

LESSON - 6

MUSIC HELPS PLANTS GROW

Session - 1

I

PRE-READING

- What are the similarities and differences between plants and humans ?
Discuss with your friends and make a note of them.
- Music makes us happy. Does music have any effect on plants ?
Let's read this lesson to know something about it.

II

WHILE-READING

- **SGP-1**
- Read para- 1 to 3 silently and answer the questions that follow.
 1. Many scientists believe that music soothes the plant. It also helps it grow. This is now a scientific fact.
 2. Les Harsten, a sound engineer from New York, carried out some exciting experiments. Here is one of them.
 3. Harsten's theory was that plants definitely react to music. In his experiment, he used two banana plants. He gave both plants the same light, heat and water. But, one of the plants 'listened' to some music for about an hour a day. This music, in fact, was a high-pitched humming sound. He found that this plant grew faster. It also grew 70 percent taller than the other plant!
- **Comprehension Questions:**
 1. The first paragraph is about a scientific fact. What is that ?
 2. What is the second paragraph about ?
 3. Who is Les Harsten ?
 4. What is his native place ?

5. What is the third paragraph about ?
6. What is Harsten's theory ?
7. What did he use for his experiment ?
8. What did he give to both the banana plants ?
9. He exposed one of the plants to music. How many hours a day ?
10. What was his finding ?
11. What happened to the plant that listened to music ?

Session - 2

- **SGP-2**

- Read silently paragraph 4 and 5 and answer the questions that follow:
4. Lynn and Joe Rapp, the authors of a book called 'Indoor Plants', say that plants respond to all sound, whether it is music or voices. These sound waves make vibrations which stimulate growth. They say plants have definite likes and dislikes in music- and they seem to like classical music more!
 5. Harsten explained this in a very scientific way. He said the hum (or similar music) stimulated the plant's breathing cells and made them stay open for longer periods. Because of this, the plant took in more nutrients from the air than it normally would, and thus it grew faster. He also said that if the sound was played continuously, the breathing-cells would not be able to close. Therefore the plant would grow so fast that it would kill itself.

- **Comprehension Questions:**

1. Who are the authors of - "Indoor Plants" ?
2. What do they say ?
3. What does 'this' (in the first line of para - 5) refer to ? What do you understand by 'stimulate' ?
4. What did music stimulate ? (Para - 5)
5. What happened when the breathing cells of the plant were stimulated ?
6. What happened when the cells stayed open for longer periods ?
7. What would happen if the music was played continuously ?
8. What is the fifth paragraph about ?
9. How is the finding of Lynn and Rapp different from that of Harsten ?

Session - 4

3 Listening :

- Your teacher reads out the following statements.
Listen to him/her and say whether they are true or false.
 - Lynn is a sound engineer.
 - Harsten's theory says that plants definitely react to music.
 - Lynn and Harsten are the writers of the book, "Indoor Plants."
 - The vibration of the sound waves increases the growth of plants.
 - The plants don't like classical music.
 - The humming sounds make the cells open for longer periods.
 - The plants take more nutrient when their cells are closed.

4 Speaking :

Chain-drill:

"Music helps the plants grow faster."

"Plants like classical music more."

Session - 5

5 Vocabulary :

Match words under 'A' with their meanings under 'B'. One has been done for you.

A	B
- soothe — - hum - vibration - stimulate - cell - excite	- to make someone move active/alert - very small unit of living matter - to cause strong feeling of eagerness/interest - to make someone/something calm/quiet - to sing a tune with one's lips closed - continuous rapid shaking movement

6 Usage :

- We add '-ing' to verbs and use before nouns to talk more about them; for example, 'breath+ ing=breathing' and it is used before 'cells' in the text as 'breathing cells'.

- (i) Now add '–ing' to the verbs in the box-1, use them before the nouns choosing from the box-2(Refer to the text.)

Box-1

breath
grow
excite
hum
sooth

Box-2

plants
cells
waves
sounds
experiments

Example: 1. Breathing cells

2. _____
3. _____
4. _____
5. _____

- (ii) Then fill in the blanks with the above suitable pairs in the sentences given below. One is done for you.

1. There are _____ on plants and music.
2. The _____ help plant grow fast.
3. The music stimulates the plants' breathing cells to stay open.
4. The _____ activate the growth of the plants.
5. The continuous _____ help plants to take more nutrients.

Session - 6

- b. We combine our ideas by combining small parts together and we make a long sentence. Now complete the following sentences choosing the suitable parts from the box.

- (i) Many scientists believe

- (ii) Harsten's theory was

- (iii) Lynn and Joe Rapp, in their book, "Indoor Plants" say

(iv) Harsten said

(v) Harsten's experiment also proved

- that plants dislike classical music.
- that continuous sound of music does not allow breathing cells to be closed.
- that music soothes the plants.
- that the plants definitely react to music.
- that the humming sounds activate the breathing cells and make them stay open.

Remember:

The verbs used in the second parts of the sentences are in present simple/1st form because they talk about general/scientific facts.

Session - 7

7 Writing :

- a. Provided below are some facts. Some of them are about Harsten and others, about Lynn and Rapp. But these are mixed. Put them neatly under two heads.
- Music helps plant grow.
 - Wrote a book, 'Indoor Plants'.
 - Plants respond to all sounds.
 - Plants respond to only music.
 - An engineer by profession
 - Plants have definite likes and dislikes in music.
 - Experiments with banana plants
 - When listened to music plants grew faster.
 - Plants like classical music.
 - Plants dislike rock music.

Harsten

1. _____
2. _____
3. _____
4. _____
5. _____

Lynn and Rapp

1. _____
2. _____
3. _____
4. _____
5. _____

b. Using the hints write instructions for doing Harsten's experiment.

For Example: Take two banana plants.

- Give both plants the same _____.
- Provide music to _____.
- For about an _____.

c. The following statements are not in order. See para- 4 and rearrange the statements in order as they come one after another in Harsten's experiment.

1. The plant grew faster.
2. Cells stay opened for longer periods.
3. Music stimulated plant cells.
4. The plant took more nutrient from air.

d. Based on the statements under two heads: under-1 about Harsten and under-2 Lynn and Rapp. Write two paras, one on Harsten and the other on Lynn and Rapp.

1. Harsten

2. Lynn and Rapp

Session - 8

e. Write answers to the following questions.

(i) What is Harsten's theory ?

(ii) What did he use for his experiment ?

(iii) What did he give to both the banana plants ?

(iv) What was his finding ?

(v) Who are the authors of the book- "Indoor Plants" ?

(vi) What happened when the breathing cells of the plant were stimulated ?

(vii) What happened when the cells stayed open for longer periods ?

(viii) How is the finding of Lynn and Rapp different from that of Harsten ?

8 Mental Talk :

- Plants have definite likes and dislikes.
- Plants like classical music more.

9 Let's Think :

- Think of some new ways to know more about plants.
- Take up a project on plants. Collect information about them from different sources.

MUSIC HELPS PLANTS GROW



Summary of the Text :

Many scientists think that music soothes the plant. It also helps it grow. This fact has been proved by the scientists.

Les Harsten, a sound engineer from New York; developed a theory that plants react to music. He carried out his experiment on two banana plants. He provided both the plants with the same light, heat and water. But one of the plants listened to some music for an hour everyday. The music was a high-pitched humming sound. He then noticed, that plant grew faster. It also grew seventy per cent taller than the other plant.

Lynn and Joe Rapp the authors of a book titled '**Indoor Plants**', are of the opinion that plants respond to all sounds. These sound waves create vibrations which stimulate the growth of the plants. Lynn and Rapp say that plants also have their likes and dislikes with regard to music and they seem to like the classical music more.

Harsten said that the hum or similar music stimulated the plant's breathing cells and made them stay open for longer periods. This opening helped the plant take in more nutrients from the air which made it grow faster. He was of the opinion that if the sound was played continuously, the breathing-cells would not be able to close. As a result, the plant would grow so fast that it would kill itself.

ସାରାଂଶ :

ବହୁ ବୈଜ୍ଞାନିକ ବିଶ୍ୱାସ କରନ୍ତି ଯେ ସଙ୍ଗୀତ ବୃକ୍ଷକୁ ଶାନ୍ତ ଓ କୋମଳ ହେବାରେ ସାହାଯ୍ୟ କରେ । ଏହା ମଧ୍ୟ ତାହାର ବୃଦ୍ଧିରେ ସାହାଯ୍ୟ କରେ ।

ନିୟୁକରେ ଲେସ୍ ହାର୍ଷ୍ଟେନ ନାମରେ ଜଣେ ଧ୍ୱନି ଇଞ୍ଜିନିୟର ତାଙ୍କର ପରୀକ୍ଷାଦ୍ୱାରା ଏକ ସିଦ୍ଧାନ୍ତ ଦେଲେ ଯେ ବୃକ୍ଷମାନେ ନିଶ୍ଚିତ ଭାବରେ ସଙ୍ଗୀତ ପ୍ରତି ସେମାନଙ୍କର ପ୍ରତିକ୍ରିୟା ପ୍ରକାଶ କରନ୍ତି । ସେ ତାଙ୍କର ପରୀକ୍ଷା ପାଇଁ ଦୁଇଟି କଦଳୀ ଗଛକୁ ବ୍ୟବହାର କରିଥିଲେ । ଉଭୟ ଗଛକୁ ସେ ସମାନ ଆଲୋକ, ଉତ୍ତାପ ଓ ଜଳ ପ୍ରଦାନ କରିଥିଲେ । କିନ୍ତୁ ସେ ଦୁଇଟି ଗଛ ମଧ୍ୟରୁ ଗୋଟିଏ ଗଛ ପ୍ରତିଦିନ ପ୍ରାୟ ଏକଘଣ୍ଟା ଧରି ସଙ୍ଗୀତ ଶୁଣୁଥିଲା । ଏହି ସଙ୍ଗୀତ ଉଚ୍ଚସ୍ୱରରେ ଗାନ କରାଯାଉଥିବା ଗୁରୁଗୁରୁ ଶବ୍ଦ ଥିଲା । ତା'ପରେ ସେ ଦେଖିଲେ ଯେ ଏହି ଗଛଟି ଖୁବ୍ ଦ୍ରୁତଗତିରେ ବଢ଼ିବାରେ ଲାଗିଛି । ଏହା ମଧ୍ୟ ଅନ୍ୟ ଗଛଟିଠାରୁ ସତୁରି ପ୍ରତିଶତ ଅଧିକ ଉଚ୍ଚ ଥିଲା ।

ଇନ୍ଡୋର ପ୍ଲାଣ୍ଟସ୍ ବା ଗୃହ ଭିତର ବୃକ୍ଷମାନେ ପୁଷ୍ଟକର ରଚୟିତା ଲିନ୍ ଏବଂ ଜୋ ରାପ ମଧ୍ୟ କହନ୍ତି, ବୃକ୍ଷମାନେ ସବୁପ୍ରକାର ଧ୍ୱନି ପ୍ରତି ସଂବେଦନଶୀଳ, ସେହି ଧ୍ୱନି ସଙ୍ଗୀତର ଧ୍ୱନି ହେଉ ବା କଥୋପକଥନର ସ୍ୱର ହେଉ । ଏହି ଶବ୍ଦ ତରଙ୍ଗ ସବୁ କେତେକ ସ୍ୱୟନ ସୃଷ୍ଟି କରନ୍ତି; ଯେଉଁମାନେ ବୃକ୍ଷମାନଙ୍କର ଅଭିବୃଦ୍ଧି ପାଇଁ ଉଦ୍ଦୀପନା ସୃଷ୍ଟି କରନ୍ତି । ସେମାନେ ମଧ୍ୟ ମତ ଦିଅନ୍ତି ଉଦ୍ଭିଦମାନଙ୍କର ସଙ୍ଗୀତ ବିଷୟରେ ମଧ୍ୟ ସେମାନଙ୍କର ପସନ୍ଦ ଓ ଅପସନ୍ଦ ରହିଛି । ସେମାନେ ବୋଧହୁଏ ଶାସ୍ତ୍ରୀୟ ସଙ୍ଗୀତକୁ ବେଶି ଭଲ ପାଆନ୍ତି ।

ହାର୍ଷ୍ଟେନ କହୁଥିଲେ ଗୁରୁଗୁରୁ ଶବ୍ଦ ଉଦ୍ଭିଦକୁ ତାହାର ନିଃଶ୍ୱାସ-ପ୍ରଶ୍ୱାସ କୋଷଗୁଡ଼ିକୁ ଲମ୍ବା ସମୟ ପାଇଁ ଉନ୍ମୁକ୍ତ କରି ରଖିବାରେ ସାହାଯ୍ୟ କରୁଥିଲେ । କୋଷଗୁଡ଼ିକ ଖୋଲା ରହିବା କାରଣରୁ ସେମାନେ ବାୟୁମଣ୍ଡଳରୁ ଅଧିକ ପୁଷ୍ଟିକାରକ ଦ୍ରବ୍ୟ ଗ୍ରହଣ କରୁଥିଲେ ଯାହା ବୃକ୍ଷକୁ ଅଧିକ ବଢ଼ିବାରେ ସାହାଯ୍ୟ କରୁଥିଲା । ସେ ମଧ୍ୟ କହୁଥିଲେ, ଯଦି ସଙ୍ଗୀତ କ୍ରମାଗତ ଭାବେ ବଜାଯିବ, ତାହାହେଲେ ନିଃଶ୍ୱାସ-ପ୍ରଶ୍ୱାସ କରୁଥିବା କୋଷଗୁଡ଼ିକ ବନ୍ଦ ହେବାରେ ସକ୍ଷମ ହେବେ ନାହିଁ ଯାହା ଫଳରେ ସେହି ବୃକ୍ଷଟି ଏତେ ଅଧିକ ମାତ୍ରାରେ ବଢ଼ିବ ଯେ ଶେଷରେ ସେ ନିଜକୁ ନିଜେ ନଷ୍ଟ କରିଦେବ ।

Comprehension Questions & Answers

1. The first paragraph is about a scientific fact. What is that ?

Ans. The fact is that music soothes the plant and helps it grow.

2. What is the second paragraph about ?

Ans. The second paragraph is about Les Harsten, a sound engineer who conducted some exciting experiments.

3. Who is Les Harsten ?

Ans. Les Harsten is a sound engineer.

4. What is his native place ?

Ans. New York is his native place.

5. What is the third paragraph about ?

Ans. The third paragraph is about Harsten's experiment on two banana plants with regard to their reaction to music.

6. What is Harsten's theory ?

Ans. Harsten's theory is that plants definitely react to music.

7. What did he use for his experiment ?

Ans. He used two banana plants for his experiment.

8. What did he give to both the banana plants ?

Ans. He gave the same light, heat and water to both the banana plants.

9. He exposed one of the plants to music. How many hours a day ?

Ans. He exposed one of the plants to music for about an hour a day.

ପ୍ରଥମ ଭାଗ

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10. What was his finding ?

Ans. His finding was that plant which listened to music grew faster and taller than the other plant.

11. What happened to the plant that listened to music ?

Ans. The plant that listened to music grew faster. It also grew seventy per cent taller than the other plant.

growth. The word 'stimulate' means to encourage or develop further.

4. What did music stimulate ? (Para - 5)

Ans. The music stimulated the plant's breathing cells.

5. What happened when the breathing cells of the plant were stimulated ?

[2017-18 (Sansthan)]

Ans. When the breathing cells of the plant were stimulated, they stayed open for longer periods.

6. What happened when the cells stayed open for longer periods ?

Ans. When the cells stayed open for longer periods, the plant took in more nutrients from the air than it normally would.

7. What would happen if the music was played continuously ?

Ans. If the music was played continuously, the breathing cells would not be able to close.

8. What is the fifth paragraph about ?

Ans. The fifth paragraph is about the effect of music on the breathing cells of a plant.

9. How is the finding of Lynn and Rapp different from that of Harsten ?

Ans. Harsten's findings were derived from scientific experiments. He proved that plants react to music. Plants exposed to music grow faster and taller. However, if the music is played continuously, the plants won't be able to close their breathing cells. And, these plants will grow so fast that they will kill themselves.

Lynn and Rapp, on the other hand, wrote in their book that plants react to all types of sounds, be it music or voice. The sound waves make vibrations that stimulate plants' growth. According to Lynn and Rapp, plants also have their likes and dislikes in music.

Comprehension Questions & Answers :

1. Who are the authors of - "Indoor Plants" ?

Ans. Lynn and Joe Rapp are the authors of Indoor Plants.

2. What do they say ?

Ans. They say that plants respond to all sound, whether it is music or voices.

3. What does 'this' (in the first line of para - 5) refer to ? What do you understand by 'stimulate' ?

Ans. 'This' refers to the idea that sound waves make plant vibrations which stimulate

10. Do plants have likes and dislikes in music according to Lynn and Rapp ?

Ans. Yes, the plants according to Lynn and Rapp, have likes and dislikes in music.

11. What type of music do plants like ?

Ans. The plants like classical music.

12. Do you know any Indian scientists who have experimented on plants ?

Ans. Yes, I know an Indian scientist who experimented on plants. His name is Jagadish Chandra Bose.

POST-READING

Comprehension Activities :

Answer the following questions choosing the most appropriate answer from the options.

1. 'It' in the second sentence in para-1 refers to _____.

- A. Plant B. music
C. scientific fact D. scientists

2. Les Harsten was a _____.

- A. Civil engineer
B. sound engineer
C. software engineer
D. electrical engineer

3. Harsten, in his experiment, gave both bananas _____.

- A. Light and heat B. heat and water
C. light and water D. light, heat, and water

4. Which banana plant grew faster?

- A. The plant which listened to the music.
B. The plant which got more water.
C. The plant which got more water and light.
D. The plant which got light, heat and water.

5. The plants can take more nutrients if the plants breathing cells _____.

- A. remain closed B. stay open
C. get water D. get heat

Ans. 1. (B) to 'music' and then to 'the plant'.
2. (B) sound engineer, 3. (D) light, heat and water, 4. (A) The plant which listened to the music. 5. (B) stay open.

Listening :

- Your teacher reads out the following statements.

Listen to him/her and say whether they are true or false.

- (i) Lynn is a sound engineer.
- (ii) Harsten's theory says that plants definitely react to music.
- (iii) Lynn and Harsten are the writers of the book, "Indoor Plants."
- (iv) The vibration of the sound waves increases the growth of plants.
- (v) The plants don't like classical music.
- (vi) The humming sounds make the cells open for longer periods.
- (vii) The plants take more nutrient when their cells are closed.

Ans. (i) false, (ii) true, (iii) false, (iv) true, (v) false, (vi) true, (vii) false.

Vocabulary :

Match words under 'A' with their meanings under 'B'. One has been done for you.

- | A | B |
|-------------|---|
| • soothe | • to make someone move active/alert |
| • hum | • very small unit of living matter |
| • vibration | • to cause strong feeling of eagerness/interest |
| • stimulate | • to make someone/ something calm/quiet |
| • cell | • to sing a tune with one's lips closed |
| • excite | • continuous rapid shaking movement |

Ans.

A	B
• soothe	• to make someone move active/alert
• hum	• very small unit of living matter
• vibration	• to cause strong feeling of eagerness/interest
• stimulate	• to make someone/ something calm/quiet
• cell	• to sing a tune with one's lips closed
• excite	• continuous rapid shaking movement

Usage :

- a. We add '-ing' to verbs and use before nouns to talk more about them; for example,

'breath+ ing = breathing' and it is used before 'cells' in the text as 'breathing cells'.

- (i) Now add '-ing' to the verbs in the box-1, use them before the nouns choosing from the box-2 (Refer to the text.)

Box-1	Box-2
breath	plants
grow	cells
excite	waves
hum	sounds
soothe	experiments

Example : 1. Breathing cells

2. Growing plants
3. Exciting experiments
4. Humming sounds
5. Soothing waves.

- (ii) Then fill in the blanks with the above suitable pairs in the sentences given below. One is done for you.

1. There are _____ on plants and music.
2. The _____ help plant grow fast.
3. The music stimulates the plants' breathing cells to stay open.
4. The _____ activate the growth of the plants.
5. The continuous _____ help plants to take more nutrients.

- Ans.**
1. There are exciting experiments on plants and music.
 2. The soothing waves help plant grow fast.
 3. The music stimulates the plants' breathing cells to stay open.
 4. The humming sounds activate the growth of the plants.
 5. The continuous humming sounds help plants to take more nutrients.

- b. We combine our ideas by combining small parts together and we make a long sentence. Now complete the following sentences choosing the suitable parts from the box.

- (i) Many scientists believe _____
- (ii) Harsten's theory was _____
- (iii) Lynn and Joe Rapp, in their book, "Indoor Plants" say. _____
- (iv) Harsten said _____
- (v) Harsten's experiment also proved _____

- Ans.**
- (i) Many scientists believe that music soothes the plants.
 - (ii) Harsten's theory was that the plants definitely react to music.
 - (iii) Lynn and Joe Rapp, in their book, "Indoor Plants" say that plants like classical music.
 - (iv) Harsten said that the humming sounds activate the breathing cells and make them stay open.
 - (v) Harsten's experiment also proved that continuous sound of music does not allow the breathing cells to be closed.

- that plants dislike classical music.
- that continuous sound of music does not allow breathing cells to be closed.
- that music soothes the plants.
- that the plants definitely react to music.
- that the humming sounds activate the breathing cells and make them stay open.

Remember :

The verbs used in the second parts of the sentences are in present simplest form because they talk about general / scientific facts.

Writing :

a. Provided below are some facts. Some of them are about Harsten and others, about Lynn and Rapp. But these are mixed. Put them neatly under two heads.

- Music helps plant grow.
- Wrote a book, 'Indoor Plants'.

- Plants respond to all sounds.
- Plants respond to only music.
- An engineer by profession
- Plants have definite likes and dislikes in music.
- Experiments with banana plants
- When listened to music plants grew faster.
- Plants like classical music.
- Plants dislike rock music.

Ans. Facts about Harsten

1. ● Music helps the plant grow.
2. ● Plants respond to only music.
3. ● An engineer by profession
4. ● Experiments with banana plants
5. ● When listened to music plants grew faster.

Facts about Lynn and Rapp

1. ● Wrote a book, 'Indoor Plants'.
2. ● Plants respond to all sounds.
3. ● Plants have definite likes and dislikes in music
4. ● Plants like classical music.

b. Using the hints write instructions for doing Harsten's experiment.

For Example : Take two banana plants.

- Give both plants the same _____
- Provide music to _____
- For about an _____

Ans. ● Take two banana plants.

● Give both plants the same light, heat and water.

- Provide music to one of the plants.
- For about an hour a day.

c. The following statements are not in order. See para- 4 and rearrange the statements in order as they come one after another in Harsten's experiment.

1. The plant grew faster.
2. Cells stay opened for longer periods.
3. Music stimulated plant cells.
4. The plant took more nutrient from air.

- Ans. 1. Music stimulated plant cells.
2. Cells stay opened for longer periods.
3. The plant took more nutrient from air.
4. The plant grew faster.

d. Based on the statements under two heads: under-1 about Harsten and under-2

Lynn and Rapp. Write two paras, one on Harsten and the other on Lynn and Rapp.

(i) **Harsten** : Many scientists believe that music helps the plant grow. Harsten was an engineer by profession. His theory was that plants respond to only music. He carried out his experiment with two banana plants. He found that the plant that listened to music, grew faster.

(ii) **Lynn and Rap** : Lynn and Joe Rapp wrote a book titled 'Indoor Plants'. They say that plants respond to all sounds. According to them plants have definite likes and dislikes

in music. They say that plants seem to like classical music more.

e. **Write answers to the following questions :**

(i) **What is Harsten's theory ?**

Ans. Harsten's theory was that plants definitely react to music.

(ii) **What did he use for his experiment ?**

Ans. He used two banana plants for his experiment.

(iii) **What did he give to both the banana plants ?**

Ans. He gave the same light, heat and water to both the banana plants.

(iv) **What was his finding ?**

Ans. His finding was that the banana plant which listened to music grew faster and seventy per cent taller than the other plant.

(v) **Who are the authors of the book - "Indoor Plants" ?**

Ans. Lynn and Joe Rapp were the authors of the book "Indoor Plants".

(vi) **What happened when the breathing cells of the plant were stimulated ?**

Ans. They stayed open for longer periods.

(vii) **What happened when the cells stayed open for longer periods ?**

Ans. They took in more nutrients from the air.

(viii) **How is the finding of Lynn and Rapp different from that of Harsten ?**

Ans. Harsten's finding was that plants react to music, but Lynn and Rapp say that plants respond to all sound, whether it is music or voices. Harsten said humming sound makes a plant grow faster and taller. Lynn and Rapp say plants like classical music more.

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