



# CLIMATE CHANGE IN SCIENCE LEARNING

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*FOR KEY TEACHERS OF SENIOR HIGH SCHOOL IN SOUTHEAST ASIA*

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# CLIMATE CHANGE: WHAT IS IT?

- ❑ **CLIMATE: A DESCRIPTION OF AGREGATE WEATHER CONDITIONS THAT HELPS DESCRIBE A PLACE/REGION**
- ❑ **AVERAGE OF ALL STATISTICAL WEATHER INFORMATION OVER A 30 YEARS PERIOD**
- ❑ **CLIMATE CHANGE: THE LONG-TERM FLUCTUATION IN RAINFALL, TEMPERATURE, AND OTHER ASPECTS OF EARTH CLIMATE**



# WHY CLIMATE CHANGE HAPPENED?

- ❑ **HUMAN ROAM EARTH'S SURFACE**
- ❑ **HUMAN DEMAND MAGNIFIED**
- ❑ **TECHNOLOGY EVOLVED**
- ❑ **EARTH'S POPULATION INCREASED**



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# PROTECTING HUMAN FROM CLIMATE CHANGE

- **LEARNING CHARACTERISTICS OF THE ENVIRONMENT**
- **MEASURING CHEMICAL & PHYSICAL CHARACTERISTICS OF ENVIRONMENT**
- **MODIFY DECISION MAKING BASED ON SOCIAL & CULTURAL WISDOM TO SAVE THE EARTH**



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# THREE-STEP PROCESS TO BECOME ENLIGHTENED CITIZEN

- **KNOW: TAKING RESPONSIBILITY FOR OUR WORLD BY KNOWING HOW IT WORKS**
- **CARE: HOW OUR ACTIONS AFFECT OTHERS AND AFFECTED BY OTHERS**
- **ACT: DO SOMETHING, MAKE YOUR OPINION KNOWN**



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# THE AIMS OF CLIMATE CHANGE EDUCATION

- ❑ **CITIZENS CAN IDENTIFY PROBLEMS AND PARTICIPATE IN THEIR SOLUTION TO A THREE-STEP PROCESS**
- ❑ **CITIZENS CAN MAKE INFORMED CHOICES HOW THEY INTERACT WITH THEIR LOCAL, NATIONAL, AND GLOBAL ENVIRONMENTS**
- ❑ **CITIZENS UNDERSTAND THE COMPLEX WORKINGS OF ALL ASPECTS OF THE EARTH SYSTEM AND THE TIME SCALES ON WHICH THEY OPERATE**



# INNOVATIVE LEARNING OF CLIMATE CHANGE

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**THE PROCESS OF LEARNING SHOULD BE:  
INTERACTIVE, INSPIRING, JOYFULL,  
CHALLENGING, MOTIVATING TO BE ACTIVE  
AND CREATIVE**



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# THE INNOVATION IN LEARNING ACTIVITIES

- ❑ **FROM ATTENTION TO ACTIVITY**
- ❑ **FROM VERIFICATION TO INQUIRY**
- ❑ **FROM ANSWER TO QUESTION**
- ❑ **FROM COPYING TO SUMMARIZING**
- ❑ **FROM LISTENING TO PRESENTATION**
- ❑ **FROM GUIDED TO CREATE**



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# INNOVATIVE MODELS OF TEACHING ?

- **INQUIRY MODEL OF TEACHING**
- **CONTEXTUAL TEACHING**
- **THEMATIC MODEL OF TEACHING**
- **CREATIVE-PRODUCTIVE MODEL OF TEACHING**
- **HIGHER ORDER THINKING SKILL MODEL OF TEACHING**



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# INQUIRY TEACHING

- **INQUIRY DEVELOPING**
- **PRODUCTIVE QUESTIONING**
- **CHALLENGING**
- **SCIENCE AS MYSTERY**
- **CRITICAL QUESTIONING**



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# CONTEXTUAL TEACHING

- ❑ COGNITIVE AND AFFECTIVE DOMAIN
- ❑ START FROM DAILY LIFE
- ❑ VALUE BASED
- ❑ APPLIED IN DAILY LIFE
- ❑ SAFETY OF HUMAN & ENVIRONMENT
- ❑ AVOID NEGATIVE IMPACT



# THEMATIC TEACHING

- BASED ON DAILY LIFE EXPERIENCE
- SCIENCE DISCIPLINE RELATIONSHIP: SYSTEM, MODEL, CONSERVATION, CHANGE PROFILE, SCALE, EVOLUTION
- HANDS-ON & MINDS-ON
- LEARNING IN AND OUT OF CLASS



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# CREATIVE-PRODUCTIVE TEACHING

- CONSTRUCTIVISM BASED
- MODIFICATION OF LEARNING CYCLE
- APPLICATION OF ASSIMILATION-ACOMODATION
- CONCEPT APPLICATION (INTERPRETATION & RE-CREATION)
- CRITICAL & CREATIVE THINKING AS NURTURANCE EFFECT



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# HIGHER ORDER THINKING SKILL TEACHING

- HIGHER ORDER THINKING SKILLS AS NURTURANT EFFECT
- THINKING SCIENCE DEVELOPMENT: GENERIC SCIENCE SKILLS
- ICT BASED LEARNING



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**THANK YOU!**

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