MEXT MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY-JAPAN

SEAMEO-Japan ESD Award

Theme for 2012: Education for Disaster Risk Reduction

Supporting Partners:

UNESCO Bangkok Office Asia and Pacific Regional Bureau for Education

Bank of Tokyo-Mitsubishi UFJ

REDUCE THE RISK OF NATURAL DISASTER LANDSLIDES AND FLOODING WITH TREE PLANTING AND HOLE PORE LAND

BY:

KOSASIH

SEKOLAH MENENGAH KEJURUAN NEGERI MODEL GORONTALO

GORONTALO MODEL VOCATIONAL HIGH SCHOOL

JL. SAPTA MARGA DESA PANGGULO, KECAMATAN BOTUPINGGE

KABUPATEN BONE BOLANGO, PROVINSI GORONTALO

PART I: Details of Your School

1. Name of your school: SEKOLAH MENENGAH KEJURUAN NEGERI MODEL GORONTALO
2. Full address: JL. SAPTA MARGA DESA PANGGULO, KECAMATAN BOTUPINGGE KABUPATEN BONE BOLANGO, PROVINSI GORONTALO
3. Postcode: 96183
4. Country: INDONESIA
5. Telephone number (country code+city code+telephone number): 62 0435 829948
6. Fax number (country code+city code+fax number):
7. Name of the Head Master/ Principal/ School Director:
   RISMAN ABDULLAH HUSAIN, M.Si
8. Name of Teacher Coordinator: KOSASIH, S.Pd
9. Email address: allinshash@gmail.com
10. School website (if available):
11. Educational level (Such as Kindergarten 1 to Grade/Year 9): VOCATIONAL HIGH SCHOOL
12. Number of teachers in your school: 39 teachers
13. Number of students in your school: 365 students
14. Please provide the name of teachers and students who were/have been involved in the planning and implementation of this school activity/programme on Education for Disaster Risk Reduction.

    Teachers:
    a) KOSASIH , S.Pd
    b) IMAM MUSTAKIM, S. Hut
    c) NIKSWANTO HAPULU, S. Pd
    d) ABDUL WAHID LABUNA, S. Pi
    e) NURAIN DJAFAR, S.Pd
    f) Dra. HURAENI
    g) KAHARUDDIN A. HAFIED, S. Pd
    h) SULEMAN G. AHMAD, S. Pd
    i) ZAINURDIN BILONDATU, S. Pd
    j) NURWATI, S. P
    k) ISWAN BAU, S.Pd
    l) HADJARA S. DETI, S.Pd…

    Students:
    a) MOH. SAEFULLAH HIOLA
    b) RONALDI RAHMAN
    c) RISKAWATI DAUD
    d) YAHYA ZULFIKAR
    e) FATMAWATI HASAN
    f) NOVRIYANTI ISIMA
    g) ABDUL RAHIM LASALUSU
    h) ALDI PAKAYA
    i) TRIA APLILIA NENTO
    j) IRNAWATI HUSAIN
    k) RISKI K. HULU
    l) MOH. AFANDI ISMAIL
    m) SULVANA S. KASUMA
    n) SUWARDI RAHMAN
    o) M. ERIK BARUADI
    p) FATMAWATI LAJIJI
    q) MARYAM DIDIPU
    r) HABIBA Y. TASDI
    s) SANTIKA TALIB
    t) NURHAYATI LAJIJI

PART II: Information about the School's Activity/Programme on Education for Disaster Risk Reduction

The information of part II from no.1 to 11 should be no longer than **eight** pages long (A4 type, Arial font, size 11 point). A half to one page A4 of the project summary should be included.

1. Title of the school's activity/programme on Education for Disaster Risk Reduction

REDUCE THE RISK OF NATURAL DISASTER LANDSLIDES AND FLOODING WITH TREE PLANTING AND HOLE PORE LAND

2. Summary of the activity/programme (a half to one page A4)

With topography where we live is hilly slope bare without any plants with more than 10 degrees, teacher friends are motivated to make a positive contribution to the natural environment and surrounding communities. At the beginning of the school year (2008). School curriculum launched in an integrated learning environment. In addition, we established a forum called the ”GREEN EARTH” Environmentalist Club.

Its members are the result of recruitment of students who have strong motivation to be active in extra-curricular activities (outside of school hours learning). Activities of the group "GREEN EARTH". the conduct of research and experiment, especially the problem of waste, crop planting, and environmental action. Motivation is the driving force of all students in school.

School as a formal institution curriculum design facilitates integration with environmental and public relations through cooperation with relevant agencies and stakeholders

Some of the institutions and stakeholders that have been forged with the deed of partnership is

- ✓ The School Committee,
- ✓ Local Government (Village And District),
- ✓ Agency For Environmental Research And Information Technology Gorontalo Province.
- ✓ Ministry Of Agriculture And Food Security Gorontalo Province.
- ✓ Ministry Of Forestry And Marine Gorontalo Province
- ✓ Nursery Entrepreneurs As The Province Of Gorontalo
- ✓ Ministry Of Education And Cultural Districts, And The Province Of Gorontalo Bone Bolango
- ✓ Etc

Several activities have been carried out are:

- ✓ Planting shade trees / greening
- ✓ Planting trees productive plants (fruits)
- ✓ Research waste for fertilizer
- ✓ The study of plant adaptation
- ✓ Preparation of the soil pore holes
- ✓ Greening plant nurseries
- ✓ Counseling public guidance
- ✓ Etc.

3. Background information or reasons why the school initiated this activity/programme

Our residence of Regional (Botupingge) hilly topography and slope over 20 degrees, the ground rocky, sandy and rare plants grow, so when the rain came down with a high intensity soil surface eroded. It thus may cause landslides and flooding by carrying material mud, sand and gravel to rock

Awareness of the surrounding community who are less concerned with the environment. Where people are less motivated to plant trees / greening of open land it is also a habit of removing the livestock (cattle and goats) in the open and residential areas. So many new plants that grow off the cattle eat.

School as a formal institution, in which there are student learners and teachers as educators are expected to change the mindset of society and the environment. Students who are educated and trained have skills and knowledge and attitude are expected to be ambassadors of change towards a better present and future as a member of the community.

Activities and ideas can be implemented successfully if integrating between schools, communities and institutions concerned .. These activities need to be a spirit, the cost, time and patience from activists. These partners need to achieve all that

4. Objectives/goals of the activity/programme

Objectives/goals of the activity/programs are

- The creation of a comfortable living environment and safe from natural disaster concerns
- Minimize the presence of natural disasters in the form of floods and landslides
- People have become aware and concerned with the environment
- Spread the eco-activist and motivator through students and alumni
- Students and teachers to be trained in research

5. Period of time when this activity/programme was/has been implemented

This environmental care program activities carried out since 2008 until now (2012)

6. Activities (Short-term actions and strategies of implementation of the short-term actions)

Short-term actions

1. Integration program in the curriculum
2. Extracurricular activities guidance on the core group of students joined in the "GREEN EARTH" Environmentalist Club
3. Conducting the practice, research and experiments both in teaching and learning activities and extracurricular activities
4. Following the contests of the research district, provincial and national level
5. Conduct field studies to several places who related program activities
6. Conducting social activities involving all students and teachers are also regular activities or special groups

strategies of implementation of the short-term actions:

1. Integration program in the curriculum

Hold meetings subject teachers (Musyawarah Guru Mata Pelajaran/ MGMP) and workshops led by the principal every new school year begins. In this MGMP & workshop school and make the program the next year and annual evaluations have been conducted. In this activity, socialization programs and job creation programs subject teachers and learning tools. Sync program supervisor / coach of "GREEN EARTH" Environmentalist Club with school programs and other teachers work program. Special science teacher (Physical Sciences / IPA) program implementation in the syllabus, lesson plans and teaching tools.

2. extracurricular activities guidance on the core group of students joined in the "GREEN EARTH" Environmentalist Club

Guidance to the student members of the "GREEN EARTH" Environmentalist Club is scheduled once a week. However it can be done more incidental one time, it depends on circumstances. The guidance is a member of "GREEN EARTH" Environmentalist Club given additional insight into the environment, conduct research and administrative skills of the existing devices in this activity is a member, attendance list, journal of activities and work programs. that require a long time, for example planting/ greenery on the hillside needed regular maintenance. When the plants die the party responsible for an obligation to replant. Currently each member of the group "GREEN EARTH" must maintain the plant at least five trees every year in area campus. Grow fond of that slogan GREEN EARTH ".

3. Conducting the practice, research and experiments both in teaching and learning activities and extracurricular activities

Science learning activities (Natural Sciences) in the class a little more practice and theory. Specifically incorporated in the "GREEN EARTH" Environmentalist Club conduct practical experiments and research activities outside of school hours. Experimental and special research of crop cultivation, and waste . Some research has been done as follows:

- Liquid organic fertilizer from fish waste; used for crops on barren lands

- Organic fertilizer tablet of livestock and fish waste
- Starter microbes from waste coconut water
- Plant *Samanea saman* as a pioneer plant in the ground barren soil erosion prevention
- Etc.

Practical activities carried out mass care for the environment by all students with student coordinator of the members "GREEN EARTH" Environmentalist Club of which are:

- Nursery plants
- Planting shade trees on the campus land area
- Planting fruit trees in the campus area of conservation land
- Making a hole in the sloping lands pore
- Maintenance of plant (fertilizing, watering and cleaning of weeds)
- Planting greenery along the way Botupingge
- Etc.

4. Following the contests of the research district, provincial and national level

A number of 20 active members (in 2012) is divided into 5 groups to do simple research. Research and experiments conducted by the "GREEN EARTH" Environmentalist Club, exposed through the competition of scientific works and the appropriate technology race. Event race that had followed the district, provincial and national levels. The move follows the race begins with the research / practice / experiment, writing scientific papers, presentations.

5. Conduct field studies to several places who related program activities

In order for students to have broader horizons and a high concern for the environment, students are members of the group conduct field trip. Object of the visit that is where the exploration of sand and rock in hills (mining quarrying C), barren hills, lading farmer on the hillside, the location of landslides, flood disaster, the final waste disposal sites (landfill), market, factory / industry, etc.. Object field visits / field of study is to explore the place of inspiration and ideas. Completion of the visit the students have to make statements/ report of work.

6. Conducting social activities involving all students and teachers are also regular activities or special groups

Social activities involving all students are usually in the specific events, such as national holidays and important days of the world. (Example: national education day, environment day, earth day, the birthday of the district, etc.). Social activities are conducted are planting shade trees on the roadside, the distribution of seedlings to villagers, guidance and education about natural and environmental disasters

7. Resources used for implementing the activity/programme

Resources used in the implementation of environmental care are:

- ✓ The program curriculum is tailored to the natural conditions of the local environment
- ✓ Learning device that supports the implementation of activities
- ✓ Power discipline science educators from a variety of (normative teacher, adaptive teachers / science teachers and productive /vocational teacher) are always working together and teamwork.
- ✓ Partners, namely the business community and relevant agencies
- ✓ Equipment and materials needed for activities and facilities
- ✓ All students and students as the motor nuclei and other students model
- ✓ Etc.

8. Monitoring and evaluation mechanism and results

Any activity that involves all students or members of the "GREEN EARTH", always equipped with the administration of the list of participants, attendance lists and worksheets. Division of the working group needs to be done, and to facilitate the supervision of each end of the evaluation is to check the work and the report of the working group coordinators.

Special tree planting activities in the action every teacher guiding students at least three members of the "GREEN EARTH" and fostering non-member student group 15-20 students

The role of the supervising teacher / coordinator to the guidance and supervision of work group members. Routine evaluation meetings every month, every three months and the final meeting of the semester.

To measure the progress of the activities is to evaluate the work program. What percentage of programs that can be implemented, what percentage of the work program is not implemented, what are the obstacles that hinder the program is not implemented.

9. List of partners, local government bodies, companies or development agencies who participated in the planning and implementation, including their roles in the activity/programme.

Name of Partners	Roles or contributions
a) the School Committee	financing activities
b) Local Government (village and district),	Application of local regulations for public policy
c) the Environment Agency for Research and Information Technology Gorontalo Province	Providing data and information
d) Ministry of Agriculture and Food Resilience Gorontalo province.	Provision of seeds
e) The Ministry of Forestry and Marine Gorontalo Province	Licensing location / forest land
f) Nursery /Plants Seeds Entrepreneur in Gorontalo Province	Provision of seeds and place of practice
g) Ministry of Education and Culture District, Bone Bolango And Gorontalo Province	Responsible and policy

10. Benefits/impacts of the activity/programme to teaches, students and the community

Benefits/impacts of the activity/programs to teaches:

1. More innovative and creative teacher to teach about the environment and Reduce The Risk Of Flooding And Landslides Natural Disaster
2. Teachers can develop their knowledge.
3. Teachers can establish cooperation and brotherhood
4. Teachers will continue to be motivated to innovate in teaching

Benefits / Impacts of the activity / program to students:

1. Learn to care about the environment, appreciate and maintain the grace of God, thus increasing the faith and devotion to God Almighty. .
2. Develop spirit of cooperation, creativity, and innovation
3. Students learn to organize and self-learning in practice.
4. Student learning more fun, more free and creative expression. Learning is not always in the classroom
5. Can arouse students' scientific attitude because the students are trained to write reports practice / research, conducted literature review and present
6. Students likes to grow.
7. Learning more meaningful for students, because students learning by doing.

.

Benefits / Impacts of the activity / program to the community:

1. People are starting to realize the care environment
2. Society likes to grow.
3. Most of the people already know not to remove the cattle, as it can damage plants
4. The public to get information about the disaster and prevent it
5. More comfortable living environment for many plants.
6. Beside of village road has green, because several area planted *Samanea saman* tree.

11. Plan for sustainability and plan for the future

Plan for sustainability:

1. Conducting research and studies
2. Planting fruit trees on the campus and surrounding area
3. Making holes more soil pore
4. Competition the care environment poster for primer school (SD) and secondary/ high school students.

Plan for the future:

1. Doing greening (a forestation) on the hills are still rugged
2. Reforesting barren hills and slopes.
3. Every village there are environmental groups
4. Make the collection of forest / Botanic Garden
5. Botupingge become green city

12. List of attachments such as a copy of learning/ teaching materials, samples of student worksheet, manual, etc.

Attachment 1) Syllabus science subjects mater (IPA)
Attachment 2) Example, Lesson Plans
Attachment 3) Worksheet For Students; Topographic Practice
Attachment 4) Manual Work Sheet; Fish Waste Processing to Organic Fertilizer
Attachment 5) Format of Journal Of Activities "GREEN HEART"
Attachment 6) List of activity Students "GREEN HEART"

13. Photos related to the activity/programs (The school can provide the related photos as many as you can)

Photo1

Hilly topography of the land-Hill
Landslide hazards / erosion in the sub district. Bone Bolango Gorontalo)

Photo 2

When the Rain Brings Floods Material Mud, Sand and Stone

Photo 3

Learning atmosphere Science / IPA In Classroom.

Learning out classroom, students are happy

Photo 4

Utilizing Fish Waste In The Market For Research Fertilizer Plant in arid land
Presentation of Research In Competition Events Science And Environment

Photo 5

Making holes Pori Land can stop run off carrying top soil and maximal infiltration
Tree planting on Sloping Land

Photo 6

seedlings must be protection from livestock (cattle and goats)

Samanea saman Plant Age 2 Years, thrives

Photo 7

field trip to coconut nursery.

Several members and coordinator the "GREEN EARTH" Environmentalist Club

Photo 8

Seedling for greening land

Learning in laboratory several activity "GREEN EARTH" Environmentalist Club

Photo 9

Production of organic fertilizer tablets, to foster the greening plants

Photo 10

Planting jack fruits.

Coach give instruction planting

Photo 11

Seedling for greening land from partner

Evaluation report activity of "GREEN EARTH" Environmentalist Club

Attachment 1) Syllabus science subjects (IPA)
Lampiran 1

SILABUS

NAMA SEKOLAH : SMK NEGERI MODEL GORONTALO
MATA PELAJARAN : ILMU PENGETAHUAN ALAM
KELAS/SEMESTER : XI/ 1 dan 2
STANDAR KOMPETENSI : Memahami polusi dan dampaknya pada manusia dan lingkungannya
KODE KOMPETENSI : 2
ALOKASI WAKTU : 64 x 45 Menit

KOMPETENSI DASAR	INDIKATOR	MATERI PEMBELAJARAN	KEGIATAN PEMBELAJARAN	PENILAIAN	ALOKASI WAKTU			SUMBER BELAJAR
					TM	PS	PI	
2. 1 Mendeskripsikan cara-cara menangani limbah	- Pemilihan metode penanganan limbah sesuai dengan sifat dan wujud limbahnya dilakukan dengan benar. - Pembuatan kompos dari limbah padat industri berbahan baku / pasar/ rumah tangga dilakukan dengan baik. - Pedaurulangan kertas dilakukan dengan baik. - Pembuatan model penanganan limbah berdasarkan hasil studi di lingkungan kerja dilakukan dengan baik.	Cara-Cara Penanganan Limbah	- Membuat karya ilmiah tentang cara penanganan limbah melalui pengkajian literatur dan kunjungan ke industri yang memiliki instalasi pengolahan limbah. - Melakukan studi literatur untuk mencari cara membuat kompos dan kertas daur ulang. - **Praktik membuat kompos dari limbah alami**. - Praktik membuat kertas daur ulang. - Membuat model penanganan limbah berdasarkan hasil studi di industri. - Diskusi dan informasi tentang penanganan limbah, pembuatan kompos, pembuatan kertas daur ulang, dan model penenganan limbah	- Tugas - Penilaian proses.	2	5 (10) 6 (12) 6 (12) 6 (12) 14 (28)	10 (40)	- Buku atau Media Lain yang Relevan - Lingkungan Kerja

Attachment 1. Syllabus Science Subjects (IPA)
Lampiran 1

SILABUS

NAMA SEKOLAH : SMK NEGERI MODEL GORONTALO
MATA PELAJARAN : ILMU PENGETAHUAN ALAM
KELAS/SEMESTER : XII/ 1 dan 2

STANDAR KOMPETENSI : Memahami komponen ekosistem serta peranan manusia dalam menjaga keseimbangan lingkungan dan Amdal
KODE KOMPETENSI : 3
ALOKASI WAKTU : 64

KOMPETENSI DASAR	INDIKATOR	MATERI PEMBELAJARAN	KEGIATAN PEMBELAJARAN	PENILAIAN	ALOKASI WAKTU			SUMBER BELAJAR
					TM	PS	PI	
3.1 Mengidentifikasi komponen ekosistem	- Komponen-komponen ekosistem diidentifikasi berdasarkan lingkungan sekitar - Komponen biotik dan abiotik diidentifikasi berdasarkan fungsinya. - Jaring-jaring makanan dalam ekosistem diidentifikasi berdasarkan rantai makanan - Mengatasi masalah lingkungan dengan menggunakan konsep rantai makanan - Interaksi antar komponen biotik dalam bentuk mutualisme, komensalisme, dan parasitisme diidentifikasi melalui kegiatan penelitian di lapangan. - Peran komponen biotik dan abiotik dijelaskan berdasarkan data hasil praktikum.	- Komponen-Komponen Ekosistem - Interaksi komponen-komponen ekosistem - Jaring-Jaring Makanan dan Rantai-rantai makanan - Bentuk interaksi antar komponen biotik - Peran komponen biotik dan abiotik dalam kehidupan	- Mengamati lingkungan sekolah secara berkelompok. - Mencatat makhluk hidup dan tak hidup yang ada di lingkungan sekolah. - Mengelompokkan makhluk hidup dan tak hidup dari hasil pengamatan. - Diskusi dan tanya jawab tentang pengertian lingkungan dan komponen penyusunnya. - Menunjukkan komponen lingkungan biotik dan abiotik dari hasil pengamatan kelompok. - Mendefinisikan pengertian komponen biotik dan abiotik serta menyebutkan contohnya. - Melakukan kajian pustaka untuk membedakan istilah-istilah habitat, populasi, komunitas, ekosistem, biosfer. - Mengidentifikasi hubungan proses makan dan dimakan dalam rantai makanan dan jaring-jaring makanan dengan menggunakan gambar. - Disajikan suatu kasus misalnya mewabahnya hama tikus. Menganalisis bagaimana pemecahan masalah tersebut dengan menggunakan konsep rantai makanan. - Diskusi dan tanya jawab tentang fungsi, dan	- Observasi/ pengamatan - Laporan praktikum - Test sikap terhadap pengelolaan lingkungan	1	3		- Buku pelajaran - Referensi lain. - Lingkungan sekolah - Alat&Bahan Praktik

KOMPETENSI DASAR	INDIKATOR	MATERI PEMBELAJARAN	KEGIATAN PEMBELAJARAN	PENILAIAN	ALOKASI WAKTU			SUMBER BELAJAR
					TM	PS	PI	
			interaksi antar komponen biotik. - Membandingkan Interaksi antar komponen biotik dalam bentuk mutualisme, komensalisme, dan parasitisme dengan kegiatan penelitian di lapangan, atau berdasarkan studi literatur. - Melakukan praktikum tentang peran komponen biotik dan abiotik dalam kehidupan, misalkan **praktikum mengukur kemiringan lahan**. - Mengaplikasikan pemahaman tentang fungsi komponen biotik dan abiotik dalam kehidupan dengan cara membersihkan lingkungan dan **menanam pohon-pohonan** di sekolah.					

Keterangan:
TM : Tatap Muka
PS : Praktik di Sekolah (2 jam praktIk di sekolah setara dengan 1 jam tatap muka)
PI : Praktek di Industri (4 jam praktIk di Du/Di setara dengan 1 jam tatap muka)

Attachment 2. Lesson Plans (Science / IPA)

Lampiran 2

RENCANA PELAKSANAAN PEMBELAJARAN

Nomor : 01

Nama Sekolah	:	SMK Negeri Model Gorontalo
Mata Pelajaran	:	IPA (Ilmu Pengetahuan Alam)
Kelas/Semester	:	X / 1
Pertemuan ke	:	1
Alokasi Waktu	:	2 jam pelajaran

Standar Kompetensi : Memahami gejala-gejala alam melalui pengamatan.

Kompetensi Dasar : Mengidentifikasi obyek secara terencana dan sistematis untuk memperoleh informasi gejala alam biotik.

Indikator :

- Langkah-langkah metode ilmiah diijelaskan dan masing-masing diberikan contohnya
- Gejala-gejala alam biotik di lingkungan sekitar diidentifikasi secara cermat dan masalah yang ditemukan dirumuskan dengan jelas.
- Hipotesis disusun sebagai solusi terhadap masalah yang telah dirumuskan. Rumusan hipotesis memperlihatkan hubungan antar variabel.
- Rencana penelitian disusun dengan varibel-variabel (manipulasi, respon, dan kontrol) yang akan diukur, prosedur, cara pengumpulan data dan mengolah data diuraikan dengan jelas.
- Variabel-variabel penelitian diperlakukan dan diukur dengan teliti/akurat, diolah serta simpulan yang dibuat sesuai dengan data.
- Laporan penelitian ditulis, dikomunikasikan dan hasilnya dipertahankan dengan argumentasi yang sesuai.

I. Tujuan Pembelajaran

- Siswa dapat menjelaskan langkah-langkah metode ilmiah beserta masing-masing contohnya
- Siswa dapat mengidentifikasi gejala-gejala alam biotik di lingkungan sekitar secara cermat dan merumuskan masalah yang ditemukan dengan jelas.
- Siswa dapat menyusun hipotesis sebagai solusi terhadap masalah yang telah dirumuskan dengan memperlihatkan hubungan antar variabel.
- Siswa dapat menyusun rencana penelitian dengan variabel-variabel (manipulasi, respon, dan kontrol) yang akan diukur, dan dapat menguraikan dengan jelas prosedur, cara pengumpulan data dan mengolah data.
- Siswa dapat memperlakukan dan mengukur pengolahan variabel-variabel penelitian dengan teliti/akurat, serta membuat kesimpulan yang dibuat sesuai dengan data.
- Siswa dapat menulis dan mengkomunikasikan laporan penelitian dan mampu mempertahankan hasilnya dengan argumentasi yang sesuai.

II.Materi Pokok

- Metode ilmiah
- Perumusan masalah
- Perumusan hipotesis
- Perancangan penelitian
- Pelaksanaan penelitian
- Pelaporan penelitian

III. Metoda Pembelajaran

- Guru menerangkan tentang: metode ilmiah, cara-cara identifikasi langkah-langkah ilmiah berikut contohnya
- Guru dan siswa melakukan pengamatan gejala alam biotik di lingkungan sekitar (perilaku maupun keadaan hewan, tumbuhan, dan mikroorgamisme baik pada individu maupun dampak dari perilaku individu itu. Misalnya, luruhnya bunga sebelum waktunya pada tanaman tertentu, hilangnya populasi katak di suatu kawasan, dsb).
- Diskusi kelompok untuk:
    - Merumuskan masalah dari temuan gejala alam biotik di lingkungan sekitar sebagai isyu yang perlu dibahas selanjutnya.
    - Melengkapi informasi, baik dengan melakukan pengamatan yang lebih cermat di lokasi sesuai dengan masalah yang dirumuskan, ataupun studi pustaka di perpustakaan/ internet.
    - Informasi itu selanjutnya digunakan untuk membuat hipotesis.
    - Menyusun rencana penelitian.
- Melakukan penelitian sesuai dengan rencana yang disusun.
- Mengkomunikasikan hasil penelitian.

IV. LANGKAH-LANGKAH PEMBELAJARAN

Kegiatan Awal:

1. Guru dan siswa berdoa bersama
2. Absensi kehadiran siswa
3. Guru memberikan pendahuluan tentang apa yang akan dibahas

Kegiatan Inti:

1. Guru menerangkan tentang metode ilmiah berikut identifikasi langkah-langkah ilmiah beserta contohnya.
2. Guru memberikan bimbingan dalam melakukan pengamatan gejala alam biotik di lingkungan sekitar.
3. Guru dan siswa melakukan pengamatan gejala alam biotik di lingkungan sekitar.
4. Guru dan siswa membahas hasil pengamatan gejala alam biotik di lingkungan sekitar.
5. Membuat kelompok kerja siswa yang terdiri dari 6 orang dan melakukan diskusi untuk:
    - Merumuskan masalah dari temuan gejala alam biotik di lingkungan sekitar sebagai isyu yang perlu dibahas.
    - Membuat rencana dalam hal melengkapi informasi, baik dengan melakukan pengamatan yang lebih cermat di lokasi sesuai dengan masalah yang dirumuskan, ataupun studi pustaka di perpustakaan/internet.
    - Membuat hipotesis

- Menyusun rencana penelitian.
- Memberikan batasan pokok bahasan masing-masing kelompok dengan tema:
  - Reboisasi
  - Banjir
  - Tanah Longsor
  - Tsunami
  - Gempa Bumi
  - Kebakaran Hutan
  - Pencemaran Lingkungan

Penutup:

1. Membuat rangkuman tentang apa yang telah dipelajari.
2. Memberi PR.
3. Memberikan tugas kelompok yang telah dibentuk selama kegiatan inti berupa penyusunan makalah untuk dikumpulkan dan dalam keadaan siap didiskusikan pada pertemuan berikutnya.
4. Guru dan siswa berdoa bersama.

V. Sumber dan Media Pembelajaran

1. Lingkungan
2. Buku sumber
3. Internet

VI. Evaluasi

1. Tuliskan dan jelaskan langkah-langkah ilmiah dalam melakukan sebuah penelitian.
2. Jelaskan bagaimana umumnya proses terjadinya penyebaran suatu penyakit.
3. Jelaskan bagaimana umumnya langkah-langkah pencegahan terjadinya penyebaran/ penularan suatu penyakit

BENTUK MAKALAH:

COVER

DAFTAR ISI

A. PENDAHULUAN
B. METODE ILMIAH
   1. TEORI
   2. DATA/INFORMASI KASUS
C. LATAR BELAKANG MASALAH
D. HIPOTESIS
E. HASIL PENELITIAN
   1. RANCANGAN PENELITIAN
   2. PELAKSANAAN PENELITIAN
F. KESIMPULAN

Gorontalo, Juli 2011

Mengetahui,

Kepala SMK Negeri Model Gorontalo

Guru Mata Pelajaran,

Attachment 3. Work Sheet For Students; topographic practice

Lampiran Lembar Kerja Sirwa

MENENTUKAN TOPOGRAFI

1. Ringkasan Materi

Topografi adalah gambaran permukaan bumi/lahan yang terdapat di suatu areal tertentu. Berdasarkan kondisi topografi maka lahan dibedakan menjadi beberapa kelas, yaitu datar, landai, berombak, bergelombang, berbukit, bergunung. Klasifikasi kemiringan :

- datar atau kemiringan 0 - <3% / 2,7º
- landai(agak miring) 3 - < 8% / 7,2º
- berombak (miring) 8 - < 15% / 13,5º
- bergelombang (agak terjal) 15 - < 25% / 22,5º
- berbukit (terjal) 25 - < 40% / 36º
- bergunung (curam) > 40% / >36º

Semakin miring suatu lahan akan manimbulkan :

1. Memperbesar jumlah aliran permukaan
2. Memperbesar kecepatan aliran permukaan
3. Memperbesar energi angkut air.
4. Jumlah butir-butir tanah yang terpecik ke bawah oleh tumbukan butir hujan semakin banyak.

2. Tujuan

siswa dapat menguraikan tentang topografi, macam-macamnya dan akibat yang timbul pada lerang yang semakin miring.

siswa dapat mengukur kemiringan dan derajat kemiringan lahan

3. Sumber Belajar
   a. Modul menyiapkan lahan.
   b. Power point tentang topografi
   c. Rol meter
   d. Patok bambu
   e. Busur derajat

4. Cara kerja
   1. Baca modul dan petunjuk kerja.
   2. Siapkan alat dan bahan yang diperlukan
   3. Carilah lokasi yang agak miring
   4. Tancapkan patok bamboo di bagian atas lahan
   5. Tarik dua benang ke lereng bawah sepanjang 100 meter, satu benang mengikuti keadaan kemiringan lereng dan satu lagi mengikuti rata air.
   6. Ukur sudut kemiringan dengan menggunakan musur. Catat derajat kemiringannya dan beda tinggi benga rata air dan benang rata lereng.
   7. Diskusikan dan buat laporan kerja..
   8. Jawab pertanyaan berikut :
      Sebutkan akibat yang akan muncul pada lerang bila derajat kemiringan semakin besar?

Attachment 3. Evaluation From Work Sheet

LEMBAR EVALUASI

.

Petunjuk :

1. Lembar instrumen ini digunakan selama peserta didik melakukan kegiatan Praktik.
2. Isi lembaran ini untuk memberi skor peserta didik selama melakukan prkatik
3. Rentang skor antara 1 - 4 dengan perincian :
   1 = kurang
   2 = sedang
   3 = baik
   4 = amat baik

Hari, Tanggal :

Judul Kegiatan :

Kelas :

Kelompok :

Anggota Kelompok : 1.
2.
3.
4.
5.
6.

Daftar Asesmen Tugas Kinerja (DATK)

No	Aspek Psikomotorik yang Diamati	Skor				Jumlah
		1	2	3	4	
1	Kemampuan mengolah data dari berbagai sumber					
2	Kemampuan kerja sama					
3	Kemampuan menyiapkan menggunakan alat					
4	Kecepatan kerja /sigap/ cekatan					
5	Kemampuan menyusun laporan sesuai format yang telah ditentukan					
	Jumlah					

Nilai

Botupingge, 2011
Guru Pengamat/MP,

$N = \frac{\text{Jumlah Skor Capaian}}{\text{Jumlah Skor Maksimal}} \text{ X } 100\%$

$N = \frac{\cdots\cdots\cdots}{20} \text{ X } 100\% =$

Attachment 4. Manual Work Sheet, Fish Waste Processing to Organic Fertilizer

Lampiran Manual/ Petunjuk Kerja Pembuatan Pupuk Organik Limbah Ikan

.

PETUNJUK KERJA PEMBUATAN PUPUK CAIR DARI LIMBAH

A. Bahan dan Alat

BAHAN :

1. MBio = 400 cc
2. Air kelapa = 2.000 cc
3. Limbah ikan laut = 5 kg
4. Air cucian beras = 2.000 cc
5. Air = 7.000 cc
6. Molase = 100 cc

ALAT :

1. Ember 20 Liter
2. Gelas Piala 1.000 Cc
3. Jerigen 20 Liter
4. Gelas Ukur
5. Corong plastik besar
6. Pengaduk
7. Termometer
8. Kain kasa

B. Tahapan Pembuatan Pupuk Cair Organik Limbah Ikan

1. Pengumpulan dan Pemilahan limbah ikan
2. Pada tahap ini dilakukan pemisahan limbah ikan dari sampah anorganik atau bahan selain limbah ikan. Pemilahan harus dilakukan dengan teliti karena akan menentukan kelancaran proses dan mutu pupuk cair yang dihasilkan
3. Pengecilan Ukuran
   - Pengecil ukuran dilakukan untuk memperluas permukaan limbah, sehingga limbah ikan dapat dengan mudah dan cepat didekomposisi dan ekstrasi.
4. Pembuatan campuran / larutan
   - bahan-bahan cair berupa air kelapa, molase, air cucian beras serta Mbio dilarutkan terlebih dahulu sebelum ditambahkan kedalam limbah ikan bahan baku pupuk
5. Perebusan limbah ikan
   - setelah dilakukan pencucian bahan limbah ikan direbus menggunakan dandang besar selama 30 menit.
   - Perebusan ini fungsinya untuk mematikan bakteri/ kuman pathogen yang tidak dikehendaki.
6. Pencampuran dan Fermentasi
   - Bahan limbah ikan yang sudah direbus didinginkan pada suhu kamar kemudian ditampung pada ember besar/ tangki yang dipasang keran,
   - pencampuran media fermentasi (Mbio, molase, air kelapa, air cucian beras) sambil dilakukan pengadukan pada ember besar/ tangki.
   - Ember/ tangki ditutup rapat, dibiarkan terjadi fermentasi selama kurang lebih 2 minggu.
7. Pemisahan bahan padat dan cair
   - Setelah fermentasi berjalan 7 – 14 hari, dilakukan pemisahan bahan padat dengan cair, dengan dillakukan penyaringan atau cairan dialirkan melalui keran yang terpasang pada ember/tangki.
   - bahan padat dikeringkan, ini bisa dijadikan kompos, setelah dihancurkan terklebih dahulu.
   - Bahan cair hasil pemisahan / ekstraksi diendapkan selama 24 jam. Bagian bening cairan / ekstrak dimasukkan kedalam wadah gelas/ toples.

8. Fermentasi ke 2
    - Fermentasi tahap ke 2 dilakukan pada ekstrak hasil pengendapan ditambah mbio 5 % dan molase 10 %.
    - Fermentasi tahap ke 2 dilakukan untuk mengurangi bau yang tidak enak dan untuk menambahkan mikrobia yang menguntungkan, sehingga pupuk cair organic yang dihasilkan selain mengandung nutrisi dari ekstrak ikan juga mengandung bakteri aktif yang menguntungkan bagi tanah maupun tanaman.
9. Pengemasan dan Penyimpanan
    - Pupuk cair organic yang dihasilkan disaring dan dikemas dalam botol sesuai dengan kebutuhan pemasaran.
    - pupuk cair yang telah dikemas disimpan dalam gudang yang aman dan terlindung dari kemungkinan tumbuhnya jamur dan tercemari oleh bibit jamur, bakteri dan mikroorganisme lain yang tidak diinginkan

Attachment 5. Journal of activity Students “GREEN HEART”

LAMPIRAN 5 JOUNAL KEGIATAN PECINTA ALAM “GREEN HEART”

JOURNAL KEGIATAN
SMK NEGERI MODEL GORONTALO
SEMESTER 1 TAHUN PELAJARAN 2011/2012

PROGRAM STUDI KEAHLIAN : AGRIBISNIS PRODUKSI TANAMAN & TERNAK

KOMPETENSI KEAHLIAN : ATPH, ATR

KEGIATAN ESKUL : PECINTA ALAM “GREEN HEART”

KELAS : X, XI XII.

NO.	PERTEMUAN KE	TANGGAL	KEGIATAN	KETERANGAN
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Gorontalo, 2011

coordinator,

KOSASIH, S.Pd

NIP. 196506221989021002

Attachment 6. List of activity Students "GREEN HEART"

LAMPIRAN DAFTAR HADIR ANGGOTA **ESKUL '' GREEN HEART ''**

DAFTAR HADIR ESKUL '' GREEN HEART ''

SMK NEGERI MODEL GORONTALO

TAHUN PELAJARAN 2011/ 2012

BULAN :

NO.	NAMA SISWA	L/P	KELAS/ PROG	PERTEMUAN										KETERANGAN
				1	2	3	4	5	6	7	8	9	10	
1	MOH. AFANDI ISMAIL	L	XI.ATPH.3											
2	RISKAWATI DAUD	P	XI.ATPH.2											
3	SULVANA S. KASUMA	P	XI.ATPH.3											
4	YAHYA ZULFIKAR	L	X.ATPH.1											
5	SUWARDI RAHMAN	L	X.ATPH.3											
6	FATMAWATI HASAN	P	X.ATPH.1											
7	M. ERIK BARUADI	L	XATPH.1											
8	NOVRIYANTI ISIMA	P	X.ATPH.1											
9	FATMAWATI LAJIJI	P	X.ATPH.2											
10	AB.RAHIM LASALUSU	L	X.ATPH.3											
11	MARYAM DIDIPU	P	X.ATPH.1											
12	ALDI PAKAYA	L	XI.ATPH.3											
13	HABIBA Y. TASDI	P	X.ATPH.2											
14	TRIA APLILIA NENTO	P	X.ATPH.3											
15	SANTIKA TALIB	P	XI.ATPH.2											
16	IRNAWATI HUSAIN	P	X.ATPH.2											
17	NURHAYATI LAJIJI	P	XI.ATPH.2											
18	RONALDI RAHMAN	L	XII.ATPH.2											
19	RISKI K HULU	L	XII.ATPH.2											
20	SAEFULAH HIOLA	L	XII.ATPH.2											

CATATAN PEMBINA:

GORONTALO, 2012

Coordinator,

KOSASIH, S.Pd