

We are inviting you to our upcoming program with anak orang asli

STEM Activity #1

Theme: Science & Engineering (energy, power, & mechanical)

Activity: Design & Build Solar Powered Car

Targets & Objectives

- Build student character in working in group
- Gauge student performance & knowledge
- Teach & guide student in project/gadget development
- Promote renewal energy and mechanical engineering careers

Location: Asrama Darul Falah PERKIM (ASDAF)

Date: March (Saturday 30th)

Time: 9 am - 11 am

Lead: Dr. Habibah

Activity coordinator: Ir. Mah Siew Kien & Ir. Nur Azhani

Member: Ir. Noorfaizah, Ir. Rusnida

Target Group: Orang Asli secondary student Form 1 to Form 5 (57 students)

SDGs Target

- SDG4 Quality Education
- SDG5 Gender Equality
- SDG7 Affordable and Clean Energy: Ensure access to affordable, reliable, and sustainable material & energy
- SDG9 Industry, Innovation, and Infrastructure: Build resilient infrastructure, promote sustainable industrialization, and foster innovation
- SDG10 Reduced Inequality
- SDG11 Sustainable Cities and Communities

Materials

- ❖ Solar panel (standby battery pack & Ammeter)
- ❖ Wires and alligator clips
- ❖ Motor
- ❖ Cardboard/styrofoam/carton
- ❖ Skewer/Ice cream sticks/straw
- ❖ Rubber band
- ❖ Bottle cap/gears/wheels
- ❖ Glue/tape/clips
- ❖ Scissors/cutter

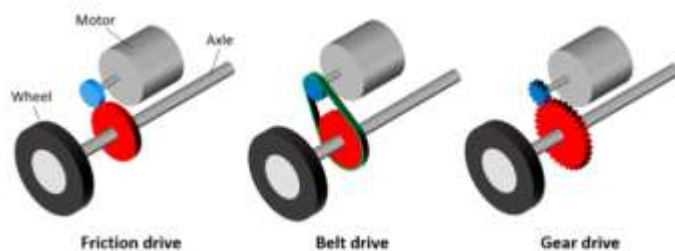
Introduction

Fossil fuels can cause significant pollution and emit greenhouse gases. Introduce renewal energy of solar power, which a clean energy. Make to understand solar power drawbacks on a cloudy day and technology to overcome.

Solar panel convert sunlight into electrical energy will be used to power machines like car. The solar panel need to be connected by wires to form an electrical circuit. A motor can be used to drive the car's wheels.

Typical car basic parts and operation;

- Chassis is the car's frame, or body
- Axles and rigid rods to support the wheels
- Bearings connect the axles to the chassis and allow them to spin
- Motor converts electrical energy from the solar panel into spinning motion with metal shaft that spins
- The transmission transmits rotating motion from the motor's shaft to an axle
- Introduce types of transmission (mechanical);
- In a friction drive, a disk on the motor shaft rubs directly against another disk on the axle
- In a belt drive, a disk on the motor shaft is connected to a disk on the axle by a belt (e.g. a rubber band)
- In a gear drive, a gear on the motor shaft meshes with a gear on the axle



Decision making and evaluation based on science & engineering in making a design and building a solar car;

- Mass and stiffness
Material use for car chassis, different materials have different densities (mass per unit volume) and stiffnesses (resistance to bending/flexing)
- Friction is the force that resists two surfaces sliding against each other'
Sometimes friction is bad—bearings and axles to have as little friction between them as possible, so the axles can spin freely. However, sometimes friction is good—wheels with a lot of friction do not slip
- The gear ratio is the ratio between the diameter of the drive gear on the motor shaft and the driven gear on the axle
For example, if the driven gear is five times bigger in diameter than the drive gear, then whenever the drive gear completes one full rotation, the driven gear will complete 1/5 of a rotation
- Adjusting the transmission ratio allows you to adjust the speed of your motor, measured in rotations per minute or RPM, and the torque of the motor makes car go the fastest
- The angle of the solar panel relative to the sun's rays affects how much electrical power produces

Activity Rundown

Time	Description	Remarks
900 – 905 am	Arrival & setup location	
905 – 915 am	Opening ceremony	
915 – 930 am	Introduction	
930 am	Group breakout	
	Design sketch	
	Build the design	
	Test the design	
1045 am	Competition time	Car to finish line
1100 am	Closing ceremony	

Activity Cost

Itemise	Description	Cost	Remarks
Stationery		-	From IEM
Banner/Bunting		-	Use general WE bunting
Competition Price/Active participant price		-	From IEM
Material	solar car	RM 15/pcs	Quantity 15 pcs

Community Services: charity works

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STEM Activity #2

Theme: Innovation & Creativity (physics & structure)

Activity: Design & Build Structure (bridge/building)

Targets & Objectives

- Build student character in working in group
- Gauge student performance & knowledge
- Teach & guide student in project/gadget development
- Promote civil and structure engineering careers

Location: Asrama Darul Falah PERKIM (ASDAF)

Date: May (Saturday 11th)

Time: 9 am - 11 am

Lead: Dr. Habibah

Activity coordinator: Ir. Sumathi & Ms. Irene

Member: xxxx

Target Group: Orang Asli secondary student Form 1 to Form 5 (57 students)

SDGs Target

- SDG4 Quality Education
- SDG5 Gender Equality
- SDG9 Industry, Innovation, and Infrastructure: Build resilient infrastructure, promote sustainable industrialization, and foster innovation
- SDG10 Reduced Inequality
- SDG11 Sustainable Cities and Communities

Materials

Paper/cardboard/styrofoam/carton

- ❖ Skewer/Ice cream sticks/straw
- ❖ Rubber band/rope
- ❖ Glue/tape/clips
- ❖ Scissors/cutter
- ❖ Weight (for testing)

Introduction

Many factors are considered in engineering and building, the project apply practical physics context design;

- Forces & environmental impact
- Design types
- Tension and torque
- Load, Pressure, compression

Activity Rundown

Time	Description	Remarks
900 – 905 am	Arrival & setup location	
905 – 915 am	Opening ceremony	
915 – 930 am	Introduction	
930 am	Group breakout	
	Design sketch	
	Build the design	
	Test the design	
1045 am	Competition time	Strength test
1100 am	Closing ceremony	

Activity Cost

Itemise	Description	Cost	Remarks
Stationery		-	From IEM
Banner/Bunting		-	Use general WE bunting
Competition Price/Active participant price		-	From IEM
Material	Bridge/building Structure	RM 15/group	Quantity 15 groups

Community Services: charity works

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STEM Activity #3

Theme: Game Development

Activity: Coding & Robotic

Targets & Objectives

- Build student character in working in group
- Gauge student performance & knowledge
- Teach & guide student in project/gadget development
- Promote electronic engineering careers

Location: Asrama Darul Falah PERKIM (ASDAF)

Date: July (Saturday 13th)

Time: 9 am - 11 am

Lead: Dr. Habibah

Activity coordinator: Ms. Choong Pooi Ying & Ir. Noorfaizah

Member: xxxx

Target Group: Orang Asli secondary student Form 1 to Form 5 (57 students)

SDGs Target

- SDG4 Quality Education
- SDG5 Gender Equality
- SDG9 Industry, Innovation, and Infrastructure: Build resilient infrastructure, promote sustainable industrialization, and foster innovation
- SDG10 Reduced Inequality

Materials

- ❖ Computer
- ❖ Robotic

Introduction

Customize robot from design and coding

Activity Rundown

Time	Description	Remarks
900 – 905 am	Arrival & setup location	
905 – 915 am	Opening ceremony	
915 – 930 am	Introduction	
930 am	Group breakout	
	Design sketch	
	Build & coding the design	
	Test the design	
1045 am	Competition time	Innovation & creativity
1100 am	Closing ceremony	

Activity Cost

Itemise	Description	Cost	Remarks
Stationery		-	From IEM
Banner/Bunting		-	Use general WE bunting
Competition Price/Active participant price		-	From IEM
Material	Robotic	RM 25/group	Quantity 15 groups