SANGAM SKM COLLEGE NADI

LESSON NOTES

WEEK 1

BASIC SCIENCE

YEAR 9

Strand 3	**ENERGY**
Sub strand	**3.1 ENERGY SOURCE AND TRANSFER**
Content Learning Outcome	Investigate and categorize different sources, types and forms of energy with their benefits and drawbacks and the significance of the sun as the main source of light and heat.

Energy: Power to do work. Energy measured in Joules (J) unit of energy
Main source of energy is **Sun**

Sources of Energy

1.Firewood (Plants)
2.Wind Energy 1-Generate electricity (wind mill) 2-Sail boats
3.Hydro Power-Force of falling water to general electricity
4.Solar Power-using the suns energy eg.solar cells
5.Geothermal Energy-heat from the earth eg.Hot springs
6.Ocean Thermal Energy-The heat from the earth heats the ocean
7.Nuclear Energy-In atomic bombs and nuclear reactors.

Renewable Energy

Energy that come from the natural source and supply will never run out.

Non Renewable Energy

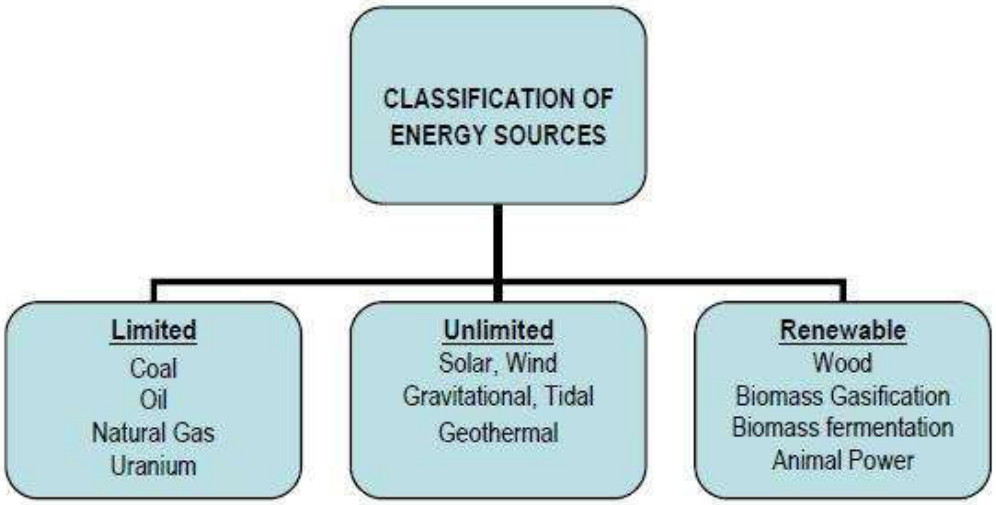
Formed from the organic remains of plants and animals such as coal, oil and gas. If not used wisely supply will run out.

Advantages and Disadvantages of Energy Sources

Source	Advantages	Disadvantages
Firewood	Can be used as fuel in rural areas	Causes destruction of forests Causes pollution
Wind Energy	Pollution free, cost free renewable	Wind not available all the time Can be disastrous during cyclone
Hydropower	Pollution free , Cost free, renewable	Cannot be constructed anywhere Will have an impact on drought.

Solar Energy	Pollution free, Cost free Renewable	High installation cost Will not be able use at night and rainy time
Geothermal Energy	Clean safe reduced Reliance in fossil fuels	May release harmful gases
Ocean Thermal Energy Conservation (OTEC)	Works day and night little ongoing cost	Needs constant supply at warm and cold water Suitable for tropical locations

Classification of Energy Source



Renewable Energy Source - Carries from natural resource, wind, tides, geothermal, biofuel, sunlight, falling water.

Advantages	Disadvantages
It is renewable energy supply, will never run out, cost free	Difficult to generate large quantities
Causes no pollution	Often rules on weather, Un predictable

Non Renewable Sources – Coal, oil, gas.

Advantages	Disadvantages
Easy to transport	Causes pollution when fuel burn
Produces a lot of energy	Not renewable once we've burnt them there isn't any more

Activity: Multiple Choice.
Circle the correct answer.

1. Which of these sources of energy is renewable?
   A. Tides C. Fossil
   B. Coal D. Oil

2. Which of these is a source of non-renewable energy?
   A. Sun. C. Biofuel.
   B. Geothermal. D. Fossils.

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LESSON NOTES

WEEK 2

BASIC SCIENCE

YEAR 9

Strand 3	**ENERGY**
Sub strand	**3.1 ENERGY SOURCE AND TRANSFER**
Content Learning Outcome	Investigate and categorize different sources, types and forms of energy with their benefits and drawbacks and the significance of the sun as the main source of light and heat.

Formation of Fossil Fuels

1. Oil - Formed from the remains of marine organisms in the sea that sink down to the sea bed. It takes millions of years to form.

2. Coal - Formed from the remains of plants on land. It also takes millions of years to form.

Coal Formation

The following diagrams show the stages on the formation of coal and their fuel content:

Copy table from Science Book 1 Lower Secondary pages: 91-92

Fractional Distillation -is used to separate liquids of different boiling points. This petroleum is used to separate different fuels from crude oil.

Crude Oil

↓

Fractional Distillation

-Unleaded -diesel -benzene -alkanes -alkenes -alkynes

Behaviour of Light on Materials

Behaviour of light

- Light is a form of useful energy that supports life.
- It can be detected by our eyes and transferred from one place to another.
- Light does not need a medium to travel in, therefore can travel in a vacuum.

- Light travels in different speeds in different medium. In the same medium, light travels in straight lines.

Ray is used to show direction of light. →
That is why, we are not able to see around.

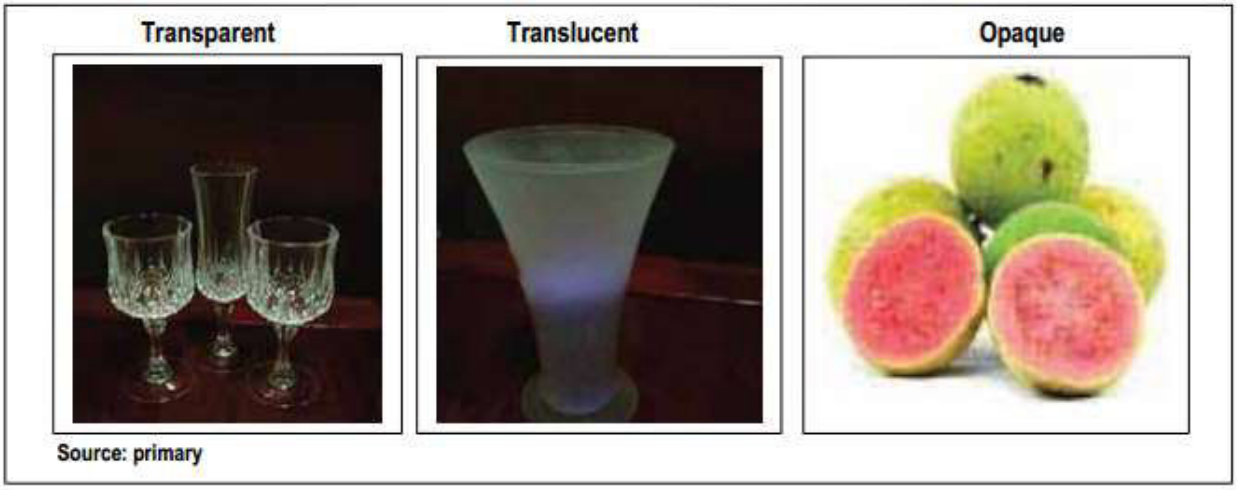
Light and Materials

1. Opaque - substance that does not allow light to pass through and able cannot see through eg: paper, rock, wood, concrete, mirror.

2. Transparent - materials that allow light to pass through and we can see through eg: air, glass

3. Translucent - materials that allow light to pass but we cannot see through eg: tubelight, frosted glass, tracing paper.

Examples:



Activity: Multiple Choice

Circle the correct answer.

1. A clear plastic used to cover books allows light to pass through it. This type of material is called _____.

A. opaque
B. transparent
C. conductor
D. translucent

2. Crude oil formed from the organic remains of prehistoric plants and animals is also known as

A. peat.
B. petroleum.
C. brown coal.
D. anthracite.

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WEEK 3

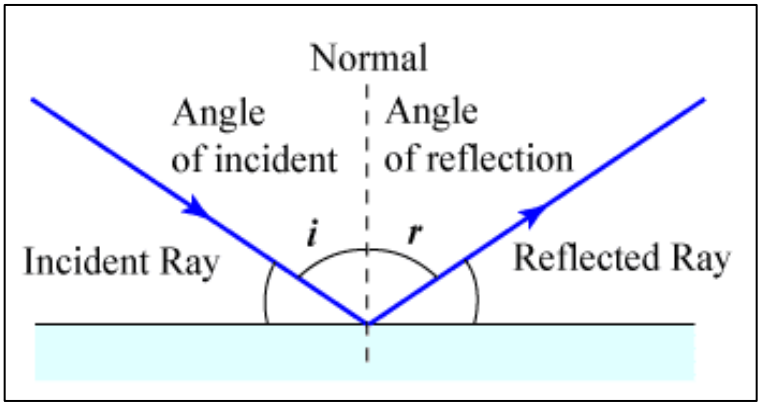
BASIC SCIENCE

YEAR 9

Strand 3	**ENERGY**
Sub strand	**3.1 ENERGY SOURCE AND TRANSFER**
Content Learning Outcome	***S9.3.1.2*** Examine and explore how light behaves on materials, mirrors, and relate it to their uses by conducting simple activities.

Reflection -Bouncing back of light when it hits a surface

Plane Mirror



a. Normal-An imaginary line making an angle of 90 ^{O} with the mirror line (perpendicular)

b. Incident Ray- The ray of light that strikes the surface of the mirror.

c. Reflected Ray-a ray of light that leaves the surface

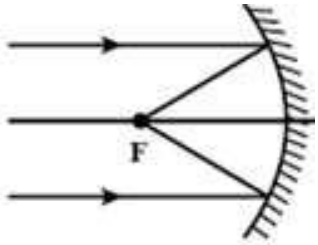
d. Angle of Incidence-Angle between the incident ray and the normal

e. Angle of Reflection-Angle between the reflected ray and the normal.

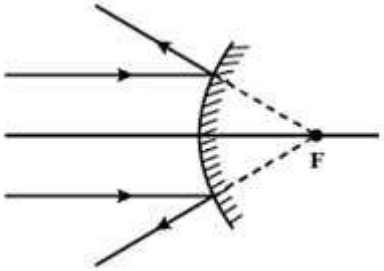
Note

The angle of incidence is equal to angle of reflection.

Concave Mirrors	• This type of mirror focuses light • Reflected rays meet at a point on it lying half way between the centre of curvature and the vertex, called the principal focus. • Image is virtual, magnified if the object is near the mirror. • **Used**-as shaving mirrors, cosmetics, microscopes, dentists mirror, search lights and can head lights.

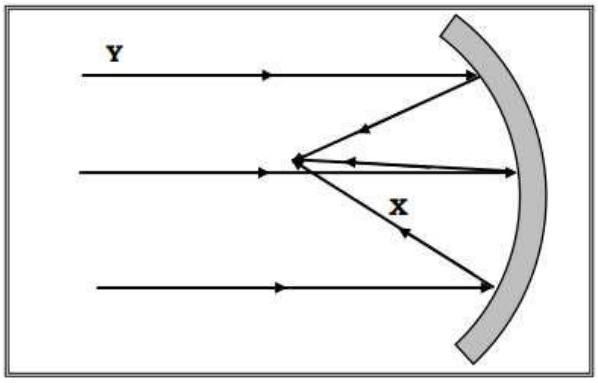


Convex Mirror	• The mirror bulges towards the objects • Image is always smaller than the object and upright. -Gives a wider field of view • Used as security mirrors in shops and rear vision mirrors in cars.



Activity:

1. The diagram below shows reflection of light rays from a mirror. Use it to answer the questions that follow.



(i) Name the type of mirror shown above.

_____

(ii) State which of the two rays, **X** or **Y**, is the

Incident ray: _____

Reflected ray: _____

2. Write two uses of type of mirrors shown in question 1.

Use 1:

_____

Use 2:

_____