



Fig. 1

Priya wants to write an article on colours. She started observing her mother while preparing tea. Suddenly her brother Teja rushed into the kitchen shouting "See my white shirt is spoilt. It has colour patches. Yesterday it was fine. Why has it become like this? Who spoilt my shirt?"

Mother saw the shirt and said that it might have got this red patch when it was soaked in soap water along with a new red shirt.

Priya who was listening to all this began thinking about all the changes she had

seen. She had noticed the change in the colour of the tea after milk was added to it. There was a change in the colour of the shirt. She started wondering,

- Why does the colour of the tea change?
- How did the red patch get on her brother's shirt?
- How do colours change?
- Can you find answers to these questions? Discuss with your friends and think of the answers.

The change of state from liquid to gas is called evaporation.

In our daily life we notice many changes around us. These include the changes from time to time, in the crops growing in the fields fall of leaves, the growth of fresh leaves on trees, change in the colour of the sky, change in colour of leaves of trees etc. Flowers bloom and then wither away. Apart from this we notice some changes in our body like increase in length of nails and hair, increase or decrease in weight, and increase in height etc.

Of all the changes we observe in our daily life, we are able to find out reasons for some of them. For other changes, we are not able to find reasons. To explain any change we need to ask the following questions :

- What has changed?
- How do we know that it has changed?
- What are the possible reasons for that change?
- Which seems to be the most appropriate reason?
- How would we check if the reason is correct?

Let us discuss certain changes in detail.

Changing of milk into curd

We know that curd is prepared from milk. Making curd is our common

experience. Curd is prepared in almost every house.

- Do you know how milk can be converted into curd?

Generally curd is prepared by adding a very small quantity of curd (sample curd) to the bowl containing warm milk. The milk is stirred well. Then the bowl containing milk with the sample curd is covered by a lid and kept still and undisturbed for few hours to get curd.

- What changes do you see when milk is converted into curd?
- How do you know that milk is changed into curd?
- Is there any change in its state?
- Is there any change in its volume?
- Is there any change in the weight?

Activity-1: Comparing milk and curd

Take some milk in a bowl and some curd in another bowl, compare the colour of the milk and curd carefully.

What do you notice? You may notice that there is slight difference in colour from milk to curd.

Now take some milk and curd in separate tea spoons and taste them. Do you find any difference in the taste of milk and curd? You may notice that milk is somewhat sweet and curd can be slightly or highly sour in taste.

The change of state from gas to liquid is called condensation.

Touch the milk and the curd with your finger to know their state. You will notice that milk is in liquid form and the curd is in semi-solid form. Now measure the level of milk in a bowl and its weight. Then measure the level of the curd and its weight in the bowl.

Write the values of measurement in table

Precautions

Do not try to taste any substance until you know what it is and its properties. Tasting of some substances can be hazardous to health. The test for taste is to be done only under the guidance of teacher and for substances we know are safe.

Table 1

S.No.	Substance	Level in bowl	Weight
1	Milk		
2	Curd		

Compare the measurements, what do you notice?

From this activity, we find that there are changes in milk when it becomes curd. These include change in the colour, taste, and in the state. These indicators of change explain that a change has taken place from milk to curd.

- What can be the reasons for this change?

Activity-2: Finding the conditions for making curd

Take three empty bowls with lids as shown in Fig. 2



Fig. 2

Add some ice-cold milk to bowl 1 and same quantity of some warm milk to the bowls 2 and 3. Then add small quantity of curd to the bowls 1 and 2. Stir them well. The curd must mix in the milk. Cover all the bowls with lids and keep them in your classroom. Leave them and ensure they are not touched even after you have left for home. Observe the changes in the three bowls

The change of state from liquid to solid is called solidification.

when you come back to the school next day.

What do you notice about the milk in the three bowls?

Has the milk in all the three bowls changed into curd? If not, which has not changed into curd?

Compare bowls 1 and 2, and bowls 2 and 3 separately and try to answer the following questions :

- Why do we notice change only in bowl 2, though we added curd to the milk of bowl 1 as well.
- Why do we notice change in bowl-2 though we took warm milk in both bowls 2 and 3?

When we compare the bowls 1 and 2 though the sample curd is added in both bowls, the bowl having warm milk is converted into curd. The cold milk does not change into curd.

Similarly if we compare bowls 2 and 3, though we have taken warm milk in both bowls, only the milk in the bowl 2 to which sample curd has been added changes into curd. We may note that the warm milk in the other bowl does not change into curd.

These two observations explain that the reason for change of milk into curd is due to addition of sample curd to warm milk.

The adding of sample curd to the milk helps to grow some kind of bacteria in it, and enables conversion of the milk into curd. You will learn more about this type of bacteria in the lesson "living things under microscope".

Let us discuss one more change

Changing seasons

Every year we observe that seasons changes. We go from rains to winter and winter to summer and so on.

- What changes do you observe from winter season to summer season?
- Is there any change in the clothes we wear?
- Is there any change in coldness and hotness of the air around us?
- Is there any change in duration of day and duration of night?
- Is there any change in the food that we eat or drink?

If the winter season changes into summer, we observe change in our clothes. For example, wearing of woolen clothes in winter changes to wearing of cotton clothes in summer. Similarly we observe that the winter season is cool and summer season is hot. In winter, duration of night is longer than in summer. We take cold drinks in summer

Due to heat, a place gets heated and pressure gets lowered.

but prefer hot tea, coffee or milk in winter. These changes that we observe, show the change of seasons.

- Which of the above changes are because of changes in seasons?
- Which changes could possibly be the causes for the change in seasons?

List the changes that you think are caused by the change of seasons.

We also need to think about what are the reasons for changing seasons?

Activity-3: Comparing duration of day in December and May.

See table 2. Column (1) shows time of sunrise and sunset at a particular place in the month of December, and column (2) shows the same information in the month of May.

- What is the duration of the longest day in December?
- What is the duration of the longest day in May?
- Do December and May belong to the same season? If not, to which seasons do they belong?

By looking at the data regarding the times of sunrise and sunset on a particular day in December and May, we see that days are shorter in December and longer in May. Thus there are short duration days in winter and long duration days in summer.

The weather changes, as well as the seasons, because of the earth's rotation on its tilted axis.

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VI Class

Table-2

	December (1)		May (2)	
Day	Sunrise	Sunset	Sunrise	Sunset
1	06:29	17:40	05:51	18:36
2	06:30	17:40	05:50	18:36
3	06:31	17:41	05:50	18:37
4	06:31	17:41	05:49	18:37
5	06:32	17:41	05:49	18:37
6	06:32	17:41	05:48	18:38
7	06:33	17:41	05:48	18:38
8	06:34	17:42	05:47	18:38
9	06:34	17:42	05:47	18:38
10	06:35	17:42	05:46	18:39
11	06:35	17:43	05:46	18:39
12	06:36	17:43	05:46	18:39
13	06:37	17:43	05:45	18:40
14	06:37	17:44	05:45	18:40
15	06:38	17:44	05:45	18:41
16	06:38	17:45	05:44	18:41
17	06:39	17:45	05:44	18:41
18	06:39	17:45	05:44	18:42
19	06:40	17:46	05:43	18:42
20	06:40	17:46	05:43	18:42
21	06:41	17:47	05:43	18:43
22	06:41	17:47	05:43	18:43
23	06:42	17:48	05:42	18:43
24	06:42	17:48	05:42	18:44
25	06:43	17:49	05:42	18:44
26	06:43	17:49	05:42	18:45
27	06:44	17:50	05:42	18:45
28	06:44	17:50	05:42	18:45
29	06:45	17:51	05:41	18:46
30	06:45	17:52	05:41	18:46
31	06:46	17:52	05:41	18:46

Activity-4: Does the sun rise exactly in the east in all seasons?

In the chapter "playing with magnets" we learnt about the magnetic compass. This helps us to find the North-South direction. Take a magnetic compass find the North-South directions with its help. We know that the East-West direction is exactly perpendicular to North-South direction. Mark East-West direction with the help of magnetic compass and compare it with the direction in which the sun rises during the winter season.

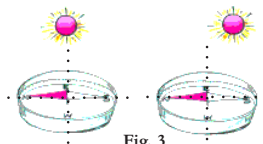


Fig. 3

Observe the direction of sunrise three to four times in winter and in summer. Compare it with the exact east direction marked with the help of the compass.

- Do you find any change in direction of sunrise between winter and summer season?
 - What difference do we notice?
- Try to find the direction in which the sun rises even if it is not winter at the time of reading the chapter.
- Did the sun rise exactly in the east?

Observing the changes in shadow during winter and summer seasons

Teja likes photos very much. His father took photos in the months of December and May and are given below. Observe Fig. 4(a) and 4(b):



Fig. 4(a)

Fig. 4(a) shows the shadow of a boy, standing on the doorstep of an east facing house, at the time of sunrise. This is on a day in the month of December.



Fig. 4(b)

Digestion is the mechanical and chemical breakdown of food into smaller components.

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Fig. 4(b) shows the shadow formed at the time of sunrise on a day in the month of May.

- What difference do you notice in length and direction of the two shadows?
- What does it say about the change in the direction of sunrise in December and in May?

You may also ask some elders about the change in the direction of the sun rays coming through windows or doors facing east during winter and summer. You can also observe shadows formed by the sun rays through windows and doors in your house or in a neighbour's house.

You will notice that the sun does not

Activity-5: Indicators and causes for change.

The changes observed, indicators of the changes, and possible causes for the changes discussed above are shown in table 3.

Table 3

S. No.	Change	Indicators of change	Causes of the change
1.	Change from milk to curd	Change in : State, taste, smell	The small quantity of curd added to warm milk makes certain bacteria to grow in the milk and it converts to curd.
2.	Changes in seasons	Change in dress we wear, coldness or hotness of air, food/drinks we take, usage of water, fruits and flowers available duration of a day.	The slight change in the direction of sun rise

We have used running water as an energy source for thousands of years.

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VI Class

Compare the change of milk to curd with change of seasons.

- Which change is slow and which is fast? Why?
- Which change takes place naturally?
- Which change needs initiation/intervention of human beings to occur?
- Which is a temporary change and which is permanent?

If we compare the two changes i.e. the "change from milk to curd" and "change of seasons", we notice that the change of seasons is slow when compared to change of milk to curd.

But if we compare change of milk to curd and change in electric bulb due to the switch being on or off, the change of milk to curd is a slow change.

Thus the change of milk to curd is a fast change when compared with change of season but it is a slow change when compared with change in electric bulb being put on or off.

Therefore, whether a change is slow or fast is relative.

Similarly, the comparison of above two changes explains that change of seasons takes place naturally, but to change milk into curd we need to add some curd to the warm milk and keep it in such a

way that it is not shaken and remains warm. Thus we need some initiation and intervention from human beings to bring a change in the milk.

Also, seasonal changes are temporary as these changes from winter to summer and summer to rains then rains to winter are continuous. Thus we get winter again. Change of milk into curd is permanent because we cannot get back milk from curd.

The comparison shows that it is possible to classify certain changes as slow or fast, natural or man-made and temporary or permanent.

- Can you think of any other basis for categorization of changes?

Write the indicators and causes for the other changes given below. You may not be able to write the causes of all changes. Try to discuss with your friends and elders to know the causes.

- ☞ Change of ice into water and water into ice
- ☞ Rusting of iron
- ☞ Growth in plants
- ☞ Rice to cooked rice
- ☞ Melting of ice-cream
- ☞ Boiling an egg in water
- ☞ Electric bulb on and off
- ☞ Changes in Atti-Patti Plant

Are you able to categorize these changes as slow or fast, natural or manmade temporary or permanent?

Curds are a dairy product obtained by curdling (coagulating) milk with rennet.

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Activity-6: Categorizing changes

Table 4 describes some changes. Study the changes, discuss in groups with your friends and state the category of each change by writing yes or no in relevant columns.

Table 4

S. No.	Change	Type of change					
		Natural	Man made	Temporary	Permanent	Changes the state	Changes the shape
1	Change from milk to curd						
2	Change in seasons						
3	Change of ice into water and water into ice						
4	Rusting of iron						
5	Growth in plants						
6	Rice to cooked rice						
7	Melting of ice-cream						
8	Egg to boiled egg						
9	Electric bulb on and off						
10	Changes in Atti Pattu						

- How many changes are natural?
- How many are man-made?
- How many changes are temporary?
- How many are permanent?
- How many changes are slow?
- How many are fast?

List them in tables 5, 6 & 7

Coal, oil and gas are called "fossil fuels" because they have been formed from the organic remains of prehistoric plants and animals.

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VI Class

Table 5

S. No.	Slow Change	Fast Change
1.		
2.		
3.		

Table 6

S. No.	Permanent Change	Temporary Change
1.		
2.		
3.		

Table 7

S. No.	Natural Change	Man made Change
1.		
2.		
3.		

In this activity we have categorized ten changes in three ways - slow/ fast, permanent/temporary and natural/man-made.

- Are there any other properties by which you can categorize the above changes?

Discuss with your friends and list properties other than those mentioned above for categorization. Prepare a new table for grouping.

Keywords

Changes, change in state, duration of day, indicators of change, slow/fast change, temporary/permanent change, natural/man-made change.

What we have learnt

- Many changes are taking place around us.
- Some changes take place naturally and some changes are initiated by human beings.
- There will be many indicators of changes to show that a change took place.
- There exists a cause for every change.
- We can classify changes around us in many ways; slow-fast, permanent-temporary, natural - man-made etc.
- Classification of changes is also made based on various indicators of change like the change in state, change in colour, change in size, change in taste etc.

Fuel is any material that stores energy that can later be extracted to perform mechanical work in a controlled manner.

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Improve your learning

- Is the change of ice into water a temporary or permanent change? Explain.
- How do you know that rusting of iron is a change?
- If a raw egg is boiled in water, what changes do you notice in it?
If you are given two eggs, can you determine which one is boiled and which one is not? Explain.
- Name five changes you notice in your surroundings. Classify them as natural or man-made changes.
- Choose incorrect statements from the following and rewrite them correctly :
 - The coldness in air during winter is a permanent change
 - Boiled egg is a temporary change.
 - There is a cause for every change.
 - An electric bulb going on and off is a permanent change.
 - There is a change in state when ice-cream melts.
 - Some changes are listed below, classify them as temporary and permanent.
- We use clay to make idols. Can we get back clay from the idol? What type of change is it? Explain.
- Carpenter made a chair using wood, what type of change is it?
- Rafi said that "Flour from Rice / Wheat is a man-made change." He wants to make a list of examples of this kind of change, help him expand his list.
- Select a plant in your house / school observe and record changes keeping in view height of plant, number and size of leaves and flowers etc. over a period of 2 months. Display your observations.
- What will happen if a decorative colour paper is dipped in water? Predict the possible changes. Verify your predictions by doing experiments and write down the steps of the process.

The explosion of fireworks is an example of chemical change.

Science

VI Class

- Write various processes involved in making ghee from milk, what changes do you find, during this process.
- Observe the following table and answer the questions give below.

Place	Month	Temperature		Rainfall	Sunrise	Sunset
		Min.	Max.			
Rentachintala	January	21°C	27°C	2.41mm	6.50	17.12
	April	39°C	47°C	0.01mm	6.11	17.47
	August	24°C	34°C	39.12mm	6.37	17.31

- Which month had maximum rainfall?
 - Which season occurs in the month of August? How can you support your answer.
 - In which month is the duration of day minimum? What could be the reason for this?
 - Do you find any relation between sunrise and seasons?
 - What changes can you identify from January to August?
- Farha wondered "How it could be possible for Nature to bring changes in seasons periodically". Can you add some changes like this. How will you explain them?
 - Sita wondered and felt very happy to see the beauty of the fields and insects like twinkling beetle (*Arudra*) during rainy season in their village. Can you list some such changes which make you wonder and feel happy?



A common physical change occurs when matter changes from one phase to another.

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