EXPERIMENT BOOKLET The secrets of health

Subject – 1 Module – 401



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Preface

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National Institute of open schooling – We have published four experiment booklets based on the four modules of 'Gramsakhi'. While studying the Gramsakhi modules, only reading or explaining them orally is not sufficient for understanding them. The procedure will only remain embedded in our minds permanently if we actually implement it.

Similarly, frequent repetition of the demonstrations enhances our skills.

Since the instructor is present while conducting the procedure, mistakes, if any, are immediately rectified. All doubts arising during the execution of the procedure can be clarified on the spot. Moreover, a large part of the syllabus is covered automatically. This is the reason for publishing these booklets. Experiments have been selected independently from each module and diagrams have been given as and when required.

All these experiments are of use in our daily life. Implementing these regularly will help in increasing our self-confidence.

We hope that these booklets will be of use to you.

Contact us in case of any queries, difficulties or in case you feel that some other important information must be included or in case you have any suggestions regarding the arrangement and layout. This will make these experiment booklets easier and simpler and in turn, will aid in achieving our goal.

1. Drawing a picture of the human body and familiarising ourselves with the various organs of the body.

Aim :

Familiarising ourselves with the various organs of the body.

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Requirement :	Pencil and paper or chalk and a person.
Procedure :	Draw a picture of a man and a woman or make a man or a woman lie down on the ground and draw the outline of his/her body on the ground.
	Trace the internal and external organs from the head to the abdomen on the drawing or the outline on the ground. Illustrate the brain in the skull, the left and right lungs as well as the heart in the chest, food pipe and windpipe (trachea), chest and the muscle (diaphragm) that divides the chest from the abdomen. Illustrate the stomach, liver, intestines,
	large intestine, bladder, spleen, womb, prostate glands. Illustrate the ears, nose, eyes, forehead, and neck. Draw a picture of a body, face- down, and illustrate the vertebral column, spinal cord etc. Illustrate as

Observation : Identifying the relationship between the external and internal organs of the body.

many organs as possible.

When one complains of stomach pain, it could be related to the internal organs like the intestine or liver. This experiment is useful in order to understand the mutual relationship between all organs and for informing yourself about various organs of the body as well as for familiarising yourself with your body.

For additional information – The body puzzle manufactured by 'Tathapi', (Pune). Website – Inside the body.



2. Giving expression to problems/ How do you identify an illness?

- 1. It is possible to sense that a person is not well by his/her expression.
- 2. The patient's complaints can be sensed when he/she enters the room. A patient with stomach pain cannot walk upright. He/she will always walk bent at the waist. A patient with a pain in the lumbar area will enter with a hand on the pelvis. A patient with a sprained neck will be holding his/her neck stiff.
- 3. An infant touches his/her ear if he/she has ear pain.

3. The mutual dependence of nature and human beings

- Aim : To acknowledge that human beings are a part of nature and are dependent on it.
- Requirement : One cup rice and one cup jowar

Procedure : Sprinkle rice and jowar in the courtyard/ on the road or in any open place.

Observation :

- : 1) Sparrows, pigeons and crows will peck the grains.
 - Cows/buffaloes on the road or even domestic cows will eat these grains.

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3) Even mice will arrive to eat the remaining few grains.

Opinion : 1) We grow grains in fields, this in itself means that various plants produce grains. Land, water and favourable weather conditions are required for producing grains.

2) This food produced by nature is eaten by human beings, animals as well as birds.

3) Chaff, dried leaves of trees as well as animal and human excreta in the fields turn to manure again. It mixes with the soil and nourishes the crops leading to a healthier yield.

4) It is the intrinsic character of nature to maintain balance. This means that all parts of nature (including humans) are mutually dependant. For example, the number of mice will increase if we kill the snakes that generally prey on mice. If there is an increase in the number of mice, they will attack and destroy the crops. We will not have any food to eat.

Inference :

- 1) This means that we are dependent on nature for food, water, air and clothing.
- 2) We are only a cog in the wheel of nature.
- 3) Not only is it our responsibility to maintain the balance of nature, but it is also essential for our happy existence.

For more information : Nisarg aani manus (Nature and man) Dr. Madhav Gadgil

4. For explaining the necessity (importance) of the bone structure/ cavity.

Aim :To understand why the bone cavity is necessary.Requirement :Bone structureProcedure/
Observation :Examining the skeleton and explaining the importance of the chest
cavity. There are three bone cavities in the body.1.Skull: The skull is the bone of the head. The function of the
skull is the complete protection of the delicate and most important
organ of the body, the brain. This is the reason that it has a round

shape. It also protects the eyes, a very delicate organ.

2. Thoracic cavity: The thoracic cavity is created with 12 ribs from the front and 12 vertebral columns from the back. Not only does the thoracic cavity protect the heart and the lungs, but it also helps in their expansion. When we breathe in, the ribs are lifted upwards and outwards due to which the lungs expand and a large quantity of air is inhaled.

3. Pelvic cavity: The pelvic cavity is like a vessel, wherein the upper section is joined with the abdominal cavity. The pelvic cavity is home to the female reproductive organs, the bladder and has space for the rectum to expand. Similarly, the uterus grows upwards, i.e. towards the abdominal cavity. The main bone of the legs (femur) is joined with the bone of the pelvic cavity. The various bone joints in the limbs make movement easy. The body can move easily owing to the spinal cord and it has been made flexible by the spine.

Inference : The different cavities in the body protect the important organs of the body. Movement becomes easy and flexible. The various bone joints in the limbs make movement easy.

Examining the tonsils



5. The immune system of the body.

Aim : Learning to examine the immune system of the body.

Requirement : A torch.

Procedure : (1) Request the patient to open his/her mouth and say 'Aaah'. At the same time, shine the torch in his/her throat.

Observation : The pair of tissue masses that are visible behind the wisdom teeth are tonsils. The shape, colour and the white/ yellow spots on these tissue masses aid us in diagnosing tonsillitis.

- 1) Diagnose tonsillitis if the tonsils as well as the internal walls (mucous membrane) of the throat are red.
- 2) Diagnose chronic tonsillitis if the tonsils are enlarged and pink and the throat also seems pink.
- Diagnose bacterial infection of the tonsils if the tonsils are red and has red or yellow spots on them.
- 4) Diagnose diphtheria if the tonsils and the throat are encased in a white film.
- **Procedure :** (2) Using your palms, examine the lymph nodes in the throat, armpits and inner thighs gently.

Observation : We obtain information about enlarged lymph nodes as well as which part is infected by examining the neck from all sides. Lymph nodes on both sides of the jaw are enlarged in case of tonsillitis. The lymph nodes under the ear lobes swell in case of external infection.

Lymph nodes at the back of the neck swell in case of scalp infections and lice.

Lymph nodes in the armpits swell in case of breast diseases, ingrown hair in the armpit or in case of some lung diseases. Lymph nodes in the inner thighs swell in case a wound on the leg is infected or in case of sexual diseases.

Inference : Tonsils, lymph nodes and spleen develop the immune system of the body.

6. Checking the pulse rate.

- 1) Stand to the right of the patient for measuring his/her pulse rate.
- 2) Check the pulse of the right hand of the patient with your right hand
- 3) To check the pulse rate, place the index, middle and ring fingers of your hand on the pulse that is in line with the patient's right thumb, just below the place where the palm and the arm are joined as shown in the figure.
- 4) Press the radial artery to feel the pulse with your index and ring fingers, and count the pulse with your middle finger.
- 5) Count for an entire minute.
 - The normal pulse rate of an adult is between 60 and 90/minute.
 - It is often not possible to check the pulse rate of children, in which case the heart rate can be checked using a stethoscope.
 - Apart from the hands, we can measure the pulse rate in a few more places. For example, on the left and right side of the inguinal region, at the centre of the heel or on the left and right side of the neck at a high point.

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Checking the pulse rate



7. Measuring blood pressure

Aim :	To diagnose a patient's illness by measuring blood pressure.	
Requirement :	Stethoscope, sphygmomanometer (BP apparatus)	
Procedure :	Stand to the right of the patient for measuring his/her blood pressure, since it is convenient to examine the entire body of the patient while standing to his/her right.	
	 Place the sphygmomanometer at level with the patient's heart. Blood pressure can be measured while the patient is sitting or lying down. Request the patient lie down and talk to him/her as this will divert his/her attention. Tie the handcuff of the sphygmomanometer around the patient's arm above the elbow joint. Raise the mercury level to 160-170 mm by compressing the balloon. Simultaneously, check whether you can feel the pulse. The pressure at which the pulse can be identified is the systolic blood pressure. Let the mercury drop to the minimum level. 	
	 you feel a pulse and place the diaphragm of the stethoscope exactly there. 6) Raise the mercury level to 160-170 mm by compressing the balloon and turn the key located near the balloon and lower the mercury 	
	slowly. Listen to the pulse by placing the stethoscope at the centre of the inner elbow at the same time. The time when you can here the pulse is the systolic blood pressure. When the pulse becomes indistinct and then stops altogether is the diastolic blood pressure.	
Observation :	The blood pressure of an average adult human is from 90/60 mm / mercury to 140/90 mm /mercury. The average blood pressure of an individual depends on his/her constitution.	
Inference :	There is a difference of 10 mm in the blood pressure taken while a person is sitting and lying down. This is normal.	

Aim :

To count the heartbeats using a stethoscope.

The heart is located on the left side of the rib cage. The pulse rate is the heart rate. We can measure the heart rate or beat using a stethoscope. It is possible to hear the heartbeat four fingers below our left nipple slightly to the left.

Place the ends of the rigid part of the stethoscope tubes in the ears and listen to the heartbeats and the sounds of the respiratory system by placing the diaphragm of the stethoscope on the chest.

Heartbeats :

The heartbeat sounds like lub-dub. You can hear the first sound 'lub' during the contraction of the atrium and 'dub' during the contraction of the ventricle. The two sounds of lub and dub are not separated by a large time interval. This interval is less than that between the sounds of dub and lub. Lub-dub, lub-dub, lub-dub. We can listen to the other sounds of the internal organs of the respiratory system using the diaphragm of the stethoscope. The

sound of regular breathing is like the sound of air being passed in and out of a large pipe. We can hear a whistle-like or flute-like sound through the stethoscope when a patient is afflicted with asthma. When the stethoscope is placed on the lung area of the abdomen of a patient afflicted with pneumonia, noises like a paper being crumpled can be heard.

9. Examination related with the respiratory system.

A list of questions that are to be asked to the patient.

A) 1. Personal details about the patient
	What is your name?
	What is the name of your village?
	Address?
	Age?
	Gender?
	Education?
	Marital status: A) Unmarried B) Married
	C) Widow/Widower D) Divorced
	Financial condition:
	About the house
	What kind of roof does the house have?
	Does the house have a chimney?
	Is there a toilet/bathroom?
	Fuel used:
	1. Wood 2. Dried cow dung cakes 3. Kerosene 4. Gas
	Type of work:
	Where do you work?
	1. On the farm 2. In the house 3. Salaried employee
	What type of work is it?
B)	History of illness

Vaccination (for children) Are you allergic to any food/medicine? Addiction – cigarette/bidi/alcohol

C) Present examination - Description

A patient afflicted with an illness of the respiratory system has the following symptoms

- 1. Phlegm/cough
- 2. Difficulty in breathing.
- 3. Acute pain in the chest

In case the patient states any of the above complaints, then regard them as the main symptoms and first obtain additional information about the same and then about the remaining symptoms.

D) Examining for phlegm/cough

Ask the following questions first if a patient complains about phlegm-cough:

- Since when do you have this problem?
- How do you exactly cough? What type of cough is it?
- When is the cough acute?
- In case of cough with expectoration –
- What colour is the phlegm?
- Is the phlegm thick or thin?
- Since when do you have this problem?
- It is imperative to find out for how long the bouts of cough last.
- Cough occurs due to germs/pollution/allergy.
- Cough that occurs due to virus is cured within 8-10 days on its own. If the cough occurs due to bacteria and does not stop even with antibiotics, then following five diseases must be taken into consideration – TB, cough due to the cancer virus, smoker's cough, farmer's cough.
- How do you exactly cough? What type of cough is it?

Observation

Dry cough

This type of cough occurs due to allergies, worms in the abdomen or it occurs in farmers due to the mould in the farm.

Cough with expectoration

The phlegm produced in the upper respiratory system (nose, pharynx) is thin and that produced in the lower respiratory tract (lungs, bronchi, and bronchioles) is thick. Watery phlegm is formed due to virus. Thick, greenish-yellow phlegm is formed due to bacteria. One can suspect TB, pneumonia or lung cancer if the phlegm is reddish brown in colour

At what time of the day to you experience severe bouts of coughing?

The person afflicted with long-term illness of the respiratory system will complain of severe bouts of coughing in the mornings. The phlegm discharged during a single bout of coughing can vary from a spoonful to a cupful.

2. Ask the following questions first if the patient complains about difficulty in breathing –

1. What do you mean when you say that you are experiencing difficulty in breathing? If the patient complains about chest pain, then ask him/her the questions mentioned in point three. In case of breathlessness ask the following questions.

- 2. Do you feel breathless while working? It is normal for everybody to become breathless while exercising, but it should come under control within a short period. Difficulty while inhaling or exhaling indicates a disorder of the respiratory system. Difficulty in breathing while lying down or constantly is a serious symptom. Many a times, difficulty in breathing indicates heart diseases. In such cases the patient must be sent to the doctor.
- What makes you feel better?
 In case of an illness of the respiratory system the patient is constantly breathless.
 Nothing eases the patient's difficulty. A patient with a heart disease will feel worse when lying down and better when sitting.
- Since when do you have the problem of breathlessness? Is it increasing or has it decreased?
 If breathlessness is caused due to an illness of the respiratory system, it gradually increases. The patient can tackle this problem by making lifestyle changes.
- 5. For this reason, ask him/her whether he/she can still perform all the activities that he/she performed last year?

3. Ask this question first to the patient if he/she complains about acute pain in the chest, let the patient describe the type of pain in his/her own words.

Extreme cutting pain is caused due to the inflammation of the lung covering. A pressing pain or pain like a stone kept on the chest is caused due to heart diseases.

Where does it pain? In case of pneumonia, the pain is acute and the patient can easily pinpoint this spot. In case of pneumonia, the site and the pain are mutually associated.

If the patient has chest pain related with heart diseases, then the pain is diffusing which spreads to the left side of the chest, shoulders and sometimes, down to the left hand.

The patient does not have fever in case of heart diseases, whereas the patient has fever along with chest pain in case of pneumonia and TB. The windpipe (trachea) is located in the centre of the chest, so an inflammation of the windpipe (trachea) causes pain in the middle of the chest.

Swelling or inflammation of tonsils and larynx causes throat pain. If the pain increases on pressing the larynx externally, it is suggestive of tonsillitis.

1. Tonsils

Difficulty in swallowing.

Pain in the centre of the chest.

- 2. Inflammation of the larynx Pain increases on pressing externally.
- 3. Inflammation of the trachea -

- 4. Pneumonia, TB
- 5. Heart diseases
- Acute cutting pain in specific areas and fever Pressing pain, radiating to the shoulder, chest till the hands.

Turn to the other two sets of questions only after asking the sets of questions corresponding to the patient's complaints about the main symptoms. Obtain the following information apart from that above.

- 1. Do you have fever with chills? Fevers with chills are caused due to germs.
- 2. Are you taking any medicines?
- 3. Are you allergic to any medicines? Even allergy causes breathlessness.
- 4. Do you suffer from constant exhaustion?
- 5. Are you loosing weight? If the answer to the above two questions are 'yes', the illness has not arisen suddenly; you could diagnose that they possibly indicate heart disease, TB, anaemia or emphysema. Send the patient to a doctor in this case.
- 6. Do you smoke bidi or cigarette? The inflammation of the respiratory system may increase due to the house. Collect information regarding pollution in the house. Ask which type of fuel is used in the house.
- 7. What is your occupation?

Carrying out a few specific jobs exposes a person to the risk of dust and micro organisms entering the body along with the air. This may cause a burning sensation in the respiratory system or fibrosis.

Occupations that pose a risk to the respiratory system.

- 1. Quarry work
- 2. Stone-splitting
- 3. Factories manufacturing slates chalks
- 4. Carding cotton.
- 5. Traffic police
- 8. Does anyone else from your family suffer from the same problems?

In case someone in the family has TB, other members of the family are at a risk of contracting the same. Asthma may occur in children whose parents are afflicted with it.

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10. Examining the organs of the respiratory system

Aim :

To examine the organs related to the respiratory system and diagnosing ailments if any.

Requirement : Torch, tongue depressor, stethoscope

Procedure :

The respiratory system begins with the nose: Examine the nose with a torch. The mucous membrane of our nose appears red and wet. The mucous membrane appears swollen in case of a stuffy nose. A grape-like, soft and swollen knot can also be observed in the nose.

2) The next organ is the throat: Request the patient to open his/her mouth and say 'Aaah'. Now, the mucous membrane can be viewed at the back wall of the throat. The mucous membrane of a healthy person will appear pink. This mucous membrane appears red in case of pharyngitis. Even white/yellow/ash-coloured spots may be observed in our throat in case of bacterial infection. The tongue depressor can be used for a clearer view of the throat. The tonsils, throat and larynx as well as the trachea can be viewed by pressing the tongue depressor down on the back of the tongue.

The mucous membrane in all of these parts of a healthy person will appear pink, whereas it will appear red in case of an inflammation of any of these organs.

All these are regarded as external organs as they can be viewed with the help of a torch. But, we have to use the stethoscope and listen to the sounds of the internal organs of the respiratory system, which cannot be viewed with the eyes, in order to diagnose illnesses related with them.

A whistle-like, suuuui-suuuui, sound would be heard when the stethoscope is placed on either side of the chest in case of asthma. When the stethoscope is placed on the chest of a pulmonary oedema patient, it sounds like a paper crumpling.

Inference :

The reasons behind hearing both these sounds are,

1. In case of asthma, there is a hindrance in the bronchioles while exhaling. Pressure is created while exhaling, as more air has to be exhaled out of a narrow passage and a noise like the one created while blowing air through a flute is produced.

2. In case of pulmonary oedema, water fills in the air sac. That is why a sound like a paper being crumpled is emitted when the air flows into it. It is also known as rales.

Apart from this examination, we can obtain knowledge about chronic illness of the respiratory system by examining the nails. Risen nails indicate previous bronchitis and long term asthma. The ribs are drawn-in in case of asthma and pneumonia in children. The nostrils flare and the neck muscles are stretched.

Throat examination



11. Examining for previous illness

Aim :

- Discerning the previous illnesses of the patient and ascertaining if it has any effect on the present illness.
- 2) We can discern the patient's past history of illness before examining the patient by taking his/her history, e.g. we can be informed about past pneumonia, TB, blood pressure, diabetes, heart diseases, heart disorders, asthma.
- 3) We can also discern about any surgeries that the patient has undergone by inquiring about the same with the patient.

For example:

- 1. The scar of a gallbladder surgery can be seen on the right side of the abdomen, below the ribs.
- 2. A diagonal scar on the seventh quadrant of the abdomen may indicate an appendix surgery.
- A scar on the second quadrant of the abdomen, above the navel, usually indicates a surgery of the duodenum of the small intestine or a surgery for ulcers.

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4. A vertical or horizontal scar below the navel in women usually indicates a caesarean section.



20 Examining the eyes for anaemia and jaundice 2. Conjunctiva as it appears in 1. Conjunctiva as it appears in anaemic patient normal person 1. Conjunctiva as it appears in 2. Conjunctiva as it appears in patient suffering from normal person jaundice

12. Examining present illness

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Aim : Diagnosing the patient's illness and prescribing medicines accordingly as well as advising the patient about health.

Requirement : Torch, tongue depressor, stethoscope, soap for washing hands, water.

Procedure : Listen to all the complaints of the patient; start examining the patient only after obtaining all information about his/her illness. The examination can be conducted in the following steps.

Pulse : Check the pulse rate for one minute using a watch. Describe it as given below. For example, 80 per minute.

Rate ofCheck the patient's rate of breathing for one minute by placing yourbreathing :hand on the patient's abdomen/chest.Describe it as given below.For example, 20/minute

Blood pressure : Request the patient lie down and measure the blood pressure. For example, 120/80 mm mercury

General examination

Observation

of the hair: Sparse hair in infants may indicate malnourishment. Information regarding hair hygiene as well as dandruff in the hair can be obtained through this examination.

Eyes:

Check whether the eyes are kept clean. Whether the patient is anaemic or not, as well as the approximate severity of anaemia can be ascertained by examining the mucous membrane of the lower eye lids. The mucous membrane of an average healthy person is reddish in colour. It is pinkish in persons with low or moderate anaemia and whitish in case of severe anaemia.

Whether the patient has jaundice can be ascertained by examining the colour of the conjunctiva under the upper eye lids.

In the same manner, information as regards eye infections can be obtained by the redness of the eyes and the accumulation of dirt at the corners of the eyes.



Nose : Information as regards the mucous membrane in the nose and the cleanliness of the nose can be obtained through examination.

Ears : Information as regards the cleanliness of the ears as well as any ear infections can be diagnosed after viewing the ears using a torch.

Mouth: Request the patient to open his/her mouth and say 'Aaah' for examining the patient's throat. We have been informed about the same in the chapter regarding the examination of respiratory illnesses.

Along with the throat, we can obtain information as regards the diseases of the different parts of the mouth. We can first ascertain the patient's oral hygiene by looking at his/her teeth. Then, the state of the mucous membrane of the tongue and its dryness gives information regarding dehydration. We can estimate the haemoglobin content of the patient through the colour of his/her tongue.

Boils and wounds inside the mouth indicate malnourishment and vitamin B deficiency.

We can obtain information regarding the patient's addictions by examining the mouth, e.g. a blackish layer is formed on a part of the gums between the teeth of persons addicted to mishri (roasted and powdered tobacco).

The lips of persons addicted to cigarettes and bidi turn black at the centre and their front teeth are stained yellow. A white patch may be observed at the spot where a person always places tobacco.

Neck :The lymph nodes on the neck should be examined gently and slowly.This helps in diagnosing any infection of the throat, mouth or ears.

Nails : Examine nails for cleanliness, shape and colour. Raised nails indicate long term asthma in 90% of the patients. The colour of the nails provides information about the haemoglobin content in the blood.

Chest : The chest is shaped like a drum in case of emphysema.

Abdomen : Examine the abdomen gently using the entire palm of your hand. But since the finger tips are more sensitive we receive more information through them. Press the lower abdomen gently and with proper pressure for ruling out the possibility of lumps. Pain at specific spots on the abdomen while examining with a gentle pressure signals specific illnesses, e.g.

The possibility of appendicitis cannot be ruled out in case there is a pain in the lower right side of the abdomen on pressing gently. In that case the patient will also have the symptoms of fever and vomiting. In the initial stages of appendicitis, the pain is just below the navel and it then shifts to the seventh quadrant of the abdomen.

In case of parasitic infections like Giardiasis, Amoebiasis : Pain in the lower left side of the abdomen. In that case the patient will also complain about ordinary fever, diarrhoea with mucous and blood discharge, nausea, vomiting.

In case of inflammation in the stomach : The patient may experience pain in the upper left side of the abdomen that may sometimes spread up to the navel, but does not have fever. The patient will also complain about burning sensation in the heart and abdomen, nausea as well as vomiting. The patient may experience pain in the upper right side of the abdomen in case of liver diseases.

In case of kidney diseases : The patient will experience acute pain in the back when the areas on both sides of the spine just under the ribs are pressed.



13. McBurney's sign

Aim : Diagnosing appendicitis.

Procedure :

Request the patient to lie down on his/her back and examine the abdomen gently. Examine from just below the right ribs up to the right thigh.

In case of appendicitis, if the centre point of an imaginary line from the navel to the pelvic bone is pressed with the hand and then suddenly released, the patient will writhe in pain.

Inference :

In case of appendicitis, the peritoneum is inflamed. The patient experiences pain when the abdomen is pressed, as in doing so the peritoneum is pressed.

The patient has fever and vomiting in case of appendicitis.

14. Murphy's sign

Aim : Diagnosing the diseases of the gallbladder.

Procedure : Request the patient to sleep on his/her back. Press the area above the lower abdomen gently to examine the stomach. Request the patient to breathe deeply during this examination.

Observation : The patient with an inflammation of the gallbladder writhes in pain during examination.

Inference : When the patient breathes deeply, the lungs expand and diaphragm shifts downwards and as the liver is under the diaphragm it shifts downwards as well. The gallbladder is situated directly below the liver. While examining, the hand presses the gallbladder when the liver shifts downwards. The patient experiences pain in case of an inflamed gallbladder and he/she writhes in pain.

15. Examining a patient's liver and spleen

Procedure :

1) Liver examination

Request the patient to lie down on his/her back with the legs straight or with the legs bent from the knees. For examining the liver, inspect from the right thigh up to the upper abdomen just under the right ribs by pressing the abdomen gently with your right hand. Request the patient to breathe deeply during this examination.

Observation : When the patient breathes deeply, your right index finger will feel the lower section of the liver if it is enlarged. The liver is enlarged in case of jaundice. Amoebiasis also leads to the enlargement of the liver as small lumps are formed in the liver.

Procedure : 2) Spleen examination

For examining the spleen, inspect from the left thigh up to just under the left ribs by pressing the abdomen gently with your right hand. Ask the patient to breathe deeply during this examination as well.

Observation : The spleen is enlarged in case of sickle cell anaemia and frequent bouts of malaria.

EXPERIMENT BOOKLET Health and environment

Subject – 2 Module – 402



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Preface

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1. The requirement of oxygen for combustion

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Aim:	Proving that the oxygen in air is required for combustion.
Requirement:	Two small candles, 2 glasses, 1 saucer, matchbox
Procedure:	 Place 2 glasses next to one another. Light the 2 candles using the matchbox. Fix one candle each in the two glasses using a drop of hot wax. Ensure that the candles are not taller than the glasses. Now, place a steel saucer over one glass. Observe both glasses for 15 to 20 minutes.
Observation:	 The candle in the uncovered glass will keep burning even after 15 – 20 minutes. The candle in the covered glass will extinguish within a short
Inference:	 Since one glass was uncovered, the candle was supplied with air. The oxygen in air was used for combustion and the candle continued burning.
	 Since the other candle was covered, the air supply to the candle ceased. The candle kept burning till oxygen in the air trapped inside the glass existed. As soon as it was used up, the candle extinguished.

From this it can be inferred that the oxygen in air is required for combustion.



2. What is your rate of breathing?

Aim: Counting your breath rate

Requirement: A second clock, paper, pen and a friend for assistance.

Procedure: 1) With the help of your friend, count the number of breaths per minute while sitting calmly. Use this method to count the number of breaths per minute four times and calculate the average.

2) Now, take a brisk walk and immediately record the number of breaths per minute.

3

3) Now, run the distance that you walked and record the number of breaths per minute.

4) Record the number of breaths per minute after jumping up and down on the spot 25 to 30 times.

5) Accordingly, draw a graph of the records to find out when your rate of breathing was the fastest and it was the slowest?

Further uses:

Repeat the same experiment on your friend and record the observations. Take age and physique into consideration while comparing.

Aim: To observe the capacity of the lungs to inhale air

Requirement: Rubber tubes, one large glass bottle (2 litre capacity), a rubber stopper for a glass tube, potassium permanganate, a scale with centimetre reading, etc.

Procedure: 1) Prepare the rubber stopper for the glass bottle by fitting two glass tubes as shown in the diagram.

2) Mark the cm or ml indications on the glass bottle, in case it does not already exist. Fill this bottle with 2 litres of water to which potassium permanganate has been added.

3) Now, take a deep breath and hold it and then blow forcefully into one rubber tube, water will start spilling out from the other tube. Pour this water into an empty vessel.

4) The more the air in your lungs the more the water that spills out from the bottle. Now, either, calculate the difference between the water level before and after the experiment or measure the water that spilled out from the bottle.

5) (Clean the tube with a disinfectant each time after blowing air through it.)

6) What is your lung capacity? , Instead of taking a deep breath, take a normal breath. Observe the difference in the result of a deep breath as against a normal breath.

Further uses:

Check the lung capacity of different persons using this apparatus.
What is the lung capacity?





TM-110

4. Getting acquainted with the income of the Gram Panchayat

Aim:

 Getting acquainted with the different means of income of the Gram Panchayat.

2) Classifying the different means of income.

Requirement: Register, pen, Xerox copies, etc.

Procedure:

 It is necessary to consider the availability of money before undertaking any development work in the village. Obtain information about the different means through which the Gram Panchayat collects funds. Consult with the village worker, Sarpanch, members and former members for the same. As residents of the village, you have the right to obtain detailed information about the income of your Gram Panchayat.

2) Obtain detailed information about grants to the Gram Panchayat, taxes levied by the Gram Panchayat, charged fees, auctions, rent on immoveable property, special grants, and donations to the Gram Panchayat, contribution from the people, etc.

Income of the Gram Panchayat from the aforementioned as well as other sources is called Panchayat funds. It can be classified as follows:

1. Grants to the Gram Panchayat

2. Different taxes levied by the Gram Panchayat

3. Rent received by the Gram Panchayat

4. Loans taken by the Gram Panchayat

5. Donations and contributions accepted by the Gram Panchayat

6. Fees charged by the Gram Panchayat

Example 2 Income from the different taxes levied by the Gram Panchayat

a) House-tax on buildings and open space

b) Water tax

c) Entertainment tax, fair and festival tax

d) Vehicle tax (Parking lot)

e) Market tax

f) Cattle shed fee

- g) Different records/registration fees
- h) Tax on cattle (cattle trading)
- i) Lighting tax
- j) Health tax, etc.

Classify as mentioned above and stay informed about the income gained from them.

7

Further uses: After obtaining information about the income of the Gram Panchayat, as a vigilant resident, take active part in the planning of work and expenditure in future.

Funds of the Gram Panchayat by the Gram Panchayat	Income from the taxes levied	
 Different taxes levied by the Gram Panchayat Grants to the Gram Panchayat Rent received by the Gram Panchayat Loans taken by the Gram Panchayat Donations and contributions accepted by the Gram Panchayat Fees charged by the Gram Panchayat h) Health tax, etc. 	 a) House-tax on buildings and open space b) Water tax c) Entertainment tax, fair and festival tax d) Vehicle tax (Parking lot) e) Market tax f) Tax on cattle (cattle trading) g) Lighting tax 	

In this manner, we can classify the income of the Gram Panchayat obtained from fees, donations, rent and loan, from which we can estimate the total income of the Gram Panchayat.

5. Using bleaching powder to purify water

Aim: Deciding and administering the dosage of bleaching powder for purifying water.

Objective: 1) Calculating the capacity of the water storage tank.

2) Deciding the dosage of bleaching powder for purifying water.

Requirement: A cloth tape (5 meters); string; weighing scale; blank paper; pen, etc.

Procedure: 1) Measure the interior of the village water supply tank with the help of a tape in meters in the following manner.

For a square or rectangle tank -Length, breadth and the water depth For a round tank -The diameter of the tank and the depth of water (Use the string for measuring the water depth)

Enter the above measurements in the following formula to calculate the total water capacity in litres.

The total of a square or rectangle tank Water (litre) = length (meter) x breadth (meter) X water depth (meter) x1000

The total of a round tank Water (litre) = diameter (meter) x diameter (meter) X water depth (meter) x 785

(The resultant answer indicates the total water capacity of the tank in litres.)

Use 5 gm of bleaching powder having 35% active chlorine for purifying every 1000 litres of water. (Use bleaching powder with an ISI mark)

- 2) Depending on the water capacity weigh the bleaching powder with the help of a weighing scale. Add enough water to the powder in the bucket to make a paste. Then, add enough water to make ½ to ¾ bucketful of water. Stir this mixture well with a stick. Cover and keep aside till it settles.
- 3) Pour this settled mixture into another bucket and add this mixture to the water by dipping the bucket deep in and out of the water till it is well mixed. The water is ready for use after half an hour.

Further uses:

- 1) Apply the O.T test to verify whether the water in your village has been processed. If not, then teach the above mentioned process to the waterman of your village.
- 2) Test the appropriateness of the process with the help of the O.T test. Make appropriate changes in case of any errors.

6. Mother solution

To sterilize water at the household level. Aim: 1) Preparing the mother solution and using it to purify water at **Objective:** the household level. 2) Using mother solution to purify water in each and every household. 200 g bleaching powder, cotton cloth for straining water, a thick **Requirement:** plastic bucket (high), a dry wooden stick one foot in length, a cover for the bucket, one litre water, rust coloured thick glass bottle. 1) First, measure one litre of water and strain it using a cotton Procedure: cloth into a tall bucket. 2) Weigh 200 g fresh bleaching powder having 35% active chlorine (The bleaching powder (T.C.L) should be of good quality. Ensure that the packet of bleaching powder is sealed airtight.) 3) Pour the entire 200 g of bleaching powder into the plastic bucket (in which one litre of water is taken) and stir well to dissolve using a clean and dry wooden stick. Cover and set this mixture aside for a half an hour to one hour. 4) On removing the cover you will see that the limestone residue has settled at the bottom. Pour the upper layer i.e. the light coloured solution containing chlorine carefully into the rust coloured bottle. This solution containing chlorine is the mother solution. (Use this solution for purifying water at a ratio of one drop for four litres of water) 5) Supply this solution in a clean glass bottle for use in every household in the village and inform the people about its use and encourage them to use it for water purification. 1) While getting informed, also inform the people of the village, Further uses: especially anganwadi teachers, primary school staff, social workers about the same. 2) Prepare this mother solution in the primary school and taking adequate precautions send it home with the children. This

procedure must be followed diligently.

7. "A"-frame - a useful device for digging continuous channels at the same level

- Aim: To construct an "A" frame and to draw contour lines on a mountain slope.
- **Objective:** 1) Building a contour marker using the equipment available at the local level and which can be used by everybody.
 - 2) Drawing level contour lines (level lines) with the help of the frame (contour marker)
- **Requirement:** Three 10 feet long bamboos of identical thickness, cotton string for tying, tailoring tape, sketch pen, lime powder, etc.

Procedure: 1) First, take three 10 feet long bamboos that are of the same shape, light-weight and straight.

- 2) Mark at points that are one and a half feet away from both ends of these bamboos using a sketch pen or lime powder. Use the tailoring tape for measuring. Place the bamboos on these marks and tie them up to form a triangle as shown in the figure. You will now have points 'A' 'B' and 'C' and the distance between these points, i.e. 'A' to 'B', 'B' to 'C' and 'C' to 'A', will be identical i.e. seven feet. With the tailoring tape, determine the mid point of the base bamboo 'C', 'B'. Name this point 'D'.
- 3) Tie one end of a cotton string to the apex 'A' and tie a small stone to the other end of the string and leave this end hanging as shown in the figure.
- 4) This frame will be an equilateral triangle. Likewise, the hanging end of the plumb bob will be perpendicular with the base 'C', 'B'. As per the formula of this triangle, when the plumb bob is over point 'D', both legs, 'B' and 'C', will show the even ground level. In short, these two points are on the same contour level.
- 5) Now, mark points 'B' and 'C' on the ground with lime powder and select one of these points and place one leg of the frame on this point and then select the other point. It is necessary for the plumb bob to be steady on point 'D' before marking another point. Draw the entire continuous contour lines in this manner.
- Further uses:
- 1) Channels can be dug or bunds can be constructed by drawing continuous contour lines.
- 2) The damages to the farm and expenses caused due to the frequent bursting of bunds can be avoided by constructing flood-vent at the same level with the help of the 'A' frame.



8. Preparing a drainage pit and maintaining it.

Aim:

1) To drain sewage water

2) To let the sewage water seep into the soil.

Requirement:

A foot ruler, a pickaxe, a hoe, an iron container, a crowbar, medium sized earthen pot, coconut husks or coir, jute bag, screw, etc.

Procedure:

Select a location to dig a drainage pit. It should preferably be away from walls and in a place where the combined water from the bathroom and kitchen emerges. Do not dig a drainage pit in a rocky or damp place.

- The dimensions of the drainage pit are decided depending on the number of people in a family. A pit that is 3 feet long, 3 feet wide and 3 feet deep must be dug for a family of 5 to 6 persons.
- 2) Fill the bottom 1/3rd layer of the pit with stones and bricks of approximately 4 to 6 inch diameter. (In this case, 1/3rd is 1 foot.)
- 3) Then, fill the middle 1 foot layer with pieces of bricks, tiles or round stones of 2 to 4 inch diameter. (Middle layer 1 foot)
- 4) Fill the topmost 1 foot layer with stones, pebbles (with thickness less than 2 inches) or with coarse sand. The earthen pot has to be positioned in this layer.
- 5) Make 10 12 holes at the bottom of a medium sized earthen pot with the help of a screw (by twisting the screw around). Fill the pot with coir (fill with shredded coconut husks). Make place for the pot in the drainage pit and place it such that the mouth of the pot is at the level of the ground.
- 6) Now, spread the jute bag over the area surrounding the pot. Plaster it to the ground using cow dung and mud.
- 7) Replace the coir/coconut husks in order to maintain the cleanliness of the pot. After 3 to 4 years or in case you realize that the water is not seeping in through the pit any longer, dig out the entire drainage pit and prepare a new drainage pit by filling it with new stones and bricks or by using the same ones after drying them well.

Further uses:

In case space is available near or around your house, refilling water ditches, pits can be can be prepared by digging large pits and filling it in with the same items as for the drainage pit. Due to this, the water collected in the rainy season will seep through the soil leading to the refilling of water and will help in increasing the ground water level.

Drainage pit



9. Purifying water using solar energy

Aim: To purify impure water using solar energy.

Requirement: A wide vessel, a concave transparent glass lid that fits over the vessel, salt, drinking water, even a polythene film will do as a lid.

Procedure: Take water in a wide vessel and dissolve enough salt in it to make it saline. Cover it with the concave transparent glass lid and expose it to sunlight. In case of bright sunlight, keep checking, after 30 – 40 minutes small water droplets would have started accumulating on the inner side of the concave glass lid. When enough water has accumulated on the lid, lift the lid and taste the water droplets. Then, taste the water in the main wide vessel.

Evaluation:

Evaporation and condensation are the two actions that take place in this demonstration. Since the wide vessel was exposed to sunlight, the water turned to vapour and rose upwards to the lid and accumulated on the concave transparent glass lid or the polythene cover in the form of water droplets.

Further uses:

1) Cloud formation.

2) Checking whether it is possible to obtain drinking water from sea water.

10. Using solar energy

Aim: Proving that solar energy can be used in daily life.

Requirement: 1 small cup split kesari (Tur dal), 1 small cup rice, solar cooker, water

Procedure: 1) Wash the split kesari and rice thoroughly.

2) Put the rice and gram separately in the two containers of the solar cooker and add water in the usual proportion.

3) Taking the position of the sun into consideration, place the solar cooker in the courtyard/terrace in the morning (between 9:30 a.m. and 10:00 a.m.). Keep the containers of rice and split kesari in the cooker and cover with the glass lid

4) Move the solar cooker according to the movement of the sun. Ensure that the solar cooker is always exposed to the sun.

Observation:

1) After approximately two to two and a half hours open the containers in the cooker. (Use a dry cloth to open the containers to avoid burning your hands).

2) You will observe that the rice and split kesari are well cooked, piping hot and ready to serve.

Inference: With equipment like the solar cooker we can use solar energy in our daily life as well.

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Note:

Maharashtra Energy Development Agency (MEDA) provides these solar cookers at a subsidised rate. Solar cookers of different manufacturers are also available in the market.)

For more information: Publications of the Maharashtra Energy Development Agency



11. Report writing

Aim: Keeping a record of the monthly savings group meetings.

Requirement: Register, pen, clipboard, etc.

Procedure: First of all, record the date, time, group name, village name, place of the meeting and the meeting attendance in detail. If possible, mention the meeting number as well.

Background: Here, a brief account of the important qualitative and quantitative topics and decisions taken in the previous meeting should be discussed briefly and documented so as to associate it with the present meeting.

The main topics of the meeting - meeting objectives:

1) Follow-up for the decisions and the main topics (In short, recording the decisions taken or the actions taken on the decisions.)

Mention the details regarding the quantitative topics of the meeting

 monetary transactions – savings receipts, savings returns, loan
 instalments, interest, fees, new loans, total receipts and
 disbursements.

3) Even the qualitative topics like – the important decision-issues of the meeting, e.g. who was given a loan? how and why was a person elected? opinions of the members regarding the same, reaction participation as well as report, new information and discussion about this information, votes, decisions, etc. must be noted. It is necessary to record the reactions, questions, discussions, etc. of the members regarding the new information. Even the situational context must be given while recording the opinions of the members.

4) Giving information as regards the date, time, place and topic as well as the action plan of the next meeting.

Further uses: As a health worker, it is necessary to prepare a report of the daily or monthly work. Through this, you can estimate as well as ascertain the progress of work. It would be possible to pinpoint the problems as well as rectify them in time. It also aids in recording the collective work of the institution.

Sample

We can use the following sample to record the monetary transactions of the savings group monthly meeting.

Date:		
Time:	Place:	
Group name	e:	
Meeting nu	mber	

No.	Name	Savings receipt	Savings returns	Loan instalments	Interest
					× * *
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EXPERIMENT BOOKLET Health Education

Subject – 3 Module – 403



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Preface

National Institute of open schooling – We have published four experiment booklets based on the four modules of '**Gramsakhi**'. While studying the Gramsakhi modules, only reading or explaining them orally is not sufficient for understanding them. The procedure will only remain embedded in our minds permanently if we actually implement it.

Similarly, frequent repetition of the demonstrations enhances our skills.

Since the instructor is present while conducting the procedure, mistakes, if any, are immediately rectified. All doubts arising during the execution of the procedure can be clarified on the spot. Moreover, a large part of the syllabus is covered automatically. This is the reason for publishing these booklets. Experiments have been selected independently from each module and diagrams have been given as and when required.

All these experiments are of use in our daily life. Implementing these regularly will help in increasing our self-confidence.

We hope that these booklets will be of use to you.

Contact us in case of any queries, difficulties or in case you feel that some other important information must be included or in case you have any suggestions regarding the arrangement and layout. This will make these experiment booklets easier and simpler and in turn, will aid in achieving our goal.

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Diag. Symptoms of diseases	17

1. Recognising the signs and symptoms of the respiratory system diseases.

1

Physical	1. On examining with a stethoscope, you will hear a sound
examination :	like the waves
	2. In case of acute infection, you will hear a whistle-like sound.

There are four stages of the chronic inflammation of the respiratory tract

First stage – More bouts of coughing in the morning.

Second stage – Breathlessness while climbing, picking up heavy objects and after walking for a longer distance.

Third stage – The patient is so weak that he/she cannot even walk up to the main door of the house and complains about cough with phlegm in the morning.

Fourth stage – The patient experiences pain even while talking.

 You can treat the patients in the first and second stages, but send the patients in the third and fourth stages to a doctor or a hospital.

Examining the patient :

- 1. A ronchi or whistle-like sound would be heard while examining with a stethoscope.
- 2. The patient's chest would have a sunken appearance.
- 3. If the patient is exhaling slowly, it means that the patient is using his/her strength to exhale.

Symptoms :

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- 1. Difficulty in breathing
- 2. A whistle-like sound.
- 3. Cold, cough, phlegm

Signs: 1. The patient requires more time than usual to exhale.

- The signs and symptoms of infants between the ages of 2 months and one year
 - 1. The infant cannot suckle.
 - 2. Epileptic fits

- 3. The infant sleeps longer and it is difficult to wake the infant.
- 4. When the child is sleeping peacefully, you can hear a wheezing sound.

5. The infant remains malnourished.

Pneumonia

- 1. It is pneumonia, in case the ribs do not get drawn in while breathing.
- 2. It is pneumonia if breathing speed has increased.
- For 2 12 month old infants More than 50 breaths per minute is a high rate of breathing.
- For 1- 5 year old children More than 40 breaths per minute is a high rate of breathing.

Respiratory Tract Infection



2. Acute symptoms of the respiratory system diseases

In case parents come to you with complaints regarding the child's respiratory mechanism, you can determine the severity of the case in the following manner –

- 1. The child does not consume any thing.
- 2. The child cannot suckle the mother's milk.
- 3. Experiences epileptic fits.
- 4. The child sleeps longer than usual. It is difficult to wake the child.
- 5. A loud noise is emitted while breathing.
- 6. A whistle-like sound is emitted while the child is quiet.
- 7. High fever or the body temperature drops below normal.
- 8. The child becomes extremely malnourished.

In case of serious illness, send the child to a hospital or doctor immediately.

Acute pneumonia :

Infant below 2 months of age

- 1. The breath rate increases to more than 60 breaths per minute.
- 2. The ribs are drawn in.

Pneumonia in adults :

Signs and symptoms

A)

A person troubled by pneumonia has a high fever with chills, has a cough, experiences difficulty in breathing (increase in the rate of breathing) and complains of chest pain.

B)

- 1. The nostrils flare.
- 2. Very high temperature
- 3. Increase in the rate of breathing.
- 4. The chest does not expand uniformly
- 5. No sound is heard when you tap on the chest.
- 6. A sound like that of the waves is heard when examined using a stethoscope.
- Examine the patient's nails and lips. In case oxygen supply is less than that required, the nails and lips turn blue.

Send the patient to the doctor if there is no improvement even after 24 hours. Send to the doctor in the following cases.

- If the child stops drinking milk and water.
- · If the child stops crying
- " If the rate of breathing increases.
- In case of cough even after treatment.

Our responsibility as a health worker

Explaining the symptoms of pneumonia to the parents or the guardian of the child.

1

Informing about the preventive measures against pneumonia.

3. Household remedies for illnesses of the respiratory system like the common cold

5

Aim : Acquainting yourself with the household remedies for common cold

- **Requirement :** Basil, peppercorns, ginger, cinnamon, oil, camphor, long pepper, lemon, sugar, salt, water, dry ginger powder, turmeric, jaggery, pure ghee, lemon grass, linseed, white onion.
- Procedure : 1) Wash 10 12 basil leaves. Boil 2 peppercorns, 1 small piece of ginger and basil leaves in 2 cups of boiling water. Simmer this decoction till it boils down to 1 cup. Administer this hot decoction to the person having the common cold 2-3 times a day.
 - Heat two spoons of oil in a small bowl. Add 1 spoon of ground camphor to the oil and mix. Keep this mixture in a bottle. Rub this mixture on the nose, forehead and chest in case of common cold and cough.
 - 3) Prepare tea using lemon grass and cinnamon. Serve this tea to the person suffering from cough and cold.
 - 4) For common cold, drink lemonade (juice made with water, sugar and lemon juice).
 - 5) Add 2-3 seeds of long pepper to 1 cup milk and boil. Serve this to the person suffering from common cold.
 - 6) Take 2 spoons of dry ginger powder in a bowl. Add 1 spoon pure ghee, 1 spoon turmeric and 1 spoon jaggery to it and mix till well blended. Prepare 4-6 tablets of this mixture. In case of common cold take 4-5 tablets a day, one at a time.
 - 7) Take 1 spoon of linseed in a pan and heat. When the linseeds start to crackle add one cup of water. Then add one chopped white onion. Simmer this decoction till it boils down to 1/2 cup. Drink this warm decoction at night just before sleeping.
- **Observation :** 1) A decoction of basil, ginger and peppercorns reduces common cold with a runny nose and eliminates feverishness.
 - 2) Rubbing oil, to which camphor has been added, on the nose and chest relieves a running nose.

- 6
- 3) Lemon grass and cinnamon tea soothes aching throat and helps clear the nostrils.
- 4) Dry ginger powder and jaggery tablets as well as long pepper aids in reducing phlegm.
- 5) Linseed and white onion helps in thinning coagulated phlegm, which is discharged via the nose and is excreted via the faeces.

Inference :

 Illnesses of the respiratory system like the common cold are caused due to germs, pollutants and allergens. You can try curing this illness with the above mentioned household remedies before visiting the doctor.

1

2) The patient will feel the difference within 3-4 days.

4. Oral Rehydration Solution

Aim : Compensating the water deficiency in a person dehydrated due to diarrhoea.

Requirement : One litre water, salt, a fistful of sugar, vessel, fireplace/gas, a clean four-ply cotton cloth, (lemon, baking soda if easily available)

- Procedure : Strain the water through a clean four-ply cotton cloth. Boil this water for 5 minutes. When cool add one large pinch (three-fingered) of salt and one pinch (two-fingered) baking soda (if easily available) and then taste it. It should taste like our tears. Then add a fistful of sugar and if required, lemon to taste.
- **Precautions :** 1) Use this mixture only for four to six hours after preparation as there is a possibility of the mixture getting contaminated with germs.
 - Take the patient to a doctor in case the patient's condition does not improve satisfactorily even after administering Oral Rehydration Solution (ORS).

Preparation of ORS (Oral Rehydration Solution)



5. Recognising the symptoms of dehydration

Minor	Major	Critical	
Child irritable	Extremely irritable reasons	Listless for unexplainable	
Normal pulse	Pulse rate lowers hands and feet are cold	Pulse rate extremely low, to the touch.	
Average urination	Slightly less urination than 12 hours.	Not urinated for more	
	Fontanel slightly depressed	Fontanel deeply depressed	
	Sunken eyes	Deeply sunken eyes	
	Dry and drawn face	Extremely dry and drawn face	
	Dryness of the mouth	Feeling of thirst	
	Skin on the lips starts peeling	Flakiness of the lips due to dryness	
	The elasticity of the skin reduces	The elasticity of the skin is destroyed	
		The child may faint	
Weight reduces	Weight reduces by 5-10%	Weight reduces by more than by 5%10-20%	

 We can determine the type of dehydration the child is suffering from by observing the child's condition (minor, major or critical).

Examining of dehydration

1



The elasticity of the skin reduces.

To Examine - Pinch & pull the skin between the thumb & index finger.

After releasing if the skin does not get back to normal instantaneously, it is dehydrated.



6. Checking for fever

Aim : Using a thermometer to check temperature

Requirement : Thermometer

Procedure : Wash the thermometer thoroughly and place it in the right or left armpit of the patient. Instruct the patient to hold it in place firmly. Take a thermometer reading after two minutes.

The thermometer can be placed under the tongue for a time period of two minutes to check the temperature in adults. It is possible to check the temperature in children by inserting the thermometer into the rectum. This thermometer is different from regular thermometers and is known as the rectal thermometer.

Note : Before checking the temperature, shake the thermometer briskly and lower the mercury level to 35 °C.

Observation: The fever can be classified into approximately three types depending on the temperature reading. Ordinary fever - 99° to 100 °F Moderate fever - 101° to 103 °F High fever - more than 103 °F

Inference: The basic property of mercury is that it remains in the solid state at normal temperatures and expands correspondingly with increasing temperature. We can hence measure fever.



7. Recognising different types of fever

Types of fever

1. Malaria :

Signs and symptoms

Fever with chills. The fever is above 104 °F and it subsides after 2-3 hours with sweating. Fever appears on alternate days or after every 2 days. The patient is fresh when he/ she does not have fever. In some cases, the spleen could be enlarged when examined. This illness can be diagnosed from the above symptoms and this diagnosis can be ascertained by a blood test done during the fever with chills. Critical condition – incoherent movement, condition veering towards restlessness. Sometimes, even jaundice can occur along with malarial fever. This jaundice is not caused due to viral infection but due to the extensive destruction of red blood corpuscles.

2. Flu (viral fever) : Body ache, headache, fever, running nose, moderate fever when examined.

3. Rheumatic fever : There is a possibility that the patient has suffered form an inflamed throat a few days previously. Swelling and pain in the knee, ankle and elbow joints, breathlessness and fatigue. This illness occurs in children aged between 5 and 15 years.

4. Sunstroke : High fever, acute headache, nausea, vomiting...when examined, the face is red, fever above 104 °F and we are informed that the patient was exposed to extreme sunlight.

 5. Urinary tract infection : Moderate fever with chills, burning sensation and soreness while urinating. Sometimes, blood is discharged along with urine. Pain in the lower abdomen.

While examined: patient has moderate fever, the patient complains of pain when the lower abdomen is pressed.

6. Jaundice : Ordinary fever, appetite loss, weight loss, yellowish urine, the eyes and nails turn yellow.
of the liver) While examining: The liver swells and hence its size increases.
Pain when the area just below the right ribe is presend. The

Pain when the area just below the right ribs is pressed. The nails and eyes are yellow, even the skin seems yellow in some cases.

- 7. Puerperal fever : Fever occurs within ten days of delivery or miscarriage. Along with fever, the patient also has chills. Fatigue, acute pain in the genitals and lower abdomen, face turns red due to fever, pulse rate increases, foul smelling dark red blood clots pass through the vaginal discharge.
- 8. Wound infections : All areas surrounding the wound turn red. A whitish-yellowish layer forms on the wound due to viral infection, the wound is painful, movement slows down, moderate fever and pulse rate is fast.
- 9. Amoebiasis / Pain on the left side of the lower abdomen.

Giardiasis: Bowel movements are not very loose. Cramps in the abdomen, mucus and blood passes through the stool, vomiting, nausea, low or moderate fever, lassitude, exhaustion, loss of appetite. When examined, acute pain on the left side of the lower abdomen in particular. There are no symptoms of dehydration.

- **10. Cholera :** Watery stools, vomiting, moderate fever, signs of dehydration are observed early.
- 11. Pneumonia : Sometimes, there is possibility of the child contracting pneumonia if the child is malnourished and is just recuperating form chicken-pox or measles, since the resistance power of the child, which is already low due to malnourishment, decreases significantly due to these two diseases. Infections can occur quickly under these circumstances and the child is afflicted with pneumonia.
- We can identify the type of fever depending on each observation given above.



8. Symptoms of diseases

Migraine : Unbearable headache, nausea, dizziness. There is a possibility of an increase in blood pressure.

Diphtheria : Inflammation of the throat, pricking sensation and a white film over the throat, difficulty in swallowing.

Bronchitis : Pain in the centre of the chest, cough and phlegm, moderate fever, whistle-like sound while breathing.

- Heart attack : Squeezing pain on the left side of the chest. Pain radiating towards the left hand, dizziness, profuse sweating, difficulty in breathing, nausea, vomiting.
- Gastritis : Pain in the abdomen, on the left side under the ribs, pain reduces after eating, nausea, vomiting, heaviness of the stomach, loss of appetite. But, in case pain decreases after eating assume that it is the inflammation of the duodenum of the small intestine.
- Kidney stone : Pain in the abdomen on the left of the navel, which radiates forward from the spine. Nausea and vomiting. Burning sensation while urinating.
- Gallstones : Pain on the right side of the abdomen under the ribs. Pressing with hands causes Pain which increases after eating fried food, nausea, vomiting.

InflammationPain on the right side of the lower abdomen, Murphy signof thepositive, vomiting and nausea, fever, either diarrhoea orappendix :constipation

Blood clots

and infection

in the veins Pain in the calf, swelling and redness.

of the calf :

(Varicose veins)

Fracture : Unbearable pain on the spot on the hand or leg that was hurt after falling, swelling and redness.

 We can identify the illness depending on the types of pain described above.

1)Appendicitis (Inflammation/ Infection of appendix) 2) Blood clots & in infection in the veins of the calf.(Varicose veins)

Symptoms of diseases

EXPERIMENT BOOKLET Means of Health Promotion

Subject – 4 Module – 404



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Preface

National Institute of open schooling – We have published four experiment booklets based on the four modules of '**Gramsakhi**'. While studying the Gramsakhi modules, only reading or explaining them orally is not sufficient for understanding them. The procedure will only remain embedded in our minds permanently if we actually implement it.

Similarly, frequent repetition of the demonstrations enhances our skills.

Since the instructor is present while conducting the procedure, mistakes, if any, are immediately rectified. All doubts arising during the execution of the procedure can be clarified on the spot. Moreover, a large part of the syllabus is covered automatically. This is the reason for publishing these booklets. Experiments have been selected independently from each module and diagrams have been given as and when required.

All these experiments are of use in our daily life. Implementing these regularly will help in increasing our self-confidence.

We hope that these booklets will be of use to you.

Contact us in case of any queries, difficulties or in case you feel that some other important information must be included or in case you have any suggestions regarding the arrangement and layout. This will make these experiment booklets easier and simpler and in turn, will aid in achieving our goal.

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1. Malnourishment

Aim: Assessing the nutritional status of 0 to 5 year old children and identifying the stages of malnourishment.

Requirement: Weighing machine, tape, growth chart graph

Procedure - 1 - Depending on the weight and age

A) First, ensure that weighing machine is set to zero.

B) Weigh the infant.

C) Record the infant's weight in front of the age on the growth chart.

D) Ask the infant's age and record it on the horizontal line of the growth chart.

E) Remove the infant's clothes and weigh him/her and record the same in the vertical line.

F) Identifying the stage of nourishment of the infant.

Procedure - 2 - In case the age of the infant is not known

Using the tape: The infant is surely aged between 0 and 5 years, but the exact age is not known. Use the following procedure and check only in centimeters.

First, hold the tape at the infants shoulder and bring it down till the inner elbow and check the measurement, then calculate the mid-point. Place the tape around this point of the arm and check the measurement.

Inference:

In case the mid-arm circumference measurement is as given below then the infant falls in the malnourished category

- 1. If the mid-arm circumference measurement is less than 12.5 cm the infant is severely malnourished.
- 2. If the mid-arm circumference measurement is between 12.5 and 13.5 cm, the infant is moderately malnourished.
- 3. If the mid-arm circumference measurement is more than 13.5, the infant is normal.

* [O. P. Ghai: Essential Paedatrics Shakir's tape]



[2]



2. The 'Sahli's method' of testing haemoglobin.

Aim: To check the haemoglobin level in the blood.

Requirement:

Haemoglobinometer, test tube, rubber pipette, injection needle, rod, spirit, distilled water, hydrochloric acid, brush, etc.

Procedure:

- 1) Wash hands thoroughly and wear gloves.
- 2) Place the haemoglobinometer in front of you.
- 3) Take 20 ml hydrochloric acid in a test tube.
- 4) Place this test tube in the haemoglobinometer.
- 5) Clean the finger of the person whose haemoglobin is to be checked with a spirit swab.
- 6) Prick the finger with a needle.
- 7) Press and extract one drop of blood.
- 8) Suck this blood through the pipette up to the blue line.
- 9) Release this blood into the test tube in which hydrochloric acid has been poured.
 - 10) Immediately clean the rubber pipette using water.
 - 11) Stir the hydrochloric acid (HCL) and the blood that is inside the test tube with a rod. Set this mixture aside for 5 minutes. Then, pour distilled water into this tube little by little, till the colour matches the colour on both the side tubes of the haemoglobinometer. View the number at the top of the test tube once all three colours look alike. The number till which the solution rises is the haemoglobin level of the person. Then, clean the test tube thoroughly with water and a brush.

Precautions:

- 1) Hold the haemoglobinometer in front of your eyes and in ample light while matching the colours.
- 2) Shake the mixture well.

Note:

We can determine the blood haemoglobin level of a person as well as decide whether the person has anaemia or not using this test.

3. Recognising the nutrition quotient of foodstuff

Aim: Studying the nutrient quotient of the various types of food constituents.

Requirements: Thick blank papers, chalk, blackboard, pencil, colour sketch pen, etc.

Procedure: First, make enough chits from the blank paper. Write the names of all foodstuffs in your diet. Prepare approximately 50 to 60 chits.

Then, make all participants (Tais) sit in a circle in front of the blackboard. Put all chits in a box and pass this box around the circle. Let every participant remove one chit from the box each time. Pass the box around till empty.

Make four columns A, B, C and D on the blackboard A) Carbohydrates (energy giving substance) B) Proteins (for growth and development) C) Oily food D) Vitamins and minerals (body defence).

Now, let everyone read out their chits and enter them in one of the above columns. After entering the item, discuss with the whole group as to whether the entry is correct or incorrect. Then, take the necessary decision.

Example:

A	В	С	D
Carbohydrates (energy giving	Proteins (for growth substance)	Oily substances and development)	Vitamins and minerals
Wheat, jowar, rice, potato, etc.	Split Bengal gram (harbara dal), Kesari dal (tur), fish, eggs, etc.	Groundnut oil, ghee, etc.	Lemon, papayas,

Further uses:

Make note of lack of a certain foodstuff in our diet with the help of the table and see if any solution can be planned or any alternative measures can be taken.

Like in the above procedure, make chits of the illness caused due to a lack of certain foodstuff in our diet (Rickets, night blindness, malnourishment, anaemia, etc.) and write the symptoms, causes, and preventive measures on it. Make a diseases column; fill in this column with the information obtained after a discussion.

4. Notice writing

Board/blackboard, white chalk, coloured chalk.

Aim: For providing information to the public.

Requirement:

Thought:

- 1) Select the topic as per the needs of the public e.g. new plans, regarding agriculture, etc.
- 2) Provide information as regards local questions/problems.
- 3) Inform about the remedies for illnesses if you know them. Give information regarding preventive measures.
- Awaken consciousness about social issues (e.g. superstition, dowry deaths, female foetus tests and foeticide, alcohol pro hibition)
- 5) Inform about the village programmes.(Date, time and place of the village meeting)

Precautions:

- 1) The language should be simple.
- 2) The sentences should be short.
- 3) The writing should be visible and legible.
- The chosen, meaningful information should be a maximum of 5-6 lines.
- 5) The priority of the information should be determined de pending on the conditions.

5. Our tradition of well being and resource wealth.

Aim: Mapping of the resources locally available and required for traditional remedies.

Objectives: 1) As a health worker, staying informed about availability of the natural resources in our region that are required for traditional remedies.

- 2) Promoting the knowledge and traditional remedies about the tra dition of well being appropriately and effectively.
- **Requirement:** The available outline map of our region (copy prepared by Xerox or tracing paper), coloured pen, paper, record of the person practicing traditional medicine and of the place, record of the available natural resources, rangoli if the map is to be drawn on the ground, coloured rangoli, etc.

Procedure:

1) Make a complete detailed list of the manpower and the well being tradition as well as the remedies available at the local level in our region (Maintain a register. Record all mid-wives/wet-nurses, masseurs, fomentation experts, bone setters, physicians, persons anointing with herbs (traditional practitioners), health workers, nurse, doctor, etc.), and also the medicines prepared using medicinal plants, minerals, animal ingredients, etc. and the place where it is available.

2) At the local level, through experience and traditional treatment methods, the order of treatment is decided depending on the illness. First, household remedies, then, seek advice from a more knowledgeable and experienced woman/man, a physician (vaidya/hakim) (one who prescribes Ayurvedic medicines), a health worker, nurse, doctor and hospital sequentially. Discuss the sequence of seeking health care with respect to illnesses.

3) As a health worker, consciously note down the importance of the health related knowledge of women in the map so as to encourage and give them respect in society.

4) Show each other the entries in the map. After all workers have drawn the drawing/map, prepare a large map after a combined discussion and mount in a public place if possible.

Discuss the advantages-disadvantages and limitations of traditional treatments.

Advantages: Easily available service, affordable, quick help, sharing of experience, gives a boost to self sufficiency.

Limitations: Limitations arise in case of serious illness and in emergency situations.

Further uses: 1) Sowing and growing of medicinal plants – sowing in pots, kitchen gardens, Dhanvantari garden, etc.

2) Giving detailed information to the wet-nurses/mid-wives about the prevention of infections as well as identifying dangerous symptoms.

3) Experience should be shared with the physicians (Vaidya/hakim).

4) Ensure that the contractor does not harvest the medicinal plants excessively for commercial purposes.

Tradition of well being and resource wealth

(Household remedies) - Coffee, lemon

(Knowledgeable person) - Decoction of guava leaves

(Physician (Vaidya/hakim)) - Nutmeg

(Health worker) - Oral Rehydration Solution

(Nurse/doctor/hospital) – Treatment depending on the type of diarrhoea e.g. Amoebiasis – Metronidazol.

6. Enriching village life

Aim:

1) To identify the vulnerable section of the society and understanding the solutions that can be planned for their needs/problems.

Requirement:

2) Three different groups, register, pen, pencil, rubber, blank paper, a list of all the heads of the house along with their house numbers.

Procedure: 1) Make a list of different development works of the village, e.g. hand pump, toilets, etc that are carried out for our hygiene facility (with the assistance of the Gram Panchayat records, village worker, the Sarpanch, and former Sarpanch).

2) Prepare a map of the village (Draw the outline map on a blank paper. In case the village is very big, draw the map as per the ward arrangement or by dividing it into sections. Join them if possible.)

3) Display the list of all the village service and facilities (development work) e.g. public bathrooms, anganwadi, primary school, cooperative society, Gram Panchayat, library, Nirantar Education Programme, notice board, constructed gutters, community hall, market, etc. on the map in detail.

4) Display the maps of all three groups on a wall and discuss the following topics with the participating village institution: Does everybody in the village gain from the service-facilities available in the village? Who faces what kind of problems to obtain the service-facilities? Which are the other facilities that are additionally necessary?

5) The needs of various groups of the society like the poor, schedule caste-tribe, women, children, disabled, the aged and the abandoned are different. It is imperative that their needs be given top priority. Keeping this in mind, make a list of their needs by speaking with them separately.

6) The vulnerable sections face with injustice even today. Create awareness about this prevailing condition in the groups and focus their attention towards creating an action plan for 2 or 3 of their needs and start working towards meeting the same.

Further uses:

Creating awareness in the groups as well as the members of the Gram Panchayat about the prevailing condition of the vulnerable sections facing with injustice even today and focusing their attention towards creating an action plan.