




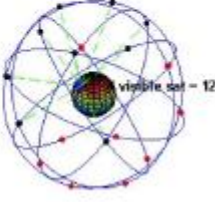


<h2 style="color: red;">Sense of Humour !</h2> 	<h2 style="color: blue;">Creativity Development through SCAMPER</h2>  <ul style="list-style-type: none"> • Substitute • Combine • Adapt • Magnify / Minify • Put to other uses • Eliminate • Rearrange / Reverse <div style="border: 1px solid red; border-radius: 50%; padding: 5px; width: fit-content; margin-top: 10px;"> <p>Thinking -Breaking rules -Brain storming -Connection</p> </div>
<h1 style="color: purple;">SCAMPER</h1> <div style="display: flex;">  <p>This brainstorming technique SCAMPER was created by Alex Osborn, but Bob Eberle developed the name. This method is useful when you want to explore possibilities around a goal or idea. It's good for turning a tired idea into something new and different. It can be used in many creative fields such as making new inventions, fashion designing, cooking recipes, story writing, or just solving everyday problem.</p> </div> <div style="display: flex;">  </div>	<p style="font-size: small;">The Second Annual International Seminar on Trends in Science and Science Education Medan, 12 - 13 December 2015</p> <p style="font-size: small; text-align: right;">Effective Teaching Models in Physics Dr. Janchai Yingsrayeeen</p> <h2 style="color: red;">CONNECTING THE WHOLE WORLD WITH SATELLITES</h2> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>

The Second Annual International Seminar on Trends in Science and Science Education Medan, 12 - 13 December 2015

Effective Teaching Models in Physics
Dr. Janchal Yingsrayoon

M-Learning

Distance measurement Decibel measurement



Augmented Reality



iStormAR



iDinosaurAR

GIF animator

<http://gifmaker.me/>

Graphics Interchange Format

From Wikipedia, the free encyclopedia

"GIF" redirects here. For other uses, see GIF (disambiguation).

The **Graphics Interchange Format** (better known by its acronym **GIF**; /ˈdʒɪf/ or /ˈɡɪf/) is a bitmap image format that was introduced by CompuServe in 1987^[C] and has since come into widespread usage on the World Wide Web due to its wide support and portability.

The format supports up to 8 bits per pixel for each image, allowing a single image to reference its own palette of up to 256 different colors chosen from the 24-bit RGB color space. It also supports animations and allows a separate palette of up to 256 colors for each frame. These palette limitations make the GIF format unsuitable for reproducing color photographs and other images with continuous color, but it is well-suited for simpler images such as graphics or logos with solid areas of color.

GIF images are compressed using the Lempel-Ziv-Welch (LZW) lossless data compression technique to reduce the file size without degrading the visual quality. This compression technique was patented in 1983. Controversy over the licensing agreement between the software patent holder, Unisys, and CompuServe in 1994 spurred the development of the Portable Network Graphics (PNG) standard. All the relevant patents have now expired.



Creative Physics Activities



The Second International Seminar on Trends in Science and Science Education Medan, 12 - 13 December 2015

Effective Teaching Models in Physics
Dr. Juchat Yuzguzayeva

Archimedes' screw



First Helicopter designed by Da Vinci



The Second International Seminar on Trends in Science and Science Education Medan, 12 - 13 December 2015


Effective Teaching Models in Physics
Dr. Juchat Yuzguzayeva

Jumping Bean



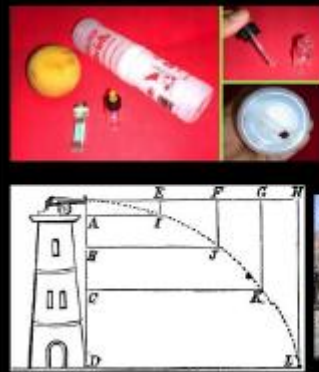
Drop a jumping bean and watch its jumping.

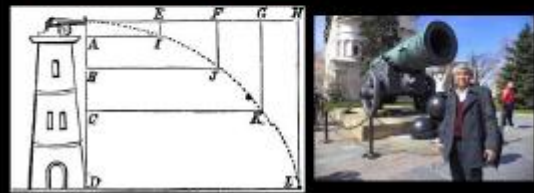
Jumping Bean




ALCOHOL GUN

Projectile motion





Magic Bottle



VIDEO

VIDEO

Magic Butterfly



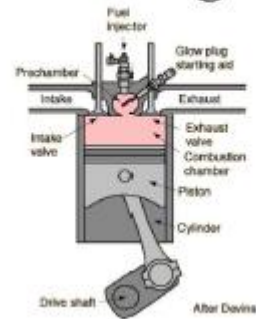
Simple Thermometer






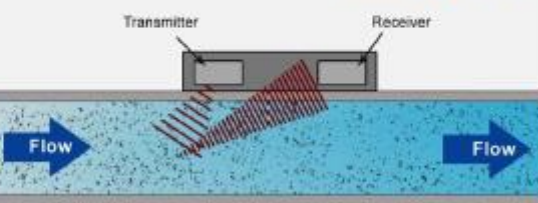


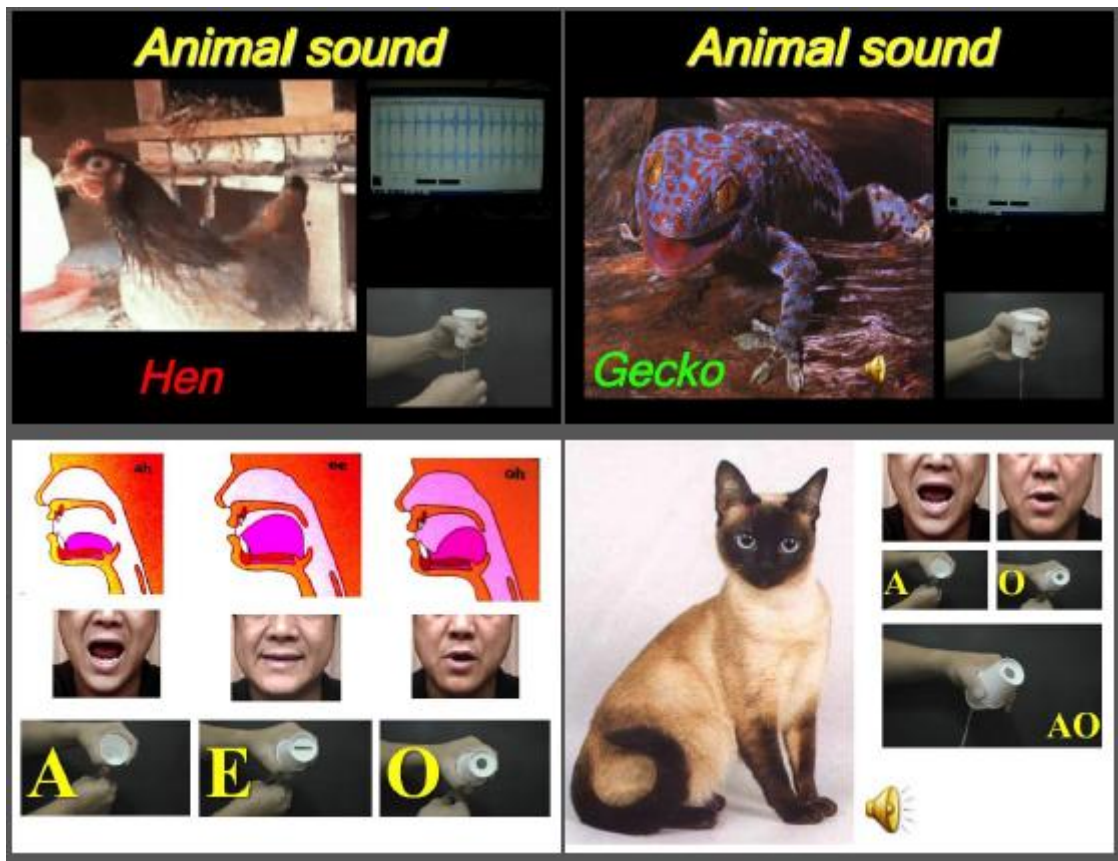
Internal Combustion




Diesel Engine




<p>Are Pressures in Big and Small Balloons different?</p> <p>VIDEO</p>  <p>The effect can be shown by using a balloon helicopter. Different sizes of balloons will make the propeller move with different speeds (observing the flying) and it will give different sounds.</p> 	<p>Making Liquid Carbon dioxide</p> 
<p>Doppler Effect</p>  <p>The frequency of the sound you hear as the vehicle approaches you is higher than the frequency you hear as it moves away from you. This is one example of the Doppler effect.</p> <p>VIDEO</p> $f' = \left(\frac{v}{v + v_S} \right) f \quad (\text{source moving away from observer})$ $f' = \left(\frac{v}{v - v_S} \right) f \quad (\text{source moving toward observer})$	<p>Measurement of Flow rate of oil</p>   <p>Doppler Flow Meter</p>




Speed of sound

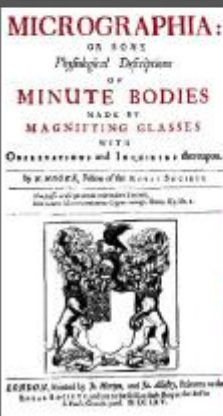



In 1679, Robert Hooke explained in his lecture how to make lens of his microscope.



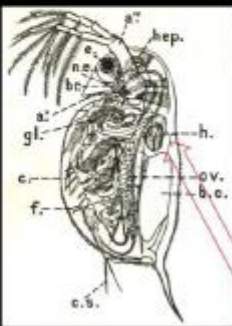
Robert Hooke

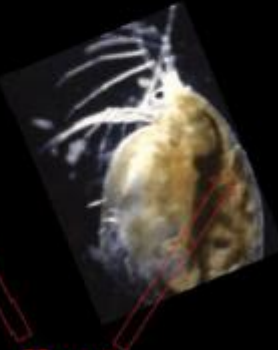




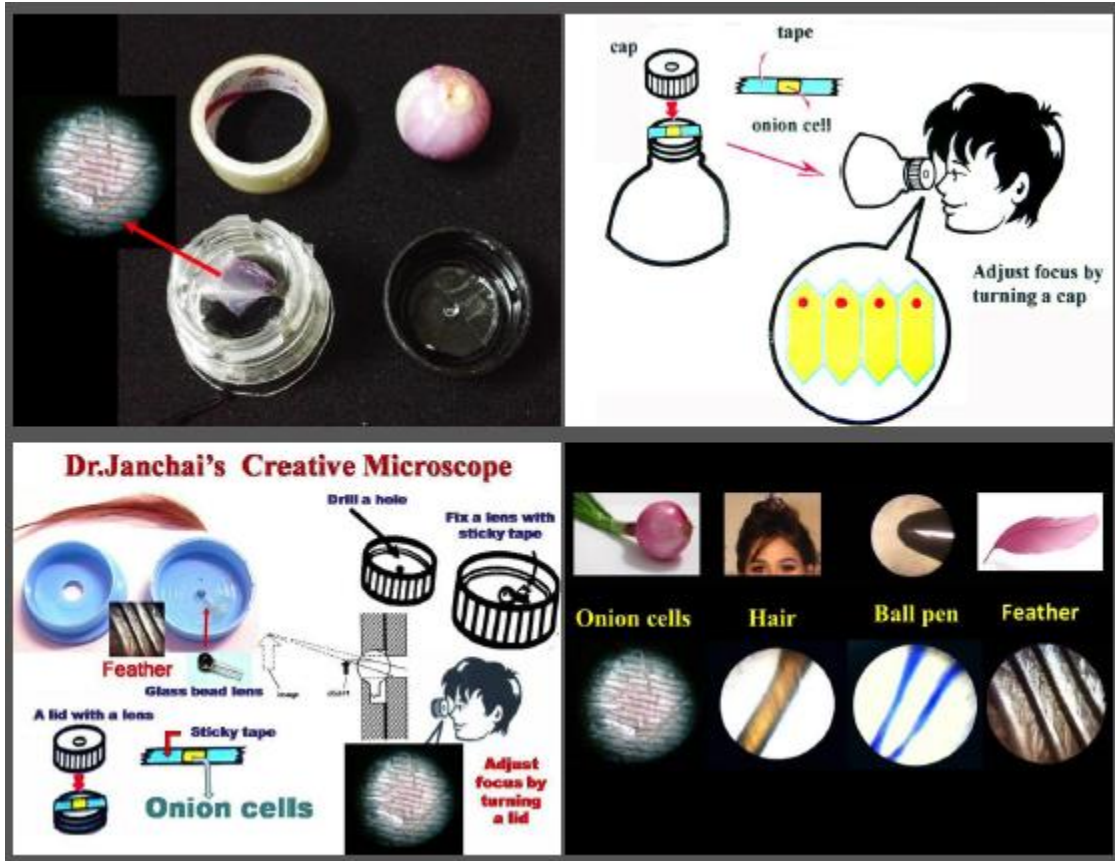



Plastic bottle







Heart

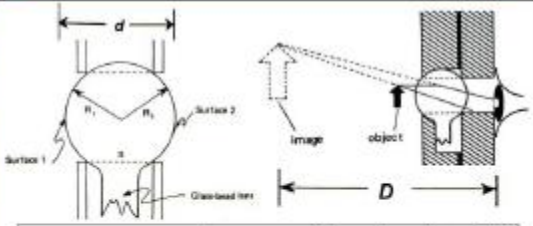




Lice on head






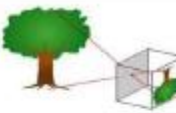
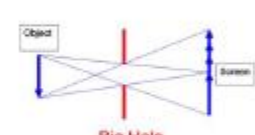

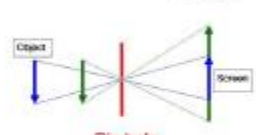
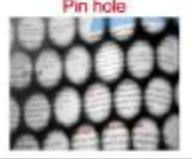






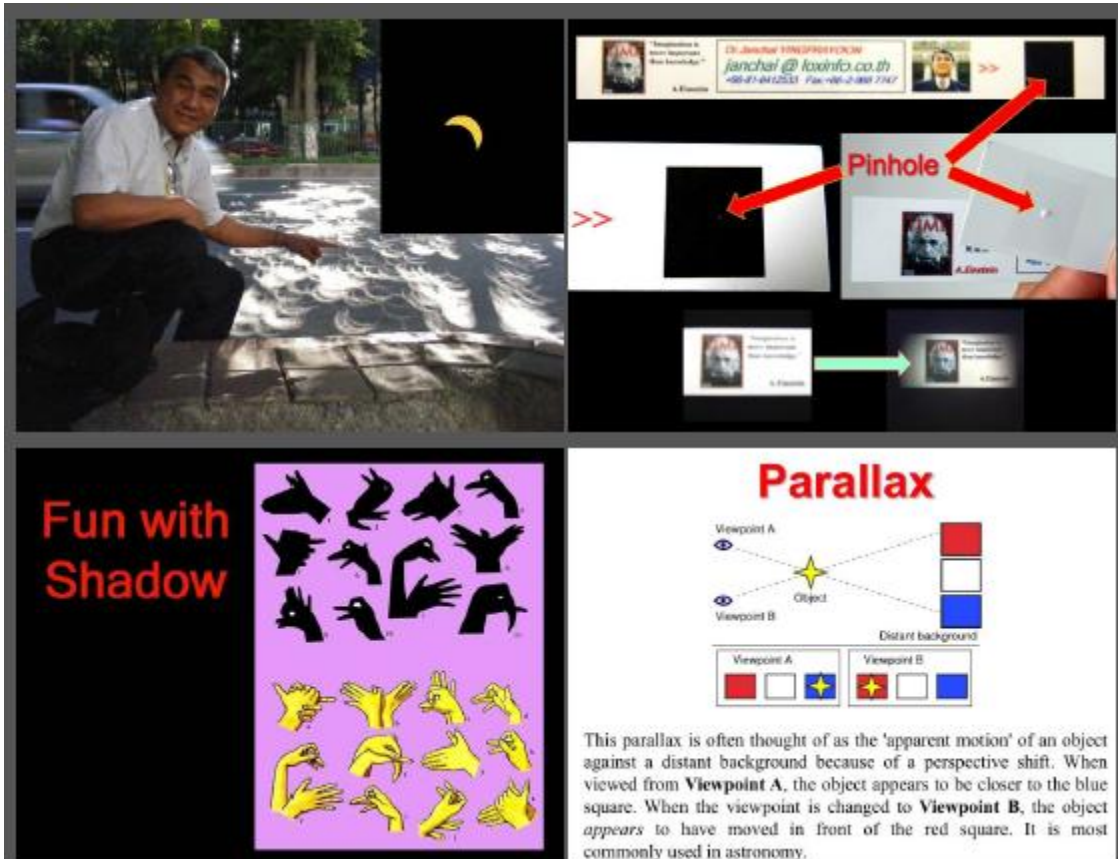


Thick lens formula $\frac{1}{f} = (n_l - 1) \left[\frac{1}{R_1} - \frac{1}{R_2} + \frac{(n_l - 1)d}{n_l R_1 R_2} \right]$

f = Focal length
n_l = Reflective index of the lens = 1.5
D = Near point = 25 cm.
m = Magnification = *D*/*f*
d = Lens thickness = 0.2 cm.

m = *D*/*f*
 If *R*₁ = *R*₂ = *R* = 0.1 cm.
f = 0.1 cm.
 Magnification = 25/0.1 = 250

<h3>Reflective index of liquid</h3>  $\frac{1}{f} = (n_l - 1) \left[\frac{1}{R_1} - \frac{1}{R_2} + \frac{(n_l - 1)d}{n_l R_1 R_2} \right]$	<h3>Pinhole Spectacles</h3>  <p>VIDEO</p> 
<h3>Pinhole Effect</h3>  <div style="display: flex; justify-content: space-around;"> <div data-bbox="271 1030 526 1321">  <p>Big Hole</p>  </div> <div data-bbox="542 1030 798 1321">  <p>Pin hole</p>  </div> </div>	  <div style="display: flex; justify-content: space-around;">   </div>



Fun with Shadow

Parallax


Viewpoint A
Viewpoint B
Object
Distant background

Viewpoint A: [Red square] [White square] [Yellow star]

Viewpoint B: [Yellow star] [White square] [Blue square]

This parallax is often thought of as the 'apparent motion' of an object against a distant background because of a perspective shift. When viewed from **Viewpoint A**, the object appears to be closer to the blue square. When the viewpoint is changed to **Viewpoint B**, the object *appears* to have moved in front of the red square. It is most commonly used in astronomy.

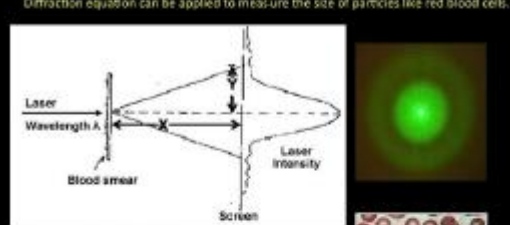
Fun with Parallax



Dr. Juchael Masripkoro
juchael@teknico.ac.id


Measurement of red blood cell size

Particles bigger than wavelength of light can be measured by diffraction of laser light. Bragg's Diffraction equation can be applied to measure the size of particles like red blood cells.

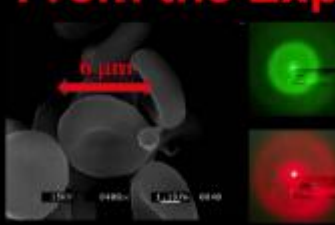


$$\text{Diameter } d = \lambda \frac{X^2 + Y^2}{Y}$$

d = Red blood cell diameter
 λ = Wavelength of a laser beam



From the Experiment



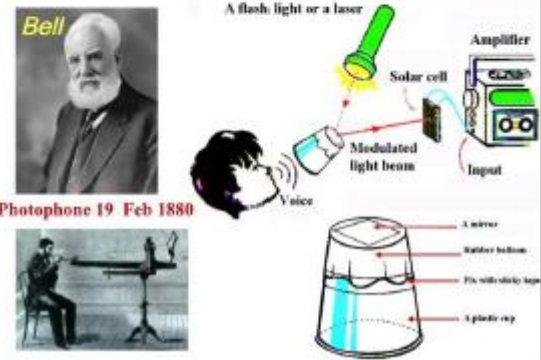
Red Blood cell Size = 6.2 μm
close to result from Electron microscope

Green Laser Experiment
 $X = 41.0 \text{ cm}$, $Y = 3.5 \text{ cm}$
 $\lambda = 532 \text{ nm}$, $d = 6.2 \mu\text{m}$

Red Laser Experiment
 $X = 41.0 \text{ cm}$, $Y = 4.3 \text{ cm}$
 $\lambda = 650 \text{ nm}$, $d = 6.2 \mu\text{m}$


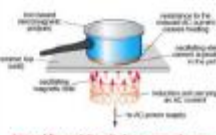


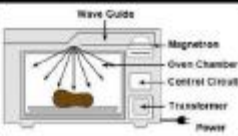




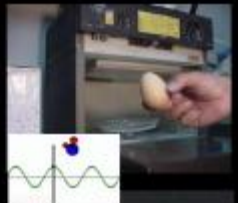

$$\text{Diameter } d = \lambda \frac{X^2 + Y^2}{Y}$$

Communication with a Laser Beam



Photophone 19 Feb 1880

 <p>In 1800 Alessandro Volta made the first battery. It consists of two electrodes: one made of zinc, the other of copper. The electrolyte is either sulfuric acid mixed with water or a form of saltwater brine.</p>   <p>VIDEO</p>	  <p>Battery on an airline life vest</p>
<p>Electromagnetic Induction by Michael Faraday</p>    <p>Making a microphone from a kitchen pot.</p> 	<p>Magic Microphone- Loud Speaker</p>   

<h3>Induction Stove</h3>   <p>http://rpublic.ci.det.nsw.edu.au</p> 	<h3>Invention of Microwave oven by Percy Spencer in 1945</h3>    <p>VIDEO</p>  <p>The metal grid on the microwave oven prevents microwave radiation from coming out.</p>
<h3>Super Heating</h3>  <p>VIDEO</p>	<h3>Microwave Applications</h3>  <p>VIDEO</p>  

TOP

The time derivative of angular momentum is called torque:

$$\tau = \frac{dL}{dt} = \frac{dr}{dt} \times p + r \times \frac{dp}{dt} = 0 + r \times F = r \times F$$




Boomerang





Cotton Sugar



Paper Clip Top (Sakai's Top)



<http://www.c20.physik.hu-muenchen.de/~suecke/1p/lectures/sakaigiu.htm>

<p>Acceleration of the plane when taking off</p> <p>VIDEO</p>  <p>Estimation of the plane acceleration a, where $\theta = 12^\circ$</p> $a = g \cdot \tan 12^\circ = 2.08 \text{ m/s}^2$  <p>Dr. Juchal YINGRAYOEN</p>	<p>Great Invention of the Airplane in 1903 : Orville and Wilbur Wright</p> <p>History of Flying</p>  <p>VIDEO</p> <p>Video clip from German TV station ZDF, 1987</p>
<p>The Second International Seminar on Trends in Science and Science Education Medan, 12 - 13 December 2015</p> <p>SCIENCE IN ADVANCE AND SCIENCE EDUCATION 2015</p> <p>Effective Teaching Models in Physics Dr. Juchal Yingrayoen</p> <p>VIDEO</p> <p>Creative Flying</p> 	<p>Thank you</p> 