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Science Experiments – Class VII

This document has a list of experiments to assist students to strengthen basics, understand and relate science to their day to day life. Most of the experiments listed are as per the prescribed curriculum of Karnataka State Secondary 7th standard.

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MATTER

1.

Name of the experiment	Molecular arrangement
Purpose / Objective	To demonstrate the arrangement of molecules in solids, liquids and gases
Concept to explain	Molecules are very tightly packed in solids, loosely packed in liquids and are very far away from each other in gases.
Steps (if not available in arvindguptatoys) :	<p>Tightly pack thermocol balls in a small cover to depict arrangement of molecules in solids.</p> <p>Take a pot of water and cover the surface of water with thermocol balls such that they are able to move but yet very close to each other. This depicts arrangement of molecules in liquids</p> <p>Take a pot of water and add some thermocol balls such that they float very far away from each other. This depicts arrangement of molecules in gases.</p>
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	

2.

Name of the experiment	Formation of compounds
Purpose / Objective	To demonstrate the formation of compounds from elements
Concept to explain	A mixture of 2 or more elements is called compound. Atoms are held together in compounds through ionic or covalent bonds.
Steps (if not available in arvindguptatoys) :	Make paper balls from news papers to depict molecules of different elements. Name the molecules. Demonstrate the formation of compounds from individual molecules by joining them through straws. Straws depict the ionic or covalent bonds between molecules.
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	

3.

Name of the experiment	Shape of liquids
Purpose / Objective	To demonstrate that liquids can take any shape
Concept to explain	Unlike solids, liquids and gases do not have predefined shape. Liquids take up the shape of the container.
Steps (if not available in arvindguptatoys) :	Take glass tumblers of different shapes and pour water in them.
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	

4.

Name of the experiment	Compression of liquids and gases
Purpose / Objective	To demonstrate that gases can be compressed but not liquids
Concept to explain	Gases have molecules very far away from each other. Thus can be compressed. In liquids molecules are loosely packed and close enough. Thus cannot be compressed
Steps (if not available in arvindguptatoys) :	Take a needleless syringe and pull its stalk to fill it with air. Now close the open end of the syringe and push the stalk. It can be observed that air compresses and stalk can be pushed. Repeat the same by filling the syringe with water. It can be observed that water cannot be compressed.
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	

5.

Name of the experiment	Matter occupies space
Purpose / Objective	To demonstrate that every matter occupies space
Concept to explain	When stone is put into a container full of water, excess water equivalent to the space occupied by stone spills out of the container
Steps (if not available in arvindguptatoys) :	Take a container and fill it with water to the rim. Tie a big stone with a string and place it in the container. Water spills out of the container. Amount of spilled water is equivalent to the mass of the stone.
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	

6.

Name of the experiment	Solute, solvent and solution
Purpose / Objective	To demonstrate and explain the concept of solute, solvent and solution. Also, the concept of soluble and insoluble substances.
Concept to explain	Solution is formed when solute dissolves in solvent. Substances that dissolves completely in solvent is said to be soluble while that which does not dissolve completely is called insoluble.
Steps (if not available in arvindguptatoys) :	Prepare a mixture of salt and water, mud and water to demonstrate and explain the concept. While conducting this experiment the difference between compounds and solutions can be

	clarified. Compounds are formed by 2 or more elements at molecular level which is not visible to naked eye while solution is formed by 2 or more substances and can be clearly seen.
For Class (8,7 or 6)	
Reference to arvindguptatoys (section and experiment number)	
Section	

7.

Name of the experiment	Saturation of water
Purpose / Objective	To demonstrate and explain the concept of Saturation of water
Concept to explain	Substances can dissolve in water only upto a certain limit after which it remains undissolved and settles at the bottom. The water at this point is said to be saturated.
Steps (if not available in arvindguptatoys) :	Take a cup of water and continuously dissolve salt in it until some of it remains undissolved and settles at the bottom.
For Class (8,7 or 6)	
Reference to arvindguptatoys (section and experiment number)	
Section	

HEAT

1.

Name of the experiment	Multi Boil
Purpose / Objective	To show that different materials have different heat absorption capacity
Concept to explain	Water is great at absorbing heat! It takes ten times

	as much heat to raise the temperature of 1 gram of water by 1C than it does to raise the temperature of 1 gram of iron by the same amount. The experiment clearly shows this feature since the same balloon or the plastic cup would break when placed near a candle without water in it.
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/heatexp.html
Section	Air and Water

2.

Name of the experiment	Expansion of Air
Purpose / Objective	To show the effects of Heat – Expansion
Concept to explain	Air expands by absorbing the body heat
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/expansion.html
Section	Air and Water

3.

Name of the experiment	Phat phat boat – states of matter
Purpose / Objective	To show the effects of Heat – Expansion
Concept to explain	Liquid water converted to steam when heated
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Phat-PhatBoat.html
Section	Air and Water

4.

Name of the experiment	Effects of Heat – Expansion of Air
Purpose / Objective	To show the effects of heat on air

Concept to explain	The temperature change caused due to the burning of the candle will create pressure differences – gases exert pressure from an area of high pressure to an area of low pressure.
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/oxygen.html
Section	Air and Water

5.

Name of the experiment	Effects of Heat – Convection Currents
Purpose / Objective	To show the causes of Convection Currents
Concept to explain	convection currents are responsible for the movement of heat (and mass) within a fluid system. Heat wants to go from where it is to where it isn't. When atoms and or molecules of a fluid (a gas or liquid, for example) are hotter then their companion particles, they are less dense and rise in the fluid. Cooler, more dense groups of atoms or molecules take their place. Convection currents are thus set up, and heat travels "around" the system via those currents.
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/convection.html http://www.arvindguptatoys.com/toys/Convectioninglass.html
	Both experiments explain the same concept
Section	Air and Water

6.

Name of the experiment	Sun as a natural source
Purpose / Objective	Solar energy
Concept to explain	Solar energy is a free and clean source of energy
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7

Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Solarwaterheater.html http://www.arvindguptatoys.com/toys/Solarfan.html
Section	Air and Water

7.

Name of the experiment	Expansion of Warm Air
Purpose / Objective	Expansion of Air on heating
Concept to explain	Air expands on heating
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Expansionofwarmair.html
Section	Fun with Pressure

8.

Name of the experiment	Simple Conduction
Purpose / Objective	To show that heat travels from hot to cold
Concept to explain	
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/simpleconduction.html
Section	Fun with Light

9.

Name of the experiment	Hot Air Bag
Purpose / Objective	Hot air is lighter and rises higher
Concept to explain	Hot air is lighter than cooler air hence the cover filled with hot air rises higher when left freely
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7

Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Hotairbag.html
Section	Flying Toys

10.

Name of the experiment	Annealing in Action
Purpose / Objective	Effect of Heating materials
Concept to explain	Annealing in metallurgy and materials science, is a heat treatment that alters a material to increase its ductility and to make it more workable
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Annealinginaction.html
Section	Flying Toys

11.

Name of the experiment	Flying Flame
Purpose / Objective	Effects of Heat
Concept to explain	Heating causes convection currents in fluids which explain various natural phenomenon atmospheric circulation, ocean circulation etc
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Flyingflame.html
Section	Magic Miscellany

WAVES

1.

Name of the experiment	Rope Ripple
Purpose / Objective	Waves
Concept to explain	To show wavelength, frequency etc
Steps (if not available in arvindguptatoys) :	

For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/roperipple.html another link which explain various concepts http://helios.gsfc.nasa.gov/qa_gp_ls.html
Section	Magic Miscellany

2.

Name of the experiment	Straw Waves
Purpose / Objective	Waves
Concept to explain	To show the model of a wave
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/waves.html
Section	Magic Miscellany

3.

Name of the experiment	Dynamic Wave model
Purpose / Objective	Waves
Concept to explain	To show the model of a wave
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Dynamicwavemodel.html
Section	Magic Miscellany

LIGHT

1.

Name of the experiment	Path of Light
Purpose / Objective	To demonstrate that light travels in straight lines

Concept to explain	Light falling on the mirror is reflected only from the places where it is not covered with black paper. It can be observed that the reflected light is in straight lines.
Steps (if not available in arvindguptatoys) :	Take a plane mirror. Cover it with black paper using rubberband at the ends of the mirror. Make small holes at equal distances in the black paper at one end of the mirror. Place the end with holes on the table. Flash the mirror with torch. It is observed that reflected light rays are straight lines.
For Class (8,7 or 6)	
Reference to arvindguptatoys (section and experiment number)	
Section	

2.

Name of the experiment	Laws of reflection
Purpose / Objective	To demonstrate the laws of reflection
Concept to explain	<ol style="list-style-type: none"> 1. The incident and reflected light are in the same plane. 2. The angle of incidence is equal to the angle of reflection.
Steps (if not available in arvindguptatoys) :	Take a plane paper and mark the incident point and different angles from it using a protractor. Place a plane mirror on the 0-180 line. Incident light on the mirror from a laser along the line of a particular angle as marked on the paper.
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	
Section	

3.

Name of the experiment	Total Reflection
Purpose / Objective	Light – Reflection and Refraction
Concept to explain	Demonstrate the concept of total internal reflection and

	refraction
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/refraction.reflection.html
Section	Fun with Light

4.

Name of the experiment	Simple Rainbow
Purpose / Objective	Light –Refraction
Concept to explain	Explain formation of Rainbow through Refraction of light
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/rainbow.html
Section	Fun with Light

5.

Name of the experiment	Fiber Optics
Purpose / Objective	Light – Total Internal Reflection
Concept to explain	Explain role of total internal reflection and uses in fiber optics
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/fiberoptics.html
Section	Fun with Light

6.

Name of the experiment	Light Experiments
Purpose / Objective	Concave and Convex lenses
Concept to explain	Explains Reflection, Refraction etc
Steps (if not available in	

arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/lightexp.html
Section	Fun with Light

7.

Name of the experiment	Sunlight your home
Purpose / Objective	Sunlight
Concept to explain	Sunlight as a light source inside homes
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Sunlightyourhome.html
Section	Fun with Light

8.

Name of the experiment	Moon Distance
Purpose / Objective	Light – to measure distance
Concept to explain	Measuring the distance by using reflected light
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/laserref.html
Section	Fun with Light

9.

Name of the experiment	Cool colors
Purpose / Objective	Light
Concept to explain	Primary and secondary colors
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/coolcolours.html
Section	Fun with Light

10.

Name of the experiment	Add Sugar Bend Light
Purpose / Objective	Light
Concept to explain	Bending of light when it passes through density gradient
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/AddSugarBendLight.html
Section	Fun with Light

11.

Name of the experiment	Simple Periscope
Purpose / Objective	Light
Concept to explain	Reflection Application
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/periscope.html
Section	Fun with Light

12.

Name of the experiment	Solar Eclipse
Purpose / Objective	Light
Concept to explain	Eclipse – safe viewing
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/solareclipse.html
Section	Fun with Light

13.

Name of the experiment	Imagining Images
Purpose / Objective	Light
Concept to explain	Concave and Convex Lens
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/imaginingimages.html
Section	Fun with Light

14.

Name of the experiment	Colour Wheel
Purpose / Objective	Light
Concept to explain	Formation of colours
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/colourwheel.html
Section	Fun with Light

SOUND

1.

Name of the experiment	Crown Cap Tik tiki
Purpose / Objective	Sound
Concept to explain	How Sound is produced
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7

Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/crowncap.html
Section	Simple sounds

2.

Name of the experiment	Paper phataka
Purpose / Objective	Sound
Concept to explain	How Sound is produced
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/phataka.html
Section	Simple sounds

3.

Name of the experiment	Loud Lid
Purpose / Objective	Sound
Concept to explain	How Sound is produced
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/Loudlid.html
Section	Simple sounds

4.

Name of the experiment	Trumpet thunder
Purpose / Objective	Sound
Concept to explain	How Sound is produced
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/flute.html
Section	Simple sounds

5.

Name of the experiment	Rolling bottle
Purpose / Objective	Energy
Concept to explain	Potential Energy
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/rollingbottle.html
Section	Force Fun

ENERGY

1.

Name of the experiment	Straw Swivel
Purpose / Objective	Wind fun
Concept to explain	wind
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/strawswivel.html
Section	Spinning Toys

2.

Name of the experiment	Balloon Rocket
Purpose / Objective	Law of conservation of Energy
Concept to explain	Potential to kinetic energy
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/balloonrocket.html
Section	Newton Unplugged

3.

Name of the experiment	Simple Rocket
Purpose / Objective	Law of conservation of Energy

Concept to explain	Potential to kinetic energy
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	Class 7
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/simplerocket.html
Section	Newton Unplugged

FORCE

1.

Name of the experiment	Sudarshan chakra
Purpose / Objective	To demonstrate centripetal and centrifugal forces
Concept to explain	Objects moving in circular paths around a center are under the influence of an attractive centripetal force. The centrifugal force is that equal and opposite force that keeps the object in its circular path avoiding it from being attracted from the center. Eg: Rotation of planets around sun. How things are held on surface of earth though earth is rotating.
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/sudarshanchakra.html
Section	Amazing Astronomy

2.

Name of the experiment	Water centrifuge
Purpose / Objective	To demonstrate centrifugal force
Concept to explain	Objects moving in circular paths in the absence of an attractive centripetal force tend to move away. This is due to centrifugal force that pushes the object away.
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	

Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/watercentrifuge.html
Section	Amazing Astronomy

3.

Name of the experiment	Power of spin
Purpose / Objective	To demonstrate the dependence of centrifugal/centripetal force on velocity
Concept to explain	When velocity increases, centrifugal/centripetal force also increases. In this experiment, the increased force helps the light weight object to lift a heavier object.
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/powerofspin.html
Section	Amazing Astronomy

NEWTONS LAWS OF MOTION

1.

Name of the experiment	Upright coin
Purpose / Objective	To demonstrate inertia
Concept to explain	When the paper is pulled slowly, the coin falls. When the paper is pulled quickly, the coin does not fall. This is due to inertia. The coin tends to remain in its previous position.
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/inertiacoins.html
Section	Newton unplugged

2.

Name of the experiment	Spinner
Purpose / Objective	To demonstrate Newtons second law of motion Second law: The <u>acceleration</u> of a body is directly proportional to, and in the same direction as, the net <u>force</u> acting on the body, and inversely proportional to its <u>mass</u> . Thus, $F = ma$, where F is the net force acting on the object, m is the mass of the object and a is the acceleration of the object.
Concept to explain	When air is blown through the straw, the force applied in blowing the air is converted into acceleration of the spinning straw. And as Force=mass*acceleration, lighter the mass and greater the force applied, greater the acceleration.
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/sspinner.html
Section	Newton Unplugged

3.

Name of the experiment	Balloon Car
Purpose / Objective	To demonstrate Newtons third law of motion
Concept to explain	Energy spent in blowing the air into balloon is stored in the balloon as potential energy. When end of straw is opened, there is equal and opposite force exerted from the balloon converting potential energy into kinetic energy
Steps (if not available in arvindguptatoys) :	
For Class (8,7 or 6)	
Reference to arvindguptatoys (section and experiment number)	http://www.arvindguptatoys.com/toys/balloon.html
Section	Newton unplugged

