DEVELOPING STRATEGIES FOR EFFECTIVE UTILIZATION OF GENERAL SCIENCE BROADCAST PROGRAMMES FOR GRADE-VII

Title : PHULARU PHALA (Fruit from Flower)

Overview

The students will learn the nature and use of flower alongwith their different parts and their functions, pollination, fertilisation and the process of formation of fruit.

Form of Broadcast: Student-teacher discussions.

CONTENT SEQUENCE:

1. Flower is the most beautiful part of the plant.
2. Most of the flowers have four parts:
   (a) Sepals (b) Petals (c) Stamens (d) Pistil.
3. Sepals are thin green leaf like parts on the first row of the flower. Their functions are :
   (a) They cover and protect the flower bud.
   (b) They support and protect the flower.
   All the sepals together is called calyx.
4. Petals are of various colours which attract insects.
   (a) Petals are in the 2nd row of the flower.
   (b) Some flowers with sweet fragrance attract the bees to collect honey.
   (c) All the petals together is called Corolla.
5. Stamen is the male organ of the flower :
   (a) Stamen contains filament and anther.
   (b) Filament is the thin stem of the stamen.
   (c) The anther is at the top of the filament and is knobby in shape.
   (d) The anther contains yellow and red powder called pollen.
6. Pistil is the female organ of the flower :
   (a) It is at the centre of the flower, being surrounded by stamens.
   (b) Pistil has got three parts- ovary, style and stigma.
   (c) Ovary is the large or swollen bottom of the pistil.
   (d) Inside the ovary are one or more ovule which grows into seeds.
   (e) Style is the thin stalk or stem of the pistil.
   (f) Stigma is the sticky top of the pistil.

7. The process of reproduction takes place in the following steps: pollination & fertilisation.
   (a) Transfer of pollen from anther of a stamen to the sticky stigma of the pistil is called pollination. It is of two types: self pollination and cross pollination.
      (i) When the transfer is in the same flower it is called self pollination.
      (ii) When the transfer is between two different flowers of the same variety it is called cross pollination.
   (b) Fertilisation takes place in ovary after the pollination.
   (c) When pollen falls on the stigma it starts to grow into a pollen tube with the help of sugary substance in the stigma.
   (d) The growing pollen tube carries two male gametes on its tip.
   (e) The pollen tube grows down the style into the ovary.
   (f) Inside the ovary there are ovules which contain eggs.
   (g) When the pollen tube enters into the ovary the tube gets fused and one of the male gametes fuses with the egg and the embryo is formed. This is called fertilisation.
   (h) The other gamete forms the cell of the embryo.
   (j) The ovule develops into the seed.
   (k) The petals fall down and the ovary develops into the fruit.
8. The flower in which the sepals and petals are same is called a unit flower.
9. Generally the female flower develops into the fruit.

EXPECTED TERMINAL BEHAVIOURS

Pupils will be able to

1.1 recognise flower as the most beautiful part of the plant.
2.2 recognise different parts of a flower.
3.3 recognise the position of sepals in the 1st row of the flower.
3.4 tick out the function of sepals from a given list of functions.
3.5 recognise that all the sepals together is called calyx.
3.6 recognise the petal is in the second row of the flower.
4.7 recognise that all the petals together is called corolla.
4.8 recognise the reason for attraction of bees and other insects towards the flowers.
5.9 recognise the male organ of the flower as stamen.
5.10 recognise different parts of the stamen.
5.11 identify the stamen and the anther in a given flower.
5.12 recognise the anther at the top of the filament.
5.13 recognise the anther contains pollen grains.
6.14 recognise the female organ of the flower as pistil.
6.15 recognise the pistil at the centre of the flower.
6.16 recognise the different parts of the female organ of a flower.
6.17 put a tick mark against the statement "Ovary is the female organ of a flower".
6.18 recognise that the ovary contains ovules.
6.19 recognise that the ovule grows into the seed.
6.20 recognise that the thin stalk of the pistil is called style.
6.21 recognise that the sticky top of the pistil is called stigma.
7.22 recognise the two processes of reproduction.
7.23 recognise the process of pollination.

7.24 recall the two types of pollination.
7.25 differentiate between self and cross pollination.
7.26 recognise where fertilisation takes place.
7.27 recognise what happens to the pollen after pollination.
7.28 recognise what the pollen tube contains on its tip.
7.29 recognise that the pollen tube grows down the style into the ovary.
7.30 arrange the processes of fertilisation in a sequential manner.
7.31 recognise the process of fertilisation as the union of male gamete and the ovule.
7.32 recognise the development that takes place in the ovary after fertilisation.
7.33 recognise what happens to corolla after fertilisation.
7.34 recognise that the ovary develops into a fruit.
7.35 draw the figure of a pistil and show the process of fertilisation.
8.36 recognise the definition of a complete flower (unit flower).
8.37 recognise the flower that grows into fruit.

THE CRITERION TEST

1.1.1 Which is the most beautiful part of the plant?
(i) Flower (ii) Leaf (iii) Stem (iv) Fruit.

2.2.2 Which of the following are the parts of a flower?
(i) Leaf (ii) Petals (iii) Pistil (iv) Fruit
(v) Stamen (vi) Sepal (vii) Seed.

3.3.3 The position of sepals is in the
(i) first row of the flower from outside.
(ii) middle of the flower.
(iii) second row of the flower.

3.4.4 Which of the following is the function of sepals?
(i) Increase the beauty of the flower.
(ii) Protect the flower bud.
(iii) Attract bees and other insects.

3.5.5 All the sepals together is called_____.(Corolla, calyx, ovary).

4.6.6 The position of petals is
(i) in the first row of the flower.
(ii) in the middle of the flower.
(iii) in the second row of the flower.

4.7.7 All the petals together is called
(i) ovary (ii) stamen (iii) corolla (iv) calyx.

4.8.8 Why are the bees and other insects attracted towards the petals of a flower?
(i) To collect honey. (ii) Due to its attractive colours only. (iii) Due to its attractive colours and fragrance.
(iv) To generate pollination.

5.9.9 The male organ of the flower is called_____.
(calyx, pistil, stamen).

5.10.10 Which of the following are the different parts of the stamen?
(i) Ovary (ii) Petals (iii) Pollen grain (iv) Stigma
(v) Pistil (vi) Male gametes.

5.11.11 Identify stamen, pistil, ovary, anther, petals, sepals in the figure of the flower given.

5.12.12 Where is the anther located?

(i) Inside the pollen grains. (ii) At the top of the filament. (iii) In the lower part of the filament. (iv) Inside the ovary.

5.13.13 What does the anther contain?

(i) Pollen grains (ii) Pollen tube
(iii) Ovules (iv) Ovary.

6.14.14 Which of the following parts is the female organ of flowers?

(i) Calyx (ii) Corolla (iii) Stamen (iv) Pistil

6.15.15 Where is the pistil located?

(i) In the first row of the flower.
(ii) In the second row of the flower.
(iii) In the middle of the flower.

6.16.16 Which of the following parts belong to the female organ of the flower?

(i) Ovary (ii) Pollen grains (iii) Stamen (iv) Style.

6.17.17 Put (_/) against the correct statement :

(i) Ovary is the female organ of the flower.
(ii) Stigma and anther are inside the ovary.

6.18.18 What does the ovary contain?

(i) Ovules (ii) Eggs (Gametes) (iii) Pollen grains.

6.19.19 Ovule develops into

(i) fruit. (ii) flower. (iii) seed.

6.20.20 The thin stalk in the pistil is called_____.

(style, filament, pollen tube).

6.21.21 The sticky top of the pistil is called_____.

(style, stigma, anther).

7.22.22 Which are the processes, a flower undergoes before becoming a fruit?

(i) Respiration (ii) Pollination (iii) Carbon assimilation
(iv) Fertilisation.

7.23.23 What is pollination?

(i) Falling of pollen on the stamen.

(ii) Falling of pollen on the stigma.

(iii) Growth of the bud from the calyx.

(iv) Attraction of bees to the corolla.

7.24.24 Pollination is of two types: _____ and _____.

7.25.25 Where does self pollination take place?

(i) In a mixed flower (bi-sexual)

(ii) In any two flowers of a plant.

(iii) In different flowers of different plants.

(iv) In two flowers of the same or different plants.

7.25.26 Where is cross pollination possible?

(i) In a mixed flower.

(ii) In two different flowers of different variety.

(iii) Only in different flowers of the same variety.

(iv) None of the above.

7.26.27 Where does fertilisation take place?

(i) Ovary (ii) Stigma (iii) Style (iv) Pollen grain.

7.27.28 What happens to the pollen after pollination?

(i) It enters into the ovary.

(ii) It germinates into pollen tube.

(iii) It grows into seed.

7.28.29 What does the pollen tube contain on its tip?

(i) Gametes (ii) Ovules (iii) Pollen grains

(iv) Both ovule and gametes.

7.29.30 Where does the pollen tube move?

(i) Gets fused with the style.

(ii) Grows down and enters into the ovary.

(iii) Comes back to the anther.

7.30.31 Given below are the processes of fertilisation in a distorted manner. Arrange them in sequence by putting the numbers 1, 2, 3, against the processes.

(a) Falling of pollen on the stigma.

(b) Bursting of ovary and union of gamete with ovule.

(c) Germination of the pollen tube and growth towards the ovary.

(d) Entering of the pollen tube into the ovary.

7.31.32 How does fertilisation take place?

(i) When the butterfly sits on the flower.

(ii) When the gamete unites with the ovule.

(iii) When the pollen falls on the stigma.

7.32.33 What development takes place in the ovary after the fertilisation?

(i) The ovule grows into seed.

(ii) The gamete comes out of the ovule.

(iii) The style is separated.

7.33.34 What happens to the corolla after fertilisation?

(i) Gets fused with ovary and helps the fruit growing.

(ii) Remains as such with the fruit.

(iii) Falls down from the fruit.

7.34.35 After fertilization,_____grows into fruit.(ovary,ovule, gamete(s)).

7.35.36 Draw a figure of pistil and show the development of the pollen tube and the process of fertilisation.

8.36.37 What is an "Unit Flower"?

(i) The flower which is completely bloomed.

(ii) The flower in which the calyx and the corolla are same.

(iii) The flower in which the calyx and the corolla are different.

(iv) None of the above.

8.37.38 Generally the_____flower grows into fruit. (male, female, colourful).

(Test to be arranged according to the types of items and along with necessary instruction will be ready for administration)

ଆ କା ଶ ବା ଣୀ

ବିଦ୍ୟାଳୟ କାର୍ଯ୍ୟକ୍ରମ
ମାନନିର୍ଦ୍ଧାରଣ ପରୀକ୍ଷା

ବିଷୟ :- 'ଫୁଲର ଫଳ'

ନାମ: ରୋଲ ନଂ : ତାରିଖ :

୧। (କ) ବୃକ୍ଷର ସୁବଠାରୁ ସୁନ୍ଦର ଅଂଶ କିଏ ?

(୧) ଫଳ ( )

(୨) ଫୁଲ ( )

(୩) ପତ୍ର ( )

(୪) କାଣ୍ଡ ( )

(ଖ) ଫୁଲରେ ବୃନ୍ତି ମଣ୍ଡଳର ସ୍ଥାନ କେଉଁଠି ?

(୧) ବାହ୍ୟର ପାର୍ଶ୍ୱର ପ୍ରଥମ ଧାଡି ବା ମଣ୍ଡଳରେ ( )

(୨) ଫୁଲର ଠିକ୍ ମଧ୍ୟ ଭାଗରେ ( )

(୩) ଫୁଲର ୨ୟ ଧାଡି ବା ମଣ୍ଡଳରେ ( )

(ଗ) ଫୁଲରେ ଦଳମଣ୍ଡଳର ସ୍ଥାନ କେଉଁଠି ?

(୧) ଫୁଲର ପ୍ରଥମ ଧାଡି ବା ମଣ୍ଡଳରେ ( )

(୨) ଫୁଲର ଠିକ୍ ମଧ୍ୟ ଭାଗରେ ( )

(୩) ଫୁଲର ୨ୟ ଧାଡି ବା ମଣ୍ଡଳରେ ( )

(ଘ) ପାଖୁଡା ଗୁଡିକର ସମଷ୍ଟିକୁ କ'ଣ କହନ୍ତି ?

(୧) ଡିମ୍ବାଶୟ ( )

(୨) କେଶର ମଣ୍ଡଳ ( )

(୩) ଦଳ ମଣ୍ଡଳ ( )

(୪) ବୃନ୍ତି ମଣ୍ଡଳ ( )

(ଙ) ଫୁଲରେ କେଉଁ ଅଂଶଟି ଫଳର ସ୍ତ୍ରୀ ଅଂଶ ?

(୧) ବୃନ୍ତି ମଣ୍ଡଳ ( )

(୨) ଦଳ ମଣ୍ଡଳ ( )

(୩) କେଶର ମଣ୍ଡଳ ( )

(୪) ଫଳିକା ମଣ୍ଡଳ ( )

(ଚ) ଫୁଲରେ ଫଳିକା ମଣ୍ଡଳର ସ୍ଥାନ କେଉଁଠି ?

(୧) ଫୁଲର ବାହାରୁ ପ୍ରଥମ ମଣ୍ଡଳାକୃତି ଧାଡିରେ ( )

(୨) ୨ୟ ମଣ୍ଡଳାକୃତି ଧାଡିରେ ( )

(୩) ଫୁଲର ମଧ୍ୟ ଭାଗରେ ( )

(ଛ) ବୃନ୍ତି ମଣ୍ଡଳର କାର୍ଯ୍ୟ କଣ ?

(୧) ଫୁଲର ଶୋଭା ବର୍ଦ୍ଧନ କରେ ( )

(୨) କଢ ଅବସ୍ଥାରେ ଫୁଲକୁ ଯୋଡାଇ ରଖେ ( )

(୩) ମହୁମାଛି ଓ ଅନ୍ୟାନ୍ୟ କୀଟ ଆକୃଷ୍ଟ କରେ ( )

(୪) ଜନନ କ୍ରିୟାରେ ସାହାଯ୍ୟ କରେ ( )

(ଜ) ମହୁମାଛି ଏବଂ ଅନ୍ୟାନ୍ୟ କୀଟ ପତଂଗ କାହିଁକି ଫୁଲର ପାଖଡା ପ୍ରତି ଆକୃଷ୍ଟ ହୁଅନ୍ତି ?

(୧) ମହୁ ସଂଗ୍ରହ କରିବା ପାଇଁ ( )

(୨) କେବଳ ଏହାର ମନଲୋଭା ରଂଗ ଯୋଗୁ ( )

(୩) ଏହାର ମନଲୋଭା ରଂଗ ଏବଂ ସୁଗନ୍ଧି ଯୋଗୁ ( )

(୪) ପରାଗ ର ସଂଗମ ଘଟାଇବା ପାଇଁ ( )

(ଝ) ଡିମ୍ବାଶୟ ମଧ୍ୟରେ କ'ଣ ଥାଏ ?

(୧) ଡିମ୍ବାଣୁ ( )

(୨) ଶୁକ୍ରାଣୁ ( )

(୩) ପରାଗ ରେଣୁ ( )

(ଞ) ଡିମ୍ବାଣୁ କେଉଁଥିରେ ପରିଣତ ହୁଏ ?

(୧) ଫଳ ( )

(୨) ଫୁଲ ( )

(୩) ମଂଜି ( )

(ଟ) ପରାଗ ପେଟି କେଉଁଠାରେ ଥାଏ ?

(୧) ପରାଗ ରେଣୁ ମଧ୍ୟରେ ( )

(୨) ପରାଗ ବଣ୍ଡର ଅଗ୍ର ଭାଗରେ ( )

(୩) ପରାଗ ବଣ୍ଡର ନିମ୍ନ ଭାଗରେ ( )

(୪) ଗର୍ଭାଶୟ ମଧ୍ୟରେ ( )

(୦) ପରାଗ କେଟି ମଧ୍ୟରେ କ'ଣ ଥାଏ ?

(୧) ପରାଗ ରେଣୁ ( )

(୨) ପରାଗ ଦଣ୍ଡ ( )

(୩) ଡିମ୍ବାଣୁ ( )

(୪) ଡିମ୍ବକ ( )

(୬) ପରିପୁଷ୍ପ କାହାକୁ କହନ୍ତି ?

(୧) ଯେଉଁ ଫୁଲ ସଂପୂର୍ଣ୍ଣ ଭାବେ ଫୁଟି ଥାଏ ( )

(୨) ଯେଉଁ ଫୁଲର ଦଳ ଏବଂ ବୃନ୍ତି ଏକ ହୋଇଥାଏ ( )

(୩) ଯେଉଁ ଫୁଲର ବୃନ୍ତି ଏବଂ ଦଳ ଅଲଗା ଅଲଗା ହୋଇଥାଏ ( )

(୪) ଅପରୋକ୍ତ ତିନୋଟି ମଧ୍ୟରୁ କେହି ନୁହେଁ ( )

(୭) ପରାଗ ସଂଗମ କାହାକୁ କହନ୍ତି ?

(୧) କେଶର ଦଣ୍ଡରେ ପରାଗ ରେଣୁର ପତନ ( )

(୨) ଗର୍ଭ-ଶୀର୍ଷ ବା ଫଳିକାଶୀର୍ଷରେ ପରାଗ ରେଣୁର ପତନ ( )

(୩) ବୃନ୍ତି ମଣ୍ଡଳରୁ କଢର ବିକାଶ ( )

(୪) ଦଳମଣ୍ଡଳରୁ ମହୁମାଛି ର ଆକର୍ଷଣ ( )

(୫) ଏ ପରାଗ ସଂଗମ କେଉଁଠାରେ ସମ୍ଭବ ହୁଏ ?

(୧) ଗୋଟିଏ ଉଭୟ ଲିଂଗି ଫୁଲରେ ( )

(୨) ଗୋଟିଏ ଗଛର ଯେ କୌଣସି ୨ ଟି ଫୁଲରେ ( )

(୩) ଅଲଗା ଅଲଗା ଗଛର ଅଲଗା ୨ ଫୁଲରେ ( )

(୪) ଅଲଗା ଅଲଗା ଗଛ କିମ୍ବା ଏକା ଗଛର ୨ଟି ଫୁଲରେ ( )

(୫) ପର ପରାଗ ସଂଗମ କେଉଁଠାରେ ସମ୍ଭବ ହୁଏ ?

(୧) ଗୋଟିଏ ଉଭୟ ଲିଂଗି ଫୁଲରେ ( )

(୨) ଗୋଟିଏ ଗଛର ୨ଟି ଫୁଲରେ ( )

(୩) କେବଳ ଅଲଗା ଅଲଗା ଗଛର ଅଲଗା ୨ ଫୁଲରେ ( )

(୪) ଅଲଗା ଅଲଗା ଗଛ କିମ୍ବା ଏକା ଗଛର ୨ଟି ଫୁଲରେ ( )

(ଥ) ପରାଗ ସଂଗମ ପରେ ପରାଗ ରେଣୁର କି ପରିବର୍ତ୍ତନ ହୁଏ ?

(୧) ପରାଗ ରେଣୁ ଡିମ୍ବାଶୟରେ ପ୍ରବେଶ କରେ ( )

(୨) ଏହା ପରେ ହୋଇ ପରାଗ ନଳୀରେ ପରିଣତ ହୁଏ ( )

(୩) ଏହା ମଂଜିରେ ପରିଣତ ହୁଏ ( )

(ଛ) ପରାଗ ନଳୀର ଅଗ୍ର ଭାଗରେ କ'ଣ ଥାଏ ?

(୧) ଶୁକ୍ରାଣୁ ( )

(୨) ଡିମ୍ବାଣୁ ( )

(୩) ପରାଗ ରେଣୁ ( )

(୪) ଡିମ୍ବାଣୁ ଏବଂ ଶୁକ୍ରାଣୁ ( )

(ଧ) ପରାଗ ନଳୀ କୁଆଡେ ଯାଏ ?

(୧) ଫଳିକା ଦଣ୍ଡ ସହ ମିଶି ଯାଏ ( )

(୨) ବଢି ବଢି ଡିମ୍ବାଶୟ ମଧ୍ୟରେ ପ୍ରବେଶ କରେ ( )

(୩) ପରାଗ ପେଟିକୁ ଫେରି ଆସେ ( )

(ନ) ଯଷ୍ମପଯୋଗ କେଉଁଠାରେ ହୁଏ ?

(୧) ଡିମ୍ବାଶୟ ( )

(୨) ଫଳିକା ଶୀର୍ଷ ( )

(୩) ଫଳିକା ଦଣ୍ଡ ( )

(୪) ପରାଗ ରେଣୁ ( )

(ପ) ଯଷ୍ମପଯୋଗ କିପରି ହୁଏ ?

(୧) ଫୁଲ ଉପରେ ପ୍ରଜାପତି ବସିଲେ ( )

(୨) ଡିମ୍ବାଣୁ ସହ ଶୁକ୍ରାଣୁର ମିଳନ ହେଲେ ( )

(୩) ପରାଗରେଣୁ ଫଳିକା ଶୀର୍ଷରେ ପଡିଲେ ( )

(ଫ) ଯଷ୍ମପଯୋଗପରେ ଡିମ୍ବାଣୁଶୟରେ କି ପରିବର୍ତ୍ତନ ହୁଏ ?

(୧) ଡିମ୍ବାଣୁ ବଢି ମଞ୍ଜିରେ ପରିଣତ ହୁଏ ( )

(୨) ଡିମ୍ବାଣୁର ଶୁକ୍ରାଣୁ ଜାତ ହୁଏ ( )

(୩) ଫଳିକା ଦଣ୍ଡ ଅଲଗା ହୋଇଯାଏ ( )

(ବ) ଯଷ୍ମପଯୋଗପରେ ବଳ ମଣ୍ଡଳ କ'ଣ ହୁଏ ?

(୧) ଭୁଣାଶୟ ସହ ମିଶି ଫଳକୁ ବଢିବାରେ ସାହାଯ୍ୟ କରେ ( )

(୨) ଫଳରେ ପୂର୍ବପରି ଲାଗି ରହିଥାଏ ( )

(୩) ଝଉଳି ଯାଇ ଝଡି ପଡେ ( )

୨। ବନ୍ଧନୀ ମଧ୍ୟରୁ ଶବ୍ଦ ବାଛି ଶୂନ୍ୟ ସ୍ଥାନ ପୂରଣ କର ?

(କ) ----- ଫୁଲ ସାଧାରଣତଃ ଫଳରେ ପରିଣତ ହୁଏ ।

(ପୁରୁଷ, ସ୍ତ୍ରୀ , ଉଭୟ ପୁରୁଷ ଓ ସ୍ତ୍ରୀ)

(ଖ) ଫୁଲରେ ବୃନ୍ତି ଗୁଚ୍ଛିକର ସମଷ୍ଟିକୁ ------- କହନ୍ତି ।

(ବୃନ୍ତି ମଣ୍ଡଳ , ପଙ୍ଖିକା ମଣ୍ଡଳ , କେଶର ମଣ୍ଡଳ)

(ଗ) ଫୁଲର ପୁରୁଷ ଅଂଗକୁ ------- କହନ୍ତି ।

(ବୃନ୍ତି ମଣ୍ଡଳ , ପଙ୍ଖିକା ମଣ୍ଡଳ, କେଶର ମଣ୍ଡଳ)

(ଘ) ଫୁଲର ପଙ୍ଖିକାରେ ଥିବା ସରୁ ବସ୍ତୁଟିକୁ ------- କହନ୍ତି ।

(ପଙ୍ଖିକା ବସ୍ତୁ, ପରାଗ ବସ୍ତୁ, ପରାଗ ନଳୀ)

(ଙ) ଫୁଲର ସ୍ତ୍ରୀ ଅଂଗରେ, ଅଣ୍ଡ ଭାଗରେ ଥିବା ଚଟରା ଅଂଶକୁ ----- କହନ୍ତି

(ପଙ୍ଖିକା ବସ୍ତୁ, ପରାଗ ପେଟି, ପଙ୍ଖିକା ଶୀର୍ଷ)

(ଚ) ପରାଗ ସଂଗମ ଦୁଇ ପ୍ରକାରର ---------- ଏବଂ ---------- ।

(ଛ) ଯଥୁପଯୋଗପରେ -------- ଫଳରେ ପରିଣତ ହୁଏ ।

(ଡିମ୍ବାଶୟ, ଡିମ୍ବାଣୁ, ଶୁକ୍ରାଣୁ)

୩। (କ) ନିମ୍ନରେ ଉଦ୍ଭିଦର କେତୋଟି ଅଂଶ ଦିଆ ଯାଇଛି , ସେଗୁଡିକ ମଧ୍ୟରୁ କେଉଁ ଗୁଡିକ ଫୁଲର ଅଂଶ ଚିହ୍ନାଇ ଦିଅ ?

(୧) ପତ୍ର	( )	(୫) କେଶର	( )
(୨) ପାଖୁଡା	( )	(୬) ବୃନ୍ତି	( )
(୩) ପଙ୍ଖିକା	( )	(୭) ମଂଜି	( )
(୪) ଫଳ	( )		

(ଖ) ନିମ୍ନରେ ଦିଆଯାଇଥିବା ଅଂଶ ଗୁଡିକ ମଧ୍ୟରୁ କେଉଁ ଗୁଡିକ ଫୁଲର ପୁରୁଷ ଅଂଶର ଅନୁର୍ଗତ ?

(୧) ଡିମ୍ବାଶୟ	( )	(୪) ପରାଗପେଟି	( )
(୨) ବଳ	( )	(୫) ପଙ୍ଖିକା	( )
(୩) ପରାଗରେଣୁ	( )	(୬) ଶୁକ୍ରାଣୁ	( )

(ଗ) କେଉଁ ଗୁଡିକ ଫୁଲର ସ୍ତ୍ରୀ ଅଂଗର ଅନୁର୍ଗତ ?

(୧) ଡିମ୍ବାଶୟ	( )
(୨) ପରାଗରେଣୁ	( )
(୩) ପଙ୍ଖିକା ବସ୍ତୁ	( )
(୪) କେଶର ବସ୍ତୁ	( )

(ଘ) ଫୁଲ, ଫଳରେ ପରିଣତ ହେବା ପାଇଁ କେଉଁ କେଉଁ ଅବସ୍ଥା ଦେଇ ଗତି କରିଥାଏ ?

(୧) ଶ୍ୱାସକ୍ରିୟା ( )
(୨) ପରଂ ସଂଗମ ( )
(୩) ଅଂଗାର ଆମ୍ଳୀକରଣ ( )
(୪) ଯଗ୍ମପଯୋଗ ( )

୪। ନିମ୍ନରେ ଦିଆଯାଇଥିବା ଠିକ୍ ଉକ୍ତି ଗଡିକ ପାଖରେ (✓) ଚିହ୍ନ ଦିଅ ।

(୧) ଡିମ୍ବାଶୟ ଫୁଲର ସ୍ତ୍ରୀ ଅଂଗ ଅଟେ ( )

(୨) ଫଳିକା ଚକ୍ର ଏବଂ ପରାଗ ପେଟି , ଡିମ୍ବାଶୟରେ ଥାଏ ( )

୫। ନିମ୍ନରେ ପୁଷ୍ପର ଜନନ କ୍ରିୟାର କ୍ରମ ବିଲିପ୍ତ ଭାବରେ ଦିଆଯାଇଛି । ଏ ଗଡିକ ନିର୍ଦ୍ଦିଷ୍ଟ କ୍ରମରେ ବଂଧନୀ ମଧ୍ୟରେ ୧, ୨, ୩ ----- ସଂଖ୍ୟାମାନ ଲେଖି ସଜାଅ ?

(କ) ପରାଗ ରେଣୁର ଫଳିକା ଶୀର୍ଷରେ ପତନ ( )

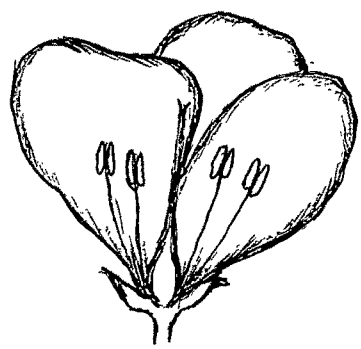
(ଖ) ଡିମ୍ବକ ଫାଟିଯାଇ ଶୁକ୍ରାଣୁର ଡିମ୍ବାଣୁ ସହ ମିଳନ ( )

(ଗ) ପରାଗ ରେଣୁର ଅଂକୁରଣ ଓ ନିମ୍ନରେ ଡିମ୍ବାଶୟ ପର୍ଯ୍ୟନ୍ତ ବୃଦ୍ଧି ( )

(ଘ) ବୀଜରଂଧ୍ର ଦେଇ ପରାଗ ନଳୀର ଡିମ୍ବାଶୟ ମଧ୍ୟରେ ପ୍ରବେଶ ( )

୬। ଦିଆଯାଇଥିବା ଚିତ୍ରରେ ତୀର ଚିହ୍ନ ଦେଇ (⟶) ନିମ୍ନ ଲିଖିତ ଅଂଶ ଗଡିକ ଚିହ୍ନାଇ ଦିଅ :-

ଫଳିକା
ଡିମ୍ବାଶୟ
ପରାଗପେଟି
କେଶର ଦଣ୍ଡ



ବୃନ୍ତ
ଦଳ

୭। ଗୋଟିଏ ଫଳିକାର ଚିତ୍ର ଅଂକନ କରି ସେଥିରେ ପରାଗ ନଳୀର ବିକାଶ ଏବଂ ଯଗ୍ମପଯୋଗ ଦର୍ଶାଅ ?

୪୫୫...

ଆଦର୍ଶ ଉତ୍ତର

ପୂଲୁର ଫଳ

୧। କ-୨, ଖ-୧, ଗ-୩, ଘ-୩, ଙ- ୪, ଚ- ୩,
ଛ-୨, ଜ-୩, ଝ- ୧, ଞ- ୩, ଟ- ୨, ଠ- ୧,
ଡ- ୩, ଢ-୨, ଣ-୧, ତ- ୪, ଥ- ୨, ଦ- ୧,
ଧ- ୨, ନ- ୧, ପ-୨, ଫ- ୧, ବ- ୩ ।

୨। କ- ସ୍ତ୍ରୀ ଖ- ବୃନ୍ତି ମଣ୍ଡଳ ଗ- କେଶର ମଣ୍ଡଳ
ଘ- ଫଳିକା ଦଣ୍ଡ ଙ- ଫଳିକା ଶୀର୍ଷ ଚ- ଘର ପରାଗ ସଂଗମ ଓ ସ୍ୱ ପରାଗ ସଂଗମ
ଛ- ଡିମ୍ବାଶୟ ।

୩। କ- ୨, ୩, ୫, ୬ । ଖ- ୩, ୪, ୬ । ଗ- ୧, ୩ ।
ଘ- ୨, ୪ ।

୪। ୧- ✓ ୨- X

୫। କ- ୧ , ଖ- ୪, ଗ- ୨, ଘ- ୩ ।

୬।

ଫଳିକା
ଡିମ୍ବାଶୟ
ପରାଗ ପେଟି
କେଶର ଦଣ୍ଡ
ବୃନ୍ତି
ଦଳ

୭।

LEARNING EXPERIENCES

PRE-BROADCAST ACTIVITIES

Method: Question-Answer

Aids: Picture of a flower garden.

(The teacher in the listening room would hang a picture of a flower garden. He will be waiting for the students to arrive. When the students enter the room and take their respective seats, the teacher would welcome the students and start the session.)

Teacher's Activities		Expected Activities of the Students
Tr:	Hellow students! you are welcome to the first programme of our science series of school broadcast programme.	
Q.	(Showing a picture) What do you see here?	A beautiful garden.
Q.	What is that adds to the beauty of the garden?	Flowers, leaves, etc.
Q.	What are the flowers you see in this picture?	Rose, Sunflowers,etc.
Q.	What other flowers you have seen?	Lotus, Jasmine, etc.
Q.	In what way the flower comes to our use?	Worshiping, decoration, getting honey, etc.

Teacher's Activities	Expected Activities of the Students
Q. In what way it helps the plant?	Improving the beauty, fruit bearing etc.
Q. What happens to the flower after some days?	It falls down.
Q. (To another student) What do you say? Does it fall down really?	No, the petals fall down.
Q. If petals fall down, what happens to the rest part of the flower?	It grows into fruit.
Q. How does it grow? What are the processes through which the fruit is borne in the plants?	
Let us listen to a discussion on how this fruit bearing takes place. While listening you may come across the names of different parts of a flower and other processes. If you feel that you may not remember them please write in the abbreviated form which you know. We would discuss them in the post broadcast session. Please listen and observe the pictures carefully.	

(The teacher would tune the radio and the visuals will be shown at appropriate times.)

ACTIVITIES DURING THE BROADCAST

Method: Radio-vision

Aids: Slides of

1. Plant life cycle
2. Flower and its parts
3. Sepals, calyx and corolla
4. Stamen with pollen grains
5. Description of pistil, ovary and fertilisation process
6. Pollination- self and cross
7. Darwin
8. Pollination with the help of insects, air and water.
9. Microscopic view of the pollen grains.
10. Cross section of ovary
11. Corolla falling down after fruit formation.

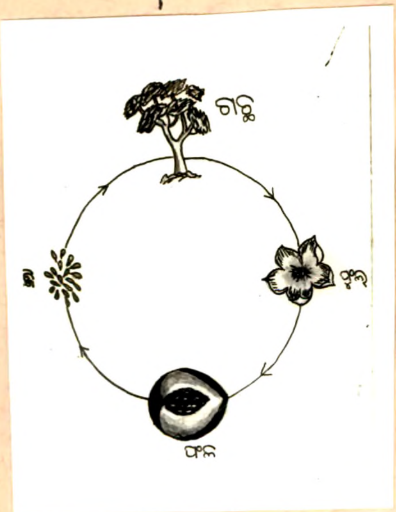
These slides will be shown in synchronization with the contents of the broadcast programmes. While the slides will be projected the important parts may be shown with the help of a pointer.

Teaching Points Through the Radio	Visuals
1. Which comes first? Seed or Plant?	Slide No.1
x x x	x x
2. Flower has parts like.....	Slide No.2
x x x	x x
3. Sepals, calyx, etc.....	Slide No.3
x x x	x x

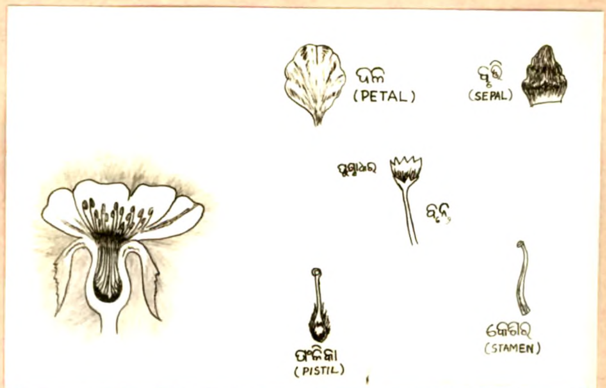
Teaching Points Through the Radio	Visuals
4. .....stamens are inside the petals.....	Slide No.4
x x x	x x
5. The pistil.....swollen bottom called ovary.....	Slide No.5
x x x	x x
6. Falling of pollen grain on the stigma is pollination.....	Slide No.6
x x x	x x
7. According to Darwin	Slide No.7
x x x	x x
8. Cross pollination is done by.....	Slide No.8
x x x	x x
9. Seeing through microscopes, the pollen grain.....	Slide No.9
x x x	x x
10. Pollen tube enters the ovary.....	Slide No.5 (Reprojection)
x x x	x x
11. Inside the ovary, ovules.....	Slide No.10
x x x	x x
12. Corolla falls down after the formation of fruit.	Slide No.11
x x x	x x

(Photographs of the slides developed for this topic are given in the following pages).

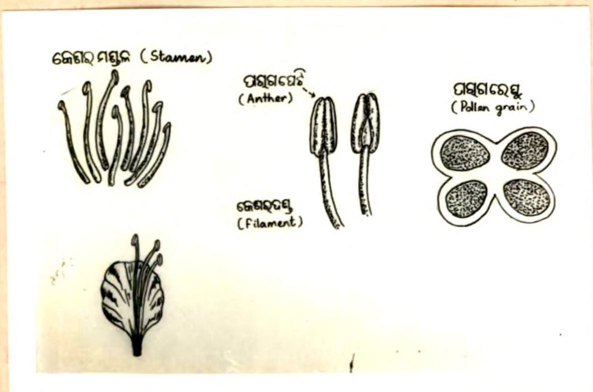
1


ଗଛ
ଫୁଲ
ଫଳ

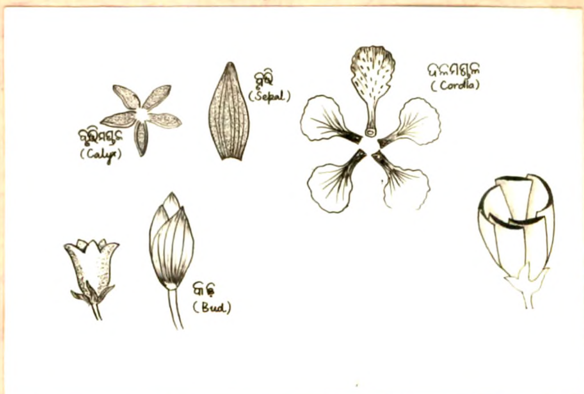
2


ଦଳ
(PETAL)
ବୃତି
(SEPAL)
ପୁଷ୍ପାଧାର
ବୃନ୍ତ
ଫଳିକା
(PISTIL)
କେଶର
(STAMEN)

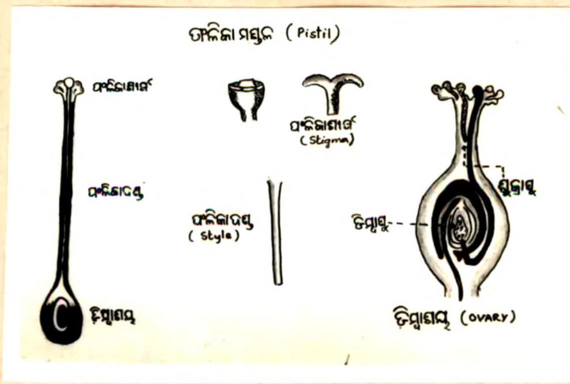
4


କେଶର ମଣ୍ଡଳ (Stamen)
ପରାଗଧାନୀ
(Anther)
ପରାଗରେଣୁ
(Pollen grain)
କେଶରଦଣ୍ଡ
(Filament)

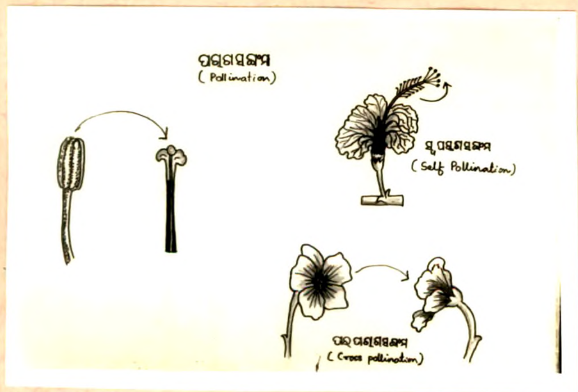
3


ବୃତି
(Sepal)
ଦଳମଣ୍ଡଳ
(Corolla)
ବୃତିମଣ୍ଡଳ
(Calyx)
କଢ଼ି
(Bud)

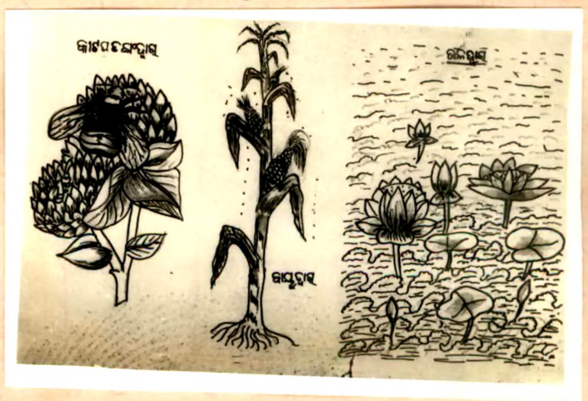
5


ଫଳିକା ମଣ୍ଡଳ (Pistil)
ଫଳିକାଶୀର୍ଷ
ଫଳିକାଦଣ୍ଡ
ଡିମ୍ବାଶୟ
ଫଳିକାଶୀର୍ଷ
(Stigma)
ଫଳିକାଦଣ୍ଡ
(Style)
ଶୁକ୍ରାଣୁ
ଡିମ୍ବାଣୁ
ଡିମ୍ବାଶୟ (OVARY)

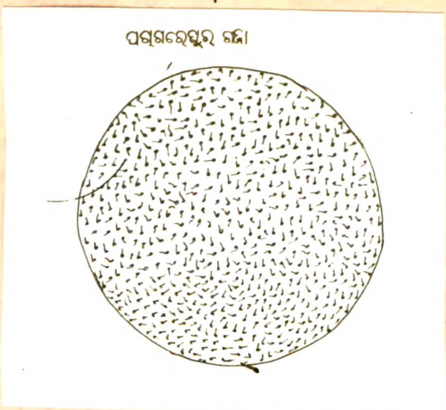
6


ପରାଗସଙ୍ଗମ
(Pollination)
ସ୍ୱ ପରାଗସଙ୍ଗମ
(Self Pollination)
ପର ପରାଗସଙ୍ଗମ
(Cross pollination)

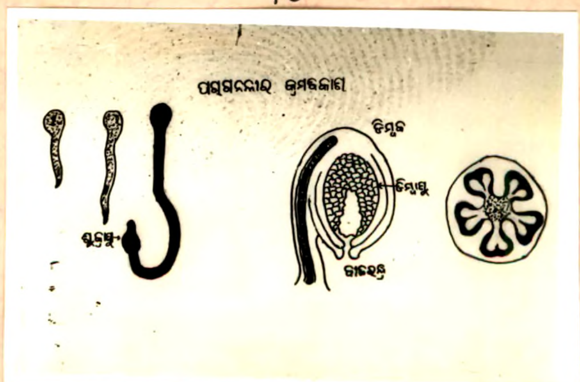
୮


କୀଟପତଙ୍ଗଦ୍ୱାରା
ବାୟୁଦ୍ୱାରା
ଜଳଦ୍ୱାରା

9



10


ପରାଗନଳୀର କ୍ରମବିକାଶ
ଡିମ୍ବକ
ଡିମ୍ବାଣୁ

11

POST BROADCAST ACTIVITIES

Method: (i) Field trip.
(ii) Demonstration cum discussion.

	Teacher's Activities	Expected Activities of the Students
Tr:	Well students! we have just listened to a programme on the formation of fruit from flower. Let us all go to our school garden and observe the phenomena in real situations. I hope, this will help you for better understanding of the subject-matter.	
	In the Flower Garden	
1	The teacher takes a specimen of flower in his hand, invites the group to surround him, takes different parts of a flower one by one, asks students to identify the parts, asks questions focusing on specific parts like stamen, pollen, ovary, etc.; explain the phenomena of fruit formation, asks students to clarify their doubts if any.	Students observe the different parts, identify the parts and answer the questions put by the teacher, clarify doubts by asking questions to the teacher.

Teacher's Activities	Expected Activitie of the Students
2 The group is divided into several small groups. Each group is directed to take a flower and observe closely the different parts shown by the teacher. The teacher visits each group and asks them to show various parts and explain one by one.	Students take flower, dissect the different parts, identify and explain their functions.
Tr: Well, we have seen the flowers and discussed about formation of fruit. Let us go back to our classroom.	
In the Classroom	
Tr: Students! we have listened to the programme and also discussed the content while going round the school garden. I hope, you have enjoyed the programme. Tomorrow we will have the test. Please read the topic thoroughly from your text-book and come prepared for the test.	
Thank you.	

DEVELOPING STRATEGIES FOR EFFECTIVE UTILIZATION OF GENERAL SCIENCE BROADCAST PROGRAMMES FOR GRADE-VII

Title: "MANISHARA BHABISHYATA BASASTHANA, CHANDRA"
(Moon, the future residence of man)

Overview

Man has conquered the moon by landing on it. Three astronauts viz. Armstrong, Collins and Aldrin went to the moon by means of a space-craft named Apollo-11. It was launched from Cape Kennedy (U.S.A.) by the help of a rocket named Saturn-V. The astronauts after reaching the moon, hoisted the flag, collected soils, stones, etc.; took photographs and came back to the earth after their successful landing.

Man proposes to build houses for the purpose of living on the Lunar surface. For that he also plans how to get water, air and other essentials on the moon. In this way, he attempts to build his future residence on the moon.

Form of the Broadcast: Discussion

A teacher discusses with a group of students.

CONTENT SEQUENCE:

1.(a) The diameter of the Earth is around 12000 kms. It is surrounded by atmosphere.

(b) Earth attracts everything towards its Centre due to its gravitational force.

(c) The theory of gravitation was discovered by Newton.

(d) There is no gravitational force of the earth beyond the layer of atmosphere.

(e) The density of air lowers down in the higher layers of the atmosphere gradually.

(f) There is no air after three hundred kms limit of the atmosphere.

(g) The vaccum portion beyond the atmosphere of the earth is called 'space'.

(h) For the first time a bitch named 'Lyka' was sent to the space.

(i) Yuri Gagarin is the first man who went to the space.

2. Moon is the satelite of the earth.

(a) It is 1/6th of the earth in size.

(b) Its diameter is about 3300 kms.

(c) The weight of anybody on the moon is 1/6th of its weight on the earth.

(d) The moon takes about 29½ days to rotate around its own axis. So the duration of both day and night is around 14 days each. As there is no existence of atmosphere and dust particles, twilight is not possible on the moon.

3. Man reached the Moon by Apollo-11 which was launched by the rocket, saturn-V, on 16th July 1969. Armstrong, Collins and Aldrin had been in this space-craft.

The weight of Saturn-V was more than 56000 quintals. Its height was more than 120 mitres. Apollo weighing 425 quintals reached near the moon after four days of launching and revolved round it. The Lunar module being separated from Apollo, landed on the moon on 21-7-69. First, Armstrong put his foot on the moon by descending through a ladder. After getting down on the moon, the astronauts hoisted the flag of their victory; collected soil, pebbles etc. and took photographs of the Lunar surface. Again by Apollo-11 they returned to the earth and landed in the Pacific Ocean.

4. They found hills, vulcanoes, craters, and cracks on the moon. The temperature of moon in the day time is about 225°F and in the night it varies from 0°F to 200°F. As the astronauts were in some special type of dress, there was no effect of pressure and heat on their body. If they could have gone there without special dress, the blood from their body could have come out by piercing the skin.

5. The earth when viewed from the moon looks similar to the view of the moon from the earth.

6.(a) The aim of the expedition to moon may be to build houses on the moon for settlement.

(b) The arrangements planned are :
Plastic houses will be constructed and they will be filled with air taken from the Earth.
Oxygen will be procured from carbon dioxide through scientific processes. Oxygen can also be available from the stones of silicate available on the moon.
Water will be taken from the earth and will be reserved there. From the reservoir, it will be supplied to different places for use and the used water will be reused after purification.

(c) The vehicle to be used on the lunar surface would work by Solar energy and Atomic energy.

7. The place will be advantageous for researches on low pressure, movement of stars and planets, etc.

EXPECTED TERMINAL BEHAVIOURS

Students will be able to

1.1 recognise the approximate figure of the diameter of the earth in kms.

1.2 recognise the reason to the falling of the bodies on the earth.

1.3 recognise the name of Newton who discovered the theory of gravity.

1.4 recognise the place where there is no effect of gravity.

1.5 agree with the statement, "The higher we go, the lesser will be the density of air".

1.6 recognise the approximate thickness of the atmosphere in kms.

1.7 write the meaning of "space".

1.8 recall the name of the first animal in the space.

1.9 recall the name of the first man in the space.

2.10 disagree with the statement "Earth is the satelite of moon".

2.11 recall that the size of the earth is 6 times that of the moon.

2.12 recognise the approximate diameter of the moon.

2.13 recognise the relationship between the weight of a body on the moon and that on the earth.

2.14 recall the time of rotation of the moon.

2.15 agree with the statement, "Duration of day and night on the moon is about 14 days each".

2.16 give reason to the absence of twilight on the moon.

3.17 recall the name of the space-craft by which man landed on the moon.

3.18 recognise the date on which Apollo started its journey towards the moon.

3.19 recognise the name of the rocket which sent the Apollo to the space.

3.20 recognise the reason for using the rocket.

3.21 tick out the names of the astronauts who went in Apollo-11.

3.22 recognise the approximate weight of the Saturn-V rocket.

3.23 recognise the approximate height of the Saturn-V rocket.

3.24 recognise the approximate weight of Apollo-11.

3.25 recognise how the Lunar module reached the moon.

3.26 recognise the date on which Lunar module landed on the moon.

3.27 recognise the name of the astronaut who first set foot on the moon.

3.28 recognise how the astronauts descended down on the moon.

3.29 tick out the activities done by the astronauts on the moon.

3.30 recognise the vehicle by which the astronauts came back to the earth, and where they landed on the earth.

4.31 recognise that the Lunar surface has craters and cracks.

4.32 recognise the approximate temperature on the moon during day and night separately.

4.33 recognise the reason to the special dresses worn by the astronauts.

4.34 recognise the disadvantages which could have occured if the astronauts had gone without special dresses.

5.35 agree with the statement, "The sight of earth from moon is like that of the moon from the earth".

6.36 recognise the probable objectives of moon expedition.

6.37 tick out the possible arrangements to be made on the moon for getting air.

6.38 recognise how Oxygen will be procured on the moon.

6.39 recognise how water will be procured on the moon.

6.40 recall the type of the energies by which the vehicles will move on the moon.

7.41 tick out the advantages expected after settling of man on the moon.

42 sketch the figure of Apollo-11.

CRITERION TEST

1.1.1 What is the diameter of the earth?

(i) Approximately 1200 kms ( )

(ii) Approximately 2000 kms ( )

(iii) Approximately 12000 kms ( )

(iv) Approximately 22000 kms ( )

1.2.2 When thrown up a body falls down due to the

(i) attraction of the Sun. ( )

(ii) gravity of the earth. ( )

(iii) presence of atmosphere. ( )

(iv) repulsion of the earth. ( )

1.3.3 Who discovered the "gravity"?

(i) Galileo. ( )

(ii) Archmedes. ( )

(iii) Grahambell. ( )

(iv) Newton. ( )

1.4.4 Tick out the place where there is no gravity.

(i) Inside the earth. ( )

(ii) In the atmosphere around the earth. ( )

(iii) Outside the atmosphere. ( )

(iv) on the Lunar surface. ( )

1.5.5 Write Yes '✓' or No 'x' against "The higher we go the lesser will be the density of the air".

1.6.6 Upto what height the atmosphere is extended to?

(i) Approximately 300 kms. ( )

(ii) Approximately 3 kms. ( )

(iii) Approximately 3000 kms. ( )

(iv) Approximately 30 kms. ( )

1.7.7 What is 'space'?

(i) Outside of earth where there is no air. ( )

(ii) Surface of the moon. ( )

(iii) The space between earth and moon. ( )

(iv) Inside of the earth. ( )

1.8.8 Name of the animal which first went to the space is_____.

1.9.9 The name of the first man who went to space is_____.

2.10.10 Write yes '_/' or No 'x' against "Earth is the satelite of moon".

2.11.11 The earth is_____times the size of the moon.

2.12.12 The diameter of the moon is around_____kms.(3000,3300,330)

2.13.13 Why a body weighs less on the moon than on the earth?

(i) The size of the earth is smaller than the moon.( )

(ii) There is no atmosphere on the moon. ( )

(iii) The gravity of moon is less than that of the earth. ( )

(iv) The gravity of moon is greater than that of the earth. ( )

2.14.14 Moon takes_____days time for rotating round its axis. (29½,365,20)

2.15.15 Write yes '_/' or No 'x' against "On the moon, day and night are around 14 days each".

2.16.16 Why is there no twilight on the Lunar surface? Because

(i) there are no atmosphere and dust particles on the moon. ( )

(ii) the time of rotation and revolution of moon is not same. ( )

(iii) Moon is nearer to the Sun. ( )

3.17.17 The name of the vehicle by which man landed on the moon is_____.

3.18.18 Apollo started journey towards the moon on_____. (July 16, 1969; Aug.15,1947; July 21, 1969).

3.19.19 By which rocket was Apollo launched to the space?
(i) Soyuz-3 (ii) Saturn-V (iii) Ranger-11 (iv) Vostak-2

3.20.20 Rocket was used to
(i) reach the moon itself ( )
(ii) increase the speed of Apollo ( )
(iii) send Apollo-11 to the space ( )
(iv) vacate air from the atmosphere ( )

3.21.21 Tick out the names of astronauts who went in Apollo-11.
(i) Gagarin ( ) (iv) Aldrin ( )
(ii) Valentina ( ) (v) Newton ( )
(iii) Collins ( ) (vi) Armstrong ( )

3.22.22 The weight of Saturn-V rocket was_____quintal.
(5000, 56000, 56, 560)

3.23.23 What was the height of Saturn-V rocket?
(i) 120 meters ( )
(ii) 20 meters ( )
(iii) 120 yards ( )
(iv) 1200 meters ( )

3.24.24 The weight of Apollo-11 was_____quintal.(425, 25, 4)

3.25.25 How did the Lunar module reach the moon?
(i) Landed in a sea on the moon. ( )
(ii) Being separated from main Apollo-11, revolved round the moon for certain time and finally landed ( )
(iii) Went slowly and dashed against a rock. ( )

3.26.26 On which date the Lunar module landed on the moon?
(i) July 21, 1969 ( )
(ii) July 16, 1969 ( )
(iii) Nov. 14, 1970 ( )
(iv) Aug.15, 1947 ( )

3.27.27 Who first stepped on the moon?
(i) Valentina ( )
(ii) Collins ( )
(iii) Gagarin ( )
(iv) Armstrong ( )

3.28.28 How did the astronaut step on the moon from the Lunar module?

(i) By jumping down from the Lunar module. ( )
(ii) With the help of a rope. ( )
(iii) By the ladder fitted with the Lunar module. ( )
(iv) With the help of a bamboo. ( )

3.29.29 What did the astronauts do on the Lunar surface?

(i) Hoisted the flag ( )
(ii) Planted trees ( )
(iii) Built roads ( )
(iv) Collected soil, pebbles, etc. ( )
(v) Took photographs ( )
(vi) Searched for water by digging the surface ( )

3.30.30 How did the astronauts return back to the earth?

(i) They came by Apollo-11 and landed in the pacific ocean. ( )
(ii) Landed in Cape Kennedy by Saturn-V ( )
(iii) Landed in the Pacific ocean by Vostak ( )

4.31.31 How is the Lunar surface to look at?

(i) Full of craters amd cracks ( )
(ii) Full of forests ( )
(iii) Full of seas and vulcanoes. ( )

4.32.32 The temperature on the moon in the day time is_____.
(200F, 225°F, 110°C)

4.32.33 The temperature on the moon comes down upto_____degree in the night.

4.33.34 Why were the astronauts putting on special dresses?

(i) To protect themselves from sun light. ( )
(ii) To protect themselves from moon light. ( )
(iii) To bring an equilibrium between the pressure of their body and that on the moon. ( )
(iv) To get comfort out of the special dress. ( )

4.34.35 What difficulty would have occured if the astronauts were without special dresses?

(i) There would have been no difficulty. ( )
(ii) The veins and arteries of their body would have burst due to low pressure. ( )
(iii) They would have experienced heavy air pressure . ( )

5.35.36 'The sight of earth from the moon is like that of moon from the earth'. (Put a '_/' if the statement is true).

6.36.37 What was the aim of the moon expedition?

(i) Only to build house on the moon. ( )

(ii) Only to have cultivation of the lands on the moon( )

(iii) For doing reserches concerning space and low pressure. ( )

6.37.38 What arrangement can be made on the lunar surface to get air?

(i) The houses will have plastic coverings with air inside. ( )

(ii) Air will be sent from the earth through pipes. ( )

(iii) Air will be created from the sun rays. ( )

6.38.39 How will oxygen be available on the Lunar surface?

(i) Oxygen will be taken from the earth. ( )

(ii) Oxygen will be collected from the moon rocks. ( )

(iii) Oxygen will be collected from cultivation areas and sent to the areas of living. ( )

6.39.40 How will the arrangement be made for water on the moon?

(i) First some water will be taken from the earth, for use and that will be reused after purification. ( )

(ii) Water will be got through artificial rain. ( )

(iii) Water will be got by digging wells. ( )

6.40.41 By which form of energy will the vehicles move on the moon?

(i) Steam energy ( ) (iii) Atomic energy only ( )

(ii) Solar energy only( ) (iv) Both solar energey & atomic energy ( )

7.41.42 What are the advantages expected after moon expedition?

(i) Blind belief will be removed from human mind. ( )

(ii) More and more space researches can be taken up.( )

(iii) There will be friendship between moon and earth. ( )

42.43 Draw the figure of Apollo-11.

(Test is to be arranged for use according to type of items and with necessary instructions).

ଆ କା ଶ ବା ଣୀ

ବିଦ୍ୟାଳୟ କାର୍ଯ୍ୟକ୍ରମ
ମାନନିର୍ଦ୍ଧାରଣ ପରୀକ୍ଷା

ବିଷୟ :- ମଣିଷର ଭବିଷ୍ୟତ ବାସସ୍ଥାନ ଚନ୍ଦ୍ର

ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ

ନାମ : ରୋଲ ନଂ : ତାରିଖ :

୧। ଠିକ୍ ଉତ୍ତର ପାଖରେ ଥିବା ବନ୍ଧନୀ ମଧ୍ୟରେ (✓) ଚିହ୍ନ ଦିଅ ?

(କ) ପୃଥିବୀର ବ୍ୟାସ କେତେ ?

(୧) ପ୍ରାୟ ୧୨୭୫୭ କିଃମିଃ ( )
(୨) ପ୍ରାୟ ୨୦୦୦ କିଃମିଃ ( )
(୩) ପ୍ରାୟ ୧୨୦୦୦ କିଃମିଃ ( )
(୪) ପ୍ରାୟ ୨୨୭୦୦ କିଃମିଃ ( )

(ଖ) କୌଣସି ବସ୍ତୁକୁ ଉପରକୁ ଫୋକାଇଦେଲେ ତାହା ପୁଣି ତଳକୁ ପଡିଯାଏ କାହିଁକି ?

(୧) ସୂର୍ଯ୍ୟର ଆକର୍ଷଣ ଯୋଗୁ ( )
(୨) ପୃଥିବୀର ମାଧ୍ୟାକର୍ଷଣ ଯୋଗୁ ( )
(୩) ପୃଥିବୀର ବାୟୁ ମଣ୍ଡଳ ଯୋଗୁ ( )
(୪) ପୃଥିବୀର ବିକର୍ଷଣ ଯୋଗୁ ( )

(ଗ) କିଏ ମାଧ୍ୟାକର୍ଷଣ ଶକ୍ତି ଆବିଷ୍କାର କରିଥିଲେ ?

(୧) ଗାଲିଲିଓ ( )
(୨) ଆର୍କମେଡିସ୍ ( )
(୩) ଗ୍ରାହାମ୍‌ବେଲ ( )
(୪) ନିଉଟନ୍ ( )

(ଘ) କେଉଁଠାରେ ମାଧ୍ୟାକର୍ଷଣ ଶକ୍ତିର ପ୍ରଭାବ ନ ଥାଏ ?

(୧) ପୃଥିବୀର ଅଭ୍ୟନ୍ତରରେ ( )
(୨) ପୃଥିବୀ ଉପରିସ୍ଥ ବାୟୁ ମଣ୍ଡଳରେ ( )
(୩) ପୃଥିବୀର ବାୟୁ ମଣ୍ଡଳ ବାହାରେ ( )
(୪) ଚନ୍ଦ୍ର ପୃଷ୍ଠରେ ( )

(ଙ) ପୃଥିବୀର ବାୟୁମଣ୍ଡଳ କେତେଦୂର ଯଏଁନ୍ତ ବିସ୍ତୃତ ଥାଏ ?

(୧) ପ୍ରାୟ ୩୦୦ କିଃମିଃ ଉପରକୁ ( )

(୨) ପ୍ରାୟ ୩ କିଃମିଃ ଉପରକୁ ( )

(୩) ପ୍ରାୟ ୩୦୦୦ କିଃମିଃ ଉପରକୁ ( )

(୪) ମାତ୍ର ୩୫ କିଃମିଃ ଯଏଁନ୍ତ ( )

(ଚ) ମହାକାଶ କାହାକୁ କହନ୍ତି ?

(୧) ପୃଥିବୀ ବାହାରେ ଯେଉଁଠାରେ ବାୟୁ ନ ଥାଏ ( )

(୨) ଚନ୍ଦ୍ରର ଉପରି ଭାଗକୁ ( )

(୩) ପୃଥିବୀ ପୃଷ୍ଠ ଏବଂ ଚନ୍ଦ୍ରର ମଧ୍ୟବର୍ତ୍ତୀ ଅଂଶକୁ ( )

(୪) ପୃଥିବୀର ଅଭ୍ୟନ୍ତରକୁ ( )

(ଛ) ଆପୋଲୋ ଯାନଟିକୁ କେଉଁ ରକେଟ ସାହାଯ୍ୟରେ ମହାକାଶକୁ ପଠାଯାଇଥିଲା ?

(୧) ସୋୟୁଜ -୩ ( )

(୨) ସାଟର୍ଣ୍ଣ - ୫ ( )

(୩) ରେଂଜର -୧୧ ( )

(୪) ଭୋସ୍ତକ-୨ ( )

(ଜ) ରକେଟ ବ୍ୟବହାର କରାଯିବାର କାରଣ କ'ଣ ?

(୧) ରକେଟକୁ ଚନ୍ଦ୍ରରେ ପହଂଚାଇବା ପାଇଁ ( )

(୨) ଆପୋଲର ବେଗ ବଢାଇବା ପାଇଁ ( )

(୩) ଆପୋଲୋ-୧୧କୁ ମହାକାଶରେ ପହଂଚାଇବାପାଇଁ ( )

(୪) ବାୟୁ ମଣ୍ଡଳକୁ ବାୟୁ ଶୂନ୍ୟ କରିବା ପାଇଁ ( )

(ଝ) ଚନ୍ଦ୍ର ଯାତ୍ରୀମାନେ କାହିଁକି ସ୍ପେସ୍ସୁଟ ପିନ୍ଧିଥିଲେ ?

(୧) ସୂର୍ଯ୍ୟାତାପରୁ ରକ୍ଷା ପାଇବା ପାଇଁ ( )

(୨) ଚନ୍ଦ୍ର ତାପରୁ ରକ୍ଷା ପାଇବା ପାଇଁ ( )

(୩) ଚନ୍ଦ୍ର ପୃଷ୍ଠର ତାପ ଏବଂ ନିଜ ଶରୀରର ତାପ ମଧ୍ୟରେ ସମତା ଆଣିବା ପାଇଁ ( )

(୪) ସେ ପୋଷାକ ତାଂକୁ ଆରାମ ଲାଗୁଥିଲା ( )

(ଝ) ସାଟର୍ଣ୍ଣ ରକେଟର ଉଚ୍ଚତା କେତେ ?

(୧) ୧୨୦ ମିଟର ( )

(୨) ୨୦ ମିଟର ( )

(୩) ୧୨୦ ଗଜ ( )

(୪) ୧୨୦୦ ମିଟର ( )

(ଟ) ଚନ୍ଦ୍ରଯାନ କିପରି ଚନ୍ଦ୍ରରେ ପହଞ୍ଚିଲା ?

(୧) ଚନ୍ଦ୍ରରେ ଥିବା ସମୁଦ୍ରରେ ଓହ୍ଲାଇଥିଲା ( )

(୨) ମୂଳଯାନଠାରୁ ଅଲଗା ହୋଇ ଚନ୍ଦ୍ରକୁ ଦିନିଟି ସମସ୍ତ ଯାଇଁ ପରିକ୍ରମା କଲାପରେ ଓହ୍ଲାଇଲା ( )

(୩) ଧୀରେ ଧୀରେ ଯାଇଁ ପାହାଡରେ ଧକ୍କା ଖାଇଥିଲା ( )

(ଠ) ଚନ୍ଦ୍ରଯାନ କେଉଁଦିନ ଚନ୍ଦ୍ରରେ ଓହ୍ଲାଇଥିଲା ?

(୧) ଜୁଲାଇ ୨୧, ୧୯୬୯

(୨) ଜୁଲାଇ ୧୬, ୧୯୬୯

(୩) ନଭେମ୍ବର ୧୪, ୧୯୬୦

(୪) ଅଗଷ୍ଟ ୧୫, ୧୯୪୭

(ଡ) କିଏ ସର୍ବ ପ୍ରଥମେ ଚନ୍ଦ୍ରରେ ପଦାର୍ପଣ କରିଥିଲେ ?

(୧) ଆଲେଣ୍ଟିନା ( )

(୨) କଲିନ୍ସ ( )

(୩) ଗାଗାରିନ୍ ( )

(୪) ଆର୍ମଷ୍ଟ୍ରଂଗ ( )

(ଢ) ଚନ୍ଦ୍ରଯାତ୍ରୀ କିପରି ଚନ୍ଦ୍ରଯାନରୁ ଚନ୍ଦ୍ର ପୃଷ୍ଠକୁ ଓହ୍ଲାଇଲେ ?

(୧) ଚନ୍ଦ୍ରଯାନରୁ ଡଳକୁ ଡେଇଁପଡି ( )

(୨) ଖଣ୍ଡେ ବଉଡି ସାହାଯ୍ୟରେ ( )

(୩) ଚନ୍ଦ୍ରଯାନରେ ଲାଗିଥିବା ସିଡି ଦ୍ୱାରା ( )

(୪) ଏକ ବାଉଁଶ ସାହାଯ୍ୟରେ ( )

(ଣ) ଚନ୍ଦ୍ର ଯାତ୍ରୀମାନେ କିପରି ପୃଥିବୀକୁ ଫେରିଲେ ?

(୧) ଆପୋଲୋଯାନରେ ଅସି ପ୍ରଶାନ୍ତ ମହାସାଗରରେ ଓହ୍ଲାଇଲେ ( )

(୨) ସାଟର୍ଣ୍ଣ ରକେଟ ସାହାଯ୍ୟରେ କେପ୍‌କେନେଡିରେ ଓହ୍ଲାଇଲେ ( )

(୩) ଭୋସ୍ତକ ରକେଟରେ ଅସି ପ୍ରଶାନ୍ତ ମହାସାଗରରେ ଓହ୍ଲାଇଲେ ( )

(ତ) କୌଣସି ବସ୍ତୁର ଓଜନ ପୃଥିବୀ ପୃଷ୍ଠ ଅପେକ୍ଷା ଚନ୍ଦ୍ରପୃଷ୍ଠରେ କମ୍ ହେବାର କାରଣ କ'ଣ ?

(୧) ଚନ୍ଦ୍ରର ଆକାର ପୃଥିବୀର ଆକାରଠାରୁ ସାନ ( )

(୨) ଚନ୍ଦ୍ରରେ ବାୟୁ ମଣ୍ଡଳ ନ ଥିବାରୁ ( )

(୩) ଚନ୍ଦ୍ରର ମାଧ୍ୟାକର୍ଷଣ ଶକ୍ତି ପୃଥିବୀର ମାଧ୍ୟାକର୍ଷଣ ଶକ୍ତିଠାରୁ କମ୍ ହୋଇ ଥିବାରୁ ( )

(୪) ଚନ୍ଦ୍ରର ମାଧ୍ୟାକର୍ଷଣ ଶକ୍ତି ପୃଥିବୀଠାରୁ ଅଧିକ ହୋଇଥିବାରୁ ( )

(ଥ) ଚନ୍ଦ୍ର ପୃଷ୍ଠରେ କାହିଁକି ସଂଧ୍ୟା ହୁଏ ନାହିଁ ?

(୧) ଚନ୍ଦ୍ରରେ ବାୟୁମଣ୍ଡଳ ଓ ଧୂଳିକଣା ନ ଥିବାରୁ ( )

(୨) ଚନ୍ଦ୍ରର ପରିକ୍ରମଣ ଓ ଆବର୍ତ୍ତନ ସମୟ ସମାନ ହୋଇ ନ ଥିବାରୁ ( )

(୩) ଏହା ସୂର୍ଯ୍ୟର ନିକଟବର୍ତ୍ତୀ ହୋଇ ଥିବାରୁ ( )

(ଦ) ଚନ୍ଦ୍ର ପୃଷ୍ଠ ଦେଖିବାକୁ କିପରି ?

(୧) ଗର୍ତ୍ତ ଓ ଫାଟ ପୂର୍ଣ୍ଣ ( )

(୨) ଜଂଗଲରେ ପରିପୂର୍ଣ୍ଣ ( )

(୩) ସମୁଦ୍ର ଏବଂ ଜିବନ୍ତ ଆଗ୍ନେୟଗିରିରେ ପୂର୍ଣ୍ଣ ( )

(ଧ) ଚନ୍ଦ୍ରଯାତ୍ରୀମାନେ ସ୍ୱତନ୍ତ୍ର ପୋଷାକ ନ ପିନ୍ଧିଥିଲେ କ'ଣ ଅସୁବିଧା ହୋଇଥାନ୍ତା ?

(୧) କିଛି ଅସୁବିଧା ହୋଇ ନ ଥାନ୍ତା ( )

(୨) ନିମ୍ନ ଚାପ ଯୋଗ ତାଙ୍କ ଦେହର ଶିରା ପ୍ରଶିରା ଫାଟି ଯାଇଥାନ୍ତା ( )

(୩) ତାଙ୍କ ଉପରେ ଅଧିକ ବାୟୁଚାପ ପଡିଥାନ୍ତା ( )

(ନ) ଚନ୍ଦ୍ର ଅଭିଯାନର ଉଦ୍ଦେଶ୍ୟ କ'ଣ ?

(୧) କେବଳ ଚନ୍ଦ୍ରରେ ବସତି ସ୍ଥାପନ ( )

(୨) କେବଳ ଚନ୍ଦ୍ରରେ ଚାଷ କରିବା ( )

(୩) ମହାକାଶ ଓ ନିମ୍ନଚାପ ସମ୍ବନ୍ଧୀୟ ଅଧିକ ଗବେଷଣା ( )

(ପ) ଚନ୍ଦ୍ର ପୃଷ୍ଠରେ ବାୟୁ ପାଇବା ପାଇଁ କି ବ୍ୟବସ୍ଥା କରାଯାଇ ପାରିବ ?

(୧) ଘର ଗୁଡିକ ପ୍ଲାଷ୍ଟିକ୍ ଦ୍ୱାରା ଆବଦ୍ଧ କରି ବାୟୁ ରଖାଯିବ ( )

(୨) ପୃଥିବୀ ପୃଷ୍ଠରୁ ପାଇପ୍ ସାହାଯ୍ୟରେ ବାୟୁ ପଠାଯିବ ( )

(୩) ସୂର୍ଯ୍ୟ କିରଣରୁ ବାୟୁ ସୃଷ୍ଟି କରାଯିବ ( )

(ଘ) ଚ·ନ୍ଦ୍ର ପୃଷ୍ଠରେ କିପରି ଅନୁଜାନ ମିଳିବ ?

(୧) ପୃଥିବୀର ଅନୁଜାନ ନିଆଯିବ ( )

(୨) ଚ·ନ୍ଦ୍ରର ଶୀଳାର ଅନୁଜାନ ସ·ଗୃହିତ ହେବ ( )

(୩) ଚାଷ କରାଯାଇ ସେ ସ୍ଥାନର ଅନୁଜାନ ସ·ଗ୍ରହକରି ଜନ ବସତିକୁ ପଠାଯିବ ( )

(ଙ) ଚ·ନ୍ଦ୍ରପୃଷ୍ଠରେ କେଉଁ ଶକ୍ତି ସାହାଯ୍ୟରେ ଯାନ ବାହାନ ଚଳାଚଳ କରିବ ?

(୧) ବାଷ୍ପୀୟ ଶକ୍ତି ( )

(୨) କେବଳ ସୌର ଶକ୍ତି ( )

(୩) କେବଳ ପରମାଣୁ ଶକ୍ତି ( )

(୪) ଉଭୟ ସୌରଶକ୍ତି ଓ ପରମାଣୁ ଶକ୍ତି ( )

(ଚ) ଚ·ନ୍ଦ୍ର ପୃଷ୍ଠରେ କିପରି ଜଳର ବ୍ୟବସ୍ଥା କରାଯିବ ?

(୧) ପ୍ରଥମେ ପୃଥିବୀରୁ ଅଳ୍ପ ଜଳନେଇ ତାହାକୁ ବ୍ୟବହାର କରିବ ଏବ· ସେହି ଜଳକୁ ପୁଣି ବିଶୋଧନ କରି ବ୍ୟବହାର କରାଯିବ ( )

(୨) ସେଠାରେ ବର୍ଷା କରାଇ ଜଳ ସୃଷ୍ଟି କରାଯିବ ( )

(୩) କୂପ ଖୋଳି ଜଳ ବ୍ୟବହାର କରାଯିବ ( )

(ଛ) ଚ·ନ୍ଦ୍ର ଅଭିଯାନ ଦ୍ୱାରା କି ଉପକାର ପ୍ରଭୂତ ହେବ ?

(୧) ଲୋକ·କ ମନରୁ ଅ·ଧ ବିଶ୍ୱାସ ଦୂର ହେବ ( )

(୨) ଅଧିକ ମହାକାଶ ଗବେଷଣା କରିହେବ ( )

(୩) ଚନ୍ଦ୍ର ଏବ· ପୃଥିବୀ ମଧ୍ୟରେ ବ·ଧୁତା ସ୍ଥାପିତ ହେବ ( )

୨। (କ) ଆପୋଲୋ-୧୧ ଯାନରେ କେଉଁ ମହାକାଶଚାରୀମାନେ ଯାଇଥିଲେ ?

(୧) ଗାଗାରିନ୍ ( ) (୪) ଆଲଡ୍ରିନ୍ ( )

(୨) ଭାଲେଣ୍ଟିନା ( ) (୫) ନିଉଟନ ( )

(୩) କଲିନ୍ସ ( ) (୬) ଆର୍ମଷ୍ଟ୍ରଙ୍ଗ ( )

(ଖ) ଚ·ନ୍ଦ୍ରଯାତ୍ରୀମାନେ ଚ·ନ୍ଦ୍ର ପୃଷ୍ଠରେ କ'ଣ ସବୁ କଲେ ?

(୧) ପତାକା ଉଡାଇଲେ ( ) (୪) ମାଟି, ଗୋଡି ସ·ଗ୍ରହ କଲେ ( )

(୨) ଗଛ ଲଗାଇଲେ ( ) (୫) ଫଟୋ ଉଠାଇଲେ ( )

(୩) ରାସ୍ତା ତିଆରିକଲେ ( ) (୬) ଗାତଖୋଜି ପାଣି ଖୋଜିଲେ ( )

୩। ଠିକ୍ ଉତ୍ତର ପାଖରେ (✓) ଏବଂ ଭୁଲ ଉତ୍ତର ପାଖରେ (×) ଦିଅ ?

(୧) ଉପରକୁ ଉପରକୁ ଗଲେ ବାୟୁର ଘନତ୍ୱ କମି କମି ଯାଏ ( )

(୨) ଚନ୍ଦ୍ର ପୃଷ୍ଠରେ ଦିନ ୧୪ ଦିନ ଓ ରାତି ୧୪ ଦିନ ( )

(୩) ଏଣୁରୁ ଆମକୁ ଚନ୍ଦ୍ର ଯେପରି ଦେଖାଯାଏ, ଚନ୍ଦ୍ର ପୃଷ୍ଠରୁ ପୃଥିବୀ ମଧ୍ୟ ସେହିପରି ଦେଖାଯାଏ ( )

(୪) ପୃଥିବୀ ଚନ୍ଦ୍ରର ଉପଗ୍ରହ ( )

୪। ଶୂନ୍ୟ ସ୍ଥାନ ପୂରଣ କର ?

(୧) ଯେଉଁ ପ୍ରାଣୀ ସର୍ବ ପ୍ରଥମେ ମହାକାଶକୁ ଯାଇଥିଲା ତାହାର ନାମ ----------

(୨) ମହାକାଶରେ ପ୍ରଥମ ମଣିଷଙ୍କ ନାମ ----------

(୩) ଯେଉଁ ଯାନ ସାହାଯ୍ୟରେ ମଣିଷ ଚନ୍ଦ୍ରରେ ଓହ୍ଲାଇଥିଲା ତାହାର ନାମ ----------

(୪) ଆକାରରେ ପୃଥିବୀ ଚନ୍ଦ୍ରର --------- ଗୁଣ (୧, ୬, ୧୦)

(୫) ଚନ୍ଦ୍ରର ବ୍ୟାସ ପ୍ରାୟ ---------- କିଃମିଃ (୩୦୦୦, ୩୩୦୦, ୩୩୦)

(୬) ଆପୋଲୋ ଯାନ ------- ଦିନ ଚନ୍ଦ୍ର ଅଭିମୁଖେ ଯାତ୍ରା ଆରମ୍ଭ କରିଥିଲା ।
(ଯୁଲାଇ ୧୬, ୧୯୬୯, ଅଗଷ୍ଟ ୧୫, ୧୯୪୬, ଯୁଲାଇ ୨୧, ୧୯୬୯)

(୭) ଆପୋଲୋ ୧୧ ଯାନର ଓଜନ ------- କ୍ୱିଣ୍ଟାଲ୍
(୪୨୫, ୨୫, ୪)

(୮) ପାର୍ଶ୍ୱ ରକେଟର ଓଜନ ------- କ୍ୱିଣ୍ଟାଲ (୫୦୦୦, ୧୬୦୦୦, ୫୬, ୫୬୦)

(୯) ଚନ୍ଦ୍ର ତା ସେରୁଦଣ୍ଡ ଚାରିପଟେ ବୁଲିବା ପାଇଁ ------- ଦିନ ସମୟ ନିଏ ।
(୨୯$\frac{୧}{୨}$, ୩୬୫, ୨୦ ଦିନ)

(୧୦) ଚନ୍ଦ୍ର ପୃଷ୍ଠରେ ଦିନର ଉତ୍ତାପ ----------
(୨୦୦ ଡିଗ୍ରୀ ଏଫ୍ , ୨୨୫ ଡିଗ୍ରୀ ଏଫ୍, ୧୦୦ ଡିଗ୍ରୀ ସିଃ)

(୧୧) ଚନ୍ଦ୍ର ପୃଷ୍ଠରେ ରାତିରେ ଉତ୍ତାପ ------- ଡିଗ୍ରୀ ପର୍ଯ୍ୟନ୍ତ ଖସି ଆସେ ।

୫। ଆପୋଲୋ ଯାନର ଚିତ୍ରଟିଏ ଅଙ୍କନ କର ।

....

ଆ ଦ ର୍ଶ ଉ ତ୍ତ ର

ମଣିଷର ଭବିଷ୍ୟତ ବାସସ୍ଥାନ ଚନ୍ଦ୍ର

୧। କ- ୩, ଖ- ୨, ଗ- ୪, ଘ- ୩, ଙ- ୧, ଚ- ୧,
ଛ- ୨, ଜ- ୩, ଝ- ୩, ଞ- ୧, ଟ- ୨, ଠ- ୧,
ଡ- ୪, ଢ- ୩, ଣ- ୧, ତ- ୩, ଥ- ୧, ଦ- ୧,
ଧ- ୬, ନ- ୩, ପ- ୫, ଫ- ୩, ବ- ୪ ଭ- ୧,
ମ- ୨ ।

୨। କ- ୩, ୪, ୬। ଖ- ୧, ୩, ୫, ୬ ।

୩। ୧- ✓ ୨- ✓ ୩- ✓ ୪- ✗

୪। ୧। ଲାଇକା ୨- ଗାଗାରିନ୍ ୩- ଆପୋଲୋ -୧୧ ,
୪- ଛଅ ୫- ତେତିଶ ଶହ କିଃମିଃ ୬- ଜୁଲାଇ ୧୬, ୧୯୬୯
୭- ଛପନହଜାର କ୍ୱିଣ୍ଟାଲ ୮- ୪୨୫ କ୍ୱିଣ୍ଟାଲ ୯- ୨୯½ ଦିନ
୧୦- ୨୨୫° ଫାରେନ୍‌ହିଟ୍ ୧୧- ୦ ରୁ ୨୦୦° ଏଫ୍ଃ

.....

LEARNING EXPERIENCES

PRE-BROADCAST ACTIVITIES

Method: Question-Answer

Teacher's Activities		Expected Students' Activities
Tr:	Hellow students! you are welcome to the 2nd programme in the series of school broadcast programmes in Science. Today we will listen to an interesting programme. Mr._____a lecturer in Physics has been invited to talk to you in the post-broadcast session. (Teacher will introduce the guest). Before we start listening to the programme from the radio, I would like to listen to some of your experiences which you might have gained by visiting places other than your own.	
Q.1	Well, students! who joined the excursion party of our school in last summer from your class? (If anybody stands, the teacher would ask him Q.2, otherwise, he should pass on to Q.3).	
Q.2	What are the places you have visited? (Skip over Q.3)	Bombay, Delhi, Madras, etc.
Q.3	If this time some excursions are arranged and you are asked to suggest the places of visit, which are the places you would like to suggest?	
Q.4	To which country those places belong?	India.
Q.5	Won't you like to go to the countries other than India?	Yes, Sir.
Q.6	Which country(s) would you like to visit?	Russia/America/ England.

Teacher's Activities	Expected Students' Activities
Q.7 Can you tell me what are the vehicles you may use to reach America?	Aeroplanes, Trains,etc.
Q.8 Well, you have to go by Aeroplane to a country other than ours. This is the time, you are thinking to go on excursion to a country outside India. In the past, people were not thinking about going to other countries at all because there was no vehicle. Now Science has made everything possible. Also time will come when children like you will think of going to a place out of this world.	
Q.9 Can you tell me to which nearer place outside the earth excursion can be planned?	Yes Sir, it can be planned to the moon.
Q.10 How can man go to the moon? You know, man has already reached the moon. But you may wish to know how the man went, what did he do and what are the future plans on the moon. Today's broadcast programme is on this only. In this programme we will listen everything about moon landing. While listening, I will show you the pictures for your better understanding. One thing - do not forget to write the key points coming through the broadcast as in case of other programmes. Let us now listen to the programme.	By the help of space craft.
(The teacher would tune the radio).	

ACTIVITIES DURING THE BROADCAST

Method: Radio-vision

Aids: The following slides will be projected in synchronisation with the teaching points coming through the broadcast programmes. Whenever necessary, the teacher may help the students by pointing the desired aspects in the maps and pictures.

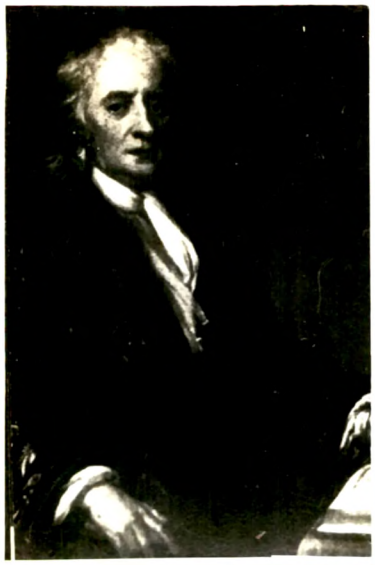
1. Sir Isac Newton
2. Rocket(Saturn-V)
3. Yuri Gagarin
4. Lyka the bitch who went to space before Gagarin.
5. Cape Kennedy, the launching station
6. Saturn-V (Magnified)
7. Armstrong
8. Aldrin
9. Collins
10. Apollo-11 going round the moon.
11. Lunar module separated from Apollo-11
12. Lunar module landed on the moon
13. Armstrong putting foot on the moon
14. Space dress
15. Moon surface
16. Moon rocks collected by the astronauts
17. Flag on the moon
18. Landing in the pacific ocean
19. A portion of earth seen from the moon
20. Armstrong digging on the moon

Teaching Points Through the Radio	Visuals
1. Earth has gravitional force. Newton...	Slide No.1
x x x	x x
2. .....Scientists have invented rockets....	Slide No.2
x x x	x x
3. ......first man in the space.....	Slide No.3
x x x	x x
4. .....first animal, a bitch named Lyka.	Slide No.4
x x x	x x
5. Apollo-11, on July 16,1969 from Cape Kennedy....	Slide No.5
x x x	x x
6. .....with the help of Saturn-V rocket....	Slide No.6
x x x	x x
7. .....In this space craft, Armstrong, Aldrin and Collins.	Slide No.7 followed by No.8 & 9
x x x	x x
8. After four days Apollo-11 reached nearer to and went round the moon.....	Slide No.10
x x x	x x
9. .....on being separated from Apollo-11, the Lunar module.....	Slide No.11
x x x	x x
10. .....Lunar module reached the moon	Slide No.12
x x x	x x
11. .....Armstrong landed on the moon.....	Slide No.13
x x x	x x

Teaching Points Through the Radio	Visuals
12. .....They were given special dresses.....	Slide No.14
x x x	x x
13. .....They saw the moon surface full of sands, pebbles, craters, etc.....	Slide No.15
x x x	x x
14. .....They collected rocks.....	Slide No.16
x x x	x x
15. .....They hoisted their flag.....	Slide No.17
x x x	x x
16. .....They returned back and landed in the pacific ocean.....	Slide No.18
x x x	x x
17. .....There is no water on the moon. The surface is full of craters, hills, vulcanoes, etc.	Slide No.19
x x x	x x
18. .....When Armstrong was digging the moon surface.....	Slide No.20

(Photographs of the slides developed by the investigator are given in the following pages).

1



2

3

4

5

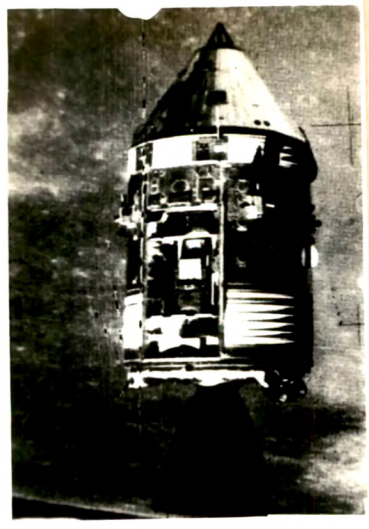
6

7

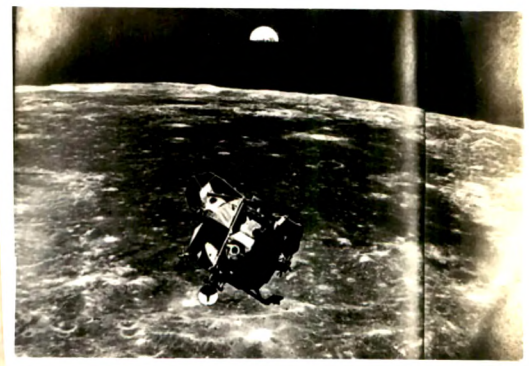
8

9

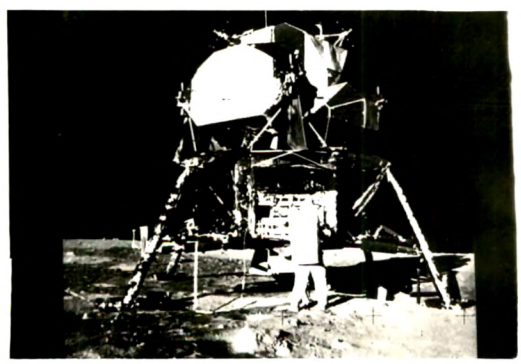
10



11



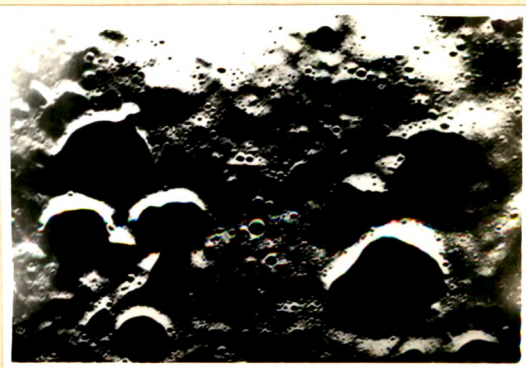
12



13

14

15



16

17

18

19

20

POST-BROADCAST ACTIVITIES

Method: Guest Talk (Discussion with an expert)
(Guest is an expert who has better knowledge on the topic. Preferably a lecturer in Physics).

Activity I: The teacher involves the guest to throw more light on the relevant knowledge of the topic specially by putting questions.

Q.1. What are the possible immediate benefits from moon landing?

Q.2. Is it really possible to make moon a new residence for man?

Q.3. Will you explain, in a few simple words, the path traced by Apollo-11 from earth to moon and from the moon to the earth?

Q.4. What are the interesting elements, the astronauts came across on the moon?

The guest will explain to the group. Teacher will be asking intermittently small questions so as to make the discovery appealing to children.

Activity-II: Teacher stimulates students to ask questions to clarify their doubts, if any. The expert will be given opportunity to answer children's questions. Teacher will also participate to make the interaction more lively.

Finally, the teacher will thank the guest and the students. Students will be asked to come prepared for the test to be conducted next day.

DEVELOPING STRATEGIES FOR EFFECTIVE UTILIZATION OF GENERAL SCIENCE BROADCAST PROGRAMMES FOR GRADE-VII

Title: NAKSHYATRA MANDALA (Constellations)

Overview

Through this programme, students will learn about the science of Astrology in general and about stars, planets, constallations like Great Bear, Sisumara; and the galaxy of Milkyway in particular.

Form of Broadcast: Discussion
(Two teachers discussing with a group of students).

CONTENT SEQUENCE:

1. The Science of Astrology which is based on the positions of stars and planets is more practiced by the Indians. Pathani Samanta, a notable astrologer, who was observing the position of stars and planets through bamboo tubes has written "Sidhanta Darpana".

2.(i) The heavenly stationary bodies twinkling in the sky are called stars. They twinkle because the light rays coming from them through different atmospheric layers of varying density trace uneven path which make them to appear twinkling.

(ii) These innumerable hot and gaseous bodies rotate round their own axis and have apparent movement. At a time about ten thousand stars are visible to the naked eye during the night, but they are not visible in the day time due to bright sun light.

(iii) In the stars, heat is produced always due to non stop division of atoms. This was propagated by Einstein.

(iv) Distances of stars and planets are measured in terms of light years.

One light year = 945×10^{10} K.M.

(v) The two nearest (from earth) stars Sun and Proxima Centaury are $8\frac{1}{4}$ light minute and 4 light years away from us. The sun has 9 planets viz. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Naptune and Pluto (in order of distance) which revolve round it. These planets are cool and solid bodies lighted by the light of the sun have both rotation and revolution. Now a days planets and stars are observed through telescopes.

3.(i) Taking a cluster of stars constellations are imagined. Among them, Saptarshimandala, Sisumara, Orion, Andromada, Batelegus, etc. afe of importance.

(ii) Saptarshimandala, which appears like a bear is known as Ursa major in Latin and Great Bear in English. The 7 stars of it are named after seven rishis, i.e., Kratu, Pulaha, Pulstya, Atri, Basistha, Angira, and Marichi.

(iii) The 'Sisumara' which is called Ursaminer and Little Bear, has seven stars of which, Dhruba (Pole Star) is important. It helps in knowing the directions in the night.

4. Milky way which looks like a white path (extending from north to south) has the shape of a cycle rim.

5. The 12 "Rashis" in the "Rashichakra"; Aries, Bull, Gemini, Cancer, Leo, etc. are the twelve rashis named after different constellations.
Also the months of a year are named after the rashis.

EXPECTED TERMINAL BEHAVIOURS

Students will be able to

1.1 tick out the meaning of Astrology.

1.2 point out that the science of Astrology is more practiced by the Indians than any other people.

1.3 agree with the statement "Calculation of star position is a science".

1.4 relate the name of Pathni Samanta with 'Sidhanta Darpana'.

1.5 recognise the process of astrological observations adopted by Pathani Samanta.

2.6 define "star".

2.7 identify the sun as a star.

2.8 state the reason for the twinkling of stars.

2.9 explain the apparent movement of the stars.

2.10 state the approximate number of stars visible to the naked eye.

2.11 point out the reason of non-visibility of stars during the day time.

2.12 explain why the stars do not get cooled.

2.13 relate the name of Einstein with the theory of division of atom.

2.14 agree with the statement "In the stars, division of atom takes place always".

2.15 recall the unit by which the distances of the stars and planets from the earth are expressed.

2.16 state the meaning of "light year".

2.17 convert "light years" into kilometers.

2.18 recognize the distance of the sun from the earth.

2.19 point out the name of the nearest star to us besides the sun.

2.20 pick out the distance of Proxima Centaury from us.
2.21 dis-agree with the statement, "The sun is a planet".
2.22 recognise the number of planets revolving round the sun.
2.23 write in order of distance the positions of different planets from the sun.
2.24 differentiate between stars and planets.
2.25 recognise the instrument by which stars and planets are observed now-a-days.
3.26 point out how constellations are imagined.
3.27 Write the names of atleast three constellations.
3.28 Write the names of atleast four stars included in the Saptarshi Mandala.
3.29 state the other names of Saptarshimandala and Sisumara separately and give the reason for it.
3.30 recall the number of stars in Sisumara.
3.31 recgonise the Pole Star and state its use for a common man.
3.32 agree with the statement, "Sisumara includes Pole Star".
3.33 draw a figure of Saptarshimandala and indicate the position of Pole Star.
4.34 define milky way and recognise its shape.
4.35 reason out why milky way is not equally lighted.
5.36 define "Rashi Chakra" and write at least the names of four 'Rashis' belonging to it.
5.37 point out how the months of a year are named.

CRITERION TEST

1.1.1 What is Astrology?

(i) Calculation of "rashis" in the horoscope. ( )
(ii) Calculation of the positions of planets. ( )
(iii) Calculation of star positions. ( )
(iv) Study of palmistry. ( )

1.2.2 Among whom is astrology more practised?

(i) The Japanese ( )
(ii) The Indians ( )
(iii) The Chinese ( )
(iv) The Americans ( )

1.3.3 Write yes '_/' or No 'x' against "Calculation of star positions is a science".

1.4.4 Pick out the appropriate item from column-B related to Pathani Samanta.

1.5.5 How was Pathani Samanta observing the movement of stars and planets?

(i) By the help of powerful telescopes. ( )
(ii) By the help of two bamboo tubes. ( )
(iii) In the naked eyes. ( )

2.6.6 Define "Stars".

2.7.7 Pick out the appropriate word from column 'B' related to sun.

2.8.8 Why do the stars twinkle?

2.9.9 What is the unreal movement of the stars.

2.10.10 In the night, if we look to the sky approximately how many stars will be visible to the naked eye?

2.11.11 Why are the stars not visible in the day time?
Because

(i) they change their positions. ( )

(ii) due to bright sun light, the light coming from them is not visible. ( )

(iii) they remain hidden during the day time. ( )

2.12.12 Why do not the stars get cooled?

2.13.13 Pick out the appropriate word for Einstein from column 'B'.

2.14.14 Write yes '_/' or No ' x ' against, "Division of atoms takes place in the stars always".

2.15.15 The distance of stars and planets are expressed in the unit of_____.

2.16.16 What is a "Light Year"?

(i) Unit of time. ( )

(ii) Unit of distance. ( )

(iii) Both unit of time and distance. ( )

(iv) None of the above. ( )

2.17.17 One light year = _____.
(2000 km, 365 km, 945 x 10^{10}km).

2.18.18 The distance of sun from the earth is_____.
($8\frac{1}{8}$ years, $8\frac{1}{4}$ light years, $8\frac{1}{4}$ light minutes).

2.19.19 Besides sun, which is the nearest star to us?

(i) Planet-x ( )

(ii) Pole Star ( )

(iii) Proxima Centaury ( )

(iv) Atri ( )

2.20.20 The distances of Proxima Centaury from us is_____.
(4 light years, 6 light years, 14 light years).

2.21.21 Write yes '_/' No 'x' against "Sun is a planet".

2.22.22 How many planets are revolving round the sun?

(i) one ( ) (iii) Nine ( )

(ii) seven ( ) (iv) Twelve ( )

2.23.23 Write in order of distance the names of planets moving round the sun.

2.24.24 Write at least three differences between stars and planets.

2.25.25 How is the movement of stars and planets observed now?

(i) With the help of powerful telescopes. ( )
(ii) With the help of mirrors. ( )
(iii) With the help of bamboo tubes. ( )

3.26.26 How are the constellations imagined?

(i) Taking some stars. ( )
(ii) Taking some planets. ( )
(iii) Taking only 7 stars at random. ( )
(iv) Taking both stars and planets. ( )

3.27.27 Write the names of at least three constellations.

3.28.28 Write the names of four stars belonging to "Saptarshimandala".

3.29.29 What is the Latin term for Saptarshimandala?

(i) Great Bear ( )
(ii) Little Bear ( )
(iii) Ursa Major ( )
(iv) Ursa Minor ( )

3.29.30 Why is the name "Great Bear"?

3.29.31 What is the Indian term for "Little Bear"?

3.30.32 There are_____stars in Sisumara.

3.31.33 What is Pole Star?

(i) A planet revolving round the sun. ( )
(ii) A satellite revolving round the earch. ( )
(iii) A particular star visible in the north sky ( )
(iv) None of the above. ( )

3.31.34 For what purpose is the Pole Star useful?

(i) For knowing the direction ( )
(ii) For locating planets in the sky. ( )
(iii) For going to the moon. ( )

3.32.35 Write Yes ' _/' or No ' x ' against the statement, "Pole Star belongs to Sisumara."

3.33.36 Trace a figure of "Saptarshi Mandala" and locate the position of Pole Star.

4.34.37 Which is called Milky way?

(i) The path in which there are shadows. ( )

(ii) The path in which the ghosts move. ( )

(iii) A white path like impression extended from north to south in the night sky.

4.35.38 Why Milky way is not equally lighted in all places?

4.35.39 What like the Milky way looks in shape?

(i) Like a cycle rim. ( )

(ii) Like the skew path of a river. ( )

(iii) Like the Saptarshimandala. ( )

5.36.40 What is "Rashi Chakra".

(i) The cluster of the sun, earth and moon. ( )

(ii) Cluster of group of stars, like bull, atries, etc. ( )

(iii) The wheel mark in the horoscope. ( )

5.36.41 Write atleast five "Rashis" belonging to "Rashi Chakra".

5.37.42 How are the months of a year named?

(i) Taking all the 'rashis'. ( )

(ii) Taking all the planets. ( )

(iii) Taking groups of stars. ( )

5.37.43 Pick out the appropriate word for "Mithuna" (Gemini) from column B.

(Test is to be arranged according to the type of items and with necessary instructions kept ready for use.)

ଆ କା ଶ ବା ଣୀ

ବିଦ୍ୟାଳୟ କାର୍ଯ୍ୟକ୍ରମ

ମାନନିର୍ଦ୍ଧାରଣ ପରୀକ୍ଷା

ବିଷୟ :- ନକ୍ଷତ୍ର ମଣ୍ଡଳ

ନାମ :- ରୋଲ ନଂ :- ତାରିଖ :-

ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ

୧। ନିମ୍ନରେ କେତେ ଗୁଡିଏ ପ୍ରଶ୍ନ ସହ ସେଗୁଡିକର ସମ୍ଭାବ୍ୟ ଉତ୍ତର ଦିଆଯାଇଛି. ଯେଉଁ ଉତ୍ତରଟିକୁ ତୁମେ ଠିକ୍ ବୋଲି ଭାବୁଛ ତାହାର ତାହାଣପଟେ ଥିବା ବନ୍ଧନୀ ମଧ୍ୟରେ (✓) ଚିହ୍ନ ଦିଅ ।

(କ) ଜ୍ୟୋତିର୍ବିଜ୍ଞାନ କେଉଁ ଦେଶର ଲୋକଙ୍କ ମଧ୍ୟରେ ବହୁ ପରିମାଣରେ ଆଲୋଚିତ ହୁଏ ?

(୧) ଜାପାନ ( )
(୨) ଭାରତ ( )
(୩) ଚୀନ ( )
(୪) ଆମେରିକା ( )

(ଖ) ଜ୍ୟୋତିର୍ବିଜ୍ଞାନ କାହାକୁ କହନ୍ତି ?

(୧) ରାଶି ଗଣନାକୁ ( )
(୨) କେବଳ ଗ୍ରହମାନଙ୍କର ଅବସ୍ଥାନକୁ ( )
(୩) କେବଳ ନକ୍ଷତ୍ର ମାନଙ୍କର ଅବସ୍ଥାନକୁ ( )
(୪) ହାତର ରେଖା ଗଣନାକୁ ( )

(ଗ) ପଚାଶି ସାମନ୍ତ କିଭଳି ଗ୍ରହ ଓ ନକ୍ଷତ୍ର ମାନଙ୍କ ଗତିବିଧି ଲକ୍ଷ କରୁଥିଲେ ?

(୧) ଶକ୍ତିଶାଳୀ ଟେଲିସ୍କୋପ ସାହାଯ୍ୟରେ ( )
(୨) ଦୂରଖଣ୍ଡୁ ବାଉଁଶ ନଳୀ ସାହାଯ୍ୟରେ ( )
(୩) ଖାଲି ଆଖିରେ ( )

(ଘ) ଆମ ସୌରଜଗତରେ ସୂର୍ଯ୍ୟ ଚତୁର୍ଦ୍ଦିଗେ କେତୋଟି ଗ୍ରହ ପରିକ୍ରମଣ କରୁଛନ୍ତି ?

(୧) ଗୋଟିଏ ( )
(୨) ପାଞ୍ଚଗୋଟି ( )
(୩) ନଅ ଗୋଟି ( )
(୪) ବାର ଗୋଟି ( )

(ଙ) ଆମେ ଯଦି ଗଣ୍ଡିରେ ଖାଲି ଆଖିରେ ଆକାଶକୁ ଚାହିଁବା ତେବେ ଆମକୁ ପ୍ରାୟ କେତୋଟି ନକ୍ଷତ୍ର ଦେଖାଯିବେ ?

(୧) ୧୦,୦୦୦ ଟି ( )
(୨) ୨୦,୦୦୦ ଟି ( )
(୩) ୩୦,୦୦୦ ଟି ( )

(୫) ବର୍ତ୍ତମାନ ଗ୍ରହ ଓ ନକ୍ଷତ୍ର ମାନଙ୍କ ଗତିବିଧି କିପରି ଲକ୍ଷ କରାଯାଉଛି ?

(୧) ଦର୍ପଣ ସାହାଯ୍ୟରେ ( )
(୨) ଶକ୍ତିଶାଳୀ ଦୂରବୀକ୍ଷଣ ଯନ୍ତ୍ର ସାହାଯ୍ୟରେ ( )
(୩) ବାଉଁଶ ନଳୀ ସାହାଯ୍ୟରେ ( )

(୬) ଆଲୋକ ବର୍ଷ କାହାକୁ କହନ୍ତି ?

(୧) ସମୟର ଏକକକୁ ( )
(୨) ସମୟ ଓ ଦୂରତାର ଏକକକୁ ( )
(୩) ଏକ ବର୍ଷରେ ଆଲୋକ ଯେତେବାଟ ଯାଏ ( )

(ଜ) ସୂର୍ଯ୍ୟ ବ୍ୟତୀତ ଆମର ନିକଟତମ ତାରକାର ନାମ କ'ଣ ?

(୧) ପ୍ରାନେଟ - X ( )
(୨) ଧ୍ରୁବ ( )
(୩) ପ୍ରୋକ୍ସିମା - ସେଣ୍ଟାଉରି ( )
(୪) ଅଷ୍ଟ୍ରୀ ( )

(୪) ତାରକା ଗୁଡିକ କାହିଁକି ଦିନରେ ଦେଖା ଯାଆନ୍ତି ନାହିଁ ?

(୧) ସେମାନେ ସେମାନଙ୍କର ସ୍ଥାନ ପରିବର୍ତ୍ତନ କରି ଦିଅନ୍ତି ( )
(୨) ସେମାନେ ଦିନରେ ଛୁଟି ଯାଆନ୍ତି ( )
(୩) ପ୍ରଖର ସୂର୍ଯ୍ୟ କିରଣ ଯୋଗୁ ସେମାନଙ୍କଠାରୁ ଆସୁଥିବା ଆଲୋକ ଜାଣି ହୁଏ ନାହିଁ ( )

(ଞ) ନକ୍ଷତ୍ର ମଣ୍ଡଳ କିପରି ନିର୍ଣ୍ଣୟ କରାଯାଇଛି ?

(୧) କେତୋଟି ନକ୍ଷତ୍ରକୁ ଏକତ୍ର ନେଇ ( )
(୨) କେତୋଟି ଗ୍ରହକୁ ଏକତ୍ର ନେଇ ( )
(୩) ମାତ୍ର ସାତୋଟି ନକ୍ଷତ୍ରକୁ ନେଇ ( )
(୪) ଉଭୟ ଗ୍ରହ ଓ ନକ୍ଷତ୍ରକୁ ନେଇ ( )

(ଟ) ସପ୍ତର୍ଷି ମଣ୍ଡଳକୁ ଇଂରାଜିରେ କ'ଣ କହାଯାଏ ?

(୧) ଗ୍ରେଟ ବିଅର (Great Bear) ( )
(୨) ଲିଟିଲ୍ ବିଅର (Little Bear) ( )
(୩) ଉର୍ସା ମେଜର (Ursa Major) ( )
(୪) ଉର୍ସା ମାଇନର (Ursa Minor) ( )

(ଠ) ସପ୍ତର୍ଷି ମଣ୍ଡଳକୁ କାହିଁକି ଗ୍ରେଟ ବିଅର ବୋଲି କହାଯାଏ ?

(୧) ଏହାର ଆକାର ଏକ ଭାଲୁ ପରି ହୋଇଥିବାରୁ ( )
(୨) ସେଠାରେ ଗୋଟିଏ ଭାଲୁ ବାସ କରୁଥିବାରୁ ( )
(୩) ସେପରି କୌଣସି କାରଣ ନ ଥାଇ ନାମକରଣ ହୋଇଛି ( )

(ଚ) ଲିଟିଲ୍ ବିଅର (Little Bear)କୁ ଭାରତୀୟମାନେ କ'ଣ କହନ୍ତି ?

(୧) ଧ୍ରୁବତାରା ( )
(୨) ଶିଶୁମାର ( )
(୩) ଗ୍ରହ ମଣ୍ଡଳ ( )
(୪) ଆଲୋକ ବର୍ଷ ( )

(ଛ) ଧ୍ରୁବତାରା କାହାକୁ କହନ୍ତି ?

(୧) ସର୍ଯ୍ୟ ଚାରିପଟେ ଘୂରୁଥିବା ଯେ କୌଣସି ତାରକାକୁ ( )
(୨) ସର୍ଯ୍ୟ ଚାରିପଟେ ଘୂରୁଥିବା ଏକ କୃତ୍ରିମ ଉପଗ୍ରହକୁ ( )
(୩) ଉତ୍ତର ଆକାଶରେ ଦେଖା ଯାଉଥିବା ଏକ ନିର୍ଦ୍ଦିଷ୍ଟ ତାରକା ଯାହାର ଆଦୌ ସ୍ଥାନ ପରିବର୍ତ୍ତନ ହୁଏ ନାହିଁ ( )

(ଜ) ଧ୍ରୁବତାରା ଆମକୁ କିପରି ସାହାଯ୍ୟ କରେ ?

(୧) ଦିଗ ନିର୍ଣ୍ଣୟ କରିବା ପାଇଁ ( )
(୨) ଆକାଶରେ ଗ୍ରହମାନଙ୍କର ଗତି ନିରୂପଣ କରିବାରେ ( )
(୩) ଚଂଦ୍ରକୁ ଯିବା ପାଇଁ ( )

(ଝ) ଛାୟାପଥ କାହାକୁ କହନ୍ତି ?

(୧) ଯେଉଁ ପଥରେ ଛାଇ ପଡିଥାଏ ( )
(୨) ଯେଉଁ ପଥରେ ଭୂତ ପ୍ରେତମାନେ ଜା ଆସ କରନ୍ତି ( )
(୩) ଅଂଧକାର ରାତ୍ରିରେ ଆକାଶଗଙ୍ଗର ଉତ୍ତରରୁ ଦକ୍ଷିଣକୁ ପଡିଥିବା ଧଳା ହୋଇ ଆଲୋକିତ ପଥକୁ ( )

(ଞ) ଛାୟାପଥ ସବୁସ୍ଥାନରେ ସମାନ ଭାବରେ ଆଲୋକିତ ହୁଏ ନାହିଁ କାହିଁକି ?

(୧) ସବୁ ସ୍ଥାନରେ ସମ ପରିମାଣରେ ନକ୍ଷତ୍ର ନ ଥାନ୍ତି ( )
(୨) ସବୁ ସ୍ଥାନରେ ସମ ପରିମାଣରେ ଆଲୋକ ନ ଥାଏ ( )
(୩) ସେଠାରେ ଠିକ୍ ଭାବରେ ସୂର୍ଯ୍ୟାଲୋକ ପଡେ ନାହିଁ ( )

(ଟ) ଛାୟା ପଥର ଆକାର କିପରି ?

(୧) ସାଇକେଲ ରିମ୍ ପରି ( )
(୨) ଅଂକାବଂକା ନଦୀ ପରି ( )
(୩) ସପ୍ତର୍ଷି ମଣ୍ଡଳ ପରି ( )

(ଠ) ଆମର ମାସ ଗଡିକର ନାମ କରଣ କିପରି ହୋଇଛି ?

(୧) ସମସ୍ତ ଲୋକ ଗଡିକୁ ନେଇ ( )
(୨) ଗ୍ରହ ଗଡିକୁ ନେଇ ( )
(୩) କେତେକ ନକ୍ଷତ୍ର ଅନୁଯାୟୀ ( )

(ନ) ରାଶିଚକ୍ର କାହାକୁ କହନ୍ତି ?

(୧) ସୂର୍ଯ୍ୟ, ଚନ୍ଦ୍ର ଓ ପୃଥିବୀର ସମାହାରକୁ ( )

(୨) ମେଶ, ବୃଷ ଆଦି ରାଶିମାନଙ୍କର ସମାହାରକୁ ( )

(୩) ପ୍ରତ୍ୟେକ ରାଶିର ମଧ୍ୟରେ ଥିବା ଚକ୍ର ଚିହ୍ନକୁ ( )

୨। ନିମ୍ନ ପ୍ରଶ୍ନ ଗୁଡିକର ଉତ୍ତର ସଂକ୍ଷେପରେ ଲେଖ ?

(କ) ନକ୍ଷତ୍ର କାହାକୁ କହନ୍ତି ?

(ଖ) ନକ୍ଷତ୍ର ଗୁଡିକ କାହିଁକି ମିଟିମିଟି ଆଲୋକ ପ୍ରଦାନ କରନ୍ତି ?

(ଗ) ନକ୍ଷତ୍ର ମାନଙ୍କର ଅବାସ୍ତବ ଗତି କ'ଣ ?

(ଘ) ସୂର୍ଯ୍ୟଠାରୁ ଦୂରତା କ୍ରମରେ ଗ୍ରହ ଗୁଡିକୁ ସଜାଇ ଲେଖ ?

(ଙ) ଗ୍ରହ ଓ ନକ୍ଷତ୍ର ମଧ୍ୟରେ ଥିବା ୩ଟି ପ୍ରଭେଦ ଲେଖ ?

ନକ୍ଷତ୍ର		ଗ୍ରହ

(ଚ) ନକ୍ଷତ୍ର ଗୁଡିକ କାହିଁକି ଥଣ୍ଡା ହୁଅନ୍ତି ନାହିଁ ?

(ଛ) ତିନୋଟି ନକ୍ଷତ୍ର ମଣ୍ଡଳର ନାମ ଲେଖ ?

(ଜ) ସପ୍ତର୍ଷି ମଣ୍ଡଳର ୪ ଟି ତାରକାଙ୍କ ନାମ ଲେଖ ?

(ଝ) ୫ଟି ରାଶିର ନାମ ଲେଖ ?

୩। ଶୂନ୍ୟସ୍ଥାନ ପୂରଣ କର ?

(କ) ଶିଶୁମାର ନକ୍ଷତ୍ର ମଣ୍ଡଳରେ ---- ଟି ନକ୍ଷତ୍ର ଅଛନ୍ତି ।

(ଖ) ଗ୍ରହ ଓ ନକ୍ଷତ୍ର ମାନଙ୍କ ଦୂରତାକୁ ---- ଏକକରେ ପ୍ରକାଶ କରାଯାଏ ।

(କିଃ ଗ୍ରାଃ , ଆଲୋକବର୍ଷ , କିଃମିଃ)

(ଗ) ଗୋଟିଏ ଆଲୋକ ବର୍ଷ =--- କିଃମିଃ

(୨୦୦୦ କିଃମିଃ , ୩୨୪ କିଃମିଃ , ୯୪୫ କିମି:୧୦୧୦ କିଃମିଃ)

(ଘ) ସୂର୍ଯ୍ୟଠାରୁ ପୃଥିବୀର ଦୂରତା ------
($8\frac{1}{2}$ ବର୍ଷ , $8\frac{1}{2}$ ଆଲୋକ ବର୍ଷ, $8\frac{1}{2}$ ଆଲୋକ ମିନିଟ)

(ଙ) ଆମଠାରୁ ପ୍ରୋକ୍ସିମା ସେଣ୍ଟାଉରିର ଦୂରତ୍ୱ ---- ଆଲୋକ ବର୍ଷ ।
(୪ , ୬ , ୧୪)

୪। ଭୁଲ ଉକ୍ତି ଗୁଡିକ ପାଖରେ (×) ଏବଂ ଠିକ୍ ଉକ୍ତି ଗୁଡିକ ପାଖରେ (✓) ଚିହ୍ନ ଦିଅ ?

(କ) ରାଶି ଗଣନା ଏକ ପ୍ରକାର ବିଜ୍ଞାନ ( )

(ଖ) ସୂର୍ଯ୍ୟ ଗୋଟିଏ ଗ୍ରହ ( )

(ଗ) ଧ୍ରୁବତାରା ଶିଶୁମାର ମଣ୍ଡଳର ଅନ୍ତର୍ଗତ ( )

(ଘ) ନକ୍ଷତ୍ରମାନଙ୍କରେ ଅନବରତ ପରମାଣୁ ବିଭାଜନକ୍ରିୟା ଚଲିଥାଏ ( )

୫। 'କ' ସ୍ତମ୍ଭରେ ଥିବା ପ୍ରତ୍ୟେକ ଅଧାବାନ ପାଇଁ 'ଖ' ସ୍ତମ୍ଭରେ ଯେଉଁ ଉପାବାନଟି ପୂରଣ ତାହାର ତାହାଣରେ ଥିବା ବନ୍ଧନୀ ମଧ୍ୟରେ ଉକ୍ତ କ୍ରମ ଟି ଲେଖ ?

"କ"		"ଖ"
ପଠାଣି ସାମନ୍ତ	( )	(୧) ମିଥୁନ
ସୂର୍ଯ୍ୟ	( )	(୨) ଗୋଟିଏ ତାରକା
ଆଇନ୍‌ଷ୍ଟାଇନ	( )	(୩) ସିଦ୍ଧାନ୍ତ ଦର୍ପଣ
ରାଶିଚକ୍ର	( )	(୪) ରାତ୍ରିରେ ଦିଗ ନିର୍ଣ୍ଣୟକ
		(୫) ପରମାଣୁ ବିଭାଜନ କ୍ରିୟା
		(୬) ଗ୍ରହ

୬। ଗୋଟିଏ ସପ୍ତର୍ଷି ମଣ୍ଡଳର ଚିତ୍ର ଅଂକନ କରି ଧ୍ରୁବତାରାର ସ୍ଥାନ ଚିହ୍ନିତ କର ।

.....

ଆ ଦ ର୍ଶ ଉ ତ୍ତ ର

ନକ୍ଷତ୍ର ମଣ୍ଡଳ

୧। କ-୨ , ଖ-୧ , ଗ-୨, ଘ- ୩, ଙ- ୧, ଚ- ୨,
ଛ-୩ , ଜ- ୩, ଝ- ୩, ଞ- ୧, ଟ- ୧, ଠ- ୧,
ଡ-୨ , ଢ- ୩ , ଣ- ୧, ତ- ୩, ଥ- ୧, ଦ- ୧ ,
ଧ- ୧, ନ- ୨ ।

୨। (କ) ଆକାଶରେ ମିଂଜି ମିଂଜି ହୋଇ ଦେଖାଯାଉଥିବା ଆଲୋକ ପିଣ୍ଡ ଗତିକୁ ନକ୍ଷତ୍ର କୁହାଯାଏ ।

(ଖ) ସେମାନଂକଠାରୁ ଆସୁଥିବା ଆଲୋକ ବାୟୁମଣ୍ଡଳର ବିଭିନ୍ନ ସ୍ତର ଦେଇ ଆସୁଥିବାରୁ ସବୁ ସମୟରେ ସମଧରିମାଣରେ ଆସି ପାଉେନା ।

(ଗ) ପୃଥିବୀ , ପଶ୍ଚିମର ପୂର୍ବକୁ ଆବର୍ତ୍ତନ କରୁଥିବାରୁ ଆକାଶରେ ସ୍ଥିର ହୋଇଥିବା ନକ୍ଷତ୍ରମାନେ ପୂର୍ବରୁ ପଶ୍ଚିମକୁ ଗତି କଲାଭଳି ଜଣାଯାଏ । ଏହାକୁ ନକ୍ଷତ୍ର ମାନଂକର ଅବାସ୍ତବ ଗତି କହନ୍ତି ।

(ଘ) ବୁଧ, ଶୁକ୍ର, ପୃଥିବୀ , ମଂଗଳ , ବୃହସ୍ପତି , ଶନି, ୟୁରେନସ୍, ନେପ୍ଚୁନ୍ ଓ ପ୍ଲୁଟୋ ।

(ଙ)

ନକ୍ଷତ୍ର	ଗ୍ରହ
(୧) ନିଜର ଆଲୋକ ଅଛି	(୧) ସୂର୍ଯ୍ୟର ଆଲୋକରେ ଆଲୋକିତ
(୨) ସ୍ଥିର	(୨) ଗତିଶୀଳ
(୩) ଉତ୍ତପ୍ତ ଏବଂ ଗ୍ୟାସୀୟ	(୩) ଶୀତଳ ଏବଂ କଠିନ
(୪) ଆବର୍ତ୍ତନ ଗତି ଅଛି	(୪) ଉଭୟ ଆବର୍ତ୍ତନ ଓ ପରିକ୍ରମଣ ଗତି ଅଛି
(୫) ମିଂଜି୨ଆଲୋକ ଦିଅନ୍ତି	(୫) ସ୍ଥିର ଆଲୋକ ଦିଅନ୍ତି
(୬) ଆମଠାରୁ ବହୁ ଦୂରରେ ଅବସ୍ଥିତ	(୬) ଆମମାନଂକ ନିକଟରେ ଅବସ୍ଥିତ
(୭) ସଂଖ୍ୟା ଅସୀମ	(୭) ସଂଖ୍ୟା ମାତ୍ର ୯ ଟି

(ଚ) ଏମାନଂକ ମଧ୍ୟରେ ଅନବରତ ପରମାଣୁ ବିଭାଜନ କ୍ରିୟା ଚାଲିଥାଏ ।

(ଛ) କାଲପୁରଷ , ସପ୍ତର୍ଷି ମଣ୍ଡଳ , ଶିଶୁମାର ।

(ଜ) କ୍ରତୁ, ପୁଲହ, ପୁଲସ୍ତ୍ୟ, ଅତ୍ରି, ଅଂଗିରା, ବଶିଷ୍ଠ , ମରିଚୀ ।

(ଝ) ମେଶ, ବୃଷ, ମିଥୁନ, କର୍କଟ, ସିଂହ, କନ୍ୟା, ତଳା, ବିଛା-ଧନୁ, ମକର, କୁମ୍ଭ, ମୀନ ।

୩। କ- ୭ ଟି , ଖ- ଆଲୋକ ବର୍ଷ (ଗ) ୯୪୫ × ୧୦^{୧୦} କି:ମି: (ଘ) $\frac{୧}{୪}$ ଆଲୋକ ବର୍ଷ
ଙ- ୪ ।

୪। କ- ✓ ଖ- × ଗ- × ଘ- ✓ ।

୫। ଧଠାଣି ସାମନ୍ତ (୩) , ସୂର୍ଯ୍ୟ (୨) , ଆଇନଷ୍ଟାଇନ୍ (୫) , ରାଶିଚକ୍ର (୧) ।

୬। ଧ୍ରୁବ

LEARNING EXPERIENCES

PRE-BROADCAST ACTIVITIES

Method: Question-Answer.

Teacher's Activities		Expected Students' Activities
Teacher:	Students! you are welcome to the 3rd programme of our science series of school broadcast.	
Q.	What is that programme we listened last?	"Manishana Bhabisyata Basasthana- Chandra"
Q.	Besides moon, what else are there outside the earth?	The sun, planets like Mars, Saturn, Uranus, etc.
Q.	Are they all visible during the day time?	No, only the sun is visible.
Q.	In the night, if you look to the sky, what can you see?	The moon, stars and planets.
Q.	Where do they go in the day time?	They don't go any where. They are not visible because of the powerful sun light.

Teacher's Activities		Expected Activities of the Students
Q.	Do they stay at a place always?	No, only stars stay.
Q.	What about the planets?	They go round the sun.
Q.	Please tell the names of some of the stars.	Students will give the names of some stars.
Q.	How do we identify them?	
	In to-days programme we will know about the stars. Taking together some stars, "Constellations" are imagined. A group of students with their teachers are discussing. So please listen to the programme and observe the pictures projected. Like previous programmes, write the points coming through the radio.	
	(Teacher tunes the radio.)	

ACTIVITIES DURING THE BROADCAST

Method: Radio-visiom

Aids: Slides of

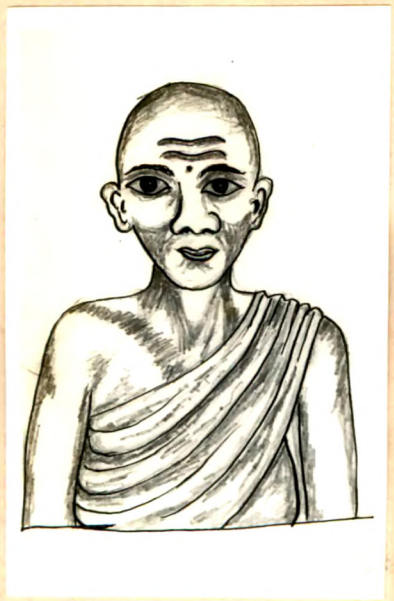
(1) Pathani Samanta, a famous astrologer.
(2) Close view of a star.
(3) Sun and its planets.
(4) Chart showing difference betweeen stars and planets.
(5) Telescope.
(6) Chart on calculation of Light Year.
(7) Einstein the Scientist.
(8) A Constellation.
(9) Saptarshimandal with Pole Star.
(10) Great Bear.
(11) Milky Way.
(12) Rashi Chakra.

Teaching Points Through the Radio	Visuals
1. .....you must have heard the name of Pathani Samanta.	Slide No.1
x x x	x x
2. .....Stars are like burning fire bulbs.....	Slide No.2
x x x	x x

Teaching Points Through the Radio	Visuals
3. ……Sun is a star. It has 9 planets….	Slide No.3
x x x	x x
4. ……How are the planets different from stars?	Slide No.4
x x x	x x
5. ……With the help of telescope……	Slide No.5
x x x	x x
6. ……Light year is calculated by……	Slide No.6
x x x	x x
7. ……This was told by Einstein……	Slide No.7
x x x	x x
8. ……Constellations are imagined.	Slide No.8
x x x	x x
9. ……and Saptarshimandala?….	Slide No.9
x x x	x x
10. ……it is also called "Great Bear"…	Slide No.10
x x x	x x
11. ……in English it is Milky way……	Slide No.11
x x x	x x
12. ……cluster of twelve 'Rashis' is called "Rashi Chakra"…	Slide No.12
x x x	x x

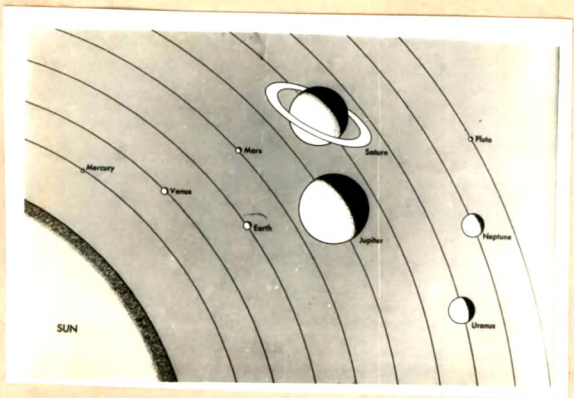
(Photographs of the slides developed by the investigator are given in the following pages.)

1



2

3



4

ନକ୍ଷତ୍ର	ଗ୍ରହ
୧) ନିଜର ଆଲୋକ ଅଛି ।	୧) ନିଜର, ସୂର୍ଯ୍ୟ ଆଲୋକରୁ ଆଲୋକିତ
୨) ଦୂରତ୍ୱ ବହୁତ ।	୨) ଅତି ଚ ନିକଟ
୩) ଆକାର ଅଛି	୩) ଆକାର ଚ ପରିମାଣ ଥାଏ ଅଛି
୪) ମିଟିମିଟି ଆଲୋକ ଦିଅନ୍ତି	୪) ସ୍ଥିର ଆଲୋକ ଦିଅନ୍ତି
୫) ସୂର୍ଯ୍ୟଙ୍କଠାରୁ ବହୁଦିନ ଦୂରରେ ଅଛନ୍ତି ।	୫) ସୂର୍ଯ୍ୟଙ୍କଠାରୁ ଅଳ୍ପଦିନ ଦୂରରେ ଅବସ୍ଥିତ ।
୬) ସଂଖ୍ୟା ଅଧିକ	୬) ସଂଖ୍ୟାରେ ନଅ

5

6

ଆଲୋକର ବେଗ = ସେକେଣ୍ଡରେ ପ୍ରାୟ ୩ ଲକ୍ଷ କି.ମି.

ଏକବର୍ଷ = ୩୬୫ ଦିନ ।

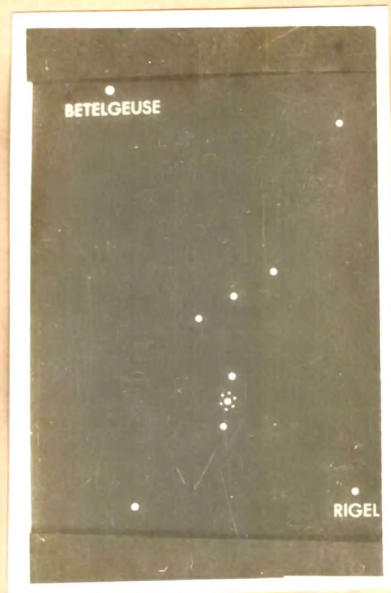
ଏକଦିନ = ୨୪ ଘଣ୍ଟା

ଏକଘଣ୍ଟା = ୩୬୦୦ ସେକେଣ୍ଡ ।

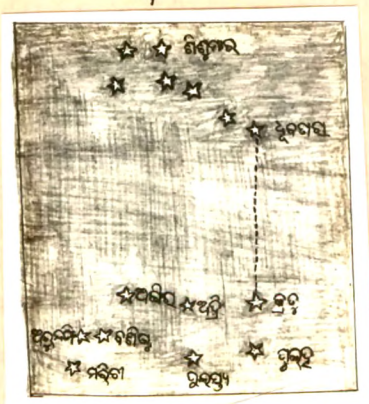
ଆଲୋକବର୍ଷ = ୩୬୫ × ୨୪ × ୩୬୦୦ × ୩୦୦୦୦୦ କିଲୋମିଟର ।

7

8



9



10

11

12

POST-BROADCAST ACTIVITIES

Method: Discussion

	Teacher's Activities	Expected Students' Activities
Tr:	Well, students! we have listened to a programme on constellations. I hope, you have enjoyed it.	
Q.1	Can you tell me now, how your horoscope is prepared?	By calculating the star positions at the time of birth.
Q.2	Do you believe this way of fore telling? But to me Astrology is not the exact science because the instruments available for measuring star positions are crude. What do you feel about this? (Teacher would initiate discussion).	Students will give their own views.
Q.3	How sky appears at night? (With this question, he probes for following points : 1.Difference between stars and planets 2.Naming of stars and constellations 3.Telescope 4.Light year 5.Pole star 6.Milky way.)	Students will answer the questions asked by the teacher.
Tr:	Well, students! we have listened and discussed on 'Constellations'. This night you observe the stars and planets in the sky. Then read about them from your book and come prepared for the test.	
	Thank you all.	

DEVELOPING STRATEGIES FOR EFFECTIVE UTILIZATION OF GENERAL SCIENCE BROADCAST PROGRAMMES FOR GRADE-VII

Title: "MANUSYA KANKALA O TAHARA SANCHALANA"
(Human Skeleton & Its Movement)

Overview

The human body has different systems like digestive system, circulatory system, skeleton system, etc. The skeleton system carries the weight of the body. The skeleton has got three main parts i.e. head, body and the limbs.

In this lesson the students will learn about the structure of the skeleton and the process of movement of different parts of it.

Form of Broadcast: Student teacher discussion with dramatised inserts.

CONTENT SEQUENCE:

1 Human body functions through different systems such as Digestive System, Circulatory System, Respiratory System and Skeleton System.

2 (i) The Skeleton System which is the frame of the body, carries weight of the body.

(ii) The skeleton is constituted with two types of bones: hard bones and soft bones.

(iii) Hard bones are seen in the hands, legs, thighs etc. and soft bones are seen in nose, ear, tongue, respiratory canal, etc.

(iv) The function of the hard bones are, carrying weight of the body, constituting joints, shaping body structure, and forming frame of the body, sockets, cavities, ribcases etc.

(v) The function of the soft bones are, forming nerve fibres, minimising friction between hard bones and helping movement of the body.

(vi) Skeleton has 216 pieces of bones. As there are some twin bones, the total number of bones considered are 206.

3 The skeleton has three parts i.e. the head, the body and the limbs.

(i) Head, with 29 pieces of bones in its parts like skull, face, ear and bottom of the tongue. The skull is round and is box like being tightly fitted with teeth like bones. The face and ear has 14 and 6 pieces of bones respectively. There is only one piece of bone under the tongue. The upper and lower section of the teeth are called upper and lower jaws. There are two pieces of bones in the upper jaw and only one piece in the lower jaw.

(ii) The part from the neck to the arms is body of the skeleton, which contains the vertebral column and ribs. The vertebral column which is tube like with 26 pieces of bones connected like a garland, has the function of carrying the weight of the head at the top and forming the chest cavity along with the ribs. The movement of the body is done by the rotary motion of the bones in the vertebral column. The vertebral column contains spinal cord in its tube. There are 24 pieces of rib bones. The chest cavity contains the heart, liver and lungs inside it. The diaphram is in between the stomach and the chest cavity. Its movement causes the expansion and contraction of the chest cavity.

(iii) The legs and the hands are called lower limbs and upper limbs respectively. There are 66 and 64 pieces of bones in the lower and upper limbs respectively. Movement of limbs is due to the movement of bones and joints. Because of the mechanism of lubrication at joints, the bones are not damaged in rubbing.

4 Human head is resting above the vertebral column, whereas it is projected anteriorly from vertebral column in cattle, dog etc.

EXPECTED TERMINAL BEHAVIOURS

Students will be able to

1.1 write at least names of three of the human systems.
2.2 tick mark the system which carries the weight of the human body.
2.3 agree with the statement, "Skeleton is the frame of the human body".
2.4 recognise the classification of bones.
2.5 recognise the parts of the body containing hard bones and soft bones and their functions separately.
2.6 point out the cause, why it is told that the skeleton has 206 pieces of bones although it has got more than that.
3.7 recall the three main parts of the skeleton.
3.8 recall the parts of the human head and recognise the number of bones possessed by them such as face, ear, upper jaw, lower jaw, etc.
3.9 recognise the structure of the skull.
3.10 specify the portion called body and recognise the number of bones in it.
3.11 explain the shape of the vertebral column and recognise its function and the number of bones contained in it.
3.12 recognise that the vertebral column contains the spinal cord.
3.13 explain the process of body movement.
3.14 recognise the number of rib bones.
3.15 point out the organs of the body inside the chest cavity.
3.16 identify the position of diaphragm and stomach.
3.17 point out the reason for expansion and contraction of chest cavity.
3.18 tick mark the parts of the body called lower limbs and upper limbs.

3.19 recognise the number of bones the lower limbs and upper limbs have.

3.20 point out the reason for movement of limbs.

3.21 explain why the bones at joints are not worn out through the process of friction.

3.22 explain the difference between the position of human head and that of other animals like cattle, dog, etc.

3.23 sketch the figure of human skeleton and indicate different parts.

CRITERION TEST

1.1.1 Write atleast three sub-systems of the human system.

2.2.2 Which of the following sub-systems of the human system carries the weight of the human body?

(i) Skeleton system ( )
(ii) Digestive system ( )
(iii) Respiratory system ( )
(iv) Muscles system ( )

2.3.3 Write yes '_/' or No 'x' against "Skeleton system is the frame of the human body".

2.4.4 The two classifications of the bones are

(i) joints and veins ( )
(ii) veins and arteries ( )
(iii) head bones and body bones ( )
(iv) soft bones and hard bones ( )

2.5.5 Which of the following parts contain hard bones?

(i) Ear ( ) (iv) Leg ( ) (vii) Nose ( )
(ii) Head ( ) (v) Hand ( ) (viii) Fingers ( )
(iii) Heart ( ) (vi) Stomach ( ) (ix) Vertebral column( )

2.5.6 Which of the following parts contain soft bones?

(i) Ear ( ) (iv) Leg ( ) (vii) Nose ( )
(ii) Head ( ) (v) Hand ( ) (viii) Fingers ( )
(iii) Heart ( ) (vi) Stomach ( ) (ix) Spinal Cord( )

2.5.7 Which of the following are the functions of the hard bones?

(i) Articulating in different ways to form cavities and sockets. ( )
(ii) Helping the brain to develop. ( )
(iii) Framing the shape of the body. ( )
(iv) Helping in blood circulation. ( )

2.5.8 Which of the following are the functions of soft bones?

(i) To form nerve fibres. ( )

(ii) To protect the hard bones from getting worn out through friction. ( )

(iii) To develop hairs in the body. ( )

(iv) To help in body movement. ( )

2.6.9 Why is it accepted that human skeleton contains 206 pieces of bones eventhough we have more than that?

2.6.10 Write yes '_/' or No 'x' against, "Actual number of bones contained in the skeleton is 217".

3.7.11 What are the three main divisions of the skeleton system?

(i) (ii) (iii)

3.8.12 What are the main parts of human head?

(i) (ii) (iii) (iv)

3.8.13 Total number of bones in the head is _____.
(20, 26, 29).

3.8.14 Number of bones in the face is_____(14, 24, 34).

3.8.15 Write yes '_/' or No 'x' against "Ear has five pieces of bones".

3.8.16 Number of bones situated under the tongue is_____(5,3,1).

3.8.17 Which portion of the body is called upper jaw?

(i) The section of the lower teeth. ( )

(ii) The section of the upper teeth. ( )

(iii) The upper limbs. ( )

3.8.18 Which portion of the body is called the lower jaw?

(i) The section of the lower teeth. ( )

(ii) The section of the upper teeth. ( )

(iii) The lower limbs. ( )

3.8.19 Number of bones in the upper jaw is_____and that in lower jaw is_____(2,4,5,1).

3.9.20 How are the bones of the skull associated?

(i) One upon another. ( )

(ii) Being joined by soft bones form a box. ( )

(iii) Fitted strongly to their teeth. ( )

(iv) None of the above three. ( )

3.10.21 Which are the two ends, describe the body of human skeleton?

3.10.22 Total number of bones in human body is_____(24,26,28,33)

3.11.23 Write the structure of the vertebral column.

3.11.24 Which of the following are the functions of the vertebral column?

(i) To help in digestion. ( )

(ii) To develop the eye sight. ( )

(iii) To bear the weight of the body. ( )

(iv) To form the chest cavity with the ribs. ( )

3.11.25 Vertebral column contains_____number of bones.(13,23,26,33)

3.12.26 Write yes '✓' or No 'X' against "The nerve cells inside the vertebral column is called 'Merujyoti'".

3.13.27 How is the movement of the body possible?

3.14.28 Number of rib bones is_____.(24,26,28)

3.15.29 Which of the following organs are located in the chest cavity?

(i) Heart ( ) (iv) Stomach ( )

(ii) Liver ( ) (v) Lungs ( )

(iii) Kidney ( ) (vi) Brain ( )

3.16.30 Write yes '✓' or no 'X' against "The stomach is inside the chest cavity".

3.16.31 Write yes '✓' or no 'X' against, "The diaphragm is in between the chest cavity and stomach".

3.17.32 The expansion and contraction of chest cavity take place due to the

(i) movement of the diaphragm. ( )

(ii) expansion of the skin on the chest. ( )

(iii) expansion of the bones in the chest. ( )

3.18.33 Which part of the body is called lower limbs?

(i) Both the hands. ( )

(ii) Both the legs. ( )

(iii) Both hands and legs ( )

3.18.34 Which part of the body is called upper limbs?

(i) Both the hands. ( )

(ii) Both the legs. ( )

(iii) Both hands and legs. ( )

3.19.35 The upper limbs and the lower limbs have_____and _____ pieces of bones respectively.(34,44,64,66).

3.20.36 We move our legs and hands by the

(i) movement of the muscles. ( )

(ii) movement of the bones and joints. ( )

(iii) direction of the brain. ( )

3.21.37 How is it that the bones at joints are not worn out due to friction against each other?

3.22.38 What difference do you find in respect of the position of human head when compared to the position of the head of the animals like dogs, tigers, cows, etc.?

3.33.39 Sketch the diagram of human skeleton and show the following parts - lower jaw, lower limbs, vertebral column, ribs.

(Test is to be arranged according to the types of items and with necessary instruction, it will be kept ready for use).

ଆ କା ଶ ବା ଣୀ

ବିଦ୍ୟାଳୟ କାର୍ଯ୍ୟକ୍ରମ

ମାନ ନିର୍ଦ୍ଧାରଣ ପରୀକ୍ଷା

ବିଷୟ : ମନୁଷ୍ୟ କଙ୍କାଳ ଓ ତା'ର ସଂଚାଳନ

ନାମ : ରୋଲ ନଂ : ତାରିଖ :

ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ

୧। ନିମ୍ନରେ କେତେ ଗୁଡିଏ ପ୍ରଶ୍ନ ଏବଂ ସେଗୁଡିକର ସମ୍ଭାବ୍ୟ ଉତ୍ତର ରହିଛି । ଯେଉଁଟିକୁ ତମେ ଠିକ୍ ବୋଲି ମନେ କରୁଛ ତାହାର ତାହାଣରେ ଥିବା ବନ୍ଧନୀ ମଧ୍ୟରେ (✓) ଚିହ୍ନ ଦିଅ ।

(କ) ମନୁଷ୍ୟ ଶରୀରର କେଉଁ ବିଭାଗଟି ଅନ୍ୟ ସମସ୍ତ ବିଭାଗର ଭାର ବହନ କରେ ?

(୧) ଖାଦ୍ୟ ପରିପାକ ବିଭାଗ ( )

(୨) ଶ୍ୱାସକ୍ରିୟା ବିଭାଗ ( )

(୩) ଚର୍ମ ଓ ମାଂସପେଶୀ ବିଭାଗ ( )

(୪) ଅସ୍ଥି କଙ୍କାଳ ବିଭାଗ ( )

(ଖ) ହାଡକୁ କିପରି ଭାବରେ ବିଭାଗୀ କରଣ କରାଯାଇଛି ?

(୧) ଖଂଜା ଓ ଶିରା ( )

(୨) ଶିରା ଓ ପ୍ରଶିରା ( )

(୩) ମଜ୍ଜାର ହାଡ ଓ ଦେହର ହାଡ ( )

(୪) ନରମ ହାଡ ଓ ଟାଣ ହାଡ ( )

(ଗ) ଆମେ ଆମର ହାତ ଓ ଗୋଡ ସଂଚାଳନ କରିବାକୁ କିପରି ସକ୍ଷମ ହୁଅନ୍ତି ?

(୧) ମାଂସ ପେଶୀର ସଂଚାଳନ ଦ୍ୱାରା ( )

(୨) ଅସ୍ଥି ଓ ଖଂଜାର ସଂଚାଳନ ଦ୍ୱାରା ( )

(୩) ମସ୍ତିସ୍କର ନିର୍ଦ୍ଦେଶ ଦ୍ୱାରା ( )

(ଘ) ବକ୍ଷ ଗହ୍ୱରର ପ୍ରସାରଣ ଏବଂ ସଂକୋଚନ କିପରି ସମ୍ଭବ ହୁଏ ?

(୧) ମଧ୍ୟଚ୍ଛଦାର ସଂଚାଳନ ଦ୍ୱାରା ( )

(୨) ବକ୍ଷ ଉପରିସ୍ଥ ଚର୍ମର ପ୍ରସାରଣ ଦ୍ୱାରା ( )

(୩) ବକ୍ଷରେଥିବା ହାଡ ଗୁଡିକର ପ୍ରସାରଣ ଦ୍ୱାରା ( )

(ଙ) ଆମ ଶରୀରରେ ୨୦୬ ଖଣ୍ଡରୁ ଅଧିକ ହାଡ ଥିଲେ ମଧ୍ୟ ଆମେ ଆମ ଶରୀରରେ ୨୦୬ ଖଣ୍ଡ ହାଡ ଅଛି ବୋଲି କାହିଁକି କହୁ ?

(୧) ବହିରେ ଲେଖା ଅଛି ବୋଲି ( )

(୨) ଶରୀରରେ କୌଣସି ନିର୍ଦ୍ଦିଷ୍ଟ ସଂଖ୍ୟକ ହାଡ ନାହିଁ, ସାଧାରଣତଃ ଗୋଟାଏ ୨୦୬ ଖଣ୍ଡ ହାଡ ଅଛି ବୋଲି ଧରି ନିଆଯାଇଛି ( )

(୩) କେତେକ ଯନ୍ତ୍ର ହାଡକୁ ଖଣ୍ଡିଏ ହାଡ ବୋଲି ଧରି ନିଆଯାଇଛି ( )

(ଚ) ଖପୁରୀର ହାଡ ଗଡିକ କିପରି ସଂଯୁକ୍ତ ହୋଇ ରହିଛନ୍ତି ?

(୧) ଖଣ୍ଡିକ ଉପରେ ଖଣ୍ଡିଏ ଥାକ ଥାକ ହୋଇ ରହିଥାନ୍ତି ( )

(୨) ନରମ ଅସ୍ଥି ଦ୍ୱାରା ସଂଯୁକ୍ତ ହୋଇ ବାକ୍ସ କରିଥାଆନ୍ତି ( )

(୩) ବନ୍ଧୁରି ତ ହୋଇ ପରସ୍ପର ସହ ଶକ୍ତ ଭାବରେ ଖାପ ହୋଇ ରହି ଥାଆନ୍ତି । ( )

(୪) ଉପରୋକ୍ତ ୩ଟି ମଧ୍ୟରୁ କେହି ନୁହେଁ ( )

(ଛ) ଉର୍ଦ୍ଧ୍ୱହନୁ କାହାକୁ କହିନ୍ତି ?

(୧) ତଳ ଦାନ୍ତର ଶ୍ରେଣୀକ ( )

(୨) ଉପର ଦାନ୍ତର ଶ୍ରେଣୀକ ( )

(୩) ଉର୍ଦ୍ଧ୍ୱ ଅବୟବକ ( )

(ଜ) ଅଧଃ ହନୁ କାହାକୁ କହନ୍ତି ?

(୧) ତଳ ଦାନ୍ତର ଶ୍ରେଣୀକ ( )

(୨) ଉପର ଦାନ୍ତର ଶ୍ରେଣୀକ ( )

(୩) ନିମ୍ନ ଅବୟବକ ( )

(ଝ) ନିମ୍ନ ଅବୟବ କାହାକୁ କହନ୍ତି ?

(୧) କେବଳ ଦଇ ହାଡକୁ ( )

(୨) କେବଳ ଦଇ ଗୋଡକୁ ( )

(୩) ଉଭୟ ଦଇ ହାତ ଓ ଦଇ ଗୋଡକୁ ( )

(ଞ) ଉର୍ଦ୍ଧ୍ୱ ଅବୟବ କାହାକୁ କହନ୍ତି ?

(୧) କେବଳ ଦଇ ହାଡକୁ ( )

(୨) କେବଳ ଦଇ ଗୋଡକୁ ( )

(୩) ଉଭୟ ଦୁଇହାତ ଓ ଦଇ ଗୋଡକୁ ( )

୨। ନିମ୍ନ ପ୍ରଶ୍ନ ଗୁଡିକର ଏକାଧିକ ଠିକ୍ ଉତ୍ତର ରହିଛି , ସେ ଗୁଡିକ ପାଖରେ (✓) ଚିହ୍ନ ଦିଅ ।

(କ) ଶରୀରରେ କେଉଁ ଅଂଶ ଗୁଡିକରେ ଟାଣ ହାଡ ଥାଏ ?

(୧)	କାନ	( )	(୬)	ପାକସ୍ଥଳୀ	( )
(୨)	ମଣ୍ଡ	( )	(୭)	ନାକ	( )
(୩)	ହୃତପିଣ୍ଡ	( )	(୮)	ଆଂଗଠି	( )
(୪)	ଗୋଡ	( )	(୯)	ମେରୁଦଣ୍ଡ	( )
(୫)	ହାତ	( )			

(ଖ) ଶରୀରର କେଉଁ ଅଂଶଗଡିକରେ ନରମ ହାଡ ଥାଏ ?

(୧)	କାନ	( )	(୬)	ପାକସ୍ଥଳୀ	( )
(୨)	ମଣ୍ଡ	( )	(୭)	ନାକ	( )
(୩)	ହୃତପିଣ୍ଡ	( )	(୮)	ଆଂଗଠି	( )
(୪)	ଗୋଡ	( )	(୯)	ମେରୁଦଣ୍ଡ	( )
(୫)	ହାତ	( )			

(ଗ) ଏମାନଂକ ମଧ୍ୟରୁ କେଉଁଗଡିକ ଟାଣ ହାଡର କାର୍ଯ୍ୟ ?

(୧)	ବିଭିନ୍ନ ଉଦ୍ଯାସ୍ଥରେ ଖଂଜି ହୋଇ ଖୋଳ ଓ ଗହ୍ୱର ଗଠନ କରିବା	( )
(୨)	ମସ୍ତିସ୍କର ବିକାଶ ଘଟାଇବା	( )
(୩)	ଶରୀରର ଆକାର ଗଠନ କରିବା	( )
(୪)	ରକ୍ତ ସଂଚାଳନରେ ସାହାଯ୍ୟ କରିବା	( )

(ଘ) ଏମାନଂକ ମଧ୍ୟରୁ କେଉଁ= ଗଡିକ ନରମ ହାଡର କାର୍ଯ୍ୟ ?

(୧)	ଶରୀରର ଶିରାପ୍ରଶିରା ଗଠନ କରିବା	( )
(୨)	ଶକ୍ତ ହାଡ ଗୁଡିକ ଘସି ହୋଇ କ୍ଷୟ ହେବାର ରକ୍ଷା କରିବା	( )
(୩)	ଶରୀରରେ ଲୋମ ସୃଷ୍ଟି କରିବା	( )
(୪)	ଗଣ୍ଠିକୁ ଚଳ ପ୍ରଚଳ କରାଇବା	( )

(ଙ) ଏମାନଂକ ମଧ୍ୟରୁ କେଉଁଟି ଗଡିକ ମେରୁଦଣ୍ଡର କାର୍ଯ୍ୟ ?

(୧)	ପାକ କ୍ରିୟାରେ ସାହାଯ୍ୟ କରିବା	( )
(୨)	ବଷ୍ଟିଶକ୍ତି ବଢାଇବା	( )
(୩)	ମଣ୍ଡର ଭାର ବହନ କରିବା	( )
(୪)	ପଂଜରାସ୍ଥି ସହ ସଂଯୁକ୍ତ ହୋଇ ବକ୍ଷ ଗହ୍ୱର ଗଠନ କରିବା	( )

(ଚ) ଏମାନଙ୍କ ମଧ୍ୟରୁ କେଉଁ ଗଡିକ ବକ୍ଷ ଗହ୍ୱର ମଧ୍ୟରେ ଅଛନ୍ତି ?

(୧) ହୃତପିଣ୍ଡ ( )

(୨) କଲିଜା ( )

(୩) ନତ୍ରାଶୟ ( )

(୪) ପାକସ୍ଥଳୀ ( )

(୫) ଫୁସ୍‌ଫୁସ୍ ( )

(୬) ମସ୍ତିଷ୍କ ( )

୩। ନିମ୍ନ ପ୍ରଶ୍ନ ଗଡିକର ଉତ୍ତର ସଂକ୍ଷେପରେ ଲେଖ ?

(କ) ମନୁଷ୍ୟ ଶରୀରର ଯେ କୌଣସି ୩ ଟି ବିଭାଗର ନାମ ଲେଖ ।

୧। ୨। ୩।

(ଖ) ମନୁଷ୍ୟ କଙ୍କାଳଯନ୍ତ୍ର ମୁଖ୍ୟତଃ କେଉଁ ୩ଟି ଅଂଶରେ ବିଭକ୍ତ କରାଯାଇଛି ?

୧। ୨। ୩।

(ଗ) ମଣିଷ ମୁଣ୍ଡକୁ କେଉଁ କେଉଁ ପ୍ରଧାନ ଅଂଶରେ ବିଭକ୍ତ କରାଯାଇଛି ?

୧। ୨। ୩। ୪।

(ଘ) ମଣିଷ ଶରୀରର କେଉଁ ଅଂଶକୁ ଗଣ୍ଡି କହନ୍ତି ?

(ଙ) ମେରୁଦଣ୍ଡର ଗଠନ କିଭଳି ହୋଇଥାଏ ?

(ଚ) ଆମ ଶରୀରରେ ଗଣ୍ଡିର ସଂଚାଳନ କିପରି ହୋଇଥାଏ ?

(ଛ) ଆମ ଦେହରେ ଖଂଜା ଗଡିକରେ ଥିବା ହାଡ ଗଡିକ ଘୋରି ହୁଏ ନାହିଁ କାହିଁକି ?

(ଜ) ମଣିଷ ଶରୀରରେ ମୁଣ୍ଡର ଅବସ୍ଥିତି ଏବଂ ଗୋରୁ , ମେଣ୍ଢା, ବାଘ କୁକୁର ଆଦି ପଶୁମାନଙ୍କର ମୁଣ୍ଡର ଅବସ୍ଥିତି ମଧ୍ୟରେ ତୁମେ କି ପ୍ରଭେଦ ଲକ୍ଷ କରୁଛ ?

୪। ନିମ୍ନରେ କେତେଗଡିଏ ଠିକ୍ ଏବଂ କେତେ ଗଡିଏ ଭୁଲ ଉକ୍ତି ଦିଆଯାଇଛି, ଠିକ୍ ଉକ୍ତି ଗଡିକ ପାଖରେ (✓) ଏବଂ ଭୁଲ ଉକ୍ତି ଗଡିକ ପାଖରେ (×) ଚିହ୍ନ ଦିଅ :-

(କ) ଅସ୍ଥି କଙ୍କାଳ ବିଭାଗକୁ ଶରୀରର ଢାଂଚ କହନ୍ତି ( )

(ଖ) ଆମ ଶରୀରରେ ୬୨ ଖଣ୍ଡ ହାଡ ଥାଏ ( )

(ଗ) ମଣିଷ କାନରେ ୫ ଖଣ୍ଡ ହାଡ ଥାଏ ( )

(ଘ) ମେରୁଦଣ୍ଡ ମଧ୍ୟରେ ମେରୁ ଜ୍ୟୋତି ଥାଏ ( )

(ଙ) ପାକସ୍ଥଳୀ ବକ୍ଷ ଗହ୍ୱର ମଧ୍ୟରେ ଥାଏ ( )

(ଚ) ବକ୍ଷ ଗହ୍ୱର ଏବଂ ପାକସ୍ଥଳି ମଧ୍ୟରେ ମଧ୍ୟଚ୍ଛଦା ଥାଏ( )

୫। ଶୂନ୍ୟ ସ୍ଥାନ ପୂରଣ କର :-

(କ) ମଣିଷ ମସ୍ତକରେ ------- ଖଣ୍ଡ ହାଡ ଥାଏ ।

(୨୦, ୨୬, ୨୯)

(ଖ) ଆମ ମୁଖ ମଣ୍ଡଳରେ ----- ଖଣ୍ଡ ହାଡ ଥାଏ ।

(୧୪, ୨୪, ୩୪)

(ଗ) ଆମ ଜିଭ ତଳ ------- ଖଣ୍ଡ ହାଡ ଥାଏ ।

(୫, ୩, ୧)

(ଘ) ଉର୍ଦ୍ଧ୍ୱ ହନୁରେ -------- ଖଣ୍ଡ ଓ ଅଧଃ ହନୁରେ ---- ଖଣ୍ଡ ହାଡ ଥାଏ ।

(୨, ୪, ୫ , ୧)

(ଙ) ଗଣ୍ଡିରେ -------- ଖଣ୍ଡ ହାଡ ଥାଏ ।

(୨୪, ୨୬, ୨୮)

(ଚ) ମେରୁ ଦଣ୍ଡରେ -------- ଖଣ୍ଡ ହାଡ ଥାଏ ।

(୧୩, ୨୩, ୩୩)

(ଛ) ପିଂଜରାରେ ------ ଖଣ୍ଡ ହାଡ ଥାଏ ।

(୨୪, ୨୬, ୨୮)

(ଜ) ଉର୍ଦ୍ଧ୍ୱ ଅବୟୁବରେ ----- ଖଣ୍ଡ ଏବଂ ନିମ୍ନ ଅବୟୁବରେ ---- ଖଣ୍ଡ ହାଡ ଥାଏ ।

(୩୪, ୪୪, ୬୪, ୬୬)

୬। ମଣିଷ ଙ୍କାଳର ଚିତ୍ର ଅଂକନ କରି ନିମ୍ନ ଅଂଶ ଗୁଡିକ ଦର୍ଶାଅ ।

(୧) ପିଂଜରା ହାଡ

(୨) ନିମ୍ନ ଅବୟୁବ

(୩) ମେରୁଦଣ୍ଡ

(୪) ଅଧଃ ହନୁ ।

.....

ଆ ଦ ର୍ଶ ଉ ତ୍ତ ର

ମଣିଷ ଶରୀର ଓ ତା'ର ସଂଚାଳନ

୧। କ-୪, ଖ- ୪, ଗ- ୨, ଘ- ୧, ଙ- ୩, ଚ- ୩,
ଛ- ୨, ଜ- ୧, ଝ- ୨, ଞ- ୧ ।

୨। କ- ୨,୪,୫,୮,୯ । ଖ- ୧,୬,୭ । ଗ- ୧,୩ ।
ଘ- ୧,୨ । ଙ- ୩,୪ । ଚ- ୧,୨,୫ ।

୩। କ- ଖାଦ୍ୟପରିପାକ, ରକ୍ତ ସଂଚାଳନ, ଶ୍ୱାସକ୍ରିୟା
ଖ- ମୁଣ୍ଡ, ଗଣ୍ଠି , ଅବୟବ
ଗ- ଖପୁରି, ମୁଖ ମଣ୍ଡଳ, କାନ, ଜିଭର ନିମ୍ନ ଅଂଶ
ଘ- ବେକଠାରୁ ମଳଦ୍ୱାର ପର୍ଯ୍ୟନ୍ତ
ଙ- ଏହା ଏକ ନଳୀପରି ଦେଖାଯାଏ, ଏଥିରେ ଥିବା ମଣ୍ଡଳାକାର ତରଣାସ୍ଥି ଗୁଡିକ ଥାକ ଥାକ ହୋଇ ରହିଥାନ୍ତି ।
ଚ- ମେରୁ ଦଣ୍ଡରେ ଥିବା ମଣ୍ଡଳାକାର ତରୁଣାସ୍ଥି ଗୁଡିକ ଏପରି ଥାଆନ୍ତି ଯେ ଗୋଟିକ ଉପରେ ଗୋଟିଏ ଯେ କୌଣସି ପାର୍ଶ୍ୱକୁ ଘୂରି ପାରେ । ଏଥିଯୋଗୁ ମସ୍ତିଷ୍କ ଯେ କୌଣସି ପାଖକୁ ସଂଚାଳିତ କରି ହୁଏ ।
ଛ- ଖଂଜା ଗୁଡିକରେ ଥିବା ଏକ ପ୍ରକାର ତୈଳାକୁ ରସ ଯୋଗୁ ହାଡ ଗୁଡିକ ଇରସ୍ପର ସହ ଘସି ହୋଇ ପାରନ୍ତି ନାହିଁ ।
ଜ- ମଣିଷର ମସ୍ତିଷ୍କ ମେରୁଦଣ୍ଡ ଟେକି ରଖିଥାଏ ଏବଂ ଏହା ଭୂମି ସହ ଲମ୍ବ ଭାବରେ ଥାଏ ମାତ୍ର ଗୋରୁ, କୁକୁର ଆଦି ପଶୁମାନଙ୍କର ମସ୍ତିଷ୍କ ମେରୁଦଣ୍ଡ ଓହ୍ଲାଇ ରଖିଥାଏ ଏବଂ ତାହା ଭୂମି ସହିତ ସମାନ୍ତର ଭାବରେ ଥାଏ ।

୪। କ- ✓ ଖ- ✓ ଗ- × ଘ- × ଙ- × ଚ- ✓ ।

୫। କ- ୨୯, ଖ- ୧୪ , ଗ- ୧, ଘ-୨ ଓ ୧, ଙ- ୨୬ ଚ- ୩୩,
ଛ- ୨୪, ଜ- ୬୪ ଓ ୬୬ ।

୬। ପିଂଜରା ହାଡ
ନିମ୍ନ ଅବୟବ
ମେରୁ ଦଣ୍ଡ
ଅଧଃ ହନୁ

.....

LEARNING EXPERIENCES

PRE-BROADCAST ACTIVITIES

Method: Question-Answer

Teacher's Activities		Students' Activities
Tr:	Hellow, students! you are welcome to the 4th programme of school broadcast in the series of our science topics. To-day we will listen to a very interesting topic. This topic is very much informative to us. Before we listen to the programme, let me ask you a few questions.	
Q.	What are the important celebrations you observe in your school?	Independence Day, Republic Day, Ganesh Puja, Saraswati Puja, etc.
Q.	What do we do on the festival day of Ganesh Puja and the Saraswati Puja?	We worship the idol.
Q.	From where do you get the idol?	The sculptor prepares it with soil and other supporting materials.

Teacher's Activities		Students' Activities
Q.	How does he begin to prepare?	At first, he prepares a frame of the idol.
Tr:	So to give shape to an idol a frame is necessary.	
Q.	Which is the frame of our body?	The skeleton.
Tr:	Today's programme is on the frame of our body i.e. "Human Skeleton and Its Movement". Before listening to the programme, you may go through this book. (Teacher supplies the books to the students). You can see some questions on Human Skeleton given in the book with their answers. But some alphabets or words are missing. You can listen to those answers through the radio. Please write the correct answer immediately after listening to that point. If you fail to answer a particular question, leave it otherwise you may miss the other points. So please listen carefully and answer the questions one after another. I will also show you the various parts of the skeleton while listening to the programme. (Skeleton is brought) Let us listen. (Teacher tunes the radio).	

ACTIVITIES DURING THE BROADCAST

Method: (i) Radiovision, (ii) Writing answers in workbook.

Aids: 1.Model of skeleton (Teacher to point out various parts during the broadcast).

2.Radio supporting workbook (To be filled in by the students during the broadcast).

Questions given in the workbook for which students will be answering.

AKASHVANI

RADIO SUPPORTING WORK BOOK

Topic: Human skeleton and its movement.

1. The sub-systems of the human system are
   (a) Respirat system (c) Circul system
   (b) Digest system (d) Ske system
2. The sub-system which is called the frame of the body is_____ton system.
3. The organs which contain hard bones are (a)
   (b)
   (c)
4. The organs which contain soft bones are (a)
   (b)
   (c)
5. The three main parts of the body are (a)
   (b)
   (c)
6. Number of bones in the human skeleton is_____.
7. Number of bones in the head is_____ .
8. Number of bones in the skull is_____ .
9. Number of bones in the face is_____.
10. Number of bones in the body is_____.
11. Number of bones in the rib cage is_____ .
12. Number of bones in the vertebral column is_____.
13. Number of bones in the upper limbs is_____.
14. Number of bones in the lower limbs is_____.

POST-BROADCAST ACTIVITIES

Method: Discussion
Aid: Human Skeleton.

Teacher'sActivities	Expected Students' Activities
Activity 1 Teacher reads the right answers for the questions of the workbook and instructs students to check through their answers.	Students do their self evaluation, understand their mistakes.
Activity 2 Teacher demonstrates the skeleton exposed to the classroom. He involves the group in discussion by raising several questions pertaining to parts of skeleton.	The students respond to the questions and actively participate.
Activity 3 Teacher invites question from the group to clarify their doubts and discuss interesting points raised by the students. Lastly, the teacher asks students to read and come prepared for the test to be conducted in the next day.	Students ask questions to the teacher to clarify their doubts.