

**Johns Hopkins Center for Talented Youth**  
**Course Outline and Lab Activity Form**

Course: Fast Paced High School Biology

Text: Biology, Miller and Levine

Note: \*the asterisk indicates consumables for labs selected

Day		Topics	Activities	Lab/Equipment
Intro—Sunday		Pretest,	Lab inventory, safety video, contracts	
Day 1 Monday	Morning (9-12)	Course Outline and Expectations, Basic Chemistry – terminology & macromolecules	Practice and review exercises, Think/pair share, Teams, safety contracts	
	Afternoon (1-3:30)	Macromolecule Structure	Lab activity	Molecular model kits
	(Set up lab for Tuesday)  -clean up lab from previous course.	Food Nutrient Analysis Kit (LS1)	Carbohydrate ID lab; lab rubric  -select groups for 8 stations for the rotation (LS) on last day.	Hot water bath (or hot plate and large beaker) 3 sets Tongs/eye droppers Test tube rack (9) Test tubes *Glucose (dextrose) *Sucrose *Starch *Benedict's Solution *IKI? or Iodine?
	Evening		Readings and 2 lab write ups, <b>homework questions</b>	
Day 2 Tuesday	Morning	Cell Theory, Surface area to Volume, organelles, Plasma membrane and membrane transport, diffusion, osmosis	Problem solving activity Cooperative group-organelle function(cut/paste) Think/pair share on Plant vs. Animal—Venn Plasma membrane: color and fill with rubric	Glue sticks Scissors
	Afternoon Set up lab for Wed	Review Diffusion/passive transport/rate of diffusion  Osmosis diagram	Diffusion Lab—with rubric	250 ml beakers (16) Electronic balance *Dialysis tubing *15% Glucose/1% starch solution *Benedicts solution *IKI <b>*string (bring)</b>
			Osmosis Activity	Light microscopes Eye droppers/250ml flasks/forceps/knife *salt *distilled water *onion *slides/cover slips
	Evening		Reading, lab write ups	<b>Hmk Q's</b>

Day		Topics	Activities	Lab/Equipment
Day 3 Wednesday	Morning	Cell energy: ATP, carbon cycle, cellular respiration vs. photosynthesis	Think/pair share review sheet	
	Afternoon Prepare for Thursday's lab	Plant Pigment photosynthesis kit(LS2)		
	Evening		Readings, lab write up,	Hmk Q's
Day 4 Thursday	Morning	Molecular Genetics: DNA, Replication, Transcription, Translation, Control of gene expression	Fill in organizer Group activity for translation	
	Afternoon (set up agar plates or do it Friday morning-transformation lab)		DNA extraction Lab (LS3)	Hot water bath (or hot plate and beaker) **"Gene in a Bottle" DNA extraction module (Biorad) *Ethanol or isopropanol *ice
	Evening		Readings, lab write- up, study for quiz	Homework Q:
Day 5 Friday  Lab prep for Mon.	Morning	Transcription comparison, Bacteria and Viruses, reverse transcriptase	Group activity, Quiz, video.	
	Afternoon	Continuation from morning		
Sunday	Evening	ecology lecture and activities		
Day 6 Monday	Morning Lunch--rehydrate	Cell reproduction Mitosis/Meiosis Errors during Meiosis	Mitosis vs. Meiosis comparison activity	*yarn (4 colors) *scissors
	Afternoon Set up lab for Tues.	Mendelian Genetics	Genetics problems	
	Evening		Lab write up	Hmk Q.
Day 7 Tuesday		Selective Breeding Recombinant DNA technology(bacteria, plasmid, gene regulation, rest. enzymes)	Comparison activity Group share Assign poster due on Friday.	Chart paper, markers, tape
	Afternoon	2-3 computer lab/ISP	Transformation Lab Day 1	Flask 1L Incubation Oven Water bath UV lamps *distilled water *bleach for cleanup **pGLO bacterial transformation kit" (Biorad)

Day		Topics	Activities	Lab/Equipment
	Set up lab for Wednesday-culture tubes			
	Evening		Lab write ups, poster	Hmk Q
Day 8 Wednesday	Morning	Bioethics—Case studies in GMO	Editorial, summary	
	Afternoon	Computer lab	Transformation Lab Day 2—Analysis of Results (LS4)	
	Evening	Computer lab	Write-up	Hmk Q
Day 9 Thursday	Morning	Human genetics	ABO exercise Problem sets	
	Afternoon	Mutation and genetic disorders	Lysosyme procedure Karyotyping Lab ABO kits (LS6)	*scissors/glue sticks
		Computer lab		
	Evening	Computer lab	Labs , hmk Q:	Study for quiz
Day 10 Friday	Morning	Darwin, Evidence, Microevolution	Journal, group share, quiz	
	Afternoon	Population Genetics and Evolution kit  Computer lab	chromatography	
	Evening		Readings, write-up	Computer lab
Sunday			Invertebrates	Computer lab
Day 11 Monday	Morning	Patterns of evolution, Taxonomy, Phylogeny	Articles are due-written part of ISP Cladograms	
	Afternoon	Population Genetics Kit cont'd		
	Start putting away inventory		Presentations	TV/VCR Laptop display unit
	Evening		Start working on question for game review	Hmk Q.
Day 12 Tuesday	Morning	Plants Overview	Handouts and exercises	
	Afternoon	Dicot vs. monocot leaf (LS7)	Microscope work	Cross-section of Dicot leaf Microscope Blank paper
	Set up dissection		Presentations continued	TV/VCR Laptop display unit
	Evening		Lab write up, game review preparation	Hmk Q.
Day 13 Wednesday	Morning	Vertebrate Systems	Diagrams—fill in function,	
	Afternoon	Clean up inventory and set up for rotation	Dissection (LS8)	Trays Stereoscopes Dissecting kits *Rats *vinyl gloves
	Evening		game review	Hmk Q.

<b>Day</b>		<b>Topics</b>	<b>Activities</b>	<b>Lab/Equipment</b>
Day 14 Thursday	Morning	Game review-use student question prepared during evening sessions. Give each team 2 units to work on one week before today.--- prizes	10:00 post test	
	Afternoon	Clean-up and prepare for science rotation	1-3 science rotation all LS (lab stations prepared throughout course)	
Day 15 Friday	Morning	Party/Video/certificates/report card distribution		