



**Shirpur Education Society**

**R.C. Patel**

**Institute of Pharmaceutical Education and Research, Shirpur**

[ NBA Accredited – 6Yrs 9 3<sup>rd</sup> Cycle], NAAC Accredited, NiRF Ranking- Ranked in Top 50 institutes from last four cycles; CII- Platinum]

## **Student centric methods for enhancing learning experiences**

### **Sample copy of**

- Flipped class room activity model
- Think Pair Share model
- Peer instructions model

# FLIPPED CLASSROOM ACTIVITY

## For Acid-Base Titration

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# Out-of-class Activity Design -1

## Learning Objective(s) of Out-of-Class Activity

After watching video students will be able to understand & draw following elements using **G Chem Paint** Software

- Principle behind acid-base titration
- Neutralization curve for acid base titration
- Role of indicator in acid-base titration
- End point or equivalence point

## Key Concept(s) to be covered

- Concept of titration and molarity
- Titration experiment
- Understanding the calculation of acid base titration

# About Out-of-Class Segment

- Meant mainly for Information-Transmission to student.
- Mostly help achieve lower-order cognitive levels (Recall-Understand-Apply)
- Teacher takes time to search and locate videos.
- Out-of-Class activity should not be too lengthy,  
(ideally think of 1 lecture being transferred outside)

Main Video Source URL: <https://www.youtube.com/watch?v=LgRZRHW9-14>

### Mapping Concept to Video Source

CONCEPT	VIDEO SEGMENT	DURATION (in min)
Concentration of solution	Seg 1- 0:10 – 0.51	0.41
Molarity	Seg 2- 0.52 – 2.19	1.67
Titration	Seg 3- 2.20 – 3.38	1.18
Apparatus	Seg 4- 3.40 – 5.17	1.77
Acid-base titration experiment	Seg 5- 5.19 – 8.32	3.13
Titration calculation	Seg 5- 8.35 – 10.41	2.06

**TOTAL DURATION - 10.48 min**

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Concept of preparation of molar solution</p> <p>(<b>Note:</b> By attempting Q1 &amp; 2 students will be able to know concept of preparation of molar solution)</p>	<p>Q1. What is molarity</p> <p>Q2. What is the difference between molarity and normality?</p>	<p>10 Min</p>	<p><b>Note:</b> Que. No 1 &amp; 2 is for <b>1 marks</b> each. Que no. 2 to 6 holds <b>2 mark</b> each.</p> <p><b>Total marks : 8</b></p> <p>•For Q1 &amp; Q2: Watch Seg 2 Pause</p>

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Basics about the acid base titration</p> <p><b>(Note:</b> By attempting Q3 to Q6 students will be able to understand how to calculate the concentration of acid or bases)</p>	<p>Q3. What is acid base titration?</p> <p>Q4. What is an equivalence point in titration?</p> <p>Q5. What is the role of indicator in a reaction?</p> <p>Q6. A solution has a pH 7.0 what would be the color of the solution, if phenolphthalein indicator was added</p>	<p>20 Min</p>	<ul style="list-style-type: none"> <li>•For Q3 and Q4: Watch Seg 3 &amp; 4 Pause</li> <li>• For Q5 and Q6: Watch Seg 5 &amp;</li> </ul> <p><b>[Imp Note: Submit answers 24 hrs before lecture]</b></p>



# In-class Activity Design -1

## Learning Objective(s) of In - Class Activity

After completion of activity students should be proficient in the following

- Determining the concentration of an acid or base by exactly neutralizing it with a standard solution of base or acid having known concentration
- Determining the molarity of the solution

## Key Concept(s) to be covered

- Concept of molarity
- Principle behind acid-base titration
- Acid-base titration experiment and calculation

# In-class Activity Design -2

Active Learning activity planned

Think-Pair-Share

Explain the strategy by giving details of

**What Teacher will do? ( Think phase: 6 min.)**

After initial discussion on the concept covered in the Out-of-class activity, teacher will pose the following question

**Q1:** How do the indicator work in titration

**What Students will do?**

Students will think individually and draw the concerned reactions

**What Teacher will do? (Pair phase: 15 min.)**

After 6 min. teacher will ask students to form pairs and discuss the step by step procedure to perform the acid-base titration

Now students will be ask to steps involved in acid base titration.

**What Student will do?**

In pairs students will discuss and understand the step involved in acid base titration

**What Teacher will do? (Share phase: 15 min.)**

Teacher will ask pairs to share their procedure of acid base titration so that correct procedure can be explained and after students sharing teacher will discuss the concept and will try eliminate any misconceptions.

## why TPS is an active learning strategy ? Justify

**Think Phase:** Allows students to think and explain individually upon the concept they had learn in out-of –class activity

**Pair Phase:** Stimulates discussion and analysis to identify correct procedure and extend cognitive level by discussing and understanding the procedure.

**Share phase:** Stimulates larger discussion and helps to eliminate misconceptions regarding the topic if any and students also get feedback.

Therefore TPS is an active learning strategy



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## **Student centric methods for enhancing learning experiences**

### **Sample copy of**

- Flipped class room activity model
- Think Pair Share model
- Peer instructions model

# FLIPPED CLASSROOM ACTIVITY

## For Pharmacognosy & Phytochemistry-II

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# Out-of-class Activity Design -1

## Learning Objective(s) of Out-of-Class Activity

After watching video students will be able to understand the Tannins on the basis of

- System of Classification of tannins.
- Basic ring structures involved in various classes of tannins.
- Physical and chemical properties of each class.
- Examples.

## Key Concept(s) to be covered

- Chemical structure of tannins involved in each class.
- Identification of Class
- Understanding Phenolic nuclei and linkage in each class
- Chemical test for identification



# About Out-of-Class Segment

- Meant mainly for Information-Transmission to student.
- Mostly help achieve lower-order cognitive levels (Recall-Understand-Apply)
- Teacher takes time to search and locate videos.
- Out-of-Class activity should not be too lengthy,  
(ideally think of 1 lecture being transferred outside)

Main Video Source URL: <https://www.youtube.com/watch?v=JWXqQxs2Xlc>

License of Video: CC-BY-SA (reuse allowed)

### Mapping Concept to Video Source

CONCEPT	VIDEO SEGMENT	DURATION (in min)
Introduction and System of classification of tannin	Seg 1- 0:00 - 1:15	1:15
Hydrolysable tannins its basic nuclei and linkage	Seg 2- 1:16-4:30	0:46
	Seg 3- 4:30- 8:56	3:16
	Seg 4- 9:00- 9:20	0:20
Condensed Tannins	Seg 5- 11:25- 12:35	1:10
Pseudo tannins	Seg 6- 14:38- 16:08	0:30

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Classification of tannins w.r.t its chemical properties and test</p> <p><b>(Note:</b> By attempting Q1 &amp; 2 students will be able to get an idea about classification based on chemical nuclei)</p>	<p>Q1. Draw the flow chart for classification of tannins.</p> <p>Q2. what are different phenolic acids present in hydrolysable tannins and draw its structure</p>	<p>15 Min</p>	<p><b>Note:</b> Que. No 1 &amp; 2 is for <b>2 marks</b> each. Que no. 3 to 7 holds <b>1 mark</b> each.</p>

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Identification of classes on the basis of chemical nature and test</p> <p><b>(Note:</b> By attempting Q3 to Q7 students will be able to understand reaction path, resonance and retrosynthesis)</p>	<p>Q3. what are true tannins?</p> <p>Q 4. hydrolysable tannins are esters of phenolic acid explain</p> <p>Q5. What are phlobaphenes?</p> <p>Q6. What is test for identification of pseudo tannins</p> <p>Q7: Solve Q1 &amp; Q2 of assignment section of the video</p>	<p>20 Min</p>	<ul style="list-style-type: none"> <li>•For Q3: Watch Seg 1 &amp; Pause</li> <li>•For Q4: Watch Seg 2 &amp; Pause</li> <li>•For Q5: Watch Seg 5 &amp; Pause</li> <li>•For Q6: Watch Seg 6 &amp; Pause</li> </ul> <p><b>[Imp Note: Submit answers 24 hrs before lecture]</b></p>

# In-class Activity Design -1

## Learning Objective(s) of In - Class Activity

After completion of activity students should be proficient in the following

- Classify the tannins with its basic nuclei
- Determining Chemical properties and chemical tests for various classes
- Quotes the examples for different classes of tannins

## Key Concept(s) to be covered

- Chemical linkage present in each class of tannins
- Basic chemical nuclei of classes
- Chemical test for identification

# In-class Activity Design -2

Active Learning activity planned

Think-Pair-Share

Explain the strategy by giving details of

**What Teacher will do? ( Think phase: 6 min.)**

After initial discussion on the concept covered in the Out-of-class activity, teacher will pose the following question

**Q1:** Mention the chemical test for identification for hydrolysable tannins and Condense tannins.

**What Students will do?**

Students will think individually and draw the concerned reactions

**What Teacher will do? (Pair phase: 15 min.)**

After 6 min. teacher will ask students to form pairs and discuss the reactions and identify the correct reactions for each class.

**What Student will do?**

In pairs students will identify the correct reactions and re-write it.

**What Teacher will do? (Share phase: 15 min.)**

Teacher will ask pairs to share their reaction and mechanism so that correct reactions and mechanism can be identified and after students sharing teacher will discuss the concept and will try eliminate any misconceptions.

## why TPS is an active learning strategy ? Justify

**Think Phase:** Allows students to think and rewrite individually upon the concept they had learn in out-of –class activity

**Pair Phase:** Stimulates discussion and analysis to identify correct reaction and extend cognitive level by discussing and drawing mechanism

**Share phase:** Stimulates larger discussion and helps to eliminate misconceptions regarding the topic if any and students also get feedback.

Therefore TPS is an active learning strategy





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## **Student centric methods for enhancing learning experiences**

### **Sample copy of**

- Flipped class room activity model
- Think Pair Share model
- Peer instructions model

# FLIPPED CLASSROOM ACTIVITY

## For Pharmaceutical Inorganic Chemistry-I

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# Out-of-class Activity Design -1

## Learning Objective(s) of Out-of-Class Activity

After watching video students will be able to understand buffered isotonic solution

- Term osmotic pressure
- Mechanism of hypotonic and hypertonic solution
- Methods to measure tonicity

## Key Concept(s) to be covered

- Understanding buffered isotonic solution
- hypotonic and hypertonic solution movement
- Understanding the Methods to measure tonicity

# About Out-of-Class Segment

- Meant mainly for Information-Transmission to student.
- Mostly help achieve lower-order cognitive levels (Recall-Understand-Apply)
- Teacher takes time to search and locate videos.
- Out-of-Class activity should not be too lengthy,  
(ideally think of 1 lecture being transferred outside)

Main Video Source URL: <https://www.youtube.com/watch?v=RxLBv4E-gGY>

License of Video: CC-BY-SA (reuse allowed)

### Mapping Concept to Video Source

CONCEPT	VIDEO SEGMENT	DURATION (in min)
buffered isotonic solution	Seg 1- 1:00 - 2:11	1:11
	Seg 2- 2:12- 3:10	0:98
hypotonic , isotonic & hypertonic solution	Seg 3- 3:10-4:48	1:38
	Seg 4- 4:49- 6:51	2:02
Understanding the Methods to measure tonicity	Seg 5- 6:52- 18:20	12:32

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Understanding terms like tonicity, types of solution based on the movement of solute and osmotic pressure.</p> <p><b>(Note:</b> By attempting Q1 &amp; 2 students will be able to know tonicity ,osmotic pressure and the types of solution based on tonicity)</p>	<p>Q1. What do you mean by tonicity and osmotic pressure</p> <p>Q2. Give the types of solution based on tonicity.</p>	<p>15 Min</p>	<p><b>Note:</b> Que. No 1 &amp; 6 is for <b>2 marks</b> each. Que no. 2 to 5 holds <b>1 mark</b> each.</p> <p><b>Total marks : 8</b> (* 50% of obtained marks will be credited to internal assessment. For e.g. if you get 6 mark, then 3M will be credited)</p> <p>•For Q1 &amp; Q2: Watch Seg 1 – 2 &amp; Pause</p>

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Understanding isotonicity and methods to measure tonicity.</p> <p><b>(Note:</b> By attempting Q3 to Q6 students will be able to isotonicity and methods to measure tonicity.</p>	<p>Q3. What do you mean by isotonic solution?</p> <p>Q4. What are methods to measure tonicity</p> <p>Q5: Solve Q3 &amp; Q4 of assignment section of the video</p>	<p>20 Min</p>	<ul style="list-style-type: none"> <li>•For Q3: Watch Seg 4 &amp; Pause</li> <li>•For Q4: Watch Seg 3 &amp; Pause</li> <li>•For Q5: Watch Seg 5 &amp; Pause</li> </ul> <p><b>[Imp Note: Submit answers 24 hrs before lecture]</b></p>



# In-class Activity Design -1

## Learning Objective(s) of In - Class Activity

After completion of activity students should be proficient in the following

- Determining tonicity of solution
- Understanding the Methods to measure tonicity

## Key Concept(s) to be covered

- Understanding buffered isotonic solution
- hypotonic and hypertonic solution movement
- Understanding the Methods to measure tonicity

# In-class Activity Design -2

Active Learning activity planned

Think-Pair-Share

Explain the strategy by giving details of

**What Teacher will do? ( Think phase: 6 min.)**

After initial discussion on the concept covered in the Out-of-class activity, teacher will pose the following question

**Q1:** What is class I Method to measure tonicity?

**What Students will do?**

Students will think individually and write the concerned topic.

**What Teacher will do? (Pair phase: 15 min.)**

After 6 min. teacher will ask students to form pairs and discuss the topic and identify the correct content.

Now students will be ask to write the concerned topic

**What Student will do?**

In pairs students will identify the correct content and will write in correct form.

**What Teacher will do? (Share phase: 15 min.)**

Teacher will ask pairs to share their written content, so that correct content can be identified and after students sharing teacher will discuss the concept and will try eliminate any misconceptions.

## why TPS is an active learning strategy ? Justify

**Think Phase:** Allows students to think and write individually upon the concept they had learn in out-of –class activity

**Pair Phase:** Stimulates discussion and analysis to identify correct concept and extend cognitive level by discussing and drawing mechanism

**Share phase:** Stimulates larger discussion and helps to eliminate misconceptions regarding the topic if any and students also get feedback.

Therefore TPS is an active learning strategy



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## **Student centric methods for enhancing learning experiences**

### **Sample copy of**

- Flipped class room activity model
- Think Pair Share model
- Peer instructions model

# FLIPPED CLASSROOM ACTIVITY

For Advanced Organic Chemistry-I

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# Out-of-class Activity Design -1

## Learning Objective(s) of Out-of-Class Activity

After watching video students will be able to understand & draw following elements using **G Chem Paint** Software

- Structures of organic intermediates like carbocations and free radicals
- Shifting of an electron and electron pair
- Reaction pathway (Using appropriate reaction arrow and curve arrows)
- Resonance structures

## Key Concept(s) to be covered

- Generation of organic intermediates
- Bonded & non-bonded electron movement
- Understanding the resonance and retrosynthetic pathway



# About Out-of-Class Segment

- Meant mainly for Information-Transmission to student.
- Mostly help achieve lower-order cognitive levels (Recall-Understand-Apply)
- Teacher takes time to search and locate videos.
- Out-of-Class activity should not be too lengthy,  
(ideally think of 1 lecture being transferred outside)

Main Video Source URL: <https://youtu.be/97Ds5mV1wyl>

License of Video: CC-BY-SA (reuse allowed)

### Mapping Concept to Video Source

CONCEPT	VIDEO SEGMENT	DURATION (in min)
Formation of Carbocations & free radicals	Seg 1- 0:00 - 3:12	3:12
	Seg 2- 3:13- 5:09	1:96
Reaction pathway & resonance	Seg 3- 5:10-5:56	0:46
	Seg 4- 5:57- 6:47	0:90
Retrosynthetic pathway, Summary & Assignment	Seg 5- 6:48- 8:29	1:81

**TOTAL DURATION - 9: 27 min**

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Drawing structures of organic intermediates and understanding shifting of electrons</p> <p><b>(Note:</b> By attempting Q1 &amp; 2 students will be able to know homo &amp; hetero bond fission to form free radicals &amp; carbocations)</p>	<p>Q1. Draw intermediates of <b>a</b> &amp; <b>b</b> by G Chem Paint using correct arrows</p> <p>a)</p> <p>b)</p> <p>Q2. Why carbon get positive charge after bond fission with halogen?</p>	<p>15 Min</p>	<p><b>Note:</b> Que. No 1 &amp; 6 is for <b>2 marks</b> each. Que no. 2 to 5 holds <b>1 mark</b> each.</p> <p><b>Total marks : 8</b> (* 50% of obtained marks will be credited to internal assessment. For e.g. if you get 6 mark, then 3M will be credited)</p> <p>•For Q1 &amp; Q2: Watch Seg 1 – 2 &amp; Pause</p>

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Reaction pathway (Using appropriate reaction arrow and curve arrows) &amp; Resonance structure</p> <p><b>(Note:</b> By attempting Q3 to Q6 students will be able to understand reaction path, resonance and retrosynthesis)</p>	<p>Q3. How reaction path is created in G Chem Paint</p> <p>Q4. Draw resonance structures of acetate ion</p> <p>Q5. What is retrosynthetic pathway ?</p> <p>Q6: Solve Q1 &amp; Q2 of assignment section of the video</p>	<p>20 Min</p>	<ul style="list-style-type: none"> <li>•For Q3: Watch Seg 3 &amp; Pause</li> <li>•For Q4: Watch Seg 4 &amp; Pause</li> <li>•For Q5: Watch Seg 5 &amp; Pause</li> <li>•For Q6: Watch Seg 5 &amp; Pause</li> </ul> <p><b>[Imp Note: Submit answers 24 hrs before lecture]</b></p>

# In-class Activity Design -1

## Learning Objective(s) of In - Class Activity

After completion of activity students should be proficient in the following

- Determining organic intermediate formation
- Application of the concept in drawing related reaction mechanisms

## Key Concept(s) to be covered

- Homolytic & heterolytic bond fission
- Electronegativity and electron movement
- Reaction conditions and mechanisms

# In-class Activity Design -2

Active Learning activity planned

Think-Pair-Share

Explain the strategy by giving details of

**What Teacher will do? ( Think phase: 6 min.)**

After initial discussion on the concept covered in the Out-of-class activity, teacher will pose the following question

**Q1:** Draw two reactions of Alkyl halide with appropriate conditions which will proceed via carbocation and free radical formation

**What Students will do?**

Students will think individually and draw the concerned reactions

**What Teacher will do? (Pair phase: 15 min.)**

After 6 min. teacher will ask students to form pairs and discuss the reactions and identify the correct reactions.

Now students will be ask to draw complete mechanisms of those reactions by using appropriate arrows and showing electron movement.

**What Student will do?**

In pairs students will identify the correct reactions and will draw their mechanism

**What Teacher will do? (Share phase: 15 min.)**

Teacher will ask pairs to share their reaction and mechanism so that correct reactions and mechanism can be identified and after students sharing teacher will discuss the concept and will try eliminate any misconceptions.

## why TPS is an active learning strategy ? Justify

**Think Phase:** Allows students to think and draw individually upon the concept they had learn in out-of –class activity

**Pair Phase:** Stimulates discussion and analysis to identify correct reaction and extend cognitive level by discussing and drawing mechanism

**Share phase:** Stimulates larger discussion and helps to eliminate misconceptions regarding the topic if any and students also get feedback.

Therefore TPS is an active learning strategy





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## Student centric methods for enhancing learning experiences

### Sample copy of

- Flipped class room activity model
- Think Pair Share model
- Peer instructions model

# FLIPPED CLASSROOM ACTIVITY

For Pharmacology - III

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# Out-of-class Activity Design -1

## Learning Objective(s) of Out-of-Class Activity

After watching video students will be able to understand Antimicrobial Drugs

- Definition of Antimicrobials and Antibiotics and other Associated terms
- Basic concept of Antimicrobial therapy
- Different basis of Classification
- Examples of each Class

## Key Concept(s) to be covered

- Basic Concept and Definition of Antimicrobials
- Difference between Antimicrobials and Antibiotics
- Understanding the different basis of classification of Antimicrobials

# About Out-of-Class Segment

- Meant mainly for Information-Transmission to student.
- Mostly help achieve lower-order cognitive levels (Recall-Understand-Apply)
- Teacher takes time to search and locate videos.
- Out-of-Class activity should not be too lengthy,  
(ideally think of 1 lecture being transferred outside)

Main Video Source URL: <https://www.youtube.com/watch?v=nRMe15DYeI8>

License of Video: CC-BY-SA (reuse allowed)

### Mapping Concept to Video Source

CONCEPT	VIDEO SEGMENT	DURATION (in min)
Definition and Introduction of antimicrobial drugs	Seg 1- 0:00 - 0:58	0:58
	Seg 2- 0:59- 4:16	3:15
Classification of Antimicrobial drugs on different basis e.g. Chemical Structures	Seg 3- 4:17-4:27	0:10
	Seg 4- 4:28- 7:18	2:50
Classification on basis of Mechanism and others, Summary	Seg 5- 7:20- 12:40	5:20

**TOTAL DURATION - 12: 40 min**

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Understanding the basic concept about Antimicrobial Classifications</p> <p><b>(Note:</b> By attempting Q1 &amp; 2 students will be able to know basic similarities and Differences in Concepts of Antimicrobials)</p>	<p>Q1. Define the following term with examples</p> <p>a) Antimicrobial drugs</p> <p>b) Antibiotics</p> <p>Q2. What is the Difference in between Antimicrobials and Antibiotics?</p>	<p>15 Min</p>	<p><b>Note:</b> Que. No 1 &amp; 6 is for <b>2 marks</b> each. Que no. 2 to 5 holds <b>1 mark</b> each.</p> <p><b>Total marks : 8</b> (* 50% of obtained marks will be credited to internal assessment. For e.g. if you get 6 mark, then 3M will be credited)</p> <p><b>•For Q1 &amp; Q2: Watch Seg 1 – 2 &amp; Pause</b></p>

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Classification Based on Chemical Structure, Mechanism of Action and Others</p> <p><b>(Note:</b> By attempting Q3 to Q6 students will be able to understand Different basis of Classification of Antimicrobials)</p>	<p>Q3. How Antimicrobials are classified on basis of Chemical Structure.</p> <p>Q4. Classify the Antimicrobials on basis of Mechanism of Action.</p> <p>Q5. What are the other ways of Classification of Antimicrobials ?</p> <p>Q6: Solve Q1 &amp; Q2 of assignment section of the video</p>	<p>20 Min</p>	<ul style="list-style-type: none"> <li>•For Q3: Watch Seg 3 &amp; Pause</li> <li>•For Q4: Watch Seg 4 &amp; Pause</li> <li>•For Q5: Watch Seg 5 &amp; Pause</li> <li>•For Q6: Watch Seg 5 &amp; Pause</li> </ul> <p><b>[Imp Note: Submit answers 24 hrs before lecture]</b></p>



# In-class Activity Design -1

## Learning Objective(s) of In - Class Activity

After completion of activity students should be proficient in the following

- Understand the Basic Concept of Antimicrobial drugs and their Classification with Example.
- Reasons of Different basis of classifications of Antimicrobials and their chemical structure, mechanism of actions and other basis and their Applications

## Key Concept(s) to be covered

- Definitions of Different terminologies used in Antimicrobials
- Basic similarities and Difference in concept of Antimicrobials
- Classification on basis of Chemical structure, mechanism of Action and Others with examples and their Application.

# In-class Activity Design -2

Active Learning activity planned

Think-Pair-Share

Explain the strategy by giving details of

**What Teacher will do? ( Think phase: 6 min.)**

After initial discussion on the concept covered in the Out-of-class activity, teacher will pose the following question

**Q1:** Enlist and Define the different terminology used in Antimicrobial therapy.

**What Students will do?**

Students will think individually and enlist different terms used in Antimicrobial Therapy along with their examples.

**What Teacher will do? (Pair phase: 15 min.)**

After 6 min. teacher will ask students to form pairs and discuss the Concept and Enlist the Terminologies and different bases of Antimicrobials classification.

Now students will be ask to Classify complete Antimicrobial drugs on Different Basis like Chemical Structure, mechanisms of actions and other ways.

**What Student will do?**

In pairs students will identify the correct Classification and will write down it with examples.

**What Teacher will do? (Share phase: 15 min.)**

Teacher will ask pairs to share their Classification along with examples so that correct Classification along with examples can be identified and after students sharing teacher will discuss the concept and will try eliminate any misconceptions.

## why TPS is an active learning strategy ? Justify

**Think Phase:** Allows students to think and Classify Antimicrobials individually upon the concept they had learn in out-of –class activity

**Pair Phase:** Stimulates discussion and analysis to identify correct Classification with example and extend cognitive level by discussing and drawing tree diagrams of Different Classifications.

**Share phase:** Stimulates larger discussion and helps to eliminate misconceptions regarding the topic if any and students also get feedback.

Therefore TPS is an active learning strategy



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## Student centric methods for enhancing learning experiences

### Sample copy of

- Flipped class room activity model
- Think Pair Share model
- Peer instructions model

# **FLIPPED CLASSROOM ACTIVITY**

## **For Pharmaceutical Biotechnology**

**Dr. Rajveer Bhaskar**

Associate Professor

Dept. of Pharmaceutical Quality Assurance & Industrial Pharmacy

R.C. Patel Institute of Pharmaceutical Education & Research Shirpur (M.S.) India.

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# Out-of-class Activity Design -1

## Learning Objective(s) of Out-of-Class Activity

**After watching video students will be able to understand Basic principles of genetic engineering.**

- Study of cloning vectors
- restriction endonucleases and DNA ligase
- Recombinant DNA technology
- Application of r DNA technology

## Key Concept(s) to be covered

- Role of vectors in genetic engineering
- Role of enzymes in genetic engineering
- Application of genetic engineering in medicine



# About Out-of-Class Segment

- Meant mainly for Information-Transmission to student.
- Mostly help achieve lower-order cognitive levels (Recall-Understand-Apply)
- Teacher takes time to search and locate videos.
- Out-of-Class activity should not be too lengthy,  
(ideally think of 1 lecture being transferred outside)

Main Video

Source URL: [https://www.youtube.com/watch?v=ZWgzPdb\\_Bso&ab\\_channel=biologyexams4u](https://www.youtube.com/watch?v=ZWgzPdb_Bso&ab_channel=biologyexams4u)

License of Video: CC-BY-SA (reuse allowed)

### Mapping Concept to Video Source

CONCEPT	VIDEO SEGMENT	DURATION (in min)
Definition and summary of steps in rDNA technology	Seg 1- 0:00 – 1:25	1:25
Step 1 identification and isolation of gene of interest	Seg 2- 1:26 – 2:15	0:49
Step 2: Insertion of this isolated gene in a suitable vector using restriction enzyme and ligase.	Seg 3- 2:16 – 4:10	1:54
Step 3: Introduction of this vector into a suitable organism/ cell called host	Seg 4- 4:11 – 5:23	1:12
Step 4: Selection of the transformed host cell.	Seg 5- 5:24 – 6:35	1:11
Step 5: Multiplication or expression of the introduced gene in the host	Seg 5- 6:36- 8:16	1:40

**TOTAL DURATION - 8:16 min**

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Drawing process of rDNA technique and understanding the mechanism</p> <p>(<b>Note:</b> By attempting Q1 &amp; 2 students will be able to understand the principle of rDNA technique)</p>	<p>Q1. Draw steps of rDNA technique using correct arrows</p> <p>Q2. Why is recombination required?</p>	<p>15 Min</p>	<p><b>Note:</b> Que. No 1 &amp; 6 is for <b>2 marks</b> each.            Que no. 2 to 5 holds <b>1 mark</b> each.  <b>Total marks : 8</b>            (* 50% of obtained marks will be credited to internal assessment. For e.g., if you get 6 mark, then 3M will be credited)  <b>•For Q1 &amp; Q2: Watch Seg 1 – 2 &amp; Pause</b></p>

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Utilization of host cell and enzymes</p> <p>(Note: By attempting Q3 to Q6 students will be able to understand utility of host cell and enzymes)</p>	<p>Q3. How is host cell selected?</p> <p>Q4. Draw the structure of host cell with labelling.</p> <p>Q5. What is the role of DNA ligase ?</p> <p>Q6: What is the role of restriction endonuclease?</p>	<p>20 Min</p>	<p>[Imp Note: Submit answers 24 hrs before lecture]</p>

# In-class Activity Design -1

## Learning Objective(s) of In - Class Activity

After completion of activity students should be proficient in the following

- Understanding the principle and technique of rDNA technology
- Application of the rDNA technology

## Key Concept(s) to be covered

- Vector and host cell
- Endo and Exo restriction endonuclease
- DNA ligase and topoisomerase

# In-class Activity Design -2

Active Learning activity planned

Think-Pair-Share

Explain the strategy by giving details of

**What Teacher will do? ( Think phase: 6 min.)**

After initial discussion on the concept covered in the Out-of-class activity, teacher will pose the following question

**Q1:** Explain the steps in rDNA technology.

**What Students will do?**

Students will think individually and draw the basic steps involved.

**What Teacher will do? (Pair phase: 15 min.)**

After 6 min. teacher will ask students to form pairs and discuss the principle and identify the correct elements used in rDNA technology.

Now students will ask to draw complete mechanisms of rDNA technique by using appropriate arrows and showing gene movement.

**What Student will do?**

In pairs students will write the correct principle and will draw the mechanism.

**What Teacher will do? (Share phase: 15 min.)**

Teacher will ask pairs to share their principle and mechanism so that correct rDNA mechanism be identified and after students and teacher will discuss the concept and will try eliminate any misconceptions.

## why TPS is an active learning strategy ? Justify

**Think Phase:** Allows students to think and write individually upon the concept they had learn in out – of – class activity

**Pair Phase:** Stimulates discussion and analysis to identify correct principle by discussing and drawing vectors and host cell.

**Share phase:** Stimulates larger discussion and helps to eliminate misconceptions regarding the topic if any and students also get feedback.

Therefore, TPS is an active learning strategy





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## **Student centric methods for enhancing learning experiences**

### **Sample copy of**

- Flipped class room activity model
- Think Pair Share model
- Peer instructions model

# FLIPPED CLASSROOM ACTIVITY

For Medicinal Chemistry-III

**Dr. Akhil Nagar**

Assistant Professor

Dept. of Pharmaceutical Chemistry

R.C. Patel Institute of Pharmaceutical Education & Research Shirpur (M.S.)

India.

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# Out-of-class Activity Design -1

## Learning Objective(s) of Out-of-Class Activity

After watching video students will be able to understand the concept of protein synthesis in human body.

- The different process takes place during protein synthesis could be understood.
- The process of translation and transcription could be understood by 3-D graphics
- The synthesis of new DNA or protein could be understood.

## Key Concept(s) to be covered

- To understand the concept of protein synthesis
- To understand the role of m-RNA, ATP and ribosomes.
- Understanding the genome sequence, initiation and termination during new DNA formation

# About Out-of-Class Segment

- Meant mainly for Information-Transmission to student.
- Mostly help achieve lower-order cognitive levels (Recall-Understand-Apply)
- Teacher takes time to search and locate videos.
- Out-of-Class activity should not be too lengthy,  
(ideally think of 1 lecture being transferred outside)

Main Video Source URL: <https://youtu.be/NDIJexTT9j0>

License of Video: [www.designmate.com](http://www.designmate.com)

### Mapping Concept to Video Source

CONCEPT	VIDEO SEGMENT	DURATION (in min)
Process of transcription and role of m-RNA and sequence of amino acid	Seg 1- 0:00 - 1:24	1:24
	Seg 2- 1:24- 2:55	2:55
Process of Translation, role of t-RNA, ATP Initiation of new DNA synthesis and formation of codon	Seg 3- 2:59-4:18	3:18
	Seg 4- 4:19- 7:44	3:40
Elongation of New DNA	Seg 5- 7:44- 8:40	1:00

**TOTAL DURATION - 8: 40 min**

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>To understand the concept and process of protein synthesis.</p> <p><b>(Note:</b> By attempting Q.1 &amp; 2 students will be able to know the steps and role of protein synthesis with its importance)</p>	<p>Q1. What is protein synthesis and its importance</p> <p>a)</p> <p>b)</p> <p>Q2. Under how many process the protein synthesis takes place?</p>	<p>15 Min</p>	<p><b>Note:</b> Que. No 1 &amp; 2 is for <b>2 marks</b> each. Que no. 2 to 5 holds <b>1 mark</b> each.</p> <p><b>Total marks : 8</b> (* 50% of obtained marks will be credited to internal assessment. For e.g. if you get 6 mark, then 3M will be credited)</p> <p>•For Q1 &amp; Q2: Watch Seg 1 – 2 &amp; Pause</p>

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
<p>Protein synthesis pathway and steps involved.</p> <p><b>(Note:</b> By attempting Q3 to Q6 students will be able to understand the types of protein synthesis.</p>	<p>Q3. What is the role of ATP in protein synthesis.</p> <p>Q4. Why ribosomes are important in translation.</p> <p>Q5. What are the three sites defined in ribosomes.</p> <p>Q6: How elongation and termination process differs</p>	<p>20 Min</p>	<ul style="list-style-type: none"> <li>•For Q3: Watch Seg 3 &amp; Pause</li> <li>•For Q4: Watch Seg 4 &amp; Pause</li> <li>•For Q5: Watch Seg 5 &amp; Pause</li> <li>•For Q6: Watch Seg 5 &amp; Pause</li> </ul> <p><b>[Imp Note: Submit answers 24 hrs before lecture]</b></p>



# In-class Activity Design -1

## Learning Objective(s) of In - Class Activity

After completion of activity students should be proficient in the following

- Understanding the concept of protein synthesis.
- Differentiating the process of transcription and Translation.

## Key Concept(s) to be covered

- To understand the concept of protein synthesis
- To understand the role of m-RNA, ATP and ribosomes.
- Understanding the genome sequence, initiation and termination during new DNA formation

# In-class Activity Design -2

Active Learning activity planned

Think-Pair-Share

Explain the strategy by giving details of

**What Teacher will do? ( Think phase: 6 min.)**

After initial discussion on the concept covered in the Out-of-class activity, teacher will pose the following question

**Q1:** What is protein synthesis and its importance

**What Students will do?**

Students will think individually to answer the growth mechanism related to protein synthesis.

**What Teacher will do? (Pair phase: 15 min.)**

After 6 min. teacher will ask students to form pairs and discuss how the transcription and translation are different from each other.

Now students will be asked to write the two processes and steps included in each.

**What Student will do?**

In pairs students will discuss and write two steps and mechanisms included in each step.

**What Teacher will do? (Share phase: 15 min.)**

Teacher will ask pairs to share their concepts so that correct mechanisms can be identified and after students share, the teacher will discuss the concept and will try to eliminate any misconceptions.

## why TPS is an active learning strategy ? Justify

**Think Phase:** Allows students to think and understand individually upon the concept they had learn in out-of –class activity

**Pair Phase:** Stimulates discussion and analysis to identify correct mechanism and extend cognitive level by discussing

**Share phase:** Stimulates larger discussion and helps to eliminate misconceptions regarding the topic if any and students also get feedback.

Therefore, TPS is an active learning strategy



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## **Student centric methods for enhancing learning experiences**

### **Sample copy of**

- Flipped class room activity model
- Think Pair Share model
- Peer instructions model

# Flipped Classroom Activity with Peer Instruction Strategy

## Harun M. Patel

1

Diabetes Mellitus and its type

Pharmacology

Pharmacy

2<sup>nd</sup> Year Undergraduate Students

North Maharashtra University Jalgaon

Dept. of Pharmaceutical Chemistry

R.C. Patel Institute of Pharmaceutical Education & Research Shirpur (M.S.) India.

# Out-of-class Activity Design -1

2

Learning Objective(s) of Out-of-Class Activity:

- At the end of watching the videos student should be able to,
1. Definition of Diabetes (Understand Level)
  2. Types of Diabetes (Understand Level)
  3. Risk Factors( Understand Level)
  4. How to avoid Diabetes (Apply Level)

Key Concept(s) to be covered:

1. Diabetes Mellitus
2. IDDM and NIDDM Diabetes
3. Risk Factor and Symptoms

# Out-of-class Activity Design - 2

3

Uploaded Video URL <https://www.youtube.com/watch?v=2jTLBWhSGmw>

License of Video [CC-BY-SA](#)

Duration of Screencast [7.26](#)



# Out-of-class Activity Design - 3

4

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
Q1:Definition of Diabetes (Understand Level)	Q.1 What is Diabetes a) Metabolic disease b) Deficiency of Insulin c) Both a and b d) None of the above	10 Min	Watch V1 and then answer Q1
Q2:Types of Diabetes (Understand Level)	Q 2. Which of the following diabetes needs insulin a) Type-I                      b) Type-II c) Both a and b      d) None of the above Q 3. Which diabetes is not insulin dependant a) Type-I                      b) Type-II c) Both a and b      d) None of the above	10 Min	Watch V1 and then answer Q2

# Out-of-class Activity Design - 3

5

## Aligning Assessment with Learning Objective

Learning Objective	Assessment Strategy	Expected duration (in min)	Additional Instructions (if any)
Q3: Risk Factors	Q4. Which is risk factors for Type-I diabetes a) Auto-immune disease b) Overweight c) Blood pressure d) High Lipid	10 Min	Watch V1 and then answer Q3
Q4. How to avoid Diabetes	Q5. Which are factors responsible for Type-2 DM a) Overweight b) Age c) Genetics d) All of the above	10 Min	Watch V1 and then answer Q4

Expected activity duration **40 Minutes**

# In-class Activity Design -1

6

Learning Objective(s) of In-Class Activity:

At the end of the class, students will be able to...

- 1) What is diabetes
- 2) What are the types of diabetes
- 3) What are the symptoms and risk factors
- 4) How we can avoid diabetes

Key Concept(s) to be covered:

1. Diabetes and its types
2. Symptoms and risk factors

# In-class Activity Design -2

7

Active Learning activity(ies) that you plan to do

1. Think Pair and Share to understand the Diabetes

Explain the strategy by giving details of:

1. What Teacher will do? Teacher will involved in discussion with students about Diabetes
2. What Students will do? Students will discuss about Diabetes, Symptoms and risk factors

Justify why the above is an active learning strategy

They are required to think deeply about the content they were familiarized in out-of-class and do higher order thinking. There is also feedback provided (either through peer discussion or instructor summary)

# In-class Activity Design -2

8

Active Learning activity(ies) that you plan to do

Real world problem solving using

1. Think-Pair-Share

Concept clarification using

1. Peer Instruction

# In-class Activity Design -2

## Peer Instruction Strategy – What Teacher Does

Pose the two PI questions at the start of the class and provide summary of basic identities and expression simplification:

Q.1 What is Diabetes

- a) Metabolic disease
- b) Deficiency of Insulin
- c) Both a and b
- d) None of the above

Q 2. Which of the following diabetes needs insulin

- a) Type-I                      b) Type-II
- c) Both a and b      d) None of the above

Q 3. Which diabetes is not insulin dependant

- a) Type-I                      b) Type-II
- c) Both a and b      d) None of the above

# In-class Activity Design -2

10

Peer Instruction Strategy – What Student Does

Then they will discuss with peers and come to consensus

# In-class Activity Design -2

11

## TPS Strategy – What Instructor does

Think (~2 minutes)

Instruction: Which is risk factors for Type-I diabetes whether Auto-immune disease, Overweight, Blood pressure or High Lipid

Think individually and identify the risk factors for Type-I diabetes



# In-class Activity Design -2

12

## TPS Strategy – What Instructor does

Pair (~5 minutes)

Instruction: Now pair up and compare your answers. Agree on one final answer.

While students are pairing and discussing, instructor goes to 2~3 sections to see what they are doing.

# In-class Activity Design -2

13

## TPS Strategy – What Instructor does

Share (~8 minutes)

Instructor asks a group to share their answer with class and see whether there are different answers. After sharing is done, instructor gives feedback on the correct solution and discuss the risk factors associated with Type-I diabetes

# In-class Activity Design -2

14

Justify why the above is an active learning strategy

In both the above strategies, students are required to go beyond mere listening and execution of prescribed steps. They are required to think deeply about the content they were familiarized in out-of-class and do higher order thinking. There is also feedback provided (either through peer discussion or instructor summary)