the most common surgical procedure, exacting a heavy toll on social security.

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The dangers of childhood sun exposure

Dermatologists, oncologists, and public health experts all agree over the fact that the child's overexposure to the sun is the main factor for the adult's melanoma. The reasons are twofold: on the one hand, open-air activity is preponderant for a child or a teenager. On the other hand, the body's protective mechanism against the sun - the skin's ability to tan and thicken - is not completely functional before age 15.

Childhood is a crucial time for sun-damage prevention

Sun exposure is at its riskiest during childhood, a crucial time when individuals form lifelong habits and powers of reasoning. Therefore, it is on-point to explain kids that tanning is not only the skin's defense mechanism against solar aggressions, but also a fashion statement. Teaching them to recognize the signs of sun damage, its effect on their health, as well as the cultural traps they are subject to, will help them avoid risky behaviours. Additionally, children developing an interest in public health issues - as they have for anti-smoking and road safety programs - often create positive repercussions for the whole family. For these reasons, the World Health Organization and the French Academy of Medicine² recommend developing children-oriented, sun-damage prevention programs.

¹ Plan against cancer initiated by French President, M Jacques Chirac in 2003, measures n°20 & 21.

² OMS -Intersun Program, French Academy of medicine - report "Health and the Sun" - may 2004, Plan cancer 2003.

A contribution to the fight against racism

Educating schoolchildren about the sun contributes to the education for citizenship at large. Understanding that we are not all equally susceptible to sun-related skin diseases is an opportunity to confront issues of skin colours. Taboos about race and class are lifted once students make the link between skin colour and the body's adaptive responses to the sun. Putting the origins of skin colours into scientific context, without prejudice or discrimination, inspires productive dialogue that combats racism.

Talking about the sun, an opportunity to put health education into motion

Unlike another public health issue like tobacco, the sun doesn't just have negative effects. To avoid a one-sided, anti-sun discourse that could strike children as partisan, it is important to bring up the benefits of the sun. Doing so paves the way for a more balanced understanding of both the risks and their prevention. Furthermore, an object of fascination and dreams like the sun lends itself to numerous other disciplines: literature, energy, astronomy and arts.

THE HOW-TOS OF SUN EDUCATION

The symbiotic relationship between science and health curriculum

Science is a perfectly-suited discipline to take on the sun study. Providing traditional lessons about the sun's trajectory, the light and the UV rays, the essence of science is experimentation and discovery. Implementing a scientific method opens children up to sun basics, but also to the understanding of its dangers and risky situations. At the end, taking protective measures against the sun is no longer the subject of a moralistic adult discourse, but a necessity, discovered and tested by the children's own initiative. Meanwhile, health education is an effective and original venue to initiate engaging, stimulating scientific activities. Emboldened by their own discoveries, students become sun-damage prevention activists and do so, notably by spreading the word to their families.

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A contribution to the common knowledge base

The guide's goal is to have teachers implement a sun prevention program in their classroom. Surveys led among hundreds of 6-to-11-year-old pupils showed a clear improvement of their knowledge and behaviour (see the CRLC Val d'Aurelle 2008 study for example). But the guide also bases itself on the teachers' involvement within the frame of their profession and the goals fixed by National Education. Evaluations led among thousands of teachers, interviews made with several education inspectors, school councillors and resources masters unambiguously show the guide's effective contribution to the pupils' acquisition of a common knowledge and skills base.

Activities described step by step

The teacher's guide aims to have teachers implementing a sun damage prevention program in their classrooms using a scientific method, as part of a larger health and public health curriculum.



Presentation and advices

GUIDE'S PRESENTATION

The guide contains two educational progressions (age 4-8 and 9-13) which both aim to have teachers leading an action in the health education field, but also in citizenship and sustainable development. Transverse and multidisciplinary, the adopted approach and the discussed themes are aligned with official school programs.

An open guide

The guide can be used by any seasoned or starting teacher, with or without scientific background. No need to be familiar with the investigation method either: the guide forms a fully-fledged auto-learning tool.

A hands-on tool

Every step is described and illustrated in details. Every indication – the specific objectives, the length, the materials, the procedures – is laid out. Although the written traces always have to be elaborated with the pupils, token questions and conclusions are included in the guide to facilitate the teacher's work. Scientific and educational notes are added in each session. These notes can take the teacher to the "lighting pages" in the second part of the guide.

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Scientific lighting

It gives the teacher a documentary background to help him learn more or answer the countless questions pupils may ask him: "*Is the sun a danger for our health? What is cancer? What are ultra violets? Can we see them?*" It worths reminding that a teacher is not an "expert" of every topics he talks about in his classroom. Facing a tough question, he or she must not hesitate to reply "*I don't know, but I will do some research*".

Educational lighting

It helps the teacher know better and embrace the investigation approach, as recommended in official programs. Simple yet concrete explanations, contextualized to each module, describe the different phases of a science session. For example: how to bring the pupils to a research situation, or how to use the experience notebook.

TIPS AND ADVICES

How to adapt the activities modules?

Each activities module targets pupils of different level. Some sessions offer different ways to take the diversity of the situations into account. There are numerous specificities – social, cultural... - in a class. Some of them must lead the teachers to adapt the modules, or even build their own educational progression.

Age 4-8 module

While some of the sessions proposed may be difficult for an early nursery school pupil, most of them can be implemented from the middle section year. Handling the UV-paper may be tricky, but experiences can be made with simple bananas or games of shadow. When experiences reveal themselves hard to conceive and/or hard to realize by the pupils, the teacher can explain ("*what we are going to do to answer the question*") and implement with them the experience described in the guide. Following the guide step-by-step, frequently going back to the initial question and the reason behind the experience, verifying the pupils' support and understanding at every stage of the session: all of this concurs to a true initiation to the investigation approach.

Age 9-13 Module

Save for two of the three optional sessions (6bis and 6ter), this module can be implemented with 3rd and 4th grade classes altogether. It is nevertheless important for the teacher to adapt it in regard to the pupils' overall level and the topics made already or yet to be made. For example, teachers often implement the sessions 4 (*Are the risks the same during the course of the day?*) and 5 (*Are the risks the same during a year?*) in the chapter dedicated to the apparent move of the sun.

The evaluation protocols can be used before the beginning of the work to find out the pupils' very first ideas and, at the end, underline their progression.

When implementing this activities?

Between April and June in the Northern Hemisphere

Between October and January in the Southern Hemisphere

As some experiences consist in measuring the ultraviolet intensity with the UV-sheet furnished in this book, they can be made possible only with a significant enough light intensity. The prevention action is more effective when made just before summer vacations.

How rate the pupils' progresses?

At the end of the two activities modules, two evaluation protocols are proposed. They can also be used before the beginning of this work to find out the pupils' very first ideas and, *in fine*, underline their progression.

With what tools?

The UV-sensitive paper is furnished in enough quality to sustain a full year. The white-coloured sheet turns blue when exposed to the UV. The more it received UV, the bluer it becomes. It has a protecting film that must be taken off before the exposure (a pre-cut makes that operation easier). Still it is recommended to keep this paper away from the light (inside the book, for example). To fix it on a poster or a page in the experience notebook, the non-reactive side is composed of a sticky surface. After the exposure, it must be put away from the light (by putting back the protecting film and leaving it in a notebook) in order to preserve the shade obtained with the sun exposure.

Other tools

Only casual, inexpensive material is required, see list below (optional sessions excluded):

Age 4-8 Module:

For the class	For each group
<ul style="list-style-type: none">• Bananas• 1 Flashlight• 3 dolls• Hat, cap, sun cream, sunglasses• tissues or dolls' clothes• A couple of magazine• Basic furniture : A3 sheet, 1 carton sheet, colour chalk• 2 thermometers (optional)• 1 camera (optional)	<ul style="list-style-type: none">• Bananas• 1 tiny sun umbrella (as used on ice cream)• 1 flashlight• Basic furniture : 1 compass, 1 pair of scissors, sticky tags, glue, color felt-tip

Age 9-13 Module :

For the class	For each group
<ul style="list-style-type: none">• 1 pair of glasses, 2 pairs of sunglasses• 2 tiny sun umbrellas (as used on ice cream)• A couple of sun cream and tissue samples• Basic furniture : 1 ruler (or meter), 1 cardboard box, some magazines in color	<ul style="list-style-type: none">• 1 flashlight• 1 grapefruit• Some toothpicks• 1 bristol-type A4 sheet• Plasticine• Basic furniture : 1 compass, 1 pair of scissors, 1 ruler, 1 chalk, 1 scotch tape

Synthesis and goals

LIVING WITH THE SUN ACTIVITIES MODULES - Age 4-8

	Sequences goals	N°	Sessions	Pages
Sun & Health	Identifying the positive and negative effects of the sun	1 ☼	What happen when one under the sun?	14
	Becoming aware of the sun exposure dangers	2 ☼	What happen if one stays long under the sun?	16
	Sensitizing to the particular risks of light-skinned people	3	Who get the most sunburns?	18
Sun & Shadow	Find out some shades properties	4 ☼	How is my shadow?	22
	Understanding that the shadow's size depends on the sun's height	5 ☼	Does the shadow change during daytime?	24
	Understanding that the sun is dangerous, especially at its higher	6 ☼	What are the most dangerous moments?	26
Sun & Protection	Becoming aware that sun protection requires a complete outfit	7 ☼	How to protect from the sun?	30
	Identifying that the shadow help protecting from the sun heat	7 bis ☼ option	Is it less hot in the shadow or under the sun?	33
	Summarize the risky behaviours and the protection means. Rate the experience. Make the pupils actors.	8 ☼	Becoming a prevention actor	34
EVALUATION				37
Photocopy slips				41

Sessions marked by a ☼ require a sunny weather (or slightly cloudy) to make the experimentations possible.

Synthesis and goals

LIVING WITH THE SUN ACTIVITIES MODULES - Age 9-13

	Sequences goals	N°	Sessions	Pages
Sun & Health	Becoming aware that the sun has positive and negative effects on our health, and we are not equal against the risks	1 ☼	What are the effects of the sun?	50
		2 ☼	Are the risks equal for everyone?	52
		2bis option	Why are there different skin colours?	54
Sun & UV	Identifying UV rays as a dangerous component of the sunlight	3 ☼	What are ultraviolet?	58
	Becoming aware of the importance of the time of sun exposure	4 ☼	Are the risks the same during the course of the day?	62
	Understanding the variation of UV intensity according to the hour and the season	5	Are the risks the same during the course of a year?	64
Sun & Atmosphere	Linking the height of the sun in the sky with the thickness of the atmosphere traversed by the light	6	What's between us and the sun?	68
	Understanding the variation of UV intensity according to the place (latitude and altitude)	6bis ☼ option	Are the risks the same everywhere on Earth?	70
	Understanding the protective role of the atmosphere	6ter ☼ option	What is the role of the atmosphere?	72
Protection & Prevention	Being able to recognize risky situations and use a sun forecast map	7	What is the purpose of sun forecast?	74
	Efficiently protecting the eyes and the skin	8	How to sun-protect?	76
		9 ☼	Are all protections really effective?	78
	Being a health prevention actor	10	Becoming a prevention actor?	82
EVALUATION				85
Photocopy slips				89

Sessions marked by a ☼ require a sunny weather (or slightly cloudy) to make the experimentations possible.