

PART TWO

LEARNING THROUGH SEEING, DOING, AND THINKING

IF I HEAR IT
I FORGET IT.



IF I SEE IT
I REMEMBER IT.



IF I DO IT
I KNOW IT.



IF I DISCOVER IT
I USE IT.



This part of the book gives ideas for bringing learning to life. It suggests ways to make learning more meaningful, useful, and adventurous.

To be effective, health education must be practical. **Health workers need to learn skills that help them observe, understand, and explore ways to improve the life and health of their people.**

An effective training program puts emphasis on these three ways of learning:

1. **Observation:** encouraging students to look at things closely and fearlessly, and to ask searching questions.
2. **Understanding:** helping students learn to analyze problems critically and work together toward finding appropriate solutions.
3. **Action:** students and instructors learn together through experience and practice.

Put simply, observation, understanding, and action mean *seeing, thinking, and doing*. Unfortunately, many training programs do little to encourage students to think. They focus on memorizing facts and carrying out specific instructions. Even standard teaching aids tend to demonstrate information rather than help students discover answers for themselves. Students learn to follow directions (or sometimes flow charts) step by step, without having to think or make decisions. Their training is oriented toward 'performing tasks' rather than 'solving problems'.

Such a mechanical, not-quite-fully-human approach to learning may be a suitable way to train animals—but not people! It can turn students into typical civil servants. They may carry out their duties obediently (or they may become careless or corrupt). But they will probably not become leaders of the poor in their struggle to overcome the biggest causes of ill health.

The human mind is made to think and explore. It grows stronger with exercise. But it grows weak, lazy, or resentful when limited to 'clearly defined tasks'.

If health workers are to become leaders who will defend the interests of the poor, their training must help them learn to use the tools best suited for this purpose.

The best tool a person has for understanding and changing the conditions that affect his world is the human mind. Health workers must be prepared to analyze problems, take initiative, and search for the ways of doing things that will help people meet their needs. Training should encourage people to think!

Part Two includes more than just ‘teaching aids’. It is a collection of suggestions and methods to help equip students (and instructors) to be thinking, questioning, creative persons who can work intelligently to deal with their communities’ needs.

Chapter 11 gives examples of teaching methods and aids that help get the students actively involved. It explores techniques that let students discover new facts and ways of doing things for themselves—using their own minds and hands. This not only helps students remember what they learn, but prepares them to take initiative in solving still bigger problems they will face in their own villages or communities.

Chapter 12 looks at ways of making and using pictures—valuable skills that help health workers share what they know with others. Both drawings and photos are considered.

Chapter 13 discusses ways that story telling can be used as a tool for teaching. It gives examples of spoken stories and stories told with drawings, slides or photographs, and comic strips.

Chapter 14 explores role playing and ‘sociodrama’ as ways of bringing learning closer to the lives, feelings, and needs of real people. (Examples are also found in Chapter 27.)

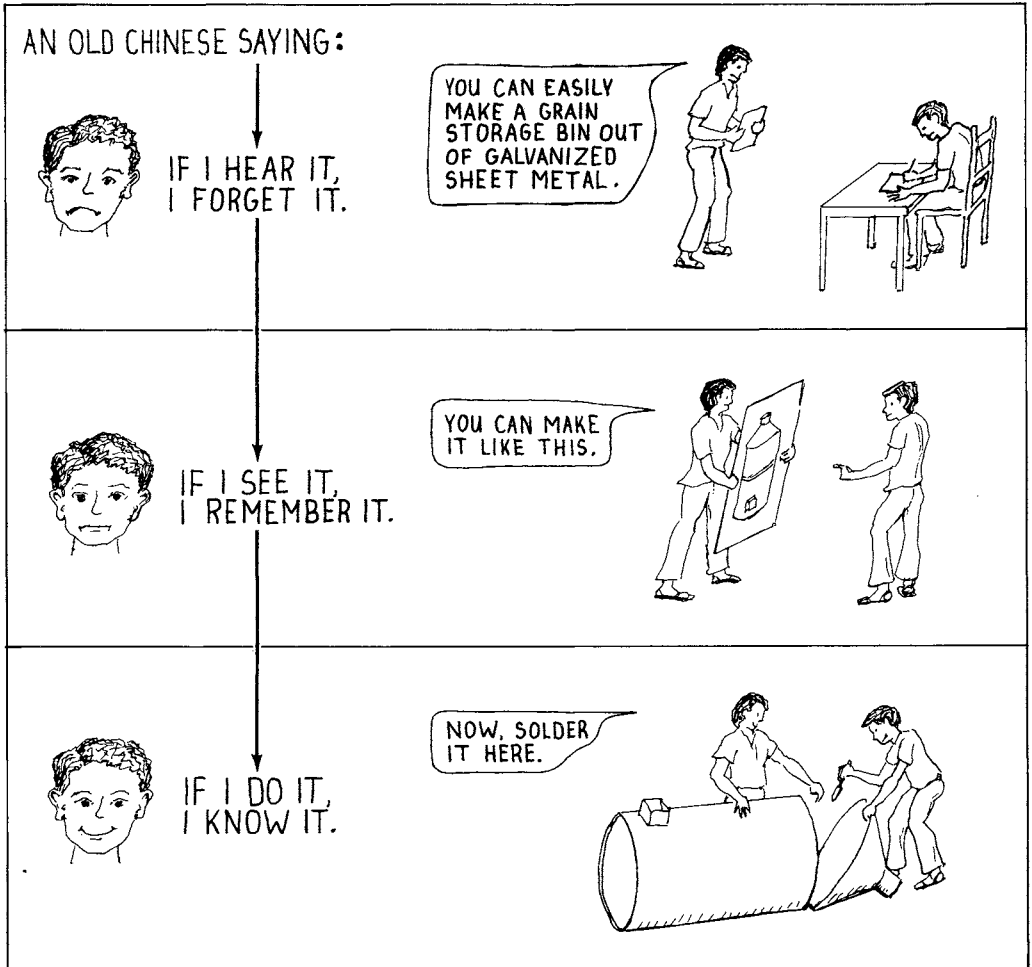
Chapters 15 and 16 explore inappropriate and appropriate technologies—both ‘soft technology’ (methods and ideas) and ‘hard technology’ (things to make and use). We consider appropriate those ideas, methods, and tools that are controlled and understood by the people who need and use them. **Chapter 16** looks at homemade, low-cost equipment, as well as appropriate ways of writing and copying written materials.

Chapter 17 looks at ways to help health workers take a thoughtful, organized approach to solving problems. We call this ‘scientific method’.

Chapter 18 examines the problem of overuse and misuse of medicines, both by medical professionals and by people in general. It discusses ideas for helping health workers and other people to use medicines more sensibly.

Chapter 19 follows up on Chapters 11 and 18. It gives examples of imaginative teaching aids for learning how to use antibiotics intelligently, and for understanding the measurement of blood pressure. Blood pressure is discussed in detail, as this is an important skill for health workers in many communities.

Making and Using Teaching Aids



We all learn best when we take an active part in finding out things that are new to us!

- A class in which we **take part in discussions** is more interesting than a class in which we just listen to a lecture.
- A class in which we can **see for ourselves** what things look like and how they work, is more interesting than a class in which we only talk about things.
- A class in which we not only talk and see, but actually **do and make and discover things** for ourselves, is exciting! When we learn by finding things out for ourselves, by building on experience we already have, we do not forget. What we learn through active discovery becomes a part of us.

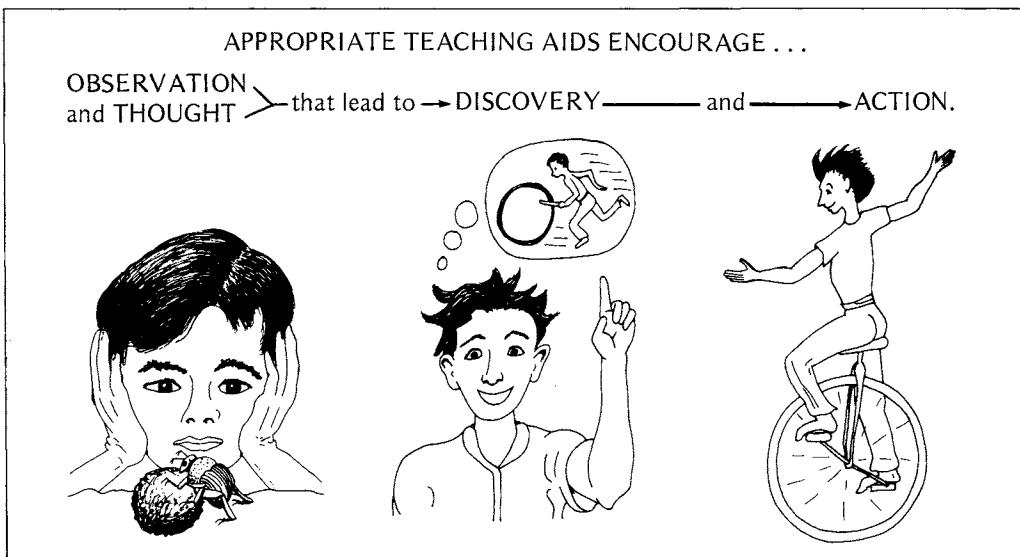
GUIDELINES FOR APPROPRIATE TEACHING AIDS

Whenever possible:

1. **Make your own teaching aids**, using low-cost local materials.
2. When making teaching aids, **use and build on skills students already have**.
3. Try not to make the aids *for* the students, but rather **involve students** or members of the community in making them for themselves.
4. Look for ways to **use real objects** instead of just drawing things.
5. Draw human anatomy (and signs of health problems) on people, not on paper.
6. Teach new ideas or skills by comparing them with familiar objects or activities.
7. **Make teaching aids as natural and lifelike as you can**, especially when detail is important.
8. Use teaching aids that call for doing as well as seeing—aids that students must handle or put together.
9. Make them as fascinating or fun as possible, especially teaching aids for children.
10. Use teaching aids that do not simply show or explain something, but that **help the students to think things through and discover solutions for themselves**—teaching aids that exercise the learners' powers of observation and reason.
11. **Use your imagination**, and encourage students to use theirs. Turn the making and inventing of teaching aids into a challenge and an adventure.
12. **Keep teaching aids relatively simple**, so that when health workers return to their communities, they can make their own and teach others.

In summary: Create and use teaching aids that help develop self-reliance in both acting and thinking—in helping persons find things out for themselves.

In this chapter, we give detailed examples of these 12 points, and then discuss teaching aids that make use of flannel-boards, flip charts, puzzles, and games.



1. MAKING YOUR OWN TEACHING AIDS FROM LOW-COST MATERIALS

Example: **Learning about childbirth**

LESS APPROPRIATE



Some programs use an expensive plastic model of a woman's hips to teach health workers or midwives about childbirth. Although such models look natural and are easy to practice with, they are not something health workers can make in their villages to teach local people. (photo from Venezuela)

MORE APPROPRIATE



A surprisingly lifelike model for teaching about childbirth can be made by cutting and painting a cardboard box. Health workers or midwives can make this 'birth box' at almost no cost. The back flap, cut to look like breasts, is used to teach the importance of putting the baby to the breast right after birth. This helps to deliver the placenta and reduce bleeding.

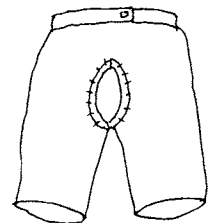


STILL MORE APPROPRIATE

In these photos, student health workers and a midwife act out a birth. (Mexico)



Teaching about birth can become even more lifelike with the use of two local resources: a student and a pair of old pants. The student dresses like a woman about to give birth, and has a doll 'baby' hidden in her clothing. The pants are cut to form a 'birth opening'. The student wears other pants underneath to avoid embarrassment. If possible, sew elastic around the opening so it will stretch.



In this way, the students can explore the hope, fear, pain, and joy of childbirth. They learn about the mother's feelings, as well as the mechanics of delivery. By using real people, students learn to feel more relaxed about this natural process. (For more ideas for learning about childbirth, see p. 22-8 and 22-9.)

2. MAKING TEACHING AIDS BY BUILDING ON SKILLS PEOPLE ALREADY HAVE

Example: **Making a large Road to Health chart for a flannel-board**

LESS APPROPRIATE

If mothers, midwives, or students with little formal education are asked to draw a complicated chart, they may find it very difficult. They may feel foolish or ashamed because drawing charts is something they have never done before.



Mothers who have had little schooling try to draw a large teaching model of a Road to Health chart (see *WTND*, p. 299).

MORE APPROPRIATE



Mothers and students make a teaching model of a Road to Health chart by sewing ribbons and threads onto a big piece of flannel. (Project Piaxtla, Mexico)

Here, however, some mothers and students are making a chart by sewing rather than drawing the lines. Because they are using a skill they already have and enjoy (decorative sewing), some of the strangeness, or magic, is taken out of chart making from the beginning.

In this way, **the students develop a new skill by building on an old one.** They feel confident and proud to put their traditions and knowledge to use in new ways. Where you live, people may be skilled in weaving straw mats or cloth, dyeing cloth (batik), or carving wood. Any of these traditional skills could be used to make a large teaching model of a Road to Health chart. (In some regions, of course, people may have more experience in drawing. In that case, it would make more sense to draw the chart.)

For ideas about using the flannel-board Road to Health chart, see p. 22-15.

3. INVOLVING STUDENTS IN MAKING THEIR OWN TEACHING AIDS

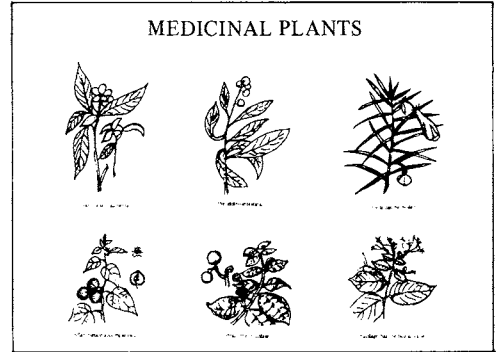
Example: **Health posters**

LESS APPROPRIATE—
poster made by outside artist



Many programs use posters made by professional artists when drawings by health workers and other local persons might work as well and involve people more.

MORE APPROPRIATE—
poster made by outside artist



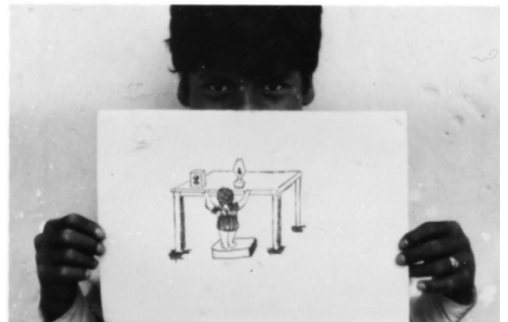
However, it may make sense to use some professionally made posters and displays, especially when details are important.

Instructors or a local artist can help students learn to draw or copy pictures (see p. 12-9). The health workers can then help school children to make posters about health subjects. The best posters can be displayed in public. This way, the health workers and the children learn the messages of the posters extra well. They also learn a valuable skill—drawing—and have fun at the same time.

MORE APPROPRIATE



Health worker showing children how to make health posters.



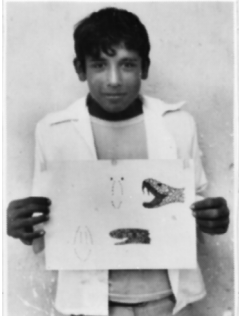
Poster made by school child.

For more ideas on making drawings and posters, see Chapter 12.

4. USING REAL PEOPLE OR OBJECTS INSTEAD OF JUST DRAWINGS

Example 1: **Snakebite**

LESS APPROPRIATE



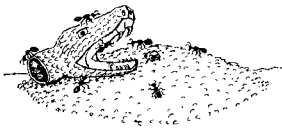
For the CHILD-to-child activity on preventing accidents (see p. 24-7), a school teacher in Ajoya, Mexico used drawings to show the difference between the bites of poisonous and non-poisonous snakes.

But a local health worker drew red fang marks right on a child's arm. This made the lesson much clearer.

MORE APPROPRIATE



STILL MORE APPROPRIATE

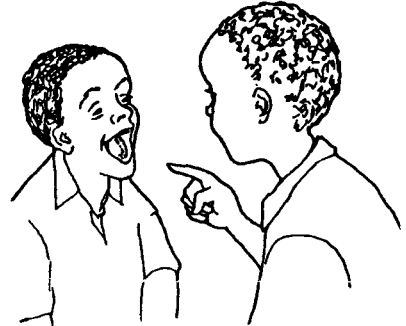


It is even better if you can show students the teeth of live snakes (be careful!) or the skulls. A skull can be cleaned of flesh by putting it on an ant hill for a day or so, and then soaking it in potash (water with ashes) or lye.

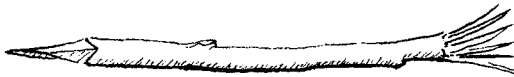
Example 2: **Learning about cleaning teeth**

Instead of simply learning that germ colonies, called plaque, form on teeth and gums, students can actually see where the plaque is and learn the best way to remove it with a simple experiment.

Students can gather in pairs or groups and color their teeth with an ordinary household food dye (or try betel nut or berry juice). It can be applied with a clean cloth, or simply by putting several drops onto the tongue and wiping the tongue around the teeth.



Students then look into each others' mouths or into a mirror to see where the staining is heaviest. It will be heaviest where the plaque is heaviest. They can then try to remove the stain with brushes, chewing sticks, or using any other local method.



Students can make a brushstick like this one, using the twig of a tree in their area. The teeth can be sharpened with one end and brushed with the other (*WTND*, p.230).

The students will also see what teeth are hard to clean and what teeth need the most cleaning to remove the stains and plaque. They can also learn which ways of cleaning work best by checking others' teeth and comparing the different cleaning methods.

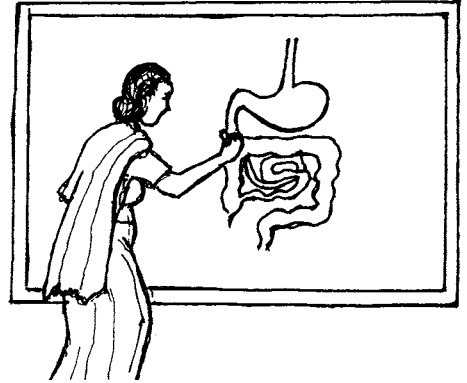
For some students one method will work best, for others a different one will work best to clean teeth and remove plaque.

5. DRAWING PARTS OF THE BODY (AND SIGNS OF HEALTH PROBLEMS) ON PEOPLE, NOT PAPER

Example: **Anatomy of the belly or chest**

Drawing anatomy on paper or on the blackboard makes things not only flat, but dull.

LESS APPROPRIATE



MORE APPROPRIATE



Whenever possible draw on people, not paper.

Drawing the inner parts or organs of the body directly on a person has 3 advantages:

- It is more interesting, and therefore easier to remember.
- The organs are seen in relation to the rest of the body and appear more lifelike.
- It is a good way to get students to feel more comfortable about touching and examining each other—and eventually a sick person.

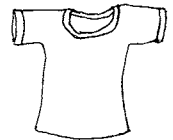
MORE OR LESS APPROPRIATE

T-shirt with anatomy



One disadvantage of drawing on people in class is that it takes time.

A quicker way is to use T-shirts with drawings of different body systems already on them: one for the digestive system, one for the bones, one for the heart and blood system, and so on.



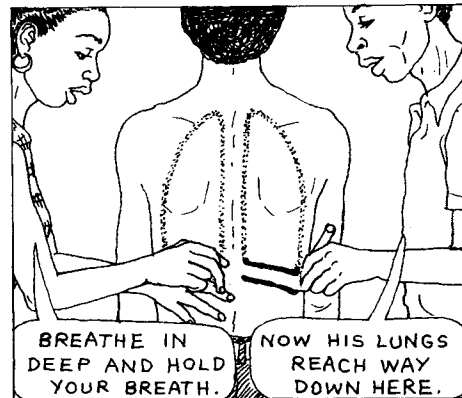
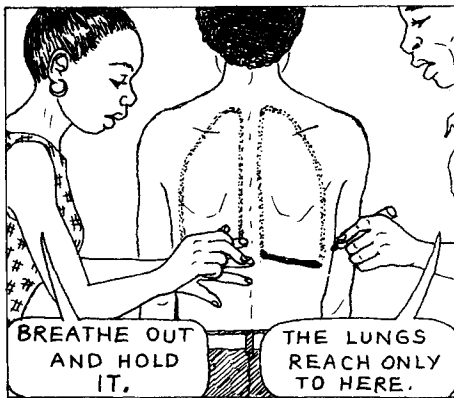
T-shirts with anatomy printed on them can be purchased in some countries. But these may be expensive and more detailed than you need. It is better to draw or paint the anatomy on T-shirts with your student group. You can even try 'silk screening' them using the method described on page 16-12.

6. TEACHING NEW SKILLS OR IDEAS BY COMPARING THEM WITH THINGS THAT ARE FAMILIAR

Example: **Thumping (percussing) the lungs**

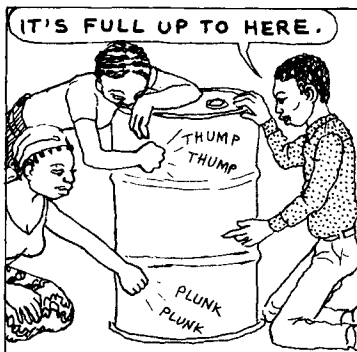
When teaching about physical exam or respiratory problems, you probably will want to explain where the lungs are and how they work. For this, it helps to draw the lungs on a student, as shown on page 11-7. Draw them on both the chest and the back.

To determine the size of the lungs, show students how to thump or *percuss* the back, listening for the hollow sound of air in the lungs. Draw the bottom line of the lungs first when they are as empty as possible, and then when they are full. Students will see how the movement of the *diaphragm* (a muscular sheet below the lungs) affects breathing and lung size (also see p. 11-13).



By doing this, students not only learn about the position, size, and work of the lungs, they also learn a useful skill for physical examination—thumping the lungs to listen for relative hollowness. This can help them spot signs of disease.

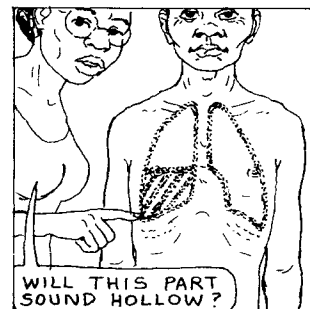
To help students understand the different sounds they hear when thumping, have them determine the level of water (or gasoline) in a large drum or barrel.



Then thump the chest of a student.



Next, compare with a person who has a solid (diseased) area or liquid in a lung.



If possible, also show the students X-rays of normal and diseased lungs.

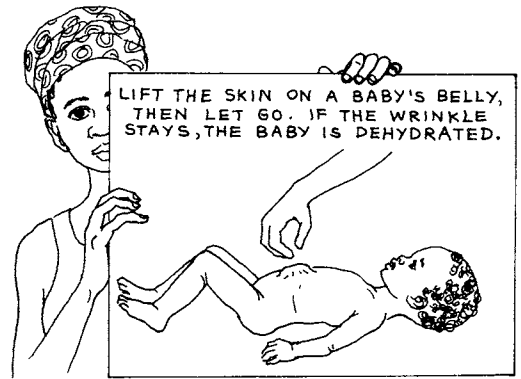
For other examples of teaching new things by comparing them with something familiar, see 'how flies spread germs', p. 7-11; the story from India, p. 13-1; and the use of plants and fruit to teach about dehydration, p. 24-19.

7. MAKING TEACHING AIDS AS LIVELIKE AS POSSIBLE

Example: **The belly wrinkle test**

APPROPRIATE (A DRAWING)

When teaching mothers and children about the signs of dehydration, health workers can tell them about the 'belly wrinkle test', or even show drawings like this:

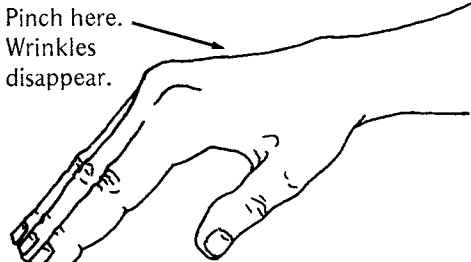


It is much better, however, if students actually **do** the test and find out how it works.

Students can practice doing the test on the back of someone's hand. (The hand of an older person works better than the hand of a child.)

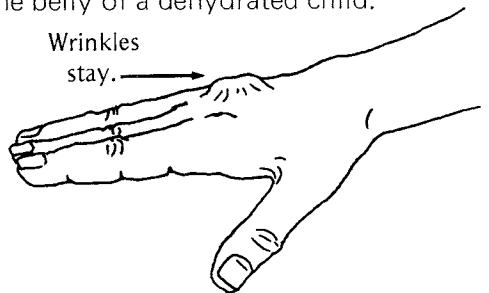
MORE APPROPRIATE (ACTUALLY DOING IT)

In this position, wrinkles will not stay after the skin is pinched.



This is like the skin on the belly of a healthy baby.

But in this position, the pinched skin stays wrinkled for a moment—just as on the belly of a dehydrated child.

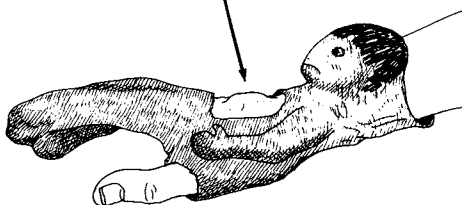


This is like the skin on the belly of a dehydrated baby.

When you show the belly wrinkle test to children, make sure they realize that the test should be done on the belly of a baby, not the hand. You can have the children make a doll like this, out of an old glove or stocking and an egg.

STILL MORE APPROPRIATE

When the 'belly' is pinched, the wrinkle stays.



Using a doll like this makes the test more realistic. It also turns learning into a game.

8. TEACHING AIDS THAT REQUIRE DOING AS WELL AS SEEING

Example: **Closing a cut or wound**

The poster at right is adapted from a drawing in ***Where There Is No Doctor*** (p. 85). It shows, step by step, how to make butterfly bandages and close a wound.

But it does not, by itself, give students a chance to learn through practice. Students see how something is done, but they do not actually do it.



LESS APPROPRIATE

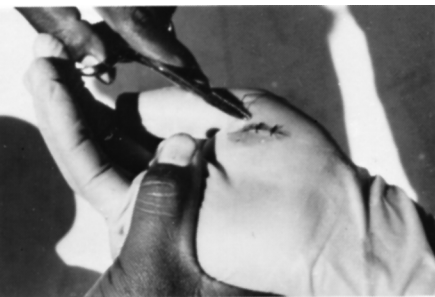
MORE APPROPRIATE



A lifelike way to practice closing wounds is to have someone wear a tight-fitting rubber (surgical) glove. Make a cut in the glove, and color the skin under the cut red to make it look like blood.

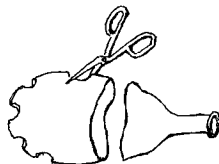


The rubber glove tends to stretch and pull apart like real skin. The students can prepare butterfly bandages and close the 'wound' by pulling the sides of the cut together.



The students can also practice sewing or suturing a wound using the same rubber glove. As with a real wound, care must be taken with the placement and tension (pull) of the thread in order to avoid tearing or bunching up the delicate 'skin'.

If you do not have surgical gloves, try using a large balloon. Cut holes for the fingers, like this.

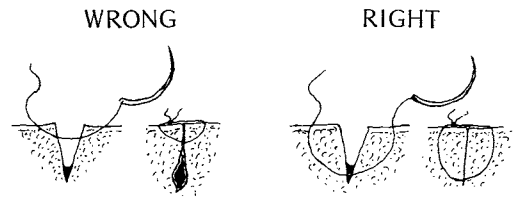


And wear it like this. But be careful. It tears easily.



Helping Health Workers Learn 2012

A common mistake when suturing wounds is to make the stitches too shallow. If the wound is not completely closed inside, it heals more slowly and is more likely to become infected.



EVEN MORE APPROPRIATE



Foam rubber helps students learn how deep to sew stitches.

Unfortunately, the rubber glove teaching aid does not let students practice deep suturing. A better teaching aid for this can be made by wrapping a piece of foam rubber or thick felt around someone's arm. Make a deep cut in the foam and color it red.

Students will learn even better if they can practice on real wounds. It is, of course, best if they do not practice on people until they have gained some skill. Try to use freshly killed animals—especially pigs.

(In the Philippines, health workers make cuts and practice suturing on live dogs. But this also teaches them that cruelty can sometimes be justified. Do you think this is right?)

STILL MORE APPROPRIATE



Students practice closing a wound on a dead pig.

MOST APPROPRIATE (after learning the skill through other practice)



After students have had plenty of practice, they should be given every opportunity to close real human wounds—even if this sometimes means interrupting a class.

In this photo, student health workers are helping to close the head wound of a boy hit by a rock.

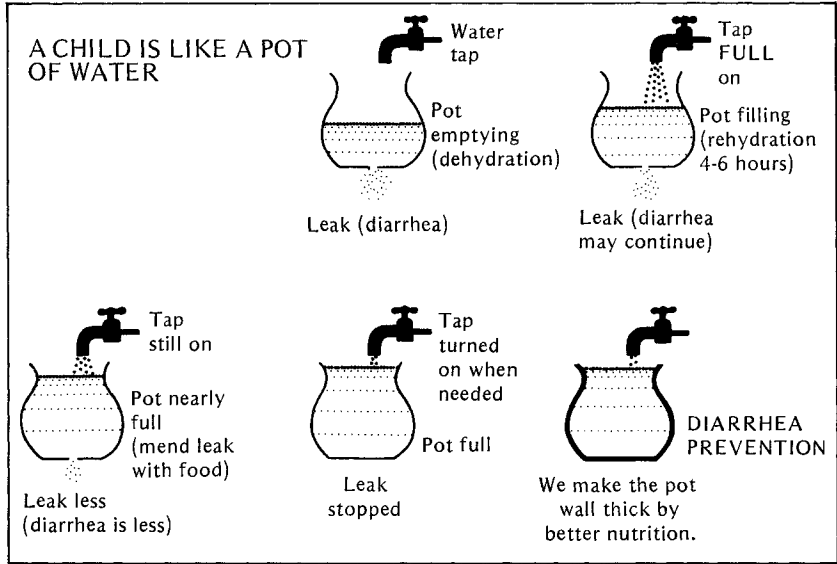
(Ajoja, Mexico)

9. MAKING TEACHING AIDS FASCINATING AND FUN— ESPECIALLY THOSE USED WITH CHILDREN

Example: **Diarrhea and dehydration**

Drawings like these contain important ideas. But children, especially, may have trouble understanding them. Also, they are not much fun—even when actual pots are used along with the drawings.

LESS APPROPRIATE

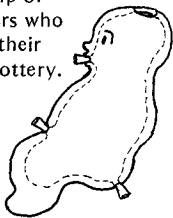


It is more fun and children learn better if they can make or paint their own 'pots' to look like babies. Model babies can be made out of clay, tin cans, plastic bottles, or gourds.

MORE APPROPRIATE

CLAY BABY—

This can be made with the help of mothers who make their own pottery.



GOURD BABY—

Gourds of this shape are grown in many parts of the world for use as water jugs.



The children then experiment with the model baby to find out about dehydration. Because they make their own teaching aid and discover answers for themselves, learning becomes an adventure. It is fun and they never forget what they learn.



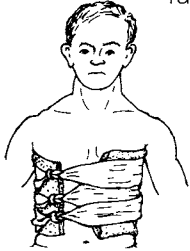
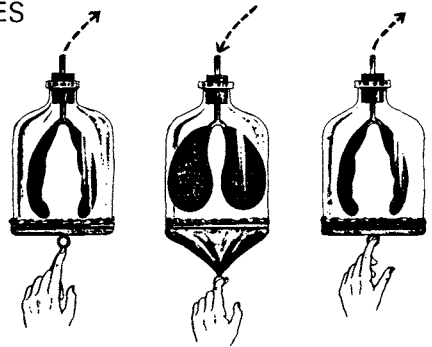
Children in Ajoya, Mexico use a gourd baby to demonstrate signs of dehydration.

For more ideas on how to teach about dehydration using these model babies, see page 24-18.

10. USING TEACHING AIDS THAT GET STUDENTS TO FIGURE THINGS OUT FOR THEMSELVES

Example 1: Learning about injuries to the chest and lungs

The pictures to the right are taken from a popular Venezuelan health magazine called *Ser*. They show how the movement of the *diaphragm* (the muscular sheet below the lungs) helps the lungs fill with air.



In the mountains of Mexico, gunshot and knife wounds to the chest are common. If air is being sucked through the wound when the person breathes, the hole should be covered at once with an air-tight bandage. (See *WTND*, p. 91). To help students discover why this is important, the instructors in Ajoya designed a teaching aid based on the idea shown above.

1. They drilled a small hole in a glass bottle (using a dental drill).
2. They put a balloon in the bottle and blew it up. Then they plugged the hole with wax.
3. They asked the students to pretend the bottle was a man's chest and the balloon his lung. The students were amazed that the balloon stayed full of air although it was open at the top. (They discovered the principle of the vacuum.)
4. To show why it is important to cover a chest wound at once, a student slowly sucked the air out of the bottle until the 'lung' filled up again. (In the body, the air is slowly absorbed.)



One student then stabbed the 'chest' (through the small hole),



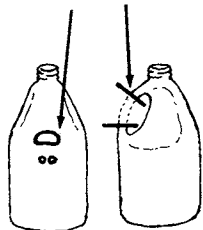
and the 'lung' inside collapsed.

As long as the student kept the hole covered, the 'lung' stayed full. So the students discovered why an air-tight bandage is important.

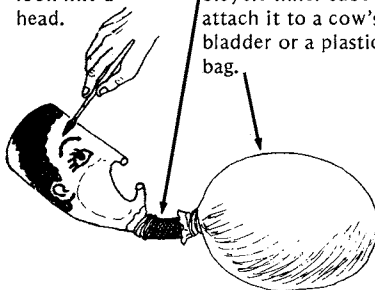
Example 2: Mouth-to-mouth breathing

Students can use the following model to find out how mouth-to-mouth breathing works and practice doing it.

Cut holes in a plastic bottle, like this or like this.



Paint it to look like a head.



Use a piece of old bicycle inner tube to attach it to a cow's bladder or a plastic bag.

One person gives mouth-to-mouth breathing while another presses on the 'chest' as it rises and falls.



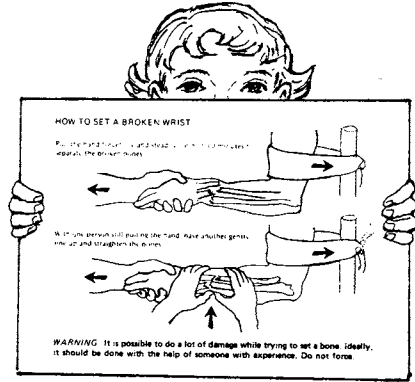
A still better way to learn about mouth-to-mouth breathing, of course, is for students to practice on each other.

11. USING IMAGINATION TO DEVELOP NEW TEACHING AIDS

Example: Setting broken bones

The poster on the right is from page 98 of *Where There is No Doctor*. It gives an idea of how to set a broken arm, but does not provide students with a chance to practice it—to learn by doing.

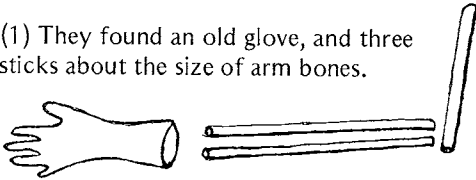
LESS APPROPRIATE



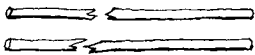
MORE APPROPRIATE

An experienced village health worker, Pablo Chavez, and his students invented the following teaching aid:

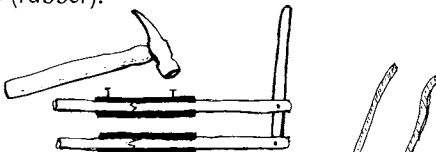
(1) They found an old glove, and three sticks about the size of arm bones.



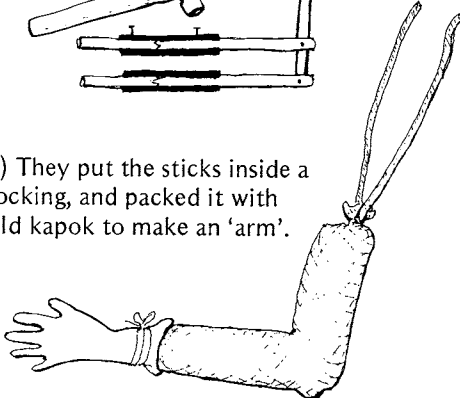
(2) They broke two of the sticks.



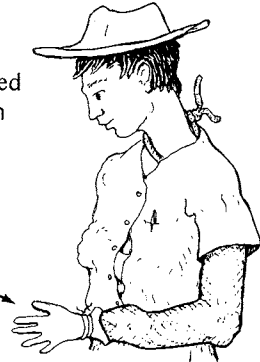
(3) Then they fastened them back together with tightly stretched pieces of an old inner tube (rubber).



(4) They put the sticks inside a stocking, and packed it with wild kapok to make an 'arm'.



(5) The 'arm' was tied to a person's neck in such a way that it looked natural.



The 'arm' was then 'broken', like this

so that the ends of the sticks overlapped, like this

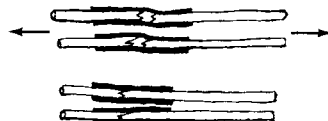


inside view

(6) Students then practiced setting the broken 'bones'. Just as with a real break, two persons had to stretch the arm while a third person positioned the bones.



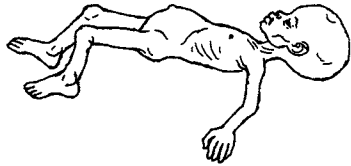
Pull apart, then set 'bones'.



12. KEEPING TEACHING AIDS SIMPLE, SO THAT STUDENTS CAN MAKE THEIR OWN FOR TEACHING IN THEIR COMMUNITIES

Example: **Cardboard babies**

A set of life-size 'babies' cut out of cardboard can be used for teaching many things in many ways.

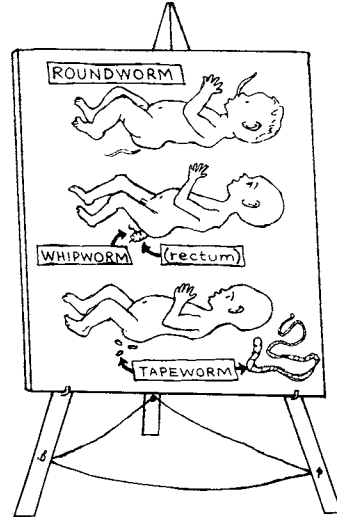
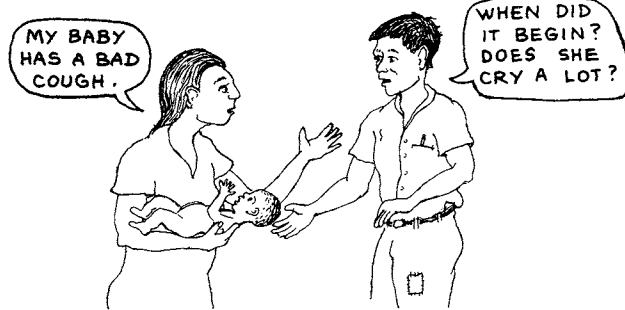


The 'babies' should be drawn and colored to look as lifelike as possible. If students find it hard to draw realistically, they can copy or trace the program's teaching models.

Ways of using the cardboard babies:

(1) **On flannel-boards.** You can paste flannel on the backs of the cardboard babies, and use them for many different flannel-board presentations. Here the babies are shown with different kinds of worms. The worms and the labels are also cut out of cardboard. (For other flannel-board ideas, see the Index.)

(2) **In role playing.** For classroom learning, health workers can act out the diagnosis, treatment, and prevention of different health problems. The use of cardboard babies makes the role plays more fun and more realistic. (See Chapter 14.)



(3) **For public plays and farmers' theater.** The cardboard babies can be used on stage instead of real babies. See the play on "The Importance of Breast Feeding," page 27-31.



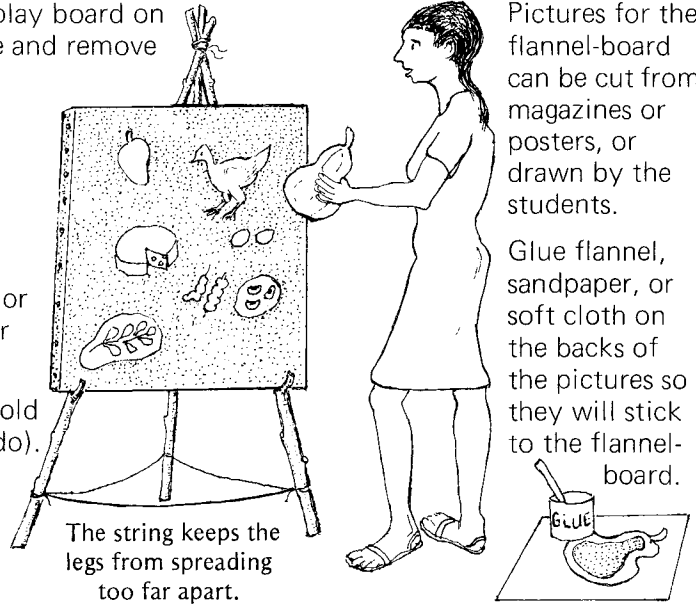
IDEAS FOR PRESENTING TEACHING AIDS

FLANNEL-BOARDS

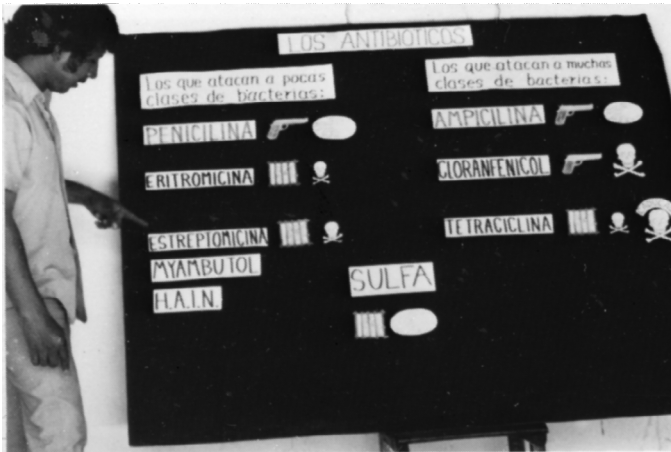
A flannel-board is a display board on which you can easily place and remove pictures. It consists of:

- A frame with a firm surface made of boards, plywood, fiberboard, masonite, or strong cardboard.
- A large sheet of flannel or soft cloth stretched over the frame.
- Some sort of stand to hold it up (even a chair will do).

This stand is made of three sticks tied together.



A flannel-board like the one above is a handy teaching aid. It is a good idea to have each student make one during the course to take home and use in his community. Experience shows that **having students make their own teaching aids during the course often works out better** than simply telling them how and expecting them to do it when they are back in their villages.



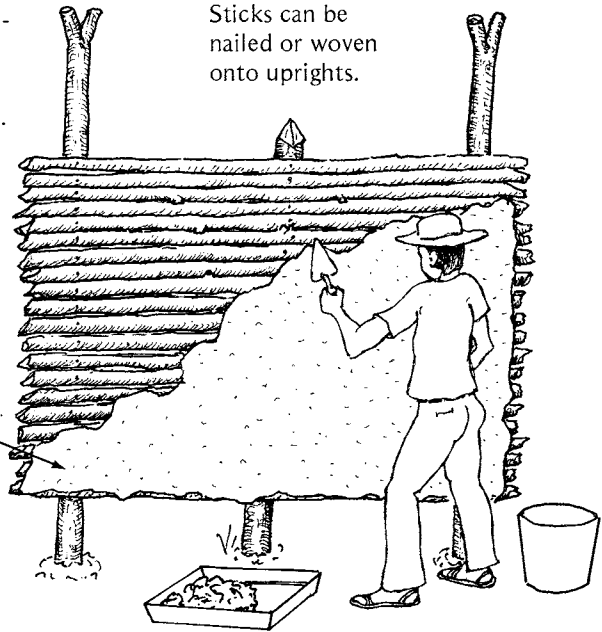
For a training program, a **large flannel-board** like this is extremely useful. It can hold signs and objects large enough for everyone to see clearly. If plywood, masonite, or fiberboard is too expensive, the flannel can simply be tacked on a wall. However, pictures will stay in place better if the surface is tilted backward somewhat.

Remember: Teaching methods need to be adapted to local circumstances. In the highlands of Guatemala, nutrition workers have found that many people are uncomfortable standing in front of large groups. So, instead of asking them to come up to a flannel-board in front of the group, leaders pass around a **small flannel-board**. That way, participants have a chance to see and touch the board, and place objects on it, without embarrassment.

If classes are often held in a particular spot outdoors, a low-cost 'billboard' of *bajareque* (mud on bamboo or sticks) can be made to hold up a flannel sheet and posters. Be sure the surface tilts backward a little so that flannel-board pieces will not fall off easily. Try to build it in a place that is protected from the wind.

To make the billboard flat, cover it with mortar made of mud and sand, and a little cement, if possible.

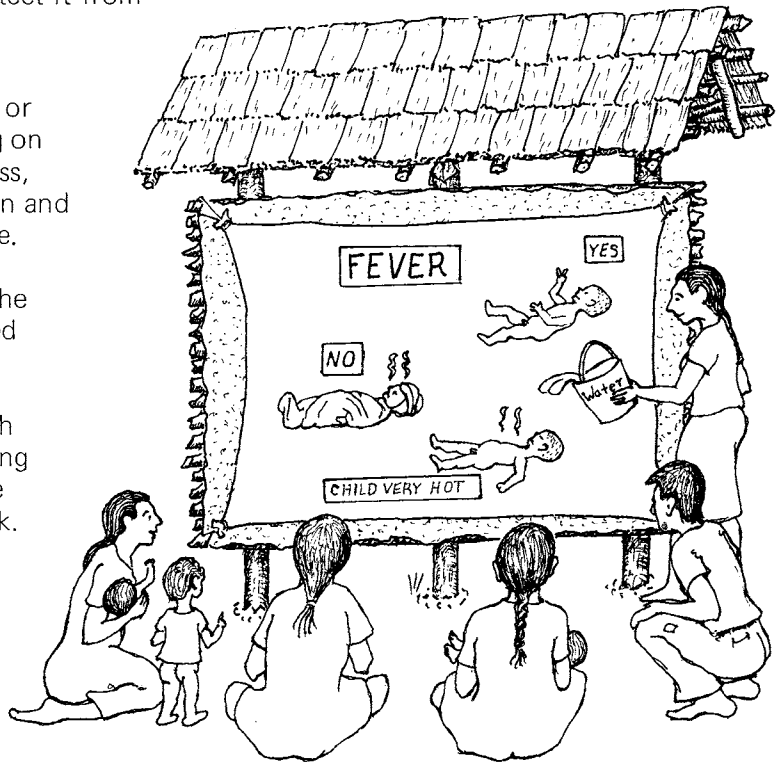
If you use a final surface of rough sand mixed with cement, flannel-backed pictures may stick to it directly – as on sandpaper.



You can build a small roof over the billboard to protect it from the weather.

The flannel sheet or blanket can be hung on the billboard for class, and then taken down and stored in a safe place.

Between classes the billboard can be used for posters and announcements. If children make health posters, try displaying the best ones on the billboard every week.



FLANNEL-BOARD ALTERNATIVES

Two common problems with flannel-boards are that . . .

- the materials are too expensive, and
- the pieces fall off if there is the slightest breeze.

You can overcome both of these problems by using local resources and your imagination.

1. Low-cost flannel-board

From Guatemalan health workers come the following suggestions for making flannel-boards from local materials at almost no cost:

- For the display board, use a **blanket** folded over the back of a chair.
- To make the pictures stay in place, make a paste of flour and water and smear it on the backs of the pictures. Then sprinkle **wheat chaff** (the waste husks of the grain) over the wet paste. The tiny barbs of the chaff work better than sandpaper or flannel to hold the pictures on the blanket.



A Guatemalan health worker uses a blanket over a chair as a flannel-board.

Mix white flour → in water. → Spread on back of picture → and sprinkle with wheat chaff.



Rice chaff or other grain husks may work as well. (Please let us know the results if you try them.)

Homemade glue can also be made from certain local plants. In Mexico, villagers make a strong glue by squeezing the juice from the bulbs of certain wild orchids, and boiling it into a thick syrup.

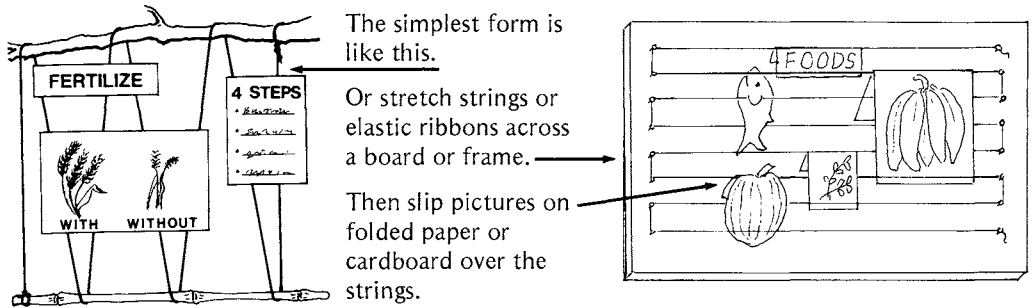


2. Masonite instead of flannel

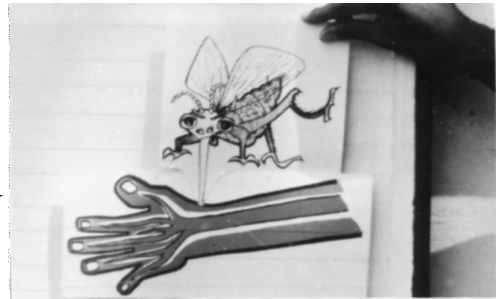
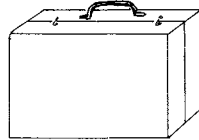
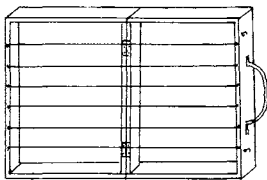
In Mexico, health workers found that the rough back side of a sheet of masonite (fiberboard) works just as well as a flannel-board. It does not need to be covered with cloth.

3. String-board

To prevent pictures from falling off or blowing away, you can use a string-board instead of (or combined with) a flannel-board.



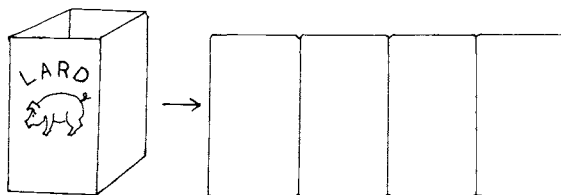
Imaginative string-board teaching aids were developed in the Gambia, Africa by a Peace Corps volunteer. This one is used to teach mothers and children about malaria. The learners can place the mosquito so it actually 'bites' the arm.



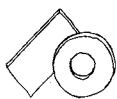
This is a combination string-board and flannel-board. It folds into a simple case for carrying and storing the pictures.

4. Magnet-board

This is another wind-resistant alternative to the flannel-board.

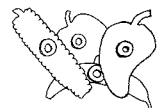


Use a thin piece of tin-plated steel. Perhaps you can find an old metal sign board or open up and flatten an old lard tin.



You will need some way to magnetize small pieces of iron. One way is to use an old induction coil from an automobile. Ask a school teacher or mechanic to help you.

Glue or tape the bits of magnetized iron to the backs of your pictures. They will then stick to the metal board.



If you paint the magnet-board with black non-glare paint, it can be used as a chalkboard as well.

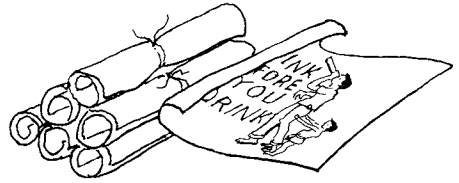
FLASH CARDS

Flash cards are cards showing a series of pictures or messages. Like flip charts (see p. 11-23), they can be used to tell stories or to teach skills step by step. But they allow more flexibility because they are not attached together in a given order. You can rearrange them to tell different stories, or to teach different ideas. The size of the cards will depend on how they are to be used and how big the group is.

Flash cards can be used . . .

- To teach basic concepts of health care—especially with groups of mothers, children, and persons who cannot read.
- To start discussions that help people to look critically at the physical and social factors that affect their health and well-being.
- For playing educational games. In this case the cards are often smaller. Each person is given several to ‘play’ or match with other cards, according to the rules of the game (see p. 11-22).

Flash cards are usually drawn on cardboard. But they can also be made of heavy cloth that can be rolled up for carrying.



The Voluntary Health Association of India (VHAI) distributes an instruction sheet explaining how to prepare **flash cards from old tins or metal cans**. First the tin is hammered flat, cut into cards, and painted white. Then pictures can be drawn or painted on the cards.

On these 2 facing pages, we show the 8 photographs from the VHAI’s instruction sheet. This printed sheet communicates completely through pictures, without any need for words. It is a good example of an effective teaching material that can be used by persons who cannot read (as well as by those who can).

1.



2.



3.



4.



5.



6.



7.










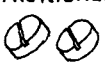


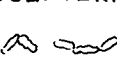


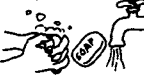
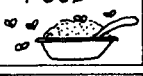



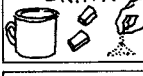








8.



Flash card games

Sets of flash cards can be used to play games that help students learn about particular health problems. For example, for games about the different problems that cause diarrhea, students can make a set of flash cards like these:

CAUSES	PROBLEMS	SIGNS		TREATMENTS	PREVENTION
SHITTING ON THE GROUND 	INTESTINAL FLU (VIRUS) 	STARTS SUDDENLY 	WITH MUCUS AND BLOOD 	NO MEDICINE NEEDED 	EAT WELL 
DIRTY HANDS 	AMEBAS 	MILD DIARRHEA 	SEVERE DIARRHEA 	METRONIDAZOL 	BREASTFEEDING 
WATER FAR FROM HOMES 	BACTERIAL DYSENTERY 	WITH FEVER 	NO FEVER 	AMPICILLIN 	WASH HANDS 
FLIES AND UNPROTECTED FOOD 	FOOD POISONING 	CRAMPS 	DEHYDRATION 	LOTS OF LIQUID REHYDRATION DRINK 	LATRINES 
BOTTLE FEEDING 	GIARDIA 	YELLOW AND BUBBLY DIARRHEA 	WITH VOMITING 	GIVE FOOD AS SOON AS SHE WILL EAT 	IMPROVED, PROTECTED WATER SUPPLY 

The cards shown here are only a beginning. Add more according to the common diarrheal diseases in your area.

Health workers can play several games with these cards. Make the games lively by having people announce or act out what is on each card they play.

GAME 1: What and why? First, hand each person some cards of each kind (CAUSES, SIGNS, TREATMENTS, etc.). One student holds up a card with a sign of an illness and asks, "What other signs might I have?" Other students hold up more signs, one by one, forming a description of a particular problem. They ask, "What problem do I have?" Then the student who has the card naming that problem holds it up. If no one challenges the diagnosis, that student asks, "Why did I get sick?" Now each person who has a card with a possible cause of the problem holds it up. The group discusses how the illness is spread.

GAME 2: What to do? Following GAME 1, a similar game can be played to review the treatment and prevention of different kinds of diarrhea. Encourage the students to look in their books and to add information and suggestions not included on the cards.

More games: Students can divide into small groups to think of new games using the cards. Or have them design new cards about other health problems, or cards without words to use with children or people who do not read. This way students use their imaginations to create learning games for people in their communities.

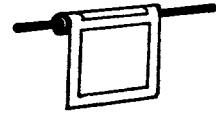
FLIP CHARTS AND OTHER WAYS TO TELL STORIES WITH PICTURES

Pictures—hand drawn or copied—can be used as aids for telling stories or teaching skills step by step.

It is easier to keep pictures in order if they are joined together in some way. They can be rolled on a stick, linked together, or made into flip charts. Attach them together any way you like—by stapling, sewing, gluing, attaching them to rings, or bolting them between 2 thin boards.

Pictures are doubly effective if the learning group—health workers or mothers or children—helps to make them. The group may want to use a flip chart or story from some other source as a model, and adapt the pictures and events to the local situation.

ROLL



LINKED IN A CHAIN



FLIP CHART



To make it easier to read a flip chart story to a group, write the part of the story that goes with each picture on the back of the page before. With the writing, include a small copy of the picture being shown. This lets you know what the group is looking at.

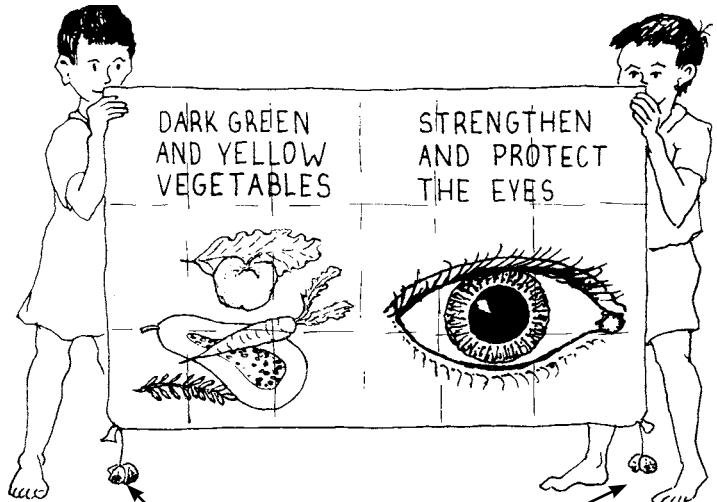
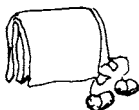
But even better than telling people the story is to let them tell you what they see happening in the pictures.

FOLDABLE POSTERS ON THIN PLASTIC SHEETS:

You can make large posters from thin sheets of white plastic or old plastic mattress covers. Draw on them with 'waterproof' marking pens. These posters can easily be folded, carried about, and even washed.

UNFOLDED

FOLDED UP



Rocks to make it hang straight.

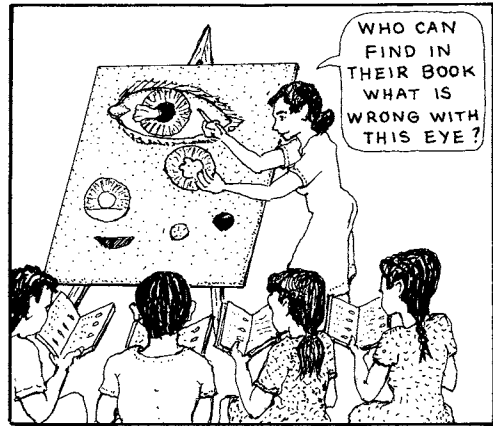
GAMES THAT HELP PEOPLE LEARN

Many of the teaching aids described in this book can be used for group learning games.

For example, you can use the flannel-board eyes (described on page 21-8) in a game that helps health workers learn to identify various eye problems. Students take turns arranging the pieces to form different eye problems, while the others try to identify them by using their books.

If quicker students always answer first, have everyone take turns answering. Or you can decide who will answer next by spinning a bottle (p. 4-8), throwing dice, or picking numbers out of a hat.

You and your students can invent similar games for learning about skin problems or other illnesses.



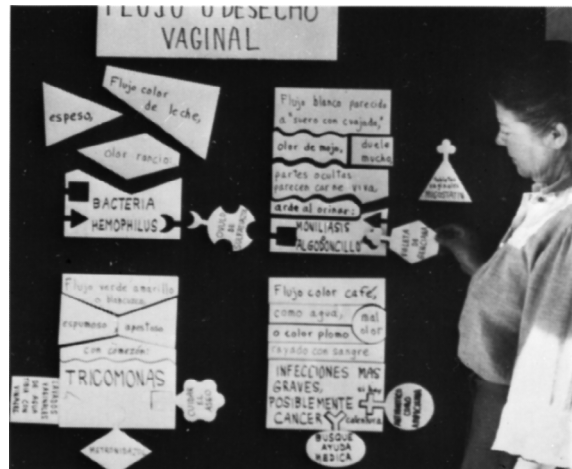
Many teaching aids can be used as games to test students' abilities to identify different health problems.

Puzzles

Students can make their own puzzles by cutting pieces of cardboard, wood, or cloth to fit together in certain ways. They can design 'jigsaw' puzzles that fit together to form one picture or shape (like the puzzle about diarrhea on the next page). Or they can make puzzles that have separate pieces representing signs of illnesses that fit onto a human figure (see the teaching aid about swollen lymph nodes, p. 21-6). Either of these can be used in many kinds of learning games.

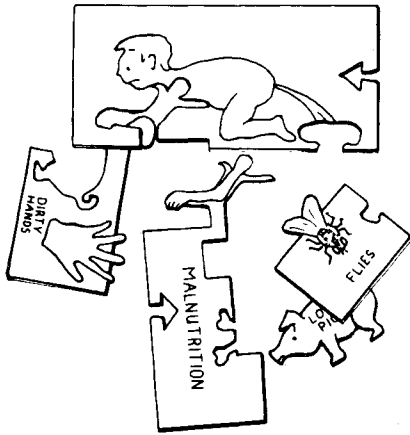
Playful, yet serious learning puzzles can also be used as aids for learning about antibiotics and worm medicines. (These are described on pages 19-2 to 19-12.)

A similar set of puzzles for learning about different vaginal infections has been designed by the health team in Ajoja, Mexico. The puzzles include pieces that fit together (on a flannel-board) to demonstrate signs of the problems and aspects of treatment.



Puzzles for learning about signs and treatment of different vaginal infections can be used for 'self-testing' games.

'JIGSAW' PUZZLE SHOWING THE CAUSES OF DIARRHEA:



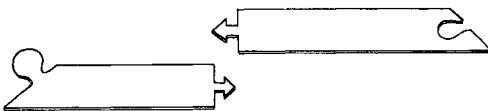
Life itself is full of puzzles. A responsible health worker helps people look at their many problems to see how they fit together to form a whole picture. It is like putting together the pieces of a puzzle.

Teaching aids in the form of puzzles can help students see for themselves how many different conditions and problems in their lives are related.

Putting together the puzzle shown here helps students to recognize how various factors combine to cause death by diarrhea. Poor personal hygiene and poor public

sanitation lead to the spread of infection. Several factors cause malnutrition, and poorly nourished children get sick more often and are more likely to die because they cannot fight off disease. The students also see how the whole unhealthy situation is locked in place by unjust social factors.

To encourage students to think and choose, include alternative pieces for different diseases, signs, and causes. Or have some blank pieces that students can fill in based on their own ideas and experience.

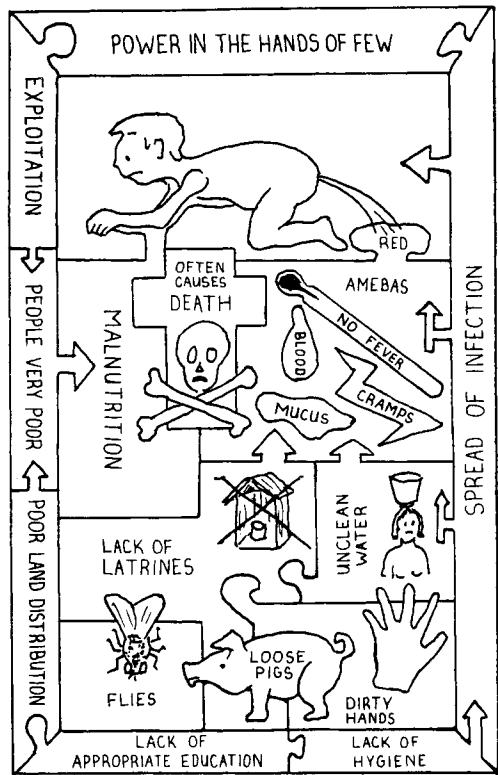


Many exciting discussions can result from putting together this kind of puzzle.

After the group explores how the different causes relate to each other, a whole new area of discussion can be opened by asking questions such as these:

- What should be done about this situation?
- What can be done about each of the contributing causes?
- Will treating the diarrhea solve the problem? What will?
- Where should we begin?

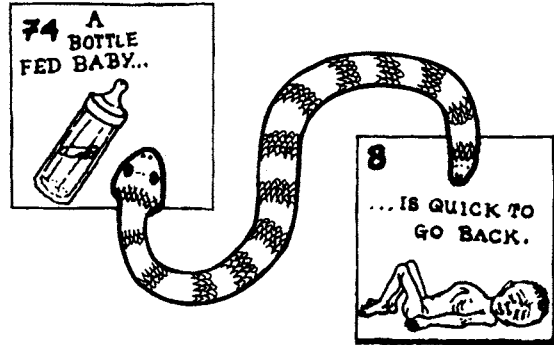
Encourage students to make their own puzzles based on problems and causes in their communities.



Games health workers can introduce in their villages

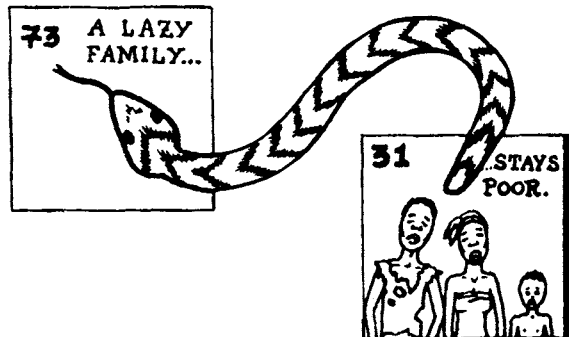
Games can be fun to play and at the same time teach about important health practices. Some learning games are used with groups of mothers and children in community programs. An example is the "Snakes and Ladders" game from Liberia, Africa shown and explained on the next page.

One of the strengths of this version of "Snakes and Ladders" is that the pictures, messages, and language have been adapted to the local situation. For instance, in squares 74 and 8 it says that a bottle-fed baby is "quick to go back"—which to the Liberian people means to go back to God, to die. Also, "running stomach" in square 24 is the local term for diarrhea.

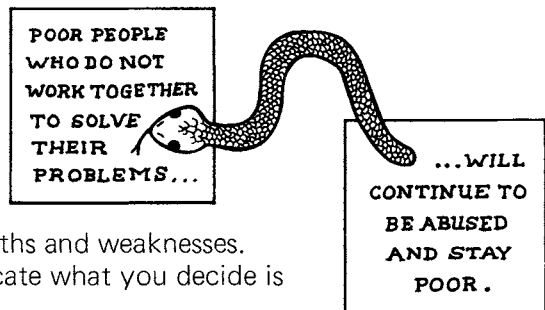


One of the weaknesses of this version of the game is that it focuses mainly on the physical causes of poor health. Where social causes are mentioned, the messages tend to put the blame on the poor themselves rather than on problems in the social system. This reinforces poor people's sense of powerlessness and worthlessness, rather than strengthening their self-confidence and their will to act to change their situation.

For example, the message in squares 73 and 31 tells players that **the family's poverty is their own fault**, that if they were not so lazy they would not be poor. This message misses the fact that many poor people work very hard, or gladly would if given the chance. Also, much of the benefit of their work goes to those who already have plenty. Most of the poor stay poor no matter how hard they work.



A much more positive message about the cause of poverty might be one like this →




If your group plans to use this snakes and ladders game, we suggest that you first discuss its strengths and weaknesses. Then adapt the messages to communicate what you decide is most helpful for your situation.

HEALTH EDUCATION SNAKES AND LADDERS*

RULES:

2, 3, or 4 people can play this game. Each player uses a seed to show what place he or she has on the board.

Each player throws the die. The player with the highest number starts the game. 

The first player throws the die and moves his or her seed according to the number shown on the die, beginning from square 1, marked **START**.

If a player rolls a 6, the die can be thrown again for another turn.

If a marker stops on the head of a **SNAKE**, the snake swallows it. The player then moves the seed down to the tail of the snake, and reads the message to all the players. That player's turn is over, and his next turn begins from the square at the tail of the snake.

If a seed lands on a square that has the foot of a **LADDER**, the player moves it to the top of the ladder, and reads the message to all the players. That player's turn ends at the top of the ladder, and his or her next turn begins from there.

The first player to reach square 100 wins the game, but **the player must throw the exact number needed to land on that final square.**

* This game was adapted for Liberia from one prepared by the National Food and Nutrition Commission of Zambia, in *PSC Newsletter*, UNICEF.

“Snakes and Ladders” and similar games generally have two big weaknesses as teaching aids:

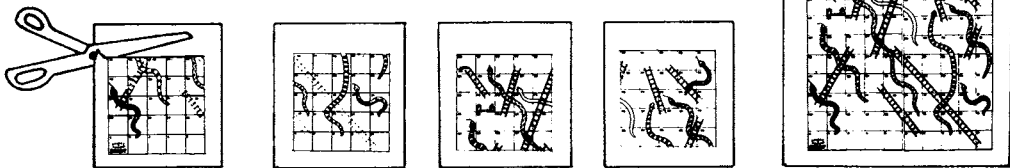
1. **The messages are given to the players.** The players land on the squares and read the messages, but they do not need to think or solve anything for themselves. It is doubtful whether such pre-packaged messages will be effective unless people discuss them and relate them to their own lives during and after the game.
2. **The game is primarily one of luck or chance.** Apart from the written messages, the game carries the unwritten message that the health of a child is determined by lucky or unlucky rolls of the dice. Although the game is intended to help people learn what they themselves can do to protect their children’s health, there is a danger that it may reinforce people’s sense of ‘fatalism’. It may make them feel that their children’s health is also a matter of luck or fortune, outside their control.

There is one way to get around these weaknesses of the game, at least in part.

Involve student health workers in creating the game. You might start by having them play the game from Liberia. Then together analyze its weaknesses (for example, the attitude of blaming the victim in the statement, “A lazy family stays poor.”). Invite the students to **re-make the game, adapting it to conditions in their own villages.** See if they can think of messages that point out both physical and social causes of ill health, and that help build people’s self-confidence to improve their situation.

To make preparation of the game easier, you can give each health worker printed sheets with the squares, snakes, and ladders already filled in, but **without the messages and pictures.** The students can add these for themselves.

To make a large game board, students can glue 4 photocopied sheets onto a large piece of cardboard.

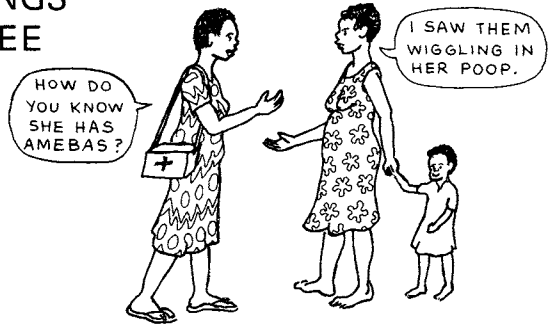


By making their own games and choosing messages appropriate for their communities, the health workers become actively involved in thinking about local problems. The health workers can, in turn, use a similar approach with groups of parents and children in their villages. (Children can color in the snakes.) If people take part in creating the games they play, they will be more likely to continue to discuss the messages they themselves have decided upon. The game becomes less one of luck, and more one of thought, purpose, and action.

Other games similar to “Snakes and Ladders” (but more like “Monopoly”) can get people involved in **role playing.** Again, dice are thrown and players advance on a board with many squares. But the game focuses more on cultural, economic, and political factors that affect health, and players act out the roles of poor workers, landholders, shopkeepers, village officials, and so on. An example of such a game is “Hacienda,” available from the Publications Department, Center for International Education, 285 Hills South, University of Massachusetts, Amherst, Massachusetts 01003, USA. www.umass.edu/cie, cie@educ.umass.edu

HOW TO 'SHOW' PEOPLE THINGS THAT ARE TOO SMALL TO SEE

One especially difficult idea to teach is the extreme smallness of things like bacteria and amebas, which can only be seen with a microscope. If a microscope is available, it helps to have students use it to look at bacteria, worm eggs, and amebas, even if they will not have microscopes in their villages.



Many people confuse amebas with small worms because they cannot imagine that amebas are too small to see.

Here is one way to help students understand how small bacteria, amebas, and worm eggs are:

1. TYPES OF BACTERIA
2. HOW MANY GERMS DO YOU SEE IN THIS CIRCLE?
I DON'T SEE A THING!
THAT'S RIGHT! THEY ARE MUCH TOO SMALL TO SEE!
3. HOW MANY BACTERIA DO YOU SEE?
NONE. IT LOOKS CLEAN.
4. NOW LOOK AT THE NEEDLE THROUGH THIS MAGNIFYING GLASS. HOW MANY BACTERIA CAN YOU SEE?
I STILL CAN'T SEE ANY.
5. THAT'S BECAUSE THE GLASS DOES NOT INCREASE THE SIZE ENOUGH. IF WE COULD MAGNIFY A TINY SPOT ON THIS NEEDLE TIP UNTIL IT WAS THIS BIG, THEN WE WOULD SEE THE BACTERIA BUT THEY WOULD STILL LOOK SMALL.
I NEVER GUESSED ANYTHING COULD BE SO TINY.

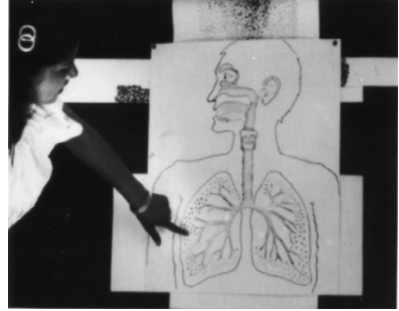
NEEDLE TIP:
← actual size
greatly magnified

BACTERIA GREATLY MAGNIFIED

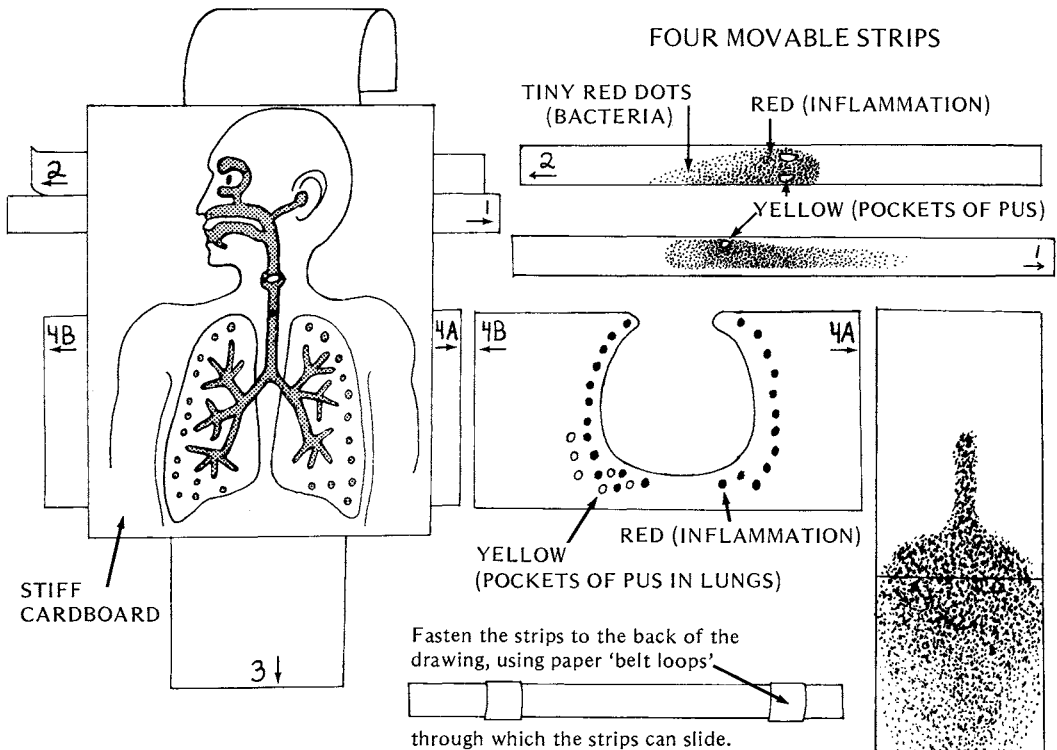
THERE COULD BE THOUSANDS ON THE NEEDLE AND WE STILL WOULDN'T SEE THEM!

A teaching aid for showing how germs invade the body

When people are learning how infection spreads, and how it invades the body, it helps if they can actually 'see' what happens. For this purpose, the village health team in Ajoya invented the following teaching aid. By pulling different cardboard strips, students can actually see the 'germs' move in through the nose and attack the different parts of the respiratory system.



WHOLE TEACHING AID ASSEMBLED



By pulling the different strips in the direction of the arrows, you can see the bacteria invade, followed by inflammation, and then infection with pus.

PULL STRIP 1, AND SEE THE GERMS BEGIN TO ENTER THE NOSE.

PULL STRIP 2, AND THEY INVADE THE SINUSES . . .

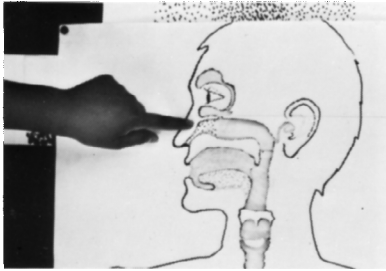
AND CAUSE INFLAMMATION.

FINALLY THERE ARE POCKETS OF PUS.

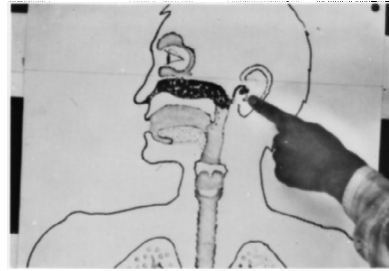


Pull strip 1 farther and the germs will invade the ear, and form pus. Pull strip 3 to show an infection of the voice box, and then the tubes in the lungs (bronchitis). Pull strip 4A and the infection reaches the tiny air sacs of the lungs, causing pneumonia. Pull strip 4B and a pocket of pus forms in the lower right lung.

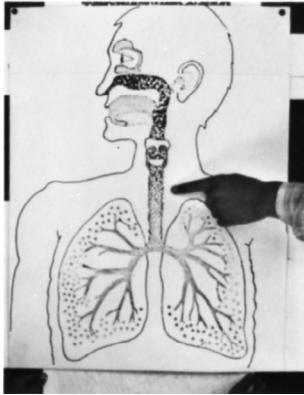
Helping Health Workers Learn 2012
 PHOTOS OF THE 'INVADING GERMS' TEACHING AID



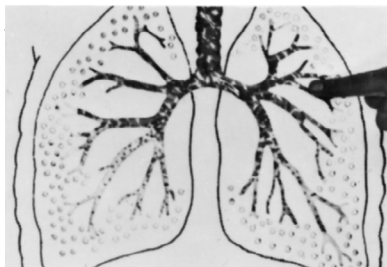
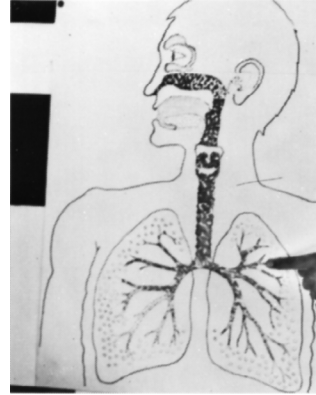
GERMS BEGIN TO INVAD.



PUS IN EAR.

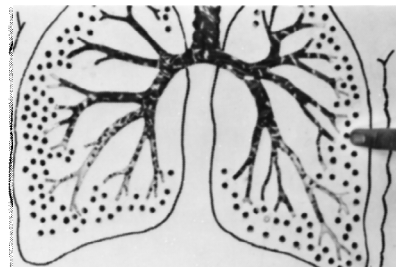


GERMS AND INFECTION SPREAD TO LOWER RESPIRATORY TRACT.



BRONCHITIS.

Bronchi (tubes) are infected, but
alveoli (little sacs) are clear.



PNEUMONIA

Infection has spread
 to even the tiny air sacs.

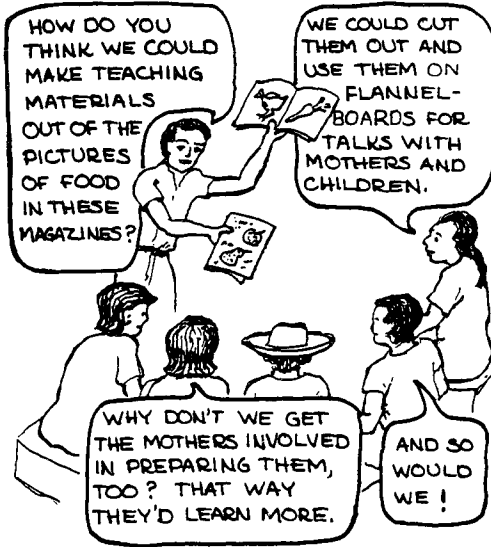
ENCOURAGING HEALTH WORKERS TO BE CREATIVE:

The 'invading germs' teaching aid was designed and put together by instructors and students during a health worker training course in Ajoya, Mexico. The invention of new and better teaching aids has become one of the most challenging and exciting parts of the training program. Teaching aids designed during the course are doubly valuable. They not only help health workers to learn and teach basic health principles, they also help the health workers and their instructors become more creative. Together they begin to think in terms of hunting for new and better answers. **Learning—and life itself—becomes an adventure!**

EACH ONE TEACH ONE

A good teacher is like a spark or *catalyst* that starts a chain of action. He or she sets a process or a project in motion . . . soon others take over . . . they, in turn, get still more people involved . . . and so on. Here is an imaginary example:

1. Teacher → Health Workers



2. Health Workers → Mothers



3. Mothers → Children



4. Children → Other Children



Here you see how the instructor sparks an idea, and how it grows. In this example, it goes from:

TEACHER → HEALTH WORKERS → MOTHERS → CHILDREN → OTHER CHILDREN → FATHERS

(Of course, in real life the spread of ideas usually happens more slowly and is not as obvious as shown here.)