

과학 + 교육 + 아프리카 = ?

김은정, LAMSADE-CNRS, PARIS

16 May 2015, General Assembly of i-DREAM

# THE STORY BEGAN...



# Ideas for Science Class in Chad

현지 상황 고려: 실험을 위한 재료가 현지에서 구하기 쉽거나 저렴하게 제작가능할 것.

하나의 아이템에서 다양한 수준의 교육이 가능하면 좋겠다. 예-개구리해부:초등생용-중학생-고등학생

- 개구리 해부! 해부 해보기, 신체의 내부, 장기의 기능

-발전기 만들기 (담당: 심창현)! 종이컵 통신 (담당: 최경일)

초급: 간단한 종이컵 통신 실험!

고급: 통신의 원리, 모르스 부호, 암호, 네트워크 layer

- 정수기: 만들어보기, 모세관 현상과 흡착 현상 이해.

- 고무동력 자동차: 제작, 엔진의 원리! 돋보기로 불붙이기

- 전지만들기:산성물질을이용한전지직접만들어보기, 전기 발생의 원리. 과일 이용.

- 허브를 이용한 향균 원리: 증류/추출법을 이용한허브성분추출.곰팡이발생정도비교. 향균원리이해.

- 비누 만들기: 간단한 화학실험.

- 비행물체 만들기: 종이나 나무를 이용해 가장 멀리 나가는 비행물체 만들기. 비행의 원리, 효율적인 비행물체 설계.

- 오리가미 (종이접기): 3차원

- 입방체 만들기: 4면체 6면체 12면체 등의 평면 도로부터 입방체 만들기, 혹은 그 역과정. 공간 적 사고.

# THE STORY UNFOLDED...

아프리카 초 중등학교 과학실습 교재 / 2014-10-3 / 심창현

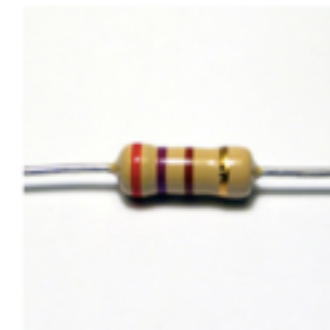
1. Title : A small electrical generator using electromagnetic induction

2. Objective

To motivate students to be interested in electric power generation  
To make a simple and small electric power generation system  
To understand a basic phenomena of electro magnetic induction

3. Preparation

Super capacitor, diode, zener diode, enamel wire, neodymium magnet, OHP film, Resistors, LEDs, Rubber, Adhesive tape, cardboard



# THE STORY UNFOLDED...

## # 사고와 체험을 유도할수 있는 주제 제시

예시)



주제 : 어떻게 자동차가 강을 건널수 있을까요?



1. 가정할수 있는 질문 유도
2. 주제 해결을 위한 제안 제시
3. 제안들 중 만들수 있는 다리들에대해 생각할수 있는 체험하기

예시들) 출처 : Enseigner les sciences à l'école - [www.sciences92.ac-versailles.fr](http://www.sciences92.ac-versailles.fr)



\* 교재 편집 방법

설명 삽화  
쉽게 주변에서 구할수 있는 재료들 제시

# CHAD, POSING A CHALLENGE

## I. INFRASTRUCTURE

- Reality not so fancy
- no textbooks for majority of school kids
- no access to reference books for teachers
- no library



# CHAD, POSING A CHALLENGE

## 2. CULTURE

- students don't interactive experience in classrooms.
- education bureaucrats don't seem to care.
- interactive, advanced education seems luxury



# CHAD, POSING A CHALLENGE

## 3. REALITY GAP IN MATERIAL

- 2% of population has access to electricity.
- teaching about e.g. electricity needs different approach.



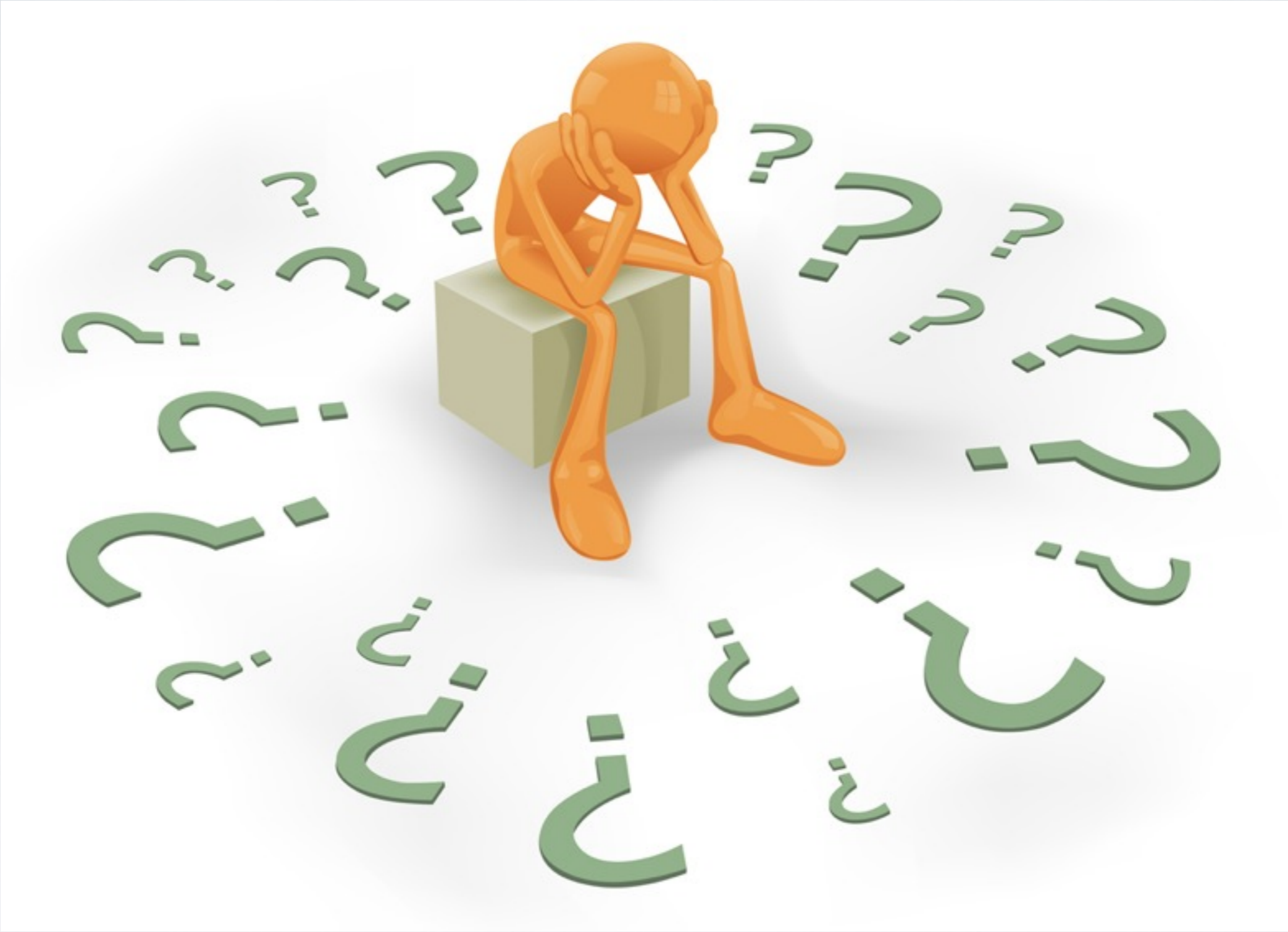


# CHAD, POSING A CHALLENGE

## 4. WHO? WHAT?

- many schools find it tricky to find a teacher.
- manpower to teach...what?
- science workshop... for whom? by whom?
- Shouldn't the government take care of education, not us?





THIS IS HOW I FEEL

# ON THE OTHER SIDE

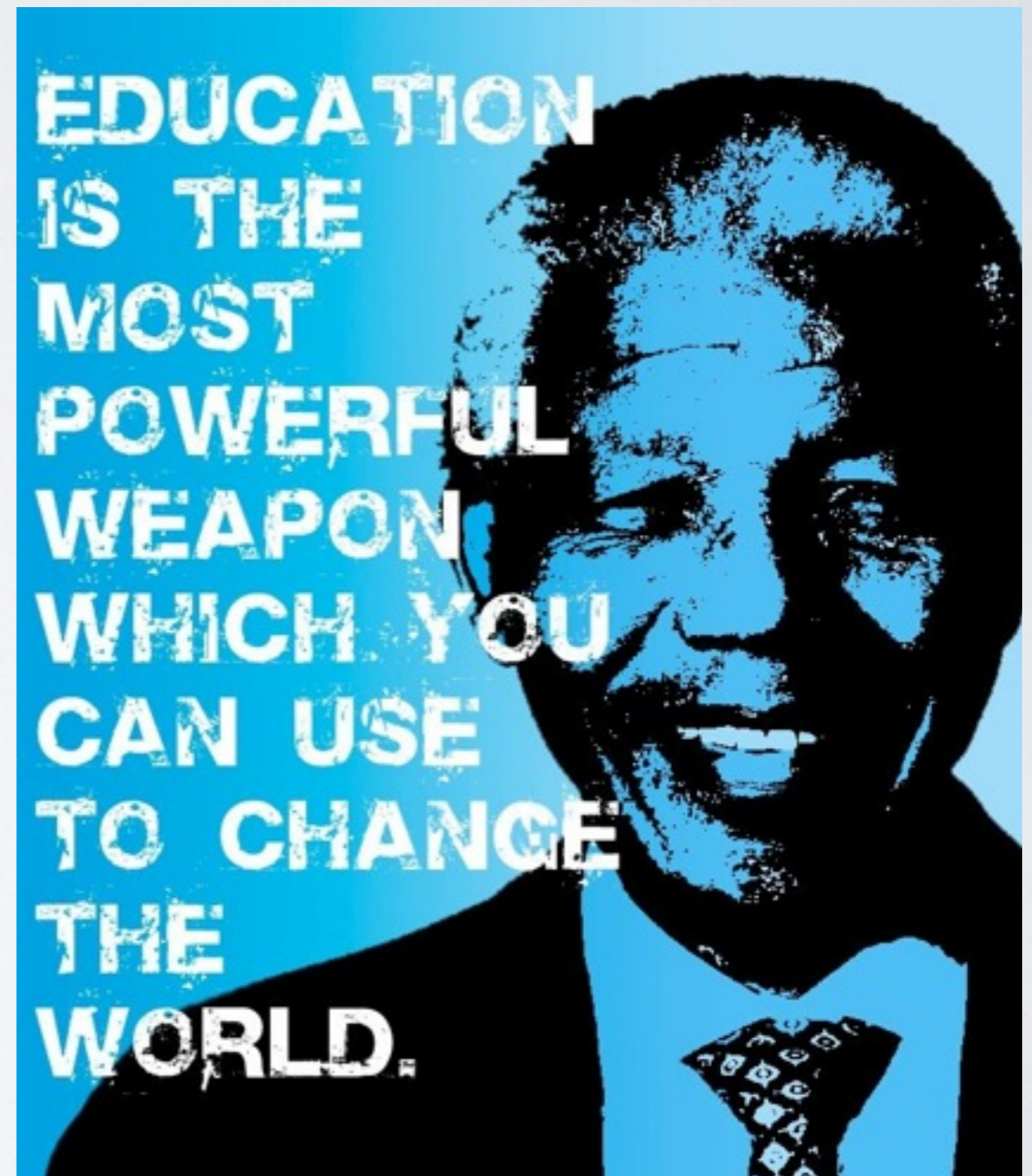


WHY DO WE CARE ABOUT  
SCIENCE EDUCATION IN  
AFRICA?

- Because we are scientists.
- Education is matters. Science is matters.
- In Africa, education can be improved a lot like many other things there.

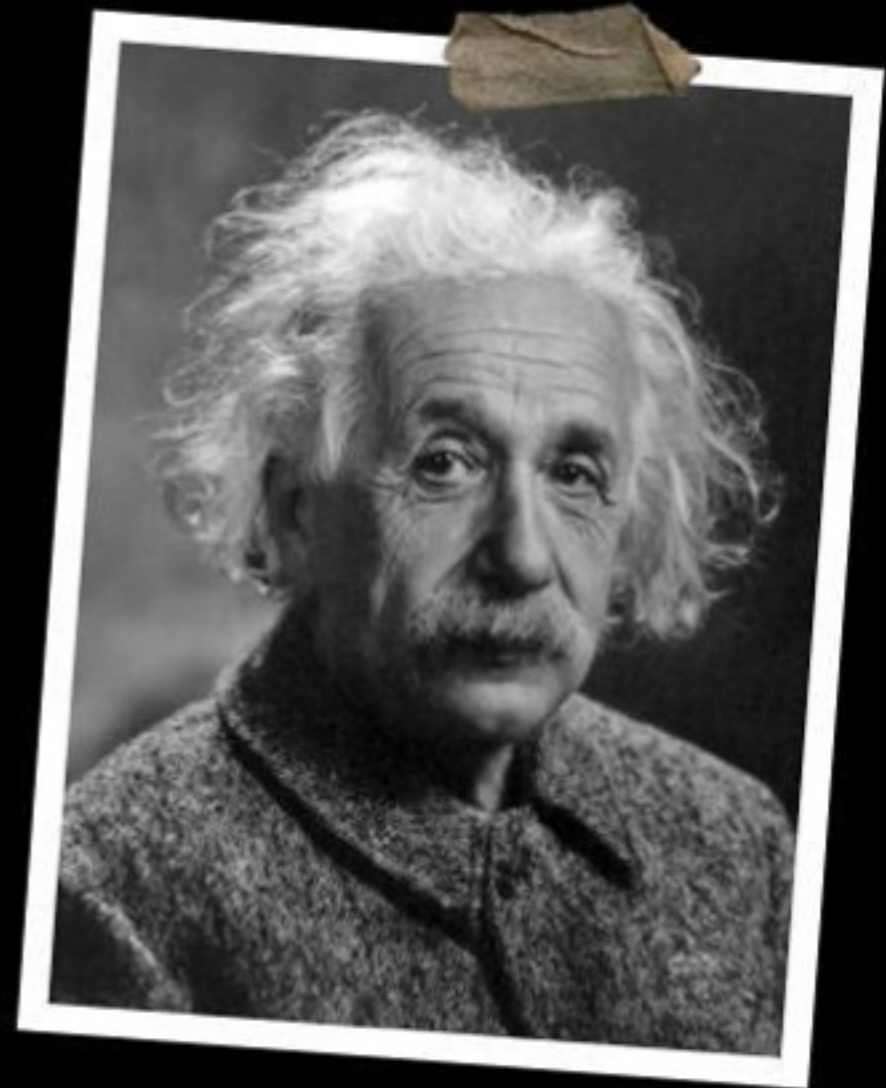
# EDUCATION MATTERS

- Through education, we learn to
  - understand
  - think
  - do things, with effect
  - discover
  - change
  - create



# SCIENCE AS A TOOL

**"Education is not  
the learning of  
facts, but the  
training of the mind  
to think."  
-Albert Einstein**



# WE'RE SCIENTISTS, AND WE'RE HAPPY ABOUT IT.

- We happen to have what can be useful to african kids and classrooms.
- Let's share what makes us happy.
- Sharing our essential self makes us even more authentic. (real scientists!)





# IN AFRICA



- 1 in 3 children out of school.
- At 5 grades; 1 in 2 fails in basic reading, writing, numeracy.
- How about teamwork, problem-solving skills?
- Teachers: sometimes they know litter or simply not there.

SCIENCE + EDUCATION +  
AFRICA = WHAT TO DO?

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WHAT DO YOU WANT TO DO?

WHAT CAN WE DO?

WHY DO YOU WANT TO DO IT?

SOME HAVE A VISION. IS IT YOURS TOO?