

THE LIFE CYCLE OF ANIMALS

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When a dry ditch gets filled with water during the monsoons, many kinds of plants and animals appear in it. Have you ever wondered where they come from? There may be all sorts of living things in there - algae, frogs, various insects, and sometimes even fish.

You might have noticed that as the rainy season begins, a number of velvety red coloured - gokul gai (bir bahuti) and millipedes (ginjai or telan) appear all of a sudden. A few days later they disappear.

Some people think that pond water or mud or cow dung gives birth to these creatures, or else they fall from the sky with the rain. Are these ideas right or wrong?

We shall do some experiments that will help us look for answers to these questions.

We shall also study the way some animals grow from eggs to become adults. These observations will give us information needed to understand the life cycles of animals.

EXPERIMENT 1

Life Cycle of a Fly

You need to get two old tin cans. If you can not find tin cans, use containers made of paper, clay, or coconut shells instead. Write "A" on one container and "B" on the other. Get some fresh cow or buffalo dung, before any flies have landed on it. Put some in the container "A" and some in the container "B".

Immediately cover the top of the container "A" with a piece of paper and fasten the paper tightly with a string or rubber band. Make a few small holes in the paper with a needle or pin so that air can go in and out, but flies and other bugs can not. Leave container "B" open and let flies land on the dung kept in it. If you leave it open for 1 or 2 hours flies will definitely sit on it. As soon as you see a fly land on it, look closely at the rear end of the fly. Can you see any

long white things come out of the rear end?

If not, wait longer. Whenever a fly lands, carefully watch its rear end. The long white things coming out from the rear of the fly are its eggs. Keep container "B" open till 5 to 10 eggs are deposited on the dung.

Figure-1 shows a container of dung with eggs deposited on it. The eggs are shown just about the size they really are.

Look at the eggs with a magnifying glass and draw a picture of them. (1)

Afterwards, close the top of container "B" with paper and make a few holes in it with a needle or a pin, just as you did with the other box. This is the first day of your experiment. We shall call it day 1 and the following days: day 2, day 3, day 4, etc. You should open both the containers each day and observe them. The experiment goes on like this for about 10 days.



Figure-1

CAUTION:

1. When you open the containers for observation, take care that flies do not sit on them.
2. Do not forget to close the containers tightly immediately after you make your observations.

Make Table 1 in your note book. Write your observations in it each day. (2)

Table-1

S.No.	Name of the stage	On which day was it first observed	Colour	Does it stay in one place, move around or fly?
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On the second day of the experiment, search through the dung in both containers for fly's eggs and the white coloured larvae that come out of these eggs.

In the beginning the larva is slightly bigger than the eggs.

If you can not find any eggs or larvae on the surface of the dung, then dig it up a little and look again.

Do you find any eggs or larvae in container "A"? (3)

Don't mistake molds for eggs

Many a times one finds tiny white specs on the surface of dung. These specs are not eggs but mold. This kind of mold often grows in the rainy season. Learn to differentiate between mold and fly's eggs by viewing them under the microscope.

On the second or third day of the experiment, you should definitely find a larva in container "B".

Write down in the table the day on which you found the larva. (4)

Does the larva move around? (5)

Look at the larva with a magnifying glass and draw its picture. (6)

A larva is also called a **maggot**.

Can you guess what food the larva must be living on? (7)

Each day observe changes occurring in the larva. Observe carefully and see on which day the larva starts appearing lazy. The day it starts looking lazy observe it more minutely.

Is a cocoon beginning to envelop the larva or has it already enveloped the larva? (8)

Has the larva stopped moving completely? (9)

This stage is known as the **pupa** stage.

On which day did you find the pupa? Note it in the Table. (10)

Look at the pupa with a hand lens and draw its picture. (11)

Now observe the pupa each day.

Be sure your flies don't fly off

Whenever you open the container to look at the pupa, take care that your fly suddenly does not fly away.

On the day you find the fly, make a note of it in the Table. (12)

What remained in the pupa after the fly came out of it? Is it now just an empty cocoon or is there more to it? (13)

When a fly comes out of a pupa your experiment is done.

Flies lay eggs, eggs give rise to larvae, larvae grow and become pupae and flies come out of the pupae. This whole process is called the life cycle of a fly. The egg, larva, pupa, and an adult fly are the different stages of a fly's life cycle. Figure 2 shows a diagram of the



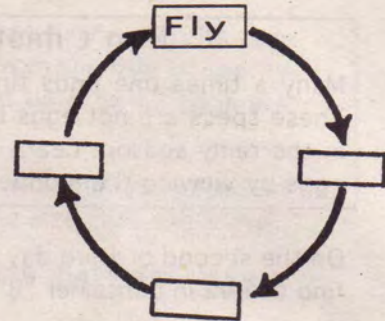
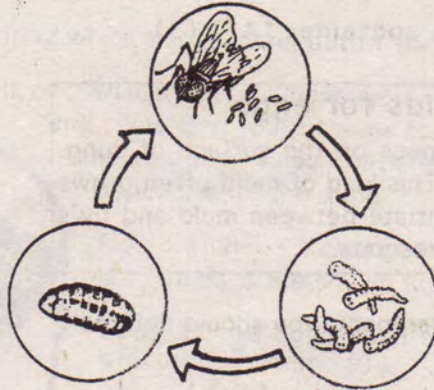


Figure-2

life cycle of a fly. Apart from the fly, the names of other stages are not written in it.

Draw this diagram in your note book and fill the blanks with the appropriate names of the stages. (14)

Such diagrams are often made to show the life cycles of plants and animals.

Can cow dung give birth to flies

On the basis of what you have seen answer the following questions:

In which container did you see the different stages of the fly's life cycle, in "A" or "B"? (15)

You began the experiment by putting fresh dung in both the containers. Yet the different stages of a fly could be seen only in one. Why is this so? (16)

Can dung by itself give birth to flies? Explain your answer. (17)

Some day after the observations, suppose a student forgets to cover both the containers. What would then go wrong with the experiment? (18)

Some people think that flies are born from cow dung alone. They even call the larva of the flies dung maggots. What would you say to such people on the basis of this experiment? (19)

The idea of control in experiments

In this experiment why was cow dung put in container "A"? If this had not been done, what problem would you have faced in answering question (17)? (20)

Maybe by now you understand that container "A" was included in the experiment so that it could be compared with container "B". If container "A" had not been used, one could still have thought that perhaps cow dung does give birth to flies. Because of container "A" no such doubts can arise. Look through your class 6 and 7 copy



Figure-3

books and make a list of experiments in which similar comparisons were made.

Measure and write down the diameter of the egg in your copy? (21)

EXPERIMENT 2

THE LIFE CYCLE OF FROGS

In the rainy season, frog spawns (clusters of eggs) can be seen floating in ponds. One such pond is shown in figure-3. The actual size of an egg of a frog is approximately the same as shown in this picture. The spawns can be found most easily in ponds after the first or second heavy shower of the season. Collect some eggs along with the pond water in a glass or in a wide mouthed bottle. While doing this, try to avoid breaking the spawn into small groups. Also collect some algae from the pond.

On returning to school pour the pond water with the eggs in to a wide pan. The pan should be about 15 cm in depth. The lower part of a broken pitcher (*matka*) would be ideal for this purpose. Also put into this pan the algae you had collected from the pond.

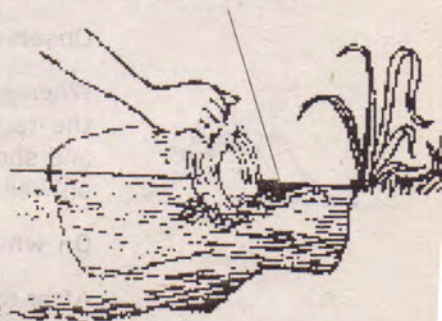
Look at the eggs carefully. The round black thing seen in the middle of the clear slippery material is the frog's embryo.

Estimate the diameter of the frog's embryo.(22)

This experiment will take a long time. If water in the pan starts to dry up during the experiment, be sure to add more pond water. Don't add any other kind of water.

Just as in the fly experiment, the day you bring the frog's eggs to

Eggs of frog





school will be called day 1, and the days after that will be called day 2, day 3, day 4 and so on. Observe the eggs and whatever comes out of the eggs each day.

On which day did the eggs hatch? (23)

Do the offsprings look just like frogs? (24)

The offsprings which come out of the eggs are called tadpoles.

HOW TO TAKE THE OBSERVATIONS

You will have to spend about 10-15 minutes everyday to observe the changes in the tadpoles, write them down, and draw their pictures. First of all look at the tadpoles in the pan itself. To look more closely, take a transparent plastic can or a glass and put a little of the water from the pan into this glass. Pick up a tadpole with some water with the help of a dropper and put it in the glass. Now you can have a good look at the tadpole from all sides. When the tadpole gets bigger it will not fit in the dropper. In this case use the palm of your hand or a bottle cap to take out the tadpole.

Observe the tadpole each day as described above.

Whenever you see any new part or something else which is new in the tadpole, write it down and draw its picture in your note book and show it to your teacher. With each picture also down the day on which it was drawn.

On which day do you first see the tadpole's eyes? (25)

After the tadpole's third or fourth day, look behind the eyes for the threadlike gills.

On which day did you first see the gills? (26)

As the tadpole grows, look for each of the parts mentioned below, and on the day you first see these parts draw a picture of the tadpole to show it.

- * heart
- * intestine
- * backbone
- * the canal that carries solid waste out of the body
- * hindlegs
- * forelegs (27)

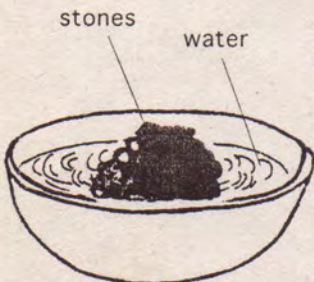


Figure-5

On the day the hindlegs appear, put some small stones in the pan to make a hillock that rises above the water, as shown in figure 4. The growing tadpole needs to sit outside the water once in a while. That is why you should make a hillock.

On which day do the gills completely disappear? (28)

On which day did the tail completely disappear? (29)

When the tadpole becomes a small frog, make a table showing the main changes and the days on which they occurred. (30)

Now answer the questions given below:

Why does the frog lay its eggs only in water? (31)

How many days does it take an egg to become a small frog? (32)

What stages did you see in the life cycle of the frog? Show these stages by drawing a diagram of the life cycle of a frog. (33)

If someone tells you that frogs fall from the sky with rain, what would you tell him/her on the basis of this experiment? (34)



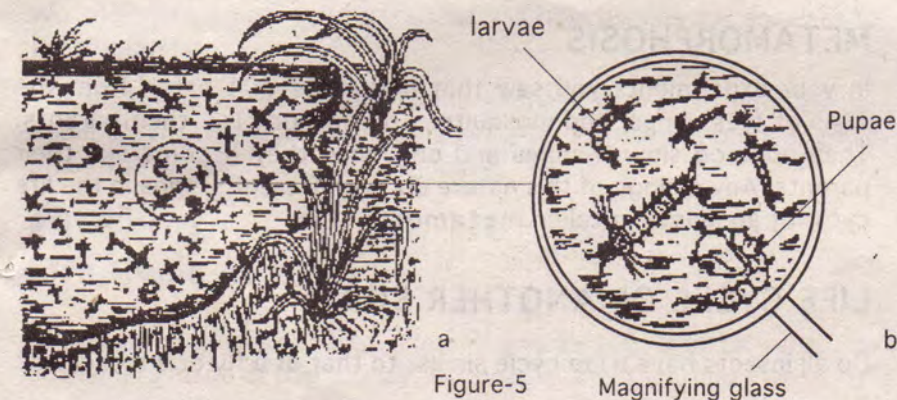
EXPERIMENT 3

THE LIFE CYCLE OF A MOSQUITO

In the rainy season mosquitoes lay eggs in water tanks, puddles, lakes, etc.

Figure 5(a) shows one such pond containing the larvae and pupae of mosquitoes. In this picture the larvae and pupae are shown just about their actual sizes.

Figure 5(b) shows a larger view of the larvae and pupae, as seen through a magnifying glass.



Take four small glass bottles. For this experiment injection bottles will work well. Now find a pond in which there are a lot of mosquito larvae and pupae. To be sure that the larvae and pupae you have got are of mosquitos, put them into a bottle cap and look at them through a magnifying glass. If what you see looks like figure 5(b) then you have found the right larvae and pupae.

In one bottle put mosquito larvae of different sizes with some pond water. In the same way, put mosquito pupae in the second bottle.



Put pond water in the third bottle. Look at it carefully with a magnifying glass. If you see any larva or pupa remove them.

In the fourth bottle put fresh water from a tap or a well.

Cover the mouths of all four bottles with paper fastening them with rubber bands. Make some holes in the paper covers with a pin.

Observe the bottles everyday to find out what kind of changes occur.

Now answer the following questions :

What changes occur in the larva bottle? (35)

What changes occur in the pupa bottle? (36)

After a mosquito is formed, what is left behind in the bottle? (37)

Did you see any larva or pupa in the bottle in which you had put only pond water? (38)

Did you see any larva or pupa in the bottle which had fresh water? (39)

If you find larvae or pupae in the bottle having only pond water, think about it and write down where you think they came from ? (40)

Why don't you find larvae or pupae in the fresh water bottle? (41)

Based on your observations, make a diagram of the life cycle of a mosquito. (42)

METAMORPHOSIS

In your experiments you saw that offsprings that hatch from the eggs of flies, frogs, and mosquitoes do not look like their parents. They undergo slow changes and only then they become like their parents. Any change of this nature during different stages in the life cycle of an animal is called **metamorphosis**.

LIFE CYCLE OF ANOTHER SORT:

Do all insects have a life cycle similar to that of a fly or a mosquito?

Come, let us find the answer to this question.

Look at figure-6.

It shows all the stages, from an egg to an adult, of the life cycle of a grasshopper.

Now answer the questions below:

Does the life cycle has a larva stage? (43)

Does it have a pupa stage? (44)

What changes can be seen from the time the eggs hatch till



we get adults? (45)

How is the life cycle of a grasshopper different from the life cycle of mosquitoes and flies? (46)

Many insects have a life cycle similar to that of a grasshopper. Some examples are bedbugs, cockroaches, and the red bugs that are found on cotton plants or *Kausam* trees.

Bedbugs lay their eggs in the crevices of beds, walls, chairs, etc. If you find their eggs, keep them carefully in a clean and empty injection bottle and fasten the cap tightly.

Observe these eggs each day with magnifying glass.

If you can see the different stages in the life-cycle of a bedbug, draw their pictures. (47)

SOMETHING SPECIAL TO DO

Insects found on *Kausam* and cotton have red coloured bodies and wings that are half red and half black. These insects feed on the juice of the fruits (*doodh* or *ghete*) of these plants. Look for those red insects that have formed pairs. Keep a few such pairs in a wide mouthed bottle or in a conical flask. These insects form pairs usually at the beginning of the rainy season. Also put into the bottle or flask a few fruits of the same tree or plant from which you collected these insects. Close the top of the bottle or flask with paper and make some holes in the paper with a pin (figure 7).



Figure-7

Observe the insects everyday to see whether they have laid any eggs.

Make pictures of the eggs and the stages they give rise to. (48)

From among the animals that are found in your area, write the names of five which do not undergo metamorphosis. (49)

NEW WORDS:

adult	larva (plural larvae)	pupa (plural pupae)
stage	life cycle	tadpole
control	mggot	metamorphosis