

Animal and Plant Biotechnology

<u>Day</u>	<u>Estimated Time</u>	<u>Discussion Items</u>	<u>Activity and Deliverables</u>
Orientation	TBA	Registration	
	TBA	<ul style="list-style-type: none"> • General Session • Introduction of Host & Site Logistics • Introduction of Lead Teachers, Participants • CASE Institute Expectations and Portfolio • CASE Curriculum Access 	<ul style="list-style-type: none"> • Activity 1.1.2 Biotechnology Notebooks
	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day <ul style="list-style-type: none"> ○ Review calculations for 1.2.3, 1.2.4, 1.2.5, and 1.2.6 ▪ Review Textbook Chapters 1 and 2 <ul style="list-style-type: none"> ○ Chapter 1 Reading Focus- Refer to Teacher's Notes- Lessons 1.1 for Points of Emphasis ○ Chapter 2 Reading Focus- Refer to Teacher's Notes- Lessons 1.2 for Points of Emphasis 	
Day 1	8:00 - 12:00	<ul style="list-style-type: none"> • Overview Unit 1 • Lesson 1.1 Foundations of Biotechnology • Lesson 1.2 Standard Operating Procedures 	<ul style="list-style-type: none"> • Activity 1.1.1 Defining Biotechnology • Project 1.1.3 When in Time? • Activity 1.1.4 Ethical Dilemmas • Activity 1.2.1 Surrounded by Safety • Activity 1.2.2 Deciphering MSDS
	12:00 - 1:00	Lunch	
	1:00 - 5:00		<ul style="list-style-type: none"> • Activity 1.2.3 Making Percent Solutions • Activity 1.2.4 Making Molar Solutions • Activity 1.2.5 Moving Microliters • Activity 1.2.6 Mixing Media

	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day <ul style="list-style-type: none"> ○ Point of Emphasis- Review Teacher Preparation for Activity 2.1.5- Diced Lambda DNA ▪ Read Chapters 3 & 4 for following day <ul style="list-style-type: none"> ○ Chapter 3 Reading Focus- Refer to Teacher's Notes- Lessons 1.3 for Points of Emphasis ○ Chapter 4 Reading Focus- Refer to Teacher's Notes- Lessons 1.3 and 2.1 for Points of Emphasis
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<u>Day</u>	<u>Estimated Time</u>	<u>Discussion Items</u>	<u>Activity and Deliverables</u>
Day 2	8:00 - 12:00	<ul style="list-style-type: none"> • Lesson 1.3 Basics of Cells and DNA • Project 1.3.3 Replicating DNA • Activity 1.34. From DNA to Genes • Overview Unit 2 • Lesson 2.1 Diving into DNA 	<ul style="list-style-type: none"> • Activity 1.3.1 Growing Cells • Activity 1.3.2 DNA Strands • Activity 2.1.1 DNA Extraction Protocol • Activity 2.1.2 Agarose Gels
	12:00 - 1:00	Lunch	
	1:00 - 5:00		<ul style="list-style-type: none"> • Activity 2.1.3 Electrophoresis Currents • Activity 2.1.4 Cutting Up DNA • Activity 2.1.5 Diced Lambda DNA
	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day <ul style="list-style-type: none"> ○ Point of Emphasis- Review Teacher Preparation for Problem 2.1.6- The Chewed Shoe, Activity 2.21- Transformation Preparation, and Activity 2.2.2- Glowing Genes ▪ Read Chapter 5 for following day <ul style="list-style-type: none"> ○ Chapter 5 Reading Focus- Refer to Teacher's Notes, Lesson 2.1 for Points of Emphasis 	
Day 3	8:00 - 12:00	<ul style="list-style-type: none"> • Lesson 2.2 Genetic Transformers 	<ul style="list-style-type: none"> • Activity 1.3.1 Growing Cells • Activity 2.1.5 Diced Lambda DNA • Problem 2.1.6 The Chewed Shoe • Activity 2.2.1 Transformation Preparation
	12:00 - 1:00	Lunch	
	1:00 - 5:00		<ul style="list-style-type: none"> • Activity 2.2.2 Glowing Genes • Project 2.2.4 Rooted in Research
	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day <ul style="list-style-type: none"> ○ Point of Emphasis- Review Teacher Preparation for Activity 2.12- Where's the protein?, Activity 3.1.3- Comparing Protein Assays, and Activity 3.1.4- ELISA Testing ▪ Read Chapter 7 for following day <ul style="list-style-type: none"> ○ Chapter 7 Reading Focus- Refer to Teacher's Notes, Lesson 3.1 for Points of Emphasis 	

Day 4	8:00 - 12:00	<ul style="list-style-type: none"> • Overview Unit 3 • Lesson 3.1 Protein Processes 	<ul style="list-style-type: none"> • Problem 2.1.6 The Chewed Shoe • Activity 3.1.1 Transcription and Translation • Activity 3.1.2 Where's the Protein?
	12:00 - 1:00	Lunch	
	1:00 - 5:00		<ul style="list-style-type: none"> • Activity 3.1.3 Comparing Protein Assays • Activity 3.1.4 ELISA Testing • Activity 2.2.2 Glowing Genes • Activity 2.2.3 Protein Purification
	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day <ul style="list-style-type: none"> ○ Point of Emphasis- Review Teacher Preparation for Activity 4.1.2- Planting the Seeds of GMOs and Activity 4.1.3- Grocery Store GMOs ▪ Read Chapter 6 for following day <ul style="list-style-type: none"> ○ Refer to Teacher's Notes, Lesson 4.1 for Points of Emphasis 	

<u>Day</u>	<u>Estimated Time</u>	<u>Discussion Items</u>	<u>Activity and Deliverables</u>
Day 5	8:00 - 12:00	<ul style="list-style-type: none"> • Overview Unit 4 • Lesson 4.1 Genetically Modified Organisms • Activity <ul style="list-style-type: none"> • 4.1.1 What is a GMO? • Preparing and programming PCR 	<ul style="list-style-type: none"> • Activity 2.2.3 Protein Purification • Activity 4.1.2 Planting the Seeds of GMOs • Activity 4.1.3 Grocery Store GMOs
	12:00 - 1:00	Lunch	
	1:00 - 5:00		<ul style="list-style-type: none"> • Activity 2.2.3 Protein Purification • Project 4.1.4 Perceptions of GMOs • Activity 4.1.3 Grocery Store GMOs
	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day <ul style="list-style-type: none"> ○ Point of Emphasis- Review Teacher Preparation for Activity 4.2.2- Corn Tissue Culture, Project 4.4.2- Biofuels in a Bag, Activity 4.3.1- Animal Immunology, and Activity 4.3.3- Marker Assisted Selection 	
Day 6	8:00 - 12:00	<ul style="list-style-type: none"> • Lesson 4.2 Performance Enhanced Plants 	<ul style="list-style-type: none"> • Activity 4.1.3 Grocery Store GMOs • Activity 4.2.1 Getting Genes into Plants • Activity 4.2.2 Corn Tissue Culture • Activity 4.2.3 Engineering Plants • Problem 4.2.4 The Complete Carrot • Project 4.4.2 Biofuels in a Bag or Biofuels
	12:00 - 1:00	Lunch	

	1:00 - 5:00	<ul style="list-style-type: none"> • Lesson 4.3 Animal Applications 	<ul style="list-style-type: none"> • Problem 4.2.4 The Complete Carrot • Project 4.4.2 Biofuels in a Bag or Biofuels • Activity 4.3.1 Animal Immunology • Project 4.3.2 reproductive Technologies • Activity 4.3.3 Marker Assisted Selection
	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day <ul style="list-style-type: none"> ○ Point of Emphasis- Review Teacher Preparation for Project 4.4.2- Biofuels in a Bag or Project 4.4.2 Biofuels (depending on assignment) and Project 4.4.1- Bioremediation 	
Day 7	8:00 - 12:00		<ul style="list-style-type: none"> • Project 4.3.2 Reproductive Technologies • Activity 4.3.3 Marker Assisted Selection • Project 4.3.4 Zoonosis Diagnosis
	12:00 - 1:00	Lunch	
	1:00 - 5:00	<ul style="list-style-type: none"> • Lesson 4.4 Everyday Biotechnology 	<ul style="list-style-type: none"> • Project 4.4.1 Bioremediation • Project 4.4.2 Biofuels in a Bag or Biofuels • Project 4.4.3 Precautionary Principles
	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day <ul style="list-style-type: none"> ○ Point of Emphasis- Review assigned demonstration ▪ Read Chapter 9 for following day <ul style="list-style-type: none"> ○ Refer to Teacher's Notes, Lesson 5.1 for Points of Emphasis 	
Day 8	8:00 - 12:00	<ul style="list-style-type: none"> • Overview Unit 5 • Lesson 5.1 Independent Researchers 	<ul style="list-style-type: none"> • Activity 4.3.3 Marker Assisted Selection • Project 4.4.1 Bioremediation • Activity 5.1.1 Inquisitive Minds • Project 5.1.2 Investigative methods • Demonstration Preparation
	12:00 - 1:00	Lunch	
	1:00 - 5:00	<ul style="list-style-type: none"> • Lesson 5.2 From Lab to Production 	<ul style="list-style-type: none"> • Activity 5.2.1 Bioinformatics • Project 5.2.2 Regulatory Roundup • Demonstration Presentations
	Homework:	<ul style="list-style-type: none"> ▪ Pre-read material for following day ▪ Read Teacher's Notes for following day 	

Day 9	8:00 - 12:00		<ul style="list-style-type: none"> • Project 4.4.1 Bioremediation • Project 4.4.2 Biofuels in a Bag or Biofuels • Demonstration Presentations • Project 5.2.3 Making Research a Reality • Activity 5.2.4 Ethical Dilemmas Revisited • Problem 5.2.5 To Infinity and Beyond • Project 5.1.2 Inquisitive Minds Poster
	12:00 - 1:00	Lunch, CI Survey, Awards	

Congratulations on completing your CASE Institute!